IC MASTER

VOL. I

1983

Engineering design begins with the IC MASTER

$95.00

1983

IC MASTER

VOLUME I

Engineering design begins with the IC MASTER

Publisher, **Jerry Eimbinder**
Associate Publisher, **James W. Graham**
Editorial Director, **Frank Egan**
Editor, **Dave Howell**
Assistant Editor, **Gail LoBue**
Assistant Editor, **Kathy Schmidt**
Technical Editor, **Paul Seamon**
Production Director, **Dan Chillak**
Typographical Consultant, **Joe Finazzo**
Circulation Manager, **Garry Mayes**
Coordinator, **Joanne Hill**
Manager, Catalog Production, **Lanny Levin**
Catalog Design Director, **Michelle Arnold**
Catalog Design Assistant, **Bill Hennessey**
Art/Production Supervisor, **Charlotte Newman**
Art Staff, **Edith Cyran, Carol Hansen, Mary Koczanowski**
Production Manager, **Martha Gaska**
Production Assistant, **Brenda Buff**
Marketing Services Manager, **Georgeann Johnson**
Sales Administration Supervisor, **Addie Bisignano**
Sales Billing Supervisor, **Aline Lewin**

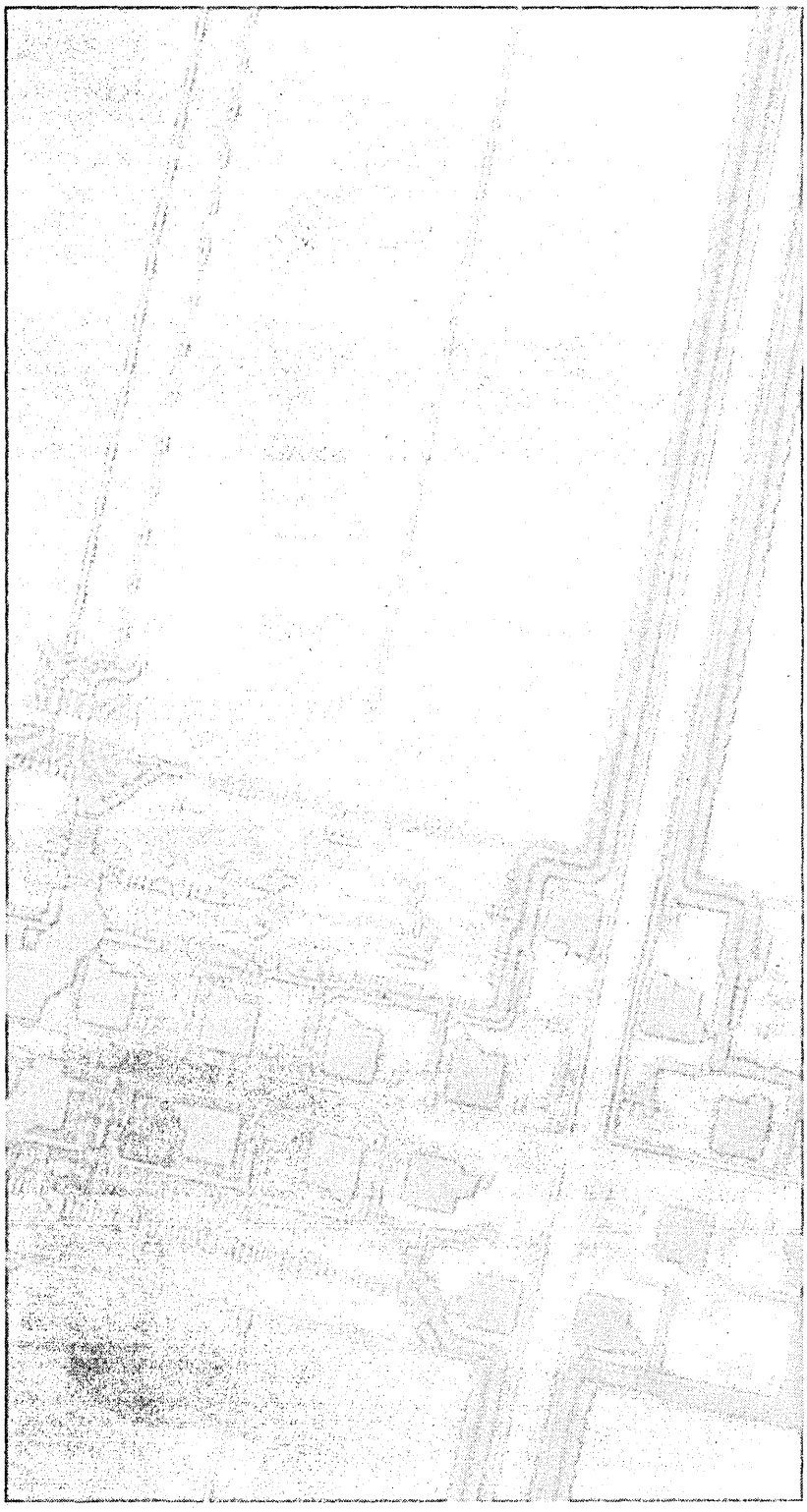
HEARST BUSINESS COMMUNICATIONS, INC./ UTP DIVISION
President, **Manley P. Ludwig**
Vice President, **Theodore Breuer**
Vice President, **Robert J. Males**
Chairman, Executive Committee, **Arthur I. Rabb**

HEARST BUSINESS COMMUNICATIONS, INC.
President, **Robert J. Males**

THE HEARST CORPORATION
President, **Frank A. Bennack, Jr.**
Chairman, **Randolph A. Hearst**
Group Vice President, Books and Business Publishing, **Gordon L. Jones**
Publishing Consultant, **Richard E. Deems**

HEARST BUSINESS COMMUNICATIONS, INC./ UTP DIVISION
East Coast:
645 Stewart Avenue
Garden City, NY 11530
Tel: (516) 222-2500 TWX: 510-222-1673 (UTP GRCY)
West Coast:
1333 Lawrence Expressway, Suite 101
Santa Clara, CA 95051
Tel: (408) 248-8044 TWX: 910-338-0272

IMPORTANT NOTICE
Considerable effort has been expended to make IC MASTER accurate and complete, but IC MASTER cannot assume responsibility for inaccuracies, ommisions, manufacturers' claims, or their representations. No portion of this book may be reproduced without express written permission of the publisher. © IC MASTER, solely owned by Hearst Business Communications Inc./UTP Division, 1983.



CMOS Static RAM (Integrated Device Technology Photo)

© IC MASTER 1983

IMPORTANT FEATURES OF YOUR IC MASTER

ONE COMPLETE SOURCE

IC MASTER is the original and only complete guide to currently available integrated circuits, microcomputer boards, development systems. PROM programmers, gate arrays, and other related components of concern to the design engineer. It has become the first place to look in the critical selection of ICs, boards, systems, and equipment. If only one device can fit the requirements of a new design or if hundreds are available, you can find out in seconds by using the IC MASTER.

EASY TO USE

The IC MASTER saves you time. No longer do you have to spend long, tedious hours and days searching through manufacturers' catalogs and data sheets for information. The MASTER gives you—at your fingertips—an easy way to narrow your IC choices quickly, accurately, and systematically with the knowledge that you have just surveyed the entire industry.

PART NUMBER INDEX

This revolutionary index lists all device types made by over 225 manufacturers in numerical sequence excluding prefixes or suffixes. You can find a device number even though you do not know either the full part number or even the manufacturer. Once a basic device number is located in the index, you can obtain instant identification of all manufacturers making a device by that number, regardless of function, and determine the full part number designation. All page references to data sheet material and any existing application note abstracts are also provided. The Part Number Index should not be used as an alternate source directory because two manufacturers may use the same part number, by coincidence, for totally different devices.

PART NUMBER GUIDE

The information in this guide allows you to break down each company's part numbering system into product temperature ranges, packaging variations, and functions. It is an invaluable tool for the elimination of costly and time-consuming ordering errors caused by lack of standardization from manufacturer to manufacturer in part numbering systems.

APPLICATION NOTE DIRECTORY

Application note descriptions are arranged alphabetically by function and application category. Each note's description identifies the specific device or devices featured, provides a 25 to 30 word abstract, and identifies both the manufacturer that originated the note and the specific application note number. This section provides all the information necessary for you to update your application note files speedily, or thoroughly research the existence of application note material for a specific design problem.

MILITARY PARTS DIRECTORY

Cross reference chart identifies all IC devices having received JAN qualification. This chart includes a cross reference listing of device numbers and corresponding military standard 38510 slash numbers and vice versa.

MILITARY DEVICE TESTING TABLE

This table identifies IC manufacturers who test to military standard 38510 and the screening to military standard 883 that they provide.

MILITARY PARTS INDEX

This guide to JAN qualifed parts makes it possible to search devices by function, and to determine if a JAN qualified part exists for a particular functional need.

ADVERTISERS' PRODUCT INDEX

This index directs the reader to detailed product information for the parts whose manufacturers have included data sheets in IC MASTER. When you are looking for data on a particular manufacturer's products, this index provides the fastest way to find the information you seek.

ALTERNATE SOURCE DIRECTORY

The most comprehensive industry-wide, pin-for-pin, functional equivalent Alternate Source Directory ever compiled. This directory is updated by asking all IC manufacturers to identify each competitive device for which they make a pin-for-pin substitute.

MASTER SELECTION GUIDE

Each guide is organized by specifications and categories to direct the reader easily and quickly to the device most likely to fill the requirements of a particular application. Once the reader finds those devices that are closest to his needs, he sees available sources, and is directed to additional data if provided by advertisers.

MANUFACTURERS AND DISTRIBUTORS DIRECTORY

Locations and phone numbers are given for manufacturers' field sales offices, representatives, and distributors, both domestic and international.

MASTER SELECTION GUIDE INDEX
pg. 10

PART NUMBER INDEX
pg. 34

PART NUMBER GUIDE
pg. 198

APPLICATION NOTE DIRECTORY
pg. 227

© IC MASTER 1983

Typical Problems Solved by IC MASTER

- **Find All Products That Meet Desired Specifications**
- **Obtain Data For A Particular Device • Decode Part Numbers**
- **Determine Alternate Sources • Plus Much More**

An engineer can use IC MASTER to solve a wide variety of problems. Answers provided to engineers by IC MASTER can range from finding the device that best meets a particular set of specifications to helping to determine which family of devices should be used in building a system.

Some of the typical problems that IC MASTER can solve are illustrated in the following examples:

Who makes a TTL 4-bit binary full-adder with look-ahead carry?

All functions are listed, in alphabetical order, in the Master Selection Guide Index. In this case, the engineer looks under adders; in the column adjacent to adders, he sees that all types of adders are listed. The particular adder being sought is covered in the Digital section of IC MASTER.

Now that the engineer knows that the devices he seeks are catalogued in the Digital section, he can turn to the Digital Master Selection Guide and see the page number where information on these devices can be obtained.

When he turns to this page, he will notice that certain device numbers and manufacturers are printed in bold face type while others appear in regular type face. Bold face type is used whenever a part's manufacturer has provided a data sheet for the device in IC MASTER. The page number assigned to the data sheet also appears in bold face type so that the engineer can turn to it directly.

Who Makes a High-Speed 12-Bit, Analog-to-Digital Converter With Guaranteed ±½ LSB Linearity and 13-μsec or Faster Conversion Time?

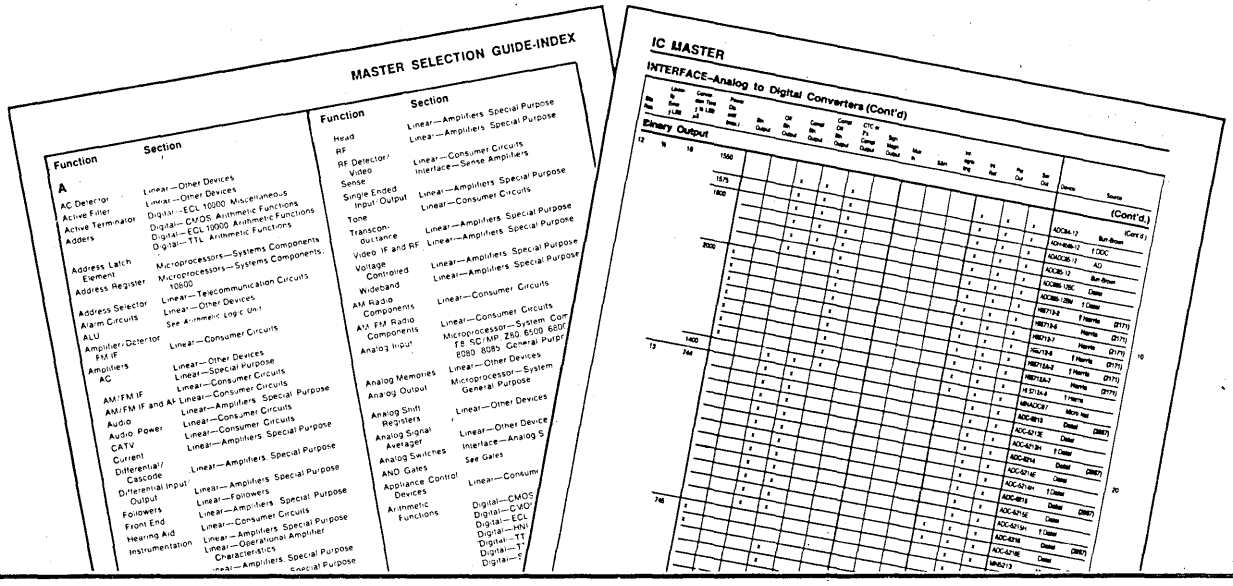
Many manufacturers make devices that meet these specifications including Analog Devices, Burr-Brown, Datel-Intersil, Data Device Corp., Harris, Hybrid Systems, Micro Networks, and Teledyne Philbrick.

The Master Selection Guide for Interface makes it possible for an engineer to find every device that meets the above specifications, regardless of who makes it, in seconds.

The Interface section is organized by product classification; an engineer can turn immediately to the category of interest such as analog switches with drivers, multiplexers, a/d converters with binary output a/d converters with decimal output, d/a converters, display drivers, error checking circuits, keyboard encoder-decoders, line drivers, line transceivers, memory and peripheral drivers, sense amplifiers, etc.

To find every 12-bit analog-to-digital converter with guaranteed ±½ LSB linearity and 13-μsec or faster conversion time, all an engineer has to do is turn directly to the analog-to-digital converter section of the Interface Master Selection Guide.

In this section, devices are organized by key parameters. Under resolution, the engineer finds 12-bit; next he looks under linearity error for ±½ LSB and then he looks under conversion time for devices with 13-μsec or faster specifications.



© IC MASTER 1983

Ways to Use IC Master

What application notes are available on emulating logic functions with PROMs?

IC MASTER provides the most complete listing of application notes available in print. It is easy to find the right application notes by looking in IC MASTER because the application note directory is organized by function.

There are two ways to look up an application note. An engineer can turn to the index page and find the appropriate function or category such as instrumentation amplifiers, multiplexers, or PROMs.

If he knows the device number, he can look it up in the part number index at the front of IC MASTER and see all of the application notes concerning that device. For example, under 8275, a programmable CRT controller listed in the part number index, the reader is referred to the listing for an Intel application note entitled "CRT Terminal Design Using the 8275 and 8279."

To find an application note concerning the use of PROMs to emulate logic functions, the engineer can turn to the application note section on PROMs and see what notes can be of help.

Each listing in the application note directory provides a detailed descriptive passage for the note, gives its length and identifies the manufacturer who publishes it.

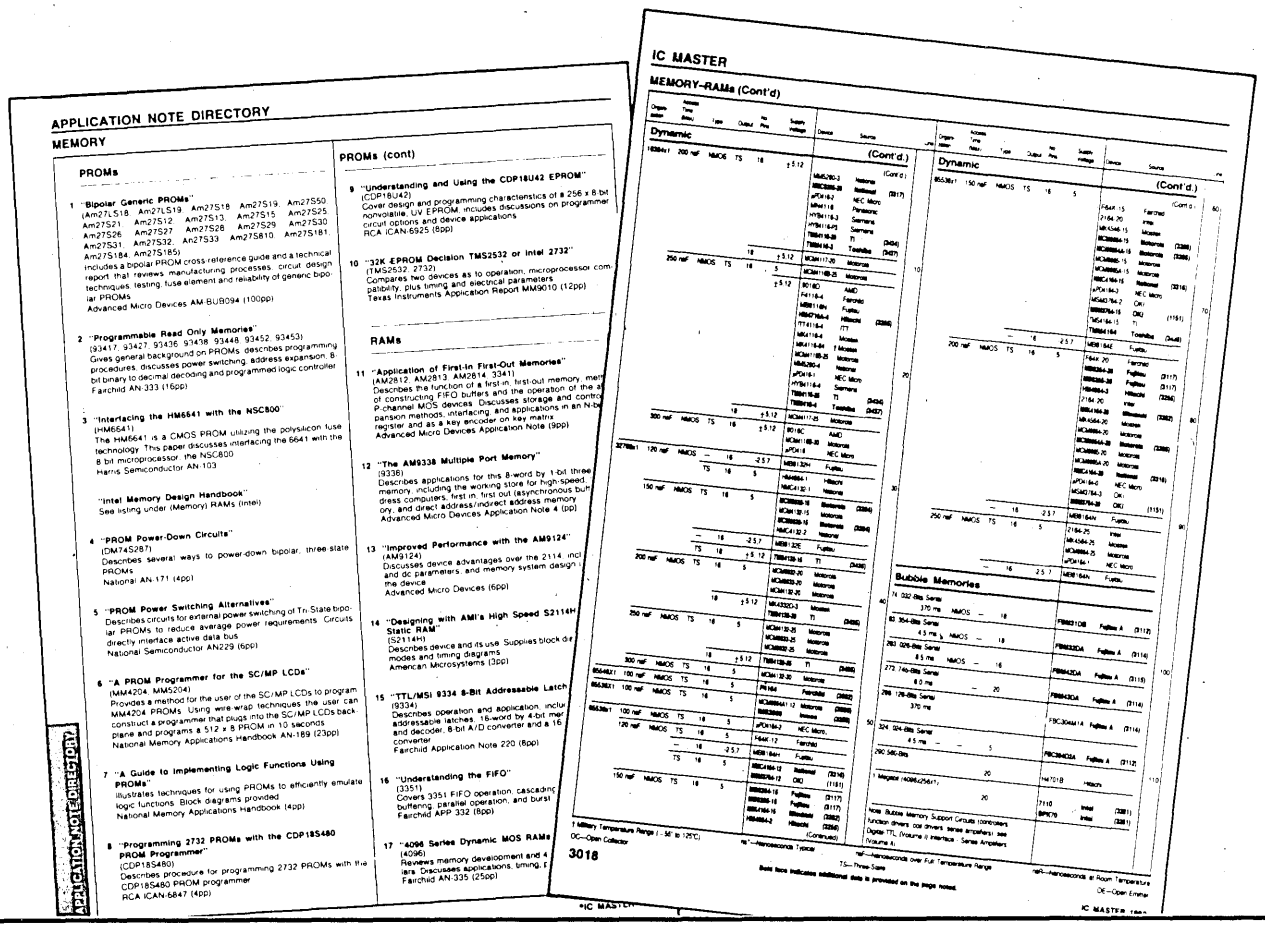
Who makes a 64K dynamic RAM with an access time of 120 ns or faster?

The Memory Section in IC MASTER has a Master Selection Guide which provides initial selection information and data on PROMs, RAMs, ROMs and other types of memories. Each device is characterized by organization (words and bit/word) and access time.

For example, if an engineer was looking for a 64K dynamic RAM, his first step would be to determine organization (words and bit/word). Next, he would locate the desired access time.

When devices are available made by various processes such as NMOS, CMOS, ECL, TTL, etc., the engineer can choose the device that best suits his needs. For further definition, output type, supply voltage and number of pins are listed along with the manufacturer's part number and name.

The engineer's next step in his memory selection process would be to study the applicable data for 64K dynamic RAMs provided by IC manufacturers and pick the most appropriate device. Literally hundreds of pages of engineering data on memories appear in IC MASTER.



Ways to Use IC Master

I need to choose between a full custom or a semi-custom/gate array solution to my design problem.

To help designers weigh custom solutions against semi-custom/gate array approaches, IC MASTER provides a Master Selection Guide on Custom/Semi-Custom and a special section entitled "Options for Going Custom." In this section, the advantages and disadvantages of various custom/semi-custom techniques are covered.

The capabilities of IC manufacturers are tabulated for easy comparison; additional information such as available design aids and testing services is also provided.

My application requires microcomputer boards. How do I start?

Single and multiple board microcomputers are arranged by manufacturer. Under each manufacturer, boards are grouped in sequence according to data word size and, within that grouping, according to the microprocessor on which they are based. Hardware and software support are listed for each board.

A supplementary selection guide is included for microcomputer support boards. The boards are grouped according to supported computer systems.

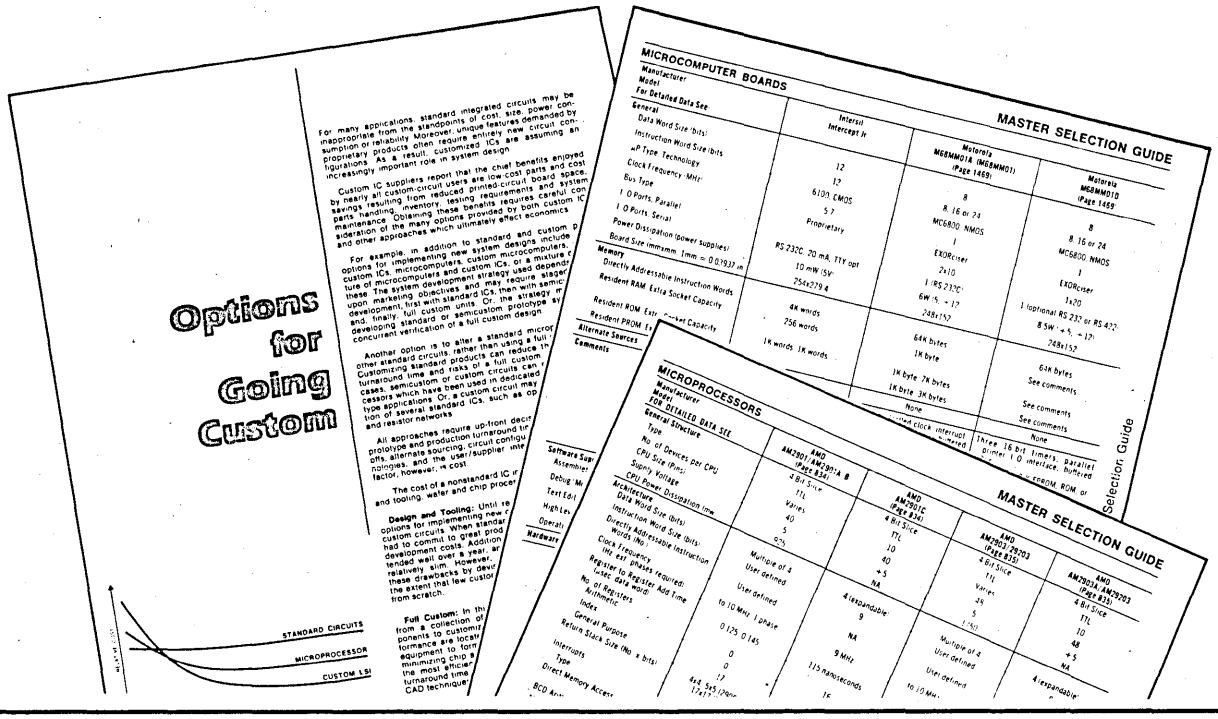
With so many mircoprocessors available, where do I begin?

Simply turn to the Master Selection Guide for Microprocessors. There you will find a listing of all microprocessors currently available and key parameters allowing you to narrow down your selection to a range of products that will meet your major requirements.

Once the microprocessor that best fits the application has been chosen, the next step is to go to the "system components" section. Here all of the available peripheral devices that work with each microprocessor are arranged by function. Thus, if the microprocessor that has been selected is the 8048, system components specifically developed for use with the 8048 are listed, organized by function.

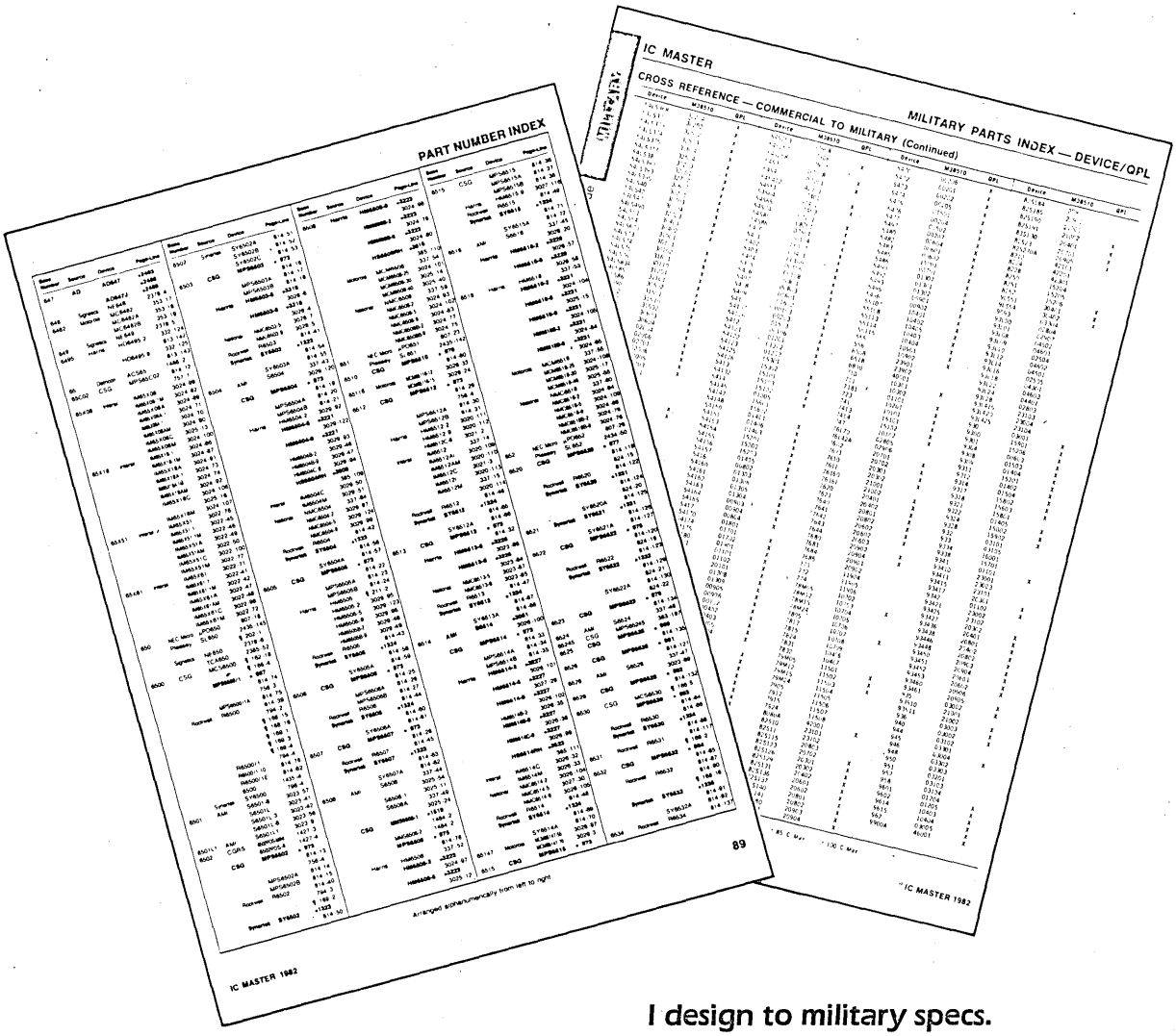
A "general purpose" section follows the "system components" section and describes devices that can be used with more than one microprocessor family.

Finally, hundreds of pages of the latest microprocessor data sheets, provided by IC manufacturers, are presented, arranged in alphabetical order by manufacturer. Each data sheet is easily found thanks to boldfaced page-number references in the Master Selection Guide.



© IC MASTER 1983

Ways to Use IC Master



If an engineer knows that the basic part number is 6508, where does he look first?

The place to look is the part number index. Here, all of the prefixes and suffixes have been stripped away to leave only the basic number. This makes it possible to see the manufacturer of every part with the same base number at a glance. Parts with the same base number, it should be kept in mind, are not necessarily identical; in fact, one could be a memory while another might be a linear device. (To find replacements, one should look in the alternate source directory, not in the part number index.)

Under 6508, the engineer would see a number of devices listed and the page and line numbers where data is given for each of the devices. If an application note concerning any of the devices is available, the location of its listing is also shown.

I design to military specs. Where can I find the latest QPL devices?

The IC MASTER includes a comprehensive military parts directory. Within this directory, tables and charts are provided to answer virtually every information need of the engineer involved in military or high-reliability equipment design.

All integrated circuits with JAN qualification are listed in IC MASTER. A cross reference table, relating device numbers to mil spec numbers, is arranged according to device number. A second table, arranged by M-38510 number, makes it possible to look up the part number when the mil spec number is known.

In addition, ICs are also organized by product section and function, which allows the user to find the proper IC without having to know either the commercial or the military part number.

This section of IC MASTER also includes a table showing the capability of manufacturers to perform MIL-STD-883 screening and high-reliability testing.

© IC MASTER 1983

ADVERTISERS INDEX

Advanced Micro Devices
Digital 601-617
Microprocessor 1201-1246
Microprocessor Development Systems 1701-1705
Microcomputer Boards 1901-1910
Interface 2601-2608
Linear 3101-3137
Memory 3601-3607
American Automation
Microprocessor Development Systems 1706
American Microsystems, Inc.
Digital 618
Microprocessor 1247-1252
Interface 2609-2611
Linear 3138-3150
Memory 3608-3614
Custom/Semicustom 4301-4308
Analog Devices
Linear 3151-3186
Arrow Electronics
357, 1720, 2300
Burr-Brown
1984
California Devices
Custom/Semicustom 4309
Computer Aided Engineering
Custom/Semicustom 4310
Creative Micro Systems
Microcomputer Boards 1911-1912
Cromemco
Microcomputer Boards 1913-1932
Custom MOS Arrays, Inc.
Custom/Semicustom 4311
Datel-Intersil
Microcomputer Boards 1933
Interface 2613-2623
Digelec
PROM Programmers 4101
Diplomat Electronics Corp.
Manufacturers and Distributors Directory
Emulogic
Microprocessor Development Systems 1708-1709
Exar Integrated Systems, Inc.
Linear 3187-3209
Custom/Semicustom 4312-4315
Fairchild
Digital 619-668
Microprocessor 1253-1304
Microprocessor Development Systems 1711-1718
Memory 3615-3666
Custom/Semicustom 4316-4317
Fujitsu America
Memory 3668-3671
Fujitsu Microelectronics
Microprocessor 1305-1308
Memory 3672-3681
Custom/Semicustom 4318-4320
General Instrument
Microprocessor 1309-1332
Memory 3683-3692
Harris Semiconductor
Digital 669-695
Microprocessor 1333-1344
Interface 2624-2742
Linear 3210-3291
Memory 3693-3788
Custom/Semicustom 4321-4430
Hilevel Technology
Microprocessor Development Systems 1719

© IC MASTER 1983

Hitachi America
Microprocessor 1345
Memory 3789
Holt, Inc.
Custom/Semicustom 4431
Hybrid Systems Corp.
Interface 2743-2748
Inmos Corp.
Memory 3790-3792
Integrated Device Technology
Memory 3793-3807
Intel
Microprocessor 1347-1350
Microprocessor Development Systems 1721-1728
Memory 3808-3825
Interdesign, Inc.
Custom/Semicustom 4433
International Microelectronic Products
Custom/Semicustom 4435
Kontron Electronics
PROM Programmers 4103
LSI Computer Systems, Inc.
Digital 696
Custom/Semicustom 4436
Micro Circuit Engineering
Custom/Semicustom 4437-4440
Micro Power Systems
Military 401
Interface 2749
Linear 3292
Mitel Semiconductor
Digital 697-714
Monolithic Memories, Inc.
Digital 715-728
Memory 3826-3838
Custom/Semicustom 4442-4478
Motorola Semiconductor
Digital 729-733
Microprocessor 1351-1360
Microprocessor Development Systems 1729-1738
Microcomputer Boards 1935-1945
Interface 2750-2761
Linear 3293-3298
Memory 3839-3849
Custom/Semicustom 4479-4480
National Semiconductor
Military 402-405
Digital 729-733
Microprocessor 1361-1456
Microcomputer Boards 1946-1955
Interface 2762-2771
Linear 3299-3345
Memory 3850-3871
Custom/Semicustom 4481-4499
OKI Semiconductor
Memory 3872-3873
Oliver Advanced Engineering
PROM Programmer 4104
Optical Electronics
Linear 3346-3347
Plessey Semiconductors
Custom/Semicustom 4501-4516
RCA
Military 406-409
Digital 739-760
Microprocessor 1457-1491
Microcomputer Boards 1956-1961
Linear 3348-3371
Memory 3874-3881
Custom/Semicustom 4517-4521
Schweber Electronics
349, 2064, Volume II opp. page 2401,
Seeq Technology, Inc.
Microprocessor 1492-1500
Memory 3882-3896
Semi Processes Inc.
Digital 761-771
Signetics
Military 410-423
Digital 773-810
Microprocessor 1501-1525
Microprocessor Development Systems 1739-1746
Microcomputer Boards 1962-1979
Interface 2772-2778
Linear 3372-3421
Memory 3897-3939
Custom/Semicustom 4522-4526
Silicon Systems
Custom/Semicustom 4528-4529
Siliconix
Interface 2779-2842
Sprague Electric
Interface 2843
Stag Microsystems
PROM Programmers 4105
Structured Design
PROM Programmers 4106
Sunrise Electronics
PROM Programmers 4107
Synertek
Military 424-432
Microprocessor 1526-1550
Microprocessor Development Systems 1747
Microcomputer Boards 1980-1983
Memory 3940-3957
Custom/Semicustom 4531-4537
TRW LSI Products
Digital 812-819
Linear 3438-3442
Teledyne Semiconductor
Interface 2845-2854
Texas Instruments
Military 433-443
Digital 821-1034
Microprocessor 1552-1564
Microprocessor Development Systems 1748-1749
Interface 2855-2868
Linear 3422-3437
Memory 3958-3980
Custom/Semicustom 4539-4560
Unitrode Corporation
Linear 3444-3446
VTI
Memory 3981-3993
Custom/Semicustom 4561-4562
Weitek
Digital 1036-1041
Western Digital
Microprocessor 1566-1579
Interface 2869-2880
Memory 3994-3997
Custom/Semicustom 4563-4564
Xicor
Memory 3998-3999
Zilog
Microprocessor 1581-1604

© IC MASTER 1983

MASTER SELECTION GUIDE INDEX

(Guide to Product Categories)

When you know the desired function and need specific devices that perform this function, use this index first. Alphabetically, look up the function in which you are interested. For information on appropriate devices that provide this function, you will be directed to one of the following Master Selection Guides:

Master Selection Guide	Starts on Page No.
Digital	444
Microprocessor	1042
Microprocessor Development Systems	1606
Microcomputer Boards	1748
Microcomputer Support Boards	1900
Interface	2410
Linear	2882
Memory	3448
PROM Programmers	4000
Custom/Semicustom	4108

HOW TO USE THE MASTER SELECTION GUIDES

These guides provide sufficient information to help the engineer make an initial product selection, or to lead him to a group of device numbers and their manufacturers. They make it possible to find the products most likely to satisfy the needs of a particular application. All devices that appear in a selection guide are included in the Part Number Index. If the part number for a device is known by the reader, by referring to the Part Number Index, he can see the page and line number for data on that device. If the manufacturer of the device has included a data sheet in IC MASTER with supplementary data, the location of this data sheet is also listed.

All integrated circuits which are intended for consumer applications (such as calculator chips, TV game chips, and organ frequency dividers) are combined under one heading for the reader's convenience; **Linear**—Consumer Circuits. The TTL major families, TTL, TTL-LS, TTL-H, and TTL-s, have been combined to facilitate function comparisons. The **Microprocessor** section includes, in addition to system selection charts, microprocessor system components grouped under the microprocessor type for which they are suited. The **Microcomputer Board** section groups boards alphabetically by manufacturer, and then in sequence according to data word size and the microprocessor on which they are based.

The **Microprocessor (MPU) Development Systems** and **PROM Programmers** are ordered alphabetically by manufacturer, and then described by specific performance parameters.

© IC MASTER 1983

Function	Section
A	
AC Detector	Linear—Other Devices
Active Filter	Linear—Other Devices
Active Terminator	Digital—ECL 10000, Miscellaneous
Adders	Digital—CMOS, Arithmetic Functions Digital—ECL 10000, Arithmetic Functions Digital—TTL, Arithmetic Functions
Address Latch Element	Microprocessors—Systems Components
Address Register	Microprocessors—Systems Components; 10800
Address Selector	Linear—Telecommunication Circuits
Alarm Circuits	Linear—Other Devices
ALU	*See Arithmetic Logic Unit*
Amplifier/Detector FM IF	Linear—Consumer Circuits
Amplifiers	
AC	Linear—Other Devices Linear—Special Purpose
AM/FM IF	Linear—Consumer Circuits
AM/FM IF and AF	Linear—Consumer Circuits
Audio	Linear—Amplifiers, Special Purpose
Audio, Power	Linear—Consumer Circuits
CATV	Linear—Consumer Circuits
Current	Linear—Amplifiers, Special Purpose
Differential/ Cascode	Linear—Amplifiers, Special Purpose
Differential Input/ Output	Linear—Amplifiers, Special Purpose
Followers	Linear—Followers
Front End	Linear—Amplifiers, Special Purpose
Hearing Aid	Linear—Consumer Circuits
Instrumentation	Linear—Amplifiers, Special Purpose Linear—Operational Amplifier Characteristics
Isolation	Linear—Amplifiers, Special Purpose
Limiting	Linear—Amplifiers, Special Purpose
Linear/Antilog	Linear—Amplifiers, Special Purpose
Log/Antilog	Linear—Amplifiers, Special Purpose
Microphone	Linear—Amplifiers, Special Purpose
Mixer/RF	Linear—Consumer Circuits
Operational	Linear—Operational Amplifier Characteristics Linear—Operational Amplifiers, General Purpose Linear—Operational Amplifiers, High Output Current Linear—Operational Amplifiers, High Voltage Linear—Operational Amplifiers, Low Bias Current Linear—Operational Amplifiers, Low Drift Linear—Operational Amplifiers, Programmable Linear—Operational Amplifiers, Single Supply Linear—Operational Amplifiers, Wide Band
Power	Linear—Amplifiers, Special Purpose
Preamplifier	Linear—Amplifiers, Special Purpose Linear—Consumer Circuits
Programmable Gain	Linear—Amplifiers, Special Purpose
Read	Linear—Amplifiers, Special Purpose
RF	Linear—Amplifiers, Special Purpose
RF Detector/ Video	Linear—Consumer Circuits
Sense	Interface—Sense Amplifiers
Single Ended Input/Output	Linear—Amplifiers, Special Purpose
Tone	Linear—Consumer Circuits
Transconductance	Linear—Amplifiers, Special Purpose
Video, IF and RF	Linear—Amplifiers, Special Purpose
Voltage Controlled	Linear—Amplifiers, Special Purpose
Wideband	Linear—Amplifiers, Special Purpose
AM Radio Components	Linear—Consumer Circuits
AM/FM Radio Components	Linear—Consumer Circuits
Analog Input	Microprocessor—System Components; F8, SC/MP, Z80, 6500, 6800, 8008, 8048, 8080, 8085, General Purpose
Analog Memories	Linear—Other Devices
Analog Output	Microprocessor—System Components; General Purpose
Analog Shift Registers	Linear—Other Devices
Analog Signal Averager	Linear—Other Devices
Analog Switches	Interface—Analog Switches
AND Gates	*See Gates*
Appliance Control Devices	Linear—Consumer Circuits
Arithmetic Functions	Digital—CMOS, Arithmetic Functions Digital—CMOS, Miscellaneous Digital—ECL, Arithmetic Functions Digital—HNIL/HTL, Arithmetic Functions Digital—TTL, Arithmetic Functions Digital—TTL, Miscellaneous Digital—Special
Arithmetic Generator/ Processor	Digital—Special Microprocessor—System Components; 1000, 8080, General Purpose
Arithmetic Logic Element	Digital—TTL, Arithmetic Functions
Arithmetic Logic Register Stack	Digital—CMOS, Arithmetic Functions Microprocessor—System Components; Macrologic Bipolar, Macrologic CMOS
Arithmetic Logic Unit	Digital—CMOS, Arithmetic Functions Digital—ECL 10000, Arithmetic Functions Digital—ECL 100K, Arithmetic Functions Digital—TTL, Arithmetic Functions Microprocessor—System Components; IMP, 10800
Arrays	
Bipolar	Linear—Arrays
CMOS	Linear—Arrays, Special Arrays
Custom Digital	Digital—ECL 100K, Miscellaneous Digital—Special Linear—Other Devices

© IC MASTER 1983

IC MASTER

Function	Section
Thyristor/ Transistor	Linear—Arrays, Special Arrays
Transistor	Linear—Arrays, Transistor Arrays
Transistor/Diode	Linear—Arrays, Special Arrays
ASTRO	Interface—Transmitters-Receivers
Asynchronous Communication Controller	Microprocessors—System Components
Asynchronous Communications Element	Microprocessor—System Components; 8080
Asynchronous Communications Interface Adapter	Interface—Transmitters-Receivers
Asynchronous/ Synchronous Transmitter/ Receiver	*See ASTRO*
Attenuator	Linear—Consumer Circuits Linear—Other Linear Devices
Audio Circuits	Linear—Consumer Circuits
Audio Equalizer	Linear—Consumer Circuits
Audio Noise Pop Noise Canceller	Linear—Consumer Circuits
Reduction Dolby	Linear—Consumer Circuits
Audio Signal Delay	Linear—Consumer Circuits
Automotive Circuits	Linear—Consumer Circuits

B

Balanced Modulator/ Demodulator	Linear—Other Devices
Bandpass Filters	Linear—Telecommunication Circuits
Bar Graph Display Driver	Interface—Display Drivers
Baseband Channel Amplifier	Linear—Telecommunication Circuits
Baseband Modem	Linear—Telecommunication Circuits
BASIC Interpreter	Microprocessor—System Components; SC/MP, 8080
Baud Rate Generator	Digital—Special Interface—Serial Transmitters, Receivers
BCD Rate Multiplier	Digital—CMOS, Miscellaneous
Bidirectional Bus Driver	Microprocessor—System Components; 3,000, 8,008, 8048, 8080, 8085
Bidirectional Port	Microprocessor—System Components; 2650
Bidirectional Transceiver	Interface—Line Circuits, Line Transceivers Microprocessor—System Components PACE
Binary Rate Multiplier	Digital—CMOS, Miscellaneous
Bit Programmable I/O	Microprocessor—System Components; SC/MP
Bit Rate Generator	Digital—CMOS, Miscellaneous Interface—Transmitters-Receivers Microprocessor—System Components; Macrologic CMOS, 6100
Blowout Resistant Transistor	Linear—Other Devices
Branch Control Unit	Microprocessor—System Components
Bubble Memories	Memory—Bubble Memories
Bubble Memory Controller	Digital—TTL Interface—Display Drivers, Microprocessor —9900, Peripheral Controllers
Bubble Memory Coil Driver	Linear—Other Devices
Bubble Memory Function Driver	Linear—Other Devices
Bubble Memory Sense Amplifier	Linear—Other Devices
Bucket Brigade Device	Linear—Other Circuits *Also See Analog Shift Registers*
Buffers	Digital—CMOS, Buffers/Inverters Digital—ECL 10000, Buffers Digital—HNIL/HTL, Buffers/Inverters Digital—TTL, Buffers/Inverters Digital—TTL, Drivers Microprocessor—System Components
Bus Interface Circuits	Interface—Line Circuits Microprocessor—System Components
BOART (Bus Oriented ART)	Interface—Transmitters-Receivers
Bus Receiver	Digital—ECL 10000, Miscellaneous Interface—Line Circuits
Bus Switch	Digital—TTL, Miscellaneous
Bus Transceiver	Digital—ECL 10000, Miscellaneous Digital—TTL, Miscellaneous Interface—Line Circuits Microprocessor—System Components; MicroNOVA, 2900, 6800
Bus Translator	Microprocessor—System Components

C

Calculator Circuits	Linear—Consumer Circuits
Calculator, Display Interface	Linear—Consumer Circuits
Calculator, Keyboard Entry Sequence Memory	Linear—Consumer Circuits
Calculator, Printing	Linear—Consumer Circuits
Camera Exposure Control	Linear—Consumer Circuits
Camera, Movie (Sound)	Linear—Amplifiers, Special Purpose; Consumer Circuits
Camera, Strobe Light Control	Linear—Consumer Circuits
Capacitive Input	Microprocessor—System Components; 1000
Cassette Cartridge Data Handler	Microprocessor—Peripheral Controllers
Cassette Controller	Microprocessor—System Components; 8080, 8085A, Peripheral Controllers
CATV Amplifiers	Linear—Consumer Circuits
CB Circuits	Linear—Consumer Circuits Linear—Phase Locked Loop Circuits
CCD Memories	Memories—RAMs, CCD Memories
CCD Memory Driver	Interface—Memory and Peripheral Drivers

© IC MASTER 1983

Function	Section
Central Processing Unit	Microprocessor—System Components; F8, MicroNOVA, M380, PACE, PPS-4 SBPO400, TLCS-12, Z80, 1600, 1800, 3000, 4000, 6100, 6500, 6800, 8008, 8080, 8085A, 9440, 14500
Character Generators	Memory—Character Generators
Chronographs/ Watches	Linear—Consumer Circuits
Citizens Band Radio Circuits	*See CB Circuits*
Click Suppressor	Linear—Telecommunication Circuits
Clock	Digital—CMOS, Oscillators/Dividers Linear—Consumer Circuits
Clock Buffer	Interface—Memory and Peripheral Drivers Microprocessor—System Components; 6800
Clock Driver	*See Drivers*
Clock Generator	Microprocessor—System Components; PPS-4, 2900, 4004, 8000, 8080
Clock Generator/ Driver	Digital—TTL, Miscellaneous
Codec	Linear—Telecommunication Circuits
Code Converters	Memory—Code Converters
Code Identification System (Manchester)	Digital—CMOS, Miscellaneous
Coin Box Circuits	Linear—Telecommunication Circuits
Compander	Linear—Telecommunication Circuits
Comparators, Digital	Digital—CMOS, Arithmetic Functions Digital—ECL 10000, Arithmetic Functions Digital—ECL III, Arithmetic Functions Digital—HNIL/HTL, Arithmetic Functions Digital—TTL, Arithmeic Functions
Comparators, Linear	Linear—Comparators, Single Comparators Linear—Comparators, Dual Comparators Linear—Comparators, Quad Comparators Linear—Phase Locked Loop Circuits
Comparator, Voltage (Analog Input-Digital Output)	Digital—TTL, Miscellaneous
Complementary Output Elements	Digital—TTL, Miscellaneous
Complementer	*See Nines Complementer*
Compressor (Compander)	Linear—Telecommunication Circuits
Constant Current Source	Linear—Other Devices
Contact Bounce Eliminator	Digital—CMOS, Miscellaneous Digital—TTL, Miscellaneous
Control Element	Microprocessor—System Components; 4004
Control ROM	Microprocessor—System Components; IMP, 5781
Control Store Sequencer	Microprocessor—System Components; 2900, General Purpose
Converters Analog to Digital	Interface—Analog to Digital Converters, Binary Output Interface—Analog to Digital Converters, Decimal Output Linear—Other Devices
BCD to Binary	Digital—TTL, Miscellaneous
BCD to Binary/ Binary to BCD	Digital—TTL, Miscellaneous
Binary to Phone Pulse	Digital—CMOS, Miscellaneous
Digital to Analog	Interface—Digital to Analog Converters
Frequency to Voltage	Linear—Other Devices
Logic Level	Digital—CMOS, Buffers/Inverters
Serial to Parallel	Digital—Special
Voltage to Frequency	Linear—Other Devices
Correlation	Digital—Special Linear—Other Devices
Counter	Digital—CMOS, Counters, Miscellaneous Digital—ECL III, Counters Digital—HNIL/HTL, Counters Digital—TTL, Counters, Miscellaneous Digital—Special
Binary	Digital—CMOS, Counters, Binary Digital—ECL 10000, Counters, Binary Digital—ECL 95000, Counters Digital—ECL III, Counters Digital—HNIL/HTL, Counters Digital—TTL, Binary Counters Up Digital—TTL, Binary Counters Up/Down Digital—Special
Decade	Digital—CMOS, Counters, Decade Digital—ECL 10000, Counters, Decade Digital—ECL 95000, Counters Digital—ECL III, Counters Digital—HNIL/HTL, Counters Digital—TTL, Decade Counters Up Digital—TTL, Decade Counters Up/Down Digital—TTL, Miscellaneous Digital—Special
Counter Logic Control	Linear—Phase Locked Loop Circuits
Counter Time Base	Digital—Special Microprocessor—System Components; Z80
Count Extender	Linear—Phase Locked Loop Circuits
Counting Register	Digital—ECL 100K, Counters
CPU	*See Central Processing Unit*
CRC Generator/ Checker	Interface—Error Checking Circuits Microprocessor—System Components; Macrologic Bipolar
CROM	*See Control ROM*
Crosspoint Array	Linear—Telecommunications Circuits
Crosspoint Switches	Interface—Analog Switches, Multiplexers
CRT Controller	Microprocessor—System Components; 6500, 6800, 8000, 8048, 8080, 8085, 9900, Peripheral Controllers
CRT Video Timer Controller	Microprocessor—System Components; General Purpose
Crystal Oscillator	*See Oscillators*
Current Booster/ Amplifier	Linear—Amplifiers, Special Purpose
Current Sensing Interface Gate	Digital—TTL, Miscellaneous
Custom Arrays	*See Custom/Semicustom Section*
Custom Circuits	*Custom Section*

© IC MASTER 1983

IC MASTER

Function	Section
D	
Darlington Switch	Interface—Memory and Peripheral Drivers Linear—Arrays
Data Access Register	Digital—CMOS, Arithmetic Functions Microprocessor—System Components; Macrologic Bipolar, Macrologic CMOS
Data Acquisition Controller	Digital—Special Interface—Memory and Peripheral Drivers Linear—Other Devices
Data Acquisition System	Linear—Other Devices
Data Encryption System	Digital—TTL, Miscellaneous; Other Digital Devices Microprocessor—System Components; Macrologic Bipolar, 6800, 8080
Data Link Controller	Microprocessor—System Components; 6800
Data Path Switch	Digital—CMOS, Arithmetic Functions Linear—Analog Switches Microprocessor—System Components; Macrologic Bipolar, Macrologic CMOS
Data Security Device	Digital—Special Microprocessor—System Components; 6800
Data Selector/ Multiplexer	*See Multiplexers*
Decade Sequencer	Digital—TTL, Miscellaneous
Decoder	Digital—CMOS, Decoders Digital—CMOS, Drivers Digital—ECL 10000, Decoders Digital—ECL 100K, Decoders Digital—TTL, Decoders Digital—CMOS, Drivers Digital—Special Interface—Display Drivers Microprocessor—System Components
FM Stereo	Linear—Consumer Circuits
Keyboard	Interface—Keyboard Encoders, Decoders
Tone	Linear—Phase Locked Loop Circuits
Deglitcher	Linear—Telecommunication Circuits
Delay Line	Linear—Other Devices
Delta Modulation System	Linear—Other Devices Linear—Telecommunication Circuits
Demultiplexer	*See Decoders*
Deskew FIFO	Memory—FIFO Microprocessors—General Purpose
Deskew—Queue Register	Interface—Error Checking Circuits
Detectors	Linear—Consumer Circuits Linear—Other Devices
Development System	Microprocessor—System Components
Dialer Circuits	Linear—Telecommunication Circuits
Digital Filter Switch	Linear—Telecommunication Circuits
Digital Mixer	*See Mixer*
Digital Modulator	Microprocessor—System Components; 6800
Digital to Analog Converters	Interface—Digital to Analog Converters
Diode Arrays	Linear—Arrays
Diode Matrix, Programmable	Digital—Special
Direct Memory Access Controller	*See DMA Controller*
Disk Memory Drivers	Interface—Memory and Peripheral Drivers
Fault Detector	Interface—Memory and Peripheral Drivers
Head Read/Write Circuit	Interface—Memory and Peripheral Drivers
Head Selector	Interface—Memory and Peripheral Drivers
Video Amplifier	Interface—Memory and Peripheral Drivers
Winchester Read/Write Circuit	Interface—Memory and Peripheral Drivers
Display Controller	Microprocessor—System Components; Macrologic Bipolar, PPS-4, 8080, Peripheral Controllers
Display Drivers	Interface—Display Drivers *Also See Drivers*
Dividers	Digital—CMOS, Oscillators/Dividers Digital—TTL, Miscellaneous Digital—Special Linear—Phase Locked Loop Circuits Linear—Other Devices
DMA Address Generator	Microprocessor—System Components
DMA Controller	Microprocessor—System Components; F8, PPS-4, Z80, 1600, 1610, 6800, 8000, 8080, 8085A, 9900, General Purpose
Double Balanced Mixer	Linear—Phase Locked Loop Circuits
DPDT Switches	Interface—Analog Switches
DPST Switches	Interface—Analog Switches
Drivers	Digital—CMOS, Drivers Digital—CMOS, Miscellaneous Digital—ECL 10000, Drivers Digital—ECL 100K, Drivers Digital—HNIL/HTL, Drivers Digital—TTL, Decoders Digital—TTL, Drivers Digital—TTL, Miscellaneous Interface—Analog Switches, Drivers Interface—Display Drivers Interface—Line Circuits Interface—Memory and Peripheral Drivers
Audio	Linear—Consumer Circuits
Counter Display	Digital—Special
DVMs	Digital—Special Interface—Analog to Digital Converters, Decimal Output
Dynamic Memory Interface	Interface—Memory and Peripheral Drivers Microprocessor—System Components; F8
Dynamic Memory Refresh	Digital—TTL, Miscellaneous
Controller	Interface—Memory and Peripheral Drivers Microprocessor—System Components; 6800, 8080
E	
Encoders	Digital—CMOS, Miscellaneous Digital—ECL 10000, Miscellaneous Digital—ECL 100K, Miscellaneous Digital—TTL, Miscellaneous Digital—Special
Keyboard	Interface—Keyboard Encoder-Decoders

© IC MASTER 1983

Function	Section
Keyboard to Binary	Digital—CMOS, Miscellaneous
Tone	Digital—CMOS, Miscellaneous Linear—Telecommunications Circuits
Error Checking Circuits	Digital—ECL10000, Miscellaneous Interface—Error Checking Circuits Microprocessor—System Components 2900
Error Pattern Register	Interface—Error Checking Circuits
Expander	Digital—TTL-Gates, AND-OR/AND-OR Invert Digital—TTL, Miscellaneous
Expander (Compander)	Linear—Telecommunication Circuits
Extender	Digital—TTL-Gates, AND-OR/AND-OR Invert
F	
Facsimile, Frequency Generator	Linear—Consumer Circuits
Fast Carry Extender	Digital—TTL, Arithmetic Functions
Fast Fourier Transformer	Linear—Telecommunication Circuits
Fiber Optics Transmitter/ Receiver	Digital—TTL, Miscellaneous Linear—Other Devices Microprocessor—9900
Fiber Optics Data Link	Linear—Other Devices
Field Programmable Array Logic	Digital—TTL, Miscellaneous Memory—PLAs
Field Programmable Logic Array	Memory—PLAs Microprocessor—System Components
First In First Out Memory	Memory—FIFO Microprocessor—System Components
Flasher (LED)	Linear—Other Devices
Flip-Flops	Digital—CMOS, Flip-Flops Digital—ECL 10000, Flip-Flops Digital—ECL 95000, Flip-Flops Digital—ECL 100K, Flip-Flops Digital—ECL III, Flip-Flops Digital—HNIL/HTL, Flip-Flops Digital—TTL, Flip-Flops Digital—Special
Floating Point Arithmetic	Microprocessor—System Components; 8080
Floppy Disc Amplifier System	Linear—Amplifiers - Special Purpose
Floppy Disc Controller	Microprocessor—System Components; PPS-4, 1600, 6800, 8000, 8048, 8080, 8085A, 9900, Peripheral Controllers
Fluid Detector	Linear—Other Devices
Fluorescent Display Drivers	Interface—Display Drivers
FM Muting/Tuning Point System	Linear—Consumer Circuits
FM Radio Circuits	Linear—Consumer Circuits
FM RF/IF Amplifier	Linear—Consumer Circuits
Followers	Linear—Followers
Four Channel Sound	Linear—Consumer Circuits
Fourier Transform Circuit	Microprocessor—Peripheral Controllers
Frequency Divider	Digital—Special Linear—Consumer Circuits
Frequency Sensitive Switch	Linear—Telecommunication Circuits Linear—Other Devices
Frequency to Voltage Converter	Linear—Other Devices
FSK Modulator/ Demodulator	Linear—Phase Locked Loop Circuits
Function Generator	Linear—Phase Locked Loop Circuits
G	
Games, Video	Linear—Consumer Circuits
Gas Discharge Display Drivers	Interface—Display Drivers
Gates	Digital—CMOS, Gates, Miscellaneous Digital—HNIL/HTL, Gates, Miscellaneous Digital—TTL, Gates, Miscellaneous
AND/NAND	Digital—CMOS, Gates, AND/NAND Digital—ECL 10000, Gates, AND/NAND Digital—HNIL/HTL, Gates, AND/NAND Digital—TTL, Gates, AND/NAND
AND-OR/AND-OR Invert	Digital—CMOS, Gates, AND-OR/ AND-OR Invert Digital—ECL 10000, Gates, AND-OR/ AND-OR Invert Digital—ECL 100K, Gates, AND-OR/ AND-OR Invert Digital—HNIL/HTL, Gates, AND-OR/ AND-OR Invert Digital—TTL, Gates, AND-OR/ AND-OR Invert
Complex Gate w/ Persistance Detector	Digital—Special
Exclusive OR/NOR	Digital—CMOS, Gates, Exclusive OR/NOR Digital—ECL 10000, Gates, Exclusive OR/NOR Digital—ECL 100K, Gates, Exclusive OR/NOR Digital—ECL III, Gates, Exclusive OR/NOR Digital—HNIL/HTL, Gates, Exclusive OR/NOR Digital—TTL, Gates, Exclusive OR/NOR
Majority Logic	Digital—CMOS, Gates, Miscellaneous Digital—TTL, Gates, Miscellaneous
OR/NOR	Digital—CMOS, Gates, OR/NOR Digital—ECL 10000, Gates, OR/NOR Digital—ECL 95000, Gates, OR/NOR Digital—ECL 100K, Gates, OR/NOR Digital—ECL III, Gates, OR/NOR Digital—TTL, Gates, OR/NOR Digital—Special
Gate Expander	Digital—HNIL/HTL, Gates, Miscellaneous
General Purpose Data Transceiver	Digital—TTL, Miscellaneous

© IC MASTER 1983

IC MASTER

Function	Section
General Purpose Interface Circuit	Microprocessor—System Components; 6800, General Purpose
General Purpose Input/Output	Microprocessor—System Components; PPS-4, TLCS-12, 1600, 4004
General Purpose Interface Bus Controller	Microprocessor—8080, 8085A, 9900
General Purpose Keyboard and Display	Microprocessor—System Components; PPS-4
GPIB Talker Listener Interface	Microprocessor—System Components; 8080, 8085
Ground Fault Interrupter	Linear—Consumer Circuits
Gyrator	Linear—Telecommunications Circuits

H

Hall Effect Devices	Digital—Special Linear—Other Devices
Hammer Driver	Interface—Memory and Peripheral Drivers
Hamming Code Detector and Generator	Digital—TTL, Miscellaneous Interface—Error Checking Circuits

I

Identity Comparator	Digital—TTL, Arithmetic Functions
Image Sensor	Linear—Other Devices
Impedance Converter	Linear—Other Devices
Input/Output Control Unit	Microprocessor—System Components
Interface Latch Element	Microprocessor—System Components; PACE
Interrupt Control Unit	Microprocessor—System Components; 3000
Interrupt Controllers, Programmable	Microprocessor—System Components, Various Families
Interrupt Controller	Microprocessor—General Purpose
Interrupter, Ground Fault	Linear—Consumer Circuits
Interval Timer	Linear—Timers Microprocessor—System Components; PPS-4, 8008, 8048, 8080, 8085
Inverters	Digital—CMOS, Buffers/Inverters Digital—HNIL/HTL, Buffers/Inverters Digital—HNIL/HTL, Gates, Miscellaneous Digital—TTL, Buffers/Inverters Digital—Special
I/O Buffer	Microprocessor—System Components; 1600, 8000
I/O Expander	Microprocessor—System Components 1000, 8048, 8080, 8085
I/O Port	Digital—TTL,Miscellaneous Microprocessor—System Components; SC/MP, 1800, 6100, 8X300, 8008, 8048, 8080,8005
I/O Register Array	Digital—TTL, Miscellaneous
I/O Transceiver	Microprocessor—System Components; MicroNOVA
I/O Transceiver Buffer	Microprocessor—System Components; MicroNOVA
IR Transmitter/ Receiver	Linear—Telecommunication Circuits

K

Keyboard/Display Controller	Microprocessor—System Components; 8008, 8048, 8080, 8085
Keyboard Encoders	Interface—Keyboard Encoders, Decoders
Keyboard Interface, Programmable	Microprocessor—8085A

L

Lamp Driver	Interface—Display Drivers
Last In First Out Memory	Memory—LIFOs
Latches	Digital—CMOS, Latches Digital—CMOS, Drivers Digital—ECL 10000, Latches Digital—ECL 95000, Latches Digital—ECL 100K, Latches Digital—ECL III, Latches Digital—HNIL/HTL, Latches Digital—TTL, Latches Microprocessor—System Components
LCD Display Drivers	Interface—Display Drivers
LED Display Drivers	Interface—Display Drivers
Level Detector	Linear—Other Devices
Level Meter	Linear—Other Devices
Level Shifter	Digital—CMOS, Translators Digital—ECL-10000, Translators Digital—HNIL/HTL, Translators Digital—TTL, Translators Interface—Memory and Peripheral Drivers
Light Activated Switch	Linear—Other Devices
Light Dimmer	Linear—Consumer Circuits
Light Detector	Linear—Other Devices
Light to Current Converter	Linear—Other Devices
Light to Frequency Converter	Linear—Other Devices
Line Drivers	Interface—Line Circuits, Single Ended Interface—Line Circuits, Differential
Line Receivers	Digital—ECL 10000, Miscellaneous Digital—ECL 100K, Miscellaneous Digital—ECL III, Miscellaneous Interface—Line Circuits, Single Ended Interface—Line Circuits, Differential
Line Transceiver	Interface—Line Circuits, Transceivers
Link Controller	Interface—Serial Transmitter-Receivers
Logic Processor	Microprocessor—System Components; 8000
Look Ahead Carry Generator	Digital—CMOS, Arithmetic Functions Digital—ECL 10000, Arithmetic Functions Digital—TTL, Arithmetic Functions Microprocessor—System Components; 2900, 3000

© IC MASTER 1983

Function	Section
Loop Disconnect Dialer	Linear—Telecommunication Circuits
Low Battery Indicator	Linear—Other Devices
M	
Macroprogram Sequencer	Microprocessor—System Components; 2900
Magnitude Comparator	Digital—CMOS, Arithmetic Functions Digital—TTL, Arithmetic Functions
Manchester Code Identification System	*See Code Identification System*
Mask Merge	Digital—ECL100K, Shift Registers
MEDIC	Microprocessor—System Components
Memories	
Active Element	Digital—TTL, Memories
CAM	Digital—CMOS, Memories Digital—TTL, Memories
Character Generators	Memory—Character Generators
Code Converters	Memory—Code Converters
FIFO	Digital—CMOS, Memories Digital—TTL, Memories Memory—FIFO
LIFO	Digital—CMOS, Memories Memory—LIFO
PLA	Memory—PLAs
PROM	Digital—ECL 10000, Memories Memory—PROMs Microprocessor—System Components
RAM	Digital—CMOS, Memories Digital—ECL 10000, Memories Digital—ECL 95000, Memories Digital—ECL 100K, Memories Digital—TTL, Memories Memory—RAMs, Bubble Memories Memory—RAMs, Dynamic Memory—RAMs, CCD Memories Memory—RAMs, Static Microprocessor—System Components
ROM	Digital—CMOS, Memories Memory—EAROMs Memory—ROMs, Static Memory—ROMs, Dynamic Microprocessor—System Components
Memory Address Driver	Microprocessor—System Components; MicroNOVA
Memory Control Unit	Microprocessor—System Components; TLCS-12, 2900, 9440
Memory Controller	Interface—Memory and Peripheral Drivers Microprocessor System Components; 6800
Memory Drivers	*See Drivers*
Memory Interface	Interface—Memory and Peripheral Drivers Microprocessor—System Components; 8000, 10800
Memory Mappers	Digital—TTL, Miscellaneous Interface—Memory and Peripheral Drivers
Memory Refresh Logic Circuits	Digital—TTL, Miscellaneous Interface—Memory and Peripheral Drivers
Micro Address Generator	Digital—TTL, Miscellaneous
Microcomputer	Microprocessor—System Components; μCOM-4, μCOM-75, μCOM-87, HMCS-48, SM-4, TLCS-12, TLCS-43, TLCS-46, TMS1000, Z8, 1400, 1500, 1650, 2100, 6000, 6400, 8048, 8051, 8840, 8850, 9900 *Also see Chip Microprocessors and Microcomputers*
Microcontroller	Digital—TTL, Arithmetic Functions Microprocessor—System Components; COP400, GENP, Macrolog, WD40 *Also see Chip Microprocessors and Microcomputers*
Microcomputer Boards	*Microcomputer Board Section*
Microcomputer Support Boards	*Microcomputer Board Section*
Microprocessor	Microprocessor—System Components; iAPX432,F8, Micro NOVA, NSC800, OLMS40, PPS-4/8, Z80, Z800, 1600, 1610, 1800, 2650, 2900, 3000, 3870, 74S481/74LS481, 5781, 5782, 6100, 6500, 6800, 8X300, 8000, 8008, 8048, 8060, 8080, 8085A, 8086, 8088, 9008, 9440, 9900, 10800, 14500, 16000, 68000 *Also see Chip Microprocessors and Microcomputers*
Microprocessor Development Systems	*MPU Development Systems Section*
Microprogram Control Unit	Microprocessor—System Components; 2900, 3000, 67000, 10800
Microprogram Sequencer	Digital—TTL, Miscellaneous Microprocessor—System Components; Macrologic Bipolar, Macrologic CMOS, 2900
Microwave Oven Controller	Linear—Consumer Circuits
Mixer	Linear—Amplifiers, Special Linear—Phase Locked Loop Circuits
Modem	Digital—CMOS, Miscellaneous Interface—Transmitters-Receivers Linear—Telecommunication Circuits Linear—Other Devices Microprocessor—System Components; 6800, 9900
Modulator	Linear—Consumer Circuits Linear—Other Devices
Modulator/ Demodulator	Linear—Consumer Circuits Linear—Other Devices
Motor Control Devices	Interface—Memory and Peripheral Devices Linear—Consumer Circuits Linear—Other Devices
Motor Load Control	Linear—Other Devices
Motor Speed Regulator	Linear—Consumer Circuits Linear—Other Devices
Multifunction Converter	Linear—Other Devices
MPCC	*See Multi-Protocol Communications Controller*

© IC MASTER 1983

IC MASTER

Function	Section
Multiplexers	
Analog	Interface—Analog Switches, Multiplexers Linear—Other Devices
Digital	Digital—CMOS, Multiplexers Digital—ECL 10000, Multiplexers Digital—ECL 100K, Multiplexers Digital—HNIL/HTL, Multiplexers Digital—TTL, Multiplexers Digital—Special
Multiplier	Digital—ECL 10000, Arithmetic Functions Digital—TTL, Arithmetic Functions Microprocessor—System Components;
Binary	Digital—CMOS, Arithmetic Functions
Binary Rate	Digital—CMOS, Miscellaneous Digital—TTL, Miscellaneous
Decade Rate	Digital—TTL, Miscellaneous
Multipliers/ Dividers,	Linear—Other Devices
Analog	Microprocessor—System Components
Multi-Protocol Communications Controller	Interface—Transmitters-Receivers Microprocessor—System Components; 2650, 8080
Multivibrators	Digital—CMOS, Multivibrators Digital—ECL III, Multivibrators Digital—HNIL/HTL, Multivibrators Digital—TTL, Multivibrators Digital—Special
Monostable/ Astable	Digital—CMOS, Multivibrators Digital—ECL 10000, Multivibrators Digital—ECL 100K, Multivibrators Digital—HNIL/HTL, Multivibrators Digital—TTL, Multivibrators
Music Circuits	Linear—Consumer Circuits
N	
NAND Gates	*See Gates*
Next Address Control Unit	Microprocessor—System Components; 2900
Nines Complementer	Digital—CMOS, Arithmetic Functions
Noise Generator	Linear—Other Devices
NOR Gates	*See Gates*
O	
Offset Control System	Linear—Phase Locked Loop Circuits
Organ Circuits	Linear—Consumer Circuits
OR Gates	*See Gates*
Oscillators	Digital—CMOS, Oscillators/Dividers Linear—Phase Locked Loop Circuits Linear—Other Devices
Overvoltage Protector	Linear—Other Devices
P	
Parallel Data Controller	Microprocessor—System Components; PPS-4, Z80
Parallel Interface Element	Microprocessor—System Components; 6100
Parity Generator	Digital—CMOS, Miscellaneous Digital—ECL 10000, Miscellaneous Digital—ECL 100K, Miscellaneous Digital—TTL, Miscellaneous Interface—Error Checking Circuits
Parity Tree	Digital—CMOS, Miscellaneous Digital—TTL, Miscellaneous
PCM Repeater	Linear—Telecommunication Circuits
Peak Detector	Linear—Other Devices
Peripheral Drivers	Interface—Memory and Peripheral Drivers
Peripheral Interface Input/Output	Microprocessor—System Components; F8, SC/MP, 8008, 8048, 8080, 8085, General Purpose
Peripheral Interface Adapter	Microprocessor—System Components; 6500, 6800
Peripheral Interface Element	Microprocessor—System Components; 6100
Phase Comparator	Digital—CMOS, Miscellaneous Interface—Phase Locked Loop Circuits
Phase Frequency Detector	Digital—TTL, Miscellaneous Linear—Phase Locked Loop Circuits
Phase Locked Loop Circuits	Digital—CMOS, Miscellaneous Digital—TTL, Miscellaneous Linear—Phase Locked Loop Circuits
Stereo Decoders	Linear—Consumer Circuits
Phase Sensitive Demodulator	Linear—Other Devices
Phase Shifter	Linear—Other Devices
PIA	*See Peripheral Interface Adapter*
PIN Diode Drivers	Digital—Other Digital Devices Linear—Other Devices
Plasma Display Controller	Interface—Display Drivers
Plasma Display Axis Driver	Interface—Display Drivers
Polynomial Generator	Digital—TTL, Miscellaneous Interface—Error Checking Circuits
Position Scaler	Digital—TTL, Miscellaneous
Potentiometer	Linear—Other Linear Devices
Power Strobe	Digital—TTL, Miscellaneous
Power Supply Control	Linear—Voltage Regulators, Switching Regulators
Power Transistor Driver/Amplifier	Linear—Amplifiers, Special Purpose
Preamplifier Audio	Linear—Amplifiers, Special Linear—Consumer Circuits
Prescalers	Digital—Special Linear—Phase Locked Loop Circuits
Pressure Transducer	Linear—Other Devices
Printer Controller	Interface—Memory and Peripheral Drivers Microprocessor—System Components; 6500, 8080, 9900, Peripheral Controllers

© IC MASTER 1983

Function	Section
Printer Driver	Interface—Memory and Peripheral Drivers
Printer Interface	Microprocessor—System Components; PPS-4, 5799
Printing Calculator Circuits	Interface—Memory and Peripheral Drivers
Priority Encoder	Digital—CMOS, Miscellaneous Digital—TTL, Miscellaneous
Priority Interrupt	Microprocessor—System Components; 2900, 6800, 8008, 8048, 8080, 8085, General Purpose
Processing and Control Element	Microprocessor—System Components; PACE
Programmable Array Logic	Digital—TTL, Miscellaneous Memory—PLAs
Programmable Communications Element	Microprocessor—System Components; 2650, 8008
Programmable General Purpose I/O	Microprocessor—System Components; 8080
Programmable Interface Controller	Microprocessor—System Components
Programmable Keyboard/ Display Device	Interface—Keyboard Encoders Microprocessor—System Components; 4004
Programmable Logic Arrays	Digital—CMOS, Miscellaneous Digital—TTL, Miscellaneous Memory—PLAs
Programmable Synchronous/ Asynchronous Receiver	*See PSAR*
Programmable Synchronous/ Asynchronous Receiver/ Transmitter	*See PSART*
Programmable Synchronous/ Asynchronous Transmitter	*See PSAT*
Programmable Systems Interface	Microprocessor—System Components; 9900
Program Memory	Microprocessor—System Components; 8000
Program Stack	Microprocessor—System Components; Macrologic Bipolar, Macrologic CMOS
Program Storage Unit	Microprocessor—System Components; F8
PROMs	Memory—PROMs Microprocessor—System Components
PROM Programmers	*PROM Programmer Section*
Protocol Controller	Microprocessor—System Components; 8080
PSAR	Interface—Transmitters-Receivers
PSART	Interface—Transmitters-Receivers
PSAT	Interface—Transmitters-Receivers
Pulse Group Decoder	Digital—Special
Pulse Group Encoder	Digital—Special
Pulse Stretcher	Digital—HNIL/HTL, Miscellaneous
Pulse Synchronizer/ Driver	Digital—TTL, Miscellaneous
Pulse Width Modulator	Linear—Voltage Regulators, Switching Regulators
Pulse Width to Voltage Converter	Linear—Other Devices

R

Radio Circuits	Linear—Consumer Circuits
Radio Transmitter	Linear—Other Devices
RAM Interface	Interface—Memory and Peripheral Interface Microprocessor—System Components; 5781, 5799
RAMs	Memory—RAMs Microprocessor—System Components
RAM and I/O	Microprocessor—System Components; M80, 4000, 6500, 8048, 8080, 8085
Read Amplifier/ Preamplifier	Linear—Amplifiers, Special Purpose
Receiver AM	Linear—Consumer Circuits
Receiver AM/FM	Linear—Consumer Circuits
Receiver/Decoder	Interface—Transmitters/Receivers
Redundancy Checker	Digital—TTL, Miscellaneous Interface—Error Checking Circuits
Register File	Digital—TTL, Memories
Regulator, Motor Speed	Linear—Consumer Circuits
Regulator, Switching	Linear—Voltage Regulators, Switching
Regulator, Voltage	Linear—Voltage Regulators
Relay Driver	Linear—Consumer Circuits
Remote Control Circuits	Linear—Consumer Circuits, T.V. Remote Control
Resolver Systems	Linear—Other Devices
Rhythm Circuit	Linear—Consumer Circuits
Ring Modulator	Linear—Other Devices
RMS to DC Converter	Linear—Other Devices
ROM Patch	Memory—PLAs
ROMs	Memory—ROMs Microprocessor—System Components

S

Sample/Hold Circuits	Linear—Sample/Hold Linear—Other Devices
SCR/Triac Control	Linear—Other Devices
Schmitt Trigger	Digital—CMOS, Miscellaneous Digital—HNIL/HTL, Miscellaneous Digital—TTL, Miscellaneous Digital—Special

© IC MASTER 1983

Function	Section
SDLC Protocol Controller	Interface—Transmitter-Receivers Microprocessor—System Components; 8048, 8080, 8085
Security Systems Detector	Linear—Consumer Circuits
Sense Amplifiers	Interface—Sense Amplifiers
Sequence Controller	Microprocessor—System Components; General Purpose
Sequential Machine	Memory—PLAs
Serial Analog Delay	Linear—Other Devices
Serial/Parallel Register	Digital—TTL, Arithmetic Functions
Serial to Parallel Converter	Digital—Special
Serial Receiver	Interface—Serial Transmitters-Receivers
Serial Transmitter	Interface—Serial Transmitters-Receivers
Serial Data Controller	Microprocessor—System Components PPS-4, Z80
Servo Amplifier	Linear—Other Devices
Servo Controller	Linear—Other Devices
Servo Driver	Linear—Consumer Circuits
Shift Registers	
Analog	Linear—Other Devices
Digital	Digital—CMOS, Shift Registers Digital—ECL 10000, Shift Registers Digital—ECL 95000, Shift Registers Digital—ECL 100K, Shift Registers Digital—ECL III, Shift Registers Digital—HNIL/HTL, Shift Registers Digital—TTL, Shift Registers Digital—Special Memory—Shift Registers, Dynamic Memory—Shift Registers, Static
Shifter	Digital—TTL, Miscellaneous
Shift Matrix	Digital—ECL100K, Shift Register
Signal Processor	Linear—Miscellaneous
Sine Wave Generator	Linear—Other Devices
Smoke Detector	Linear—Consumer Circuits
Sonar Transceiver	Linear—Consumer Circuits Linear—Other Devices
Sound Generator	Linear—Consumer Circuits
Speech Filter	Linear—Telecommunication Circuits
Speech Synthesis Processor	Linear—Consumer Circuits Linear—Other Devices
Speedometer Circuit	Linear—Consumer Circuits
SPDT Switches	Interface—Analog Switches
SPST Switches	Interface—Analog Switches
Square Law Device	Linear—Other Devices
Squaring Translator	Linear—Telecommunications Circuits
SSB Detector	Linear—Consumer Circuits
Static Memory Interface	Microprocessor—System Components; F8
Status and Shift Control Unit	Microprocessor—System Components; 2900
Stepping Motor Driver	Linear—Other Devices
Stopwatch Circuits	Linear—Consumer Circuits
Subtractor	*See Arithmetic Functions*
Subscriber Line Interface Circuit	Linear—Telecommunications Circuit
Successive Approximation Register	Digital—CMOS, Miscellaneous Digital—TTL, Miscellaneous
Switches	Linear—Consumer Circuits
Analog	Interface—Analog Switches, Switches With Drivers Interface—Analog Switches, Switches Without Drivers
Crosspoint	Interface—Analog Switches, Multiplexers
Drivers	Interface—Analog Switches, Drivers
Frequency	Linear—Other Circuits
Touch Sensing	Linear—Consumer Circuits
Switching Regulators	Linear—Voltage Regulators, Switching Regulators
Synchronous Communications Controller	Microprocessor—System Components
Synchronous Data Link Controller	Interface—Transmitters-Receivers *Also See SDLC Protocol Controller*
Synchronous Receiver/ Transmitter	Interface—Transmitters-Receivers
Synchronous Serial Data Adapter	Microprocessor—System Components; 6800, General Purpose
Synthesizer	Linear—Phase Locked Loop Circuits
System Controller and Bus Driver	Microprocessor—System Components; 8080
System Timing Elements	Microprocessor—System Components; PACE

T

Tachometer	Linear—Consumer Circuits
Tape Recorder Control Circuits	Linear—Consumer Circuits
Tele-communications Data Interface	Microprocessor—System Components; PPS-4
Telephone Circuits	Linear—Telecommunication Circuits
Telephone Restricter	Linear—Telecommunication Circuits
Telephone Signal Processing Peripheral	Linear—Telecommunication Circuits
Teletex Circuits	Linear—Telecommunication Circuits
Temperature Controlled Differential Pair	Linear—Other Devices
Temperature Transducers	Linear—Other Devices
Thermal Converter	Linear—Other Devices
Thermal Printhead Driver	Interface—Memory and Peripheral Drivers

© IC MASTER 1983

Function	Section
Thermometer	Linear—Consumer Circuits Linear—Other Devices
Threshold Switch	Linear—Other Devices
Time Slot Assigner	Digital—CMOS, Miscellaneous
Timers	Digital—CMOS, Miscellaneous Linear—Consumer Circuits Linear—Timers Microprocessor—System Components; 6800
Timing Controller	Microprocessor—General Purpose
Timing Function	Microprocessor—System Components; 10800
Tone Decoder	Linear—Phase Locked Loop Circuits
Tone Encoder	*See Encoders*
Tone Generator	Linear—Phase Locked Loop Circuits
Tone Operated Switch	Linear—Telecommunication Circuits
Tone Receiver	Linear—Telecommunication Circuits
Tone Ringer	Linear—Telecommunication Circuits
Tone Transmitter	Linear—Telecommunication Circuits
Top Octave Generator	Linear—Consumer Circuits
Tone Squelch System	Linear—Consumer Circuits
Track and Hold	Linear—Other Devices
Traffic Decoder	Linear—Other Devices
Traffic Information Control	Linear—Other Devices
Translators	Digital—CMOS, Translators Digital—ECL 10000, Translators Digital—ECL 95000, Translators Digital—HNIL/HTL, Translators Digital—TTL, Translators Interface—Memory and Peripheral Drivers Microprocessor—System Components
Transmitter	Linear—Consumer Circuits
Transmitter/ Receiver	Linear—Telecommunication Circuits
Transversal Filters	Linear—Other Devices
True/Complement, Zero/One Element	Digital—TTL, Miscellaneous
Tuner Control, AM/FM	Linear—Consumer Circuits
Tuning Voltage Stabilizer	Linear—Consumer Circuits
Two Modulus Prescaler	Linear—Phase Locked Loop Circuits
Two-Wire to Four-Wire Converter	Linear—Telecommunications Circuits
T.V. Circuits	Linear—Consumer Circuits

U

Universal Communications Interface	Interface—Transmitters-Receivers
Universal Peripheral Interface	Microprocessor—System Components; 8048, 8080, 8085
UART	Interface—Transmitters-Receivers
USART	Interface—Transmitters-Receivers
USRT	Interface—Transmitters-Receivers
USYNRT	Interface—Transmitters-Receivers

V

VCO	*See Voltage Controlled Oscillator*
Victor Dot Matrix Printer Controller	Microprocessor—System Components; PPS-4
Video Digital Converter	Interface—Digital to Analog Converters
Video Display Controller	Microprocessor—System Components; 1800, Peripheral Controllers
Video Display Controller/ Interface	Linear—Consumer Crcuits Microprocessor—6800
Video Games	Linear—Consumer Circuits
Video Tape Recorder	Linear—Consumer Circuits
Video Timer/Controller	Microprocessor—9900
Voltage Comparator	Digital—TTL, Miscellaneous
Voltage Controlled Oscillators	Digital—ECL III, Miscellaneous Digital—TTL, Miscellaneous Linear—Consumer Circuits Linear—Phase Lock Loop Circuits
Voltage Controlled Transient Generator	Linear—Consumer Circuits
Voltage Detector	Linear—Other Devices
Voltage Level Monitor	Linear—Other Devices
Voltage References	Linear—Other Devices Linear—Voltage References
Voltage Regulators	Linear—Voltage Regulators, Fixed Positive Fixed Negative Fixed Dual Adjustable Positive Adjustable Negative Adjustable Dual Switching
Automotive	Linear—Consumer Circuits
VTR	*See Video Tape Recorder*

W/Z

Wallace Tree	Digital—ECL Digital—TTL, Arithmetic Functions
Watch Circuits	Digital—CMOS, Oscillators/Dividers Linear—Consumer Circuits
Window Discriminator	Linear—Other Devices
Zero Voltage and Zero Crossing Triggers	Linear—Other Devices

© IC MASTER 1983

Last Page This Section. Next Page 34.

PART NUMBER INDEX

This index shows the page and line on that page where each device appears in the Master Selection Guide. The list is prepared by a computer from the data in these sections so that every device in them is listed. The devices are arranged in order by basic numbers so that similarly numbered devices from different manufacturers are grouped together. Basic numbers for microcomputer boards and microprocessor development systems are also included. BOLD FACED listings lead to manufacturers' supplied data sheets. Use this index to locate key operational characteristics, application notes, and devices data whenever you have a model number. This is an index of all parts with identical basic part numbers, regardless of their function. It is not an Alternate Source Directory.

HOW TO USE THE PART NUMBER INDEX

This Part Number Index is arranged in alpha-numeric sequence, ignoring the manufacturers' prefixes and suffixes and using the basic model numbers. This basic number sequence is sorted by reading the digits from **left** to **right,** assuming that letters come before numbers. (As an example, these numbers would appear in the following order: 5301, 531, 54H01, 54139, 5414.) Under each basic number, manufacturers' names and full model numbers are listed. The page references in **BOLD FACE** lead to manufacturers' data and application notes. Short editorial descriptions of all Active Applications Notes available from every manufacturer are indicated by a ¶ sign.

The arrangement of this index by base number gives you several advantages. It allows you to find a device by its basic number whether or not you know the name of the manufacturer or the manufacturer's prefixes. Also it groups similar devices together so that when you are looking for data you can quickly determine if the data has been provided in the book by any of the manufacturers and where that data is. Similarly it groups any references to application notes close together so that you do not need to guess which manufacturer might publish application notes on a device before you can locate them.

Once you become familiar with the alpha-numeric numbering sequence, you'll find that this index is easy to use.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
ADC-HUEBMC			
	Datel	ADC-HUEBMC	★2619
AMS-DB			
	Western	AMS-DB	1769-15
AMSSeries			
	Siemens	AMSSeries	1765-3
AMTS	IntCompSys	AMTS	1763-10
AMU/PR			
	AMI	AMU/PR	★1251
			1098-66
			★1251
			1077-22
BIPOLAR UNIRAYS			
	MercEng	BIPOLAR UNIRAYS	★4438
Bipolar Unirays			
	MercEng	Bipolar Unirays	★4438
CDSIV	RCA	CDSIV	1628-4
CIPMF	OhioSci	CIPMF	1757-32
CLIC-A	CalDevices	CLIC-A	4140-23
CLIC-B	CalDevices	CLIC-B	4140-24
CLIC-C	CalDevices	CLIC-C	4140-25
CLIC-D	CalDevices	CLIC-D	4140-26
CLIC-E	CalDevices	CLIC-E	4140-27
CLIC-F	CalDevices	CLIC-F	4140-28
CLIC-G	CalDevices	CLIC-G	4140-29
CLIC-H	CalDevices	CLIC-H	4140-30
CLIC-J	CalDevices	CLIC-J	4140-31
CLIC-L	CalDevices	CLIC-L	4140-32
CLIC-M	CalDevices	CLIC-M	4140-33
CMOS UNIRAYS			
	MercEng	CMOS UNIRAYS	★4439
CMOS Unirays			
	MercEng	CMOS Unirays	★4439
CSP	Crememco	CSP	★1926
DAC-HFBMC			
	Datel	DAC-HFBMC	2441-21
DPU	Crememco	DPU	★1914
			1767-32
Digitalker			
	National	Digitalker	1102-77
ECL-ARRAY			
	NEC-Electron	ECL-ARRAY	4141-55
ECL-Array			
	Fairchild	ECL-Array	4140-78
EM-Series			
	APM	EM-Series	1616-4
ES-Series			
	APM	ES-Series	1617-1
EXORciserII			
	Motorola	EXORciserII	1626-3
EZ-PRO	AMA	EZ-PRO	★1705
			1616-1
EiComp	DiversTech	EiComp	1620-4
FACT	Fairchild	FACT	★ 660
FAIRCAD			
	Fairchild	FAIRCAD	★4317
FS-I	Fairchild	FS-I	★1711
Formulator			
	Fairchild	Formulator	1621-4
HCS	CalDevices	HCS	★4309
HCSSeries			
	CalDevices	HCSSeries	4140-41
HELP	Harris	HELP	★3749
I	IMP	I	★4435
IMPEL	IMP	IMPEL	★4435
IOP	Crememco	IOP	★1921
ISOCMOS			
	Plessey	ISOCMOS	★4504
ISeries	IMP	ISeries	4140-135
Icebox	RELMS	Icebox	1630-1
IntellecIII			
	Intel	IntellecIII	1624-4
InterceptJr.			
	Intersil	InterceptJr	1767-5
KDS	Kontron	KDS	1625-3
MASTERMOS			
	Monosil	MASTERMOS	4141-37
MCA	Interdesign	MCA	★4433
			4141-142
	MasterLogic	MCA	4141-161
MCA-series			
	Motorola	MCA-series	2967-5
MCB	Interdesign	MCB	★4433
			4141-143
	MasterLogic	MCB	4141-162
MCC	Interdesign	MCC	★4433
			4141-144
	MasterLogic	MCC	4141-163
MCD	Interdesign	MCD	★4433
			4141-145
	MasterLogic	MCD	4141-164
MCE	Interdesign	MCE	★4433
			4140-95
MCF	Interdesign	MCF	★4433
			4140-96
MCG	Interdesign	MCG	★4433
			4140-97
MCS	Bedford	MCS	1763-9
MCU	Crememco	MCU	★1914
MDA	Interdesign	MDA	★4433
			4140-98
MDE	DEC	MDE	1620-1
MICROCELL			
	Plessey	MICROCELL	★4508
MICROLIN			
	Plessey	MICROLIN	★4512
MLA	Interdesign	MLA	★4433
			4140-99
MLZ-DAQ			
	Heurikon	MLZ-DAQ	1755-16
			¶ 250-13
MLZ-VDC			
	Heurikon	MLZ-VDC	1757-5
MOA	Interdesign	MOA	★4433
			4140-100
MOB	Interdesign	MOB	★4433
			4140-101
MOC	Interdesign	MOC	★4433
			4140-102
MOD	Interdesign	MOD	★4433
			4140-103
MOE	Interdesign	MOE	★4433
			4140-104
MOF	Interdesign	MOF	★4433
			4140-105
MOG	Interdesign	MOG	★4433
			4140-106
MOH	Interdesign	MOH	★4433
			4140-107
MOJ	Interdesign	MOJ	★4433
			4140-108
MOL	Interdesign	MOL	★4433
			4140-109
MOM	Interdesign	MOM	★4433
			4140-110
MON	Interdesign	MON	★4433
			4140-111
MONOCHIP			
	Interdesign	MONOCHIP	4140-112
			¶ 232-15
			¶ 232-16
			¶ 237-12
			¶ 267-2
			¶ 269-6
			¶ 269-9
			¶ 273-11
			¶ 275-4
			¶ 275-8
			¶ 275-9
			¶ 275-15
			¶ 277-13
			¶ 277-14
			¶ 278-1
			¶ 279-15
			¶ 280-6
			¶ 280-15
			¶ 281-8
			¶ 282-1
	MasterLogic	MONOCHIP	4140-163
MONOLOGIC			
	Monosil	MONOLOGIC	4141-175
MOP	Interdesign	MOP	★4433
			4140-113
MOQ	Interdesign	MOQ	★4433
			4140-114
MPA	Interdesign	MPA	★4433
			4140-115
MPB	Interdesign	MPB	★4433
			4140-116
MPC	Interdesign	MPC	★4433
			4140-117
MPD	Interdesign	MPD	★4433
			4140-118
MPX	Interdesign	MPX	★4433
			4140-119
MRA	Interdesign	MRA	★4433
			4140-120
MRB	Interdesign	MRB	★4433
			4140-121
MRC	Interdesign	MRC	★4433
			4140-122
MRD	Interdesign	MRD	★4433
			4140-123
MRE	Interdesign	MRE	★4433
			4140-124
MRF	Interdesign	MRF	★4433
MSA	Interdesign	MSA	★4433
			4140-125
MSB	Interdesign	MSB	★4433
			4140-127
MSC	Interdesign	MSC	★4433
			4140-129
MUA	Interdesign	MUA	★4433
			4140-130
MUB	Interdesign	MUB	★4433
			4140-132
MUC	Interdesign	MUC	★4433
			4140-133
MVMEBUG			
	Motorola	MVMEBUG	★1936
MicroNOVA			
	DataGen	MicroNOVA	1100-55
Microflamel			
	Fairchild	Microflamel	1622-1
NDS-I	Intel	NDS-I	1625-1
NDS-II	Intel	NDS-II	1625-2
OCPU	Zilog	OCPU	★1583
PAL	MMI	PAL	★4442
PBX	Stag	PBX	4008-4
PRI	Crememco	PRI	★1930
PSCOPE			
	Intel	PSCOPE	★1726
QDRT	Crememco	QDRT	★1925
RSBC-Z80SP			
	RELMS	RSBC-Z80SP	1757-17
SCAMP	Plessey	SCAMP	★4515
SCC	Crememco	SCC	★1917
			1755-23
SDI	Crememco	SDI	★1931
SHM-HUMC			
	Datel	SHM-HUMC	★2622
			2967-76
SHM-HUMM			
	Datel	SHM-HUMM	★2620
			2967-77
SHM-HUMR			
	Datel	SHM-HUMR	★2622
SMPSeries			
	Siemens	SMPSeries	1765-12
SpeedScreener			
	Oliver	SpeedScreener	4007-3
Starplex			
	National	Starplex	1627-4
			¶ 244-1
			¶ 248-11
StarplexII			
	National	StarplexII	1628-1
SuperboardII			
	OhioSci	SuperboardII	1759-1
SystemOne			
	Cromemco	SystemOne	1618-2
SystemThree			
	Cromemco	SystemThree	1618-4
SystemTwo			
	Cromemco	SystemTwo	1618-3
TRT	Crememco	TRT	★1923
Unides	MicroEng	Unides	4141-28
VERSAmodule			
	Motorola	VERSAmodule	1769-2
XR-CHIP			
	Exar	XR-CHIP	4140-62
XRCMA	Exar	XRCMA	4140-73
XRCMB	Exar	XRCMB	4140-74
XRCMC	Exar	XRCMC	4140-75
XRCMD	Exar	XRCMD	4140-76
Z-UPC	Synertek	Z-UPC	1101-96
ZPU	Crememco	ZPU	★1916
			1755-24
iPDS	Intel	iPDS	★1721
			1624-2
000	GI	SPR000	★1324
			2902-79
0002	Harris	LH0002	2887-14
		LH0002C	2887-15
	National	LH0002	★3342
			2887-16
			¶ 264-2
		LH0002C	★3342
			2887-17
			¶ 264-2
0003	National	LH0003	2909-82
			2913-113
			2925-46
		LH0003C	2913-114
			2925-47
0004	National	LH0004	2910-75
			2921-13
		LH0004C	2909-115
			2910-76
			2921-36
0005	National	LH0005	2909-91
			2913-115
			2933-14
		LH0005A	2909-92
			2913-116
			2925-32
		LH0005C	2909-95
			2913-117
			2933-15
0006	National	DH0006	★3344
			2484-11
		DH0006C	★3344
			2484-12
0007	National	MH0007	2481-14
			¶ 260-4
		MH0007C	2481-15
			¶ 260-4
0008	National	DH0008	★3344
			2484-13
		DH0008C	★3344
			2484-14
0009	National	MH0009	2481-102
			¶ 260-4
		MH0009C	2481-103
			¶ 260-4
001	RCA	GP001	★ 409
			1086-93
	Solitron	CJCA001	2960-15
		CJSE001	2955-46
0011	National	DH0011	★3344
			2484-15
		DH0011C	★3344
			2484-16
0012	National	MH0012	2481-16
			¶ 260-4
		MH0012C	2481-17
			¶ 260-4
0013	National	MH0013	2481-104
			¶ 260-4
		MH0013C	2481-105
			¶ 260-4
	OEI	AH0013CA	★3346
			2888-19
		AH0013CB	★3346
			2888-20
		AH0013MA	★3346
			2888-21
0014	National	AH0014	★3344
			2421-66
		AH0014C	★3344
			2421-67
0015	National	AH0015	★3344
			2416-100
		AH0015C	★3344
			2416-101
0016	National	DH0016	★3344
0017	National	DH0017C	★3344
			2484-17
0018	National	DH0018C	★3344
			2484-18

¶ Indicates page number in Application Note Directory.
★Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
0019	**National**	**AH0019**	★3344
			2420-29
		AH0019C	★3344
			2420-30
002	Solitron	CJCA002	2960-60
		CJSE002	2958-11
0020	**Fairchild**	**GE0020**	★4316
			4140-82
	National	**LH0020**	★3342
			2909-93
			2924-35
		LH0020C	★3342
			2909-94
			2931-12
0021	**National**	**LH0021**	★3342
			2909-61
			2925-42
		LH0021C	★3342
			2909-71
			2931-16
0022	**National**	**LH0022**	★3342
			2925-50
			¶ 266-15
		LH0022C	★3342
			2930-1
			¶ 266-15
			¶ 266-15
0023	**National**	**LH0023**	★3343
			2967-115
		LH0023C	★3343
			2967-116
0024	**National**	**LH0024**	★3342
			2910-14
			2913-153
			2926-32
		LH0024C	★3342
			2910-24
			2913-154
			2932-26
0025	**AD**	**HTS-0025**	★3181
			2967-64
	National	DS0025	2481-96
			¶ 285-7
		DS0025C	2481-97
			¶ 285-7
0026	Fairchild	0026	2481-93
	Motorola	MMH0026	2481-94
		MMH0026C	2481-95
	National	DS0026	2481-98
			¶ 285-7
		DS0026C	2481-99
			¶ 285-7
0028	**National**	**DH0028C**	★3344
			2480-155
003	MicroEng	MT003	464-36
	National	**LH003**	★3342
	Solitron	CJSE003	2955-47
0030	Sanyo	STK0030	2896-150
0032	**AD**	**ADLH0032**	★3155
			2913-149
			2927-24
		ADLH0032C	★3155
			2913-150
			2934-19
	National	**LH0032**	★3342
			2910-15
			2913-151
			2927-25
		LH0032C	★3342
			2910-16
			2913-152
			2934-20
	TeledyneP	TP0032	2927-23
0033	**AD**	**ADLH0033**	★3155
			2908-2
		ADLH0033C	★3155
			2908-5
	National	**LH0033**	★3342
			2908-3
		LH0033C	★3342
			2908-6
0034	**National**	**DH0034**	★3344
			505-144
		DH0034C	★3344
			505-145
0035	**National**	**DH0035**	★3344
0035	National	DH0035	511-104
			¶ 262-12
			★3344
			2965-78
			¶ 262-12
		DH0035C	★3344
			511-105
			¶ 262-12
			★3344
			2965-79
			¶ 262-12
0036	**National**	**LH0036**	★3343
			2887-86
		LH0036C	★3343
			2887-87
0037	**National**	**LH0037**	★3343
			2887-88
		LH0037C	★3343
			2887-89
0038	**National**	**LH0038**	★3343
			2887-90
		LH0038C	★3343
			2887-91
004	**National**	**LH004**	★3342
	Solitron	CJSE004	2958-12
	TI	**TAT004**	★ 438
0040	Sanyo	STK0040	2896-151
00401	DDC	ADC00401	2431-35
0041	**National**	**LH0041**	★3342
			2909-77
			2925-40
		LH0041C	★3342
			2909-78
			2931-7
0042	AD	AD0042C	2934-50
	Intersil	LH0042	2934-47
		LH0042C	2934-51
	National	**LH0042**	★3342
			2934-48
		LH0042C	★3342
			2934-52
			¶ 266-15
0043	**National**	**LH0043**	★3343
			2967-117
		LH0043C	★3343
			2967-118
0044	**National**	**LH0044**	★3342
			2911-82
			2915-8
		LH0044A	★3342
			2911-26
			2914-25
		LH0044AC	★3342
			2911-27
			2914-26
		LH0044B	★3342
			2911-49
			2915-7
		LH0044C	★3342
			2911-83
			2915-49
0045	National	LH0045	2888-136
		LH0045C	2888-137
005	**National**	**LH005**	★3342
	Solitron	CJSE005	2955-48
0050	Sanyo	STK0050	2896-152
0052	**National**	**LH0052**	★3342
			2911-32
			2917-46
			¶ 266-15
		LH0052C	★3342
			2911-43
			2920-17
			¶ 266-15
			¶ 266-15
0053	**National**	**LH0053**	★3343
			2967-119
		LH0053C	★3343
			2967-120
0055	Sanyo	STK0055	2896-153
0056	National	DS0056	2481-100
		DS0056C	2481-101
0059	Sanyo	STK0059	2896-154
006	MicroEng	MT006	464-40
	Solitron	CJSE006	2958-13
0060	Sanyo	STK0060	2896-155
0061	**National**	**LH0061**	★3342
			2909-73
			2926-17
		LH0061C	★3342
			2909-74
			2933-44
0062	**National**	**LH0062**	★3342
			2910-54
			2926-39
		LH0062C	★3342
			2910-55
			2934-16
0063	**National**	**LH0063**	★3342
			2908-7
		LH0063C	★3342
			2908-8
0069	**National**	**DH0069**	★3344
			2483-158
007	Solitron	CJCA007	2960-16
0070	**National**	**LH0070**	★3304
			★3343
			2966-156
	Sanyo	STK0070	2896-156
0071	**National**	**LH0071**	★3304
			★3343
			2966-175
		LH0071-0	★3304
			★3343
			2966-172
		LH0071-1	★3304
			★3343
			2966-173
		LH0071-2	★3304
			★3343
			2966-174
0075	**National**	**LH0075**	★3303
			★3343
			2954-1
			2958-99
			2959-15
		LH0075C	★3303
			★3343
			2959-16
0076	**National**	**LH0076**	★3303
			★3343
			2960-23
		LH0076C	★3303
			★3343
			2960-24
008	Solitron	CJCA008	2960-61
	TI	**TAT008**	★ 438
	TRW	**MPY008A**	★ 812
			475-146
			475-147
		MPY008H	★ 812
			475-148
			475-149
		Y008A	★ 812
		Y008H	★ 812
0080	Sanyo	STK0080	2896-157
	Sharp	LH0080	1097-40
			1073-23
0082	GI	ER0082	3455-17
	National	LH0082	2887-40
		LH0082C	2887-41
0084	**National**	**LH0084**	★3343
			2887-100
		LH0084C	★3343
			2887-101
0086	**National**	**LH0086**	★3343
			2887-102
		LH0086C	★3343
			2887-103
009	Solitron	CJSE009	2956-1
0091	**National**	**LH0091**	★3343
			2967-48
			¶ 277-11
		LH0091C	★3343
			2967-49
			¶ 277-11
0094	**National**	**LH0094**	★3343
			2964-146
		LH0094C	★3343
			2964-147
01	HybridSys	HSREF01	2966-139
	MicroPwr	DAC-01	2439-7
01	MicroPwr	DAC-01B	2439-8
		DAC-01C	2439-9
		DAC-01D	2439-10
		DAC-01F	2439-11
		DAC-01H	2439-12
		OP-01A	2919-54
		OP-01C	2928-23
		OP-01E	2923-22
		OP-01F	2923-23
		OP-01G	2928-24
		OP-01H	2919-55
	Motorola	MCH-01	3453-30
	National	**NB01**	★3327
	PMI	CMP-01	2891-14
			¶ 252-4
			¶ 252-5
		CMP-01B	2891-15
			¶ 252-4
			¶ 252-5
		CMP-01C	2891-33
			¶ 252-4
			¶ 252-5
		CMP-01E	2891-16
			¶ 252-4
			¶ 252-5
		DAC-01	2439-19
			¶ 255-6
		DAC-01A	2439-6
			¶ 255-6
		DAC-01B	2439-20
			¶ 255-6
		DAC-01C	2439-21
			¶ 255-6
		DAC-01D	2439-32
			¶ 255-6
		DAC-01F	2439-22
			¶ 255-6
		DAC-01H	2439-23
			¶ 255-6
		GAP-01A	2962-75
		GAP-01B	2962-76
		GAP-01E	2962-77
		GAP-01F	2962-78
		MAT-01	2889-62
			¶ 276-8
		MAT-01A	2889-63
			¶ 276-8
		MAT-01F	2889-64
			¶ 276-8
		MAT-01G	2889-65
			¶ 276-8
		MAT-01H	2889-66
			¶ 276-8
		OP-01A	2919-56
		OP-01C	2928-25
		OP-01E	2923-24
		OP-01F	2923-25
		OP-01G	2928-26
		OP-01H	2919-57
		PKD-01	2965-75
		REF-01	2966-157
			¶ 252-1
		REF-01A	2966-158
			¶ 252-1
		REF-01C	2966-159
			¶ 252-1
		REF-01D	2966-160
			¶ 252-1
		REF-01E	2966-161
			¶ 252-1
		REF-01H	2966-162
			¶ 252-1
		SW01B	2416-83
		SW01F	2416-84
	Raytheon	REF-01	2966-165
		REF-01A	2966-166
		REF-01C	2966-167
		REF-01D	2966-168
		REF-01E	2966-169
		REF-01H	2966-170
	Signetics	**XO1A**	★1514
	Supertex	VC01	2483-76
		VF-01	2481-30
	Synertek	MBC01-A2-1	1759-23
	Votrax	SC-01	2902-86
010	Solitron	CJSE010	2958-43

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
010	Synertek	MBC010-65	1759-12
		MBC010-68	1759-28
	TI	**TAC010**	**★ 438**
		TAT010	**★ 438**
	TI•	TL010	2963-3
0100	Burr-Brown	ISO100AP	2887-115
		ISO100BP	2887-116
		ISO100CP	2887-117
	RCA	**MSIA0100**	**★1959**
0101	**National**	**LH0101**	**★3342**
			2909-62
			2933-6
		LH0101A	**★3342**
			2909-63
			2925-11
		LH0101AC	**★3342**
			2909-64
			2925-12
		LH0101C	**★3342**
			2909-65
			2933-7
0104	**Harris**	**HM0104**	**★3742**
			511-113
0107	Hughes	HCTR0107	510-33
011	Solitron	CJSE011	2956-2
0117	**TI**	**TMS0117NLP**	**★1559**
			1088-30
012	Solitron	CJSE012	2958-44
	TRW	**MPY012A**	**★ 812**
			475-128
			475-129
		MPY012H	**★ 812**
			475-115
			475-116
		MPY012K	**★ 812**
			475-117
			475-118
		Y012A	**★ 812**
		Y012H	**★ 812**
		Y012K	**★ 812**
0126	**National**	**AH0126**	**★3344**
			2421-5
		AH0126C	**★3344**
			2421-6
0129	**National**	**AH0129**	**★3343**
			2420-92
		AH0129C	**★3343**
			2420-93
013	Solitron	CJSE013	2956-3
0133	**National**	**AH0133**	**★3344**
			2416-7
		AH0133C	**★3344**
			2416-8
0134	**National**	**AH0134**	**★3344**
			2416-45
		AH0134C	**★3344**
			2416-46
0139	**National**	**AH0139**	**★3344**
			2421-48
		AH0139C	**★3344**
			2421-49
014	Solitron	CJSE014	2958-45
0140	**National**	**AH0140**	**★3344**
			2420-71
		AH0140C	**★3344**
			2420-72
0141	**National**	**AH0141**	**★3344**
			2415-93
		AH0141C	**★3344**
			2415-94
0142	**National**	**AH0142**	**★3344**
			2421-59
		AH0142C	**★3344**
			2421-60
0143	**National**	**AH0143**	**★3344**
			2418-96
		AH0143C	**★3344**
			2418-97
0144	**National**	**AH0144**	**★3344**
			2418-66
		AH0144C	**★3344**
			2418-67
0145	**National**	**AH0145**	**★3344**
			2421-35
		AH0145C	**★3344**
			2421-36
0146	**National**	**AH0146**	**★3344**
			2418-45
		AH0146C	**★3344**
			2418-46
0150	Sanyo	STK0150	2896-158
0151	**National**	**AH0151**	**★3344**
			2415-101
		AH0151C	**★3344**
			2415-102
0152	**National**	**AH0152**	**★3344**
			2416-21
		AH0152C	**★3344**
			2416-22
0153	**National**	**AH0153**	**★3344**
			2420-75
		AH0153C	**★3344**
			2420-76
0154	National	AH0154	2420-105
		AH0154C	2420-106
016	**Synertek**	**C016D**	**★1983**
		MBC016D	**★1983**
	TRW	**MPY016A**	**★ 812**
			475-132
			475-133
		MPY016H	**★ 812**
			475-120
			475-121
		MPY016K	**★ 812**
			★ 815
			475-122
			475-123
		Y016A	**★ 812**
		Y016H	**★ 812**
		Y016K	**★ 812**
			★ 815
0161	**National**	**AH0161**	**★3344**
			2418-49
		AH0161C	**★3344**
			2418-50
0162	**National**	**AH0162**	**★3344**
			2418-79
		AH0162C	**★3344**
			2418-80
0163	**National**	**AH0163**	**★3344**
			2421-39
		AH0163C	**★3344**
			2421-40
0164	**National**	**AH0164**	**★3344**
			2421-53
		AH0164C	**★3344**
			2421-54
0165	**Harris**	**HD0165**	**★2733**
			★3287
			2468-4
			¶ 269-13
0168	**Harris**	**HM0168**	**★3742**
			511-109
017	Solitron	CJSE017	2953-40
018	Solitron	CJSE018	2957-27
0186	**Harris**	**HM0186**	**★3742**
			511-110
019	Solitron	CJSE019	2953-41
0198	**Harris**	**HM0198**	**★3742**
			511-111
01A2	**Synertek**	**MBC01A2**	**★1982**
			1759-24
		MBC01A2-1	**★1982**
02	MicroPwr	OP-02	2923-27
		OP-02A	2919-28
		OP-02B	2928-31
		OP-02C	2923-28
		OP-02D	2928-32
		OP-02E	2919-29
		REF-02	2966-73
		REF-02A	2966-74
		REF-02C	2966-75
		REF-02D	2966-76
		REF-02E	2966-77
		REF-02H	2966-78
	National	**NB02**	**★3327**
	PMI	CMP-02	2891-11
			¶ 283-4
		CMP-02B	2891-12
			¶ 283-4
		CMP-02C	2891-32
			¶ 283-4
02	PMI	CMP-02E	2891-13
			¶ 283-4
		DAC-02AC	2449-37
		DAC-02BC	2449-38
		DAC-02CC	2449-40
		DAC-02DD	2449-46
		OP-02	2909-34
			2923-29
		OP-02A	2919-31
		OP-02B	2928-33
		OP-02C	2923-30
		OP-02D	2928-34
		OP-02E	2919-32
		REF-02	2966-91
			¶ 283-4
			¶ 283-6
		REF-02A	2966-92
			¶ 283-4
			¶ 283-6
		REF-02C	2966-93
			¶ 283-4
			¶ 283-6
		REF-02D	2966-94
			¶ 283-4
			¶ 283-6
		REF-02E	2966-95
			¶ 283-4
			¶ 283-6
		REF-02H	2966-96
			¶ 283-4
			¶ 283-6
		SW02B	2416-85
		SW02F	2416-86
	Signetics	**X02A**	**★1513**
	Supertex	VC02	2483-77
		VF-02	2481-31
020	Solitron	CJSE020	2957-28
	Synertek	**C020-65**	**★1981**
		C020-68	**★1981**
		MBC020-65	**★1981**
			1759-13
		MBC020-68	**★1981**
			1759-29
	TI	**TAC020**	**★ 438**
		TAT020	**★ 438**
0200	GI	SP0200	2902-73
	Hughes	HCTR0200	452-163
	RCA	**MSIA0200**	**★1959**
0203	TI	TIB0203S	3491-111
021	Solitron	CJSE021	2953-42
022	TI	TL022C	2938-36
		TL022M	2938-23
0230	GI	SP0230	2902-89
0232	**GI**	**SP0232**	**★1324**
0246	Telefunken	TDD0246	2887-141
025	Ferranti	ZNREF025	2966-66
	SGS	LS025	2962-100
0250	GI	SP-0250	2902-88
0256	**GI**	**SP0256**	**★1320**
			★1324
			2902-00
0258	Siemens	S0258A	2898-115
02701	DDC	DAC02701	2455-39
028	Siemens	S028-2	2902-109
0280	Siemens	S0280	2898-48
0281	Siemens	S0281	2898-49
0289	Siemens	S0289	2898-116
0291	Siemens	S0291	2947-55
03	GI	LA03	4141-132
	PMI	BUF-03A	2908-11
		BUF-03B	2908-13
		BUF-03E	2908-10
		BUF-03F	2908-12
		DAC-03AD	2448-17
		DAC-03BD	2448-18
		DAC-03CD	2449-11
		DAC-03DD	2449-24
		OP-03	2937-1
		OP-03A	2936-16
		OP-03B	2938-21
		OP-03C	2937-2
		OP-03D	2938-22
		OP-03E	2936-17
		SW03B	2416-76
		SW03F	2416-77
	Supertex	VF-03	2481-32
030	DDC	ADH-030II-10	2457-17
		ADH-030II-12	2451-13
0300	**AD**	**HTC-0300**	**★3181**
			2967-62
	RCA	**MSIA0300**	**★1959**
032	**Synertek**	**C032D**	**★1983**
		MBC032D	**★1983**
0320	Hughes	HCTR0320	2945-139
0321	Hughes	HSSR0321	462-133
0324	Siemens	TBB0324	2943-55
0332	**National**	**DAC0332**	**★3320**
0347	Hughes	HCTR0347	2945-94
0351	Hughes	HSSR0351	462-134
04	CompAuto	NM4/04	1767-10
	National	LX04XXA	2965-119
	PMI	CMP-04B	2894-27
		CMP-04F	2894-28
		DAC-04AC	2448-14
		DAC-04BC	2448-15
		DAC-04CC	2449-9
		DAC-04DD	2449-25
		OP-04	2936-56
		OP-04A	2936-11
		OP-04B	2938-19
		OP-04C	2936-57
		OP-04D	2938-20
		OP-04E	2936-12
		SW04B	2416-78
		SW04F	2416-79
040	Ferranti	ZNREF040	2966-67
0400	**RCA**	**MSIA0400**	**★1959**
0405	**AD**	**HDG-0405**	**★3169**
			2439-4
041	**National**	**HR041**	**★3328**
	Siemens	S041	2901-57
0410	**Harris**	**HM0410**	**★3742**
			511-108
042	**National**	**HR042**	**★3328**
	Siemens	S042	2887-143
			2962-101
0436	Siemens	S0436	511-7
0437	Hughes	HLCD0437	455-25
	Siemens	S0437	511-116
0438	Hughes	HLCD0438A	455-31
044	TI	TL044C	2942-36
		TL044M	2942-35
045	SGS	LS045	2933-46
048	**Synertek**	**C048D**	**★1983**
		MBC048D	**★1983**
0488	Hughes	HLCD0488	454-178
			2463-40
05	GI	LA05	4141-133
	Intersil	OP-05	2919-7
		OP-05A	2916-23
		OP-05C	2921-23
		OP-05E	2919-13
	MicroPwr	OP-05	2919-10
		OP-05A	2916-24
		OP-05C	2921-25
		OP-05E	2919-15
	National	LX05XXA	2965-120
	PMI	CMP-05A	2891-3
		CMP-05B	2891-8
		CMP-05E	2891-4
		CMP-05F	2891-9
		DAC-05A	2449-42
		DAC-05B	2449-43
		DAC-05C	2449-44
		DAC-05E	2449-31
		DAC-05F	2449-41
		DAC-05G	2449-45
		OP-05	2911-86
			2919-11
			¶ 266-2
			¶ 267-5
		OP-05A	2911-50
			2916-26
			¶ 266-2
			¶ 267-5
		OP-05C	2911-102
			2921-26
			¶ 266-2
			¶ 267-5
		OP-05E	2911-60
			2919-16

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
05	PMI	OP-05E	¶ 266-2
			¶ 267-5
		REF-05A	2966-97
		REF-05B	2966-98
		SW-05B	2416-40
		SW-05F	2416-41
	Raytheon	OP-05	2919-8
		OP-05A	2916-22
		OP-05C	2921-22
		OP-05E	2919-12
	Rockwell	A05XX	1088-118
050	**AD**	**HOS-050**	★3155
			2910-17
		HOS-050A	★3155
			2910-18
	Ferranti	ZNREF050	2966-102
	DDC	ADH-050	2968-45
	Sanyo	STK050	2896-159
0500	**AD**	**HTC-0500**	★3180
			2967-63
	Fairchild	**GE0500**	★4316
			4140-83
	Signetics	**SMVME0500**	★1962
		VME0500	★1962
051	DDC	ADH-051	2968-46
0512	Harris	JAN-0512	3459-58
	Harris	**JAN0512**	★3735
0515	Hughes	HLCD0515	2463-41
0533	Hughes	HLSS0533	464-39
0538	Hughes	HLCD0538A	454-179
			2463-42
0539	Hughes	HLCD0539A	454-180
			2463-43
054	SGS	M054	2904-47
0540	Hughes	HLCD0540	454-181
			2463-44
0541	Hughes	HLCD0541	454-182
0542	Hughes	HLCD0542	454-183
0548	Hughes	HLCD0548	454-184
			2463-45
055	SGS	M055	2904-48
0550	Hughes	HLCD0550	454-185
			2463-46
0551	Hughes	HLCD0551	454-186
			2463-47
05712	**Sprague**	**H05712H**	★2843
058	Sanyo	STK058	2896-160
05XXA0			
	National	LX05XXA0	2965-121
06	National	LX06XXGB	2965-130
		LX06XXXA	2965-122
		LX06XXXD	2965-138
	PMI	DAC-06A	2449-12
		DAC-06B	2449-21
		DAC-06C	2449-26
		DAC-06E	2448-16
		DAC-06F	2449-10
		DAC-06G	2449-23
		OP-06A	2915-55
		OP-06B	2919-43
		OP-06F	2919-44
		OP-06G	2921-28
		SW06	2416-80
	RCA	**MSIA06**	★1959
060	AD	HDS-060	2935-13
	AD	**HOS-060**	★3152
			★3155
			2921-5
		HOS-060/883	★3152
			★3155
			2921-6
	TI	**TL060AC**	★3425
			2930-14
		TL060C	★3425
			2934-24
		TL060M	★3425
			2930-15
0600	Siemens	SAB0600	2906-99
06002	National	LX06002D	2965-136
		LX06002G	2965-137
0603	National	LX0603GB	2965-129
0605	**AD**	**HDG-0605**	★3169
			2439-34
	OEI	**AH0605**	★3346
0607	Hughes	HLCD0607	454-187
			2463-48
061	Ferranti	ZNREF061	2966-104
	TI	**TL061 Series**	★3425
			2911-126
		TL061AC	★3425
			2930-9
		TL061BC	★3425
			2925-6
		TL061C	★3425
			2934-23
		TL061M	★3425
			2930-10
062	**TI**	**TL062AC**	★3425
			2939-14
		TL062BC	★3425
			2937-19
		TL062C	★3425
			2940-44
		TL062M	★3425
			2939-15
064	**Synertek**	**C064D**	★1983
		MBC064D	★1983
	TI	**TL064AC**	★3425
			2943-10
		TL064BC	★3425
			2941-40
		TL064C	★3425
			2944-22
		TL064M	★3425
			2944-1
066	**TI**	**TL066M**	★3423
			2930-12
068	**TI**	**TL068**	★3422
07	**AD**	**ADOP-07**	★3153
			2911-10
			2915-25
		ADOP-07A	★3153
			2914-15
		ADOP-07C	★3153
			2916-31
		ADOP-07D	★3153
			2916-39
		ADOP-07E	★3153
			2915-31
	Harris	**OP-07**	★3286
			★3288
	Intersil	OP-07	2915-24
		OP-07A	2914-16
		OP-07C	2916-32
		OP-07D	2916-40
		OP-07E	2915-32
	MicroPwr	OP-07	2915-26
		OP-07A	2914-18
		OP-07C	2916-33
		OP-07E	2915-35
	PMI	OP-07	2911-97
			2915-29
			¶ 266-14
			¶ 267-12
		OP-07A	2911-61
			2914-19
			¶ 266-14
			¶ 267-12
		OP-07C	2911-109
			2916-36
			¶ 266-14
			¶ 267-12
		OP-07D	2916-42
			¶ 266-14
			¶ 267-12
		OP-07E	2911-98
			2915-36
			¶ 266-14
			¶ 267-12
	Raytheon	OP-07	2920-1
		OP-07A	2917-22
		OP-07C	2916-30
		OP-07D	2916-38
		OP-07E	2920-2
	RCA	**MSIA07**	★1959
	Rockwell	A07XX	1088-123
	TI	OP-07C	2916-29
		OP-07D	2916-17
		OP-07E	2915-30
070	Sanyo	STK070	2896-161
	TI	**TL070AC**	★3427
			2932-56
070	**TI**	**TL070AC**	★3427
			2932-57
		TL070M	★3427
			2930-7
071	**TI**	**TL071AC**	★3427
			2932-58
		TL071BC	★3427
			2932-59
		TL071C	★3427
			2932-60
		TL071M	★3427
			2930-8
072	**TI**	**TL072AC**	★3427
			2940-27
		TL072BC	★3427
			2940-28
		TL072C	★3427
			2940-26
		TL072M	★3427
			2939-13
074	**TI**	**TL074AC**	★3427
			2944-9
		TL074BC	★3427
			2944-10
		TL074C	★3427
			2944-11
		TL074M	★3427
			2943-7
0747	Siemens	TBB0747	2939-33
		TBC0747	2937-45
0748	Siemens	TBB0748	2930-41
		TBC0748	2926-19
075	Sanyo	STK075	2896-162
	TI	**TL075C**	★3427
			2933-4
			2944-12
		TL075M	★3427
			2930-6
0750	Fairchild	GE0750	4140-84
	Fairchild	**GT0750**	★4316
077	Sanyo	STK077	2896-163
078	Sanyo	STK078	2896-164
0791	Thomson-CSF	TBA0791	2931-15
		TDB0791	2930-42
08	**AD**	**ADDAC-03**	★3164
			2441-29
	AD	ADDAC-08A	2440-23
		ADDAC-08C	2443-38
		ADDAC-08E	2441-45
		ADDAC-08H	2440-24
	AMD	DAC-08	2441-28
		DAC-08A	2440-22
		DAC-08C	2443-37
		DAC-08E	2441-44
	Datel	**DAC-08EC**	★2621
			2441-42
	Datel	DAC-08BM	2441-43
	Motorola	DAC-08	2441-31
		DAC-08A	2440-25
		DAC-08C	2443-40
		DAC-08E	2441-47
		DAC-08H	2440-26
	Motorola	**DAC08**	★2759
	PMI	DAC-08	2441-33
			¶ 252-1
			¶ 253-14
			¶ 253-15
			¶ 254-6
			¶ 255-9
			¶ 255-10
			¶ 256-6
			¶ 256-13
			¶ 256-19
			¶ 266-2
		DAC-08A	2440-30
			¶ 252-1
			¶ 253-14
			¶ 253-15
			¶ 254-6
			¶ 255-9
			¶ 255-10
			¶ 256-6
			¶ 256-13
			¶ 256-19
			¶ 266-2
		DAC-08C	2443-42
08	PMI	DAC-08C	¶ 252-1
			¶ 253-14
			¶ 253-15
			¶ 254-6
			¶ 255-9
			¶ 255-10
			¶ 256-6
			¶ 256-13
			¶ 256-19
			¶ 266-2
		DAC-08E	2441-50
			¶ 252-1
			¶ 253-14
			¶ 253-15
			¶ 254-6
			¶ 255-9
			¶ 255-10
			¶ 256-6
			¶ 256-13
			¶ 256-19
			¶ 266-2
		DAC-08H	2440-31
			¶ 252-1
			¶ 253-14
			¶ 253-15
			¶ 254-6
			¶ 255-9
			¶ 255-10
			¶ 256-6
			¶ 256-13
			¶ 256-19
			¶ 266-2
		MUX-08A	2424-34
			¶ 261-8
		MUX-08B	2424-40
			¶ 261-8
		MUX-08E	2424-32
			¶ 261-8
		MUX-08F	2424-37
			¶ 261-8
		OP-08	2911-152
		OP-08A	2916-20
		OP-08B	2917-33
		OP-08C	2921-9
		OP-08E	2916-21
		OP-08F	2917-34
		OP-08G	2921-10
	Raytheon	DAC-08	2441-34
		DAC-08A	2440-32
		DAC-08C	2443-43
		DAC-08E	2441-51
		DAC-08H	2440-33
	RCA	**MSIA08**	★1959
	Rockwell	A08XX	1088-124
	Signetics	DAC-08	2441-35
		DAC-08A	2440-34
		DAC-08C	2443-44
		DAC-08E	2441-52
		DAC-08H	2440-35
	TRW	**MPY08HU**	★ 812
			475-103
			475-104
		Y08HU	★ 812
080	AMD	DAC-080QF	2440-21
	RCA	**CA080**	★3348
			2934-9
		CA080A	★3348
			2930-2
		CA080AT	★3348
			2924-47
		CA080D	★3348
			2924-45
		CA080C	★3348
			2934-10
		CA080T	★3348
			2930-3
	Sanyo	STK080	2896-165
	TI	TL080AC	2930-19
			2930-20
		TL080C	2934-27
0800	**National**	**ADC0800P**	★3319
			2429-34
		ADC0800PC	★3319
			2429-33
		DAC0800	★3320
			2441-32

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
0800	**National**	**DAC0800A**	★3320
			2440-27
		DAC0800C	★3320
			2441-48
0801	**AD**	**MAH-0801**	★3175
			2426-4
	Fairchild	uA0801	2441-30
		uA0801C	2443-39
		uA0801E	2441-46
	Intersil	ADC0801	2426-24
		ADC0801C	2426-25
	National	ADC0801C	2426-26
		ADC0801M	2426-27
	National	**DAC0801C**	★3320
			2443-41
		DADC0801	★3319
0802	**AD**	**HAS-0802**	★3175
			2426-47
		HDH-0802	★3169
			2441-3
		HDH-0802M	★3169
			2441-4
	Fairchild	uA0802	2442-31
		uA0802A	2442-32
		uA0802B	2443-49
		uA0802C	2444-4
	Intersil	ADC0802	2428-31
		ADC0802C	2428-32
	National	**ADC0802**	★3319
			2428-35
		ADC0802C	★3319
			2428-36
		DAC0802	★3320
			2440-28
		DAC0802C	★3320
			2440-29
0803	Intersil	ADC0803	2428-33
		ADC0803C	2428-34
	National	**ADC0803**	★3319
			2428-37
		ADC0803C	★3319
			2428-38
0804	Intersil	ADC0804	2429-22
		ADC0804C	2429-23
	National	**ADC0804C**	★3319
			2429-24
	TI	ADC0804	2429-25
0805	**AD**	**HDG-0805**	★3169
			2444-20
	National	**ADC0805C**	★3319
			2429-26
		ADC0805M	★3319
			2429-27
0806	**National**	**DAC0806C**	★3320
			2444-8
0807	**National**	**DAC0807C**	★3320
			2443-53
0808	**National**	**ADC0808**	★3319
			2428-23
			★3319
			2963-28
		DAC0808	★3320
			2442-6
		DAC0808C	★3320
			2442-7
	TI	ADC0808	2428-25
0809	**National**	**ADC0809**	★3319
			2963-29
081	**RCA**	**CA081**	★3348
			2934-7
		CA081A	★3348
			2930-4
		CA081AT	★3348
			2924-46
		CA081B	★3348
			2924-44
		CA081C	★3348
			2934-8
		CA081T	★3348
			2930-5
0810	**AD**	**ADHDD-0810**	★3169
	AD	HDD-0810	2444-16
		HDD-0810C	2444-18
		HDD-0810CM	2444-19
		HDD-0810M	2444-17
0810	**AD**	**HDS-0810E**	★3169
			2440-16
		HDS-0810EM	★3169
			2440-17
0816	**National**	**ADC0816**	★3319
			2428-24
		ADC0816C	★3319
			2963-45
			★3319
			1094-54
0817	**National**	**ADC0817**	★3319
			2429-19
		ADC0817C	★3319
			2963-46
082	**Exar**	**XR082**	★3206
			2939-16
		XR082C	★3206
			2940-46
		XR082M	★3206
			2939-17
	RCA	**CA082**	★3348
			2940-37
		CA082A	★3348
			2939-10
		CA082AT	★3348
			2937-17
		CA082B	★3348
			2937-15
		CA082C	★3348
			2940-39
		CA082T	★3348
			2939-11
	Sanyo	STK082	2896-166
	SGS	M082	2900-35
		M082AA	2900-36
	TI	TL082AC	2939-20
		TL082BC	2937-20
		TL082C	2940-50
		TL082M	2939-21
0820	**AD**	**HDS-0820**	★3169
			2441-14
		HDS-0820M	★3169
			2441-15
	National	**ADC0820**	★3321
			2426-50
	Signetics	TDA0820	2905-68
			2962-105
083	**Exar**	**XR083**	★3206
			2939-18
		XR083C	★3206
			2940-47
		XR083M	★3206
			2939-19
	RCA	**CA083**	★3348
			2940-38
		CA083A	★3348
			2939-12
		CA083B	★3348
			2937-16
		CA083C	★3348
			2940-40
	Sanyo	STK083	2896-167
	SGS	M083	2900-37
		M083AA	2900-38
	TI	TL083AC	2939-22
		TL083C	2940-51
		TL083M	2939-23
0830	**National**	**DAC0830**	★3320
			2440-14
0831	**National**	**ADC0831B**	★3319
			★3322
			2428-18
		ADC0831C	★3319
			★3322
			2429-13
		DAC0831	★3320
			2441-10
0832	**National**	**ADC0832B**	★3319
			★3322
			2428-19
		ADC0832C	★3319
			★3322
			2429-14
	National	DAC0832	2442-43
0833	**National**	**ADC0833B**	★3319
0833	**National**	**ADC0833B**	★3323
			2428-20
		ADC0833C	★3319
			★3323
			2429-15
0834	**National**	**ADC0834B**	★3319
			★3322
			2428-21
		ADC0834C	★3319
			★3322
			2429-16
0838	**National**	**ADC0838B**	★3319
			★3322
			2428-22
		ADC0838C	★3319
			★3322
			2429-17
084	**Exar**	**XR084**	★3206
			2943-11
		XR084C	★3206
			2944-24
		XR084M	★3206
			2943-12
	RCA	**CA084**	★3348
			2944-19
		CA084A	★3348
			2943-4
		CA084B	★3348
			2941-38
	Sanyo	STK084	2896-168
	TI	TL084AC	2943-14
		TL084BC	2941-41
		TL084C	2944-25
		TL084M	2943-15
0844	**National**	**ADC0844**	★3324
			2428-11
085	TI	TL085AC	2943-16
		TL085C	2944-26
086	Sanyo	STK086	2896-169
	SGS	M086	2900-39
		M086AA	2900-40
087	**TI**	**TL087C**	★3424
			2918-39
		TL087M	★3424
			2918-38
088	**TI**	**TL088C**	★3424
			2925-8
		TL088M	★3424
			2925-9
089	SGS	M089	2947-126
09	Datricon	ACS09	1761-26
	PMI	OP-09A	2941-19
		OP-09B	2941-34
		OP-09E	2941-20
		OP-09F	2941-35
090	SGS	M090	2947-53
0900	Western	WD0900	1767-24
091	TI	TL091C	2934-29
		TL091M	2932-27
092	TI	TL092C	2940-52
		TL092M	2940-21
094	Exar	XR094	2943-19
		XR094C	2944-28
		XR094M	2943-20
	TI	TL094C	2944-14
			2944-31
		TL094M	2944-2
			2944-15
095	Exar	XR095	2943-21
		XR095C	2944-29
		XR095M	2943-22
096	Exar	XR096	2943-17
		XR096C	2944-27
		XR096M	2943-18
099	SGS	M099	2947-127
0H161	Toshiba	TCH0H161	451-71
1	AMI	UA-1	4140-10
	Cromemco	**APC1Z**	★1927
		CBL-1	★1923
		GP1B	★1924
	Datel	**SHM-IC-1**	★2622
			2967-78
		SHM-IC-1M	★2622
			2967-79
		ST-LS1	★1933
		VF2-1C	★2623
1	Datel	VFQ-1	2968-66
		VFQ-1C	2963-86
	DEC	DCJH1-AA	1083-5
	ELInstr	MMD-1	1763-6
	Fairchild	DCM-1	1755-3
		FS-1	1622-2
	Ferranti	ZNPCM1	2947-86
			¶ 260-9
	Matrox	MTX-A1	1100-93
		MTX-B1	1100-94
	Octagon	SYS-1A	1755-5
	Supertex	SD1	2906-125
	Synertek	SYM-1	1759-6
			¶ 251-7
		SYM-1/68	1761-10
			¶ 251-7
		SYM-1/69	1761-23
			¶ 251-7
	TeledyneC	CDA1-3	2417-108
	Zilog	**ZDS-1/40**	★1602
1/40	**Zilog**	**S-1/40**	★1602
10	Burr-Brown	ADC10HT	2434-38
		DAC10HT	2451-34
		MP10	2439-1
			¶ 244-16
			¶ 247-9
			1102-17
			¶ 244-16
			¶ 247-9
	CompAuto	4/10	1619-4
		NM4/10	1767-11
	Datel	**ADC-EK10B**	★2619
			2431-11
		ADC-ET10BC	★2619
			2431-15
		ADC-ET10BM	★2619
			2431-14
		DAC-HA10BC	★2621
			2445-45
	Datel	DAC-HA10BC-1	2445-43
	Datel	**DAC-HA10BM**	★2620
			2445-46
	Datel	DAC-HA10BM-1	
			2445-44
	Datel	**DAC-HF10BMC**	★2621
			2445-19
		DAC-HF10BMM	★2620
			2445-20
	Datel	DAC-IC10B	2445-28
	Datel	**DAC-IC10BC**	★2621
			2447-30
	Datel	DAC-IC10BM	2445-29
	Datel	**DAC-UP10B**	★2615
			2448-19
		DAC-UP10BC	★2621
	Datel	VFV-10K	2968-96
	DDC	DDAC-10	2460-24
		HRDC-10	2967-13
		HSDC-10	2967-17
		HXDC-10	2967-30
	GI	LA10	4141-134
	MicroPwr	OP-10	2935-58
		OP-10A	2936-1
		OP-10C	2936-31
		OP-10E	2936-2
	MicroEng	**MCELM10**	★4440
			4141-4
			★4440
			2923-13
	National	LM10	2923-14
		LM10B	2923-15
		LM10BL	2923-12
		LM10C	2926-3
		LM10CL	2926-2
	National	**MF10**	★3308
			2962-28
	Octagon	SYS-10	1755-4
	Plessey	CLA10XX	4141-71
	PMI	DAC-10B	2445-21
		DAC-10C	2445-22
		DAC-10F	2445-23
		DAC-10G	2445-24
			2449-22
		OP-10	2911-90
			¶ 264-8
			¶ 276-8

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
10	PMI	OP-10A	2911-91
			¶ 264-8
			¶ 276-8
		OP-10C	2911-105
			2936-29
			¶ 264-8
			¶ 276-8
		OP-10E	2911-92
			¶ 264-8
			¶ 276-8
		REF-10A	2966-163
		REF-10B	2966-164
		SMP10A	2967-125
		SMP10B	2967-126
		SMP10E	2967-127
		SMP10F	2967-128
	Raytheon	DAC-10B	2447-16
		DAC-10C	2447-17
		DAC-10F	2447-18
		DAC-10G	2447-26
	RCA	**MSIA10**	★1959
	Signetics	**ECL-10K**	★ 773
	Siliconix	VN10KE	2481-35
		VN10KM	2481-36
			¶ 279-7
	TeledyneC	CAG10	2415-14
		CAG10A	2415-10
		CAG10B	2415-16
		CAG10C	2415-12
		CAG10D	2415-13
100	**AD**	**ADDAC100J**	★3164
			2447-36
		ADDAC100K	★3164
			2447-23
		ADDAC100L	★3164
			2447-24
		ADDAC100S	★3164
			2447-37
		ADDAC100T	★3164
			2447-25
		HOS-100AH	★3155
			2887-28
	AWI	AW100	2463-2
	Burr-Brown	DIV100	2963-56
		LOG100	2887-137
		PGA100AG	2887-98
		PGA100BG	2887-99
		XTR100AM	2888-132
		XTR100AP	2888-133
		XTR100BM	2888-134
		XTR100BP	2888-135
	Cherry	CS100	2898-87
	Comlinear	CLC100	2888-69
	Cromemco	**S-100**	★1918
	Curtis	PR-100A	4001-4
	DataGen	MP/100	1767-17
	Datal/O	M100A	4004-1
	Datel	VFV-100K	2968-95
	Exar	X100	4140-58
		XR-A100	4140-59
		XR-B100	4140-60
	Exar	**XR-C100A**	★4314
			4140-61
		XR-D100	★4314
			4140-63
		XR-F100	★4314
			4140-64
		XR-G100	★4314
			4140-65
		XR-J100	★4314
			4140-67
		XR-X100	★4314
			4140-68
	Ferranti	ZNP100	2964-83
		ZNREF100	2966-116
	Intersil	LM100	2959-17
	LSICamp	**RED100/120**	★ 696
			462-65
			511-18
	MasterLogic	ML100	4141-165
	MicroPwr	DAC-100C	2442-39
	MicroPwr	**MPDAC100**	★ 401
	MCC	IMC100	1765-28
	National	**AF100**	★3345
			2962-23
		CIM-100	★1950

Base Number	Source	Device	Page-Line
100	**National**	**FOR100B**	★3345
			2963-70
	PMI	DAC-100A	2445-41
			2445-42
			¶ 252-4
			¶ 252-5
			¶ 255-6
		DAC-100B	2447-35
			¶ 252-4
			¶ 252-5
			¶ 255-6
		DAC-100C	2448-26
			2448-27
			¶ 252-4
			¶ 252-5
			¶ 255-6
		DAC-100D	2449-18
			2449-19
			¶ 252-4
			¶ 252-5
			¶ 255-6
	Siemens	SDA100	2905-84
	Signetics	**ECL-100K**	★ 774
	SiliconG	SG100	2959-18
	TI	**SE100**	★1560
		SE100C	★1560
		SEB100	★1560
	Unitrode	PF100	2964-94
		PR100	2964-100
1000	**AMD**	**PS/1000**	★1908
	AMI	**GA1000**	★4307
			4140-1
	Fairchild	**GE1000**	★4316
			4140-85
	Harris	**HV1000**	★2741
			★3286
			2964-61
	Holt	HI1000	4141-140
	Lambda	LAS1000	2959-118
	Motorola	**MCA1000ECL**	★4479
			4141-44
	National	AM1000	2421-78
			¶ 262-9
	National	**DAC1000**	★3320
			2446-10
		DAC1000C	★3320
			2446-11
		DT1000	★3338
			2902-81
	Plessey	**BAA1000**	★4514
			4141-69
		CLA1000	★4505
	Plessey	SCD-1000	4141-75
	Plessey	**SCD1000**	★4510
	Siemens	TUA1000	2901-158
	Siliconix	**VQ1000**	★2835
			2483-67
	StrucDes	SD-1000	4009-2
	StrucDes	**SD1000**	★4106
	Sunrise	Z-1000	4009-4
	Supertex	VQ1000	2483-79
	Synertek	MDT-1000	1631-2
	TI	SE1000C	1088-35
			1088-46
			1055-26
		SE1000P	1088-36
			1088-47
			1055-27
	TI	**SEB1000**	★1560
		SEB1000C	★1560
		TMS1000	★1557
			1088-24
			¶ 247-10
			★1557
			1057-4
			¶ 247-10
		TMS1000C	★1557
			1088-17
			¶ 247-10
			★1557
			1057-5
			¶ 247-10
	Western	WD1000	1101-116
10000	CalDevices	HC10000	4140-34
	Fairchild	F10000C	469-57
			3489-48

Base Number	Source	Device	Page-Line
10000	LSILogic	LC-10000	4140-136
	Signetics	**SMDEV10000**	★1739
		SMSFT10000	★1745
1001	**AD**	**MAH-1001**	★3175
			2426-21
	Monosil	M1001	1051-19
	National	**1001**	★3320
		ADC1001B	★3319
			2431-8
		ADC1001C	★3319
			2431-23
	National	AM1001	2421-79
			¶ 262-9
		DAC1001	2447-48
		DAC1001C	2447-49
	Siemens	TFA1001	2887-11
	Signetics	TDA1001A	2901-84
		TDA1001B	2901-85
	Siliconix	VQ1001	2483-68
	TRW	**TDC1001**	★3438
			2426-31
	Western	WD1001	1101-114
10010	Fairchild	F10010C	467-59
		F10010M	467-60
100101	**Fairchild**	**F100101**	★ 658
			470-34
	Signetics	100101	470-35
100102	**Fairchild**	**F100102**	★ 658
			470-36
	Signetics	100102	470-37
100107	**Fairchild**	**F100107**	★ 658
			470-38
	Signetics	100107	470-39
100112	**Fairchild**	**F100112**	★ 658
			470-22
	Signetics	100112	470-23
100113	**Fairchild**	**F100113**	★ 658
			470-21
100114	**Fairchild**	**F100114**	★ 658
			470-92
	Signetics	100114	470-93
100117	**Fairchild**	**F100117**	★ 658
			470-30
	Signetics	100117	470-31
100118	**Fairchild**	**F100118**	★ 658
			470-32
	Signetics	100118	470-33
100122	**Fairchild**	**F100122**	★ 658
			470-15
	Signetics	100122	470-16
100123	**Fairchild**	**F100123**	★ 658
			470-24
	Signetics	100123	470-25
100124	**Fairchild**	**F100124**	★ 658
			470-70
100125	**Fairchild**	**F100125**	★ 658
			470-71
100126	**Fairchild**	**F100126**	★ 658
			470-20
100130	**Fairchild**	**F100130**	★ 658
			470-40
100131	**Fairchild**	**F100131**	★ 658
			470-26
	Signetics	100131	470-27
100136	**Fairchild**	**F100136**	★ 658
			470-17
10014	Fairchild	F10014C	469-82
		F10014M	469-83
100141	**Fairchild**	**F100141**	★ 658
			470-69
100142	**Fairchild**	**F100142**	★ 658
			470-43
100145	**Fairchild**	**F100145**	★ 658
			470-47
			★ 658
			3470-88
100149	Signetics	100149	3459-65
			3459-66
100150	**Fairchild**	**F100150**	★ 658
			470-41
	Signetics	100150	470-42
100151	**Fairchild**	**F100151**	★ 658
			470-28
	Signetics	100151	470-29

Base Number	Source	Device	Page-Line
100155	**Fairchild**	**F100155**	★ 658
			470-62
	Signetics	100155	470-63
100156	**Fairchild**	**F100156**	★ 658
			470-66
100158	**Fairchild**	**F100158**	★ 658
			470-67
	Signetics	100158	470-68
10016	Fairchild	F10016C	467-41
		F10016M	467-42
100160	**Fairchild**	**F100160**	★ 658
			470-90
	Signetics	100160	470-91
100163	**Fairchild**	**F100163**	★ 658
			470-58
	Signetics	100163	470-59
100164	**Fairchild**	**F100164**	★ 658
			470-64
	Signetics	100164	470-65
100165	**Fairchild**	**F100165**	★ 658
			470-85
100166	**Fairchild**	**F100166**	★ 658
			470-12
	Signetics	100166	470-13
100170	**Fairchild**	**F100170**	★ 658
			470-18
	Signetics	100170	470-19
100171	**Fairchild**	**F100171**	★ 658
			470-60
	Signetics	100171	470-61
100179	**Fairchild**	**F100179**	★ 658
			470-8
100180	**Fairchild**	**F100180**	★ 658
			470-11
100181	**Fairchild**	**F100181**	★ 658
			470-10
100182	**Fairchild**	**F100182**	★ 658
			470-14
100183	**Fairchild**	**F100183**	★ 658
			470-9
100194	**Fairchild**	**F100194**	★ 658
			470-94
1002	AMD	MK1002	3491-87
	AD	**HAS-1002**	★3175
			2430-20
	National	AM1002	2421-86
			¶ 262-9
	National	**DAC1002**	★3320
			2448-39
		DAC1002C	★3320
			2448-40
	TRW	**TDC1002**	★3438
			2426-40
	Western	**WD1002**	★1577
			1101-118
100220	Fairchild	F100220	470-72
			1049-19
100221	Fairchild	F100221	470-80
100222	Fairchild	F100222	470-87
100223	Fairchild	F100223	470-81
100224	Fairchild	F100224	470-79
1002416			
	Fairchild	**F1002416**	★3627
100255	Siemens	SH100255	470-76
1003	**AD**	**HDH-1003**	★3169
			2445-16
	AD	HDH1003M	2447-22
	ITT	TCA1003	2896-6
		UAA1003	2902-77
	National	DAC1003	2446-12
		DAC1003C	2446-13
	Signetics	TDA1003A	2906-80
			2964-136
	TRW	**TDC1003**	★ 812
			476-11
1004	ITT	TCA1004	2896-7
	National	DAC1004	2447-50
		DAC1004C	2447-51
	NEC-Electron	uPC1004	2901-36
	Siliconix	**VQ1004**	★2837
			2483-69
	TI	**SE1004C**	★1560
			1088-37
			1088-48
			★1560
			1055-28

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
1004	TI	SEB1004	★1560
		TMS1004C	★1558
			1088-18
			★1558
			1057-6
	TRW	TDC1004	★ 813
			510-26
			510-27
100402	Fairchild	F100402	★ 658
			470-46
			★ 658
			3470-87
10041	Fairchild	F10041	3490-129
	Signetics	10041BB	3475-30
100414	Fairchild	F100414	★3615
			★3624
			470-49
		F100414C	★3615
			★3624
			3472-69
			3472-69
100415	AMD	AM100415	3475-26
			3475-37
		AM100415A	3475-34
	Fairchild	F100415	★3615
			★3625
			470-52
		F100415A	★3615
			★3625
			469-12
		F100415C	★3615
			★3625
			3475-32
	Signetics	100415	3475-43
		100415A	3475-36
100416	Fairchild	F100416	★3626
			470-45
		F100416C	★3626
			3459-68
100422	Fairchild	E100422	3473-42
	Fairchild	F100422	★3615
			470-50
		F100422C	★3615
			3473-40
	Fujitsu	MBM100422	★3681
			3473-44
			3473-89
	Hitachi	HM100422	★3789
			3473-49
	National	DM100422	3473-54
	Signetics	100422	3473-58
		100422A	3473-56
		100422B	3473-46
100470	AMD	AM100470	3481-35
		AM100470A	3481-23
		AM100470SA	3481-17
	Fairchild	F100470	★3615
			★3628
			470-54
			★3615
			★3628
			3481-39
	Fujitsu	MBM100470	★3681
			470-55
			★3681
			3481-21
	Hitachi	HM100470	★3789
			3481-25
	Signetics	100470	3481-37
		100470A	3481-29
100473	Siemens	GXB100473	3472-18
100474	AMD	AM100474	3477-33
		AM100474A	3477-27
	Fairchild	F100474	★3615
			★3629
			470-53
			★3615
			★3629
			3477-37
	Fujitsu	MBM100474	★3681
			470-51
		MBM100474-15	★3681
			3477-29
		MBM100474-20	★3681
			3477-31
100474	Hitachi	HM100474	★3789
	Siemens	GXB100474	3477-35
100480	Fairchild	F100480	★3630
			470-56
			★3630
			3483-64
	Fujitsu	MBM100480	★3680
			3483-62
1005	Harris	HV1005	★2741
			★3288
			2964-62
	National	DAC1005	2448-41
		DAC1005C	2448-42
	Signetics	TDA1005A	2901-140
	TRW	TDC1005	★ 813
			3491-63
			3491-64
1006	National	DAC1006	★3320
			2446-14
		DAC1006C	★3320
			2446-15
	Signetics	TDA1006A	2906-94
			2964-137
	Siliconix	VQ1006	★2837
			2483-70
	TRW	TDC1006	★ 813
			3491-100
			3491-101
1007	National	DAC1007	★3320
			2448-1
		DAC1007C	★3320
			2448-2
	TRW	TDC1007	★3438
			2426-28
			2426-29
1008	AD	ADSP-1008K	★3183
			★3186
			449-126
		ADSP-1008T	★3183
			★3186
			449-127
	National	DAC1008	★3320
			2448-43
		DAC1008C	★3320
			2448-44
	Signetics	TDA1008	2900-13
	TRW	TDC1008	★ 812
			476-9
			476-10
		TDC1008J	★ 812
			475-158
		TDC1008JM	★ 812
			475-159
1009	ITT	TEA1009	2902-62
		UAA1009	2898-47
	NEC-Electron	uPC1009	2903-77
	Signetics	SAB1009B	2887-121
	TRW	TDC1009	★ 812
			476-12
			476-13
		TDC1009J	★ 812
			475-130
		TDC1009JM	★ 812
			475-131
100B122	Siemens	SH100B122	470-95
100B250	Siemens	SH100B250	470-78
100B252	Siemens	SH100B252	470-88
100B384	Siemens	SH100B384	470-57
100B392	Siemens	SH100B392	470-74
100B393	Siemens	SH100B393	470-84
100B395	Siemens	SH100B395	470-82
100B396	Siemens	SH100B396	470-48
100B402	Siemens	SH100B402	470-75
100B404	Siemens	SH100B404	470-77
100B417	Siemens	SH100B417	470-86
100B419	Siemens	SH100B419	470-73
100B420	Siemens	SH100B420	470-83
100B480	Siemens	SH100B480	470-96
100B481	Siemens	SH100B481	470-89
100X100	Reticon	RA100X100	2963-135
100Z416	Fairchild	F100Z416	470-44
			3459-63
101	AD	AD101A	★3153
			2909-17
			2923-54
	Burr-Brown	INA101AM	2887-48
		INA101BM	2887-49
		INA101CM	2887-50
		INA101SM	2887-51
		OPA101	2911-47
			2913-139
		OPA101AM	2918-36
		OPA101BM	2917-16
	Fairchild	uA101	2929-21
		uA101A	2909-18
		uA101AM	2923-56
	Harris	LM101A	2909-19
			2923-58
	Intersil	ICL101ALN	2923-39
	Motorola	LM101A	2909-20
			2923-59
	National	AF101	2947-31
		LM101	2929-22
		LM101A	2909-21
			2923-61
	Panasonic	AN101	2901-91
	PMI	DAC-101E	2447-27
		DAC-101F	2448-28
	Raytheon	LM101A	2909-22
			2924-1
	RCA	CA101A	2909-23
			2924-2
	Siemens	FZH101A	472-99
		FZJ101	472-57
		FZK101	473-39
	Signetics	MB101	2899-98
		ST101	2947-109
	SiliconG	SG101	2929-23
		SG101A	2909-24
			2924-4
	SiliconSys	SSI101A	2481-66
	TeledyneC	CSH101A	2967-140
	TI	LM101A	2909-25
			2924-6
		TC101	2964-53
1010	AD	ADSP-1010K	★3182
			★3186
			449-130
		ADSP-1010T	★3182
			★3186
			449-131
	AdaptSci	1010	1761-24
	Cybersys	1010	1759-7
	Harris	HV1010	★2741
			★3288
			2964-63
	IntlMicro	IM1010	4005-3
	Sanken	SI1010	2897-43
	Signetics	TDA1010	2907-2
		TDA1010A	2897-68
	TRW	TDC1010	★ 812
			476-14
			476-15
		TDC1010J	★ 812
			475-136
		TDC1010JM	★ 812
			475-137
	Weitek	WTL1010	★1041
			449-121
			511-96
	Western	WD1010	★1573
			1101-113
10100	Fairchild	F10100	468-30
	Motorola	MC10100	468-32
	Signetics	10100	468-34
10101	Fairchild	F10101	468-51
	Hitachi	HD10101	468-53
	Motorola	MC10101	468-54
			¶ 234-10
	Signetics	10101	468-57
10102	Fairchild	F10102	468-23
	Hitachi	HD10102	468-25
	Motorola	MC10102	468-26
	Signetics	10102	468-29
10103	Fairchild	F10103	467-146
	Motorola	MC10103	467-148
	Signetics	10103	467-150
10104	Fairchild	F10104	467-126
		HD10104	467-128
	Hitachi	HD10104	467-129
	Motorola	MC10104	467-130
	Signetics	10104	467-133
10105	Fairchild	F10105	468-43
	Hitachi	HD10105	468-45
	Motorola	MC10105	468-46
	National	DM10105	468-49
	Signetics	10105	468-50
10106	Fairchild	F10106	468-17
	Hitachi	HD10106	468-19
	Motorola	MC10106	468-20
	Signetics	10106	468-22
10107	Fairchild	F10107	468-89
	Hitachi	HD10107	468-91
	Motorola	MC10107	468-92
	Signetics	10107	468-95
10108	Signetics	10108	467-125
10109	Fairchild	F10109	468-35
	Hitachi	HD10109	468-37
	Motorola	MC10109	468-39
	Signetics	10109	468-42
1011	National	LM1011	2906-52
	Signetics	TDA1011	2897-69
		TDA1011A	2897-70
	Western	WD1011	★1575
			1101-115
10110	AMI	S10110	2962-68
	Fairchild	F10110	467-137
	Hitachi	HD10110	467-141
	Motorola	MC10110	467-142
	Signetics	10110	467-145
10111	AMI	S10111	2962-69
	Fairchild	F10111	468-1
	Hitachi	HD10111	468-5
	Motorola	MC10111	468-6
			¶ 257-11
	Signetics	10111	468-9
10112	Signetics	10112	468-16
10113	Fairchild	F10113	468-84
	Motorola	MC10113	468-86
	Signetics	10113	468-88
10114	Fairchild	F10114	469-92
	Motorola	MC10114	469-96
	Signetics	10114	469-104
10115	Fairchild	F10115	469-108
	Motorola	MC10115	469-110
			¶ 234-12
	Signetics	10115	469-112
10116	Fairchild	F10116	469-93
	Motorola	MC10116	469-97
			¶ 234-10
			¶ 234-12
	National	DM10116	469-103
	Signetics	10116	469-105
10117	Fairchild	F10117	468-70
	Hitachi	HD10117	468-72
	Motorola	MC10117	468-73
	Signetics	10117	468-76
10118	Fairchild	F10118	468-58
	Hitachi	HD10118	468-60
	Motorola	MC10118	468-61
	Signetics	10118	468-63
10119	Fairchild	F10119	468-64
	Hitachi	HD10119	468-66
	Motorola	MC10119	468-67
	Signetics	10119	468-69
1012	Cybersys	1012	1759-8
	Signetics	TDA1012	2896-122
	Western	WD1012	★1576
			1101-119
10121	Fairchild	F10121	468-77
	Hitachi	HD10121	468-79

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
10121	Motorola	MC10121	468-80
	Signetics	10121	468-83
10123	Fairchild	F10123	467-88
	Motorola	MC10123	467-90
			¶ 257-11
	Signetics	10123	467-91
10124	Fairchild	F10124	469-75
	Motorola	MC10124	469-77
			¶ 234-12
	Signetics	10124	469-79
10125	Fairchild	F10125	469-70
	Motorola	MC10125	469-72
			¶ 234-12
	Signetics	10125	469-74
10128	Motorola	MC10128	467-87
			¶ 234-12
10129	AMI	S10129	2900-9
	Motorola	MC10129	469-106
			¶ 234-12
	Signetics	10129	469-107
1013	Signetics	TDA1013	2896-123
10130	AMI	S10130	2900-10
	Fairchild	F10130	468-96
	Hitachi	HD10130	468-98
	Motorola	MC10130	468-100
	Signetics	10130	468-103
10131	AMI	S10131	2900-11
	Fairchild	F10131	467-96
	Hitachi	HD10131	467-100
	Motorola	MC10131	467-102
	Signetics	10131	467-107
10132	Fairchild	F10132	468-110
	Hitachi	HD10132	468-112
	Motorola	MC10132	468-113
	Signetics	10132	468-115
10133	Fairchild	F10133	468-120
	Hitachi	HD10133	468-124
	Motorola	MC10133	468-125
	Signetics	10133	468-129
10134	Fairchild	F10134	468-104
	Hitachi	HD10134	468-106
	Motorola	MC10134	468-107
	Signetics	10134	468-109
10135	Fairchild	F10135	467-120
	Motorola	MC10135	467-122
			¶ 235-5
	Signetics	10135	467-124
10136	Fairchild	F10136	467-45
	Hitachi	HD10136	467-47
	Motorola	MC10136	467-48
	Signetics	10136	467-51
10137	Fairchild	F10137	467-54
	Motorola	MC10137	467-56
	Signetics	10137	467-58
10138	Motorola	MC10138	467-52
10139	Motorola	MCM10139	468-144
			3459-9
	Signetics	10139	468-145
			3459-8
	TI	SN10139	3459-7
1014	Fairchild	LM1014	2906-67
		LM1014A	2906-68
	National	LM1014	2906-70
			2964-130
	TRW	**TDC1014**	★3438
			2426-10
			2426-11
	Western	**WD1014**	★1566
			1100-107
10140	TI	SN10140	468-162
			3472-12
10141	Fairchild	F10141	469-58
			3489-53
	Motorola	MC10141	469-60
			3489-50
	Signetics	10141	469-63
			3489-52
10142	NEC-Electron	uPB10142	3472-9
	TI	SN10142	468-157
			3472-8
10143	**Motorola**	**MCM10143**	★3839
			468-151
			¶ 234-6
			★3839
			3470-77
			¶ 234-6
10144	**Motorola**	**MCM10144**	★3839
			468-168
			★3839
	NEC-Electron	uPB10144	469-2
	Raytheon	RI10144	469-3
	TI	SN10144	469-4
10145	Fairchild	F10145A	3470-89
		F10145AC	468-152
	Hitachi	HD10145	468-154
			3470-91
	Motorola	**MCM10145**	★3839
			468-155
			★3839
	Signetics	10145	468-156
			3470-93
10146	**Motorola**	**MCM10146**	★3839
			469-18
			★3839
			3475-53
		MCM10146A	★3839
			3475-33
10147	Hitachi	HD10147	468-163
	Motorola	**MCM10147**	★3839
			468-164
			★3839
			3472-45
			3472-45
	Siemens	GXB10147A	3472-46
			3472-46
	TI	SN10147	468-166
			3472-47
			3472-47
10148	Hitachi	HD10148	468-158
	Motorola	MC10148	468-159
	Motorola	**MCM10148**	★3839
			3472-10
	NEC-Electron	uPB10148	3472-11
	TI	SN10148	468-161
			3472-13
10149	Motorola	MCM10149	468-148
			3459-69
	Siemens	GXB10149	468-149
	Signetics	10149	468-150
			3459-67
1015	**AD**	**HDD-1015**	★3169
			2450-1
		HDD-1015C	★3169
			2450-2
		HDD-1015M	★3169
			2450-3
		HDS-1015E	★3169
			2447-14
		HDS-1015EM	★3169
			2447-15
	GI	AY3-1015D	2487-63
10150	**RCA**	**MA10150**	★4518
			4141-88
10152	**Motorola**	**MCM10152**	★3839
			468-169
			★3839
			3472-73
10153	Fairchild	F10153	468-121
	Motorola	MC10153	468-126
10155	Signetics	10155	468-142
			3470-76
10158	Fairchild	F10158	469-44
	Motorola	MC10158	469-46
	Signetics	10158	469-48
10159	Fairchild	F10159	469-39
	Motorola	MC10159	469-41
	Signetics	10159	469-43
1016	**AD**	**ADSP-1016K**	★3184
			★3185
			449-128
		ADSP-1016T	★3184
			★3185
			449-129
	GI	AY5-1016	2424-94
	TRW	**TDC1016-10**	★3438
			2445-18
		TDC1016-8	★3438
			2441-18
		TDC1016-9	★3438
			2444-47
	Weitek	**WTL1016**	★1036
1016	Weitek	WTL1016	449-120
			511-99
10160	Fairchild	F10160	469-120
	Motorola	MC10160	469-122
	Signetics	10160	469-125
10161	Fairchild	F10161	467-69
	Hitachi	HD10161	467-71
	Motorola	MC10161	467-73
	Signetics	10161	467-76
10162	Fairchild	F10162	467-61
	Hitachi	HD10162	467-63
	Motorola	MC10162	467-65
	Signetics	10162	467-68
10163	Motorola	MC10163	469-84
			2467-13
10164	Fairchild	F10164	469-49
	Motorola	MC10164	469-51
	Signetics	10164	469-54
	TI	SN10164	469-55
10165	Fairchild	F10165	469-113
	Motorola	MC10165	469-115
	Signetics	10165	469-117
10166	Motorola	MC10166	467-30
10168	Fairchild	F10168	468-116
	Motorola	MC10168	468-118
1017	CentData	B1017	1767-27
	National	LM1017	2463-75
			2903-74
10170	Motorola	MC10170	469-119
10171	Fairchild	F10171	467-82
	Motorola	MC10171	467-84
	Signetics	10171	467-86
10172	Fairchild	F10172	467-77
	Motorola	MC10172	467-79
	Signetics	10172	467-81
10173	Fairchild	F10173	468-130
	Motorola	MC10173	468-132
	Signetics	10173	468-134
10174	Fairchild	F10174	469-32
	Motorola	MC10174	469-34
	Signetics	10174	469-37
	TI	SN10174	469-38
10175	Fairchild	F10175	468-135
	Hitachi	HD10175	468-137
	Motorola	MC10175	468-138
	Signetics	10175	468-141
10176	Fairchild	F10176	467-113
	Motorola	MC10176	467-115
	Signetics	10176	467-118
10177	Fairchild	F10177	469-66
	Motorola	MC10177	469-67
10178	Motorola	MC10178	467-43
10179	Fairchild	F10179	467-1
	Hitachi	HD10179	467-3
	Motorola	MC10179	467-4
			¶ 234-14
	Signetics	10179	467-7
1018	Signetics	SAB1018	511-25
		SAB1018A	511-26
	TI	**TMS1018**	★1559
			2898-78
			★1559
			1088-31
			1102-23
10180	Fairchild	F10180	467-9
	Hitachi	HD10180	467-11
	Motorola	MC10180	467-12
			¶ 234-14
	Signetics	10180	467-15
10181	Fairchild	F10181	467-22
	Hitachi	HD10181	467-24
	Motorola	MC10181	467-25
			¶ 234-14
	Signetics	10181	467-28
10182	Motorola	MC10182	467-16
10183	Motorola	MC10183	467-20
10186	Fairchild	F10186	467-109
	Motorola	MC10186	467-111
10188	Motorola	MC10188	467-35
	Signetics	10188	467-36
10189	Motorola	MC10189	467-39
	Signetics	10189	467-40
1019	National	LM1019	2904-50
	TRW	**TDC1019J**	★3438
			2430-8
10190	Motorola	MC10190	469-68
10191	Motorola	MC10191	469-80
10192	Fairchild	F10192	467-92
	Motorola	MC10192	467-94
	Signetics	10192	467-95
10193	Motorola	MC10193	469-85
			2467-14
10194	Motorola	MC10194	469-90
			¶ 260-3
10195	Motorola	MC10195	467-37
10197	Motorola	MC10197	467-134
10198	Motorola	MC10198	469-56
102	Burr-Brown	OPA102	2913-140
		OPA102AM	2918-37
		OPA102BM	2917-17
	Cherry	CS102	511-121
			2898-88
	Comlinear	CLC102	2888-70
	Ferranti	ZNP102	2964-84
	Intersil	LM102	2908-29
	MilerTron	PDC-102	1765-16
	Motorola	MMBTS102	2968-23
	National	AF102	2947-32
		LM102	2908-31
	SiliconG	SG102	2908-30
	SiliconSys	SSI102	2481-64
	TI	TC102	2964-46
1020	AdaptSci	1020	1761-11
	ITT	SAA1020	2905-81
	National	**DAC1020**	★3320
			2447-12
		DAC1020C	★3320
			2447-13
	NEC-Electron	uPC1020	2897-24
	Sanken	SI1020	2896-145
	Signetics	TDA1020	2897-71
	TI	**TMS1020NLL**	★1559
			1088-45
10209	Hitachi	HD10209	468-38
1021	**National**	**ADC1021B**	★3319
			2431-9
		ADC1021C	★3319
			2431-24
		DAC1021	★3320
			2448-22
		DAC1021C	★3320
			2448-23
	NEC-Electron	uPC1021	2900-80
	Signetics	TEA1021	2948-41
	TRW	**TDC1021**	★3438
			2426-2
			2426-3
10210	Fairchild	F10210	467-138
	Motorola	MC10210	467-143
	Signetics	10210	468-10
10211	Fairchild	F10211	468-2
	Motorola	MC10211	468-7
	Signetics	10211	468-11
10212	Fairchild	F10212	468-12
	Motorola	MC10212	468-14
10216	Motorola	MC10216	469-98
			¶ 234-12
1022	**National**	**DAC1022**	★3320
			2449-15
		DAC1022C	★3320
			2449-16
	Signetics	TDA1022	2900-3
			2962-63
	TI	TMS1022	2898-135
	TRW	**TDC1022**	★ 813
			★ 817
			474-16
			474-17
1023	NEC-Electron	uPC1023	2897-150
	Signetics	TDA1023	2968-134
	TRW	**TDC1023**	★ 813
			★ 819
			510-28
			510-29
10230	Hitachi	HD10230	468-99
10231	Fairchild	F10231	467-97
	Hitachi	HD10231	467-101
	Motorola	MC10231	467-103
	Signetics	10231	467-108
1024	IPI	MI1024	2964-21
	NEC-Electron	uPC1024	2897-151

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
1024	Panasonic	MEL 1024K	2964-22
		MEL1024KV	2964-23
	Reticon	CCPD1024	2963-148
		DAS1024A	2967-155
		RL1024	2964-30
		RL1024S	2964-31
		RL1024SF	2964-32
		RL1024SFX	2963-139
		SAD1024A	2900-1
			2967-156
			¶ 272-12
			¶ 272-2
			¶ 284-4
			¶ 284-8
	Signetics	TDA1024	2968-135
	TI	TMS1024	1088-33
	TRW	MPY1024	475-126
			475-127
	Weitek	**WTL1024**	★1040
			511-102
1025	**AD**	**HDS-1025**	★3169
			2445-10
		HDS-1025M	★3169
			2445-11
	NEC-Electron	uPC1025	2896-93
	Plessey	SL1025	2962-88
	TI	TMS1025	1088-34
	TRW	**TDC1025**	★3438
			2428-16
10250	**RCA**	**MA10250**	★4518
			4141-89
1026	NEC-Electron	uPC1026	2901-114
1027	Signetics	SAA1027	2906-97
			2964-142
	TRW	**TDC1027**	★3438
			2426-19
1028	NEC-Electron	uPC1028	2901-37
	Signetics	TDA1028	2421-68
			2888-67
	TRW	**TDC1028**	★ 813
			★ 818
			511-50
			511-51
10287	Motorola	MC10287	467-18
1029	Signetics	TDA1029	2421-70
			2889-68
			2906-150
	TRW	**TDC1029**	★3438
			2426-15
103	Burr-Brown	OPA103AM	2911-36
			2917-49
		OPA103BM	2911-34
			2917-48
		OPA103CM	2911-112
			2917-11
		OPA103DM	2917-9
	Comlinear	CLC103AI	2935-12
		CLC103AM	2935-11
	Ferranti	ZNP103	2964-85
	Motorola	MMBTS103	2968-24
	National	AF103	2947-33
		LM103	2966-17
	Panasonic	AN103	2945-65
	SiliconSys	SSI103	2481-62
	TI	TC103	2964-56
1030	Sanken	SI1030	2896-146
	TRW	**TDC1030**	★ 813
			★ 816
			3456-57
1031	NEC-Electron	uPC1031	2905-95
10315	**Motorola**	**MC10315L**	★2760
			2426-17
10317	**Motorola**	**MC10317L**	★2760
			2426-18
10318	**Motorola**	**MC10318**	★2759
			2441-19
		MC10318-9	★2759
			2440-18
		MC10318C-6	★2759
			2444-2
		MC10318C-7	★2759
			2443-35
1032	NEC-Electron	uPC1032	2897-152
	Signetics	SAF1032	2902-48
	Weitek	WTL1032	511-53
1033	Weitek	WTL1033	511-52
1034	Ferranti	ZN1034E	2951-59
			¶ 282-7
	Signetics	SA1034	510-80
103461	Hitachi	HD103461	2485-60
1035	**National**	**LM1035**	★3326
			2896-34
10350	**RCA**	**MA10350**	★4518
			4141-90
1037	**National**	**LM1037**	★3326
			2906-148
	Siemens	TDA1037	2897-66
10371	Rockwell	10371	2487-60
			1088-128
1038	**National**	**LM1038**	★3326
			2906-149
1039	Signetics	SAF1039	2902-49
104	AnalogSys	MK104	2962-126
	Burr-Brown	OPA104AM	2911-19
			2920-10
		OPA104BM	2911-13
			2917-43
		OPA104CM	2911-5
			2917-30
	LSIComp	**RDD104**	★ 696
			453-72
			510-105
	Motorola	LM104	2960-52
	National	AF104	2949-87
	National	**CIM-104**	★1950
	National	LM104	2960-54
	SiliconSys	SSI104	2481-65
	TI	TC104	2964-60
1040	Ferranti	ZN1040AE	482-22
			¶ 231-12
10410	**Fairchild**	**F10410C**	★3615
10414	**Fairchild**	**F10414C**	★3615
			3472-70
			3472-70
		F10414M	★3615
			3472-72
			3472-72
	Hitachi	10414	3472-71
			3472-71
		10414-1	3472-68
			3472-68
	Hitachi	**HM10414**	★3789
	National	DM10414	469-1
10415	AMD	AM10415	3475-27
			3475-60
		AM10415A	3475-38
			3475-48
		AM10415M	3475-67
		AM10415SA	3475-35
			3475-39
	Fairchild	**F10415**	★3615
			★3618
			469-13
		F10415A	★3615
			★3618
			469-14
		F10415AC	★3615
			★3618
			3475-40
		F10415C	★3615
			★3618
			3475-28
	Fujitsu	**MBM10415A**	★3681
			3475-61
		MBM10415AH	★3681
			3475-41
	Motorola	**MCM10415A**	★3839
			469-19
	National	DM10415	469-21
			3475-45
		DM10415A	3475-63
	Siemens	GXB10415	3475-50
	Signetics	10415	469-22
		10415A	3475-44
		10415B	3475-31
10416	Fairchild	F10416	468-146
		F10416C	3459-61
1042	Plessey	TAB1042	2943-1
	Signetics	TEA1042	2949-120
10422	**Fairchild**	**F10422**	★3615
			★3620
			3473-43
10422	**Fairchild**	**F10422C**	★3615
			★3620
			3473-41
	Fujitsu	**MBM10422E**	★3681
			469-7
			★3681
			3473-51
		MBM10422H	★3681
			469-8
			★3681
			3473-45
		MBM10422N	★3681
			469-9
			★3681
			3473-53
	Hitachi	**HM10422**	★3789
			3473-50
	Motorola	**MCM10422**	★3839
			3473-26
	National	**DM10422**	★3854
			469-11
			★3854
			3473-55
	Signetics	10422	3473-59
		10422A	3473-57
		10422B	3473-47
1043	Plessey	TAB1043	2943-2
	Signetics	TEA1043	2948-42
10430	AMI	S10430	2900-22
			¶ 272-15
10432	Rockwell	10432	1088-114
1044	Signetics	TEA1044	2948-43
1045	ITT	TEA1045	2947-4
10453	Rockwell	10453	1088-111
1046	Siemens	TDA1046	2900-68
	Signetics	SAB1046	511-27
		TEA1046	2949-121
1047	Siemens	TDA1047	2901-59
	Signetics	SAB1047	511-9
10470	AMD	AM10470AC	3481-24
		AM10470AM	3481-31
		AM10470C	3481-36
		AM10470M	3481-44
		AM10470SAC	3481-18
		AM10470SAM	3481-20
	Fairchild	**F10470**	★3615
			★3621
			469-24
		F10470C	★3615
			★3621
			3481-40
	Fujitsu	**MBM10470**	★3681
			3481-41
		MBM10470A-15	★3681
			469-23
			★3681
			3481-19
		MBM10470A-20	★3681
			469-25
			★3681
			3481-22
	Hitachi	**HM10470**	★3789
			3481-26
		HM10470-1	★3789
			3481-15
	Motorola	**MCM10470**	★3839
	National	**DM10470**	★3855
			469-28
			★3855
			3481-27
		DM10470A	★3855
			469-29
			★3855
			3481-16
		DM10470L	★3855
			469-30
			★3855
			3481-28
	Signetics	10470	3481-38
		10470A	3481-30
10474	AMD	AM10474AC	3477-28
		AM10474AM	3477-30
		AM10474C	3477-34
		AM10474M	3477-36
	Fairchild	**F10474C**	★3615
			★3622
10474	Fairchild	F10474C	469-15
			★3615
			★3622
			3477-38
	Fujitsu	**MBM10474**	★3681
			3477-32
	Hitachi	**HM10474**	★3789
	Motorola	**MCM10474**	★3839
1048	Siemens	TDA1048	2900-56
10480	Fairchild	F10480	469-31
			3483-65
	Fujitsu	**MBM10480**	★3680
			3483-63
1049	Siemens	GXB1049	3459-62
105	Burr-Brown	OPA105UM	2917-12
		OPA105WM/MIL	
			2917-8
	Fairchild	uA105M	2959-124
	Motorola	MMBTS105	2968-25
	National	AF105	2949-88
		LM105	2959-126
	Siemens	FZH105A	472-100
		FZJ105	472-58
		FZK105	473-40
		TCA105	2968-41
	Signetics	MB105	2899-99
	SiliconG	SG105	2960-2
	SiliconSys	SSI105	2481-70
1050	National	DT1050	2902-91
	Sanken	SI1050	2896-147
	Western	**WD1050**	★1571
			1101-86
10500	DDC	DRC10500	2967-9
	Motorola	MC10500	468-33
	RCA	**MA10500**	★4518
			4141-91
10501	Fairchild	F10501	468-52
	Motorola	MC10501	468-55
10502	Fairchild	F10502	468-24
	Motorola	MC10502	468-27
10503	Fairchild	F10503	467-147
	Motorola	MC10503	467-149
10504	Fairchild	F10504	467-127
	Motorola	MC10504	467-131
10505	Fairchild	F10505	468-44
	Motorola	MC10505	468-47
10506	Fairchild	F10506	468-18
	Motorola	MC10506	468-21
10507	Fairchild	F10507	468-90
	Motorola	MC10507	468-93
10509	Fairchild	F10509	468-36
	Motorola	MC10509	468-40
1051	National	DT1051	2902-74
10510	Fairchild	F10510	467-139
105100	Fairchild	F105100	468-31
10511	Fairchild	F10511	468-3
10513	Fairchild	F10513	468-85
	Motorola	MC10513	468-87
10514	Fairchild	F10514	469-94
	Motorola	MC10514	469-99
10515	Fairchild	F10515	469-109
	Motorola	MC10515	469-111
10516	Fairchild	F10516	469-95
	Motorola	MC10516	469-100
10517	Fairchild	F10517	468-71
	Motorola	MC10517	468-74
10518	Fairchild	F10518	468-59
	Motorola	MC10518	468-62
10519	Fairchild	F10519	468-65
	Motorola	MC10519	468-68
1052	National	DT1052	2902-90
10521	Fairchild	F10521	468-78
	Motorola	MC10521	468-81
10523	Fairchild	F10523	467-89
10524	Fairchild	F10524	469-76
	Motorola	MC10524	469-78
10525	Fairchild	F10525	469-71
	Motorola	MC10525	469-73
10530	Fairchild	F10530	468-97
	Motorola	MC10530	468-101
10531	Fairchild	F10531	467-98
	Motorola	MC10531	467-104
10532	Fairchild	F10532	468-111
	Motorola	MC10532	468-114
10533	Fairchild	F10533	468-122
	Motorola	MC10533	468-127

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
10534	Fairchild	F10534	468-105
	Motorola	MC10534	468-108
10535	Fairchild	F10535	467-121
	Motorola	MC10535	467-123
10536	Fairchild	F10536	467-46
	Motorola	MC10536	467-49
10537	Fairchild	F10537	467-55
	Motorola	MC10537	467-57
10538	Motorola	MC10538	467-53
1054	SGS	TDA1054M	2902-130
			¶ 273-1
10541	Fairchild	F10541	469-59
	Motorola	MC10541	469-61
			3489-51
10544	Motorola	MCM10544	468-170
10545	Fairchild	F10545A	3470-90
		F10545AM	468-153
	Motorola	MCM10545	3470-94
10546	Motorola	MCM10546	469-20
			3475-68
10547	Motorola	MCM10547	468-165
10548	Motorola	MCM10548	468-160
1055	Signetics	TEA1055	2949-122
10553	Fairchild	F10553	468-123
	Motorola	MC10553	468-128
10558	Fairchild	F10558	469-45
	Motorola	MC10558	469-47
10559	Fairchild	F10559	469-40
	Motorola	MC10559	469-42
1056	**National**	**DT1056**	★3340
			2902-92
	Signetics	SAA1056	2945-134
10560	Fairchild	F10560	469-121
	Motorola	MC10560	469-123
10561	Fairchild	F10561	467-70
	Motorola	MC10561	467-74
10562	Fairchild	F10562	467-62
	Motorola	MC10562	467-66
10563	Motorola	MC10563	469-86
			2467-15
10564	Fairchild	F10564	469-50
	Motorola	MC10564	469-52
10565	Fairchild	F10565	469-114
	Motorola	MC10565	469-116
10566	Fairchild	F10566	467-29
	Motorola	MC10566	467-31
10568	Fairchild	F10568	468-117
	Motorola	MC10568	468-119
1057	**National**	**DT1057**	★3340
			2902-93
	Signetics	SAA1057	2900-153
			2945-135
10570	Fairchild	F10570	469-118
10571	Fairchild	F10571	467-83
	Motorola	MC10571	467-85
10572	Fairchild	F10572	467-78
	Motorola	MC10572	467-80
10573	Fairchild	F10573	468-131
10574	Fairchild	F10574	469-33
	Motorola	MC10574	469-35
10575	Fairchild	F10575	468-136
	Motorola	MC10575	468-139
10576	Fairchild	F10576	467-114
	Motorola	MC10576	467-116
10578	Motorola	MC10578	467-44
10579	Fairchild	F10579	467-2
	Motorola	MC10579	467-5
1058	Signetics	SAA1058	2888-118
10580	Fairchild	F10580	467-10
	Motorola	MC10580	467-13
10581	Fairchild	F10581	467-23
	Motorola	MC10581	467-26
10582	Motorola	MC10582	467-17
10586	Fairchild	F10586	467-110
	Motorola	MC10586	467-112
1059	Signetics	TDA1059B	2906-81
10590	Motorola	MC10590	469-69
10591	Motorola	MC10591	469-81
10592	Fairchild	F10592	467-93
10593	Motorola	MC10593	469-87
			2467-16
10594	Motorola	MC10594	469-91
10595	Motorola	MC10595	467-38
10597	Motorola	MC10597	467-135
106	AnalogSys	MA106	2897-137
	Burr-Brown	OPA106/MIL	2911-48

Base Number	Source	Device	Page-Line
106	**National**	**LM106**	★3317
			2891-22
	SGS	M106	2906-43
	SiliconSys	SSI106	2480-154
	Telefunken	U106	2968-138
			¶ 263-1
	TI	LM106	2891-30
1060	Ferranti	ZN1060	2960-105
	Signetics	SAA1060	2463-55
		TDA1060	2961-26
1061	Signetics	SAA1061	2463-56
10610	Fairchild	F10610	467-140
	Motorola	MC10610	467-144
10611	Fairchild	F10611	468-4
	Motorola	MC10611	468-8
10612	Fairchild	F10612	468-13
	Motorola	MC10612	468-15
10616	Motorola	MC10616	469-101
1062	Signetics	SAA1062	2463-37
	Telefunken	TDA1062	2901-159
			¶ 271-10
		TDA1062S	2901-160
			¶ 271-10
1063	Signetics	SAA1063	2464-98
10631	Fairchild	F10631	467-99
	Motorola	MC10631	467-105
1066	Ferranti	ZN1066E	2960-106
			¶ 281-10
		ZN1066J	2960-107
			¶ 281-10
10687	Motorola	MC10687	467-19
10696	Rockwell	10696	1088-106
107	AnalogSys	MW107	2951-11
	Harris	**HA107**	★3287
	Harris	LM107	2923-40
	Intersil	LM107	2923-41
	Motorola	LM107	2923-42
	National	LM107	2923-44
	Raytheon	LM107	2923-46
	SiliconG	SG107	2923-47
	TI	LM107	2923-49
1070	Telmos	TM1070	2426-20
	TI	**TMS1070**	★1557
			1088-25
			★1557
			1057-7
		TMS1070C	★1557
			1088-19
			★1557
			1057-8
10706	Rockwell	10706	1088-102
1072	Signetics	TDA1072	2900-70
	Telefunken	TDA1072	2900-74
10736	Rockwell	10736	1088-129
10738	Rockwell	10738	1088-101
1074	Signetics	TDA1074	2896-37
			2965-82
1075	ITT	SAA1075	2904-55
1077	Signetics	SAB1077	511-21
			2946-95
		TDA1077	2948-40
10788	Rockwell	10788	1088-108
10789	Rockwell	10789	1088-112
108	AMD	LM108	2911-141
			2922-50
		LM108A	2918-42
	AD	**AD108**	★3153
			2911-142
			2922-52
		AD108A	★3153
			2918-44
	AnalogSys	MY108	2887-3
	Fairchild	uA108	2911-151
		uA108AM	2918-46
		uA108M	2922-54
	Harris	**LM108**	★3286
			★3288
		LM108A	★3286
			★3288
			2918-48
	Intersil	ICL108LN	2922-47
		LM108	2911-144
			2922-57
		LM108A	2918-49

Base Number	Source	Device	Page-Line
108	Motorola	LM108	2911-145
			2922-58
		LM108A	2918-50
	National	**CLM-108**	★1950
	National	LM108	2911-146
			2922-60
		LM108A	2918-52
	PMI	PM108	2911-147
			2923-1
		PM108A	2919-1
	SGS	M108	2900-34
	SiliconG	SG108	2911-148
			2923-3
		SG108A	2919-3
	SiliconSys	SSI108	2481-71
1080	**AD**	**ADSP-1080X**	★3185
			449-124
		ADSP-1080T	★3185
			449-125
	Cybersys	1080	1755-21
	National	**ADC1080**	★3319
			★3344
			2430-44
10800	Motorola	MC10800	467-21
			¶ 248-2
			1085-61
			¶ 248-2
			1049-12
			¶ 248-2
10801	Motorola	MC10801	1085-67
			¶ 244-10
10802	Motorola	MC10802	1085-69
10803	Motorola	MC10803	1085-66
			¶ 244-10
10804	Motorola	MC10804	1085-62
10805	Motorola	MC10805	1085-63
10806	Motorola	MC10806	1085-70
10807	Motorola	MC10807	1085-64
10808	Motorola	MC10808	1085-68
10809	Rockwell	10809	1088-115
10814	Rockwell	10814	1088-104
10815	Rockwell	10815	1088-110
10817	Rockwell	10817	1088-103
1082	Cybersys	1082	1761-12
	Signetics	SAA1082	2901-161
1083	Sprague	TDA1083	2900-132
	Telefunken	TDA1083	2900-139
			¶ 272-1
1085	Cybersys	1085	1763-30
	Plessey	TDA1085A	2906-73
			¶ 279-10
1087	Telefunken	TEA1087	2962-4
109	AnalogSys	MM109	2964-153
	Fairchild	uA109M	2952-51
	Motorola	**LM109H**	★3294
			2952-19
		LM109K	★3294
			2952-54
	National	**LM109H**	★3299
			2952-22
			¶ 281-13
		LM109K	★3299
			2952-57
			¶ 281-13
	SGS	M109	2900-4
	SiliconG	SG109K	2952-63
		SG109T	2952-27
1090	Sprague	TDA1090	2900-133
10900	**Motorola**	**MC10900**	★4479
			4141-38
	Motorola	MC10900	467-33
	Motorola	**MC10900Z**	★4479
			4141-39
10901	Motorola	MC10901	467-32
	Motorola	**MC10901Z**	★4479
			4141-40
10902	Motorola	MC10902	467-34
	Motorola	**MC10902Z**	★4479
			4141-41
10904	Motorola	MC10904	469-89
	Motorola	**MC10904Z**	★4479
			4141-42
10905	Motorola	MC10905	469-88
	Motorola	**MC10905Z**	★4479
			4141-43
10929	Rockwell	10929	1088-117

Base Number	Source	Device	Page-Line
1093	Telefunken	TDA1093	2901-71
			¶ 271-10
10930	Rockwell	10930	1088-127
10932	Rockwell	10932	1088-116
10936	Rockwell	10936	1088-105
10937	Rockwell	10937	2465-146
			1100-96
10938	Rockwell	10938	2465-6
10939	Rockwell	10939	2465-7
1094	Telefunken	TDA1094	2901-1
1096	Signetics	TDA1096	2898-24
			2962-45
	Telefunken	U1096B	2465-126
1098	TI	TMS1098	1088-41
1099	TI	TMS1099	1088-42
		TMS1099C	1088-44
10H016	**Motorola**	**MC10H016**	★730
10H100	**Motorola**	**MC10H100**	★730
10H101	**Motorola**	**MC10H101**	★730
			468-56
10H102	**Motorola**	**MC10H102**	★730
			468-28
10H103	**Motorola**	**MC10H103**	★730
10H104	**Motorola**	**MC10H104**	★730
			467-132
10H105	**Motorola**	**MC10H105**	★730
			468-48
10H106	**Motorola**	**MC10H106**	★730
10H107	**Motorola**	**MC10H107**	★730
			468-94
10H109	**Motorola**	**MC10H109**	★730
			468-41
10H113	**Motorola**	**MC10H113**	★730
10H115	**Motorola**	**MC10H115**	★730
10H116	**Motorola**	**MC10H116**	★730
			469-102
10H117	**Motorola**	**MC10H117**	★730
			468-75
10H118	**Motorola**	**MC10H118**	★730
10H119	**Motorola**	**MC10H119**	★730
10H121	**Motorola**	**MC10H121**	★730
			468-82
10H123	**Motorola**	**MC10H123**	★730
10H124	**Motorola**	**MC10H124**	★730
10H125	**Motorola**	**MC10H125**	★730
10H130	**Motorola**	**MC10H130**	★730
			468-102
10H131	**Motorola**	**MC10H131**	★730
			467-106
10H135	**Motorola**	**MC10H135**	★730
10H136	**Motorola**	**MC10H136**	★730
			467-50
10H141	**Motorola**	**MC10H141**	★730
			469-62
10H145	**Motorola**	**MC10H145**	★730
10H155	**Motorola**	**MC10H155**	★730
10H158	**Motorola**	**MC10H158**	★730
10H159	**Motorola**	**MC10H159**	★730
10H160	**Motorola**	**MC10H160**	★730
			469-124
10H161	Motorola	DG10H161	467-72
	Motorola	**MC10H161**	★730
			467-75
10H162	Motorola	DG10H162	467-64
	Motorola	**MC10H162**	★730
			467-67
10H164	**Motorola**	**MC10H164**	★730
			469-53
10H166	**Motorola**	**MC10H166**	★730
10H173	**Motorola**	**MC10H173**	★730
	Motorola	MC10H173	468-133
10H174	**Motorola**	**MC10H174**	★730
	Motorola	MC10H174	469-36
10H175	**Motorola**	**MC10H175**	★730
			468-140
10H176	**Motorola**	**MC10H176**	★730
			467-117
10H179	**Motorola**	**MC10H179**	★730
			467-6
10H180	**Motorola**	**MC10H180**	★730
			467-14
10H181	**Motorola**	**MC10H181**	★730
			467-27
10H186	**Motorola**	**MC10H186**	★730
10H188	**Motorola**	**MC10H188**	★730
10H189	**Motorola**	**MC10H189**	★730

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
10H209	Motorola	MC10H209	★ 730
10H210	Motorola	MC10H210	★ 730
10H211	Motorola	MC10H211	★ 730
10H330	Motorola	MC10H330	★ 730
10H332	Motorola	MC10H332	★ 730
10H334	Motorola	MC10H334	★ 730
10H350	Motorola	MC10H350	★ 730
10H423	Motorola	MC10H423	★ 730
10H424	Motorola	MC10H424	★ 730
10H8	MMI	HAL10H8C	506-112
		HAL10H8M	506-113
	MMI	PAL10H8-2	★4470
		PAL10H8C	★4449
			506-33
			★4449
			3457-7
		PAL10H8M	★4449
			506-34
			★4449
			3457-8
	National	DMPAL10H8C	★ 737
			506-61
			★ 737
			3457-37
		DMPAL10H8M	★ 737
			506-62
			★ 737
			3457-38
10L8	MMI	HAL10L8C	506-114
		HAL10L8M	506-115
	MMI	PAL10L8-2	★4470
		PAL10L8C	★4449
			506-35
			★4449
			3457-9
		PAL10L8M	★4449
			506-36
			★4449
			3457-10
	National	DMPAL10L8C	★ 737
			506-63
			★ 737
			3457-39
		DMPAL10L8M	★ 737
			506-64
			★ 737
			3457-40
10Z416	Fairchild	F10Z416	★3619
			468-147
			★3619
			3459-64
		F10Z416A	★3619
			3459-60
11	Burr-Brown	MP11	2439-2
			¶ 244-16
			¶ 247-9
			1102-18
			¶ 244-16
			¶ 247-9
		OPA11HT	2927-53
		UAF11	2962-9
		UAF11H	2962-10
	DEC	DCT11-AA	1083-6
		SCB11/21	1767-23
	DDC	DAC-SL-11	2457-8
		DAC-U11-1	2460-42
		DDAC-11	2460-23
		SDAC-11	2460-19
	National	LM11	2911-84
			2917-28
			¶ 265-11
		LM11C	2911-85
			2919-50
			¶ 265-11
		LM11CL	2927-32
			¶ 265-11
	National	NB11	★3327
		NR11	★3327
	Nortek	FEP-11L	1765-22
		PCP-11E	1757-11
		PCP-11L	1757-12
	PMI	OP-11A	2941-21
		OP-11B	2941-36
		OP-11E	2941-22
		OP-11F	2941-37
		SMP11A	2967-129
11	PMI	SMP11B	2967-130
		SMP11E	2967-131
		SMP11F	2967-132
		SMP11G	2967-133
	RCA	MSIA11	★1959
	Signetics	MJ11-2	2899-138
	TeledyneC	CDA11	2420-9
		CDA11-S12	2420-8
	Western	AMS-D11	1765-9
110	Burr-Brown	FOR110	2963-69
		FOT110	2963-73
	Intersil	LM110	2908-17
	MicroEng	MGB110A	★4437
			4141-7
		MGC110A	★4437
			4141-15
	Motorola	MVME110	★1936
			1769-1
	National	AF110	2949-89
		LM110	2908-21
	SGS	M110	2900-23
	SiliconG	SG110	2908-18
	Siliconix	LD110	2438-28
			¶ 255-1
			¶ 255-8
	Synertek	CP110	1759-5
1100	CalDevices	CDI1100	4140-16
	Epson	SED1100	2463-38
	Lambda	LAS1100	2960-13
	Solarise	CK1100A	2945-13
			2965-38
	TI	SE1100C	★1560
			1088-38
			1088-49
			★1560
			1055-29
		SEB1100	★1560
		TMS1100	★1557
			1088-26
			★1557
			1057-9
		TMS1100C	★1557
			1088-20
			★1557
			1057-10
	Western	WD1100	★1567
			1101-117
1101	AMD	1101A	3472-65
			3472-65
		1101AM	3472-66
			3472-66
	TI	TCM1101	2948-48
1101A1	AMD	1101A1	3472-63
			3472-63
1103	ITT	UAA1103	2902-78
11049	Rockwell	11049	1088-109
1108	Hitachi	HA1108	2903-14
111	AMD	LF111	2892-5
		LM111	2891-56
	AD	AD111	2891-39
	AnalogSys	MK111	511-127
	Fairchild	CCD111	2964-1
			2964-47
		uA111M	2891-41
	Intersil	DG111	2416-69
		LM111	2891-42
	Motorola	LM111	2891-43
	National	LF111	★3310
			★3317
			2892-3
		LM111	★3317
			2891-45
	Raytheon	LM111	2891-47
	RCA	CA111	2891-48
	Siemens	FZH111A	472-101
		FZJ111	472-55
	Signetics	LM111	2891-50
	SiliconG	SG111	2891-52
	Siliconix	DGM111A	2416-65
			2416-66
		DGM111B	2416-67
			2416-68
		LD111A	2438-29
			¶ 255-1
			¶ 255-8
	Telefunken	U111	2962-5
111	TI	LM111	2891-38
		TL111	2891-5
1110	AMD	PS/1110	★1907
1111	Monosil	M1111	1051-20
	National	LM1111	★3326
			★3328
			2896-47
	Sanyo	LA1111	2901-16
1114	Solarise	CK1114A	2945-14
			2965-39
1115	Intersil	ICM1115	2898-140
		ICM1115A	2898-141
		ICM1115B	2898-142
1117	TI	TMS1117	2951-9
	TI	TMS1117NLP	★1559
			2951-10
112	AMD	LM112	2911-150
	AnalogSys	MA112	2925-28
	Intersil	D112C	2422-88
		D112M	2422-89
		DG112	2416-70
	National	LM112	2911-138
			2922-48
	TRW	MPY112K	★ 812
			★ 814
			476-7
			476-8
		Y112K	★ 812
			★ 814
11201	National	LF11201	★3318
			2416-90
11202	National	LF11202	★3318
			2416-91
1121	ITT	SAA1121	2905-82
	Motorola	MHW1121	2903-45
	National	LM1121A	★3326
			2896-48
		LM1121B	★3326
			2896-49
		LM1121C	★3326
			2896-50
	TI	TMS1121	1088-52
	TI	TMS1121NLL	★1559
11211	Hitachi	HA11211	2900-116
11215	Hitachi	HA11215	2905-122
11219	Hitachi	HA11219	2901-90
1122	Signetics	PCA1122	2899-141
11220	Hitachi	HA11220	2905-123
11221	Hitachi	HA11221	2905-124
11223	Hitachi	HA11223	2901-102
11225	Hitachi	HA11225	2901-26
11226	Hitachi	HA11226	2896-46
11227	Hitachi	HA11227	2901-103
11229	Hitachi	HA11229	2904-159
11235	Hitachi	HA11235	2904-67
11238	Hitachi	HA11238	2905-125
1124	Hitachi	HA1124	2904-160
	SGS	M1124	2902-34
11244	Hitachi	HA11244	2904-68
11247	Hitachi	HA11247	2903-94
1125	Hitachi	HA1125	2904-161
11251	Hitachi	HA11251	2900-117
1126	Hitachi	HA1126	2903-15
	Signetics	PCA1126	2899-142
1127	Motorola	MHW1127	2903-46
113	AnalogSys	MA113	2888-131
	Intersil	D113C	2422-90
		D113M	2422-91
	National	LM113	★3304
			2966-7
		LM113-1	★3304
			2966-8
		LM113-2	★3304
			2966-9
1130	Sanyo	LA1130	2900-87
1131	National	LM1131A	★3326
			2896-51
		LM1131B	★3326
			2896-52
		LM1131C	★3326
			2896-53
11331	National	LF11331	★3318
			2416-92
11332	National	LF11332	★3318
			2416-93
11333	National	LF11333	★3318
			2416-94
1137	Hitachi	HA1137	2901-27
114	SiliconSys	SSI114	2481-63
			2481-72
1140	Sanyo	LA1140	2901-52
11405	Hitachi	HA11405	2905-126
11409	Hitachi	HA11409	2899-77
			2904-45
11412	Hitachi	HA11412	2903-95
11417	Hitachi	HA11417	2903-96
1143	ContLogic	CCS-1143A	1757-2
1144	Solarise	CK1144A	2945-15
			2965-40
1145	Solarise	CK1145A	2945-16
			2965-41
115	AnalogSys	MU115	2963-59
	Intersil	G115A	2422-70
		G115B	2422-71
	ITT	SAY115	2898-46
	Panasonic	AN115	2901-118
		MN115P	510-74
	Siemens	FZH115B	472-102
		FZJ115	472-56
	SiliconSys	SSI115	2481-73
	Siliconix	G115A	2422-76
		G115B	2422-77
1150	Sanyo	LA1150	2901-53
11508	National	LF11508	★3318
			2424-35
11509	National	LF11509	★3318
			2423-70
1151	Hitachi	HA1151	2900-59
	SGS	TDA1151	2906-77
1155	NEC-Electron	uPC1155	2897-25
115530	Harris	HD115530	★1333
1156	Hitachi	HA1156	2901-104
	NEC-Electron	uPC1156	2897-26
11580	Hitachi	HA11580	2903-97
116	AnalogSys	MC116	2967-154
	Intersil	DG116	2416-71
		G116A	2422-66
		G116B	2422-67
	Panasonic	MN116P	510-75
	SiliconSys	SSI116	2481-67
	Siliconix	G116A	2422-68
		G116B	2422-69
1160	Sanyo	LA1160	2901-88
11660	Rockwell	11660	1088-97
11696	Rockwell	11696	1088-107
117	Fairchild	uA117	2959-72
	Intersil	G117A	2422-63
		G117B	2422-64
	MicroEng	MCELM117	2959-76
	Motorola	LM117	★3295
			2959-79
		LM117L	★3295
			2959-64
		LM117M	★3295
			2959-109
	National	LM117	★3299
			2959-82
			¶ 281-13
	SiliconG	SG117	2959-68
			2959-85
	SiliconSys	SSI117	2481-74
	Siliconix	G117A	2422-65
	TI	TL117L	2959-71
1170	SGS	TDA1170	2905-104
	Sprague	TDA1170	2905-116
	TI	TMS1170	★1557
			1057-11
11700	National	LM11700A	2936-27
11701	Hitachi	HA11701	2902-151
11702	Hitachi	HA11702	2903-4
11703	Hitachi	HA11703	2902-148
11704	Hitachi	HA11704	2902-139
11705	Hitachi	HA11705	2902-140
11706	Hitachi	HA11706	2902-141
11707	Hitachi	HA11707	2903-5
1171	Motorola	MHW1171	2903-47
	Signetics	PCF1171	2898-38
			2899-21
1172	Motorola	MHW1172	2903-48
	Signetics	PCF1172	2898-39
			2899-22

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
118	AMD	LM118	2910-42
			2926-7
	AnalogSys	MS118	2967-153
	Fairchild	uA118	2910-48
	Harris	**LM118**	★3286
			★3288
			2910-51
			2926-9
	Intersil	DG118	2416-72
		G118A	2422-72
		G118B	2422-73
	National	LM118	2910-56
			2926-10
	Raytheon	LM118	2910-58
			2926-12
	Siliconix	G118A	2422-78
	TI	LM118	2910-59
			2926-13
1180	SGS	TDA1180	2904-108
11806	Rockwell	11806	1088-100
1182	Motorola	MHW1182	2903-49
119	AMD	LM119	2893-32
	Intersil	G119A	2422-82
		G119B	2422-83
	National	**LM119**	★3317
			2893-31
			2893-34
	Signetics	LM119	2893-36
	Siliconix	G119A	2422-84
		G119B	2422-85
1190	Motorola	TDA1190	2904-168
		TDA1190P	2904-170
	RCA	CA1190	2905-15
	SGS	TDA1190	2905-25
	Sprague	TDA1190Z	2905-37
11902	Motorola	TDA11902	2904-169
1191	RCA	CA1191	2905-16
1195	Siemens	TDA1195	2421-69
1196	Hitachi	HA1196	2901-105
1197	Hitachi	HA1197	2900-60
1199	Hitachi	HA1199	2900-61
	Motorola	HA1199	2900-62
11C01	Fairchild	11C01C	471-36
11C05	Fairchild	11C05-2C	471-1
		11C05-2M	471-2
		11C05C	471-3
		11C05M	471-4
11C06	Fairchild	11C06C	471-23
		11C06M	471-24
11C24	Fairchild	11C24C	501-11
			2946-30
		11C24M	501-12
			2946-31
11C44	Fairchild	11C44C	507-1
			2945-59
		11C44M	507-2
			2945-60
11C58	Fairchild	11C58C	471-44
			2945-157
11C70	Fairchild	11C70C	471-19
		11C70M	471-20
11C79	Fairchild	11C79	471-17
			2946-84
11C82	Fairchild	11C82	471-15
			2946-93
11C83	Fairchild	11C83	471-16
			2946-94
11C90	Fairchild	11C90C	471-12
			2946-73
		11C90M	471-13
			2946-74
11C91	Fairchild	11C91C	471-10
			2946-56
		11C91M	471-11
			2946-57
12	Burr-Brown	OPA12HT	2933-36
	Cromemco	**DAC12**	★1927
	Datel	**ADC-EK12B**	★2619
			2435-22
	Datel	ADC-EK12DC	2436-22
		ADC-EK12DM	2436-23
	Datel	**ADC-ET12BC**	★2619
			2435-49
		ADC-ET12BM	★2619
			2435-19
		ADC-ET12BR	★2619

Base Number	Source	Device	Page-Line
12	**Datel**	**ADC-HC12BMC**	★2619
			2435-17
		ADC-HC12BMM	★2618
			2435-18
	Datel	ADC-HS12BMC	2432-8
	Datel	**ADC-HS12BMM**	★2618
			2432-9
		ADC-HS12BMR	★2619
		ADC-HX12BGC	★2619
			2433-46
		ADC-HX12BMM	★2618
			2433-47
		ADC-HZ12BGC	★2619
			2432-6
		ADC-HZ12BMM	★2618
			2432-7
		DAC-HA12BC	★2621
			2453-5
	Datel	DAC-HA12BC-1	2453-9
	Datel	**DAC-HA12BM**	★2620
			2453-6
	Datel	DAC-HA12BM-1	
			2453-10
		DAC-HA12DC	2459-29
		DAC-HA12DC-1	
			2459-27
		DAC-HA12DM	2459-30
		DAC-HA12DM-1	
			2459-28
	Datel	**DAC-HF12BMC**	★2621
			2451-14
	Datel	DAC-HF12BMM	2451-15
		DAC-HK12BGC	2454-37
		DAC-HK12BGC-2	
			2455-1
	Datel	**DAC-HK12BMM**	★2620
			2455-2
		DAC-HK12BMR	★2621
	Datel	DAC-HK12DGC	2459-17
		DAC-HK12DMM	
			2459-18
	Datel	**DAC-HZ12BGC**	★2621
			2455-7
		DAC-HZ12BMM	★2620
	Datel	DAC-HZ12DGC	2459-19
		DAC-HZ12DMC	2459-20
		DAC-HZ12DMM	
			2459-21
		HAC-HK12BMM-2	
			2455-3
		HAC-HZ12BMM	2455-8
	Datel	**ST-LS12**	★1933
	DDC	DAC-SL-12	2455-28
		DAC-U12-1	2460-41
		DDAC-12	2460-22
		SDAC-12	2460-17
	Datricon	ACS12	1759-27
	IPI	PS12	2964-91
	IntCyber	LP-12	1767-2
		LP-12P	1767-1
	National	**HB12**	★3327
		HR12	★3327
	NEC-Electron	uPC12	2896-11
	Plessey	CLA12XX	4141-72
	PMI	OP-12	2911-153
		OP-12A	2916-18
		OP-12B	2917-31
		OP-12C	2921-7
		OP-12E	2916-19
		OP-12F	2917-32
		OP-12G	2921-8
	Supertex	VF-12	2481-33
	Toshiba	TLCS-12A	1077-13
120	AnalogSys	MS120	2967-150
	Datal/O	M120A	4003-3
	Intersil	D120C	2422-92
		D120M	2422-93
		DG120	2421-25
		IT120	2889-67
		IT120A	2889-68
	National	**AF120**	★3345
			2948-98
		LM120	★3301
		TBA120	★3325
			★3327
			2901-35

Base Number	Source	Device	Page-Line
120	**National**	**TBA120S**	★3325
			★3327
			2904-172
	Plessey	TBA120	2901-39
			2905-13
	SGS	L120	2967-147
			¶ 279-9
		M120	3475-10
			¶ 286-7
	Siemens	TBA120S	2901-58
	Signetics	ST120	2950-7
		TBA120S	2901-62
			2905-32
		TBA120U	2901-63
			2901-99
			2905-33
	SiliconG	SG120-05K	2956-120
		SG120-05P	2956-108
		SG120-05T	2956-102
		SG120-08K	2957-41
		SG120-08R	2957-42
		SG120-08T	2957-33
		SG120-12K	2957-88
		SG120-12P	2957-78
		SG120-12T	2957-65
		SG120-15K	2957-133
		SG120-15R	2957-123
		SG120-15T	2957-108
		SG120-18K	2958-22
		SG120-18R	2958-23
		SG120-18T	2958-16
		SG120-20K	2958-37
		SG120-20R	2958-38
		SG120-20T	2958-33
		SG120-5	2957-10
			2957-5
			2957-2
	Siliconix	LD120	2438-47
			¶ 255-8
			¶ 277-8
	Telefünken	TBA120	2901-70
			2905-41
1200	Cherry	CS1200	4140-42
	LSIComp	C1200	2464-87
			2899-34
	LSILogic	LCA-1200-ECL	4140-142
	Motorola	**MCA1200ECL**	★4479
			4141-45
	National	ADB1200C	2436-5
	National	**DAC1200**	★3320
			★3345
			2454-10
		DAC1200C	★3320
			★3345
			2454-11
	SGS	TDA1200	2901-56
			¶ 272-2
	Sunrise	Z-1200	4010-1
	TI	**TMS1200**	★1557
			1088-27
			★1557
			1057-12
		TMS1200C	★1557
			1088-21
			★1557
			1057-13
	Universal	HCM1200	4141-122
12000	**Motorola**	**MC12000**	★ 733
			2945-10
12001	Hitachi	HA12001	2902-115
12002	Hitachi	HA12002	2906-110
	Motorola	MC12002	2945-17
			2962-90
12005	Hitachi	HA12005	2902-117
12006	Hitachi	HA12006	2902-104
12009	Motorola	MC12009	510-88
			2946-60
			2946-65
1201	Hitachi	HA1201	2901-3
	National	**DAC1201**	★3320
			★3345
			2458-4
		DAC1201C	★3320
			★3345
			2458-5
	NEC-Electron	uPD1201	2898-54

Base Number	Source	Device	Page-Line
1201	PC/M	PPS-1201	1767-4
	Panasonic	MN1201	459-93
			1086-129
	Sanyo	LA1201	2900-109
12010	Hitachi	HA12010	2463-29
12011	Hitachi	HA12011	2463-30
	Motorola	MC12011	510-95
			2946-70
12012	Hitachi	HA12012	2897-186
	Motorola	MC12012	2946-67
12013	Motorola	MC12013	510-108
			2946-77
12014	Motorola	MC12014	2945-7
12017	Hitachi	HA12017	2897-144
1202	**AD**	**HAS-1202**	★3175
			2431-36
		HAS-1202	★3175
			2430-9
	Panasonic	MN1202	1086-128
12020	Motorola	MC12020	2945-28
12021	Motorola	MC12021	2945-29
1203	Panasonic	MN1203	3472-27
1204	Panasonic	MN1204A	1086-126
		MN1204B	1086-127
12040	Motorola	MC12040	2945-61
1205	**AD**	**HDH-1205**	★3169
			2453-22
		HDH-1205M	★3169
			2453-23
	Panasonic	MN1205A	2464-100
		MN1205E	2464-84
		MN1205F	2464-99
		MN1205H	2465-141
		MN1205P	2464-85
		MN1205Q	2464-86
1206	**AD**	**HDD-1206J**	★3169
			2454-26
		HDD-1206S	★3169
			2454-27
	Panasonic	MN1206	1086-124
12060	Motorola	MC12060	2945-8
			¶ 278-10
12061	Motorola	MC12061	2945-11
			¶ 278-10
1207	Panasonic	MN1207	1086-125
12071	Motorola	MC12071	511-10
			2945-78
			2946-87
1208	**National**	**DAC1208**	★3320
			2453-43
	Panasonic	MN1208	3455-10
1209	**National**	**DAC1209**	★3320
			2456-36
120H12	National	LM120H12	2957-63
120H15	National	LM120H15	2957-106
120H5	National	LM120H5	2956-98
120K12	National	LM120K12	2957-74
120K15	National	LM120K15	2957-119
121	AnalogSys	MD121	2483-22
	Datal/O	M121A	4003-4
	Fairchild	CCD121	2964-52
	Intersil	D121C	2422-94
		D121M	2422-95
		DG121	2421-26
		IT121	2889-69
	National	AF121	2947-34
		LM121	2888-24
		LM121A	2888-25
	SGS	L121	2967-146
			¶ 279-9
	Siemens	FZH121	472-78
		FZJ121	472-51
	Signetics	MJ121	2899-139
	Siliconix	**LD121A**	★2817
			2438-48
			¶ 255-8
			¶ 277-8
1210	**AMD**	**PS/1210**	★1907
	National	**ADC1210**	★3344
			2435-14
		ADC1210C	★3344
			2435-15
	National	DAC1210	2457-33
	Sanyo	LA1210	2900-127
1211	Hitachi	HA1211	2901-4

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
1211	**National**	**ADC1211**	**★3344**
			2436-2
		ADC1211C	**★3344**
			2436-3
1215	NEC-Electron	uPC1215V	2900-63
1217	SiliconG	SG1217	2929-7
1218	National	DAC1218	2453-44
1219	National	DAC1219	2456-37
122	AnalogSys	MW122	2951-6
	Cherry	CS122	511-123
			2898-89
			2964-74
	Fairchild	CCD122	2964-2
			2964-51
	Intersil	IT122	2889-70
	National	AF122	2947-35
		LM122	2951-13
	Siliconix	DGM122A	2420-27
		DGM122B	2420-28
		G122A	2422-81
	Siliconix	**LD122**	**★2817**
			2438-49
			¶ 255-2
			¶ 255-8
1220	ITT	SAA1220	2905-83
	National	DAC1220	2453-7
		DAC1220C	2453-8
	SGS	TDA1220A	2900-128
1221	Motorola	MHW1221	2903-50
	National	DAC1221	2458-24
		DAC1221C	2458-25
1222	Cermetek	CH1222	2948-110
	Motorola	MHW1222	2903-51
	National	DAC1222	2458-38
		DAC1222C	2458-39
	Sanyo	LA1222	2901-17
1223	Cermetek	CH1223	2948-111
1224	Cermetek	CH1224	2948-112
1225	Cermetek	CH1225	2948-104
123	Fairchild	SH123	2952-107
	Intersil	D123C	2422-102
		D123M	2422-103
		DG123	2417-100
		DG123B	2417-104
		G123	2422-38
	Motorola	**LM123**	**★3294**
			2952-111
	National	**LM123**	**★3299**
			2952-118
			¶ 281-13
	SGS	L123CB	2959-120
		L123CT	2959-121
	Signetics	MJ123	2899-140
	SiliconG	SG123	2952-122
	Siliconix	D123A	505-153
			2422-106
		D123B	505-154
			2422-107
		DG123A	2417-101
		DG123B	2417-105
		G123A	2422-39
		G123B	2422-40
	Telefunken	U123	2964-108
1230	Cermetek	CH1230	2948-145
	National	DAC1230	2453-45
	Sanyo	LA1230	2901-54
1231	National	DAC1231	2456-38
	Sanyo	LA1231N	2901-55
1232	National	DAC1232	2457-34
1235	ITT	TDA1235	2904-163
	Sanyo	LA1235	2901-82
1236	ITT	TDA1236	2904-164
124	Fairchild	uA124	2913-56
	Intersil	G124	2422-35
		LM124	2913-59
	Motorola	LM124	2913-61
	National	LM124	2913-64
		LM124A	2941-25
	Panasonic	AN124	2896-95
	Raytheon	LM124	2913-69
	RCA	CA124	2913-72
	Signetics	LM124	2913-75
	SiliconG	SG124	2913-78
	TI	LM124	2913-81
1240	**AD**	**HDS-1240E**	**★3169**
			2456-9
1240	**AD**	**HDS-1240EM**	**★3169**
			2456-10
	Sanyo	LA1240	2900-88
12402	Hitachi	HA12402	2900-118
12404	Hitachi	HA12404	2900-113
12405	Hitachi	HA12405	2900-114
12411	Hitachi	HA12411	2901-28
1242	**National**	**DAC1242**	**★3345**
1243	**National**	**DAC1243**	**★3345**
1245	Sanyo	LA1245	2900-89
1248	Sunrise	Z-1248	4010-2
125	Intersil	D125C	2422-104
		D125M	2422-105
		DG125	2417-102
		DG125B	2417-106
		G125	2422-41
	National	LM125	2958-77
			¶ 281-13
	Siemens	FZH125	472-79
		FZJ125	472-52
	Signetics	MB125	2899-100
	Siliconix	D125A	505-155
			2422-108
		D125B	505-156
			2422-109
		DG125A	2417-103
		DG125B	2417-107
	TeledyneC	CDR125A	2422-110
1250	**AD**	**HDS-1250**	**★3169**
			2451-11
		HDS-1250M	**★3169**
			2451-12
	DDC	DDC1250-10-1	2458-8
		DDC1250-10-3	2458-9
		DDC1250-12-1	2456-3
		DDC1250-12-3	2456-4
	ITT	SAA1250	2902-8
	SiliconG	SG1250	2912-8
			2912-56
12500	**Motorola**	**MC12500**	**★ 733**
			506-175
12502	Motorola	MC12502	2945-18
			2962-91
12509	Motorola	MC12509	510-89
			2946-61
			2946-66
1251	ITT	SAA1251	2902-9
	NEC-Electron	uPC1251	2940-11
12511	Motorola	MC12511	510-96
			2946-71
12513	Motorola	MC12513	510-109
			2946-78
1252	Cermetek	CH1252	2948-113
12520	Motorola	MC12520	2945-30
12521	Motorola	MC12521	2945-31
1253	Cermetek	CH1253	2948-105
	SiliconG	SG1253	2912-71
12540	Motorola	MC12540	2945-62
12560	Motorola	MC12560	2945-9
12561	Motorola	MC12561	2945-12
1257	Cermetek	CH1257	2948-114
1258	Cermetek	CH1258	2948-106
1259	Cermetek	CH1259	2948-107
126	Intersil	DG126A	2421-4
		G126	2422-42
	National	LM126	2958-67
	Signetics	MB126	2899-101
	Siliconix	DG126A	2421-7
		DG126B	2421-19
1260	Sanyo	LB1260	2890-101
12600	CalDevices	HC12600	4140-35
	LSILogic	LC-12600	4140-137
1261	Sanyo	LB1261	2890-102
1262	Cermetek	CH1262	2948-115
1263	Cermetek	CH1263	2948-108
1264	Sanyo	LB1264	2890-103
1265	Cermetek	CH1265	2948-116
1266	Cermetek	CH1266	2948-117
12660	Rockwell	12660	1088-98
1267	Cermetek	CH1267	2948-118
1268	Cermetek	CH1268	2948-109
127	Cherry	CS127	2898-90
			2964-69
	Intersil	G127	2422-43
	Panasonic	AN127	2897-156
1270	GI	AY3-1270	2907-10
1270	SGS	TDA1270	2905-105
	TI	**TMS1270**	**★1557**
			1088-28
			★1557
			1057-14
		TMS1270C	**★1557**
			1088-22
			★1557
			1057-15
1271	Cermetek	CH1271	2948-119
1272	Cermetek	CH1272	2948-120
	ITT	SAA1272	2902-10
	Sanyo	LB1272	2889-177
1273	Cermetek	CH1273	2948-121
	Sanyo	LB1273R	2889-178
1274	ITT	SAA1274	2904-56
	Sanyo	LB1274	2889-128
1275	Fujitsu	C1275	4140-90
	Sanyo	LB1275	2890-95
1276	ITT	SAA1276	2904-57
128	GI	SPR-128	3487-15
	Intersil	G128	2422-44
	Panasonic	MEL128	2964-24
	Reticon	RL128	2964-33
		RL128S	2964-34
		RL128SF	2964-35
		RL128SFX	2963-140
		SAM128LR	2967-160
		SAM128V	2967-161
1280	Cermetek	CH1280	2948-122
	National	**ADC1280**	**★3344**
			2430-10
		DAC1280AC	**★3345**
			2452-8
		DAC1280C	**★3345**
			2457-6
12806	Rockwell	12806	1088-99
1285	**National**	**DAC1285**	**★3345**
			2452-9
		DAC1285A	**★3345**
			2452-10
		DAC1285AC	**★3345**
			2452-11
		DAC1285C	**★3345**
			2452-12
1287	Sanyo	LB1287	2480-26
			2889-172
1288	Sanyo	LB1288	2480-27
			2889-173
128x2	Reticon	CCPD128x2	2963-144
128x4	Reticon	CCPD128x4	2963-145
128x8	Reticon	CCPD128x8	2963-146
129	Cherry	CS129	2898-91
			2964-75
	Intersil	D129	2422-99
		DG129A	2420-91
		G129	2422-15
	National	**LM129**	**★3304**
			2966-105
			¶ 281-13
	SGS	L129	2952-50
	Siliconix	D129A	2422-100
		D129B	2422-101
		DG129A	2420-94
		DG129B	2420-108
1290	Cermetek	CH1290	2962-15
1295	Cermetek	CH1295	2947-27
			2962-16
1296	Cermetek	CH1296	2947-28
			2962-17
12H6	MMI	HAL12H6C	506-116
		HAL12H6M	506-117
	MMI	**PAL12H6-2**	**★4470**
		PAL12H6C	**★4449**
			506-37
			★4449
			3457-11
		PAL12H6M	**★4449**
			506-38
			★4449
			3457-12
	National	**DMPAL12H6C**	**★ 737**
			506-65
			★ 737
			3457-41
		DMPAL12H6M	**★ 737**
12H6	National	DMPAL12H6M	506-66
			★ 737
			3457-42
12L10	**MMI**	**PAL12L10**	**★4458**
12L6	MMI	HAL12L6C	506-118
		HAL12L6M	506-119
	MMI	**PAL12L6-2**	**★4470**
		PAL12L6C	**★4449**
			506-39
			★4449
			3457-13
		PAL12L6M	**★4449**
			506-40
			★4449
			3457-14
	National	**DMPAL12L6C**	**★ 737**
			506-67
			★ 737
			3457-43
		DMPAL12L6M	**★ 737**
			506-68
			★ 737
			3457-44
13	**Cromemco**	**RGB-13**	**★1931**
	IPI	IPI13	2964-109
	Supertex	VC13	2483-78
		VF-13	2481-34
	TeledyneC	CAG13	2416-27
130	Cherry	CS130	2898-92
			2964-76
	Intersil	G130	2422-16
		IT130	2889-83
		IT130A	2889-84
	SGS	L130	2954-41
1300	Cherry	CS1300	4140-43
	Epson	SED1300	2463-39
	Motorola	**MCA1300ALS**	**★4479**
			4141-46
	Signetics	SAA1300	2906-129
	TI	**TMS1300**	**★1557**
			1088-29
			★1557
			1057-16
		TMS1300C	**★1557**
			1088-23
			★1557
			1057-17
13001	Motorola	MC13001	2905-127
13002	Motorola	MC13002	2905-128
1301	National	LM1301	2897-188
1302	Motorola	MC1302	2900-14
1303	**National**	**LM1303**	**★3325**
			2897-189
1305	Interdesign	MOF1305B	2470-2
1306	Motorola	MC1306	2896-80
13080	AnalogSys	MA13080	2931-26
	National	LM13080	2931-25
1309	Motorola	MC1309	2901-106
131	Cherry	CS131	2898-93
	Intersil	G131	2422-17
		IT131	2889-85
	National	LM131	2963-90
		LM131A	2963-91
	SGS	L131	2955-4
	Siemens	FZH131	472-80
		FZJ131	472-47
1310	**AMD**	**PS/1310**	**★1909**
	Exar	XR1310	2901-101
	Motorola	MC1310	2901-107
	National	**LM1310**	**★3325**
			★3328
			2901-110
	RCA	CA1310A	2901-123
	Supertex	CM1310	3487-39
1319	Hitachi	HA1319	2896-15
132	Cherry	CS132	2898-94
	Intersil	G132	2422-18
		IT132	2889-86
	National	AF132	2948-74
	TI	**SNLS132**	**★ 877**
1320	**AMD**	**PS/1320**	**★1910**
	Sanyo	LA1320	2905-22
13201	**National**	**LF13201**	**★3318**
			2416-95
13202	**National**	**LF13202**	**★3318**
			2416-96

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
1321	TeledyneP	1321	2928-9
		1321-01	2928-10
1322	TeledyneP	1322	2910-38
			2933-34
		1322-01	2910-39
			2933-35
1323	Motorola	MC1323	2903-98
			¶ 274-8
			¶ 274-9
	TeledyneP	1323	2928-15
1324	Motorola	MC1324	2903-99
1325	Hitachi	HA1325	2896-78
1327	Motorola	MC1327	2903-100
1329	Hitachi	HA1329	2896-79
133	Fairchild	CCD133	2964-3
			2964-49
	Intersil	DG133A	2416-4
		DG133B	2416-24
	National	AF133	2948-75
			¶ 269-10
	Siliconix	DG133A	2416-9
			¶ 262-14
		DG133B	2416-25
			¶ 262-14
1330	**AMD**	**PS/1330**	★1910
	Intersil	G1330	2422-45
13300	National	LF13300	2438-46
1330A1	Motorola	MC1330A1	2905-129
1331	Motorola	MC1331	2905-130
	Siemens	TBB1331A	2935-1
1332	Sanyo	LB1332	2903-164
	TeledyneP	1332	2910-81
			2930-34
13330A2			
	Motorola	MC13330A2	2905-131
13331	**National**	**LF13331**	★3318
			2416-97
13332	**National**	**LF13332**	★3318
			2416-98
13333	**National**	**LF13333**	★3318
			2416-99
134	Ferranti	ZNA134E	2903-37
		ZNA134J	2903-38
	Intersil	DG134A	2416-43
		DG134B	2416-58
	National	AF134	2948-76
			¶ 269-10
		LM134	2968-26
			2962-130
	Siliconix	DG134A	2416-47
		DG134B	2416-59
1340	Intersil	G1340	2422-46
	TeledyneP	1340	2915-41
1341	Motorola	MHW1341	2903-52
1342	Motorola	MHW1342	2903-53
1343	Motorola	MHW1343	2903-54
1344	Motorola	MC1344	2904-143
1349	Motorola	MC1349	2905-132
135	National	LM135	2968-27
	Siemens	FZH135	472-81
		FZJ135	472-48
		SAJ135	511-37
1350	GI	AY3-1350	2907-12
			¶ 273-4
	Intersil	G1350	2422-19
	ITT	SAA1350	2902-11
	Motorola	MC1350	2901-5
			2905-133
			¶ 274.7
13508	National	LF13508	2424-36
13509	National	LF13509	2423-71
1351	ITT	SAA1351	2902-12
	Motorola	MC1351	2904-165
1352	Motorola	MC1352	2905-134
			¶ 274.7
	RCA	CA1352	2905-162
	Sanyo	LA1352	2905-169
1353	Sanyo	LA1353	2905-170
1354	Sanyo	LA1354	2905-171
1355	Motorola	MC1355	2901-6
1356	Motorola	MC1356	2901-29
1357	Motorola	MC1357	2904-166
	Sanyo	LA1357N	2905-172
1358	Motorola	MC1358	2904-167
136	**National**	**LM136-2**	★3304
136	National	LM136-2	2966-55
			¶ 281-13
		LM136-5	★3304
			¶ 281-13
		LM136A-2	★3304
			2966-56
			¶ 281-13
		LM136A-5	★3304
			¶ 281-13
	TI	TL136C	2943-52
1360	Intersil	G1360	2422-20
13600	Exar	XR13600	2900-7
	National	**LM13600**	★3326
			2939-9
	Raytheon	LM13600	2888-5
		LM13600A	2888-6
1361	Hitachi	HA1361	2896-16
1363	Sanyo	LA1363	2905-23
1364	Hitachi	HA1364	2904-162
	Motorola	MC1364	2903-17
	Sanyo	LA1364	2903-28
1365	Sanyo	LA1365	2905-24
1366	Hitachi	HA1366	2897-8
1368	Hitachi	HA1368	2897-9
	Sanyo	LA1368	2903-161
1369	Sanyo	LA1369	2903-162
137	Cherry	CS137	2898-95
	MicroEng	MCELM137	2960-39
	Motorola	**LM137**	★3295
			2960-36
	National	**LM137**	★3301
			2960-42
			2960-63
			¶ 281-13
	SiliconG	SG137	2960-45
	TI	LM137	2960-48
1370	**TI**	**TMS1370**	★1557
			1057-18
13700	**National**	**LM13700**	★3326
			★3328
			2937-46
		LM13700A	★3326
			★3328
			2936-28
1371	Hitachi	HA1371	2897-10
1372	Hitachi	HA1372	2897-11
	Motorola	MC1372	2905-135
			2906-46
			¶ 238-5
			¶ 238-7
			¶ 241-13
1373	Motorola	MC1373	2905-136
			2906-47
1374	Hitachi	HA1374	2897-91
	Motorola	MC1374	2904-126
13741	**National**	**LF13741**	★3309
			2909-42
			2934-18
1376	Motorola	MC1376	2901-89
1377	Hitachi	HA1377	2897-109
138	**National**	**LM138**	★3299
			2959-52
1380	NEC-Electron	uPC1380	2903-119
1384	Motorola	MC1384	2896-81
1385	Sanyo	LA1385	2905-100
1388	Hitachi	HA1388	2896-141
1389	Hitachi	HA1389	2897-12
139	AMD	LM139	2894-60
		LM139A	2894-29
	Cherry	CS139	2898-117
	Fairchild	uA139	2894-61
		uA139A	2894-30
	Intersil	DG139A	2421-47
		LM139	2894-62
		LM139A	2894-31
	Motorola	LM139	2895-1
		LM139A	2894-32
	National	**LM139**	★3317
			2895-2
		LM139A	★3317
			2894-33
	PMI	PM139	2895-3
		PM139A	2894-34
	Raytheon	LM139	2895-4
	RCA	CA139	2895-5
		CA139A	2894-35
139	Signetics	LM139A	2895-6
	SiliconG	SG139	2895-7
		SG139A	2894-36
	Siliconix	D139A	505-132
			2422-96
		D139B	505-133
			2422-97
		D139C	2422-98
		DG139A	2421-50
		DG139B	2421-56
	TI	LM139	2895-8
		LM139A	2894-37
1390	Sanyo	LA1390	2903-163
1391	Motorola	MC1391	2904-89
		MHW1391	2903-55
	National	LM1391	2904-91
	RCA	CA1391	2904-103
1392	Hitachi	HA1392	2896-142
	Motorola	MHW1392	2903-56
1393	Motorola	MC1393	2905-89
1394	Motorola	MC1394	2904-90
	RCA	CA1394	2904-104
1395	RCA	CA1395	2901-124
1398	Motorola	MC1398	2903-101
	RCA	CA1398	2903-138
1399	Motorola	MC1399	2903-102
14	**Datel**	**DAC-HA14BC**	★2621
			2460-30
	Datel	DAC-HA14BC-1	2460-32
	Datel	**DAC-HA14BM**	★2620
			2460-31
	Datel	DAC-HA14BM-1	
			2460-33
	DDC	HRCDX-14	2967-11
		HRCT-14	2967-12
		HRDC-14	2967-14
		HSCDX-14	2967-15
		HSCT-14	2967-16
		HSDC-14	2967-18
		HXCDX-14	2967-28
		HXCT-14	2967-29
		HXDC-14	2967-31
	Datricon	ACS14/64	1759-14
	Lambda	LAS14AU	2959-22
	National	LX14XXA	2965-123
		LX14XXAF	2965-124
		LX14XXAS	2965-125
	PMI	OP-14	2909-6
			¶ 252-1
		OP-14A	2936-13
			¶ 252-1
		OP-14C	2936-58
			¶ 252-1
		OP-14E	2936-14
			¶ 252-1
	TeledyneC	CAG14	2415-17
	Wintek	MCC14	1761-1
140	Cherry	CS140	2906-63
			2964-125
	Intersil	DG140A	2420-70
	Motorola	**LM140-12**	★3294
			2954-56
		LM140-15	★3294
			2955-18
		LM140-18	★3294
			2955-88
		LM140-24	★3294
			2956-41
		LM140-5	★3294
			2952-77
		LM140-6	★3294
			2953-21
		LM140-8	★3294
			2953-87
	National	**LM140-12**	★3299
			2954-62
		LM140-15	★3299
			2955-24
		LM140-5	★3299
			2952-83
		LM140A-12	★3299
			2954-63
		LM140A-15	★3299
			2955-25
		LM140A-5	★3299
			2952-84
140	**National**	**LM140LA-12**	★3299
			2954-15
		LM140LA-15	★3299
			2954-113
		LM140LA-5	★3299
			2952-9
	Signetics	MB140	2899-102
	SiliconG	SG140-05K	2952-89
		SG140-05R	2952-90
		SG140-05T	2952-44
		SG140-06K	2953-27
		SG140-06R	2953-28
		SG140-06T	2953-7
		SG140-08K	2953-93
		SG140-08R	2953-94
		SG140-08T	2953-75
		SG140-12K	2954-71
		SG140-12R	2954-72
		SG140-12T	2954-33
		SG140-15K	2955-31
		SG140-15R	2955-32
		SG140-15T	2954-131
		SG140-18K	2955-94
		SG140-18R	2955-95
		SG140-18T	2955-69
		SG140-20K	2955-129
		SG140-20R	2955-130
		SG140-20T	2955-120
		SG140-24K	2956-49
		SG140-24R	2956-50
		SG140-24T	2956-20
	Siliconix	DG140A	2420-73
		DG140B	2420-79
1400	Cherry	CS1400	4140-44
	E-HI	1400	4004-2
	GI	ER1400	3455-18
			¶ 271-15
			¶ 284-15
			¶ 285-2
	Inmos	**IMS1400**	★3790
			3483-66
		IMS1400L	★3790
			3483-82
	Motorola	**MC1400-10**	★2761
			2966-148
		MC1400-2	★2761
			2966-47
		MC1400-5	★2761
			2966-79
		MC1400-6	★2761
			2965-167
		MC1400A-10	★2761
			2966-149
		MC1400A-2	★2761
			2966-48
		MC1400A-5	★2761
			2966-80
		MC1400A-6	★2761
			2965-168
	NCR	NCR1400	3455-19
			3455-20
	Panasonic	MN1400	1086-116
			¶ 246-8
			1053-25
			¶ 246-8
	TI	**SE1400P**	★1560
			1088-39
			1088-50
			★1560
			1055-30
		SEB1400	★1560
		TMS1400	★1557
			1057-19
	Toshiba	T1400	2900-115
14000	**Motorola**	**MC14000UBA**	★729
			458-71
		MC14000UBC	★729
			458-72
14001	Hitachi	HD14001B	458-153
	Motorola	MC14001BA	458-154
		MC14001BC	458-155
		MC14001UBA	458-156
		MC14001UBC	458-157
14002	Hitachi	HD14002B	458-89
	Motorola	MC14002BA	458-90
		MC14002BC	458-91

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
14002	Motorola	MC14002UBA	458-92
		MC14002UBC	458-93
14006	Hitachi	HD14006B	463-138
	Motorola	MC14006BA	463-139
			3489-128
		MC14006BC	463-140
			3489-127
14007	Hitachi	HD14007B	450-147
	Mostek	MK14007	1097-77
	Motorola	MC14007UBA	450-148
		MC14007UBC	450-149
14008	Hitachi	HD14008B	449-33
	Motorola	MC14008BA	449-34
		MC14008BC	449-35
14009	Hitachi	HD14009B	450-1
1401	SiliconG	SG1401	2888-106
14010	Hitachi	HD14010B	450-37
14011	Hitachi	HD14011B	457-90
	Motorola	MC14011BA	457-91
		MC14011BC	457-92
		MC14011UBA	457-93
		MC14011UBC	457-94
14012	Hitachi	HD14012B	457-15
	Motorola	MC14012BA	457-16
		MC14012BC	457-17
		MC14012UBA	457-18
		MC14012UBC	457-19
14013	Hitachi	HD14013B	455-90
	Motorola	MC14013BA	455-91
			¶ 273-5
		MC14013BC	455-92
			¶ 273-5
14014	Hitachi	HD14014B	463-115
	Motorola	MC14014BA	463-116
			3490-87
		MC14014BC	463-117
14015	Hitachi	HD14015B	462-116
			3489-92
	Motorola	MC14015BA	462-117
			3489-100
		MC14015BC	462-118
			3489-93
14016	Hitachi	HD14016B	2417-54
	Motorola	MC14016BA	2417-55
		MC14016BC	2417-56
14017	Hitachi	HD14017B	452-80
	Motorola	MC14017BA	452-81
		MC14017BC	452-82
14018	Hitachi	HD14018B	453-115
	Motorola	MC14018BA	453-116
		MC14018BC	453-117
1402	AMD	1402AC	3488-7
			3488-5
		1402AM	3488-8
			3488-6
	Panasonic	MN1402	1086-117
			¶ 246-8
			1053-26
			¶ 246-8
	SiliconG	SG1402	2964-165
			¶ 278-6
	Western	TR1402	2487-61
14020	Hitachi	HD14020B	452-16
	Motorola	MC14020BA	452-17
		MC14020BC	452-18
14021	Hitachi	HD14021B	463-46
			3490-75
	Motorola	MC14021BA	463-47
			3490-88
		MC14021BC	463-48
			3490-76
14022	Hitachi	HD14022B	453-150
	Motorola	MC14022BA	453-90
		MC14022BC	453-91
14023	Hitachi	HD14023B	457-49
	Motorola	MC14023BA	457-50
		MC14023BC	457-51
		MC14023UBA	457-52
		MC14023UBC	457-53
14024	Hitachi	HD14024B	451-153
	Motorola	MC14024BA	451-154
		MC14024BC	451-155
14025	Hitachi	HD14025B	458-120
	Motorola	MC14025BA	458-121
		MC14025BC	458-122
14025	Motorola	MC14025UBA	458-123
		MC14025UBC	458-124
14027	Hitachi	HD14027B	456-101
	Motorola	MC14027BA	456-102
		MC14027BC	456-103
14028	Hitachi	HD14028B	453-163
	Motorola	MC14028BA	453-164
		MC14028BC	453-165
14029	Motorola	MC14029BA	453-133
		MC14029BC	453-134
1403	AMD	1403AC	3488-15
		1403AM	3488-16
	AD	**AD1403**	**★3178**
			2966-38
		AD1403A	**★3178**
			2966-39
	Motorola	**MC1403**	**★2761**
			2966-49
		MC1403A	**★2761**
			2966-50
	Panasonic	MN1403	1086-118
			1053-27
14032	Hitachi	HD14032B	449-16
	Motorola	MC14032BA	449-17
		MC14032BC	449-18
14034	Hitachi	HD14034B	463-65
			3490-41
	Motorola	MC14034BA	463-66
			3490-42
		MC14034BC	463-67
			3490-34
14035	Hitachi	HD14035B	463-24
			3489-57
	Motorola	MC14035BA	463-25
			3489-69
		MC14035BC	463-26
			3489-58
14038	Hitachi	HD14038B	449-4
	Motorola	MC14038BA	449-5
		MC14038BC	449-6
1404	AMD	1404AC	3488-23
		1404AM	3488-24
	Motorola	**MC1404-10**	**★2761**
			2966-150
		MC1404-5	**★2761**
			2966-81
		MC1404-6	**★2761**
			2966-1
		MC1404A-10	**★2761**
			2966-151
	Panasonic	MN1404	1086-119
			1053-28
14040	Hitachi	HD14040B	451-181
	Motorola	MC14040BA	451-182
			¶ 273-5
		MC14040BC	451-183
			¶ 273-5
14042	Hitachi	HD14042B	459-107
	Motorola	MC14042BA	459-108
		MC14042BC	459-109
14043	Hitachi	HD14043B	459-148
	Motorola	MC14043BA	459-149
		MC14043BC	459-150
14044	Hitachi	HD14044B	459-129
	Motorola	MC14044BA	459-130
		MC14044BC	459-131
14046	Hitachi	HD14046B	464-49
	Motorola	MC14046BA	464-50
			2945-45
		MC14046BC	464-51
			2945-46
14049	Hitachi	HD14049B	450-17
	Motorola	MC14049UBA	450-18
		MC14049UBC	450-19
1405	AMD	1405A	3488-10
			¶ 289-6
	Lambda	LAS1405	2952-110
	Motorola	MC1405	2438-31
	Panasonic	MN1405	1086-120
			1053-29
	Sanyo	LB1405	2463-7
			2964-80
14050	Hitachi	HD14050B	450-52
	Motorola	MC14050BA	450-53
		MC14050BC	450-54
14051	Hitachi	HD14051B	2423-92
14051	Motorola	MC14051BA	2423-93
		MC14051BC	2423-94
14052	Hitachi	HD14052B	2423-24
	Motorola	MC14052BA	2423-25
		MC14052BC	2423-26
14053	Hitachi	HD14053B	2419-99
	Motorola	MC14053BA	2419-100
		MC14053BC	2419-101
1406	AMD	1406	3488-3
			3488-1
	Hitachi	HA1406	2897-145
	Lambda	LAS1406	2953-43
	Motorola	**MC1406**	**★2759**
			2439-28
14060	Motorola	MC14060B	452-36
14066	Hitachi	HD14066B	2417-39
	Motorola	MC14066BA	2417-40
		MC14066BC	2417-41
14067	Motorola	MC14067BA	461-156
			2424-100
		MC14067BC	461-157
			2424-101
14068	Hitachi	HD14068B	457-134
	Motorola	MC14068BA	457-135
		MC14068BC	457-136
14069	Hitachi	HD14069B	450-177
	Motorola	MC14069UBA	450-178
		MC14069UBC	450-179
1407	AMD	1407	3488-4
			3488-2
14070	Hitachi	HD14070B	459-10
	Motorola	MC14070BA	459-11
		MC14070BC	459-12
14071	Hitachi	HD14071B	458-46
	Motorola	MC14071BA	458-47
		MC14071BC	458-48
14072	Hitachi	HD14072B	458-12
	Motorola	MC14072BA	458-13
		MC14072BC	458-14
14073	Hitachi	HD14073B	456-155
	Motorola	MC14073BA	456-156
		MC14073BC	456-157
14075	Hitachi	HD14075B	458-26
	Motorola	MC14075BA	458-27
		MC14075BC	458-28
14076	Hitachi	HD14076B	455-124
	Motorola	MC14076BA	455-125
		MC14076BC	455-126
14077	Hitachi	HD14077B	459-48
	Motorola	MC14077BA	459-49
		MC14077BC	459-50
14078	Hitachi	HD14078B	458-193
	Motorola	MC14078BA	458-194
		MC14078BC	458-195
1408	AMD	1408-6	2444-6
		1408-7	2443-51
		1408-8	2442-27
		DAC1408A-6	2444-3
		SSS1408A-7	2443-47
		SSS1408A-8	2442-19
	AD	**AD1408-7**	**★3164**
			2443-48
		AD1408-8	**★3164**
			2442-21
		AD1408-9	**★3164**
			2441-7
	Motorola	**MC1408-6**	**★2759**
			2444-7
			¶ 253-6
			¶ 256-14
		MC1408-7	**★2759**
			2443-52
			¶ 253-6
			¶ 256-14
		MC1408-8	**★2759**
			2442-33
			¶ 253-6
			¶ 256-14
	National	LM1408-6	2444-9
		LM1408-7	2443-54
		LM1408-8	2442-35
	PMI	DAC-1408A-6	2444-5
		DAC-1408A-7	2443-50
		DAC-1408A-8	2442-23
	Signetics	MC1408-7	2443-36
		MC1408-8	2442-37
14081	Hitachi	HD14081B	456-178
	Motorola	MC14081BA	456-179
		MC14081BC	456-180
14082	Hitachi	HD14082B	456-140
	Motorola	MC14082BA	456-141
		MC14082BC	456-142
1409	Sanyo	LB1409	2463-8
14093	Hitachi	HD14093B	464-149
	Motorola	MC14093BA	464-150
		MC14093BC	464-151
14094	Hitachi	HD14094B	463-80
	Motorola	MC14094BA	463-81
			3491-17
		MC14094BC	463-82
			3491-18
14097	Motorola	MC14097BA	462-4
			2424-55
		MC14097BC	462-5
			2424-56
14099	Hitachi	HD14099B	460-45
	Motorola	MC14099BA	460-46
		MC14099BC	460-47
141	Intersil	DG141A	2415-91
		DG141B	2415-104
	NEC-Electron	uPC141	2959-32
	Siemens	FZH141	472-82
		FZJ141A	472-25
		SAJ141	511-33
	Siliconix	DG141A	2415-95
		DG141B	2415-106
1410	**AMD**	**PS/1410**	**★1908**
	SGS	TDA1410	2889-41
141000	Motorola	MC141000	1086-130
			1088-15
			1051-21
141099	Motorola	MC141099	1088-43
1411	**Motorola**	**MC1411**	**★2753**
			2480-71
			★2753
			2890-30
1412	Fujitsu	MB1412A	506-29
			2467-23
	Lambda	LAS1412	2954-91
	Motorola	**MC1412**	**★2753**
			2480-89
			★2753
			2890-31
141200	Motorola	MC141200	1086-131
			1088-16
			1051-22
1413	**Motorola**	**MC1413**	**★2753**
			2480-48
			★2753
			2890-32
1414	Motorola	MC1414	2893-41
			¶ 270-14
	National	**LM1414**	**★3317**
			2893-40
1415	Lambda	LAS1415	2955-49
	Sanyo	LB1415	2463-9
1416	**Motorola**	**MC1416**	**★2753**
			2480-33
			★2753
			2890-33
	Sanyo	LB1416	2463-10
14160	Hitachi	HD14160	452-134
	Motorola	MC14160BA	452-135
		MC14160BC	452-136
14161	Hitachi	HD14161B	451-50
	Motorola	MC14161BA	451-51
		MC14161BC	451-52
14162	Hitachi	HD14162B	452-106
	Motorola	MC14162BA	452-107
		MC14162BC	452-108
14163	Hitachi	HD14163B	451-26
	Motorola	MC14163BA	451-27
		MC14163BC	451-28
14174	Hitachi	HD14174B	455-165
	Motorola	MC14174BA	455-166
		MC14174BC	455-167
14175	Hitachi	HD14175B	455-148
	Motorola	MC14175BA	455-149
		MC14175BC	455-150
1419	Sanyo	LB1419	2463-11
14194	Hitachi	HD14194B	462-149

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
14194	Motorola	MC14194BA	462-150
			3489-74
		MC14194BC	462-151
142	Fairchild	CCD142	2964-4
			2964-54
	Intersil	DG142A	2421-58
	NEC-Electron	uPC142	2960-27
	SGS	M142	3491-69
		M142A	3491-70
	Siliconix	DG142A	2421-61
		DG142B	2421-65
1420	**Inmos**	**IMS1420**	★**3790**
			3483-4
		IMS1420L	★**3790**
			3483-22
	SGS	TDA1420	2889-42
1421	**Inmos**	**IMS1421**	★**3790**
			3482-113
	TeledyneP	1421	2934-3
		1421-01	2934-2
		1421-02	2934-1
142100	**Motorola**	**MC142100**	★**3298**
			2423-2
			★**3298**
			2947-128
1422	Motorola	MC1422	2951-1
1424	Intersil	ICM1424B	2899-109
		ICM1424MB	2899-110
		ICM1424MC	2899-111
	TeledyneP	1424	2935-23
1425	TeledyneP	1425	2921-38
		1425-01	2911-44
			2920-16
		1425-02	2911-45
			2920-15
1426	Sanyo	LB1426	2463-12
	TeledyneP	1426	2921-41
		1426-01	2920-18
		1426-02	2920-26
		1426-03	2920-25
143	Fairchild	CCD143	2964-5
			2964-55
	Harris	**LM143**	★**3286**
			★**3288**
			2910-73
	Intersil	DG143	2418-95
	National	LM143	2910-77
	Siliconix	DG143A	2418-98
		DG143B	2418-109
	Telefunken	U143	2463-76
			2903-75
1430	Panasonic	MN1430	1086-121
			1053-30
	Plessey	SL1430	2905-154
	TeledyneP	1430	2909-90
			2910-12
			2913-141
			2922-45
		1430-83	2910-13
			2913-142
			2922-46
1431	Plessey	SL1431	2905-155
1432	Panasonic	MN1432	1086-122
			1053-31
	Plessey	SL1432	2905-156
1435	Panasonic	MN1435	1086-123
			1053-31
	TeledyneP	1435	2910-25
			2913-167
			2929-56
1436	Motorola	MC1436	2910-83
			2933-10
		MC1436C	2910-92
			2933-51
	National	LM1436	2910-93
			2933-54
	Sanyo	LB1436	2463-13
	SiliconG	SG1436	2910-85
			2933-12
		SG1436C	2910-95
			2933-52
1437	Motorola	MC1437	2940-18
	Raytheon	RC1437	2940-19
	TeledyneP	1437	2921-3
		1437-80	2921-4
1438	Motorola	MC1438	2887-20
1439	Motorola	MC1439	2932-1
144	Intersil	DG144A	2418-65
		DG144B	2418-83
	National	LM144	2910-78
			2927-48
	Siliconix	DG144A	2418-68
		DG144B	2418-84
		L144A	2912-74
			¶ 266-9
		L144B	2912-75
			¶ 266-9
		L144C	2912-76
			¶ 266-9
1440	Plessey	SL1440	2905-157
	Siemens	TBA1440G	2905-176
	Signetics	TBA1440G	2905-182
14400	**Motorola**	**MC14400**	★ **729**
			★**3298**
			2948-64
14401	**Motorola**	**MC14401**	★**3298**
			2948-65
14402	**Motorola**	**MC14402**	★**3298**
			2948-66
14403	**Motorola**	**MC14403**	★**3298**
			2947-69
			2948-67
14404	**Motorola**	**MC14404**	★**3298**
			2947-89
14405	**Motorola**	**MC14405**	★**3298**
			2947-70
			2948-68
14406	**Motorola**	**MC14406**	★**3298**
			2947-101
14407	**Motorola**	**MC14407**	★**3298**
			2947-90
14408	**Motorola**	**MC14408**	★**3298**
			464-94
			★**3298**
			2948-18
14409	**Motorola**	**MC14409**	★**3298**
			464-95
			★**3298**
			2948-19
1441	Siemens	TBA1441	2905-177
	Signetics	TBA1441G	2905-183
14410	**Motorola**	**MC14410**	★**3298**
			2949-157
14411	**Motorola**	**MC14411**	★**3298**
			464-17
			★**3298**
			2486-34
14412	**Exar**	**XR14412F**	★**3187**
			2948-146
		XR14412V	★**3187**
			2948-147
	Motorola	**MC14412**	★**3298**
			464-42
			★**3298**
			2948-135
14413	**Motorola**	**MC14413-1**	★**3298**
			2948-85
		MC14413-2	★**3298**
			2948-86
14414	**Motorola**	**MC14414-1**	★**3298**
			2948-87
		MC14414-2	★**3298**
			2948-88
14415	Motorola	MC14415	464-141
		MC14415E	464-142
14416	**Motorola**	**MC14416**	★**3298**
			2949-56
14417	**Motorola**	**MC14417**	★**3298**
			2949-57
14418	**Motorola**	**MC14418**	★**3298**
			2949-58
14419	**Motorola**	**MC14419**	★**3298**
			465-165
			¶ 286-10
			★**3298**
			2468-5
			¶ 286-10
			★**3298**
			2948-61
			¶ 286-10
1443	TeledyneP	1443	2924-48
		1443-83	2921-40
14433	Motorola	MC14433	2438-8
			¶ 253-5
			¶ 238-15
	TeledyneS	14433	2438-11
		14433A	2438-12
14435	Motorola	MC14435	464-30
			2438-32
		MC14435E	464-31
			2438-33
1444	Motorola	MC1444	2485-75
14443	Motorola	MC14443	2429-39
14444	Motorola	MC14444	2429-37
14447	Motorola	MC14447	2429-40
1445	Motorola	MC1445	2888-41
	TI	MC1445	2888-43
14457	Motorola	MC14457	2902-13
		MCC14457	464-65
14458	Motorola	MC14458	2902-14
		MCC14458	464-66
1446	Plessey	MJ1446	2949-55
14460	Motorola	MC14460	2898-45
14466	Motorola	MC14466	2906-117
14467	Motorola	MC14467	2906-118
14469	Motorola	MC14469	464-8
			¶ 258-12
			2486-15
			¶ 258-12
14490	Motorola	MC14490	465-15
		MC14490E	465-16
14495	Motorola	MC14495	455-42
			2463-71
145	Intersil	DG145A	2421-34
	National	**LM145**	★**3301**
	Siemens	FZH145	472-83
		FZJ145A	472-26
	Siliconix	DG145A	2421-37
		DG145B	2421-43
	Telefunken	UAA145	2967-148
1450	Panasonic	MN1450	1086-109
			1053-32
	Plessey	SP1450B	2948-155
	Sanyo	LB1450	2901-86
14500	**Motorola**	**MC14500B**	★ **729**
			464-7
			★ **729**
			1086-101
145000	Motorola	MC145000	2463-64
145001	Motorola	MC145001	2463-65
14501	Hitachi	HD14501	459-66
	Motorola	MC14501UBA	459-67
		MC14501UBC	459-68
14502	Hitachi	HD14502B	449-158
	Motorola	MC14502BA	449-159
		MC14502BC	449-160
145026	Motorola	MC145026	2902-15
145027	Motorola	MC145027	2902-16
145028	Motorola	MC145028	2902-17
14503	Hitachi	HD14503B	450-94
	Motorola	MC14503BA	450-95
		MC14503BC	450-96
14504	Motorola	MC14504BA	464-3
		MC14504BC	464-4
14505	Motorola	MCM14505A	460-108
			3472-14
		MCM14505C	460-109
			3472-15
14506	Hitachi	HD14506B	457-185
	Motorola	MC14506BA	457-186
		MC14506BC	457-187
14508	Hitachi	HD14508B	459-88
	Motorola	MC14508BA	459-89
		MC14508BC	459-90
1451	GI	ER1451	3455-9
14510	Hitachi	HD14510B	452-162
	DDC	SDC-14510	2967-32
	Motorola	MC14510BA	452-164
		MC14510BC	452-165
145100	**Motorola**	**MC145100**	★**3298**
			2423-3
			★**3298**
			2947-129
145104	Motorola	MC145104	2945-95
145106	Motorola	MC145106	2945-96
145107	Motorola	MC145107	2945-97
145109	Motorola	MC145109	2945-98
14511	Hitachi	HD14511B	455-48
			2464-27
	Motorola	MC14511BA	455-49
			¶ 260-2
			2464-28
			¶ 260-2
		MC14511BC	455-50
			¶ 260-2
			2464-29
			¶ 260-2
145112	Motorola	MC145112	2945-99
14512	Hitachi	HD14512	461-144
	Motorola	MC14512A	461-145
		MC14512C	461-146
14513	Motorola	MC14513BA	455-51
			2464-30
		MC14513BC	455-52
			2464-31
14514	Hitachi	HD14514B	454-118
	Motorola	MC14514BA	454-120
		MC14514BC	454-121
145143	Motorola	MC145143	2945-100
145144	Motorola	MC145144	2945-101
145145	Motorola	MC145145	2945-102
145146	Motorola	MC145146	2945-103
14515	Hitachi	HD14515B	454-119
	Motorola	MC14515BA	454-122
		MC14515BC	454-123
145151	Motorola	MC145151	2945-104
145152	Motorola	MC145152	2945-105
145155	Motorola	MC145155	2945-106
145156	Motorola	MC145156	2945-107
145157	Motorola	MC145157	2945-108
145158	Motorola	MC145158	2945-109
145159	Motorola	MC145159	2945-110
14516	Hitachi	HD14516B	451-82
	Motorola	MC14516BA	451-83
		MC14516BC	451-84
14517	Hitachi	HD14517B	462-136
	Motorola	MC14517BA	462-137
			3491-60
		MC14517BC	462-138
			3491-57
14518	Hitachi	HD14518B	453-22
	Motorola	MC14518BA	453-23
		MC14518BC	453-24
14519	Hitachi	HD14519	461-128
		HD14519B	457-167
	Motorola	MC14519BA	461-129
		MC14519BC	461-130
1452	Hitachi	HA1452W	2897-187
14520	Hitachi	HD14520B	451-127
	DDC	SDC-14520	2967-33
	Motorola	MC14520BA	451-128
		MC14520BC	451-129
14521	Motorola	MC14521BA	462-108
		MC14521BC	462-109
14522	Hitachi	HD14522B	453-7
	Motorola	MC14522BA	453-8
		MC14522BC	453-9
14524	**Motorola**	**MCM14524A**	★**3840**
			461-11
			★**3840**
			3484-2
		MCM14524C	★**3840**
			461-12
			★**3840**
			3484-3
14526	Hitachi	HD14526B	451-118
	Motorola	MC14526BA	451-119
		MC14526BC	451-120
14527	Hitachi	HD14527B	464-96
	Motorola	MC14527BA	464-97
		MC14527BC	464-98
14528	Hitachi	HD14528B	462-29
	Motorola	MC14528BA	462-30
		MC14528BC	462-31
14529	Motorola	MC14529BA	2423-18
			2423-77
		MC14529BC	2423-19
			2423-78
1453	Panasonic	MN1453	1086-110
			1055-1
14530	Motorola	MC14530BA	459-64
		MC14530BC	459-65
14531	Hitachi	HD14531B	466-25

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
14531	Motorola	MC14531BA	466-26
		MC14531BC	466-27
14532	Hitachi	HD14532B	466-3
	Motorola	MC14532BA	466-4
		MC14532BC	466-5
14533	Hitachi	HD14533B	453-48
14534	Hitachi	HD14534B	453-84
	Motorola	MC14534BA	453-85
			¶ 232-4
		MC14534BC	453-86
			¶ 232-4
14536	Hitachi	HD14536B	462-72
	Motorola	MC14536BA	462-73
		MC14536BC	462-74
14537	Hitachi	HD14537	460-116
	Motorola	MCM14537A	460-117
			3472-64
			3472-64
		MCM14537C	460-118
			3472-67
			3472-67
14538	Motorola	MC14538BA	462-47
		MC14538BC	462-48
14539	Hitachi	HD14539B	461-81
	Motorola	MC14539BA	461-82
		MC14539BC	461-83
1454	Motorola	MC1454	2896-82
	Panasonic	MN1454	1086-111
			1055-2
14541	Hitachi	HD14541B	462-69
	Motorola	MC14541BA	462-70
			2951-27
		MC14541BC	462-71
			2951-28
145414	Motorola	MC145414	2948-94
14543	Hitachi	HD14543B	455-11
	Motorola	MC14543BA	455-12
			¶ 260-2
			2464-47
			¶ 260-2
		MC14543BC	455-13
			¶ 260-2
			2464-48
			¶ 260-2
145431	Motorola	MC145431	★3293
			2948-95
145433	Motorola	MC145433	★3293
			2948-96
145434	Motorola	MC145434	★3293
			2948-97
14544	Motorola	MC14544BA	2464-44
		MC14544BC	2464-45
145440	Motorola	MC145440	★3293
			2948-126
145441	Motorola	MC145441	★3293
			2948-127
14547	Motorola	MC14547BA	454-19
			2463-77
		MC14547BC	454-20
			2463-78
14549	Hitachi	HD14549B	464-74
	Motorola	MC14549BA	464-75
		MC14549BC	464-76
1455	Motorola	MC1455	2951-37
		MC1455BC	3491-51
	Panasonic	MN1455	1086-112
			1055-3
	Plessey	SP1455B	2948-156
14551	Motorola	MC14551BA	2420-2
		MC14551BC	2420-3
14552	Motorola	MCM14552A	460-130
			3472-6
		MCM14552C	460-131
			3472-7
14553	Motorola	MC14553BA	453-49
		MC14553BC	453-50
14554	Motorola	MC14554BA	449-122
		MC14554BC	449-123
14555	Hitachi	HD14555B	454-29
	Motorola	MC14555BA	454-30
		MC14555BC	454-31
14556	Motorola	MC14556BA	454-41
		MC14556BC	454-42
14557	Hitachi	HD14557B	463-177
14557	Motorola	MC14557BA	463-178
			3491-55
		MC14557BC	463-179
14558	Hitachi	HD14558B	454-21
	Motorola	MC14558BA	454-22
		MC14558BC	454-23
14559	Hitachi	HD14559B	464-69
	Motorola	MC14559BA	464-70
			¶ 256-14
		MC14559BC	464-71
			¶ 256-14
1456	Motorola	MC1456	2933-9
			¶ 252-12
		MC1456C	2933-53
			¶ 252-12
	Signetics	MC1456	2933-11
14560	Motorola	MC14560BA	449-1
			¶ 228-10
		MC14560BC	449-2
			¶ 228-10
14561	Motorola	MC14561BA	449-117
			¶ 228-10
		MC14561BC	449-118
			¶ 228-10
14562	Motorola	MC14562BA	463-182
			3491-42
		MC14562BC	463-183
			3491-41
14566	Hitachi	HD14566B	453-105
	Motorola	MC14566BA	453-106
		MC14566BC	453-107
14568	Hitachi	HD14568B	453-110
	Motorola	MC14568BA	453-111
			2945-32
		MC14568BC	453-112
			2945-33
14569	Hitachi	HD14569B	453-151
	Motorola	MC14569BC	453-152
1457	Hitachi	HA1457	2897-146
14572	Hitachi	HD14572	459-69
	Motorola	MC14572A	459-70
			¶ 273-5
		MC14572C	459-71
			¶ 273-5
14573	Motorola	MC14573	464-24
			2944-36
14574	Motorola	MC14574	464-23
			2895-51
14575	Motorola	MC14575	464-25
			2894-25
			2894-26
1458	Exar	XR1458	2909-1
			2939-39
	Fairchild	uA1458	2909-2
		uA1458C	2939-40
	Harris	LM1458	★3286
			★3288
	Motorola	MC1458	2909-3
			2939-42
		MC1458C	2940-33
		MC1458N	2940-6
		MC1458S	2940-7
	National	LM1458	2909-4
			2939-44
	NEC-Electron	uPC1458	2909-5
			2939-46
	PMI	PM1458	2909-7
	Raytheon	RC1458	2909-8
	RCA	CA1458	2909-9
	Siemens	TBB1458	2939-34
	SiliconG	MC1458	2909-14
		SG1458	2909-15
	TI	MC1458	2909-16
14580	Hitachi	HD14580B	460-77
	Motorola	MC14580BA	460-78
			3470-42
		MC14580BC	460-79
			3470-43
14581	Hitachi	HD14581B	449-60
	Motorola	MC14581BA	449-61
		MC14581BC	449-62
14582	Hitachi	HD14582B	449-72
	Motorola	MC14582BA	449-73
		MC14582BC	449-74
14583	Hitachi	HD14583B	464-112
14583	Motorola	MC14583BA	464-113
		MC14583BC	464-114
14584	Hitachi	HD14584B	465-21
	Motorola	MC14584BA	465-22
		MC14584BC	465-23
14585	Hitachi	HD14585B	449-85
	Motorola	MC14585BA	449-86
		MC14585BC	449-87
14597	Motorola	MC14597BA	460-70
			1086-102
		MC14597BC	460-71
			1086-103
14598	Motorola	MC14598BA	460-39
			1086-104
		MC14598BC	460-40
			1086-105
14599	Motorola	MC14599BA	460-37
			1086-106
		MC14599BC	460-38
			1086-107
145K5	National	LM145K5	2956-130
			2957-20
146	Exar	XR146	★3207
			2912-77
			2928-37
	Harris	LM146	★3285
			★3288
	Intersil	DG146A	2418-44
		DG146B	2418-52
	National	LM146	2912-85
	Raytheon	LM146	2912-88
	SGS	L146	2960-17
	Siliconix	DG146A	2418-47
		DG146B	2418-54
	Telefunken	UAA146	2967-149
1460	TeledyneP	1460	2929-43
1461	TeledyneP	1461	2909-72
		1461-83	2918-31
1463	Motorola	MC1463G	★3295
			2960-32
		MC1463R	★3295
			2960-35
	Sanyo	LA1463	2905-101
1464	Sanyo	LA1464	2905-102
1466	Motorola	MC1466	★3296
			2960-19
1468	Exar	XR1468	2958-74
	Motorola	MC1468	★3296
			2958-69
			2960-26
			2960-28
			2960-66
			2960-68
	SiliconG	SG1468	2958-71
			2960-30
			2960-70
		SG1468T	2960-72
146805	Motorola	MJ146805	★1352
		MC146805	★1352
146805E2			
	Motorola	MJ146805E2	★1737
		MJ146805E2EM	★1737
	Motorola	MC146805E2	1091-88
			1067-20
146805F2			
	Motorola	MJ146805F2	★1737
		MJ146805F2EM	★1737
	Motorola	MC146805F2	1091-52
			1067-21
146805G2			
	Motorola	MJ146805G2	★1737
		MJ146805G2EM	★1737
	Motorola	MC146805G2	1067-22
14680G2			
	Motorola	MC14680G2	1091-53
146818	Hitachi	HD146818	★1345
	Motorola	MC146818	★1352
			1092-15
146823	Motorola	MC146823	★1352
			1092-90
1468705			
	Motorola	MC1468705	★1352
			★1730
1468705G2			
	Motorola	MC1468705G2	1067-23
1469	Motorola	MC1469	★3295
1469	Motorola	MC1469	2959-55
			2959-56
1470	Sanyo	LB1470	2463-32
	SGS	TDA1470	2905-106
		TDA1470A	2905-107
	TI	TMS1470	★1557
			1057-20
1472	Motorola	MC1472	2482-49
	Motorola	MC1472U/PI	★2753
	Western	PT1472B	2487-5
		PT1472B-01	2487-6
1473	Sanyo	LB1473	2901-87
148	AMD	LM148	2942-27
	Fairchild	uA148	2942-28
	Harris	LM148	★3286
			★3288
			2942-29
	Motorola	LM148	2942-30
	Raytheon	LM148	2942-31
	TI	LM148	2942-32
1480	Plessey	MJ1480	2947-50
		SL1480	2947-51
	TeledyneP	1480	2909-85
1482	Western	PT1482B	2487-10
		PT1482B-01	2487-13
1488	Exar	XR1488	★3183
			2469-53
	Fairchild	uA1488	2469-54
	Motorola	MC1488	★2753
			2469-56
			¶ 260-3
	National	DS1488	2469-57
			¶ 257-13
	Signetics	MC1488	2469-58
	SiliconG	SG1488	2469-59
	TI	MC1488	2469-60
1489	Exar	XR1489A	★3189
			2473-29
	Fairchild	uA1489	2473-21
		uA1489A	2473-30
	Motorola	MC1489	★2753
			2473-23
			¶ 260-3
		MC1489A	★2753
			2473-32
			¶ 260-3
	National	DS1489	2473-24
			¶ 257-13
		DS1489A	2473-33
			¶ 257-13
	Signetics	MC1489	2473-25
		MC1489A	2473-34
	SiliconG	SG1489	2473-26
		SG1489A	2473-35
149	National	LM149	2942-33
	Raytheon	LM149	2942-34
	SGS	L149	2897-55
1494	Motorola	MC1494	2964-160
1495	Motorola	MC1495	2964-161
	SiliconG	SG1495	2964-166
1496	Motorola	MC1496	2962-92
	National	LM1496	2962-94
	Signetics	MC1496	2962-102
	SiliconG	SG1496	2962-106
1498	Panasonic	MN1498	1086-115
			¶ 246-8
			1055-4
			¶ 246-8
1499	Panasonic	MN1499	1086-113
			¶ 246-8
			1055-5
			¶ 246-8
		MN1499A	1086-114
			¶ 246-8
			1055-6
			¶ 246-8
14H4	MMI	HAL14H4C	506-120
		HAL14H4M	506-121
	MMI	PAL14H4-2	★4470
		PAL14H4C	★4449
			506-41
			★4449
			3457-15
		PAL14H4M	★4449
			506-42

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
14H4	**MMI**	**PAL14H4M**	**★4449**
			3457-16
	National	**DMPAL14H4C**	**★ 737**
			506-69
			★ 737
			3457-45
		DMPAL14H4M	**★ 737**
			506-70
			★ 737
			3457-46
14L4	MMI	HAL14L4C	506-122
		HAL14L4M	506-123
	MMI	**PAL14L4-2**	**★4470**
		PAL14L4C	**★4449**
			506-43
			★4449
			3457-17
		PAL14L4M	**★4449**
			506-44
			★4449
			3457-18
	National	**DMPAL14L4C**	**★ 737**
			506-71
			★ 737
			3457-47
		DMPAL14L4M	**★ 737**
			506-72
			★ 737
			3457-48
14L8	**MMI**	**PAL14L8**	**★4458**
14S10	**TI**	**TBP14S10M**	**★3964**
			3460-9
15	Datricon	ACS15/65	1757-31
	GI	LA15	4141-135
	IPI	IPI15	2964-86
	Lambda	LAS15CB	2954-105
		LAS15U	2959-25
	MicroPwr	OP-15A	2918-16
		OP-15B	2920-50
		OP-15C	2924-56
		OP-15E	2918-17
		OP-15F	2920-51
		OP-15G	2924-57
	MicroEng	**MCE-AD15C**	**★4437**
			4140-194
		MCE-D15A	**★4437**
			4140-199
		MCE-D15B	**★4437**
			4140-200
		MCE-D15D	**★4437**
			4140-201
	Plessey	CLA15XX	4141-73
	PMI	OP-15A	2918-18
			¶ 256-19
		OP-15B	2920-52
			¶ 256-19
		OP-15C	2924-58
			¶ 256-19
		OP-15E	2918-19
			¶ 256-19
		OP-15F	2920-53
			¶ 256-19
		OP-15G	2924-59
			¶ 256-19
150	MasterLogic	ML150	4141-166
	Motorola	**LM150**	**★3295**
			2959-40
	National	**AF150**	**★3345**
			2962-24
		LM150	**★3299**
			2959-43
			¶ 281-13
	Siemens	G150	2949-39
	Signetics	MJ150	2899-169
	SiliconG	SG150	2959-46
		SG150A	2959-47
1500	AMD	1500C	2894-12
		1500L	2893-22
		1500M	2893-23
	AMI	**GA1500**	**★4307**
			4140-2
	Epson	SED1500	2463-49
	Motorola	**MC1500-10**	**★2761**
			2966-152
		MC1500-2	**★2761**
			2966-51
1500	**Motorola**	**MC1500-5**	**★2761**
			2966-82
		MC1500-6	**★2761**
			2966-2
		MC1500A-10	**★2761**
			2966-153
		MC1500A-2	**★2761**
			2966-52
		MC1500A-5	**★2761**
			2966-83
		MC1500A-6	**★2761**
			2966-3
	Sanyo	LB1500	2903-80
	Signetics	**SMVME1500**	**★1964**
		VME1500	**★1964**
	Universal	HCM1500	4141-123
1501	SiliconG	SG1501A	2958-82
			¶ 281-12
	TI	TCM1501	2949-113
1502	SiliconG	SG1502	2960-74
	Western	FR1502-10	3456-27
		FR1502-11	3456-24
1503	**Motorola**	**MC1503**	**★2761**
			2966-53
		MC1503A	**★2761**
			2966-54
	SiliconG	SG1503	2966-63
1504	**Motorola**	**MC1504-10**	**★2761**
			2966-154
		MC1504-5	**★2761**
			2966-84
		MC1504-6	**★2761**
			2966-4
		MC1504A-10	**★2761**
			2966-155
	TI	TCM1504	2949-114
1505	Lambda	LAS1505	2952-75
	Motorola	MC1505	2438-34
	TI	TCM1505	2949-115
1506	AMD	1506	3488-5
			3488-3
	Lambda	LAS1506	2953-20
	Motorola	**MC1506**	**★2759**
			2439-29
	Signetics	TDA1506	2906-82
			2964-138
	TI	TCM1506	2949-116
1507	AMD	1507	3488-6
			3488-4
1508	AMD	1508-8	2442-28
		SSS1508A-8	2442-20
	AD	**AD1508-8**	**★3164**
			2442-22
		AD1508-9	**★3164**
			2441-8
	Lambda	LAS1508	2953-86
	Motorola	**MC1508-8**	**★2759**
			2442-34
			¶ 253-6
	National	LM1508-8	2442-36
	PMI	DAC-1508A-8	2442-24
	Signetics	MC1508-8	2442-38
151	Intersil	DG151A	2415-100
		DG151B	2415-107
	National	**AF151**	**★3345**
			2962-25
	National	LF151	2927-35
		LF151A	2922-44
	NEC-Electron	uPC151	2930-49
	Siemens	FZJ151A	472-21
	Siliconix	DG151A	2415-103
		DG151B	2415-109
1510	Lambda	LAS1510	2954-5
	Signetics	TDA1510	2897-124
	Western	**WD1510-00**	**★3994**
			3456-58
		WD1510-01	**★3994**
			3456-59
		WD1510-02	**★3994**
			3456-63
1512	Lambda	LAS1512	2954-54
	Signetics	TDA1512	2897-3
	TI	TCM1512	2949-117
		TCM1512A	2949-118
1514	Motorola	MC1514	2893-4
1514	Motorola	MC1514	¶ 270-14
			¶ 285-10
	National	**LM1514**	**★3317**
			2893-3
1515	Lambda	LAS1515	2955-16
	Sanyo	LB1515	2903-81
	Signetics	PCA1515	2898-170
		TDA1515	2897-125
1516	Signetics	TCA1516	2898-174
	Weitek	**WTL1516**	**★1038**
			511-100
1517	Signetics	PCA1517	2898-171
	Weitek	**WTL1517**	**★1038**
			511-101
1518	Lambda	LAS1518	2955-87
152	Intersil	DG152A	2416-20
	NEC-Electron	uPC152A	2935-27
	Siliconix	DG152A	2416-23
		DG152B	2416-57
1520	Lambda	LAS1520	2955-128
	Signetics	TDA1520	2897-4
	TI	TCM1520	2949-16
1521	Plessey	SL1521	2888-123
			¶ 268-15
			¶ 272-5
1522	Plessey	SL1522	2888-124
	Signetics	TDA1522	2898-11
1523	Plessey	SL1523	2888-125
1524	**Exar**	**XR1524**	**★3190**
			2960-87
	Lambda	LAS1524	2956-40
	National	LM1524	2961-5
	Plessey	SL1524	2888-126
	RCA	**CA1524**	**★3368**
			2961-15
	Signetics	SG1524	2961-24
		TDA1524	2896-38
			2905-73
	SiliconG	SG1524	2961-29
			¶ 277-15
			¶ 277-17
			¶ 281-9
	TI	SG1524	2961-55
	Unitrode	**UC1524A**	**★3444**
			2961-100
1525	**Exar**	**XR1525A**	**★3191**
			2960-88
	Motorola	**SG1525**	**★3297**
	Plessey	SL1525	2888-127
	SiliconG	SG1525A	2961-30
			¶ 277-16
	Siliconix	SI1525B	2961-44
1526	**Motorola**	**SG1526**	**★3297**
			2960-118
	SiliconG	SG1526	2961-31
			¶ 280-13
1527	**Exar**	**XR1527A**	**★3191**
			2960-89
	Motorola	**SG1527**	**★3297**
	Signetics	TDA1527	2421-27
			2906-151
	SiliconG	SG1527A	2961-32
			¶ 277-16
	Siliconix	SI1527B	2961-45
	Unitrode	**UC1527A**	**★3445**
			2961-101
1528	Lambda	LAS1528	2956-72
153	Intersil	DG153A	2420-74
		DG153B	2420-80
	National	LF153	2938-11
	NEC-Electron	uPC153A	2928-35
	Siemens	SM153	2948-78
	SiliconG	SG153-05	2952-123
		SG153-08	2953-108
		SG153-12	2954-96
		SG153-15	2955-54
		SG153-18	2955-111
	Siliconix	DG153A	2420-77
		DG153B	2420-82
1531	Plessey	SL1531	2888-119
1532	Plessey	SL1532	2888-120
	SiliconG	SG1532	2960-11
1533	Signetics	TDA1533	2906-87
1534	Signetics	S1534	510-82
		SA1534	510-81
1535	**Unitrode**	**UC1535**	**★3445**
			2961-102
1536	Motorola	MC1536	2910-74
			2927-49
		MC1536R	2960-51
	National	LM1536	2910-79
			2927-50
	SiliconG	SG1536	2910-80
			2927-51
1537	Motorola	MC1537	2939-8
	Raytheon	RM1537	2938-47
1538	Motorola	MC1538	2887-21
15380	Rockwell	15380	1088-130
1539	Motorola	MC1539	2925-43
154	Intersil	DG154A	2420-104
		DG154B	2421-16
	NEC-Electron	uPC154	2921-14
		uPC154A	2924-32
	Siliconix	DG154A	2420-107
		DG154B	2421-18
1541	Panasonic	MN1541	1086-132
			1055-7
1542	Panasonic	MN1542	1086-133
			1055-8
	SiliconG	SG1542	2965-61
1543	**Exar**	**XR1543**	**★3192**
			2965-89
	SiliconG	SG1543	2965-92
			¶ 280-5
			¶ 280-14
1544	Motorola	MC1544	2485-76
	Panasonic	MN1544	1086-134
			1055-9
	SiliconG	SG1544	2965-93
1545	Motorola	MC1545	2888-42
1547	SiliconG	SG1547	2965-100
1549	SiliconG	SG1549	2963-4
			¶ 280-10
155	AMD	LF155	2909-48
			2918-32
		LF155A	2921-57
	Harris	**LF155**	**★3286**
			★3288
	Intersil	LF155	2909-49
			2918-33
		LF155A	2922-2
	Motorola	LF155	2909-50
			2918-34
		LF155A	2922-4
	National	**LF155**	**★3309**
			2927-6
		LF155A	**★3309**
			2922-6
	PMI	PM155	2909-52
			2918-35
		PM155A	2922-8
	Siemens	FZJ155A	472-22
1550	**CMA**	**CMA1550**	**★4311**
			4140-55
	Motorola	MC1550	2888-75
	Plessey	SL1550	2888-86
	Sanyo	LB1550	2903-82
1552	Motorola	MC1552	2888-76
1553	Motorola	MC1553	2888-77
	SMC	COM1553A	2487-32
		COM1553B	2487-33
15530	**Harris**	**HD15530-2**	**★ 669**
			★ 688
			★1333
			464-19
			★ 669
			★ 688
			★1333
			2486-87
		HD15530-9	**★ 669**
			★ 688
			★1333
			464-20
			★ 669
			★ 688
			★1333
			2486-88
	Harris	HS15530RH	2486-86
15531	**Harris**	**HD15531-2**	**★ 669**
			★ 693
			★1333

Arranged alphanumerically from left to right.

© IC MASTER 1983

Case Number	Source	Device	Page-Line
15531	Harris	HD15531-2	464-21
			★ 669
			★ 693
			★1333
			2486-89
		HD15531-9	★ 669
			★ 693
			★1333
			464-22
			★ 669
			★ 693
			★1333
			2486-90
		HD15531A	★ 669
			★ 693
			★1333
			2486-91
		HD15531B	★ 695
1554	Motorola	MC1554	2896-83
			¶ 268-6
1555	Motorola	MC1555	2951-38
	NEC-Electron	uPC1555	2951-40
1556	Motorola	MC1556	2925-52
	Signetics	MC1556	2925-51
1558	Fairchild	uA1558M	2938-48
	Harris	LM1558	★3286
			★3288
	Motorola	MC1558	2938-50
		MC1558N	2939-7
		MC1558S	2938-40
	National	LM1558	2938-52
	PMI	PM1558	2938-54
	Raytheon	RM1558	2938-56
	RCA	CA1558	2938-58
	Signetics	MC1558	2938-60
	SiliconG	SG1558	2939-1
	TI	MC1558	2939-3
1559	Signetics	TDA1559	2906-83
156	AMD	LF156	2927-10
		LF156A	2922-10
	Harris	LF156	★3286
			★3288
			2927-12
		LF156A	★3286
			★3288
			2922-12
	Intersil	LF156	2927-13
		LF156A	2922-14
	Motorola	LF156	2927-14
		LF156A	2922-16
	National	LF156	★3309
			2927-17
		LF156A	★3309
			2922-18
	NEC-Electron	uPC156A	2931-29
	Panasonic	AN156	2965-159
	PMI	PM156	2927-20
		PM156A	2922-20
1562	Panasonic	MN1562	1086-135
			1055-10
1563	Motorola	MC1563G	★3295
			2960-34
1564	Panasonic	MN1564	1086-136
			1055-11
	Signetics	PCA1564	2898-172
1566	Motorola	MC1566	★3295
	Signetics	PCA1566	2898-173
15666	Motorola	MC15666	2960-20
1568	Exar	XR1568	2958-75
	Motorola	MC1568	★3286
			2958-70
			2960-27
			2960-29
			2960-67
			2960-69
	SiliconG	SG1568	2958-72
			2960-31
			2960-71
		SG1568T	2960-73
1569	Motorola	MC1569	★3295
			2959-112
			2959-113
157	Harris	LF157	★3286
			★3288
			2926-55
		LF157A	★3286

Case Number	Source	Device	Page-Line
157	Harris	LF157A	★3288
			2921-47
	Intersil	LF157	2926-56
		LF157A	2921-49
	Motorola	LF157	2909-51
		LF157A	2921-51
	National	LF157	★3309
			2926-58
		LF157A	★3309
			2921-53
	NEC-Electron	uPC157	2931-55
	PMI	PM157	2927-1
		PM157A	2921-55
1571	Signetics	TDA1571	2900-157
1574	Signetics	TDA1574	2900-158
1576	Signetics	TBA1576	2901-19
1578	Signetics	TDA1578	2901-141
158	Motorola	LM158	2913-29
			2938-25
	National	LM158	2913-32
			2938-26
		LM158A	2913-47
	RCA	CA158	2913-36
			2938-28
		CA158A	2936-52
	Signetics	LM158	2913-38
			2938-30
	TI	LM158	2913-44
			2938-33
1580	Signetics	TDA 1580	2900-145
159	National	LM159	2935-28
	NEC-Electron	uPC159A	2933-41
1590	Motorola	MC1590G	2887-36
			¶ 268-7
1591	Panasonic	MN1591	1087-1
1594	Motorola	MC1594	2964-162
	Signetics	TDA1594	2463-16
1595	Motorola	MC1595	2964-163
	SiliconG	SG1595	2964-167
1596	Motorola	MC1596	2962-93
	National	LM1596	2962-95
	Signetics	MC1596	2962-103
	SiliconG	SG1596	2962-107
1599	Panasonic	MN1599	1086-137
15A05	Lambda	LAS15A05	2952-76
15A12	Lambda	LAS15A12	2954-55
15A15	Lambda	LAS15A15	2955-17
16	AMD	RTE16/8050A	★1703
		RTE16/8050	★1704
	Burr-Brown	MPC16S	2425-22
	Cromemco	16KZ	★1918
	Datel	DAC-HP16DGC	★2621
	Datel	DAC-HP16BMC	2462-5
		DAC-HP16BMC-1	2462-6
	Datel	DAC-HP16BMM	★2620
			2462-7
	Datel	DAC-HP16BMM-1	2462-8
		DAC-HP16DGC	2462-17
		DAC-HP16DMC	2462-18
		DAC-HP16DMM	2462-19
	Datel	HDAS-16MC	★2623
			2432-10
			★2623
			2963-42
		HDAS-16MM	★2620
			2432-11
			★2620
			2963-43
		HDAS-16MR	★2623
	E-HI	16D	4004-3
	Fairchild	GLOW-16	1769-19
		SPARK-16	1769-20
	GI	SPR-16	3484-107
	Harris	HIDAC16B	★2722
			2461-15
		HIDAC16C	★2722
			2461-24
	IPI	IPI16	2964-106
	Lambda	LAS16CB	2954-106
			2954-107
		LAS16U	2959-26
	MicroPwr	OP-16A	2918-20
		OP-16B	2920-54

Case Number	Source	Device	Page-Line
16	MicroPwr	OP-16C	2924-60
		OP-16E	2918-21
		OP-16F	2920-55
		OP-16G	2925-1
	MicroTech	CCD16DMUX	2962-42
		CCD16MUX	2962-41
	National	LX16XXA	2965-127
		LX16XXD	2965-133
		LX16XXG	2965-139
		LX16XXGB	2965-131
	PMI	MUX-16A	2425-29
			¶ 261-8
		MUX-16B	2425-31
			¶ 261-8
		MUX-16E	2425-30
			¶ 261-8
		MUX-16F	2425-32
			¶ 261-8
		OP-16A	2918-22
			¶ 256-19
		OP-16B	2920-56
			¶ 256-19
		OP-16C	2925-2
			¶ 256-19
		OP-16E	2918-23
			¶ 256-19
		OP-16F	2920-57
			¶ 256-19
		OP-16G	2925-3
			¶ 256-19
	Trans-Data	UMC-16	2487-74
	TRW	MPY16HD	★ 812
			475-124
			475-125
		Y16HD	★ 812
160	MicroEng	MGB1603	★4437
			4141-8
		MGC1603	★4437
			4141-16
	Motorola	XC160	4141-50
	National	AF160	★3345
			2962-26
		LM160	★3317
			2892-11
1600	GI	CP-1600	1079-2
		CP1600	1089-1
	Harris	HA-1600-2	2966-133
	National	LX1600A	2965-126
			¶ 282-14
			¶ 282-15
	Supertex	CM1600	3485-55
		CM1600-1	3485-28
		CM1600-2	3485-60
		MM1600	3485-61
	TI	TMS1600	★1557
			1057-21
	Western	CP1600	1075-33
		MP1600	1081-29
16000	Fairchild	F16000	★1253
			★1297
	National	DB16000	★1365
			1767-18
	Signetics	SMSFT16000	★1742
	Synertek	SY16000	1100-9
			1081-11
16008	Fairchild	F16008	1097-120
			1061-3
	National	SC16008	1071-11
	Synertek	SY16008	1073-35
1601	Sanyo	LB1601	2967-165
16016	Fairchild	F16016	1097-121
			1077-26
	National	NS16016	1081-2
	Synertek	SY16016	1081-12
1602	AMI	S1602	2487-58
	Harris	HA-1602-2	2966-134
	Western	TR1602	2487-62
			¶ 257-9
1603	National	DS1603	2474-34
			2485-58
16032	Fairchild	F16032	★1293
			1100-7
			★1298
			1077-27
	National	NS16032-10	★1383

Case Number	Source	Device	Page-Line
16032	National	NS16032-10	★1397
			1081-3
		NS16032-6	★1381
			★1333
			★1397
			1100-8
			★1381
			★1383
			★1397
			1081-4
	Synertek	SY16032	1081-13
1605	Fairchild	SH1605	2960-100
			¶ 281-2
	Harris	HA-1605-5	2966-135
	ITT	TDD1605	2952-36
	Lambda	LAS1605	2952-102
	National	LH1605	★3343
			2961-3
		LH1605C	★3343
			2961-4
1606	Datel	MV-1606	★2622
			2424-102
		MV-1606M	★2622
			2424-98
		MX-1606	★2622
			2425-23
		MX-1606M	★2622
			2425-21
	ITT	TDD1606	2953-5
1608	Harris	HA-1608	★3210
			★3287
			2967-2
	ITT	TDD1608	2953-72
	Lambda	LAS1608	2953-105
16081	Fairchild	F16081	1097-125
	National	NS16081	★1426
			1100-10
16082	Fairchild	F16082	1097-130
	National	NS16082	★1428
			1100-13
161	Intersil	DG161A	2418-48
	National	AF161	2962-27
	National	LM161	★3317
			2891-34
	Siemens	FZH161	473-23
		FZJ161	473-20
	Siliconix	DG161A	2418-51
		DG161B	2418-56
		L161	2894-57
			¶ 270-16
1610	Harris	HA-1610-2	2966-136
	ITT	TDD1610	2954-2
	Panasonic	MN1610	1099-57
			1081-6
16105	Fairchild	F16105	1097-127
1611	National	DS1611	2482-13
	Panasonic	MN1611	1099-58
			1081-7
1612	ITT	TDD1612	2954-27
	Lambda	LAS1612	2954-86
	National	DS1612	2482-53
1613	National	DS1613	2482-124
1614	National	DS1614	2482-88
16147	National	DS16147	2483-27
16149	National	DS16149	485-7
			2483-129
1615	Harris	HA-1615-2	2966-137
		HA-1615-5	2966-138
	ITT	TDD1615	2954-125
	Lambda	LAS1615	2955-43
1616	Datel	MX-1616	2425-18
	Datel	MX-1616C	★2622
	Datel	MX-1616M	2425-19
16177	National	DS16177	2483-28
16179	National	DS16179	485-8
			2483-130
1618	ITT	TDD1618	2955-66
162	Intersil	DG162A	2418-78
	Siliconix	DG162A	2418-81
		DG162B	2418-107
1620	Harris	HA-1620	2966-68
16201	Fairchild	F16201	1097-133
	National	NS16201-6	★1397
			★1409
			★1444

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
16201	**National**	**NS16201-6**	★1446
			1100-12
16202	Fairchild	F16202	1097-128
16203	Fairchild	F16203	1097-123
16204	Fairchild	F16204	1097-122
1623	Interdesign	MOF1623B	2475-39
1624	ITT	TDD1624	2956-17
1625	Harris	HA-1625	2966-69
1627	SiliconG	SG1627	2480-20
			¶ 280-9
1628	National	DS1628	2484-3
1629	SiliconG	SG1629	2422-86
			2480-156
			¶ 280-9
			2967-176
			¶ 280-9
163	Intersil	DG163A	2421-38
		DG163B	2421-44
	National	LM163	2915-46
		LM163A	2887-65
			2914-51
	Siliconix	DG163A	2421-41
		DG163B	2421-46
1630	National	DS1630	449-154
	Panasonic	MN1630	1099-61
1631	National	DS1631	2482-9
	Panasonic	MN1631	1099-62
	Western	CP1631	1097-119
1632	National	DS1632	2482-47
1633	National	DS1633	2482-120
1634	National	DS1634	2482-84
1635	SiliconG	SG1635	2480-11
			2964-119
164	Intersil	DG164A	2421-52
		DG164B	2421-62
	National	**LF164**	★3316
	Siliconix	DG164A	2421-55
		DG164B	2421-64
1640	National	DS1640	2483-60
	Panasonic	MN1640	1099-60
16413	Fairchild	F16413	1097-124
1642	National	DS1642	2481-108
16425	Fairchild	F16425	1097-132
1644	National	DS1644	2483-53
1645	National	DS1645	2483-141
16456	**Fairchild**	**F16456**	★1302
			1097-131
			1100-14
1646	National	DS1646	2484-19
1647	National	DS1647	2483-29
1648	Motorola	MC1648	471-48
			2945-158
		MC1648M	471-49
			2945-159
	National	DS1648	2483-35
	Plessey	SP1648	471-50
			¶ 272-5
			2945-161
			¶ 272-5
16488	**Fairchild**	**F16488**	★1303
			1097-126
			1100-11
1649	National	DS1649	2483-137
165	**MicroEng**	**MCEL165**	★4440
			4141-3
			★4440
			2909-53
	National	**LP165**	★3316
			2965-141
	Siemens	FZH165B	473-24
1650	**GI**	**PIC1650A**	★1319
			1089-4
			¶ 246-16
			★1319
			1063-5
			¶ 246-16
	Motorola	MC1650	471-51
			¶ 234-12
	National	DS1650	2475-13
	Panasonic	MN1650	1099-59
	Plessey	SP1650B	471-53
1651	Motorola	MC1651	471-52
	National	DS1651	2485-66
	Western	CP1651	1097-102
		MP1651	1097-104
1652	National	DS1652	2475-16
1653	National	DS1653	2485-67
1654	**GI**	**PIC1654**	★1319
			1089-5
			★1319
			1063-6
	Motorola	MC1654	471-18
1655	**GI**	**PIC1655A**	★1319
			1089-6
			★1319
			1063-7
1656	**GI**	**PIC1656**	★1319
			1089-7
			★1319
			1063-8
1658	Motorola	MC1658	471-45
			2945-160
	Plessey	SP1658	471-46
			2945-162
166	Cherry	CS166	2963-76
	Siemens	FZJ166	473-21
1660	AMD	1660	2931-40
	Motorola	MC1660	471-33
			¶ 235-3
	Plessey	SP1660B	471-34
1661	Western	CP1661	1097-103
		MP1661	1097-105
1662	Motorola	MC1662	471-31
			¶ 234-10
			¶ 235-3
	Plessey	SP1662B	471-32
1664	Motorola	MC1664	471-28
			¶ 235-3
	Plessey	SP1664B	471-29
1665	Plessey	SP1665B	471-30
1666	Motorola	MC1666	471-26
	Plessey	SP1666	471-27
1668	Motorola	MC1668	471-42
	Plessey	SP1668	471-43
1670	**GI**	**PIC1670**	★1309
			★1319
			1089-8
			★1309
			★1319
			1063-9
	Motorola	MC1670	471-21
	National	DS1670	2483-61
	Plessey	SP1670B	471-22
	SGS	TDA1670	2905-108
	TI	**TMS1670**	★1557
			1057-22
1671	National	DS1671	2481-109
	SMC	COM1671	2486-12
			1097-106
	Western	**UC1671**	★2871
			2486-13
			★2871
			1097-107
1672	**GI**	**PIC1672**	★1319
			1089-9
			★1319
			1063-10
	Motorola	MC1672	471-38
	National	DS1672	2481-110
	Plessey	SP1672B	471-39
1674	Motorola	MC1674	471-40
	National	DS1674	2483-54
	Plessey	SP1674B	471-41
1675	National	DS1675	2483-142
1676	National	DS1676	2484-20
1677	National	DS1677	2483-30
1678	Motorola	MC1678	470-97
	National	DS1678	2483-36
1679	National	DS1679	2483-138
1680	Plessey	SL1680	2963-1
16802	Fairchild	F16802	1097-129
1686	National	DS1686	2481-49
			2949-7
1687	National	DS1687	2481-50
			2949-8
1688	Motorola	MC1688	471-37
	National	DS1688	2472-37
1689	National	DS1689	2475-29
169	Siliconix	D169	2423-10
1690	Motorola	MC1690	471-25
	National	DS1690	2475-30
1691	National	DS1691	2469-49
1691	**Western**	**WD1691**	★1569
			1101-43
1692	Motorola	MC1692	471-54
			¶ 234-12
	National	DS1692	2472-39
	Plessey	SP1692B	471-55
16923	TI	SN16923	2896-131
1694	Motorola	MC1694	471-47
			3489-87
1697	Motorola	MC1697	470-98
1699	Motorola	MC1699	470-99
16A4	MMI	HAL16A4C	506-124
		HAL16A4M	506-125
	MMI	**PAL16A4C**	★4449
			506-45
			★4449
			3457-19
	PAL16A4M		★4449
			506-46
			★4449
			3457-20
	National	DMPAL16A4C	506-73
			3457-49
		DMPAL16A4M	506-74
			3457-50
16C1	MMI	HAL16C1C	506-126
		HAL16C1M	506-127
	MMI	**PAL16C1-2**	★4470
	PAL16C1C		★4449
			3457-21
	PAL16C1M		★4449
			3457-22
	National	**DMPAL16C1C**	★737
			506-75
			★737
			3457-51
		DMPAL16C1M	★737
			506-76
			★737
			3457-52
16C55	**GI**	**PIC16C55**	★1319
			1089-10
			★1319
			1063-11
16D8	**AMD**	**AMPAL16D8**	★614
16F60	Plessey	SP16F60	471-35
16H2	MMI	HAL16H2C	506-128
		HAL16H2M	506-129
	MMI	**PAL16H2-2**	★4470
	PAL16H2C		★4449
			506-47
			★4449
			3457-23
	PAL16H2M		★4449
			506-48
			★4449
			3457-24
	National	**DMPAL16H2C**	★737
			506-77
			★737
			3457-53
		DMPAL16H2M	★737
			506-78
			★737
			3457-54
16H8	**AMD**	**AMPAL16H8**	★604
			★615
			★612
16HD8	**AMD**	**AMPAL16HD8**	★604
			★615
16L2	MMI	HAL16L2C	506-130
		HAL16L2M	506-131
	MMI	**PAL16L2-2**	★4470
	PAL16L2C		★4449
			506-49
			★4449
			3457-25
	PAL16L2M		★4449
			506-50
			★4449
			3457-26
	National	**DMPAL16L2C**	★737
			506-79
			★737
			3457-55
		DMPAL16L2M	★737
16L2	National	DMPAL16L2M	506-80
			★737
			3457-56
16L6	**MMI**	**PAL16L6**	★4458
16L8	**AMD**	**AMPAL16L8**	★604
			★615
			★611
	MMI	HAL16L8C	506-132
		HAL16L8M	506-133
	MMI	**PAL16L8-2**	★4470
	PAL16L8-4		★4470
	PAL16L8A		★4464
	PAL16L8C		★4449
			506-51
			★4449
			3457-27
	PAL16L8M		★4449
			506-52
			★4449
			3457-28
	National	**DMPAL16L8C**	★737
			506-81
			★737
			3457-57
		DMPAL16L8M	★737
			506-82
			★737
			3457-58
16LD8	**AMD**	**AMPAL16LD8**	★604
			★615
			★613
16R4	**AMD**	**AMPAL16R4**	★604
			★615
			★610
	MMI	HAL16R4C	506-134
		HAL16R4M	506-135
	MMI	**PAL16R4-2**	★4470
		PAL16R4-4	★4470
		PAL16R4A	★4464
		PAL16R4C	★4449
			506-53
			★4449
			3457-29
		PAL16R4M	★4449
			506-54
			★4449
			3457-30
	National	**DMPAL16R4C**	★737
			506-83
			★737
			3457-59
		DMPAL16R4M	★737
			506-84
			★737
			3457-60
16R6	**AMD**	**AMPAL16R6**	★604
			★615
			★609
	MMI	HAL16R6C	506-136
		HAL16R6M	506-137
	MMI	**PAL16R6-2**	★4470
		PAL16R6-4	★4470
		PAL16R6A	★4464
		PAL16R6C	★4449
			506-55
			★4449
			3457-31
		PAL16R6M	★4449
			506-56
			★4449
			3457-32
	National	**DMPAL16R6C**	★737
			506-85
			★737
			3457-61
		DMPAL16R6M	★737
			506-86
			★737
			3457-62
16R8	**AMD**	**AMPAL16R8**	★604
			★615
			★608
	MMI	HAL16R8C	506-138
		HAL16R8M	506-139
	MMI	**PAL16R8-2**	★4470
		PAL16R8-4	★4470

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
16R8	MMI	PAL16R8A	★4464
		PAL16R8C	★4449
			506-57
			★4449
			3457-33
		PAL16R8I	★4449
			506-58
			★4449
			3457-34
	National	DMPAL16R8C	★ 737
			506-87
			★ 737
			3457-63
		DMPAL16R8I	★ 737
			506-88
			★ 737
			3457-64
16X4	MMI	HAL16X4C	506-140
		HAL16X4M	506-141
	MMI	PAL16X4C	★4449
			506-59
			★4449
			3457-35
		PAL16X4I	★4449
			506-60
			★4449
			3457-36
	National	DMPAL16X4C	506-89
			3457-65
		DMPAL16X4M	506-90
			3457-66
17	IPI	IPI17	2964-87
	MicroPwr	OP-17A	2918-12
		OP-17B	2920-46
		OP-17C	2925-4
		OP-17E	2918-13
		OP-17F	2920-47
		OP-17G	2925-5
	PMI	OP-17A	2918-14
			¶ 256-19
		OP-17B	2920-48
			¶ 256-19
		OP-17C	2924-54
			¶ 256-19
		OP-17E	2918-15
			¶ 256-19
		OP-17F	2920-49
			¶ 256-19
		OP-17G	2924-55
			¶ 256-19
	Rockwell	A17XX	1088-126
170	Siemens	UAA170	2463-14
			2964-81
	TI	TL170	511-83
1700	IPI	IPI1700	2964-88
	TI	TMS1700	★1557
			1057-23
1702	AMD	1702A	3460-17
		1702A-1	3460-36
		1702A-2	3460-38
		1702A-6	3460-20
		1702AL	3460-18
		1702AL-1	3460-37
		1702AL-2	3460-39
1703	TI	TCM1703	2948-157
1705	TI	TCM1705A	2902-71
			2949-23
1706	TI	TCM1706	2902-72
			2949-24
1709	Motorola	MC1709	2929-5
		MC1709A	2924-10
171	Siemens	FZH171	472-74
1710	Cermetek	CH1710	2948-129
	Motorola	MC1710	2891-25
		MC1710C	2892-16
1711	Motorola	MC1711	2893-27
		MC1711C	2893-48
172	Siliconix	DG172A	2416-73
		DG172B	2416-74
		DG172C	2416-75
	TI	TL172	511-84
		TL172C	2963-132
1720	Cermetek	CH1720	2948-130
1723	Motorola	MC1723	★3295
			2959-93
1723	Motorola	MC1723C	★3295
			2959-94
1724	RCA	CA1724G	2889-147
1725	RCA	CA1725G	2889-148
1728	Reticon	RL1728	2964-36
173	TI	TL173C	2963-133
1730	Cermetek	CH1730	2948-131
1731	SiliconG	SG1731	2906-84
			2964-139
1733	Motorola	MC1733	2888-78
			¶ 257-7
		MC1733C	2888-79
			¶ 257-7
1740	AD	SDC1740	2967-6
	Cermetek	CH1740	2948-132
1741	AD	SDC1741	2967-7
	Motorola	MC1741	2909-31
			2929-11
		MC1741C	2930-47
		MC1741N	2929-19
		MC1741NC	2931-10
		MC1741NS	2929-35
		MC1741S	2929-33
		MC1741SC	2931-8
1742	AD	SDC1742	2967-8
1747	Motorola	MC1747	2938-51
		MC1747C	2939-43
1748	Motorola	MC1748	2929-25
		MC1748C	2930-60
175	Cherry	CS175	2906-64
			2964-126
	Siemens	FZH175	472-75
		S175	2962-40
	TI	TL175	511-85
176	TI	TL176	511-86
1761	SMC	FDC1761-02	1101-2
	Western	FD1761	1101-15
		FD1761-02	1101-56
1763	SMC	FDC1763-02	1101-3
	Western	FD1763-02	1101-57
1765	SMC	FDC1765-02	1101-4
	Western	FD1765-02	1101-58
1767	SMC	FDC1767-02	1101-5
	Western	FD1767-02	1101-59
177	Motorola	XC177	4141-51
	NEC-Electron	uPC177	2895-21
1770	SGS	TDA1770	2905-109
	Western	WD1770	★1579
			1101-24
1771	National	INS1771	1097-112
			1101-29
			¶ 238-17
	Western	FD1771-01	1097-113
			1101-16
	Western	WD1771	★1578
17741	Hitachi	HA17741	2930-46
1776	Motorola	MC1776	2911-163
			2912-37
			2928-19
			¶ 273-5
		MC1776C	2912-4
			2912-53
			¶ 273-5
178	Siemens	S178	2906-20
		S178A	2903-44
17800	CalDevices	HC17800	4140-36
17805	Hitachi	HA17805P	2952-101
17806	Hitachi	HA17806P	2953-39
17808	Hitachi	HA17808	2953-85
1781	Western	FD1781	1097-114
		FD1781-01	1097-115
			1101-17
17812	Hitachi	HA17812P	2954-85
17815	Hitachi	HA17815P	2955-42
17818	Hitachi	HA17818P	2955-86
17824	Hitachi	HA17824P	2956-62
179	Cherry	CS179	2906-115
	Panasonic	AN179	2965-160
17902	Hitachi	HA17902	2913-20
1791	Siemens	SAB1791-02	1101-31
	SMC	FDC1791	1101-6
	Synertek	SY1791-01	★1538
			1091-23
		SY1791-02	★1538
			1101-12
	Western	FD1791-02	★1574
1791	Western	FD1791-02	1097-116
			1101-18
1792	SMC	FDC1792	1101-7
	Western	FD1792-02	★1574
			1101-19
1793	SMC	FDC1793	1101-8
	Synertek	SY1793-01	★1538
			1091-24
		SY1793-02	★1538
			1101-13
	Western	FD1793-02	★1574
			1092-60
			1093-112
			1094-140
			1095-149
			1099-101
			1101-20
1794	SMC	FDC1794	1101-9
	Western	FD1794-02	★1574
			1101-21
1795	SMC	FDC1795	1101-10
	Western	FD1795-02	★1574
			1097-117
			1101-22
1797	SMC	FDC1797	1101-11
	Western	FD1797-02	★1574
			1092-61
			1093-113
			1094-141
			1095-150
			1099-102
			1101-23
18	IPI	IPI18	2964-89
	Lambda	LAS18U	2960-31
	National	LX18XXA	2965-128
		LX18XXD	2965-134
		LX18XXG	2965-140
		LX18XXGB	2965-132
	National	NSX18	★1455
	Plessey	CLA18XX	4141-74
	PMI	OP-18B	2923-35
		OP-18F	2923-36
		OP18A	2919-37
		OP18E	2919-38
	TeledyneC	CDA18	2418-120
180	Cherry	CS180	2968-122
	Intersil	DG180A	2415-87
			2415-96
		DG180B	2415-88
			2415-97
	National	FOT1803	★3345
			2963-74
	Siemens	UAA180	2463-15
			2964-82
	Siliconix	DG180A	★2779
			2415-89
			2415-98
		DG1803	★2779
			2415-90
			2415-99
	Telefunken	U180M	2463-62
1800	Harris	HI1800A	★2640
	Harris	HI1800A-5	2420-31
	IPI	IPI1800	2964-90
	National	LM1800	★3325
			★3328
			2901-111
	Raytheon	CGA1800	4141-86
	RCA	1800	★1457
		CD1800	★ 408
		CDP1800	★1465
1801	National	LM1801	2906-119
	NEC-Electron	uPD1801	2898-55
1802	Hughes	HCMP1802	1065-10
		HCMP1802A	1089-15
		HCMP1802AC	1089-16
		HCMP1802C	1065-11
		HMMP1802A	1089-17
		HMMP1802AC	1089-18
	Lambda	LAS1602	2956-84
	RCA	CDP1802	★1459
			1071-36
			¶ 242-11
			¶ 243-19
			¶ 245-5
			¶ 245-9
1802	RCA	CDP1802	¶ 246-15
			¶ 247-5
			¶ 248-7
			¶ 248-8
		CDP1802A	★1459
			1089-19
			¶ 242-11
			¶ 243-19
			¶ 245-5
			¶ 245-9
			¶ 246-15
			¶ 247-5
			¶ 248-7
			¶ 248-8
			★1459
			1071-37
			¶ 242-11
			¶ 243-19
			¶ 245-5
			¶ 245-9
			¶ 246-15
			¶ 247-5
			¶ 248-7
			¶ 248-8
		CDP1802AC	★1459
			1089-20
			¶ 242-11
			¶ 243-19
			¶ 245-5
			¶ 245-9
			¶ 246-15
			¶ 247-5
			¶ 248-7
			¶ 248-8
		CDP1802BC	★1459
			1073-1
			¶ 242-11
			¶ 243-19
			¶ 245-5
			¶ 245-9
			¶ 246-15
			¶ 247-5
			¶ 248-7
			¶ 248-8
		CDP1802C	★1459
			1073-2
			¶ 242-11
			¶ 243-19
			¶ 245-5
			¶ 245-9
			¶ 246-15
			¶ 247-5
			¶ 248-7
			¶ 248-8
		CDP1802D	★1459
			1073-3
			¶ 242-11
			¶ 243-19
			¶ 245-5
			¶ 245-9
			¶ 246-15
			¶ 247-5
			¶ 248-7
			¶ 248-8
1804	RCA	CDP1804AC	★1461
			1089-12
			★1461
			1073-4
18042	RCA	CDP18042CD	3460-16
1805	Lambda	LAS1805	2956-113
	RCA	CDP1805AC	★1461
			1089-14
			★1461
			1073-5
		CDP1805C	★1461
			1073-6

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
18052	Lambda	LAS18052	2957-8
1806	Lambda	LAS1806	2957-24
	RCA	**CDP1806AC**	**★1461**
			1089-13
			★1461
			1073-7
		CDP1806C	**★1461**
			1073-8
	Xycom	1806A	1763-21
1808	Lambda	LAS1808	2957-38
181	Intersil	DG181A	2415-111
			2415-115
		DG181B	2416-12
			2416-16
		DGM181B	2415-27
		IH181C	2416-13
			2416-17
		IH181M	2415-112
			2416-1
	National	AM181	2415-113
			2416-2
	Siemens	FZH181	473-25
	Siliconix	**DG181A**	**★2779**
			2415-114
			2416-3
			¶ 262-11
			¶ 262-14
		DG181B	**★2779**
			2416-14
			2416-18
			¶ 262-11
			¶ 262-14
1810	Lambda	LAS1810	2957-55
	Xycom	1810Z	1763-22
1812	Lambda	LAS1812	2957-83
	National	LM1812	2901-168
		M1812	2967-173
1815	Lambda	LAS1815	2957-128
1818	**Harris**	**HI1818A**	**★2646**
		HI1818A-2	**★3288**
			2424-15
		HI1818A-5	**★3288**
			2424-16
	Lambda	LAS1818	2958-19
	National	**LM1818**	**★3325**
			★3328
			2902-105
182	Datel	VR-182A	2966-31
		VR-182B	2966-32
		VR-182C	2966-33
	Intersil	DG182A	2416-31
			2416-35
		DG182B	2416-48
			2416-52
		DGM182A	2415-28
		DGM182B	2415-63
		IH182C	2416-49
			2416-53
		IH182M	2416-32
			2416-36
	National	AM182	2416-30
			2416-34
	Siliconix	**DG182A**	**★2779**
			2416-33
			2416-38
		DG182B	**★2779**
			2416-51
			2416-55
	TI	TL182C	2416-60
		TL182I	2416-61
		TL182M	2416-39
1820	Lambda	LAS1820	2958-36
	Western	**1820**	**★4563**
		WD1820	**★4563**
			4141-128
1821	National	LM1821	2900-101
	RCA	**CDP1821**	**★3874**
			460-159
			★3874
			3476-16
			★3874
			1089-69
		CDP1821C	**★3874**
			3476-47
			★3874
			1089-70

Base Number	Source	Device	Page-Line
1822	Hughes	HCMP1822C	460-170
			1089-65
		HMMP1822C	460-171
			3474-66
			1089-66
	National	**LM1822**	**★3329**
			2905-137
	RCA	**CDP1822**	**★3874**
			461-7
			¶ 288-6
			¶ 248-6
			★3874
			3474-15
			¶ 288-6
			¶ 248-6
			★3874
			1089-67
			¶ 288-6
			¶ 248-6
		CDP1822C	**★3874**
			461-8
			¶ 288-6
			¶ 248-6
			★3874
			3474-67
			¶ 288-6
			¶ 248-6
			★3874
			1089-68
			¶ 288-6
			¶ 248-6
1823	**RCA**	**CDP1823**	**★3874**
			460-162
			★3874
			3472-52
			3472-52
			★3874
			1089-63
		CDP1823C	**★3874**
			3472-58
			3472-58
			★3874
			1089-64
1824	Hughes	HCMP1824	460-124
			3471-127
			1089-56
		HCMP1824C	460-125
			3472-3
			1089-57
		HMMP1824	460-126
			3472-1
			1089-58
		HMMP1824C	460-127
			3472-4
			1089-59
	Lambda	LAS1824	2958-53
	RCA	**CDP1824**	**★3874**
			460-128
			¶ 288-5
			¶ 248-4
			★3874
			3472-2
			¶ 288-5
			¶ 248-4
			★3874
			1089-60
			¶ 288-5
			¶ 248-4
		CDP1824C	**★3874**
			460-129
			¶ 288-5
			¶ 248-4
			★3874
			3472-5
			¶ 288-5
			¶ 248-4
			★3874
			1089-61
			¶ 288-5
			¶ 248-4
1825	RCA	CDP1825	461-23
			3479-58
			1089-71
		CDP1825C	461-24
			3479-59
			1089-72

Base Number	Source	Device	Page-Line
1826	RCA	CDP1826C	3472-28
1828	**Harris**	**HI1828A**	**★2646**
	Harris	HI1828A-2	2423-49
		HI1828A-5	2423-50
	Lambda	LAS1828	2958-58
	National	LM1828	2903-103
183	Intersil	DG183A	2420-62
			2420-66
		DG183B	2420-63
			2420-67
	Siliconix	**DG183A**	**★2780**
			2420-64
			2420-68
		DG183B	**★2780**
			2420-65
			2420-69
1830	National	LM1830	2963-77
1831	Hughes	HCMP1831	461-33
			3484-11
			1089-75
		HCMP1831C	461-34
			3484-21
			1089-76
		HMMP1831	461-37
			3484-13
			1089-79
		HMMP1831C	461-38
			3484-23
			1089-80
	RCA	**CDP1831**	**★3876**
			461-41
			¶ 289-3
			¶ 248-5
			★3876
			3484-15
			¶ 289-3
			¶ 248-5
			★3876
			1089-83
			¶ 289-3
			¶ 248-5
		CDP1831C	**★3876**
			461-42
			¶ 289-3
			¶ 248-5
			★3876
			3484-25
			¶ 289-3
			¶ 248-5
			★3876
			1089-84
			¶ 289-3
			¶ 248-5
1832	Hughes	HCMP1832	461-35
			3484-12
			1089-77
		HCMP1832C	461-36
			3484-22
			1089-78
		HMMP1832	461-39
			3484-14
			1089-81
		HMMP1832C	461-40
			3484-24
			1089-82
	RCA	CDP1832	461-43
			¶ 289-3
			¶ 248-5
			3484-16
			¶ 289-3
			¶ 248-5
			1089-85
			¶ 289-3
			¶ 248-5
		CDP1832C	461-44
			¶ 289-3
			¶ 248-5
			3484-26
			¶ 289-3
			¶ 248-5
			1089-86
			¶ 289-3
			¶ 248-5
	RCA	**DEP1832**	**★3877**
1833	Hughes	HCMP1833	3484-65

Base Number	Source	Device	Page-Line
1833	Hughes	HCMP1833	1089-87
		HCMP1833C	461-46
			3484-82
			1089-88
		HMMP1833	461-49
			3484-67
			1089-91
		HMMP1833C	461-50
			3484-84
			1089-92
	RCA	**CDP1833**	**★3876**
			461-53
			¶ 289-4
			★3876
			3484-69
			¶ 289-4
			★3876
			1089-95
			¶ 289-4
		CDP1833C	**★3876**
			461-54
			¶ 289-4
			★3876
			3484-86
			¶ 289-4
			★3876
			1089-96
			¶ 289-4
1834	Hughes	HCMP1834	461-47
			3484-66
			1089-89
		HCMP1834C	461-48
			3484-83
			1089-90
		HMMP1834	461-51
			3484-68
			1089-93
		HMMP1834C	461-52
			3484-85
			1089-94
	RCA	**CDP1834**	**★3877**
			461-55
			¶ 289-4
			★3877
			3484-70
			¶ 289-4
			★3877
			1089-97
			¶ 289-4
		CDP1834C	**★3877**
			461-56
			¶ 289-4
			★3877
			3484-87
			¶ 289-4
			★3877
			1089-98
			¶ 289-4
1835	Hughes	HCMP1835	461-65
			1089-99
		HCMP1835C	461-66
			1089-100
		HMMP1835	461-69
			1089-103
		HMMP1835C	461-70
			1089-104
	RCA	**CDP1835**	**★3876**
			461-73
			★3876
			3485-1
			★3876
			1089-107
		CDP1835C	**★3876**
			461-74
			★3876
			3485-5
			★3876
			1089-108
1836	Hughes	HCMP1836	461-67
			1089-101
		HCMP1836C	461-68
			1089-102
		HMMP1836	461-71
			1089-105

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
1836	Hughes	HMMP1836C	461-72
			1089-106
1837	National	LM1837	★3325
			★3327
			2897-147
	RCA	CDP1837	★3876
184	Intersil	DG184A	2420-83
			2420-87
		DG184B	2420-96
			2420-100
		IH184C	2420-97
			2420-101
		IH184M	2420-84
			2420-88
	National	AM184	2420-85
			2420-89
	Siliconix	DG184A	★2780
			2420-86
			2420-90
		DG184B	★2780
			2420-98
			2420-102
1840	Harris	HI1840-2	2425-27
		HI1840-5	2425-20
		HS1840RH	2425-28
	Unitrode	UC1840	★3445
			2961-103
	Western	1840	★4564
		WD1840	★4564
			4141-129
1848	National	LM1848	2903-104
185	Intersil	DG185A	2420-111
			2420-115
		DG185B	2421-8
			2421-12
		IH185C	2421-9
			2421-13
		IH185M	2420-112
			2421-1
	National	AM185	2420-110
			2420-114
	National	LM185	★3304
			2966-14
		LM185-1	★3304
		LM185-2	★3304
			2966-57
	Siemens	FZH185	473-26
	Siliconix	DG185A	★2780
			2420-113
			2421-2
		DG185B	★2780
			2421-11
			2421-15
	TI	TL185C	2421-21
		TL185I	2421-22
		TL185M	2421-20
1851	Hughes	HCMP1851	1089-43
		HCMP1851C	1089-44
		HMMP1851	1089-45
		HMMP1851C	1089-46
	National	LM1851	2906-57
	RCA	CDP1851	★1475
			1089-47
		CDP1851C	★1475
			1089-48
	Western	CP1851	1097-118
1852	Hughes	HCMP1852	465-167
			1090-1
		HCMP1852C	465-168
			1090-2
		HMMP1852	465-169
			1090-3
		HMMP1852C	465-170
			1090-4
	RCA	CDP1852	★1471
			465-171
			¶ 241-14
			¶ 247-5
			★1471
			1090-5
			¶ 241-14
			¶ 247-5
1853	Hughes	HCMP1853	453-153
			1089-37
		HCMP1853C	453-154
			1089-38
1853	Hughes	HMMP1853	453-155
			1089-39
		HMMP1853C	453-156
			1089-40
	RCA	CDP1853	★1466
			453-157
			★1466
			1089-41
		CDP1853C	★1466
			453-158
			★1466
			1089-42
1854	Hughes	HCMP1854	464-80
			2487-54
		HCMP1854A	1089-111
		HCMP1854AC	1089-112
		HCMP1854C	464-81
			2487-37
		HMMP1854	464-82
		HMMP1854A	1089-113
		HMMP1854AC	1089-114
		HMMP1854C	464-83
	RCA	CDP1854	★1476
			2487-55
			¶ 241-15
			★1476
			1089-115
			¶ 241-15
		CDP1854A	★1476
			464-85
			¶ 241-15
			★1476
			1089-116
			¶ 241-15
		CDP1854AC	★1476
			2487-38
			¶ 241-15
			★1476
			1089-117
			¶ 241-15
1855	Hughes	HCMP1855	1089-31
		HCMP1855C	1089-32
		HMMP1855	1089-33
		HMMP1855C	1089-34
	RCA	CDP1855	★1478
			1089-35
			¶ 248-3
		CDP1855C	★1478
			1089-36
			¶ 248-3
1856	Hughes	HCMP1856	1089-133
		HCMP1856C	1089-134
		HMMP1856	1089-135
		HMMP1856C	1089-136
	RCA	CDP1856	★1472
			1089-137
			¶ 248-7
		CDP1856C	★1472
			1089-138
			¶ 248-7
1857	Hughes	HCMP1857	1089-139
		HCMP1857C	1089-140
		HMMP1857	1089-141
		HMMP1857C	1089-142
	RCA	CDP1857	★1472
			1089-143
			¶ 248-7
		CDP1857C	★1472
			1089-144
			¶ 248-7
1858	Hughes	HCMP1858	1089-145
		HCMP1858C	1089-146
		HMMP1858	1089-147
		HMMP1858C	1089-148
	RCA	CDP1858	★1468
			1089-149
		CDP1858C	★1468
			1089-150
1859	Hughes	HCMP1859	1089-151
		HCMP1859C	1089-152
		HMMP1859	1089-153
		HMMP1859C	1089-154
	RCA	CDP1859	★1468
			1089-155
		CDP1859C	★1468
			1089-156
186	AMD	IAPX186	★1231
			1077-18
	Intel	IAPX186	★1347
			1097-134
			★1347
			1079-8
		IAPX186/50	★1347
			★1349
			1079-9
	Intersil	DG186A	2418-36
			2418-40
		DG186B	2418-37
			2418-41
	Siliconix	DG186A	★2779
			2418-38
			2418-42
		DG186B	★2779
			2418-39
			2418-43
1860	RCA	CDP1860	1089-62
1861	Hughes	HCMP1861	1089-118
		HCMP1861C	1089-119
		HMMP1861	1089-120
		HMMP1861C	1089-121
	RCA	CDP1861	★1486
			1089-122
		CDP1861C	★1486
			1089-123
1862	RCA	CDP1862	★1486
			1089-21
		CDP1862C	★1486
			1089-22
	Xycom	1862¢A	1755-25
1863	RCA	CDP1863	★1485
			1089-53
		CDP1863C	★1485
			1089-54
	SMC	COM1863	2487-65
	Western	TR1863-00	★2872
			2487-35
		TR1863-02	★2872
			2487-40
		TR1863-04	★2872
			2487-50
1864	RCA	CDP1864	★1486
			1089-109
		CDP1864C	★1486
			1089-110
1865	National	LM1865	★3325
			★3327
			2901-30
	Western	TR1865-00	★2872
			2487-36
			¶ 257-9
		TR1865-02	★2872
			2487-41
			¶ 257-9
		TR1865-04	★2872
			2487-51
			¶ 257-9
1866	National	LM1866	★3325
			2900-119
	RCA	CDP1866	★1469
			1089-25
		CDP1866C	★1469
			1089-26
1867	RCA	CDP1867	★1469
			1089-27
		CDP1867C	★1469
			1089-28
1868	National	LM1868	★3325
			2900-102
	RCA	CDP1868	★1469
			1089-29
		CDP1868C	★1469
			1089-30
	Xycom	1868¢A	1767-28
1869	RCA	CDP1869	★1482
			1089-124
			¶ 257-8
			¶ 285-11
		CDP1869C	★1482
			1089-125
			¶ 257-8
			¶ 285-11
187	Intersil	DG187A	2418-57
			2418-61
		DG187B	2418-70
			2418-74
		IH187C	2418-71
			2418-75
		IH187M	2418-58
			2418-62
	National	AM187	2418-59
			2418-63
	Siemens	S187A	2945-140
	Siliconix	DG187A	★2779
			2418-60
			2418-64
		DG187B	★2779
			2418-72
			2418-76
1870	National	LM1870	★3325
			★3328
			2901-112
	RCA	CDP1870	★1482
			1089-126
			¶ 257-8
			¶ 285-11
		CDP1870C	★1482
			1089-127
			¶ 257-8
			¶ 285-11
	Signetics	LM1870	2901-139
1871	National	LM1871	2902-18
	RCA	CDP1871	★1484
			2468-8
			★1484
			1089-23
		CDP1871C	★1484
			2468-10
			★1484
			1089-24
		CDP1871CD	★1484
			2468-11
		CDP1871D	★1484
			2468-9
1872	National	LM1872	2902-19
	RCA	CDP1872C	★1473
			465-172
			★1473
			1090-6
	Reticon	RL1872	2964-37
	Western	CR1872	1088-68
1873	RCA	CDP1873C	★1467
			454-91
			★1467
			1090-132
1874	RCA	CDP1874C	★1473
			465-173
			★1473
			1090-7
1875	National	LM1875	★3330
			2896-143
	RCA	CDP1875C	★1473
			465-174
			★1473
			1090-8
1876	RCA	CDP1876	★1482
			1089-128
		CDP1876C	★1482
			1089-129
1877	National	LM1877	★3326
			★3328
			2897-92
	RCA	CDP1877	★1479
			1089-49
		CDP1877C	★1479
			1089-50
		CDP1877CD	★1479
			1089-51
		CDP1877D	★1479
			1089-52
1878	RCA	CD1878	1089-130
	RCA	CDP1878C	★1480
			1089-131
1879	National	LM1879	2896-85
	RCA	CDP1879	★1481
			1089-73
		CDP1879C	★1481
			1089-74

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
188	Cherry	CS188	2968-51
	Intel	**IAPX188**	**★1348**
			1067-1
	Intersil	DG188A	2418-86
			2418-90
		DG188B	2418-99
			2418-103
		IH188C	2418-100
			2418-104
		IH188M	2418-87
			2418-91
	National	AM188	2418-85
			2418-89
	Siliconix	**DG188A**	**★2779**
			2418-88
			2418-92
		DG188B	**★2779**
			2418-102
			2418-106
	TI	TL188C	2418-111
		TL188I	2418-112
		TL188M	2418-93
1880	National	LM1880	2904-69
	Signetics	LM1880	2904-80
1881	**RCA**	**CDP1881**	**★3079**
	Western	DM1881	1097-109
1882	**RCA**	**CDP1882**	**★3079**
1883	Western	DM1883	1097-110
			1102-38
1886	National	LM1886	2905-138
1889	National	LM1889	2905-139
			2906-48
189	Cherry	CS189	2907-3
	Intersil	DG189A	2419-53
			2419-57
		DG189B	2419-54
			2419-58
	Siliconix	**DG189A**	**★2780**
			2419-55
			2419-59
		DG189B	**★2780**
			2419-56
			2419-60
1893	**National**	**LM1893**	**★3331**
			2968-146
1894	**National**	**LM1894**	**★3326**
			2696-54
1895	**National**	**LM1895**	**★3326**
			2697-93
1896	**National**	**LM1896**	**★3326**
			★3328
			2697-94
1897	**National**	**LM1897**	**★3325**
			★3327
			2697-190
18A05	Lambda	LAS18A05	2956-114
18A12	Lambda	LAS18A12	2957-84
18A15	Lambda	LAS18A15	2957-129
18L4	**MMI**	**PAL18L4**	**★4458**
18S030	**TI**	**TBP18S030**	**★ 440**
			★3965
			3459-27
		TBP18S030M	**★ 440**
			★3965
			3459-43
18S22	**TI**	**TBP18S22**	**★3964**
18S42	**TI**	**TBP18S42**	**★3966**
18S46	**TI**	**TBP18S46**	**★3966**
18S601	RCA	CDP18S601	1757-20
	RCA	**CDP18S601A**	**★1956**
18S602	**RCA**	**CDP18S602**	**★1956**
			1757-19
18S603	RCA	CDP18S603	1757-21
	RCA	**CDP18S603A**	**★1956**
18S604	RCA	CDP18S604	1757-22
	RCA	**CDP18S604B**	**★1956**
18S605	**RCA**	**CDP18S605**	**★1956**
			1757-23
			★1956
			1629-3
18S606	**RCA**	**CDP18S606**	**★1956**
			1757-25
18S607	**RCA**	**CDP18S607**	**★1956**
			1757-24
18S608	**RCA**	**CDP18S608**	**★1956**
			1757-26
18S609	**RCA**	**CDP18S609**	**★1956**
			1757-27
18S610	**RCA**	**CDP18S610**	**★1956**
			1757-28
18S620	**RCA**	**CDP18S620**	**★1957**
18S621	**RCA**	**CDP18S621**	**★1957**
18S622	**RCA**	**CDP18S622**	**★1957**
18S623	**RCA**	**CDP18S623A**	**★1957**
18S625	**RCA**	**CDP18S625**	**★1957**
18S626	**RCA**	**CDP18S626**	**★1957**
18S627	**RCA**	**CDP18S627**	**★1957**
18S628	**RCA**	**CDP18S628**	**★1957**
18S629	**RCA**	**CDP18S629**	**★1957**
18S630	**RCA**	**CDP18S630**	**★1957**
18S631	**RCA**	**CDP18S631**	**★1957**
18S632	**RCA**	**CDP18S632**	**★1957**
18S640	**RCA**	**CDP18S640A**	**★1957**
18S640A1			
	RCA	**CDP18S640A1**	**★1957**
18S641	**RCA**	**CDP18S641A**	**★1957**
18S642	**RCA**	**CDP18S642**	**★1958**
18S643	**RCA**	**CDP18S643A**	**★1958**
18S644	**RCA**	**CDP18S644**	**★1958**
18S646	**RCA**	**CDP18S646**	**★1957**
18S647	**RCA**	**CDP18S647**	**★1958**
18S648	**RCA**	**CDP18S648**	**★1958**
18S650	**RCA**	**CDP18S650**	**★1957**
18S651	**RCA**	**CDP18S651**	**★1957**
18S652	**RCA**	**CDP18S652**	**★1957**
18S653V1			
	RCA	**CDP18S653V1**	**★1957**
18S653V2			
	RCA	**CDP18S653V2**	**★1957**
18S653V3			
	RCA	**CDP18S653V3**	**★1957**
18S653V4			
	RCA	**CDP18S653V4**	**★1957**
18S654	**RCA**	**CDP18S654**	**★1958**
18S657	**RCA**	**CDP18S657**	**★1958**
18S658	**RCA**	**CDP18S658**	**★1958**
18S660	**RCA**	**CDP18S660**	**★1957**
18S661	**RCA**	**CDP18S661B**	**★1958**
18S661V3			
	RCA	**CDP18S661V3**	**★1958**
18S662	**RCA**	**CDP18S662**	**★1957**
18S663	**RCA**	**CDP18S663**	**★1957**
18S693	**RCA**	**CDP18S693**	**★1960**
			1629-1
18S694	**RCA**	**CDP18S694**	**★1960**
			1629-2
18S695	**RCA**	**CDP18S695**	**★1960**
18SA030			
	TI	**TBP18SA030M**	**★ 440**
			★3965
			3459-36
18SA22	**TI**	**TBP18SA22**	**★3965**
18SA30	TI	TBP18SA30	3459-23
18SA42	**TI**	**TBP18SA42**	**★3966**
18SA46	**TI**	**TBP18SA46**	**★3967**
18U42	RCA	CDP18U42CD	1089-55
			¶ 286-6
19	Lambda	LAS19U	2959-27
	PMI	OP-19B	2923-33
		OP-19F	2923-34
		OP19A	2919-35
		OP19E	2919-36
190	Intersil	DG190A	2419-61
			2419-66
		DG190B	2419-62
			2419-67
		IH190M	2419-63
			2419-68
	National	AM190	2419-64
			2419-69
	SGS	M190	2468-3
	Siemens	UAA190	2904-131
	Siliconix	**DG190A**	**★2780**
			2419-65
			2419-70
		DG190B	**★2780**
			2419-71
			2419-73
1900	ITT	SAA1900	2900-51
	TI	LM1900	2913-108
1902	Hitachi	HA1902	2485-31
1905	Lambda	LAS1905	2952-130
	SGS	TDA1905	2897-59
1908	SGS	TDA1908	2897-60
191	Cherry	CS191	2965-143
	Intersil	DG191A	2419-76
			2419-80
		DG191B	2419-83
			2419-87
		IH191C	2419-84
			2419-88
		IH191M	2419-77
			2419-81
	National	AM191	2419-75
			2419-79
	SGS	M191	2904-128
	Siemens	FZH191	472-90
	Siliconix	**DG191A**	**★2780**
			2419-78
			2419-82
		DG191B	**★2780**
			2419-86
			2419-90
	Telefunken	U191	2903-93
	TI	TL191C	2419-92
		TL191I	2419-93
		TL191M	2419-91
1910	SGS	TDA1910	2897-61
19100	DDC	SDC19100	2967-34
1912	Lambda	LAS1912	2954-100
1915	Lambda	LAS1915	2955-57
192	National	LM192	2887-148
			2937-42
	SGS	M192	2904-129
19200	Thomson-CSF	SFF19200	2948-54
193	Fairchild	uA193	2893-43
		uA193A	2893-5
	National	AM193	2417-87
	National	**LM193**	**★3317**
			2893-44
		LM193A	**★3317**
			2893-6
	SGS	M193	2904-139
			¶ 286-7
	Signetics	LM193	2893-45
		LM193A	2893-7
	Telefunken	U193	2905-80
	TI	LM193	2893-46
	Western	**193X**	**★2880**
		WD193X	**★2880**
	Western	WD193X-00/10	2487-16
		WD193X-01/11	2487-17
		WD193X-02/12	2487-18
		WD193X-03/13	2487-19
1931	Western	WD1931	2486-11
1933	Western	WD1933	1095-80
1938	NEC-Electron	MC1938	2947-137
194	National	AM194	2417-99
		LM194	2889-78
	SGS	L194-12	2954-32
		L194-15	2954-130
		L194-5	2952-42
1941	Western	BR1941	510-11
		BR1941-00	2486-39
		BR1941-02	2486-40
		BR1941-04	2486-44
		BR1941-05	2486-41
		BR1941-06	2486-45
1943	**Western**	**WD1943**	**★2874**
			510-12
		WD1943-00	**★2874**
			2486-36
		WD1943-02	**★2874**
			2486-37
		WD1943-04	**★2874**
			2486-42
		WD1943-05	**★2874**
			2486-38
		WD1943-06	**★2874**
			2486-43
1945	**Western**	**1945**	**★2874**
		WD1945	**★2874**
			2486-54
195	National	LM195	2962-109
	Siemens	FZH195	472-91
	TI	**TL195C**	**★3436**
			2967-145
1950	ITT	TDA1950	2904-85
196	**National**	**LM196**	**★3299**
			2959-6
197	AnalogSys	MW197	2951-12
1971	Western	UC1971	1097-108
1976	Panasonic	MN1976	2906-132
	TI	TMS1976	2906-147
			1088-32
198	AMD	LF198	2967-50
	Fairchild	uAF198	2967-83
	National	LF198	2967-109
		LF198A	2967-110
1981	National	LM1981	2900-83
1983	Western	TR1983	2486-59
			1094-66
199	AD	HOS-199SH	2887-29
	National	**LM199**	**★3304**
			2966-106
			¶ 281-13
			¶ 282-13
		LM199A	**★3304**
			2966-107
			¶ 281-13
			¶ 282-13
			¶ 282-13
1993	**Western**	**WD1993-01**	**★2877**
			2486-8
		WD1993-02	**★2877**
			2486-9
		WD1993-03	**★2877**
			2486-10
1D5	Cromemco	CS-1D5E	1619-2
2	ActionIns	BC2A	1755-30
	AMI	UA-2	4140-11
	Cromemco	**CBL-2**	**★1923**
	Cromemco	Z-2H	1619-1
	DataGen	MBC/2	1767-15
	Datel	FLT-U2	2962-18
	Datel	**FLT-U2-M**	**★2623**
	Datel	FLT-U2M	2962-19
	Datel	**FTL-U2**	**★2623**
		SHM-LM-2	**★2622**
			2967-80
		VF2-2C	**★2623**
	Datel	VFQ-2	2968-67
	ELInstr	MMD-2	1763-7
			1621-1
	Ferranti	ZNPCM2	2947-155
	Intel	**NDS-2**	**★1723**
	Octagon	SYS-2A	1755-6
	Supertex	SD2	2906-126
	TeledyneC	CDA2-3	2416-10
20	Burr-Brown	MP20	2429-35
			¶ 238-14
			¶ 244-16
			1094-51
			1096-131
			1097-47
			1102-10
			¶ 238-14
			¶ 244-16
	DataGen	S/20	1767-6
	Datal/O	20B	4003-2
	GI	LA20	4141-136
	MicroEng	**A20A**	**★ 137**
		MCE-A20A	**★4437**
			4140-166
		MCE-A20AS	**★4437**
			4140-167
		MCE-A20B	**★4437**
			4140-168
		MCE-A20BS	**★4437**
			4140-169
		MCE-A20C	**★4437**
			4140-170
		MCE-A20CS	**★4437**
			4140-171
		MCE-A20E	**★4437**
			4140-172
		MCE-A20ES	**★4437**
			4140-173
		MCE-A20F	**★4437**
			4140-174
		MCE-A20FS	**★4437**
			4140-175

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
20	MicroEng	MCE-A20J	★4437
			4140-176
		MCE-A20JS	★4437
			4140-177
		MCE-A20H	★4437
			4140-178
		MCE-A20HS	★4437
			4140-179
		MCE-A20J	★4437
			4140-180
		MCE-A20JS	★4437
			4140-181
		MCE-A20L	★4437
			4140-182
		MCE-A20LS	★4437
			4140-183
		MCE-A20M	★4437
			4140-184
		MCE-A20MS	★4437
			4140-185
	MicroEng	MCE-A20W	4140-186
	MicroEng	MCE-A20WS	★4437
			4140-187
	MicroEng	MCE-B20A	4140-195
		MCE-B20B	4140-196
		MCE-P20A	4140-202
	Mostek	SCU20	1090-76
	Motorola	DAC-20	2444-42
		DAC-20A	2444-40
		DAC-20C	2444-43
		DAC-20E	2444-41
	PMI	DAC-20C	2444-44
			¶ 253-13
			¶ 255-9
			¶ 256-19
		OP-20B	2911-103
			2911-118
			2913-11
			2915-42
			¶ 266-13
		OP-20C	2911-119
			2913-12
			2916-53
			¶ 266-13
		OP-20F	2911-104
			2911-120
			2913-13
			2915-43
			¶ 266-13
		OP-20G	2911-121
			2913-14
			2916-54
			¶ 266-13
		OP-20H	2911-122
			2913-15
			2917-35
			¶ 266-13
	RCA	CSIM20	★1959
	Rockwell	A20XX	1088-125
	StrucDes	SD20/24	★4103
			4009-1
200	AD	ADG200A	★3176
			2415-58
		ADG200J	★3176
			2415-74
		ADG200C	★3176
			2415-75
	AWI	AW200	2463-3
	DataGen	MP/200	1767-12
	Exar	XR200	4140-69
		XRS200	2945-58
	Fairchild	CET200	2948-52
		F200	4140-79
	Fujitsu	B200	4140-87
	Harris	HI200-2	★2624
			★3287
			2415-59
		HI200-5	★2624
			★3287
			2415-76
	Intel	IUP-200	★1722
			4005-1
	Intersil	DG200	2415-65
		DG200C	2415-72
		DG200M	2415-56

Base Number	Source	Device	Page-Line
200	Intersil	IH200C	2415-70
		IH200M	2415-66
	MasterLogic	ML200	4141-167
	MicroPwr	MP200DI	★2749
		MP200DIA	★ 401
			2415-60
		MP200DIB	★ 401
			2415-77
		MP200DIC	★ 401
			2415-78
	Motorola	HDS-200	★1729
			★1731
			1627-1
		MVME200	★1936
	Panasonic	OM200	2896-12
	SGS	L200	2959-24
			¶ 281-6
			¶ 281-7
	Siemens	SDA200	2905-85
	Signetics	OM200	2896-13
	SiliconG	SG200	2959-19
	Siliconix	DG200A	★2779
			★2784
			2415-61
			¶ 262-14
		DG200AA	★2779
			★2784
			2415-62
			¶ 262-14
		DG200AB	★2779
			★2784
			2415-79
			¶ 262-14
		DG200AC	★2779
			★2784
			2415-80
			¶ 262-14
		DG2003	★2779
			★2784
			2415-81
			¶ 262-14
		DG200C	★2779
			★2784
			2415-82
			¶ 262-14
	Unitrode	PF200	2964-95
		PR200	2964-101
2000	AMI	GA2000	★4307
			4140-3
		GA2000D	★4307
			4140-4
	Cherry	CS2000	4140-45
	CAE	CAE2000	★4310
			4140-54
	Curtis	PD2000S	4002-2
	Fairchild	GE2000	★4316
			4140-86
	Fujitsu	B2000	4140-88
		C2000	4140-91
		C2000H	4141-130
	HyComp	M/DA2000	2455-41
	Nitron	NC2000	2948-25
	Plessey	DAA2000	★4514
			4141-70
		CLA2000	★4505
	Plessey	SCD-2000H	4141-76
		SCD-2000L	4141-77
		SCD-2000M	4141-78
	Plessey	SCD2000H	★4510
		SCD2000L	★4510
		SCD2000M	★4510
	RCA	MS2000	★1960
			1629-4
	Siemens	TDA2000	2896-43
		TUA2000	2905-121
	Signetics	SFT2000	★1974
		SMSFT2000	★1974
		SMVME2000	★1966
			1769-3
	SSM	SSM2000	2887-124
			¶ 278-4
	Sipg	PM2000	★4105
	Sunrise	Z-2000	4009-4
	Synertek	MDT-2000	★1747
			1631-3

Base Number	Source	Device	Page-Line
20000	Signetics	SFT20000	★1975
		SMSFT20000	★1975
2001	Aptek	ITT2001	2949-25
	Exar	XR2001C	★3199
			2890-7
	Fairchild	SH2001C	485-27
		SH2001M	485-28
	GI	TZ2001	2947-159
	National	LM2001	2896-86
	Nitron	NC2001	2948-26
	Siemens	SDA2001	511-8
			2945-70
	Signetics	ULN2001	2480-74
			2890-44
	SiliconG	SG2001	2480-75
			2890-47
	Siliconix	VQ2001	2483-71
	Sprague	ULN-2001A	★2843
			2480-77
			¶ 260-6
			★2843
			2890-53
			¶ 260-6
	Sprague	ULS-2001H	2480-80
			2890-58
	TI	ULN2001A	2480-84
			2890-65
	Western	WD2001	★2876
			510-64
	Zilog	Z2001B	1081-30
20010	Signetics	SFT20010	★1975
		SMSFT20010	★1975
2002	Aptek	ITT2002	2949-26
	Exar	XR2002C	★3199
			2890-8
	Fairchild	SH2002C	485-29
		SH2002M	485-30
	GI	TZ2002	2947-160
	Hitachi	TDA2002	2897-15
	Motorola	TDA2002	2897-16
		TDA2002A	2897-17
	National	LM2002	★3326
			2897-18
	National	TDA2002	2897-22
		TDA2002A	2897-23
	RCA	CA2002	2897-36
	SGS	TDA2002	2897-62
		TDA2002A	2897-63
	Siemens	SDA2002	2945-37
	SiliconG	SG2002	2480-92
			2890-48
	Sprague	TDA2002	2897-73
		TDA2002A	2897-74
	Sprague	ULN-2002A	★2843
			2480-94
			¶ 260-6
			★2843
			2890-54
			¶ 260-6
	Sprague	ULS-2002H	2480-97
			2890-59
	Telefunken	TDA2002	2897-82
		TDA2002A	2897-83
	TI	ULN2002A	2480-100
			2890-66
	Western	WD2002	★2876
			510-65
	Zilog	Z2002B	1081-31
2003	Exar	XR2003C	★3199
			2890-9
		XR2003M	★3199
			2480-44
	National	LDA2003	★3327
	SGS	TDA2003	2897-64
	Siemens	SDA2003	2903-76
		TDA2003	2897-67
	Signetics	ULN2003	2480-51
			2890-45
	SiliconG	SG2003	2480-52
			2890-49
	Sprague	ULN-2003A	★2843
			2480-54
			¶ 260-6
			★2843
			2890-55
			¶ 260-6

Base Number	Source	Device	Page-Line
2003	Sprague	ULS-2003H	2480-60
			2890-60
	TeledyneP	2003	2887-22
		2003-01	2887-23
	Telefunken	TDA2003	2897-84
	TI	TZ2003	2947-161
		ULN2003A	2480-67
			2890-67
2004	Exar	XR2004C	★3199
			2890-10
	RCA	CA2004	2896-144
	SGS	TDA2004	2897-122
	Siemens	SDA2004	2464-113
	Signetics	ULN2004	2480-35
			2890-46
	Siliconix	VQ2004	2483-72
	Sprague	ULN-2004A	★2843
			2480-36
			¶ 260-6
			★2843
			2890-56
			¶ 260-6
	Sprague	ULS-2004H	2480-39
			2890-61
	Telefunken	TDA2004	2897-85
	TI	ULN2004A	2480-43
			2890-68
2005	HyComp	M/D2005-1	2447-5
		M/DA2005	2457-10
	SGS	TDA2005	2897-123
	Siemens	SDA2005	2904-130
	Sprague	ULN-2005A	★2843
			2480-55
			★2843
			2890-57
	Sprague	ULS-2005H	2480-61
			2890-62
	Telefunken	TDA2005	2897-127
	TI	ULN2005A	2890-69
2006	SGS	TDA2006	2897-65
	Siliconix	VQ2006	★2839
			2483-73
2007	Siemens	SDA2007	2902-39
2008	SGS	TDA2008	2896-176
	Siemens	SDA2008	2902-40
2009	National	AM2009	2422-74
		AM2009C	2422-75
201	AD	AD201A	★3153
			2923-55
		ADG201A	★3176
			2416-116
		ADG201B	★3176
			2417-12
		ADG201C	★3176
			2417-13
	Fairchild	F201	4140-80
		uA201	2932-6
		uA201AM	2923-57
	Harris	HI201-2	★2626
			★3287
			2416-117
		HI201-5	★2626
			★3287
			2417-14
		HI201HS	★2628
		HI201HS-2	★2626
			★3287
			2416-102
		HI201HS-5	★2626
			★3287
			2416-103
	Intel	IUP-201	★1722
			4005-1
	Intersil	DG201C	2417-3
		DG201M	2416-114
		IH201C	2416-110
		IH201M	2416-104
	MicroPwr	MP201DI	★2749
		MP201DIA	★ 401
			2416-108
		MP201DIB	★ 401
			2416-109
	Motorola	LM201A	2923-60
	Motorola	MVME201	★1936
	National	CIM-201	★1950

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

PART NUMBER INDEX

Base Number	Source	Device	Page-Line
201	National	LM201	2932-7
		LM201A	2923-62
	PMI	SW-201B	2416-81
		SW-201F	2416-87
		SW201B	2417-82
		SW201F	2417-83
	RCA	CA201A	2924-3
	RCA	**GP201**	★ 409
			1086-97
	SGS	L201	2480-73
			2890-40
	Siemens	FZH201	472-9
	SiliconG	SG201	2932-8
		SG201A	2924-5
	SiliconSys	SSI201	2949-98
			¶ 270-5
	Siliconix	**DG201A**	★2779
			★2786
			2417-26
		DG201AA	★2779
			★2779
			★2786
			2417-27
		DG201AB	★2779
			★2786
			2417-32
		DG201AC	★2779
			★2786
			2417-33
		DG201B	★2779
			★2786
			2417-34
		DG201C	★2779
			★2786
			2417-35
	TauZero	CPU201	1767-19
	TI	LM201A	2924-7
2010	SGS	TDA2010	2896-177
			¶ 268-5
	SSM	SSM2010	2887-122
2011	**Exar**	**XR2011C**	★3199
			2890-11
	National	**LH2011**	★3342
			2935-40
		LH2011B	★3342
			2936-8
		LH2011C	★3342
			2936-25
	SSM	SSM2011	2902-129
	Sprague	**ULN-2011A**	★2843
			2480-78
			★2843
			2890-70
	Sprague	ULS-2011H	2480-81
			2890-75
2012	**Exar**	**XR2012C**	★3199
			2890-12
	SSM	SSM-2012	2486-62
		SSM2012	2887-123
	Sprague	**ULN-2012A**	★2843
			2480-95
			★2843
			2890-71
	Sprague	ULS-2012H	2480-82
			2890-76
2013	**Exar**	**XR2013C**	★3199
			2890-13
	Sprague	**ULN-2013A**	★2843
			2480-56
			★2843
			2890-72
	Sprague	ULS-2013H	2480-62
			2890-77
2014	**Exar**	**XR2014C**	★3199
			2890-14
	Siemens	SDA2014	2463-51
	Sprague	**ULN-2014A**	★2843
			2480-37
			★2843
			2890-73
	Sprague	ULS-2014H	2480-40
			2890-78
2015	Signetics	TDA2015	2962-60
	Sprague	**ULN-2015A**	★2843
			2480-57
2015	**Sprague**	**ULN-2015A**	★2843
			2890-74
	Sprague	ULS-2015H	2480-63
			2890-79
2016	**Motorola**	**MCM2016-15**	★3839
			★3846
			3480-55
		MCM2016-20	★3839
			★3846
			3480-92
	National	**MA2016**	★3871
	Toshiba	TMM2016	3480-66
		TMM2016-2	3480-104
2016C20			
	Epson	SRM2016C20	461-58
			3480-67
2016C25			
	Epson	SRM2016C25	461-59
			3480-105
2017	SMC	COM2017	2487-69
		COM2017H	2487-70
2017C20			
	Epson	SRM2017C20	461-60
			3480-68
2017C25			
	Epson	SRM2017C25	461-61
			3480-106
2018	Thomson-CSF	SFC2018	2889-5
2018C20			
	Epson	SRM2018C20	461-62
			3480-69
2018C25			
	Epson	SRM2018C25	461-63
			3480-107
202	Intersil	IH202C	2416-111
		IH202M	2416-105
	National	LM202	2908-33
	PMI	SW-202B	2416-82
		SW-202F	2416-88
		SW202B	2417-84
		SW202F	2417-85
	SGS	L202	2480-91
			2890-41
	SiliconG	SG202	2908-32
	Siliconix	**DG202A**	★2779
			★2788
			2417-28
		DG202B	★2779
			★2788
			2417-29
		DG202C	★2779
			★2788
			2417-36
2020	AD	AD2020	2436-24
	HybridSys	HS2020	2888-37
	MicroNet	MN2020	2888-38
	SGS	TDA2020	2896-178
			¶ 268-5
		TDA2020D	2896-179
			¶ 268-5
	SSM	SSM2020	2887-125
			2900-53
			¶ 278-4
2021	**Sprague**	**ULN-2021A**	★2843
			2480-79
			★2843
			2890-80
	Sprague	ULS-2021H	2890-85
2022	SSM	SSM2022	2887-126
			2900-54
	Sprague	**ULN-2022A**	★2843
			2480-96
			★2843
			2890-81
	Sprague	ULS-2022H	2480-98
			2890-86
2023	**Sprague**	**ULN-2023A**	★2843
			2480-58
			★2843
			2890-82
	Sprague	ULS-2023H	2480-64
			2890-87
2024	**Sprague**	**ULN-2024A**	★2843
			2480-38
			★2843
			2890-83
2024	Sprague	ULS-2024H	2480-41
			2890-88
2025	**Sprague**	**ULN-2025A**	★2843
			2480-59
			★2843
			2890-84
	Sprague	ULS-2025H	2480-65
			2890-89
20250	**RCA**	**PA20250**	★4518
			4141-99
203	Panasonic	AN203	2900-105
	Plessey	SW203	2905-59
	SGS	L203	2480-50
			2890-42
2030	Nitron	NC2030	2949-162
	SGS	TDA2030	2896-180
	Siemens	TDA2030	2897-1
	SSM	SSM2030	2906-100
			¶ 272-10
	Telefunken	TDA2030	2897-5
20300	**Signetics**	**SFT20300**	★1975
		SMSFT20300	★1975
2031	SSM	SSM2031	2968-70
	Sprague	ULN-2031A	2890-1
20310	**Signetics**	**SFT20310**	★1975
		SMSFT20310	★1975
2032	Sprague	ULN-2032A	2890-2
2033	Signetics	TDB2033	2888-17
	SSM	SSM2033	2906-101
	Sprague	ULN-2033A	2890-3
2035	TeledyneP	2035	2887-31
2036	Thomson-CSF	SFC2036	2889-40
20390	**Signetics**	**SFT20390**	★1975
		SMSFT20390	★1975
204	Motorola	LM204	2960-53
	National	LM204	2960-55
	SGS	L204	2890-43
	SiliconG	SG204	2960-56
2040	SGS	TDA2040	2896-181
	SSM	SSM2040	2906-102
			2962-6
			¶ 272-10
2044	SSM	SSM2044	2906-103
			2962-7
2045	Sprague	ULS-2045H	2889-36
20450	**RCA**	**PA20450**	★4518
			4141-100
2046	Sprague	ULN-2046A	2889-34
	Thomson-CSF	SFC2046	2889-37
2047	Sprague	ULN-2047A	2889-130
2048	Reticon	RL2048	2964-38
205	Exar	XR205	2946-20
	Motorola	LM205	2959-125
	National	LM205	2960-1
	Plessey	SW205	2905-60
	Siemens	FZH205	472-10
		TCA205AK	2906-153
	SiliconG	SG205	2960-3
	TauZero	CPU205	1755-12
2050	SSM	SSM2050	2906-104
			¶ 272-10
2051	GI	ER2051	3455-6
	NCR	NCR2051	3455-7
2054	SGS	TDA2054	2902-101
	Signetics	TDA2054	2896-17
	Sprague	ULN-2054A	2889-53
2055	GI	ER2055	3455-14
	NCR	NCR2055	3455-15
			3455-31
	SSM	SSM2055	2906-105
2056	SSM	SSM2056	2906-106
206	AnalogSys	MA206	2933-49
	National	**LM206**	★3317
			2891-23
	Plessey	SW206	2905-61
	PMI	DAC-206A	2439-24
		DAC-206B	2439-25
		DAC-206E	2439-26
		DAC-206F	2439-27
	TI	LM206	2891-31
2061	**Sprague**	**ULN-2061M**	★2843
			2481-88
			★2843
			2889-43
2062	**Sprague**	**ULN-2062M**	★2843
			2481-89
2062	**Sprague**	**ULN-2062M**	★2843
			2889-44
2064	Signetics	2064-20	3485-71
	SiliconG	SG2064	2482-146
			2889-93
	Sprague	**ULN-2064B**	★2843
			2482-160
			★2843
			2889-112
	Sprague	ULS-2064H	2482-172
	TI	ULN2064	2483-8
			2889-126
2065	SiliconG	SG2065	2482-147
			2889-94
	Sprague	**ULN-2065B**	★2843
			2482-161
			★2843
			2889-113
	Sprague	ULS-2065H	2482-173
	TI	ULN2065	2483-9
			2889-127
20650	**RCA**	**PA20650**	★4518
			4141-101
2066	SiliconG	SG2066	2482-148
			2889-95
	Sprague	**ULN-2066B**	★2843
			2482-162
			★2843
			2889-114
	Sprague	ULS-2066H	2482-174
	TI	ULN2066	2483-10
2067	SiliconG	SG2067	2482-149
			2889-96
	Sprague	**ULN-2067B**	★2843
			2482-163
			★2843
			2889-115
	Sprague	ULS-2067H	2482-175
	TI	ULN2067	2483-11
2068	**Motorola**	**ULN2068**	★2753
			2889-90
	SiliconG	SG2068	2482-150
			2889-97
	Sprague	**ULN-2068B**	★2843
			2482-164
			★2843
			2889-116
	Sprague	ULS-2068H	2482-176
	TI	ULN2068	2483-12
2069	SiliconG	SG2069	2482-151
			2889-98
	Sprague	**ULN-2069B**	★2843
			2482-165
			★2843
			2889-117
	Sprague	ULS-2069H	2482-177
	TI	ULN2069	2483-13
207	AnalogSys	MA207	2925-27
	Motorola	LM207	2923-43
	National	LM207	2923-45
	PMI	OP-207A	2915-44
		OP-207B	2915-45
		OP-207E	2916-48
		OP-207F	2916-49
	SiliconG	SG207	2923-48
	TI	LM207	2923-50
2070	SiliconG	SG2070	2482-152
			2889-99
	Sprague	**ULN-2070B**	★2843
			2482-166
			★2843
			2889-118
	Sprague	ULS-2070H	2482-178
2071	SiliconG	SG2071	2482-153
	Sprague	**ULN-2071B**	★2843
			2482-167
			★2843
			2889-119
	Sprague	ULS-2071H	2482-179
2072	SiliconG	SG2072	2482-154
			2889-100
2073	SiliconG	SG2073	2482-155
			2889-101
2074	Motorola	ULN2074	2889-91
	Motorola	**ULN2074B**	★2753

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
2074	SiliconG	SG2074	2482-156
			2889-102
	Sprague	**ULN-2074B**	★**2843**
			2482-168
			★**2843**
			2889-120
	Sprague	ULS-2074H	2483-1
	TI	ULN2074	2483-14
2075	SiliconG	SG2075	2482-157
			2889-103
	Sprague	**ULN-2075B**	★**2843**
			2482-169
			★**2843**
			2889-121
	Sprague	ULS-2075H	2483-2
	TI	ULN2075	2483-15
2076	SiliconG	SG2076	2482-158
			2889-104
	Sprague	**ULN-2076B**	★**2843**
			2482-170
			★**2843**
			2889-122
	Sprague	ULS-2076H	2483-3
2077	SiliconG	SG2077	2482-159
			2889-105
	Sprague	**ULN-2077B**	★**2843**
			2482-171
			★**2843**
			2889-123
	Sprague	ULS-2077H	2483-4
208	AMD	LM208	2922-51
		LM208A	2918-43
	AD	**AD208**	★**3153**
			2922-53
		AD208A	★**3153**
			2918-45
	AnalogSys	MA208	2940-54
	Fairchild	uA208AM	2918-47
		uA208M	2922-55
	Motorola	LM208	2922-59
		LM208A	2918-51
	National	LM208	2922-61
		LM208A	2918-53
	PMI	DAC-208A	2445-1
		DAC-208B	2445-3
		DAC-208E	2445-2
		DAC-208F	2445-4
		PM208	2923-2
		PM208A	2919-2
	SGS	M208	2900-52
	SiliconG	SG208	2923-4
		SG208A	2919-4
2081	Sprague	ULN-2081A	2890-100
2082	Sprague	ULN-2082A	2890-94
2083	Sprague	ULN-2083A	2889-166
		ULS-2083H	2889-167
2085	Plessey	TDA2085A	2906-74
20850	**RCA**	**PA20850**	★**4518**
			4141-102
2086	Sprague	ULN-2086A	2889-35
2089	NEC-Electron	uPB2089	3471-77
20890	**Signetics**	**SFT20890**	★**1975**
		SMSFT20890	★**1975**
209	Cherry	CS209	2965-144
	Fairchild	uA209M	2952-52
	Motorola	**LM209H**	★**3294**
			2952-20
		LM209K	★**3294**
			2952-55
	National	**LM209H**	★**3299**
			2952-23
		LM209K	★**3299**
			2952-58
	SiliconG	SG209K	2952-64
		SG209T	2952-28
20C1	**MMI**	**PAL20C1**	★**4456**
20L10	**MMI**	**PAL20L10**	★**4458**
20L2	**MMI**	**PAL20L2**	★**4458**
20X10	**MMI**	**PAL20X10**	★**4458**
20X4	**MMI**	**PAL20X4**	★**4458**
20X8	**MMI**	**PAL20X8**	★**4458**
21	Burr-Brown	MP21	2429-36
			¶ 238-14
			¶ 244-16
			1091-7
			1093-95
21	Burr-Brown	MP21	1095-124
			1096-108
			1102-11
			¶ 238-14
			¶ 244-16
		UAF21	2962-11
		UAF21H	2962-12
	National	**HA21**	★**3327**
	PMI	OP-21B	2911-131
			2916-12
		OP-21C	2911-134
			2917-5
		OP-21F	2911-132
			2916-13
		OP-21G	2911-135
			2917-6
		OP-21H	2911-136
			2919-48
	Rockwell	A21XX	1088-122
210	AnalogSys	MD-210	2483-128
	Dionics	DI210	2465-105
	Exar	**XR210**	★**3195**
			2945-19
		XR210M	★**3195**
			2945-20
	MicroEng	**MGB210C**	★**4437**
			4141-9
		MGC210C	★**4437**
			4141-17
	Motorola	**MVME210**	★**1936**
	National	COP210C	1087-60
		LM210	2908-16
	Panasonic	AN210	2900-106
	PMI	DAC-210A	2449-32
		DAC-210B	2449-33
		DAC-210E	2449-34
		DAC-210F	2449-39
		DAC-210G	2449-36
	Signetics	TCA210	2896-1
	SiliconG	SG210	2908-14
2100	CalDevices	CDI2100	4140-17
	Sanyo	LA2100	2901-92
	Signetics	PCE2100	2466-15
	SSM	SSM2100	2887-131
	Stag	**PM2100**	★**4105**
	TI	**SE2100P**	★**1560**
			1087-4
			1088-65
			★**1560**
			1055-31
		SEB2100	★**1560**
		TMS2100	★**1558**
			1088-55
			★**1558**
			1057-24
	Thomson-CSF	SFC2100	2959-20
	TRW	CA2100	2903-68
21000	**RCA**	**PA21000**	★**4518**
			4141-103
2101	AMD	AM2101	3473-36
		AM2101-1	3474-97
		AM2101-2	3474-119
		LH2101A	2937-3
	Intersil	LH2101A	2937-5
	National	**LH2101A**	★**3342**
			2937-6
	Raytheon	LH2101A	2937-8
	Sanyo	LA2101	2901-93
	Synertek	SY2101-1	3474-108
		SY2101A	3474-65
		SY2101A-2	3474-23
		SY2101A-4	3474-90
	TI	TCM2101	2948-154
2102	AMD	AM2102	3475-24
		AM2102-1	3477-5
		AM2102-2	3477-12
	Fairchild	2102F	3476-82
		2102FM	3476-83
		2102H	3476-55
		2102HM	3476-56
		2102LF	3476-84
		2102LFM	3476-85
		2102LH	3476-57
		2102LHM	3476-58
	National	MM2102A	3476-87
		MM2102A-2	3476-60
2102	National	MM2102A-2L	3476-61
		MM2102A-4	3476-104
		MM2102A-4L	3476-105
		MM2102A-6	3477-22
		MM2102A-6L	3477-23
		MM2102A-L	3476-88
	NEC-Micro	uPD2102AL-2	3476-62
		uPD2102AL-4	3476-106
	SGS	M2102A	3476-89
		M2102A-2	3476-63
		M2102A-4	3477-1
		M2102A-6	3477-24
		M2102AL	3476-90
		M2102AL-2	3476-64
		M2102AL-4	3477-2
21021	Fairchild	21021	3476-99
		21021M	3476-100
21022	Fairchild	21022	3477-17
		21022M	3477-18
2102L1	Fairchild	2102L1	3476-101
		2102L1M	3476-102
2102L2	Fairchild	2102L2	3477-19
		2102L2M	3477-20
2103	HP	2103LK	1767-14
2104	Signetics	TDA2104	2898-25
			2962-64
	Thomson-CSF	SGC2104	2960-59
2105	Signetics	TDA2105	2898-26
	Thomson-CSF	SFC2105	2960-4
2106	HP	2106AK	1767-8
	Hitachi	HM2106	468-167
2107	Signetics	TDA2107	2898-27
			2962-51
	TeledyneC	2107BE	2415-21
	Thomson-CSF	SFC2107	2923-51
2108	HP	2108MK	1767-9
	Intersil	LH2108A	2935-53
	National	**LH2108**	★**3342**
			2936-48
		LH2108A	★**3342**
			2935-54
	PMI	PM2108	2936-50
		PM2108A	2935-56
	Signetics	TDA2108	2898-28
			2962-55
	Thomson-CSF	SFC2108	2911-149
			2923-5
		SFC2108A	2919-5
2109	Thomson-CSF	SFC2109	2952-30
		SFC2109M	2952-70
211	AMD	LF211	2892-6
		LH211	2893-15
		LM211	2891-57
	AD	AD211	2891-40
	AnalogSys	MS211	2967-151
	Motorola	LM211	2891-44
	National	COP211C	1087-61
	National	**LF211**	★**3310**
			★**3317**
			2892-4
		LH211	★**3317**
			2891-46
	Panasonic	AN211	2901-119
	RCA	CA211	2891-49
	Siemens	FZH211	472-95
		FZH211S	473-22
	Signetics	LM211	2891-51
	SiliconG	SG211	2891-53
	Siliconix	**DG211C**	★**2779**
			★**2790**
			2417-30
	TI	LM211	2892-48
2110	**Hitachi**	**HM2110**	★**3789**
			469-16
			★**3789**
			3475-62
		HM2110-1	★**3789**
			3475-49
		HM2110-2	★**3789**
			3475-42
	Intersil	LH2110	2908-19
	National	**LH2110**	★**3342**
			2908-20
	Sanyo	LA2110	2901-94
	Siemens	SDA2110	2903-32
2110	Signetics	PCE2110	2466-16
		TDA2110	2962-46
	TeledyneC	2110BE	2415-19
2111	AMD	AM2111	3473-37
		AM2111-1	3474-98
		AM2111-2	3474-120
		LH2111	2893-16
	Intersil	LH2111	2893-18
	National	LF2111	2891-10
	National	**LH2111**	★**3317**
			2893-19
	NEC-Micro	uPD2111AL-2	3474-21
	Raytheon	LH2111	2893-21
	RCA	CA2111A	2901-41
	Signetics	PCE2111	2466-17
	Sprague	ULN-2111A	2901-67
			2905-38
	Synertek	SY2111-1	3474-107
		SY2111A	3474-64
		SY2111A-2	3474-22
		SY2111A-4	3474-89
	Thomson-CSF	SFC2111	2891-54
2112	AMD	AM2112	3473-38
		AM2112-1	3474-91
		AM2112-2	3474-121
	Hitachi	**HM2112**	★**3789**
			469-17
			★**3789**
			3475-29
		HM2112-1	★**3789**
			3475-25
	Siemens	SDA2112	2945-38
	Signetics	PCE2112	2466-4
	Synertek	SY2112-1	3474-96
		SY2112A	3474-63
		SY2112A-2	3474-20
		SY2112A-4	3474-88
2114	Epson	SRM2114	461-15
			3478-49
	Fairchild	2114	3479-27
		2114-2	3478-17
		2114-3	3478-89
		2114-3M	3478-90
		2114L	3479-28
		2114L-2	3478-18
		2114L-3	3478-91
		2114M	3479-29
	GTEMicro	L2114UM	3479-30
		M2114-2	3478-19
		M2114-3M	3478-92
	Intel	2114A-4	3478-21
		2114A-5	3478-53
		2114A-6	3478-94
		2114AL-1	3477-91
		2114AL-2	3477-94
		2114AL-3	3477-101
		2114AL-4	3478-22
		2114L-2	3477-95
		M2114A-4	3478-23
		M2114A-5	3478-54
		M2114AL-3	3477-102
		M2114AL-4	3478-24
	Motorola	**MCM2114-20**	★**3839**
			3478-26
		MCM2114-25	★**3839**
			3478-55
		MCM2114-30	★**3839**
			3478-96
		MCM2114-45	★**3839**
			3479-33
	National	**AH2114**	★**3344**
			2418-110
		AH2114C	★**3344**
			2418-113
	National	MM2114	3479-35
		MM2114-15	3477-103
		MM2114-2	3478-28
		MM2114-2L	3478-29
		MM2114-3	3478-98
		MM2114-3L	3478-99
		MM2114L	3479-36
	National	**NMC2114A**	★**3858**
			3477-99
		NMC2114A-1L	★**3858**
			3477-92

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
2114	**National**	**NMC2114A-2**	**★3858**
			3477-96
		NMC2114A-2L	**★3858**
			3477-97
		NMC2114A-3	**★3858**
			3477-104
		NMC2114A-3L	**★3858**
			3477-105
		NMC2114A-4	**★3858**
			3478-30
		NMC2114A-4L	**★3858**
			3478-31
	NEC-EA	EA2114L	3479-37
	NEC-Micro	uPD2114L	3479-38
	OKI	**MSM2114**	**★3873**
			3479-39
		MSM2114-2	**★3873**
			3478-32
		MSM2114-3	**★3873**
			3478-100
		MSM2114L	**★3873**
			3479-40
		MSM2114L-2	**★3873**
			3478-33
		MSM2114L-3	**★3873**
			3478-101
	Panasonic	MN2114	3479-41
	Supertex	CM2114	461-25
			3477-39
	Synertek	**SY2114**	**★3941**
			3479-42
		SY2114-2	**★3941**
			3478-34
		SY2114-3	**★3941**
			3478-102
		SY2114A-4	**★3941**
			3478-35
		SY2114A-5	**★3941**
			3478-58
		SY2114AL-1	**★3941**
			3477-93
		SY2114AL-2	**★3941**
			3477-98
		SY2114AL-3	**★3941**
			3477-106
		SY2114AL-4	**★3941**
			3478-36
		SY2114L	**★3941**
			3479-43
		SY2114L-2	**★3941**
			3478-37
		SY2114L-3	**★3941**
			3478-103
		SY2114LV-2	**★3941**
			3478-38
		SYM2114	**★ 424**
			3479-44
		SYM2114-3	**★ 424**
			3478-104
		SYM2114A-3	**★ 424**
			3477-107
		SYM2114A-4	**★ 424**
			3478-39
		SYM2114A-5	**★ 424**
			3478-59
	TI	TMS2114-15	3477-108
		TMS2114-20	3478-40
		TMS2114-25	3478-60
		TMS2114-45	3479-45
		TMS2114L-15	3477-109
		TMS2114L-20	3478-41
		TMS2114L-25	3478-61
		TMS2114L-45	3479-46
2115	Intel	2115A	3475-71
		2115A-2	3475-103
		2115AL	3475-72
		2115AL-2	3475-104
		2115H-2	3475-51
		2115H-3	3475-54
		2115H-4	3475-64
	Motorola	MCM2115A-45	3475-73
		MCM2115A-55	3475-90
		MCM2115A-70	3475-105
2116	**National**	**NMC2116-15**	**★3859**
			3480-57
2116	**National**	**NMC2116-15L**	**★3859**
			3480-58
		NMC2116-20L	**★3859**
			3480-93
		NMC2116-25	**★3859**
			3481-8
		NMC2116-25L	**★3859**
			3480-94
2118	Intel	2118-10	3468-67
		2118-15	3468-87
		2118-4	3468-75
		M2118-4	3468-76
		M2118-7	3468-88
	NEC-Micro	uPD-2118-2	3468-84
		uPD2118	3468-101
		uPD2118-3	3468-71
	Thomson-CSF	SFC2118	2910-61
			2926-15
212	AnalogSys	MC212	2906-61
			2964-124
	National	LM212	2911-139
			2922-49
	Siliconix	**DG212C**	**★2779**
			★2792
			2417-31
2120	Hitachi	HM2120	469-10
2123	**Western**	**WD2123**	**★2875**
			2487-34
2125	Intel	2125A	3475-75
		2125A-2	3475-107
		2125AL	3475-76
		2125AL-2	3476-1
		2125H-1	3475-46
		2125H-2	3475-52
		2125H-3	3475-55
		2125H-4	3475-65
	Motorola	MCM2125A-45	3475-77
		MCM2125A-55	3475-91
		MCM2125A-70	3476-2
2126	TeledyneC	2126BG	2418-82
2128	Intel	2128-12	3480-30
		2128-15	3480-52
		2128-20	3480-90
		M2128	3480-53
	OKI	**MSM2128**	**★3873**
			3480-95
		MSM2128-1	**★3873**
			3480-96
	Synertek	**SY2128-1**	**★3944**
			3480-6
		SY2128-2	**★3944**
			3480-32
		SY2128-3	**★3944**
			3480-59
		SY2128-4	**★3944**
			3480-97
		SY2128L-1	**★3944**
			3480-7
		SY2128L-2	**★3944**
			3480-33
		SY2128L-3	**★3944**
			3480-60
		SY2128L-4	**★3944**
			3480-98
		SYM2128-3	**★ 427**
			3480-63
		SYM2128-4	**★ 427**
			3480-101
2129	**Synertek**	**SY2129-1**	**★3944**
			3480-8
		SY2129-2	**★3944**
			3480-34
		SY2129-3	**★3944**
			3480-61
		SY2129-4	**★3944**
			3480-99
		SY2129L-1	**★3944**
			3480-9
		SY2129L-2	**★3944**
			3480-35
		SY2129L-3	**★3944**
			3480-62
		SY2129L-4	**★3944**
			3480-100
		SYM2129-3	**★ 427**
			3480-64
2129	**Synertek**	**SYM2129-4**	**★ 427**
			3480-102
213	AnalogSys	MC213	2906-62
			2964-123
2130	**TI**	**SE2130P**	**★1560**
			1087-5
			1088-66
			★1560
			1057-1
		SEB2130	**★1560**
2132	**TI**	**TMS2132**	**★1558**
			1087-3
			★1558
			1057-25
2136	Sprague	ULN-2136A	2901-68
214	AnalogSys	MS214	2967-152
	National	NMC214A-5	3478-57
	Panasonic	AN214	2896-96
2140	Hitachi	HM2140	469-26
			3481-13
	SGS	TDA2140	2903-165
	Sprague	ULN-2140A	2419-113
		ULS-2140H	2419-114
	Telefunken	TDA2140	2904-10
2141	Intel	2141-2	3482-4
		2141-3	3482-8
		2141-4	3482-23
		2141-5	3482-40
		2141L-3	3482-9
		2141L-4	3482-24
		2141L-5	3482-41
	National	NMC2141-2	3482-5
		NMC2141-3	3482-10
2142	Hitachi	HM2142	469-27
			3481-14
	Intel	2142	3479-49
		2142-2	3478-44
		2142-3	3478-105
		2142L	3479-50
		2142L-2	3478-45
		2142L-3	3478-106
	Synertek	SY2142	3479-51
		SY2142-2	3478-46
		SY2142-3	3478-107
		SY2142L	3479-52
		SY2142L-2	3478-47
		SY2142L-3	3478-108
2143	**Western**	**WD2143-03**	**★1568**
			1101-130
2147	AMD	AM2147-35	3481-42
		AM2147-45	3481-47
		AM2147-55	3481-57
		AM2147-70	3481-87
	Fujitsu	MBM2147E	3481-92
		MBM2147H	3481-60
		MBM2147H-35	3481-32
		MBM2147H-45	3481-45
	Intel	2147-3	3481-62
		2147A	3481-94
		2147A-3	3481-63
		2147AL	3481-95
		2147AL-3	3481-64
		2147H	3481-96
		2147H-1	3481-43
		2147H-2	3481-50
		2147H-3	3481-65
		2147HL	3481-97
		2147HL-3	3481-66
		M2147H	3481-98
		M2147H-3	3481-67
	Intersil	2147	3481-99
	ITT	ITT2147-55	3481-68
		ITT2147-70	3481-100
		ITT2147-90	3482-1
	Motorola	MCM2147-100	3482-2
		MCM2147-55	3481-69
		MCM2147-70	3481-101
		MCM2147-85	3481-113
	National	MM2147	3481-102
		MM2147-3	3481-70
		MM2147L	3481-103
		MM2147M	3481-114
		NMC2147H-3	3481-73
		NMC2147H-4	3481-74
	NEC-Micro	uPD2147	3482-3
2147	NEC-Micro	uPD2147-2	3481-106
		uPD2147-3	3481-75
	Synertek	**SY2147**	**★3941**
			3481-107
		SY2147-3	**★3941**
			3481-76
		SY2147-6	**★3941**
			3481-115
		SY2147L	**★3941**
			3481-108
		SYM2147	**★ 425**
			3481-109
		SYM2147-3	**★ 425**
			3481-77
		SYM2147-6	**★ 425**
			3481-78
	Universal	UM2147-1	3481-80
2148	Fujitsu	MBM2148-45	3477-40
		MBM2148-55	3477-50
		MBM2148-55L	3477-51
	Hitachi	HM2148	3476-4
		HM2148-3	3477-47
	Intel	2148H	3477-72
		2148H-2	3477-42
		2148H-3	3477-54
		2148HL	3477-73
		2148HL-3	3477-55
		M2148H	3477-76
	National	MM2148H	3481-104
		MM2148H-2	3481-51
		MM2148H-3	3481-71
		MM2148H-3L	3481-72
		MM2148H-L	3481-105
		NMC2148	3477-77
		NMC2148-3	3477-59
		NMC2148H	3477-78
		NMC2148L	3477-79
	Synertek	**SY2148H**	**★3942**
			3477-80
		SY2148H-2	**★3942**
			3477-44
		SY2148H-3	**★3942**
			3477-61
		SY2148HL	**★3942**
			3477-81
		SY2148HL-3	**★3942**
			3477-62
		SYM2148H	**★ 426**
			3477-84
		SYM2148H-3	**★ 426**
			3477-65
		SYM2148H-6	**★ 426**
			3477-89
2149	Fujitsu	MBM2149-45	3477-41
		MBM2149-55L	3477-52
		MBM2149-70	3477-71
		MBM2149L-55	3477-53
	Intel	2149H	3477-74
		2149H-2	3477-43
		2149H-3	3477-56
		2149HL	3477-75
		2149HL-3	3477-57
	Motorola	MCM2149-55	3477-58
		MCM2149-85	3477-88
	NEC-Micro	uPD2149	3477-60
	Synertek	**SY2149H**	**★3942**
			3477-82
		SY2149H-2	**★3942**
			3477-45
		SY2149H-3	**★3942**
			3477-63
		SY2149HL	**★3942**
			3477-83
		SY2149HL-3	**★3942**
			3477-64
		SYM2149H	**★ 426**
			3477-85
		SYM2149H-3	**★ 426**
			3477-66
		SYM2149H-6	**★ 426**
			3477-90
215	Exar	XR215	2945-34
			¶ 271-11
			¶ 279-2
		XR215M	2945-35

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
215	Exar	XR215M	¶ 271-11
			¶ 279-2
	ITT	SAK215	2906-112
	PMI	OP-215B	2911-114
			2913-16
			2937-9
		OP-215C	2911-115
			2913-17
			2937-43
		OP-215F	2911-116
			2913-18
			2937-10
		OP-215G	2911-117
			2913-19
			2937-44
	Siemens	FZH215B	472-96
2150	Telefunken	TDA2150	2904-11
	TI	**TMS2150-4**	**★3961**
			2962-121
		TMS2150-5	**★3961**
			2962-122
		TMS2150-7	**★3961**
			2962-123
		TMS2150-9	**★3961**
			2962-124
2151	SGS	TDA2151	2903-166
	Telefunken	TDA2151	2904-12
2158	**Synertek**	**SY2158A-1**	**★3943**
			3479-69
		SY2158A-2	**★3943**
			3479-78
		SY2158A-3	**★3943**
			3479-87
		SY2158A-4	**★3943**
			3479-98
		SY2158B-1	**★3943**
			3479-70
		SY2158B-2	**★3943**
			3479-79
		SY2158B-3	**★3943**
			3479-88
		SY2158B-4	**★3943**
			3479-89
		SY2158L-1	**★3943**
			3479-71
		SY2158L-2	**★3943**
			3479-80
		SY2158L-3	**★3943**
			3479-90
		SY2158L-4	**★3943**
			3479-99
2159	**Synertek**	**SY2159A-1**	**★3943**
			3479-72
		SY2159A-2	**★3943**
			3479-81
		SY2159A-3	**★3943**
			3479-91
		SY2159A-4	**★3943**
			3479-100
		SY2159B-1	**★3943**
			3479-73
		SY2159B-2	**★3943**
			3479-82
		SY2159B-3	**★3943**
			3479-92
		SY2159B-4	**★3943**
			3479-101
		SY2159L-1	**★3943**
			3479-74
		SY2159L-2	**★3943**
			3479-83
		SY2159L-3	**★3943**
			3479-93
		SY2159L-4	**★3943**
			3479-102
216	**Cromemco**	**MCB-216**	**★1917**
	Ferranti	ZNA216E	2438-36
		ZNA216J	2438-37
2160	Telefunken	TDA2160	2904-13
2161	NCR	NCR2161	3455-42
	SGS	TDA2161	2903-167
	Telefunken	TDA2161	2904-14
2164	Intel	2164-15	3469-87
		2164-25	3470-27
		2164A-15	3469-88
2164	Intel	2164A-20	3470-14
		M2164	3469-89
2165	MicroEng	MCEL2165	2909-54
2167	Intel	2167-10	3483-101
		2167-55	3483-75
		2167-70	3483-83
		2167L-70	3483-84
		M2167-10	3483-102
	ITT	ITT2167-45	3483-70
		ITT2167-55	3483-76
		ITT2167-70	3483-85
	NEC-Micro	uPD2167	3483-77
	Synertek	**SY2167**	**★3945**
			3483-87
		SYM2167	**★ 428**
			3483-88
2168	NCR	NCR2168	3455-43
	Synertek	**SY2168**	**★3946**
			3483-24
		SYM2168	**★ 429**
			3483-25
2169	**Synertek**	**SY2169**	**★3946**
			3483-23
		SYM2169	**★ 429**
			3483-26
217	Fairchild	uA217	2959-73
	MicroEng	MCELM217	2959-77
	Motorola	**LM217**	**★3295**
			2959-80
		LM217L	**★3295**
			2959-65
		LM217M	**★3295**
			2959-110
	National	**LM217**	**★3299**
			2959-83
	Panasonic	AN217P	2900-120
	SiliconG	SG217	2959-69
			2959-86
	Telefunken	U217	2968-139
	TI	LM217	2959-88
2170	Telefunken	U2170B	2905-118
	TI	**TMS2170**	**★1558**
			1088-56
			★1558
			1057-26
218	AMD	LM218	2926-8
	National	LM218	2926-11
	TI	LM218	2926-14
2186	**Intel**	**2186-25**	**★3810**
			3483-55
		2186-30	**★3810**
			3483-57
		2186/7	**★3810**
			3483-54
219	AMD	LM219	2893-33
	National	**LM219**	**★3317**
			2893-35
	Signetics	LM219	2893-37
2190	SGS	TDA2190	2905-26
21C02	SSS	883/21C02	3477-26
		SCM21C02	460-160
		SCM21C02-1	3476-97
		SCM21C02-1A	3476-81
		SCM21C02-3	3477-11
		SCM21C02-8	3477-25
21D1	**Synertek**	**SY21D1**	**★3947**
			3479-75
21H01	Synertek	SY21H01	3473-99
		SY21H01-2	3473-106
21H11	Synertek	SY21H11	3473-98
		SY21H11-2	3473-105
21H12	Synertek	SY21H12	3473-97
		SY21H12-2	3473-104
21L02	Fairchild	21L02F	3476-86
		21L02H	3476-59
21L021	Fairchild	21L021	3476-103
21L022	Fairchild	21L022	3477-21
21L14	**Motorola**	**MCM21L14-20**	**★3839**
			3478-27
		MCM21L14-25	**★3839**
			3478-56
		MCM21L14-30	**★3839**
			3478-97
		MCM21L14-45	**★3839**
			3479-34
21L15	Motorola	MCM21L15A-45	
			3475-74
		MCM21L15A-70	
			3475-106
21L25	Motorola	MCM21L25A-45	
			3475-78
		MCM21L25A-70	
			3476-3
21L47	AMD	AM21L47-45	3481-48
		AM21L47-55	3481-58
		AM21L47-70	3481-88
22	Burr-Brown	MP22	1093-96
			1094-52
			1096-132
			1097-48
			1102-12
	National	**HA22**	**★3327**
	PMI	OP-22A	2917-39
		OP-22B	2919-51
		OP-22H	2921-21
220	PMI	OP-220A	2935-35
		OP-220B	2935-41
		OP-220C	2936-9
		OP-220E	2935-36
		OP-220F	2935-42
		OP-220G	2936-10
	Signetics	TCA220	2941-11
	SiliconG	SG220-05K	2956-121
		SG220-05P	2956-109
		SG220-05R	2956-122
		SG220-05T	2956-103
		SG220-12K	2957-89
		SG220-12P	2957-79
		SG220-12R	2957-90
		SG220-12T	2957-66
		SG220-15K	2957-134
		SG220-15P	2958-1
		SG220-15R	2957-124
		SG220-15T	2957-109
		SG220-5	2957-11
			2957-6
			2957-12
			2957-3
2200	Exar	XR2200	2480-24
		XR2200M	2480-25
	Fairchild	SH2200C	485-31
		SH2200M	485-32
	MicroNet	MN2200	2887-82
			¶ 277-7
		MN2200H	2887-83
			¶ 277-7
	Sanyo	LA2200	2968-44
	TI	**SE2200P**	**★1560**
			1088-40
			1088-51
			★1560
			1057-2
	Thomson-CSF	SFC2200	2959-21
2201	AMD	LH2201A	2937-4
	Exar	**XR2201**	**★3200**
			2480-68
			★3200
			2890-15
		XR2201M	**★3200**
			2480-69
			★3200
			2890-16
	MicroNet	MN2201	2887-84
		MN2201H	2887-85
	National	**LH2201A**	**★3342**
			2937-7
	TI	TCM2201	2948-99
	Xicor	**X2201A**	**★3998**
			3455-33
		X2201AD1	**★3998**
			3455-34
22012	RCA	CD22012	2899-64
22014	RCA	CD22014	2899-65
2202	**Exar**	**XR2202**	**★3200**
			2480-85
			★3200
			2890-17
		XR2202M	**★3200**
			2480-86
2202	**Exar**	**XR2202M**	**★3200**
			2890-18
	NEC-Electron	uPB2202	3473-13
2203	**Exar**	**XR2203**	**★3200**
			2480-45
			★3200
			2890-19
		XR2203M	**★3200**
			2890-20
2204	**Exar**	**XR2204**	**★3200**
			2480-29
			★3200
			2890-21
		XR2204M	**★3200**
			2480-30
			★3200
			2890-22
	Sprague	ULN-2204A	2900-134
			¶ 272-4
	Thomson-CSF	SFC2204	2960-58
2205	NEC-Electron	uPB2205	3475-87
	Thomson-CSF	SFC2205	2960-5
2206	**Exar**	**XR2206**	**★3197**
			2946-21
			2946-22
			2948-140
			2948-141
			¶ 258-17
			¶ 259-7
			¶ 276-12
		XR2206C	**★3197**
			2946-23
			¶ 258-17
			¶ 259-7
			¶ 276-12
		XR2206M	**★3197**
			2946-24
			2948-142
			¶ 258-17
			¶ 259-7
			¶ 276-12
2207	**Exar**	**XR2207**	**★3198**
			2946-8
			2948-143
			¶ 258-17
			¶ 272-6
			¶ 278-13
		XR2207C	**★3198**
			2946-9
			¶ 258-17
			¶ 272-6
			¶ 278-13
		XR2207M	**★3198**
			2946-144
			¶ 258-17
			¶ 272-6
			¶ 278-13
	Raytheon	XR2207C	2946-14
		XR2207M	2946-15
	Thomson-CSF	SFC2207	2923-52
2208	**Exar**	**XR2208**	**★3202**
			2964-154
			¶ 276-14
			¶ 278-13
		XR2208M	**★3202**
			2964-155
			¶ 276-14
			¶ 278-13
	National	**LH2208**	**★3342**
			2936-49
		LH2208A	**★3342**
			2935-55
	PMI	PM2208	2936-51
		PM2208A	2935-57
	Thomson-CSF	SFC2208	2923-6
		SFC2208A	2919-6
2209	**Exar**	**XR2209C**	**★3197**
			2946-10
		XR2209M	**★3197**
			2946-11
	Thomson-CSF	SFC2209	2952-31
221	Fairchild	CCD221	2963-142
	National	LM221	2888-26
		LM221A	2888-27
	Siemens	SAS221	2906-152
		TBA221	2930-40

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
221	**Siliconix**	**DG221A**	★2794
			2417-1
		DG221C	★2794
			2417-2
2210	Dionics	DI2210	2465-106
	National	LH2210	2908-15
	Xicor	**X2210**	★3998
			3455-12
		X2210DM	★3998
			3455-13
22100	NEC-Electron	uPD22100	2947-130
	RCA	**CD22100**	★ 749
			★ 753
			2423-7
			★ 749
			★ 753
			2947-131
	SGS	M22100	2947-132
22101	**RCA**	**CD22101**	★ 749
			★ 754
			2423-8
			★ 749
			★ 754
			2947-133
22102	**RCA**	**CD22102**	★ 749
			★ 754
			2423-9
			★ 749
			★ 754
			2947-134
22103	**RCA**	**CD22103**	★ 749
			★ 756
			2949-119
22104	**RCA**	**CD22104**	★ 749
			455-28
		CD22104A	★ 749
			455-29
22105	**RCA**	**CD22105**	★ 749
			455-23
		CD22105A	★ 749
			455-24
2211	AMD	LH2211	2893-17
	Exar	**XR2211**	★3195
			2945-21
			2945-22
			2948-137
			2948-138
			¶ 258-17
			¶ 259-7
			¶ 276-14
		XR2211C	★3195
			2945-23
			2945-143
			2949-63
			¶ 258-17
			¶ 259-7
			¶ 276-14
		XR2211M	★3195
			2945-24
			2945-144
			2948-139
			2949-64
			¶ 258-17
			¶ 259-7
			¶ 276-14
	National	**LH2211**	★3317
			2893-20
	Raytheon	XR2211C	2945-26
			2945-153
			2949-68
		XR2211M	2945-27
			2945-154
			2949-69
	Sanyo	LA2211	2968-48
	Sprague	ULN-2211B	2905-39
	Thomson-CSF	SFC2211	2891-55
2212	**Exar**	**XR2212M**	★3196
			2945-25
			¶ 271-11
			¶ 278-8
	Xicor	**X2212**	★3998
			3455-25
		X2212DM	★3998
			3455-26
2213	**Exar**	**XR2213C**	★3196
			2945-145
2213	**Exar**	**XR2213M**	★3196
			2945-146
2216	Exar	XR2216	2947-118
2218	Thomson-CSF	SFC2218	2926-16
222	Fairchild	CCD222	2964-48
	Panasonic	AN222	2903-21
	Siemens	TBA222	2926-18
2220	**TI**	**TMS2220**	★1558
			1088-54
			★1558
			1057-27
2224	Sprague	ULN-2224A	2904-1
222741	AMD	222741	2923-31
2228	**Exar**	**XR2228**	★3202
			2964-156
			¶ 271-11
		XR2228M	★3202
			2964-157
			¶ 271-11
223	Fairchild	SH223	2952-108
	Motorola	**LM223**	★3294
			2952-112
	National	**LM223**	★3299
			2952-119
	Panasonic	AN223	2903-121
	SiliconG	SG223	2952-124
2230	**Exar**	**XR2230**	★3191
			2960-50
			2965-146
			2960-90
22301	**RCA**	**CD22301**	★ 749
			★ 757
22302	**RCA**	**CD22302**	★ 760
2231	Sprague	ULN-2231A	2898-12
2235	**Exar**	**XR2235**	★3192
			2960-91
224	Fairchild	uA224	2913-57
	Motorola	LM224	2913-62
	National	LM224	2913-65
		LM224A	2941-44
	NEC-Electron	uPC224	2913-67
	Panasonic	AN224	2903-122
	Raytheon	LM224	2913-70
	RCA	CA224	2913-73
	Signetics	LM224	2913-76
	SiliconG	SG224	2913-79
	TI	LM224	2913-82
2240	**Exar**	**XR2240C**	★3200
			2951-18
			¶ 272-6
			¶ 282-8
		XR2240M	★3200
			2951-19
			¶ 272-6
			¶ 282-8
	Fairchild	uA2240C	2951-20
		uA2240M	2951-21
	Sprague	ULN-2240A	2900-135
			¶ 271-4
	TI	TMS2240	1087-2
			1088-57
			1057-28
		uA2240C	2951-29
		uA2240M	2951-30
22404	**RCA**	**CD22404**	★ 749
			2947-52
22406	**RCA**	**CD22406**	★ 749
			2947-106
22407	**RCA**	**CD22407**	★ 749
			2947-107
2241	Sprague	ULN-2241A	2900-136
			¶ 271-4
22413	**RCA**	**CD22413**	★ 749
			2948-91
22414	**RCA**	**CD22414**	★ 749
			2948-92
22416	**RCA**	**CD22416**	★ 749
			2949-59
22417	**RCA**	**CD22417**	★ 749
			2949-60
22418	**RCA**	**CD22418**	★ 749
			2949-61
22419	**RCA**	**CD22419**	★ 749
			2949-38
2242	**Exar**	**XR2242C**	★3201
			2951-60
2242	**Exar**	**XR2242M**	★3201
			2951-61
	Sprague	ULN-2242A	2900-137
			¶ 271-4
2243	**Exar**	**XR2243**	★3201
			2951-8
	Sprague	ULN-2243A	2900-58
			2901-21
2245	Sprague	ULN-2245A	2901-143
2249	Sprague	ULN-2249A	2900-72
225	**Intel**	**iMDX225**	★1724
			1624-1
	Interdesign	MUA-225	4140-131
	Telefunken	U225	2948-102
2250	**National**	**LH2250**	★3342
			2937-26
		LH2250C	★3342
			2937-27
	SiliconG	SG2250	2912-9
			2912-57
2253	SiliconG	SG2253	2912-72
2257	Nitron	NC2257	2487-11
			¶ 258-13
2259	Nitron	NC2259	2487-7
			¶ 258-13
2260	Nitron	NC2260	2487-12
			¶ 258-13
	Sprague	ULN-2260A	2904-2
2261	Motorola	MC2261A	2486-68
		MC2261B	2486-69
		MC2261C	2486-70
	Sprague	ULN-2261A	2904-3
2264	Exar	XR2264	2967-166
2265	Exar	XR2265	2967-167
2266	Exar	XR2266	2967-168
227	PMI	OP-227A	2935-30
		OP-227B	2935-32
		OP-227C	2935-37
		OP-227E	2935-31
		OP-227F	2935-33
		OP-227G	2935-38
2270	Sprague	ULN-2270	2905-117
2271	Exar	XR2271	2465-58
2272	Exar	XR2272	2465-56
2276	**Exar**	**XR2276**	★3204
			2463-1
			★3204
			2964-77
2277	**Exar**	**XR2277**	★3204
			2463-26
2278	**Exar**	**XR2278**	★3204
			2463-27
2279	**Exar**	**XR2279**	★3205
			2463-28
228	Panasonic	AN228W	2904-144
2280	Sprague	ULN-2280B	2896-124
2283	Sprague	ULN-2283B	2896-125
2284	**Exar**	**XR2284**	★3203
			2464-102
22859	**RCA**	**CD22859**	★ 749
			★ 758
			2949-163
2288	**Exar**	**XR2288**	★3203
			2465-74
2289	NEC-Micro	uPB2289	3471-19
2290	Sprague	ULN-2290	2905-40
23	Burr-Brown	SHC23	2967-67
	TeledyneC	CDA23	2417-110
			2418-116
230	Dionics	DI230	2465-107
	National	**CIM-230**	★1951
2300	Kontron	2300	1625-4
	Sanyo	LA2300	2901-83
	Sprague	ULN-2300M	2962-38
	TI	**TMS2300**	★1558
			1088-58
			★1558
			1057-29
	Thomson-CSF	SFC2300	2959-10
	TRW	CA2300	2903-69
2301	AMD	LH2301A	2940-15
	Intersil	LH2301A	2940-16
	National	**LH2301A**	★3342
			2940-17
	Thomson-CSF	SFC2301A	2931-61
	TRW	CA2301	2903-70
2305	Thomson-CSF	SFC2305	2960-9
2307	Thomson-CSF	SFC2307	2931-49
2308	Intersil	LH2308A	2936-3
	National	**LH2308**	★3342
			2940-13
		LH2308A	★3342
			2936-4
	NEC-EA	uPD2308A	3484-79
	PMI	PM2308	2940-14
		PM2308A	2936-5
	Thomson-CSF	SFC2308	2931-39
2309	Thomson-CSF	SFC2309	2952-32
231	National	LM231	2963-92
		LM231A	2963-93
	SGS	TBA231	2913-55
	Siemens	FZH231	472-84
		SAS231L	511-67
2310	Intersil	LH2310	2908-24
	National	LH2310	2908-25
	SGS	TDA2310	2897-167
2311	AMD	LH2311	2894-9
	Intersil	LH2311	2894-10
	National	LH2311	2894-11
	National	**LM2311**	★3317
	Thomson-CSF	SFC2311	2892-47
2312	**OKI**	**MSM2312**	★3873
23128	**AMI**	**S23128**	★3610
			460-138
			★3610
			3487-23
	NEC-EA	uPD23128	3487-24
	Signetics	**23128-25**	★3901
			3487-25
		23128-30	★3901
			3487-28
	Synertek	**SY23128**	★3952
			3486-29
	Synertek	SYM23128	3487-37
		SYM23128-3	3487-29
		SYM23128A	3487-38
		SYM23128A-3	3487-30
	VTI	VT23128	3487-26
		VT23128A	3487-18
		VT23128B	3487-33
23129	VTI	VT23129	3487-21
		VT23129A	3487-19
		VT23129B	3487-34
2316	CSG	MPS2316	3485-37
		MPS2316A	3481-10
		MPS2316B	3481-11
	GTEMicro	2316-3	3485-7
		2316-4	3485-40
	NEC-EA	uPD2316E	3485-43
		uPD2316E-5	3485-24
	Rockwell	R2316B	3485-46
		R2316E	3485-47
	SGS	M2316	3485-48
	Synertek	**SY2316A**	★3949
			3484-112
		SY2316B	★3949
			3485-50
		SY2316B-2	★3949
			3485-2
		SY2316B-3	★3949
			3485-9
		SYM2316	★ 430
	Toshiba	TSU2316E	3485-53
2318	Thomson-CSF	SFC2318	2910-62
			2933-43
232	Cybernetic	CY232	2487-2
			1101-64
	Dionics	DI232	2463-67
	Fairchild	F232	3468-10
2320	Nitron	NC2320	2948-27
	SGS	TDA2320	2897-180
		TDA2320A	2898-7
2321	Nitron	NC2321	2948-28
2322	Nitron	NC2322	2948-29
2325	MicroPwr	MP2325-45	3487-54
		MP2325-85	3487-55
23256	NEC-EA	uPD23256	3487-51
	Signetics	**23256A**	★3903
			3487-43
	Synertek	**SY23256**	★3953
			3487-44

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
23256	Toshiba	TMM23256	3487-42
	VTI	VT23256	3487-46
23257	VTI	VT23257	3487-47
2331	Siemens	TBB2331	2940-53
23316	CSG	MPS23316A	3485-16
2332	CSG	MPS2332	3485-122
		MPS2332A	3485-97
	GTEMicro	2332-3	3485-102
		2332-4	3486-1
	NEC-EA	uPD2332A-1	3485-105
		uPD2332B-1	3485-106
	NEC-Micro	uPD2332	3486-5
		uPD2332-1	3485-109
	Panasonic	MN2332	3486-6
	Rockwell	R2332	3486-7
		R2332-3	3485-87
	Signetics	**2332-20**	★3897
			3485-75
		2332-25	★3897
			3485-78
		2332-30	★3897
			3485-94
		2332-45	★3897
			3486-20
	Synertek	**SY2332**	★3950
			3486-11
		SY2332-2	★3950
			3485-73
		SY2332-3	★3950
			3485-90
		SYM2332	★ 430
			3486-13
	Toshiba	TMM2332	3485-112
	VTI	VT2332	3486-18
		VT2332A	3485-92
2333	**AMI**	**S2333**	★3608
			3485-95
	CSG	MPS2333	3485-123
	Synertek	**SY2333**	★3950
			3486-12
		SY2333-2	★3950
			3485-74
		SY2333-3	★3950
			3485-91
	Synertek	SYM2333	3486-14
	Universal	UM2333-25	3485-77
	VTI	VT2333	3486-19
		VT2333A	3485-93
234	Ferranti	ZNA234	2905-70
	National	LM234	2968-28
			2962-131
2340	National	COP2340	1087-89
2341	National	COP2341	1087-90
2342	National	COP2342	1087-91
235	Siemens	FZH235	472-85
2350	AMI	S2350	2487-76
			1092-133
	Sprague	ULN-2350C	4141-116
2351	Sprague	ULN-2351C	4141-117
236	**National**	**LM236-2**	★3304
			2966-58
		LM236-5	★3304
			2966-87
		LM236A-2	★3304
			2966-59
		LM236A-5	★3304
			2966-88
	Panasonic	AN236	2903-123
2363	Plessey	SL2363C	2889-59
2364	**AMI**	**S2364**	★3609
			3486-46
	CSG	MPS2364	3486-113
		MPS2364A	3486-96
		MPS2364B	3486-77
	GTEMicro	2364-3	3486-79
		2364-4	3486-99
	MicroPwr	MP2364C	3486-109
	NEC-EA	uPD2364-20	3486-31
		uPD2364-35	3486-106
		uPD2364-45	3487-3
		uPD2364E	3486-39
	Plessey	SL2364C	2889-60
	Signetics	**2364-20**	★3899
			3486-44
		2364-25	★3899
			3486-67
2364	**Signetics**	**2364-30**	★3899
			3486-70
	Signetics	2364-35	3486-107
	Signetics	**2364-45**	★3899
			3487-5
	Synertek	SY2364	3486-117
		SY2364-2	3486-35
		SY2364-3	3486-87
		SY2364A	3486-61
		SY2364A-2	3486-36
		SY2364A-3	3486-88
	Synertek	**SYM2364**	★ 431
			3486-118
		SYM2364A	★ 431
			3486-119
	Toshiba	TMM2364	3486-69
2364A2	Rockwell	R2364A2	3486-33
2364A25			
	Rockwell	R2364A25	3486-56
2364A3	Rockwell	R2364A3	3486-84
2364B2	Rockwell	R2364B2	3486-41
2364B25			
	Rockwell	R2364B25	3486-66
2364B3	Rockwell	R2364B3	3486-92
2365	MicroEng	MCETCA2365	2909-55
	Synertek	**SY2365**	★3951
			3487-6
		SY2365-2	★3951
			3486-37
		SY2365-3	★3951
			3486-89
		SY2365A	★3951
			3487-7
		SY2365A-2	★3951
			3486-38
		SY2365A-3	★3951
			3486-90
		SYM2365	★ 431
			3487-8
		SYM2365A	★ 431
			3487-9
	VTI	VT2365	3487-10
		VT2365A	3486-93
		VT2365B	3486-42
2366	VTI	VT2366	3487-11
		VT2366A	3486-94
		VT2366B	3486-43
237	MicroEng	MCELM237	2960-40
	Motorola	**LM237**	★3295
			2960-37
	National	**LM237**	★3301
			2960-43
			2960-64
	SiliconG	SG237	2960-46
	Telefunken	U237B	2463-17
			¶ 260-12
	TI	LM237	2960-49
2370	**TI**	**TMS2370**	★1558
			1088-59
			★1558
			1057-30
2372	**TI**	**TMS2372NLL**	★1559
2376	SMC	KR2376	2468-12
238	**National**	**LM238**	★3299
			2959-53
239	AMD	LM239	2895-12
		LM239A	2894-38
	Fairchild	uA239	2895-14
		uA239A	2894-40
	Motorola	LM239	2895-17
		LM239A	2894-43
	National	**LM239**	★3317
			2895-19
		LM239A	★3317
			2894-45
	Panasonic	AN239	2904-175
	PMI	PM239	2895-24
		PM239A	2894-47
	Raytheon	LM239	2895-26
	RCA	CA239	2895-28
		CA239A	2894-49
	Signetics	LM239A	2895-30
	SiliconG	SG239	2895-32
		SG239A	2894-51
	TI	LM239	2895-34
23C128	NEC-EA	uPD23C128	3487-40
	SSS	SCM23C128	3487-20
23C16	SSS	883/23C16	3485-63
		SCM23C16	461-75
			3485-58
23C17	SSS	883/23C17	3485-64
		SCM23C17	3485-59
23C256	SSS	SCM23C256	3487-45
23C32	SSS	888/23C32	3486-25
		SCM23C32	3485-79
23C33	SSS	SCM23C33	3485-80
23C34	SSS	888/23C34	3486-26
23C64	SSS	SCM23C64	3486-71
23C65	SSS	SCM23C65	3486-72
24	IPI	PS24	2964-92
	PMI	MUX-24A	2423-68
			¶ 261-8
		MUX-24B	2423-72
			¶ 261-8
		MUX-24E	2423-69
			¶ 261-8
		MUX-24F	2423-73
			¶ 261-8
		OP-24	2916-46
	Signetics	MLA24	4141-113
	TeledyneC	CAG24	2415-110
240	Dionics	DI240	2465-108
	Exar	XR-C240	2948-150
			¶ 270-13
	National	**LM240**	★3299
	Panasonic	AN240P	2904-176
	Signetics	TCA240	2962-104
	SiliconG	SG240-20K	2955-131
2400	**Harris**	**HA-2400**	★3212
			★3287
			2888-32
			2928-48
			¶ 267-8
	Sunrise	Z-2400	4010-1
	TI	**SE2400P**	★1560
			1087-6
			1088-67
			★1560
			1057-3
		SEB2400	★1560
		TMS2400	★1558
			1088-60
			★1558
			1057-31
2401	AMD	AM2401	3488-27
	SiliconG	SG2401	2888-107
	Sprague	ULN-2401A	2968-145
			2898-43
	TI	TCM2401	2948-60
2402	SiliconG	SG2402	2964-168
2404	**Harris**	**HA-2404**	★3212
			★3287
			2888-33
			2928-49
	National	COP2404	1087-56
			1087-47
			1051-23
2405	**Harris**	**HA-2405**	★3212
			★3287
			2888-34
			2932-28
			¶ 267-8
241	Panasonic	AN241	2904-177
	Siemens	FZH241	473-43
		SAS241	511-68
2410	Siliconix	VN2410	2483-63
2412	Western	WD2412	2899-75
			2899-91
2418	TRW	CA2418	2903-71
242	Dionics	DI242	2463-68
2420	**Harris**	**HA-2420**	★3214
			★3287
			2967-85
			¶ 265-6
2425	**Harris**	**HA-2425**	★3214
			★3287
			2967-86
			¶ 265-6
24250	**National**	**LH24250**	★3342
			2912-62
			2937-28
24250	**National**	**LH24250C**	★3342
			2912-63
			2939-25
2429	Sprague	ULN-2429A	2898-44
			2963-78
243	**Siliconix**	**DG243A**	★2780
			★2796
			2419-36
		DG243C	★2780
			★2796
			2419-37
244	RCA	TCC-244	3474-16
	Telefunken	U244	2463-18
2440	National	COP2440	1087-92
			1051-24
		COP2440R	1087-48
			1087-100
			1051-25
2441	National	COP2441	1087-93
			1051-26
		COP2441R	1087-49
			1087-101
			1051-27
2442	National	COP2442	1087-94
			1051-28
2444	Xicor	X2444	3455-2
245	Analogic	MN245	2967-66
	Intel	Intellec245	1624-3
	National	**LM245**	★3301
	Panasonic	AN245	2904-145
	Siemens	FZH245	473-44
246	**Exar**	**XR246**	★3207
			2912-78
	National	LM246	2912-86
	Panasonic	AN246	2904-146
	Raytheon	LM246	2912-89
247	Panasonic	AN247P	2905-147
	Telefunken	U247B	2463-19
			¶ 260-12
2470	**TI**	**TMS2470**	★1558
			1088-61
			★1558
			1057-32
247A10	TI	TBP247A10M	3460-4
248	AMD	LM248	2943-24
	Fairchild	uA248	2943-26
	National	LM248	2943-29
	Raytheon	LM248	2943-31
	TI	LM248	2943-33
249	National	LM249	2943-35
	Raytheon	LM249	2943-37
24LS23	AMD	AM24LS23M	3490-19
24LS299			
	AMD	AM24LS299C	3490-17
24S10	**TI**	**TBP24S10**	★ 440
			★3967
			3459-96
		TBP24S10M	★ 440
			★3967
			3459-113
24S41	**TI**	**TBP24S41**	★ 440
			★3968
			3461-110
			3461-110
		TBP24S41M	★ 440
			★3968
			3461-111
			3461-111
24S81	**TI**	**TBP24S81**	★ 440
			★3968
			3463-102
		TBP24S81M	★ 440
			★3968
			3463-103
24S86	TI	TBP24S86M	3463-26
24SA10	**TI**	**TBP24SA10**	★ 440
			★3967
			3459-111
		TBP24SA10M	★ 440
			★3967
			3459-112
24SA41	**TI**	**TBP24SA41**	★ 440
			★3968
			3461-108
			3461-108
		TBP24SA41M	★ 440

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
24SA41	TI	TBP24SA41M	★3968
			3461-109
			3461-109
24SA81	TI	TBP24SA81	★ 440
			★3969
			3463-100
		TBP24SA81M	★ 440
			★3969
			3463-101
25	Siliconix	PW125	★2820
			2961-42
250	Cherry	CS250	2464-18
		CS250-1	2464-19
	Cybernetic	CY250	1101-63
	Motorola	LM250	★3295
			2959-41
	National	LM250	★3299
			2959-44
	NEC-Electron	uPC250A	2935-16
	SiliconG	SG250	2959-48
		SG250A	2959-49
	Telefunken	U250	2887-8
2500	AMI	GA2500	★4307
			4140-5
	Harris	HA-2500	★3216
			★3287
			2928-46
	Intersil	HA2500	2928-47
	Motorola	MCA2500ECL	★4480
2501	AMD	AM2501C	480-28
		AM2501M	480-29
	SiliconG	SG2501A	2958-83
			¶ 281-12
	Western	WD2501-01	★2869
			2486-78
		WD2501-03	★2869
			2486-80
		WD2501-11	★2869
			2486-82
2502	AMD	AM2502C	508-105
		AM2502M	508-106
	Harris	HA-2502	★3216
			★3287
			2932-22
	Intersil	AM2502	508-109
		HA2502	2932-24
	National	DM2502C	508-113
		DM2502M	508-114
	SiliconG	SG2502	2960-75
	SMC	COM2502	2487-71
		COM2502H	2487-72
2503	AMD	AM2503C	508-107
			¶ 232-6
		AM2503M	508-108
			¶ 232-6
	Intersil	AM2503	508-110
	National	DM2503C	508-115
		DM2503M	508-116
	SiliconG	SG2503	2966-64
2504	AMD	AM2504C	509-37
		AM2504M	509-38
	Intersil	AM2504	509-39
	National	DM2504C	509-41
		DM2504M	509-42
2505	AMD	AM2505C	475-138
		AM2505M	475-139
	Harris	HA-2505	★3216
			★3287
			2932-23
	Intersil	HA2505	2932-25
	Raytheon	RC2505	475-140
		RM2505	475-141
2506	AMD	AM2506C	474-164
			¶ 228-11
		AM2506M	474-165
			¶ 228-11
	Raytheon	RC2506	474-166
		RM2506	474-167
2507	Harris	HA-2507	2933-17
	Intersil	HA2507	2933-18
25089	AMI	S25089	2949-128
251	NEC-Electron	uPC251	2939-47
	Siemens	FZH251	472-68
		SAS251	511-69
2510	Harris	HA-2510	★3218
			★3287

Base Number	Source	Device	Page-Line
2510	Harris	HA-2510	2910-50
			2932-14
			¶ 264-14
	Hitachi	HM2510	★3789
			3476-6
		HM2510-1	★3789
			3475-81
		HM2510-2	★3789
			3475-66
	Intersil	HA2510	2910-53
			2932-15
2511	Hitachi	HM2511	★3789
			3476-10
		HM2511-1	★3789
			3475-85
	Western	WD2511-01	★2869
			2486-79
		WD2511-05	★2869
			2486-81
		WD2511-11	★2869
			2486-83
2512	Harris	HA-2512	★3218
			★3287
			2933-19
	Intersil	HA2512	2933-20
2513	GI	R03-2513	3453-7
2515	Harris	HA-2515	★3218
			★3287
			2933-26
	Intersil	HA2515	2933-27
2516	TI	TMS2516	★ 442
	Weitek	WTL2516	★1039
			511-97
2517	Harris	HA-2517	2933-24
	Intersil	HA2517	2933-25
	Weitek	WTL2517	★1039
			511-98
252	Panasonic	AN252	2896-97
2520	Harris	HA-2520	★3220
			★3287
			2910-30
			2932-16
			¶ 264-12
	Intersil	HA2520	2910-31
			2932-17
	Western	WD2520	★2870
			1100-69
2522	Harris	HA-2522	★3220
			★3287
			2933-21
	Intersil	HA2522	2933-22
	National	TDA2522	2903-112
	Plessey	TDA2522	2903-133
	Siemens	TDA2522	2903-168
	Signetics	TDA2522	2903-175
2523	National	TDA2523	2903-113
	Plessey	TDA2523	2903-134
2524	Exar	XR2524	★3190
			★3209
			2960-92
	National	LM2524	2961-6
	RCA	CA2524	★3368
			2961-16
	SiliconG	SG2524	2961-33
			¶ 277-15
			¶ 277-17
	TI	SG2524	2961-56
	Unitrode	UC2524A	★3444
			2961-104
2525	Exar	XR2525A	★3191
			2960-93
	Harris	HA-2525	★3220
			★3287
			2933-28
	Intersil	HA2525	2933-29
	Motorola	SG2525	★3297
	SiliconG	SG2525A	2961-34
	Siliconix	SI2525B	2961-46
	Unitrode	UC2525A	★3445
			2961-105
2526	Motorola	SG2526	★3297
			2960-119
	SiliconG	SG2526	2961-35
2527	Exar	XR2527A	★3191
			2960-94
	Harris	HA-2527	2933-32

Base Number	Source	Device	Page-Line
2527	Intersil	HA2527	2933-33
	Motorola	SG2527	★3297
	SiliconG	SG2527A	2961-36
	Siliconix	SI2527B	2961-47
	Unitrode	UC2527A	★3445
			2961-106
2528	TI	TMS2528	★ 442
253	NEC-Electron	uPC253A	2928-36
	Panasonic	AN253	2900-121
	SiliconG	SG253-05	2952-125
		SG253-08	2953-109
		SG253-12	2954-97
		SG253-15	2955-55
		SG253-18	2955-112
2530	Harris	HA-2530	2910-20
			2925-36
			¶ 267-9
	Intersil	HA2530	2910-21
	National	TDA2530	2903-114
	Plessey	TDA2530	2903-135
	Siemens	TDA2530	2903-169
	Signetics	TDA2530	2903-176
25309	Thomson-CSF	SFF25309	2906-128
2531	OEI	2531A	★3347
			2887-127
2532	Motorola	MCM2532	3466-65
		MCM2532-25	3466-45
		MCM2532-35	3466-54
	National	NMC2532	3466-67
	Plessey	TDA2532	2903-136
	Signetics	TDA2532	2903-177
	SiliconG	SG2532	2960-12
	TI	TMS2532	★ 442
2533	AMD	AM2533	3491-108
2535	Harris	HA-2535	2910-23
			2928-45
			¶ 267-9
2539	Harris	HA-2539-2	★3222
			★3287
			2934-33
		HA-2539-5	★3222
			★3287
			2934-32
254	NEC-Electron	uPC254	2921-27
	Telefunken	U254	2463-20
2540	Harris	HA-2540-2	★3224
			★3287
			2929-57
		HA-2540-5	★3224
			★3287
			2934-31
	National	TDA2540	2905-142
	OEI	2540	2887-128
	Plessey	TDA2540	2905-159
	Signetics	TDA2540	2905-184
	Sprague	UDN-2540B	★2843
			2483-62
2541	National	TDA2541	2905-143
	Plessey	TDA2541	2905-160
	Signetics	TDA2541	2905-185
25411	SSS	SCL25411	2464-125
2542	SiliconG	SG2542	2965-62
2543	Exar	XR2543	★3192
			2965-90
	SiliconG	SG2543	2965-94
			¶ 280-14
2544	SiliconG	SG2544	2965-95
2547	SiliconG	SG2547	2965-101
2549	SiliconG	SG2549	2963-5
255	AMD	LF255	2927-3
	Motorola	LF255	2927-4
	National	LF255	★3309
			2927-7
	Panasonic	AN255	2905-1
	PMI	PM255	2927-9
	Siemens	FZH255B	472-69
2556	Exar	XR2556C	2951-65
		XR2556M	2951-66
2559	AMI	S2559A	★3138
			2949-129
			¶ 270-8
		S2559B	★3138
			2949-130
			¶ 270-8
		S2559C	★3138

Base Number	Source	Device	Page-Line
2559	AMI	S2559C	2949-131
			¶ 270-8
		S2559D	★3138
			2949-132
			¶ 270-8
		S2559E	★3138
			2949-133
			¶ 270-8
		S2559F	★3138
			2949-134
			¶ 270-8
		S2559G	★3138
			2949-135
			¶ 270-8
		S2559H	★3138
			2949-136
			¶ 270-8
256	AMD	LF256	2927-11
	Cromemco	256MSU	★1914
	IPI	M256	2964-19
	MicroTech	CCD256SERP	2962-70
		CCD256SPS	2962-71
	Motorola	LF256	2927-15
	National	LF256	★3309
			2927-18
	PMI	PM256	2927-21
	Reticon	CCPD256	2963-147
		RL256	2964-39
2560	AMI	S2560A	2948-3
	National	TDA2560	2903-115
	Plessey	TDA2560	2903-137
	Siemens	TDA2560	2903-170
	Signetics	TDA2560	2903-178
	Supertex	CM2560	3487-56
2561	AMI	S2561	★3139
			2949-103
			2962-33
		S2561A	★3139
			2949-104
		S2561C	★3139
			2949-105
25610	AMI	S25610	★3141
			2948-49
2562	AMI	S2562	2948-50
2563	AMI	S2563	★3140
			2948-51
2564	TI	TMS2564-35	★ 442
			3467-2
		TMS2564-45	★ 442
			3467-13
		TMS2564-50	★ 442
			3467-14
2567	AMI	S2567	2900-26
	Exar	XR2567	2949-72
			¶ 269-15
		XR2567C	2946-52
			¶ 269-15
		XR2567M	2946-53
			2949-73
			¶ 269-15
256X256			
	Reticon	RA256X256	2963-136
257	AMD	LF257	2926-54
	National	LF257	★3309
			2926-59
	PMI	PM257	2927-2
	Telefunken	U257B	2463-21
			¶ 260-12
2571	Signetics	TDA2571A	2904-110
2577	Signetics	TDA2577	2904-81
2578	Signetics	TDA2578	2904-82
258	Cherry	CS258A	2906-107
	Motorola	LM258	2913-30
			2939-29
	National	LM258	2913-33
			2938-27
		LM258A	2913-34
			2937-30
	RCA	CA258	2913-37
			2938-29
		CA258A	2937-31
	SGS	M258	2900-30
	Signetics	LM258	2913-39
			2938-31
	TI	LM258	2913-83

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
2580	**Sprague**	**UDN-2580A**	★2843
			2949-11
2581	Signetics	TDA2581	2904-111
			2960-110
			2961-27
2582	Signetics	TDA2582	2904-137
2585	**Sprague**	**UDN-2585A**	★2843
			2949-12
2588	**Sprague**	**UDN-2588A**	★2843
			2949-13
259	Cherry	CS259	2906-55
	Panasonic	AN259	2900-64
	SGS	M259	2900-31
2590	National	TDA2590	2904-94
2591	National	TDA2591	2904-95
	Plessey	TDA2591	2904-102
	Signetics	TDA2591	2904-112
	Telefunken	TDA2591	2904-115
2593	Signetics	TDA2593	2904-113
	Telefunken	TDA2593	2904-116
2594	Signetics	TDA2594	2904-114
2595	**Sprague**	**UDN-2595A**	★2843
			2480-145
25L02	Intersil	AM25L02	508-111
25L03	Intersil	AM25L03	508-112
25L04	Intersil	AM25L04	509-40
25L32	Motorola	MCM25L32	3466-66
		MCM25L32-25	3466-46
	TI	**TMS25L32**	★ 442
25LS07	**AMD**	**AM25LS07C**	★1227
			486-89
		AM25LS07M	★1227
			486-90
25LS08	**AMD**	**AM25LS08C**	★1227
			485-180
		AM25LS08M	★1227
			485-181
25LS09	**AMD**	**AM25LS09C**	★1227
			499-80
		AM25LS09M	★1227
			499-81
25LS138			
	AMD	AM25LS138C	483-161
			1094-123
		AM25LS138M	483-162
			1094-124
25LS139			
	AMD	AM25LS139C	483-64
		AM25LS139M	483-65
25LS14	AMD	AM25LS14C	475-162
		AM25LS14M	475-163
25LS148			
	AMD	AM25LS148C	508-141
		AM25LS148M	508-142
25LS15	AMD	AM25LS15C	474-7
		AM25LS15M	474-8
25LS151			
	AMD	AM25LS151C	499-165
		AM25LS151M	499-166
25LS153			
	AMD	AM25LS153C	498-37
		AM25LS153M	498-38
25LS157			
	AMD	AM25LS157C	499-34
		AM25LS157M	499-35
25LS158			
	AMD	AM25LS158C	498-128
		AM25LS158M	498-129
25LS160			
	AMD	AM25LS160C	480-157
		AM25LS160M	480-158
25LS161			
	AMD	AM25LS161C	478-134
		AM25LS161M	478-135
25LS162			
	AMD	AM25LS162C	481-16
		AM25LS162M	481-17
25LS163			
	AMD	AM25LS163M	478-181
25LS164			
	AMD	AM25LS164C	502-30
			3490-127
		AM25LS164M	502-31
			3490-128
25LS168			
	AMD	AM25LS168AC	481-100
		AM25LS168AM	481-101
25LS169			
	AMD	AM25LS169AC	479-99
		AM25LS169AM	479-100
25LS174			
	AMD	AM25LS174C	486-62
		AM25LS174M	486-63
25LS175			
	AMD	AM25LS175C	485-130
		AM25LS175M	485-131
25LS18	AMD	AM25LS18C	485-164
			1086-42
		AM25LS18M	485-165
			1086-43
25LS181			
	AMD	AM25LS181C	475-30
		AM25LS181M	475-31
25LS190			
	AMD	AM25LS190C	482-4
25LS191			
	AMD	AM25LS191C	479-150
		AM25LS191M	479-151
25LS192			
	AMD	AM25LS192C	481-147
		AM25LS192M	481-148
25LS193			
	AMD	AM25LS193C	480-12
		AM25LS193M	480-13
25LS194			
	AMD	AM25LS194AC	501-156
			3489-29
		AM25LS194AM	501-157
			3489-30
25LS195			
	AMD	AM25LS195AC	501-53
		AM25LS195AM	501-54
25LS22	**AMD**	**AM25LS22C**	★1227
			476-98
		AM25LS22M	★1227
			476-99
25LS23	**AMD**	**AM25LS23C**	★1227
			502-154
			★1227
			3490-20
		AM25LS23M	★1227
			502-155
25LS240			
	AMD	AM25LS240C	503-129
			2470-62
		AM25LS240M	503-130
			2470-63
25LS241			
	AMD	AM25LS241C	504-39
			2470-3
		AM25LS241M	504-40
			2470-4
25LS242			
	AMD	AM25LS242C	503-66
			2476-58
		AM25LS242M	503-67
			2476-25
25LS243			
	AMD	AM25LS243C	503-68
			2476-59
		AM25LS243M	503-69
			2476-26
25LS244			
	AMD	AM25LS244C	503-176
			2470-5
		AM25LS244M	503-177
			2470-6
25LS251			
	AMD	AM25LS251C	500-45
		AM25LS251M	500-46
25LS2513			
	AMD	**AM25LS2513C**	★1227
			508-143
			★1227
			1102-63
		AM25LS2513M	★1227
			508-144
25LS2516			
	AMD	AM25LS2516C	475-156
		AM25LS2516M	475-157
25LS2517			
	AMD	**AM25LS2517C**	★1227
			475-32
25LS2517			
	AMD	**AM25LS2517M**	★1227
			475-33
25LS2518			
	AMD	**AM25LS2518C**	★1227
			485-166
		AM25LS2518M	★1227
			485-167
25LS2519			
	AMD	**AM25LS2519C**	★1227
			486-15
		AM25LS2519M	★1227
			486-16
25LS2520			
	AMD	**AM25LS2520C**	★1227
			486-109
		AM25LS2520M	★1227
			486-110
25LS2521			
	AMD	**AM25LS2521C**	★1227
			474-92
			¶ 228-12
		AM25LS2521M	★1227
			474-93
			¶ 228-12
25LS253			
	AMD	AM25LS253C	497-148
		AM25LS253M	497-149
25LS2535			
	AMD	**AM25LS2535C**	★1227
			500-18
		AM25LS2535M	★1227
			500-19
25LS2536			
	AMD	**AM25LS2536C**	★1227
			484-3
		AM25LS2536M	★1227
			484-4
25LS2537			
	AMD	**AM25LS2537C**	★1227
			483-44
		AM25LS2537M	★1227
			483-45
25LS2538			
	AMD	**AM25LS2538C**	★1227
			484-9
		AM25LS2538M	★1227
			484-10
25LS2539			
	AMD	**AM25LS2539C**	★1227
			483-114
		AM25LS2539M	★1227
			483-119
25LS2548			
	AMD	AM25LS2548C	483-163
25LS2568			
	AMD	AM25LS2568C	481-120
		AM25LS2568M	481-121
	AMD	**SN25LS2568**	★1227
25LS2569			
	AMD	**AM25LS2569C**	★1227
			479-165
		AM25LS2569M	★1227
			479-166
25LS257			
	AMD	AM25LS257C	498-166
		AM25LS257M	498-167
25LS258			
	AMD	AM25LS258C	498-88
		AM25LS258M	498-89
25LS273			
	AMD	**AM25LS273B**	★1227
			486-152
		AM25LS273C	★1227
			486-153
		AM25LS273M	★1227
			486-154
25LS299			
	AMD	**AM25LS299C**	★1227
			502-156
		AM25LS299M	★1227
			502-157
			★1227
			3490-18
25LS373			
	AMD	**AM25LS373C**	★1227
			496-68
25LS373			
	AMD	**AM25LS373M**	★1227
			496-69
25LS374			
	AMD	**AM25LS374C**	★1227
			487-7
		AM25LS374M	★1227
			487-8
25LS377			
	AMD	**AM25LS377B**	★1227
			487-42
		AM25LS377C	★1227
			487-43
		AM25LS377M	★1227
			487-44
25LS378			
	AMD	AM25LS378C	486-91
		AM25LS378M	486-92
25LS379			
	AMD	AM25LS379C	485-182
		AM25LS379M	485-183
25LS381			
	AMD	**AM25LS381C**	★1227
			475-34
		AM25LS381M	★1227
			475-35
25LS399			
	AMD	AM25LS399C	499-82
		AM25LS399M	499-83
25LS533			
	AMD	**AM25LS533C**	★1227
			483-164
		AM25LS533M	★1227
			483-165
25LS534			
	AMD	**AM25LS534C**	★1227
			483-166
		AM25LS534M	★1227
			483-167
25S05	AMD	AM25S05C	475-142
		AM25S05M	475-143
25S07	**AMD**	**AM25S07C**	★1227
			486-105
			¶ 289-8
		AM25S07M	★1227
			486-106
			¶ 289-8
25S08	**AMD**	**AM25S08C**	★1227
			486-11
			¶ 289-8
		AM25S08M	★1227
			486-12
			¶ 289-8
25S09	**AMD**	**AM25S09C**	★1227
			499-111
			¶ 289-8
		AM25S09M	★1227
			499-112
			¶ 289-8
25S10	**AMD**	**AM25S10C**	★1227
			508-65
			¶ 228-2
		AM25S10M	★1227
			508-66
			¶ 228-2
	Signetics	N25S10	508-67
25S11	AMD	AM25S11C	508-33
25S12	AMD	AM25S12AC	508-34
		AM25S12AM	508-35
		AM25S12M	508-36
25S18	**AMD**	**AM25S18C**	★1227
			485-170
		AM25S18M	★1227
			485-171
25S373	**AMD**	**AM25S373**	★1227
25S374	**AMD**	**AM25S374**	★1227
25S533	**AMD**	**AM25S533**	★1227
25S534	**AMD**	**AM25S534**	★1227
25S557	**AMD**	**AM25S557**	★ 601
			475-101
25S558	**AMD**	**AM25S558**	★ 601
			475-102
260	Cherry	CS260	2464-24
	National	**LM1260**	★3317
			2892-12
	Panasonic	AN260	2900-122
2600	AMI	S2600	2901-174

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
2600	**Harris**	**HA-2600**	★3226
			★3287
			2925-25
			¶ 264-14
			¶ 266-18
	Inmos	**IMS2600**	★3792
			3469-70
	Intersil	HA2600	2925-26
	Sanyo	LA2600	2896-30
	TI	**TMS2600**	★1558
			1088-62
			★1558
			1057-33
	TRW	CA2600	2903-72
2601	AMI	S2601	2901-175
	SMC	COM2601	2487-75
	TRW	CA2601	2903-73
2602	AMD	AM2602C	500-174
		AM2602M	500-175
	AMI	S2602	2901-176
	Harris	**HA-2602**	★3226
			★3287
			2927-56
	Intersil	HA2602	2927-58
2603	AMI	S2603	2901-177
2604	AMI	S2604	2901-178
2605	AMI	S2605	2902-1
	Harris	**HA-2605**	★3226
			★3287
			2927-57
			¶ 266-18
	Intersil	HA2605	2927-59
	SGS	L2605	2952-43
2607	Harris	HA-2607	2930-27
	Intersil	HA2607	2930-28
261	**National**	**FOR261F-1**	★3345
			2963-71
		FOR261F-2	★3345
			2963-72
		LM261	★3317
			2891-35
	Siemens	FZH261	472-70
		SAS261	511-70
2610	**AMI**	**S2610**	★3148
	SGS	L2610	2954-3
2611	Signetics	TDA2611A	2897-72
26123	AMD	AM26123C	500-152
			¶ 237-8
		AM26123M	500-153
			¶ 237-8
2614	AMD	AM2614C	2469-28
			¶ 258-7
		AM2614M	2469-29
			¶ 258-7
2615	AMD	AM2615C	2472-54
			¶ 258-7
		AM2615M	2472-55
			¶ 258-7
	DDC	2615-10	2460-20
		2615-11	2460-18
		2615-12	2460-16
2616	Signetics	2616-30	3485-8
		2616-35	3485-26
		2616-45	3485-49
		2616A-25	3485-3
262	Exar	XR-C262	2948-151
			¶ 270-4
	Panasonic	AN262	2902-106
2620	**Harris**	**HA-2620**	★3228
			★3287
			2910-4
			2925-53
			¶ 264-12
			¶ 264-13
			¶ 264-14
	Inmos	**IMS2620**	★3792
	Intersil	HA2620	2910-5
			2925-54
2621	Signetics	SCN2621A	2905-87
			1101-92
2622	**Harris**	**HA-2622**	★3228
			★3287
			2928-4
	Intersil	HA2622	2928-6
	Signetics	SCN2622A	2905-86
			1101-91
2625	**Harris**	**HA-2625**	★3228
			★3287
			2928-5
	Intersil	HA2625	2928-7
2627	Harris	HA-2627	2930-29
	Intersil	HA2627	2930-30
263	Cherry	CS263	2896-5
	Signetics	TAA263	2897-170
2630	**Harris**	**HA-2630**	★3230
			★3287
			2887-26
2632	**Signetics**	**2632A-20**	★3905
			3485-72
		2632A-25	★3905
			3485-76
		2632A-30	★3905
			3485-88
		2632A-35	★3905
			3485-110
		2632A-45	★3905
			3486-8
		2632AE-30	★3905
			3485-89
		2632AM-35	★3905
			3485-111
		2632AM-45	★3905
			3486-9
2635	**Harris**	**HA-2635**	★3230
			★3287
			2887-27
2636	Signetics	SCN2636A	2906-38
			1101-80
2637	Signetics	SCN2637A	2905-88
			2906-39
			1101-103
264	Fairchild	F264	3468-11
	Panasonic	AN264	2897-194
	Telefunken	U264	511-6
2640	**Harris**	**HA-2640**	★3232
			★3287
			2910-71
			2926-1
	Signetics	TDA2640	2961-28
2645	**Harris**	**HA-2645**	★3232
			★3287
			2910-72
			2930-33
265	Siemens	FZH265B	472-71
	Telefunken	U265	511-30
2650	**Harris**	**HA-2650**	★3234
			★3287
			2937-36
	Signetics	2650A	1073-24
		2650A-1	1073-25
		SCN2650A	1090-9
26501	Hitachi	HD26501	1092-16
2651	National	INS2651	1095-25
	Signetics	**SCN2651C**	★1520
			2487-3
			★1520
			1090-14
			1095-29
	SMC	COM2651	1090-18
			1095-33
2652	**Motorola**	**MC2652**	★1359
			2486-93
		MC2652-2	★1359
			2486-94
	Signetics	**SCN2652A**	★1520
			2486-92
			2487-1
			★1520
			1090-12
			1095-12
			1095-13
			1101-60
2653	**Motorola**	**MC2653**	★1360
			2467-29
	Signetics	2653	2467-32
			¶ 257-10
			¶ 257-15
			¶ 257-16
			¶ 258-2
			¶ 259-9
	Signetics	**SCN2653A**	★1520
			2948-158
2653	**Signetics**	**SCN2653A**	★1520
			1090-13
			1095-20
			1101-65
	Signetics	TDA2653	2905-110
		TDA2653A	2905-111
2654	Signetics	TDA2654	2905-112
2655	**Harris**	**HA-2655**	★3234
			★3287
			2938-35
266	Telefunken	U266	511-24
2661	**Motorola**	**MC2661A**	★1360
			1100-101
		MC2661B	★1360
			1100-102
		MC2661C	★1360
			1100-103
	Signetics	**SCN2661A**	★1521
			2486-74
			★1521
			1090-15
			1095-30
			1101-69
		SCN2661B	★1521
			2486-75
			★1521
			1090-16
			1095-31
			1101-67
		SCN2661C	★1521
			2486-76
			★1521
			1090-17
			1095-32
			1101-68
	SMC	COM2661	1090-19
	Synertek	**SY2661**	★1539
			1090-20
2664	**Signetics**	**2664-25**	★3907
			3486-58
		2664A-20	★3907
			3486-34
		2664A-25	★3907
			3486-59
		2664A-30	★3907
			3486-85
		2664A-45	★3907
			3486-115
		2664AE-30	★3907
			3486-86
		2664AM-35	★3907
			3486-108
		2664AM-45	★3907
			3486-116
267	Telefunken	U267B	2463-22
			¶ 260-12
2670	Signetics	2670	3453-63
	Signetics	**SCN2670A**	★1521
			1100-91
		SCN2670B	★1521
			1100-92
	TI	**TMS2670**	★1558
			1088-63
			★1558
			1059-1
2670AC3			
	Signetics	SC2670AC3	1090-10
2670BC3			
	Signetics	SC2670BC3	1090-11
2671	Signetics	2671	1103-1
	Signetics	**SCN2671A**	★1522
			2468-16
			★1522
			1090-21
			1101-78
	SiliconG	SC2671ACS	2487-4
2672	Signetics	2672	1093-106
	Signetics	**SCN2672A**	★1522
			1090-22
			1101-81
2673	**Signetics**	**SCN2673A**	★1522
			1090-23
			1101-104
		SCN2673B	★1522
			1090-24
			1101-105
2674	**Signetics**	**SCN2674**	★1523
			1100-62
2675	Signetics	SCB2675	1100-71
268	Intel	iAPX268/10	1079-10
	Interdesign	MOA-268B	2470-1
	SGS	M268	2900-32
2681	**Signetics**	**SCN2681**	★1521
			1090-25
26810	Signetics	26810	2486-64
26814	Signetics	26814	2486-65
26818	Signetics	26818	2486-66
2685	SGS	L2685	2953-119
2688	AMI	S2688	2900-24
			2965-36
			¶ 273-3
268T26	Hitachi	HD268T26	508-12
			2477-12
269	SGS	M269	2900-33
26LS29	AMD	AM26LS29C	2469-50
			¶ 259-8
		AM26LS29M	2469-52
			¶ 259-8
	Signetics	AM26LS29	2469-51
26LS30	AMD	AM26LS30C	2469-63
			2472-24
			¶ 259-8
		AM26LS30M	2469-65
			2472-26
			¶ 259-8
	Signetics	AM26LS30	2469-64
			2472-25
26LS31	AMD	AM26LS31C	2472-41
			¶ 259-8
		AM26LS31M	2472-42
			¶ 259-8
	Motorola	**AM26LS31**	★2753
			2472-43
		AM26LS31C	★2753
			2472-44
		AM26LS31M	★2753
			2472-45
	National	DS26LS31C	2472-46
		DS26LS31M	2472-47
	Signetics	AM26LS31	2472-48
	TI	AM26LS31C	2472-49
		AM26LS31M	2472-50
26LS32	AMD	AM26LS32C	2475-21
			¶ 259-8
		AM26LS32M	2475-22
			¶ 259-8
	Motorola	**AM26LS32**	★2753
	National	DS26LS32C	2475-23
		DS26LS32M	2475-24
	TI	AM26LS32C	2475-25
		AM26LS32M	2475-26
26LS33	AMD	AM26LS33C	2475-33
		AM26LS33M	2475-34
	National	DS26LS33C	2475-35
		DS26LS33M	2475-36
	TI	AM26LS33C	2475-37
		AM26LS33M	2475-38
26S02	AMD	AM26S02C	501-7
		AM26S02M	501-8
26S10	AMD	AM26S10C	508-37
			2478-1
		AM26S10M	508-38
			2477-59
	Motorola	MC26S10	508-44
			2478-4
	National	DS26S10C	508-46
			2478-6
		DS26S10M	508-47
			2477-62
	TI	AM26S10C	508-51
			2478-8
		AM26S10M	508-52
			2477-64
26S11	AMD	AM26S11C	2478-2
		AM26S11M	508-39
			2477-60
	Motorola	MC26S11	508-45
			2478-5
	National	DS26S11C	508-48
			2478-7
		DS26S11M	508-49
			2477-63

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
26S11	TI	AM26S11C	508-53
			2478-9
		AM26S11M	2477-65
26S12	AMD	AM26S12AC	2476-6
		AM26S12AM	2476-7
		AM26S12C	508-40
			2477-53
		AM26S12M	2477-54
27	Burr-Brown	OPA27A	2914-39
		OPA27B	2915-20
		OPA27C	2916-7
		OPA27E	2914-40
		OPA27F	2915-21
		OPA27G	2916-8
	MicroPwr	OP-27	2915-50
	NEC-Electron	uPC27	2900-103
	PMI	OP-27A	2914-31
		OP-27B	2915-14
		OP-27C	2915-60
		OP-27E	2914-32
		OP-27F	2915-15
		OP-27G	2915-59
	Raytheon	OP-27A	2914-37
		OP-27B	2915-18
		OP-27C	2916-5
		OP-27E	2914-38
		OP-27F	2915-19
		OP-27G	2916-6
	Siliconix	**PVM27**	**★2820**
			2961-43
	TeledyneC	CAG27	2415-85
		CAG27-10	2415-86
270	**MicroEng**	**MGB270E**	**★4437**
			4141-10
		MGC270E	**★4437**
	Plessey	TCA270	2905-158
	RCA	CA270	2905-163
2700	**AD**	**AD2700J**	**★3178**
			2966-117
		AD2700L	**★3178**
			2966-118
		AD2700S	**★3178**
			2966-119
		AD2700U	**★3178**
			2966-120
	Harris	HA-2700	2911-123
			2925-30
	Oliver	UPP-2700	4006-4
	Stag	**PM2700**	**★4105**
2701	**AD**	**AD2701J**	**★3178**
			2966-121
		AD2701L	**★3178**
			2966-122
		AD2701S	**★3178**
			2966-123
		AD2701U	**★3178**
			2966-124
2702	**AD**	**AD2702L**	**★3178**
			2966-177
		AD2702S	**★3178**
			2966-178
		AD2702U	**★3178**
			2966-179
27025	AD	AD27025	2966-176
2704	Harris	HA-2704	2911-124
			2925-31
2705	Harris	HA-2705	2911-125
			2928-18
2708	AMD	2708	3463-79
		2708-13	3463-72
	Fairchild	F2708	3463-81
		F2708-1	3463-73
	Motorola	MCM2708	3463-83
	OKI	**MSM2708**	**★3873**
			3463-86
	Panasonic	MN2708	3463-87
	TI	**TMS2708-35**	**★ 442**
			3463-74
		TMS2708-45	**★ 442**
			3463-88
2709	Thomson-CSF	SFC2709A	2924-12
271	NEC-Electron	uPC271	2892-40
	Panasonic	AN271	2901-120
	Siemens	FZH271	473-2
2710	**AD**	**AD2710K**	**★3178**
			2966-125
2710	**AD**	**AD2710L**	**★3178**
			2966-126
	Thomson-CSF	SFC2710	2891-29
2711	Thomson-CSF	SFC2711	2893-52
2712	**AD**	**AD2712K**	**★3178**
			2966-180
		AD2712L	**★3178**
			2966-181
27128	**Fujitsu**	**MBM27128-25**	**★3674**
			3467-19
		MBM27128-30	**★3674**
			3467-23
	Intel	**27128**	**★3821**
			3467-16
		27128-2	**★3821**
			3467-17
		27128-25	**★3821**
			3467-18
		27128-3	**★3821**
			3467-21
		27128-30	**★3821**
			3467-22
		27128-4	**★3821**
			3467-24
		27128-45	**★3821**
			3467-25
	Intel	M27128	3467-15
		M27128-45	3467-26
2716	AMD	AM2716	3465-63
		AM2716-1	3465-30
		AM2716-2	3465-44
		AM2716M	3465-64
	Cromemco	**2716**	**★1920**
	Fairchild	F2716	3465-65
		F2716-1	3465-31
	Fujitsu	MBM2716	3465-67
		MBM2716H	3465-32
	Intel	**2716**	**★3818**
			★3822
			3465-69
			¶ 238-11
		2716-1	**★3818**
			★3822
			3465-35
			¶ 238-11
		2716-2	**★3818**
			★3822
			3465-46
			¶ 238-11
		2716-5	**★3818**
			★3822
			3465-88
			¶ 238-11
		2716-6	**★3818**
			★3822
			3465-91
			¶ 238-11
	Intel	M2716	3465-70
		M2716M	3465-71
	Mostek	MK2716-12	3465-92
		MK2716-5	3465-15
		MK2716-6	3465-36
		MK2716-7	3465-47
		MK2716-8	3465-73
		MKB2716	3465-74
		MKB2716-86	3465-37
		MKB2716-87	3465-48
		MKB2716-88	3465-75
		MKB2716-90	3465-89
	Motorola	MCM2716	3465-76
		MCM2716-25	3465-12
		MCM2716-35	3465-38
		TMS2716	3465-86
	National	**DMC2716**	**★3860**
	National	MM2716	3465-78
		MM2716-1	3465-40
		MM2716-2	3465-49
		NMC2716E	3465-79
	NEC-Micro	uPD2716	3465-82
	OKI	**MSM2716**	**★3873**
			3465-83
	Panasonic	MN2716	3465-84
	SGS	M2716	3465-27
	Synertek	SY2716	3465-85
		SY2716-1	3465-42
		SY2716-2	3465-51
2716	TI	TMS2716-30	3465-17
		TMS2716-45	3465-87
272	Interdesign	MOB-272	2473-60
	Panasonic	AN272	2897-29
2720	**AD**	**AD2720**	**★3177**
			2967-1
	Harris	**HA-2720**	**★3236**
			2911-158
			2912-31
			2925-19
2723	Thomson-CSF	SFC2723C	2959-107
		SFC2723EC	2959-108
2725	**Harris**	**HA-2725**	**★3236**
			2911-159
			2912-32
			2927-39
2730	**Harris**	**HA-2730**	**★3239**
			★3287
			2912-58
			2937-24
	Signetics	TDA2730	2902-150
2731	SiliconG	SG2731	2906-85
			2964-140
2732	AMD	AM2732	3466-57
		AM2732-1C	3466-52
		AM2732M	3466-58
	Fairchild	F2732	3466-59
	Fujitsu	MBM2732A-20	3466-39
		MBM2732A-25	3466-42
		MBM2732A-30	3466-48
		MBM2732A-30X	
			3466-49
		MBM2732A-35	3466-53
	Intel	**2732A**	**★3819**
			★3822
			3466-43
	Intel	2732A-2	3466-40
		2732A-20	3466-41
		2732A-25	3466-44
		2732A-3	3466-50
		2732A-30	3466-51
		2732A-4	3466-62
		M2732/S8416	3466-72
		M2732A	3466-63
	NEC-Micro	uPD2732	3466-69
	OKI	MSM2732	3466-70
	TI	TMS2732NLL	1088-53
	Toshiba	TMM2732	3466-71
		TMM2732-2	3466-47
2735	**Harris**	**HA-2735**	**★3239**
			★3287
			2912-59
			2938-14
2740	**Harris**	**HA-2740**	**★3242**
			★3287
			2941-42
		HA-2740-2	**★3242**
			★3287
			2941-43
		HA-2740-5	**★3242**
			★3287
			2942-26
	LSIComp	**LS2740**	**★ 696**
2741	Thomson-CSF	SFC2741	2909-40
2742	AMI	S2742	2902-2
2743	AMI	S2743	2902-3
2747	AMI	S2747	2902-4
2748	AMI	S2748	2902-5
275	Siemens	FZH275	473-3
2758	National	MM2758	3463-77
	OKI	MSM2758	3463-78
276	NEC-Electron	uPD276	2898-56
2761	Siemens	TAA2761	2909-97
2762	Siemens	TAA2762	2909-98
			2937-47
2764	AMD	AM2764	3466-88
		AM2764-2	3466-82
		AM2764-20	3466-83
		AM2764-25	3466-89
		AM2764-3	3466-97
		AM2764-30	3466-98
		AM2764-4	3467-5
		AM2764-45	3467-6
	Fairchild	2764	3466-90
	Fujitsu	**MBM2764-20**	**★3674**
			3466-84
2764	**Fujitsu**	**MBM2764-25**	**★3674**
			3466-91
		MBM2764-30	**★3674**
			3466-99
	Intel	**2764**	**★3820**
			★3822
			3466-92
		2764-2	**★3820**
			★3822
			3466-85
		2764-25	**★3820**
			★3822
			3466-93
		2764-3	**★3820**
			★3822
			3466-101
		2764-30	**★3820**
			★3822
			3466-102
		2764-4	**★3820**
			★3822
			3467-7
		2764-45	**★3820**
			★3822
			3467-8
	Intel	M2764/S8460	3466-94
		M2764/S8461	3467-9
		M2764/S8462	3466-95
		M2764/S8463	3467-10
	OKI	**MSM2764A**	**★3873**
			3467-12
	Toshiba	TMM2764	3466-81
		TMM2764-2	3466-86
2765	Siemens	TAA2765	2909-99
277	Exar	XR-C277	2948-152
			¶ 270-1
	NEC-Electron	uPD277	2898-57
	Panasonic	AN277	2900-123
278	NEC-Electron	uPD278	2898-58
	Panasonic	AN278	2901-8
2791	Signetics	TDA2791	2905-35
	Western	**WD2791**	**★1572**
			1101-120
		WD2791-02	**★1572**
			1101-25
2793	**Western**	**WD2793-02**	**★1572**
			1101-121
2795	**Western**	**WD2795-02**	**★1572**
			1101-122
2797	**Western**	**WD2797-02**	**★1572**
			1101-123
27A08	Motorola	MCM27A08	3463-70
27A16	Motorola	TMS27A16	3465-16
27C16	**National**	**NMC27C16-45**	**★3864**
			3465-80
		NMC27C16-55	**★3864**
			3465-90
		NMC27C16-65	**★3864**
			3465-93
27C32	**National**	**NMC27C32-35**	**★3865**
			3466-55
		NMC27C32-45	**★3865**
			3466-68
		NMC27C32-55	**★3865**
			3466-73
		NMC27C32-65	**★3865**
			3466-74
27C64	**Fujitsu**	**MBM27C64-25**	**★3674**
			3466-87
		MBM27C64-30	**★3674**
			3466-96
27L08	**TI**	**TMS27L08-45**	**★ 442**
			3463-89
27L16	Motorola	MCM27L16	3465-77
		MCM27L16-25	3465-13
		MCM27L16-35	3465-39
27LS00	AMD	AM27LS00-1M	3473-1
		AM27LS00LC	3473-21
		AM27LS00LM	3473-24
		AM27LS00M	3473-2
27LS01	AMD	AM27LS01LC	3473-20
		AM27LS01LM	3473-23
27LS02	AMD	AM27LS02AC	3471-67
		AM27LS02C	3471-95
		AM27LS02M	3471-100
27LS03	AMD	AM27LS03AC	3471-70

¶ Indicates page number in Application Note Directory.
★ Indicates addition data is provided on the page noted.

Base Number	Source	Device	Page-Line
27LS03	AMD	AM27LS03C	3471-96
		AM27LS03M	3471-101
27LS06	AMD	AM27LS06C	3471-68
		AM27LS06M	3471-73
27LS07	AMD	AM27LS07C	3471-71
		AM27LS07M	3471-86
27LS18	AMD	AM27LS18C	3459-30
			¶ 286-1
27LS184			
	AMD	AM27LS184C	3463-121
		AM27LS184M	3464-7
27LS185			
	AMD	AM27LS185C	3464-1
		AM27LS185M	3464-8
27LS19	AMD	AM27LS19C	3459-37
			¶ 286-1
		AM27LS19M	3459-52
			¶ 286-1
27PS185			
	AMD	AM27PS185C	3464-2
		AM27PS185M	3464-9
27PS191			
	AMD	AM27PS191C	3464-68
		AM27PS191M	3464-92
27PS291			
	AMD	AM27PS291AC	3464-69
		AM27PS291AM	3464-93
		AM27PS291C	3464-70
27PS41	AMD	AM27PS41	3465-100
27PS43	AMD	AM27PS43	3466-12
27S02	AMD	AM27S02AC	3470-96
		AM27S02AM	3470-106
		AM27S02C	3471-10
		AM27S02M	3471-35
27S03	AMD	AM27S03AC	3470-101
		AM27S03AM	3471-5
		AM27S03C	3471-22
		AM27S03M	3471-36
27S06	AMD	AM27S06AC	3470-97
		AM27S06AM	3471-1
		AM27S06C	3470-98
		AM27S06M	3471-2
27S07	AMD	AM27S07AC	3470-102
		AM27S07AM	3471-6
		AM27S07C	3470-103
		AM27S07M	3471-7
27S12	AMD	AM27S12AC	3460-42
			¶ 286-1
		AM27S12AM	3460-44
			¶ 286-1
		AM27S12C	3460-51
			¶ 286-1
		AM27S12M	3460-69
			¶ 286-1
27S13	AMD	AM27S13AC	3460-43
			¶ 286-1
		AM27S13AM	3460-45
			¶ 286-1
		AM27S13C	3460-55
			¶ 286-1
		AM27S13M	3460-75
			¶ 286-1
27S15	AMD	AM27S15C	3461-42
			¶ 286-1
		AM27S15M	3461-88
			¶ 286-1
27S18	AMD	AM27S18AC	3459-10
			¶ 286-1
		AM27S18AM	3459-14
			¶ 286-1
		AM27S18C	3459-20
			¶ 286-1
		AM27S18M	3459-31
			¶ 286-1
27S180	AMD	AM27S180AC	3462-60
		AM27S180AM	3462-78
		AM27S180C	3462-94
		AM27S180M	3463-30
27S181	AMD	AM27S181AC	3462-64
			¶ 286-1
		AM27S181AM	3462-81
			¶ 286-1
		AM27S181C	3462-104
			¶ 286-1
		AM27S181M	3463-33
			¶ 286-1
27S184	AMD	AM27S184AC	3463-95
			¶ 286-1
		AM27S184AM	3463-104
			¶ 286-1
		AM27S184C	3463-109
			¶ 286-1
		AM27S184M	3463-115
			¶ 286-1
27S185	AMD	AM27S185AC	3463-96
			¶ 286-1
		AM27S185AM	3463-106
			¶ 286-1
		AM27S185C	3463-110
			¶ 286-1
		AM27S185M	3463-116
			¶ 286-1
27S19	AMD	AM27S19AC	3459-12
			¶ 286-1
		AM27S19AM	3459-18
			¶ 286-1
		AM27S19C	3459-24
			¶ 286-1
		AM27S19M	3459-38
			¶ 286-1
27S190	AMD	AM27S190AC	3464-50
		AM27S190C	3464-64
		AM27S190M	3464-91
27S191	AMD	AM27S191	3464-71
		AM27S191A	3464-52
		AM27S191AM	3464-72
27S20	AMD	AM27S20AM	3459-72
		AM27S20C	3459-76
		AM27S20M	3459-97
27S21	AMD	AM27S21AC	3459-71
			¶ 286-1
		AM27S21AM	3459-74
			¶ 286-1
		AM27S21C	3459-80
			¶ 286-1
		AM27S21M	3459-105
			¶ 286-1
27S25	AMD	AM27S25AC	3460-108
			¶ 286-1
		AM27S25AM	3460-109
			¶ 286-1
		AM27S25C	3460-110
			¶ 286-1
		AM27S25M	3460-111
			¶ 286-1
27S27	AMD	AM27S27C	3460-106
			¶ 286-1
		AM27S27M	3460-107
			¶ 286-1
27S28	AMD	AM27S28AC	3460-116
			¶ 286-1
		AM27S28AM	3461-4
			¶ 286-1
		AM27S28C	3461-19
			¶ 286-1
		AM27S28M	3461-47
			¶ 286-1
27S280	AMD	AM27S280AC	3462-61
		AM27S280AM	3462-79
		AM27S280C	3462-95
		AM27S280M	3463-31
27S281	AMD	AM27S281AC	3462-65
		AM27S281AM	3462-82
		AM27S281C	3462-96
		AM27S281M	3463-34
27S29	AMD	AM27S29AC	3460-119
			¶ 286-1
		AM27S29AM	3461-9
			¶ 286-1
		AM27S29C	3461-22
			¶ 286-1
		AM27S29M	3461-53
			¶ 286-1
27S290	AMD	AM27S290AC	3464-51
		AM27S290AM	3464-65
		AM27S290C	3464-66
27S291	AMD	AM27S291	3464-73
		AM27S291A	3464-53
		AM27S291AM	3464-74
		AM27S291M	3464-94
27S30	AMD	AM27S30AC	3460-118
			¶ 286-1
27S30	AMD	AM27S30AM	3461-7
			¶ 286-1
		AM27S30C	3461-20
			¶ 286-1
		AM27S30M	3461-57
			¶ 286-1
27S31	AMD	AM27S31AC	3461-1
			¶ 286-1
		AM27S31AM	3461-15
			¶ 286-1
		AM27S31C	3461-24
			¶ 286-1
		AM27S31M	3461-54
			¶ 286-1
27S32	AMD	AM27S32AC	3461-101
			3461-101
			¶ 286-1
		AM27S32AM	3461-114
			3461-114
			¶ 286-1
		AM27S32C	3462-9
			3462-9
			¶ 286-1
		AM27S32M	¶ 286-1
27S33	AMD	AM27S33AC	3461-102
			3461-104
			3461-102
			3461-104
			¶ 286-1
		AM27S33AM	3461-117
			3461-117
			¶ 286-1
		AM27S33C	3462-11
			3462-11
			¶ 286-1
		AM27S33M	¶ 286-1
27S37	AMD	AM27S37	3462-62
27S40	AMD	AM27S40	3465-98
		AM27S40A	3465-94
		AM27S40AM	3465-99
		AM27S40M	3466-7
27S41	AMD	AM27S41	3466-1
		AM27S41A	3465-95
		AM27S41AM	3466-2
		AM27S41M	3466-8
27S43	AMD	AM27S43	3466-13
		AM27S43A	3466-14
27S45	AMD	AM27S45	3464-42
		AM27S45A	3464-43
27S47	AMD	AM27S47	3464-44
		AM27S47A	3464-45
27S80	AMD	AM27S80C	3484-45
		AM27S80M	3484-58
27S81	AMD	AM27S81C	3484-49
		AM27S81M	3484-61
27S82	AMD	AM27S82M	3484-59
27S83	AMD	AM27S83C	3484-50
		AM27S83M	3484-62
28	PMI	MUX-28A	2424-90
			¶ 261-8
		MUX-28B	2424-92
			¶ 261-8
		MUX-28E	2424-91
			¶ 261-8
		MUX-28F	2424-93
			¶ 261-8
	TeledyneC	CDA28A	2421-71
280	Signetics	TCA280A	2968-133
2800	**Motorola**	**MCA2800ALS**	★4479
			4141-47
	TRW	CA2800	2888-54
28000	**Oliver**	**UPP-28000**	★4104
			4007-1
		UPP-28000-Z	★4104
			4007-2
2801	Motorola	MC2801	2904-62
	Motorola	**MCM2801**	★3839
			★3847
			3459-1
	Motorola	ULN2801	2480-131
	Motorola	**ULN2801A**	★2753
	Sprague	**ULN-2801A**	★2843
			2480-132
			★2843
			2890-112
2801	Sprague	ULS-2801H	2480-135
			2890-117
	Synertek	**SY2801**	★3956
			3459-55
		SY2801A	★3956
			3459-56
2802	AMD	AM2802C	3488-9
			3488-7
			¶ 289-6
		AM2802M	3488-10
			3488-8
			¶ 289-6
	Motorola	**MCM2802**	★3839
			3459-2
	Motorola	ULN2802	2480-138
	Motorola	**ULN2802A**	★2753
	Sprague	**ULN-2802A**	★2843
			2480-139
			★2843
			2890-113
	Sprague	ULS-2802H	2480-142
			2890-118
	Synertek	**SY2802**	★3957
			3460-35
2803	AMD	AM2803C	3488-17
			¶ 289-6
		AM2803M	3488-18
			¶ 289-6
	Motorola	ULN2803	2480-112
	Motorola	**ULN2803A**	★2753
	Sprague	**ULN-2803A**	★2843
			2480-115
			★2843
			2890-114
	Sprague	ULS-2803H	2480-121
			2890-119
2804	AMD	AM2804C	3488-25
			¶ 289-6
		AM2804M	3488-26
			¶ 289-6
	Motorola	ULN2804	2480-101
	Motorola	**ULN2804A**	★2753
	Sprague	**ULN-2804A**	★2843
			2480-102
			★2843
			2890-115
	Sprague	ULS-2804H	2480-105
			2890-120
	Xicor	**X2804**	★3999
			3461-94
		X2804A	★3999
			3455-29
2805	AMD	AM2805C	3488-13
			¶ 289-6
		AM2805M	3488-11
			¶ 289-6
	Sprague	**ULN-2805A**	★2843
			2480-116
			★2843
			2890-116
	Sprague	ULS-2805H	2480-122
			2890-121
2806	AMD	AM2806C	3488-21
			¶ 289-6
		AM2806M	3488-19
			¶ 289-6
2807	AMD	AM2807C	3488-14
			¶ 289-6
		AM2807M	3488-12
			¶ 289-6
2808	AMD	AM2808C	3488-22
			¶ 289-6
		AM2808M	3488-20
			¶ 289-6
2809	AMD	AM2809C	3491-92
		AM2809M	3491-88
	AMI	S2809	2463-69
281	National	AM281	2416-15
			2416-19
			2416-37
	Siemens	FZH281	472-127
	Siliconix	**DG281A**	★2779
			2416-62
		DG281B	★2779
			2416-63

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
2810	AMD	AM2810C	3491-89
		AM2810M	3491-90
	GI	ER2810HR	3455-38
		ER2810IR	3455-39
	TRW	CA2810	2888-55
28101	**OKI**	**MSM28101**	**★3873**
2811	NCR	NCR2811	3455-41
	Sprague	**ULN-2811A**	**★2843**
			2480-133
			★2843
			2890-122
	Sprague	ULS-2811A	2890-127
		ULS-2811H	2480-136
			2890-128
2812	AMD	AM2812AC	3456-17
			¶ 286-14
		AM2812AL	3456-18
			¶ 286-14
		AM2812C	3456-13
			¶ 286-14
		AM2812L	3456-14
			¶ 286-14
	Plessey	MJ2812	3456-15
	Sprague	**ULN-2812A**	**★2843**
			2480-140
			★2843
			2890-123
	Sprague	ULS-2812H	2480-143
			2890-129
2813	AMD	AM2813AC	3456-22
			¶ 286-14
		AM2813AL	3456-23
			¶ 286-14
		AM2813C	3456-19
			¶ 286-14
		AM2813L	3456-20
			¶ 286-14
	Plessey	MJ2813	3456-21
	Sprague	**ULN-2813A**	**★2843**
			2480-117
			★2843
			2890-124
	Sprague	ULS-2813H	2480-123
			2890-130
2814	AMD	AM2814C	3491-93
			¶ 286-14
		AM2814M	3491-94
			¶ 286-14
	AMI	**S2814**	**★3143**
	Plessey	MJ2814	3456-16
	Sprague	**ULN-2814A**	**★2843**
			2480-103
			★2843
			2890-125
	Sprague	ULS-2814H	2480-106
			2890-131
2815	**AMI**	**S2815**	**★3144**
	Intel	2815	3464-123
		2815-3	3465-19
		2815-4	3465-52
	Sprague	**ULN-2815A**	**★2843**
			2480-118
			★2843
			2890-126
	Sprague	ULS-2815H	2480-124
			2890-132
2816	**Intel**	**2816**	**★3824**
			3465-1
			3465-29
		2816-3	**★3824**
			3465-20
		2816-4	**★3824**
			3465-60
	Intel	M2816	3465-2
	Motorola	**MCM2816**	**★3839**
	National	**NMC2816-25**	**★3861**
			★3863
			3465-3
		NMC2816-35	**★3861**
			★3863
			3465-21
		NMC2816-45	**★3861**
			★3863
			3465-53
		NMC2816E	**★3862**
		NMC2816E-25	**★3861**

Base Number	Source	Device	Page-Line
2816	**National**	**NMC2816E-25**	**★3863**
			3465-4
		NMC2816E-35	**★3861**
			★3863
			3465-22
		NMC2816E-45	**★3861**
			★3863
			3465-54
		NMC2816M-25	**★3861**
			★3863
			3465-5
		NMC2816M-35	**★3861**
			★3863
			3465-23
		NMC2816M-45	**★3861**
			★3863
			3465-55
	OKI	MSM2816	3465-11
	Synertek	SY2816	3465-9
	Xicor	**X2816**	**★3999**
			3465-18
2817	**Intel**	**2817**	**★3825**
			3465-10
		2817-3	**★3825**
			3465-28
		2817-4	**★3825**
			3465-61
	Intel	M2817	3465-62
	Motorola	**MCM2817**	**★3839**
282	National	AM282	2416-50
			2416-54
	Panasonic	AN282	2903-124
2820	TRW	CA2820	2888-56
2821	**Sprague**	**ULN-2821A**	**★2843**
			2480-134
			★2843
			2890-137
	Sprague	ULS-2821H	2480-137
			2890-142
28211	**AMI**	**S28211A**	**★3142**
			2949-19
		S28211B	**★3142**
			2949-20
28214	AMI	S28214A	1102-40
28215	AMI	S28215	2948-55
28216	AMI	S28216	2948-59
2822	**Sprague**	**ULN-2822A**	**★2843**
			2480-141
			★2843
			2890-138
	Sprague	ULS-2822H	2480-144
			2890-143
2823	**Sprague**	**ULN-2823A**	**★2843**
			2480-119
			★2843
			2890-139
	Sprague	ULS-2823H	2480-125
			2890-144
2824	**Sprague**	**ULN-2824A**	**★2843**
			2480-104
			★2843
			2890-140
	Sprague	ULS-2824H	2480-107
			2890-145
2825	AMD	AM2825C	3488-34
		AM2825M	3488-32
	Sprague	**ULN-2825A**	**★2843**
			2480-120
			★2843
			2890-141
	Sprague	ULS-2825H	2480-126
			2890-146
2826	AMD	AM2826C	3488-35
		AM2826M	3488-33
2827	AMD	AM2827C	3488-38
		AM2827M	3488-37
2830	TRW	CA2830	2888-57
2832	**Motorola**	**MCM2832**	**★3839**
			★3848
2833	AMD	AM2833C	3491-109
		AM2833M	3491-110
284	National	AM284	2420-99
			2420-103
	NEC-Electron	uPD284	2898-59
	Siliconix	**DG284A**	**★2780**
			2421-23

Base Number	Source	Device	Page-Line
284	**Siliconix**	**DG284B**	**★2780**
			2421-24
2840	Siemens	TDA2840	2905-28
	TRW	CA2840	2888-58
	Unitrode	**UC2840**	**★3445**
			2961-107
	Western	WD2840	1101-54
2841	AMD	2841A	3456-37
		AM2841C	3456-33
		AM2841M	3456-34
	Plessey	MJ2841	3456-36
	Siemens	TDA2841	2905-29
	SiliconG	SG2841	2483-16
	Sprague	**UDN-2841B**	**★2843**
			2889-106
	TI	UDN2841	2889-124
2842	**Sprague**	**UDN-2842B**	**★2843**
			2889-107
	TRW	CA2842	2888-59
2843	**Sprague**	**UDN-2843B**	**★2843**
			2889-108
2844	**Sprague**	**UDN-2844B**	**★2843**
			2889-109
2845	**Sprague**	**UDN-2845B**	**★2843**
			2889-110
	TI	UDN2845	2889-125
2846	**Sprague**	**UDN-2846B**	**★2843**
			2889-111
2847	AMD	AM2847C	3491-77
		AM2847M	3491-74
	Fairchild	F2847	3491-78
		F2847L	3491-79
		F2847LM	3491-75
		F2847M	3491-76
285	National	AM285	2421-10
			2421-14
	National	**LM1285**	**★3304**
			2966-15
		LM1285-1	**★3304**
		LM1285-2	**★3304**
			2966-60
	SGS	LS285A	2950-6
	Siemens	FZH285B	472-128
2850	TRW	CA2850	2888-60
2851	TRW	CA2851	2888-61
2855	AMD	AM2855	3491-95
2856	AMD	AM2856	3491-102
2857	AMD	AM2857C	3491-105
2859	AMI	S2859	2949-137
286	**AMD**	**IAPX286**	**★1231**
			1077-19
	Intel	**IAPX286/10**	**★1348**
			1097-137
			★1348
			1079-11
	Intel	iAPX286/20	1079-12
	NEC-Electron	uPD286	2898-60
2860	AMI	S2860	2949-138
287	National	AM287	2418-73
			2418-77
	Panasonic	AN287	2904-147
	Siliconix	**DG287A**	**★2779**
			2418-114
		DG287B	**★2779**
			2418-115
	TI	**TL287C**	**★3424**
			2936-6
		TL287M	**★3424**
			2936-7
2870	Mostek	MK2870	1090-73
	TRW	CA2870	2888-62
2871	TRW	CA2871	2888-63
2872	Western	CR2872	1088-69
2875	TRW	CA2875	2888-64
2876	TRW	CA2876	2888-65
2877	**National**	**LM2877**	**★3326**
			★3328
			2897-95
2878	**National**	**LM2878**	**★3326**
			2897-110
2879	National	LM2879	2897-111
288	National	AM288	2418-101
			2418-105
	SGS	LS288	2949-43
	TI	**TL288C**	**★3424**
			2937-21

Base Number	Source	Device	Page-Line
288	**TI**	**TL288M**	**★3424**
			2937-22
2880	TRW	CA2880	2888-66
2886	**Sprague**	**UTN-2886B**	**★2843**
			2890-151
2887	National	LM2887	2903-105
2888	**Sprague**	**UTN-2888A**	**★2843**
			2890-152
2895	**National**	**LM2895**	**★3326**
			2896-87
2896	AMD	AM2896C	3491-85
		AM2896M	3491-84
	National	**LM2896**	**★3326**
			★3328
			2897-96
28L166	**TI**	**TBP28L166**	**★ 440**
			3464-106
		TBP28L166A	**★3972**
28L22	**TI**	**TBP28L22**	**★ 440**
			★3969
			3460-29
		TBP28L22M	**★ 440**
			★3969
			3460-34
28L42	**TI**	**TBP28L42**	**★ 440**
			★3970
			3461-28
28L45	**TI**	**TBP28L45**	**★3971**
			3461-29
28L46	**TI**	**TBP28L46**	**★ 440**
			★3971
28L85	TI	TBP28L85	3462-112
	TI	**TBP28L85A**	**★3971**
28L86	**TI**	**TBP28L86**	**★ 440**
			★3972
			3463-28
		TBP28L86M	**★ 440**
			★3972
			3463-29
28LA22	**TI**	**TBP28LA22**	**★ 440**
			★3969
			3460-25
		TBP28LA22M	**★ 440**
			★3969
			3460-32
28LA42	**TI**	**TBP28LA42**	**★3970**
28LA45	**TI**	**TBP28LA45**	**★3971**
28LA46	**TI**	**TBP28LA46**	**★3971**
28P166	**TI**	**TBP28P166**	**★3973**
			3464-48
28P42	TI	TBP28P42	3460-113
28P45	**TI**	**TBP28P45**	**★3973**
			3460-114
28P85	**TI**	**TBP28P85**	**★3973**
			3462-58
28R165	**TI**	**TBP28R165**	**★3975**
			3463-94
28R166	**TI**	**TBP28R166**	**★ 440**
			★3975
			3464-46
28R45	**TI**	**TBP28R45**	**★3974**
			3460-112
28R46	**TI**	**TBP28R46**	**★ 440**
			★3974
28R85	**TI**	**TBP28R85**	**★3974**
			3462-57
28R86	**TI**	**TBP28R86**	**★ 440**
			★3974
28S165	**TI**	**TBP28S165**	**★3979**
28S166	**TI**	**TBP28S166**	**★ 440**
			★3979
			3464-49
28S20	AMD	AM28S20AC	3459-70
28S2708			
	TI	**TBP28S2708**	**★3980**
			3463-27
28S42	**TI**	**TBP28S42**	**★ 440**
			★3975
			3461-41
		TBP28S42M	**★ 440**
			★3975
			3461-64
			3461-65
			3461-83
			3461-84

¶ Indicates page number in Application Note Directory.
★Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
28S45	TI	TBP28S45	★3976
			3460-115
28S46	TI	TBP28S46	★ 440
			★3976
			3461-46
		TBP28S46M	★ 440
			★3976
			3461-72
28S85	TI	TBP28S85	★3977
			3462-59
28S86	TI	TBP28S86-60	★ 440
			★3977
			3462-102
		TBP28S86-85	★ 440
28SA166			
	TI	TBP28SA166	★ 440
			★3979
			3464-47
28SA42	TI	TBP28SA42	★ 440
			★3976
			3461-49
		TBP28SA42M	★ 440
			★3976
			3461-80
28SA45	TI	TBP28SA45	★3976
28SA46	TI	TBP28SA46	★ 440
			3461-52
		TBP28SA46M	★ 440
			3461-82
28SA86	TI	TBP28SA86-60	★3978
			3462-103
		TBP28SA86M	★3978
			3463-21
29	AMD	AM29/6310	★1701
		AMSYS29	★1228
			1614-3
		AMSYS29/10	★1228
			★1701
			1614-4
	Datal/O	29A	4003-1
	TeledyneC	CDA29A	2419-96
290	National	AM290	2419-72
			2419-74
	SGS	L290	2963-115
	SiliconG	SG290N	2906-58
	Siliconix	DG290A	★2780
			2419-94
		DG290B	★2780
			2419-95
2900	Harris	HA-2900	2911-57
			2915-10
			¶ 267-10
	National	LM2900	2913-102
	NCR	NCR2900	510-60
	Raytheon	2900	1085-90
			1049-16
		LM2900	2913-104
	TI	LM2900	2913-106
2901	AMD	AM2901	★1201
			1049-4
			¶ 244-8
		AM2901A	★1201
			1049-5
			¶ 244-8
			¶ 244-14
		AM2901AC	★1201
			476-23
			¶ 244-8
			★1201
			1085-71
			¶ 244-8
		AM2901AM	★1201
			476-24
			¶ 244-8
			★1201
			1085-72
			¶ 244-8
		AM2901B	★1201
			1049-6
			¶ 244-8
		AM2901BC	★1201
			476-25
			¶ 244-8
			★1201
			1085-73
			¶ 244-8
2901	AMD	AM2901BM	★1201
			476-26
			¶ 244-8
			★1201
			1085-74
			¶ 244-8
		AM2901C	★1201
			476-27
			¶ 244-8
			★1201
			1085-75
			¶ 244-8
		AM2901M	★1201
			476-28
			¶ 244-8
			★1201
			1085-76
			¶ 244-8
	Fairchild	F2901A	1049-9
		F2901AC	476-32
			1085-82
		F2901AM	476-33
			1085-83
	Motorola	LM2901	2895-38
		MC2901A	1049-13
	National	ADM2901AC	476-37
	National	IDM2901A-2	★3856
			1085-87
		IDM2901A/A-1	★3856
			1049-15
		IDM2901AC	★3856
			1085-88
		IDM2901AM	★3856
			476-38
			★3856
			1085-89
	National	LM2901	2895-39
	NEC-Electron	uPC2901	2895-40
	Raytheon	LM2901	2895-41
	Signetics	LM2901	2895-42
	TI	LM2901	2895-43
2902	AMD	AM2902AC	★1202
			1085-127
			¶ 244-8
		AM2902AM	★1202
			1085-128
			¶ 244-8
	Motorola	LM2902	2913-21
		MC2902AC	1085-129
		MC2902AM	1085-130
	National	IDM2902C	1085-131
		IDM2902M	1085-132
		LM2902	2913-23
	NEC-Electron	uPC2902	2943-56
	Raytheon	LM2902	2913-25
	TI	LM2902	2913-27
2903	AMD	AM2903	★1203
			1049-7
		AM2903AC	★1203
			1085-77
		AM2903AM	★1203
			1085-78
		AM2903C	★1203
			476-29
			★1203
			1085-79
		AM2903M	★1203
			476-30
			★1203
			1085-80
	Fairchild	F2903	1049-10
		F2903C	476-34
			1085-84
		F2903M	476-35
			1085-85
		uA2903	2894-1
	Motorola	MC2903	1085-86
			1049-14
	National	LM2903	★3317
			2894-2
	Signetics	LM2903	2894-3
	TI	LM2903	2894-4
2904	AMD	AM2904C	★1204
			1085-122
		AM2904M	★1204
			1085-123
2904	Harris	HA-2904	2911-16
			2914-46
	Hitachi	HD2904	2469-24
	Motorola	LM2904	2913-22
	National	LM2904	2913-24
	RCA	CA2904	2913-26
	TI	LM2904	2913-28
2905	AMD	AM2905C	★1205
			2477-57
			★1205
			1085-91
		AM2905M	★1205
			2477-49
			★1205
			1085-92
	Harris	HA-2905	2915-40
	Hitachi	HD2905	2473-20
	National	LM2905	2951-14
2906	AMD	AM2906C	★1205
			2477-58
			★1205
			1085-93
		AM2906M	★1205
			2477-50
			★1205
			1085-94
2907	AMD	AM2907C	★1206
			2477-55
			★1206
			1085-95
		AM2907M	★1206
			2477-47
			★1206
			1085-96
	Cherry	CS2907	2963-111
			2964-127
		MC2907	2906-66
	National	LM2907	2907-5
			2963-113
			¶ 277-9
2908	AMD	AM2908C	★1206
			2477-56
		AM2908M	★1206
			2477-48
	Harris	LM2908	★3288
2909	AMD	AM2909A	★1207
			506-151
			¶ 244-14
			★1207
			1086-1
			¶ 244-14
		AM2909C	★1207
			506-152
			¶ 244-14
			★1207
			1086-2
			¶ 244-14
		AM2909M	★1207
			506-153
			¶ 244-14
			★1207
			1086-3
			¶ 244-14
	National	IDM2909AC	506-158
			1086-7
		IDM2909AM	506-159
			1086-8
291	National	AM291	2419-85
			2419-89
	SGS	L291	2963-116
	Siemens	FZH291	472-121
		S291	2947-92
	SiliconG	SG291N	2906-59
2910	AMD	AM2910C	★1208
			1098-131
		AM2910M	★1208
			1098-132
	Fairchild	F2910C	1098-133
		F2910M	1098-134
	Intel	2910	2947-97
		2910A	2947-98
	National	IDM2910A	★3857
			1101-55
	OEI	2910	★3347
2910	OEI	2910	2887-130
			2887-134
	TI	TCM2910A	2947-110
2911	AMD	AM2911A	★1207
			506-154
			★1207
			1086-4
		AM2911C	★1207
			506-155
			★1207
			1086-5
		AM2911M	★1207
			506-156
			★1207
			1086-6
	Intel	2911A	2947-44
	National	IDM2911AC	506-160
			1086-9
		IDM2911AM	506-161
			1086-10
	TI	TCM2911A	2947-58
29112	AMD	AM29112	★1223
			1098-135
29116	AMD	AM29116	★1224
			1077-14
2912	AMD	AM2912C	★1209
			1085-97
	Hitachi	HD2912	2483-39
	Intel	2912A	2948-81
			¶ 269-12
	TI	TCM2912A	2948-79
2913	AMD	AM2913C	★1209
			508-145
			¶ 244-8
			¶ 244-12
			★1209
			1086-19
			¶ 244-8
			¶ 244-12
		AM2913M	★1209
			508-146
			¶ 244-8
			¶ 244-12
			★1209
			1086-20
			¶ 244-8
			¶ 244-12
	Intel	2913	2947-67
	TI	TCM2913	2947-71
2914	AMD	AM2914C	★1210
			1086-17
			1102-64
			¶ 244-8
			¶ 244-12
		AM2914M	★1210
			1086-18
			1102-65
			¶ 244-8
			¶ 244-12
	Intel	2914	2947-68
	TI	TCM2914	2947-72
2915	AMD	AM2915AC	★1211
			2476-54
			★1211
			1085-98
		AM2915AM	★1211
			2476-22
			★1211
			1085-99
	Hitachi	HD2915	2473-19
2916	AMD	AM2916AC	★1211
			2476-55
			★1211
			1085-100
		AM2916AM	★1211
			2476-23
			★1211
			1085-101
	Hitachi	HD2916	2483-40
	OKI	MSM2916	★3873
			3485-45
2917	AMD	AM2917AC	★1212
			2476-56
			★1212
			1085-102
		AM2917AM	★1212

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
2917	AMD	AM2917AM	2476-24
			★1212
			1085-103
	Cherry	CS2917	2906-65
			2907-4
			2963-112
			2964-128
	National	LM2917	2907-6
			2963-114
			¶ 277-9
2918	AMD	AM2918C	★1213
			485-160
			★1213
			1086-44
		AM2918M	★1213
			485-161
			★1213
			1086-45
	Raytheon	AM2918C	485-162
			1086-46
		AM2918M	485-163
			1086-47
2919	AMD	AM2919C	★1213
			1086-40
		AM2919M	★1213
			1086-41
	Hitachi	HD2919	2481-42
292	National	LM292	2887-149
			2938-37
	SGS	L292	2963-117
2920	AMD	AM2920C	★1214
			486-111
			★1214
			1086-52
		AM2920M	★1214
			486-112
			★1214
			1086-53
	Intel	2920-10	2967-169
			¶ 236-4
			¶ 236-8
			¶ 236-10
			¶ 277-6
		2920-16	2967-170
			¶ 236-4
			¶ 236-8
			¶ 236-10
			¶ 277-6
		2920-18	2967-171
			¶ 236-4
			¶ 236-8
			¶ 236-10
			¶ 277-6
29203	AMD	AM29203	★1203
			476-31
			★1203
			1085-81
			★1203
			1049-8
2921	AMD	AM2921C	☆1214
			482-121
			★1214
			1086-64
		AM2921M	★1214
			482-122
			★1214
			1086-65
2922	AMD	AM2922C	★1215
			500-20
			★1215
			1086-74
		AM2922M	★1215
			500-21
			★1215
			1086-75
	Hitachi	HD2922	2483-17
2923	AMD	AM2923C	★1215
			1086-76
2924	AMD	AM2924C	★1216
			1085-113
	National	LM2924	2888-1
2925	AMD	AM2925C	★1216
			1085-110
		AM2925M	★1216
			1085-111
	SiliconG	SG2925	2906-60

Base Number	Source	Device	Page-Line
2926	AMD	AM2926C	★1217
			1086-38
2927	AMD	AM2927C	★1217
			1085-104
2928	AMD	AM2928C	★1217
			1085-105
2929	AMD	AM2929C	★1217
			1086-39
293	Fairchild	uA293	2893-53
		uA293A	2893-8
	National	LM293	★3317
			2893-55
		LM293A	★3317
			2893-10
	SGS	L293	2963-118
	Signetics	LM293	2893-57
	TI	LM293	2893-59
2930	National	LM2930-5	★3299
		LM2930-8	★3299
29301	TI	SN29301	483-21
29308	TI	SN29308	495-103
29309	TI	SN29309	497-113
2931	National	LM2931	★3299
			2959-12
		LM2931-5	★3299
29310	TI	SN29310	480-141
29311	TI	SN29311	484-36
29312	TI	SN29312	499-133
29316	TI	SN29316	478-118
29318	TI	SN29318	508-137
2932	OKI	MSM2932	★3873
294	Panasonic	AN294	2904-70
2940	AMD	AM2940C	★1218
			1085-114
		AM2940M	★1218
			1085-115
2942	AMD	AM2942C	★1219
			1085-116
		AM2942M	★1219
			1085-117
2946	AMD	AM2946C	★1220
			1085-106
2947	AMD	AM2947C	★1220
			1085-107
2948	AMD	AM2948C	★1220
			1085-108
2949	AMD	AM2949C	★1220
			1085-109
	Sprague	UDN-2949Z	★2843
			2906-98
			2964-143
295	National	LM295	2962-110
	Panasonic	AN295	2904-71
	Siemens	FZH295B	472-122
2950	AMD	AM2950C	★1221
			1086-70
		AM2950M	★1221
			1086-71
29501	AMD	AM29501	★ 602
			507-18
2951	AMD	AM2951C	★1221
			1086-72
		AM2951M	★1221
			1086-73
29516	AMD	AM29516	★ 601
			475-134
29517	AMD	AM29517	★ 601
			475-135
2952	AMD	AM2952C	1086-66
		AM2952M	1086-67
	Sprague	UDN-2952	★2843
			2964-117
29520	AMD	AM29520	★ 602
			506-168
29521	AMD	AM29521	★ 602
			506-169
2953	AMD	AM2953C	1086-68
		AM2953M	1086-69
2954	AMD	AM2954C	★1222
			1086-62
29540	AMD	AM29540	★ 603
			507-6
2955	AMD	AM2955C	★1222
			1086-63
2956	AMD	AM2956C	★1222
			1086-56

Base Number	Source	Device	Page-Line
2956	Sprague	UDN-2956A	★2843
			2480-22
			★2843
			2889-174
			2949-14
2957	AMD	AM2957C	★1222
			1086-57
	Sprague	UDN-2957A	★2843
			2480-23
			★2843
			2889-175
			2949-15
2958	AMD	AM2958C	★1223
			1086-50
2959	AMD	AM2959C	★1223
			1086-51
2960	AMD	AM2960C	1085-119
		AM2960M	1085-120
29601	TI	SN29601	500-115
2961	AMD	AM2961C	1085-124
		AM2961M	1085-125
29611	Raytheon	29611	3460-67
			3460-68
			3460-90
			3460-91
		29611A	3460-46
29613	Raytheon	29613A	3459-84
			3459-85
			3459-103
			3459-104
		29613C	3460-81
		29613M	3460-97
2962	AMD	AM2962C	1085-126
29623	Raytheon	29623	3461-63
29631	Raytheon	29631A	3462-107
			3462-108
29633	Raytheon	29633A	3462-109
			3462-110
			3463-17
			3463-18
		29633C	3463-63
29635	Raytheon	29635C	3463-57
29637	Raytheon	29637	3463-25
		29637C	3463-58
		29637M	3463-67
2964	AMD	AM2964B	1085-118
	OKI	MSM2954	★3873
2965	AMD	AM2965C	2483-146
			1086-58
		AM2965M	2483-147
			1086-59
29651	Raytheon	29651A	3464-4
		29651C	3464-21
		29651M	3464-34
29653	Raytheon	29653A	3464-5
		29653C	3464-24
		29653M	3464-35
2966	AMD	AM2966C	2483-148
			1086-60
		AM2966M	2483-149
			1086-61
29671	Raytheon	29671	3466-28
			3466-29
			3466-35
			3466-36
		29671A	3466-25
			3466-26
			3466-30
29673	Raytheon	29673	3466-31
			3466-33
			3466-34
			3466-37
			3466-38
29681	Raytheon	29681	3464-114
		29681A	3464-81
			3464-82
			3464-102
			3464-103
29683	Raytheon	29683	3464-116
		29683A	3464-83
			3464-84
			3464-104
			3464-105
29693	Raytheon	29693C	500-72
			3457-116
			1086-21

Base Number	Source	Device	Page-Line
29693	Raytheon	29693M	500-73
			3457-117
			1086-22
2970	National	IDM2970C	3471-56
29700	AMD	AM29700C	3470-99
		AM29700M	3471-3
29701	AMD	AM29701C	3470-104
		AM29701M	3471-8
29702	AMD	AM29702C	3470-100
		AM29702M	3471-4
29703	AMD	AM29703C	3470-105
		AM29703M	3471-9
29704	AMD	AM29704C	497-34
			3471-83
			1086-25
		AM29704M	497-35
			3471-94
			1086-26
	Fairchild	F29704C	3471-84
			1086-30
		F29704M	3471-85
			1086-31
	National	IDM29704C	497-43
		IDM29704M	497-44
			3471-69
29705	AMD	AM29705C	★1225
			497-45
			¶ 244-8
			★1225
			3471-57
			¶ 244-8
			★1225
		AM29705M	★1225
			497-46
			¶ 244-8
			★1225
			1086-28
			¶ 244-8
	Fairchild	F29705C	3471-58
			1086-32
		F29705M	1086-33
	National	F29705M	3471-59
		IDM29705	3471-60
		IDM29705AC	497-50
			1086-34
		IDM29705AM	497-51
			1086-35
		IDM29705C	497-52
			3471-48
		IDM29705M	497-53
29707	AMD	AM29707	★1225
			1086-29
29721	AMD	AM29721M	3473-3
29750	AMD	AM29750AC	3459-21
		AM29750AM	3459-32
29751	AMD	AM29751AC	3459-25
		AM29751AM	3459-39
29760	AMD	AM29760AC	3459-77
		AM29760AM	3459-98
29761	AMD	AM29761AC	3459-81
		AM29761AM	3459-106
29770	AMD	AM29770C	3460-52
		AM29770M	3460-70
29771	AMD	AM29771C	3460-56
		AM29771M	3460-76
298	AMD	LF298	2967-51
	Burr-Brown	SHC298AM	2967-68
	Fairchild	uAF298	2967-84
	National	LF298	2967-111
		LF298A	2967-112
	Signetics	LF298	2967-136
29800	AMD	AM29800	★2601
29803	AMD	AM29803A	★1226
	AMD	AM29803AC	1086-77
		AM29803AM	1086-78
	National	IDM29803C	1086-79
		IDM29803M	1086-80
2981	Sprague	UDN-2981A	★2843
			2480-127
			★2843
			2890-104

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
2981	Sprague	UDS-2981H	2480-129
			2890-108
29811	**AMD**	**AM29811A**	★**1226**
	AMD	AM29811AC	1086-11
		AM29811AM	1086-12
	National	IDM29811C	1086-13
		IDM29811M	1086-14
2982	**Sprague**	**UDN-2982A**	★**2843**
			2480-108
			★**2843**
			2890-105
	Sprague	UDS-2982H	2480-110
			2890-109
29821	**AMD**	**AM29821**	★**2602**
			503-16
29822	**AMD**	**AM29822**	★**2602**
			503-17
29823	**AMD**	**AM29823**	★**2602**
			503-8
29824	**AMD**	**AM29824**	★**2602**
			503-9
29825	**AMD**	**AM29825**	★**2602**
			502-63
29826	**AMD**	**AM29826**	★**2602**
			502-64
29827	**AMD**	**AM29827**	★**2604**
			477-50
29828	**AMD**	**AM29828**	★**2604**
			477-51
2983	**Sprague**	**UDN-2983A**	★**2843**
			2480-128
			★**2843**
			2890-106
	Sprague	UDS-2983H	2480-130
			2890-110
29833	**AMD**	**AM29833**	★**2606**
			505-118
29834	**AMD**	**AM29834**	★**2606**
			505-119
2984	**Sprague**	**UDN-2984A**	★**2843**
			2480-109
			★**2843**
			2890-107
	Sprague	UDS-2984H	2480-111
			2890-111
29841	**AMD**	**AM29841**	★**2607**
			496-144
29842	**AMD**	**AM29842**	★**2607**
			496-145
29843	**AMD**	**AM29843**	★**2607**
			496-142
29844	**AMD**	**AM29844**	★**2607**
			496-143
29845	**AMD**	**AM29845**	★**2607**
			496-138
29846	**AMD**	**AM29846**	★**2607**
			496-139
2986	AMD	AM2986	505-122
29861	**AMD**	**AM29861**	★**2604**
			505-123
29862	**AMD**	**AM29862**	★**2604**
			505-124
29863	**AMD**	**AM29863**	★**2604**
			505-121
29864	**AMD**	**AM29864**	★**2604**
			505-120
29882	AMD	AM29882C	3484-46
		AM29882M	3484-60
29883	AMD	AM29883C	3484-51
		AM29883M	3484-63
299	**National**	**LM299**	★**3304**
			2966-108
			¶ 282-13
		LM299A	★**3304**
			2966-109
			¶ 282-13
			¶ 282-13
	NEC-Electron	uPD299	2898-61
29901	National	IDM29901C	1086-54
		IDM29901M	1086-55
29902	National	IDM29902C	1086-15
		IDM29902M	1086-16
29903	National	IDM29903C	1086-81
29908	National	IDM29908C	1086-48
		IDM29908M	1086-49
29LS18	**AMD**	**AM29LS18**	★**1213**

Base Number	Source	Device	Page-Line
2D1	IPI	IPI2D1	2963-134
20V12	Lambda	L20V12	2965-45
20V15	Lambda	L20V15	2965-46
20V18	Lambda	L20V18	2965-47
20V20	Lambda	L20V20	2965-48
20V24	Lambda	L20V24	2965-49
20V5	Lambda	L20V5	2965-50
20V6	Lambda	L20V6	2965-51
20V9	Lambda	L20V9	2965-52
2S10	TI	AM2S10C	2478-10
3	AMI	UA-3	4140-12
	Cromemco	**CBL-3**	★**1923**
	DataGen	MBC/3	1767-16
	Datel	ADCHU3B	2426-1
	Datel	**VF2-3C**	★**2623**
	Datel	VFQ-3	2968-68
		VFQ-3C	2963-87
	DGM	DSC-3	1757-3
	Supertex	SD3	2906-127
	Synertek	**KTM-3**	★**1980**
		M-3	★**1980**
30	CompAuto	4/30	1619-4
	IPI	IPL30	2964-45
	NEC-Electron	uPC30	2900-81
	TeledyneC	CAG30	2415-20
	Unitrode	PF30	2964-96
		PR30	2964-102
300	Cybernetic	CY300	2465-3
			1101-49
	Dionics	DI300	2465-109
	Exar	XR300	4140-70
	Harris	**HI300**	★**2630**
			★**3287**
			2415-30
	Intersil	LM300	2959-8
	ITT	SAJ300	2899-33
	LSIComp	**RED300/360**	★ **696**
			462-66
			511-28
	Motorola	**MVME300**	★**1936**
	Raytheon	CGA300	4141-87
	SiliconG	SG300	2959-9
	Siliconix	**300A**	★**2779**
		DG300A	★**2779**
			2415-34
		DG300AA	★**2779**
			2415-35
		DG300AB	★**2779**
			2415-36
		DG300AC	★**2779**
			2415-37
		DG300B	★**2779**
			2415-38
		DG300C	★**2779**
			2415-39
	Unitrode	PF300	2964-97
		PR300	2964-103
3000	**AMI**	**GA3000D**	★**4307**
			4140-6
	Cherry	CS3000F	4140-46
		CS3000FX	4140-47
	Curtis	PM3000S	4002-1
	Intel	3000	1049-1
	LSIComp	**RED3000/3600**	★ **696**
			462-67
			511-32
	MicroNet	MN3000	2443-22
		MN3000H	2443-23
	Motorola	**MC3000**	★ **729**
			492-29
		SYSTEM3000	★**1943**
	Plessey	**CLA3000**	★**4505**
	RCA	CA3000	2887-37
			¶ 264-4
	Siemens	TDA3000	2897-2
	Signetics	N3000	1049-2
3001	Intel	M3001	506-157
	MicroNet	MN3001	2443-24
		MN3001H	2443-25
	Motorola	MC3001	489-156
	Panasonic	MN3001	2898-20
			2962-43
	RCA	CA3001	2888-93
			¶ 269-1
	RCA	**MSE3001**	★**1961**
	Signetics	**3001**	★**1512**

Base Number	Source	Device	Page-Line
3001	Signetics	N3001	506-162
			¶ 244-7
			¶ 244-11
			1085-59
			¶ 244-7
			¶ 244-11
		S3001	506-164
			1085-60
	Signetics	**SH3001**	★**1512**
	SiliconG	SG3001	2888-108
	Siliconix	**VQ3001**	★**2841**
			2483-74
3002	Fairchild	SH3002C	2419-6
		SH3002M	2419-7
	Intel	3002	476-36
	MicroNet	MN3002	2443-26
		MN3002H	2443-27
	Motorola	MC3002	494-151
		TCA3002	2912-83
	Panasonic	MN3002	2962-61
	RCA	CA3002	2901-10
			¶ 268-9
	Signetics	**3002**	★**1512**
	Signetics	N3002	476-39
			¶ 243-18
			¶ 244-7
			¶ 244-11
			1085-57
			¶ 243-18
			¶ 244-7
			¶ 244-11
		S3002	476-40
			1085-58
	Signetics	**SI3002**	★**1512**
	Siliconix	SI3002A	2418-121
		SI3002B	2419-1
3003	Fairchild	SH3003C	2420-25
		SH3003M	2420-26
	MicroNet	MN3003	2446-43
		MN3003H	2446-44
	Motorola	MC3003	493-144
		TCA3003	2912-84
	Panasonic	MN3003	2962-47
3004	Hughes	HNVM3004	3461-98
			3461-98
	MicroNet	MN3004	2446-45
		MN3004H	2446-46
	Motorola	MC3004	491-157
	Panasonic	MN3004	2962-62
	RCA	CA3004	2888-94
			¶ 268-10
	Signetics	SAA3004	2901-162
3005	MicroNet	MN3005	2447-1
		MN3005H	2447-2
	Motorola	MC3005	491-3
	Panasonic	MN3005	2962-59
	RCA	CA3005	2901-11
			2901-165
			¶ 268-10
			¶ 271-13
3006	MicroNet	MN3006	2443-28
		MN3006H	2443-29
	Motorola	MC3006	489-58
	Panasonic	MN3006	2962-52
	RCA	CA3006	2901-12
			2901-166
			¶ 268-10
3007	MicroNet	MN3007	2447-3
		MN3007H	2447-4
	Motorola	MC3007	490-155
	Panasonic	MN3007	2962-48
	RCA	CA3007	2887-38
			¶ 272-9
3008	Hughes	HNVM3008	3463-90
	MicroNet	MN3008	2442-48
			¶ 257-3
		MN3008H	2442-49
			¶ 257-3
	Motorola	MC3008	477-184
	Panasonic	MN3008	2962-53
	RCA	CA3008	2929-49
			¶ 265-3

Base Number	Source	Device	Page-Line
3008	RCA	CA3008A	2924-19
			¶ 265-3
	RIFA	PBA3008	2951-2
3009	MicroNet	MN3009	2442-50
		MN3009H	2442-51
	Motorola	MC3009	477-76
	Panasonic	MN3009	2962-56
	RIFA	PBA3009	2951-3
301	**AD**	**AD301A**	★**3153**
			2931-50
		AD301AL	★**3153**
			2919-30
	Fairchild	uA301A	2931-51
	Harris	**HI301**	★**2630**
			★**3287**
			2418-4
	Harris	LM301A	2931-52
	Intersil	ICL301ALN	2931-41
	MicroPwr	MP301	2889-71
	Motorola	LM301A	2931-53
	Motorola	**MVME301**	★**1936**
	National	LM301A	2931-54
	NEC-Electron	uPC301	2931-56
	Panasonic	AN301	2903-6
	Raytheon	LM301A	2928-51
	RCA	CA301A	2931-57
	RCA	**GP301**	★ **409**
			1086-99
	Siemens	FZH301	472-125
		SM301A	2949-90
	Signetics	LM301A	2931-58
	SiliconG	SG301A	2931-59
	Siliconix	**DG301A**	★**2779**
			2418-7
		DG301AA	★**2779**
			2418-8
		DG301AB	★**2779**
			2418-9
		DG301AC	★**2779**
			2418-10
		DG301B	★**2779**
			2418-11
		DG301C	★**2779**
			2418-12
	TeledyneC	CSR301	2463-36
			2481-53
	TeledyneS	301A/C	472-45
		301B/M	472-46
	TI	LM301A	2931-60
3010	IPI	IPI3010	2964-6
	MicroNet	MN3010	2444-45
		MN3010H	2444-46
	Motorola	MC3010	490-113
	Panasonic	MN3010	2898-21
			2962-44
	RCA	CA3010	2929-50
			¶ 265-3
		CA3010A	2924-20
			¶ 265-3
	Sharp	LI3010	1088-12
3011	Motorola	MC3011	488-175
	National	**LM3011**	★**3325**
			★**3328**
			2901-31
	Panasonic	MN3011	2962-57
	RCA	CA3011	2888-95
			¶ 271-13
3012	Motorola	MC3012	490-57
	Panasonic	MN3012	2962-58
	RCA	CA3012	2901-13
			¶ 271-13
3013	MicroNet	MN3013	2443-30
		MN3013H	2443-31
	RCA	CA3013	2901-42
			¶ 271-13
	Signetics	SAB3013	2904-46
	Sprague	UGN-3013	511-71
			2963-124
3014	MicroNet	MN3014	2443-8
		MN3014H	2443-9
	RCA	CA3014	2901-43
			¶ 271-13
3015	MicroNet	MN3015	2441-36
		MN3015H	2441-37
	Motorola	MC3015	492-80
	RCA	CA3015	2913-129

Arranged alphanumerically from left to right.

© IC MASTER 1983

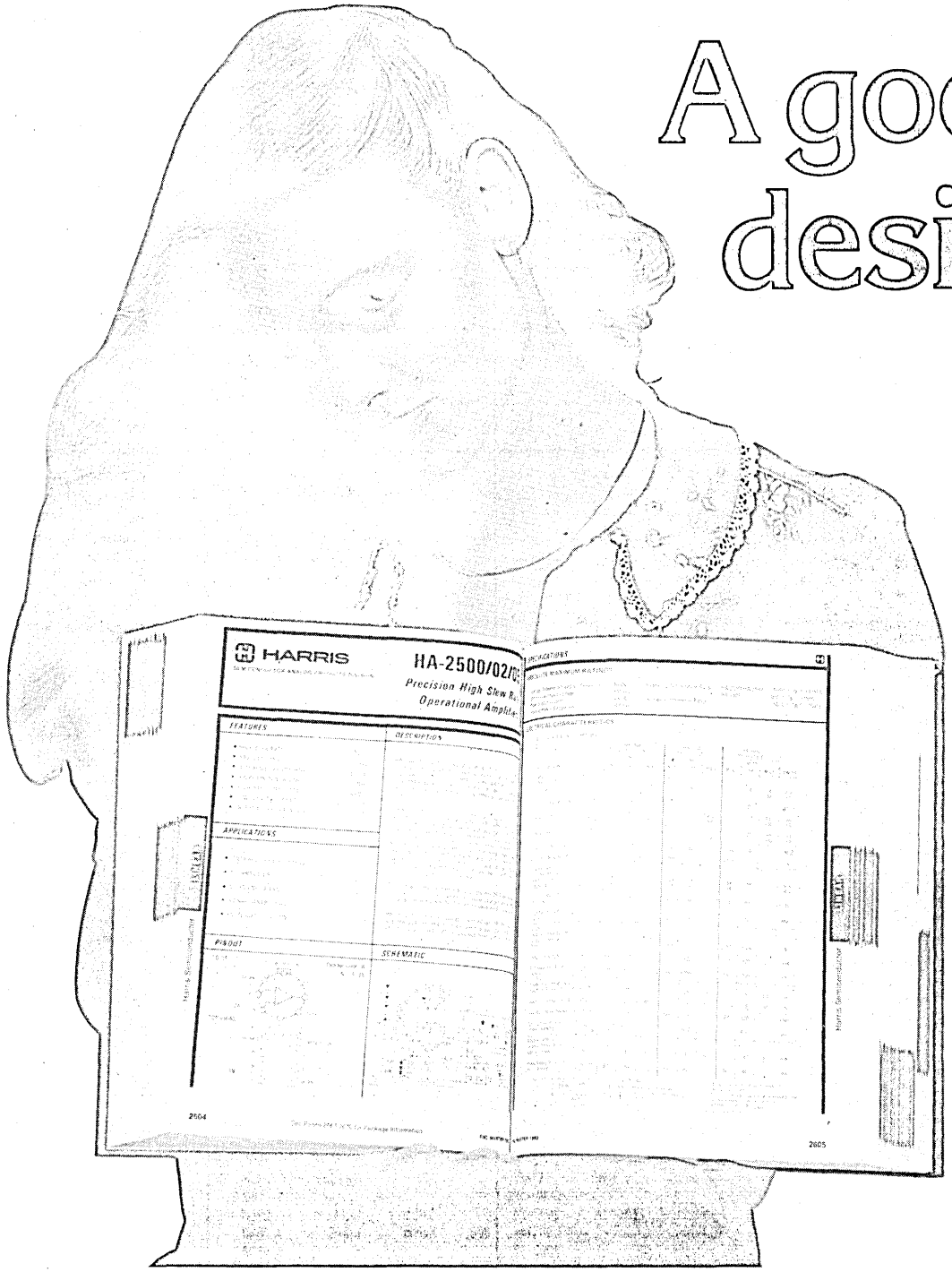
Base Number	Source	Device	Page-Line
3015	RCA	CA3015	2929-58
			¶ 265-4
		CA3015A	2913-130
			2924-23
			¶ 265-4
30150	RCA	MA30150	★4518
			4141-92
3016	IPI	IPI3016	2964-7
	IntlMicro	IM3016	4005-2
	Motorola	MC3016	492-81
	RCA	CA3016	2913-131
			2929-59
			¶ 265-4
		CA3016A	2913-132
			2924-24
			¶ 265-4
3018	RCA	CA3018	2889-1
			¶ 269-3
		CA3018A	2889-2
			¶ 269-3
3019	RCA	CA3019	2890-148
			¶ 269-4
	Sprague	UGN-3019	511-72
		UGS-3019	511-80
302	AMD	LM302	2908-38
	Dionics	DI302	2465-110
	Harris	HI302	★2630
			★3288
			2420-35
	Intersil	LM302	2908-35
	MicroPwr	MP302	2889-72
	National	LM302	2908-37
	Panasonic	AN302	2903-1
	RCA	GP302	★ 409
			1086-100
	SiliconG	SG302	2908-36
	Siliconix	DG302A	★2780
			2420-38
		DG302AA	★2780
			2420-39
		DG302AB	★2780
			2420-40
		DG302AC	★2780
			2420-41
		DG302B	★2780
			2420-42
		DG302C	★2780
			2420-43
	TeledyneS	302A/C	472-40
			¶ 233-12
		302B/M	472-41
			¶ 233-12
3020	HybridSys	HS3020B	2443-10
		HS3020C	2443-11
	HyComp	HC3020	2887-64
			2919-49
	MicroNet	MN3020	2443-12
		MN3020H	2443-13
	Motorola	MC3020	492-159
	National	TP3020	★3332
			2947-102
	RCA	CA3020	2896-104
		CA3020A	2888-96
	Sprague	UGN-3020	511-73
		UGS-3020	511-81
3021	Motorola	MC3021	495-60
	National	TP3021	★3332
			2947-46
	RCA	CA3021	2888-97
			¶ 268-11
	Signetics	SAB3021	2902-45
3022	Motorola	MC3022	495-84
	RCA	CA3022	2888-98
			¶ 268-11
3023	Motorola	MC3023	492-181
	RCA	CA3023	2888-99
			¶ 268-11
	Signetics	SAB3023	2902-46
3024	Motorola	MC3024	490-15
3025	Motorola	MC3025	490-16
30250	RCA	MA30250	★4518
			4141-93
3026	Motorola	MC3026	488-163
	RCA	CA3026	2889-50
3027	Signetics	SAA3027	2901-163
3028	Motorola	MC3028	484-48
3028	RCA	CA3028	2901-14
		CA3028A	2887-33
			¶ 268-12
		CA3028B	2887-34
			¶ 268-12
	Signetics	SAA3028	2901-164
3029	Motorola	MC3029	484-50
	RCA	CA3029	2929-51
		CA3029A	2924-21
303	Harris	HI303	★2630
			★3288
			2419-13
	MicroPwr	MP303	2889-73
	Panasonic	AN303	2903-2
	Plessey	SW303	2905-62
	Siliconix	DG303A	★2780
			2419-16
		DG303AA	★2780
			2419-17
		DG303AB	★2780
			2419-18
		DG303AC	★2780
			2419-19
		DG303B	★2780
			2419-20
		DG303C	★2780
			2419-21
	TeledyneS	303A/C	472-103
		303B/M	472-104
3030	RCA	CA3030	2913-133
			2929-60
		CA3030A	2913-134
			2924-25
	Sprague	UGN-3030	511-74
			2963-125
		UGS-3030	511-82
			2963-131
3031	Motorola	MC3031	492-137
3032	IPI	IPI3032	2964-8
	Motorola	MC3032	493-57
3035	RCA	CA3035	2888-130
	Signetics	SAB3035	2904-52
			2904-63
3036	RCA	CA3036	2889-39
	Signetics	SAB3036	2904-53
3037	RCA	CA3037	2929-52
		CA3037A	2924-22
	Signetics	SAB3037	2904-54
3038	RCA	CA3038	2913-135
			2929-61
		CA3038A	2913-136
			2924-26
304	Harris	HI304	★2630
			★3287
			2415-31
	Motorola	LM304	2960-25
	National	LM304	2960-26
	Panasonic	AN304	2902-149
	SiliconG	SG304	2960-28
			2960-57
	Siliconix	DG304A	★2779
			2415-40
		DG304AA	★2779
			2415-41
		DG304AB	★2779
			2415-42
		DG304AC	★2779
			2415-43
		DG304B	★2779
			2415-44
		DG304C	★2779
			2415-45
	TeledyneS	304A/C	472-113
		304B/M	472-114
3040	Aptek	ITT3040A	2947-23
	MicroNet	MN3040	2446-31
		MN3040H	2446-32
	National	TP3040	2948-89
		TP3040A	2948-90
	RCA	CA3040	2888-100
	Sprague	UGN-3040	511-75
			2963-126
3041	Aptek	ITT3041A	2947-24
	RCA	CA3041	2901-44
			2905-17
			¶ 274-2
3042	RCA	CA3042	2901-45
			2905-18
			¶ 274-2
	Sanyo	STK3042	2896-72
	Signetics	SAB3042	2902-47
3043	Telefunken	U3043M	2887-9
3044	Aptek	ITT3044	2947-25
3045	Aptek	ITT3045	2947-26
	National	LM3045	2889-9
	Plessey	SL3045	2889-13
	RCA	CA3045	2889-18
	SiliconG	SG3045	2889-28
3046	National	LM3046	2889-10
	Plessey	SL3046	2889-14
	RCA	CA3046	2889-19
	SiliconG	SG3046	2889-29
3047	Signetics	TDA3047	2888-16
3048	RCA	CA3048	2887-1
			2962-3
			¶ 265-9
3049	RCA	CA3049	2889-54
			2901-167
304D2	FujitsuA	FBC304D2A	★3668
			3468-9
304M1	FujitsuA	FBC304M1A	★3668
			3468-8
305	Fairchild	uA305AC	2960-6
		uA305C	2959-28
	Harris	HI305	★2630
			★3287
			2418-5
	Intersil	LM305	2959-29
	Motorola	LM305	2959-30
	National	LM305	2959-31
		LM305A	2960-7
	NEC-Micro	otPC305	2959-34
	Panasonic	AN305	2902-142
	Siemens	FZH305	472-126
	SiliconG	SG305	2959-35
		SG305A	2960-8
	Siliconix	DG305A	★2779
			2418-13
		DG305AA	★2779
			2418-14
		DG305AB	★2779
			2418-15
		DG305AC	★2779
			2418-16
		DG305B	★2779
			2418-17
		DG305C	★2779
			2418-18
3050	National	TP3050	★3333
	RCA	CA3050	2889-56
	Sanken	SI3050G	2952-103
	Telmos	TM3050	4141-178
3051	Motorola	MC3051	487-85
			¶ 235-7
	National	TP3051	★3334
			2947-65
	RCA	CA3051	2889-57
3052	Motorola	MC3052	487-92
			¶ 235-7
	National	TP3052	★3335
			2947-73
	RCA	CA3052	2887-2
3053	National	TP3053	★3335
			2947-74
	RCA	CA3053	2887-35
3054	Motorola	CA3054	2889-49
	National	TP3054	★3335
			2947-75
	RCA	CA3054	2889-51
3056	National	TP3056	★3334
			2947-66
3057	National	TP3057	★3335
			2947-76
3058	RCA	CA3058	2968-129
			¶ 262-8
3059	Motorola	CA3059	2968-123
	RCA	CA3059	2968-130
			¶ 262-8
	SiliconG	SG3059	2968-136
306	Harris	HI306	★2630
			★3288
			2420-36
306	National	LM306	★3317
			2892-14
	Panasonic	AN306	2902-143
	Siliconix	DG306A	★2780
			2420-44
		DG306AA	★2780
			2420-45
		DG306AB	★2780
			2420-46
		DG306AC	★2780
			2420-47
		DG306B	★2780
			2420-48
		DG306C	★2780
			2420-49
	TeledyneS	306A/C	472-129
	TI	LM306	2892-20
3060	Motorola	MC3060	485-82
			¶ 235-7
	RCA	CA3060	2912-64
			2941-5
		CA3060A	2912-69
		CA3060B	2912-70
3061	Motorola	MC3061	488-5
			¶ 235-7
3062	Motorola	MC3062	488-6
			¶ 235-7
	Sanyo	STK3062	2896-73
3064	Aptek	ITT3064	2948-69
	National	LM3064	2903-19
	RCA	CA3064	2903-26
3065	Aptek	ITT3065	2948-70
	RCA	CA3065	2901-46
			2905-19
3067	RCA	CA3067	2903-139
			¶ 273-6
3068	RCA	CA3068	2905-164
			¶ 273-9
307	Harris	HI307	★2630
			★3288
			2419-14
	Harris	LM307	2931-42
	Intersil	LM307	2931-43
	Motorola	LM307	2931-44
	National	LM307	2931-45
	Panasonic	AN307	2902-144
	Raytheon	LM307	2928-50
	RCA	CA307	2931-46
	SiliconG	SG307	2931-47
	Siliconix	DG307A	★2780
			2419-22
		DG307AA	★2780
			2419-23
		DG307AB	★2780
			2419-24
		DG307AC	★2780
			2419-25
		DG307B	★2780
			2419-26
		DG307C	★2780
			2419-27
	TeledyneS	307A/C	472-124
	TI	LM307	2931-48
3070	RCA	CA3070	2903-140
3071	RCA	CA3071	2903-141
3072	RCA	CA3072	2903-142
3075	National	LM3075	★3325
			★3327
			2901-32
	RCA	CA3075	2901-47
			2905-20
3076	RCA	CA3076	2901-15
3078	Raytheon	RC3078	2926-33
		RC3078A	2925-49
	RCA	CA3078	★3354
			2911-169
			2912-43
			2926-34
		CA3078A	★3354
			2912-6
			2912-55
3079	Motorola	CA3079	2968-124
	RCA	CA3079	2968-131
			¶ 262-8
	SiliconG	SG3079	2968-137

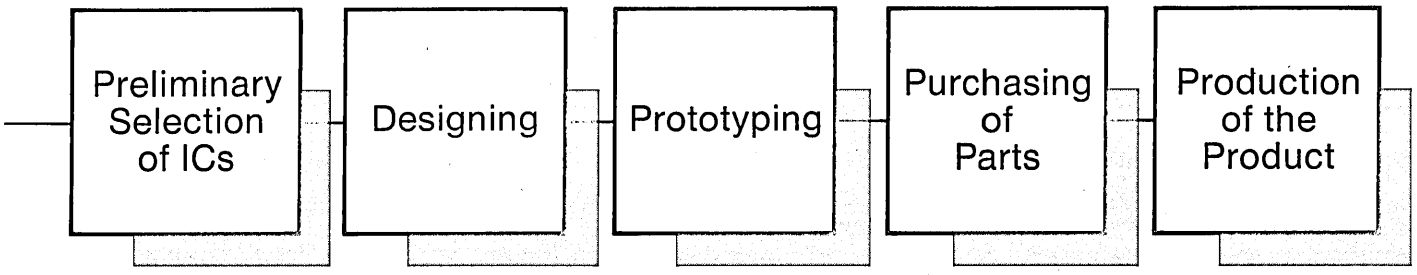
¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

SIX KEY PHASES OF NEW SYSTEM DEVELOPMENT

Planning

A good design





is "mastered" early.

When is the best time for an engineer to pick the integrated circuits that will go into his next design?

The best time is at an early stage in the design process when the engineer's plans are still flexible enough to take full advantage of the features selected.

There is a point in the early phases of every design when engineers focus on selecting integrated circuits. Specifications are examined, relative strengths and weaknesses of various devices are weighed, and the field of candidates is chosen. This is the critical time in the design cycle when designers want to be sure the right devices are in serious contention for their applications.

It is at this moment that the engineer reaches into his technical reference library. Of the material on his shelves, **IC MASTER** is the only reference source that has been especially prepared for this moment.

The engineer can look up each precise function that he needs and see all of the devices and their manufacturers that might satisfy his requirements. He sees this information for all manufacturers, not just for advertisers. But if an IC maker has chosen to include technical data for his products in **IC MASTER,** the engineer sees each index listing for that manufacturer in **bold face type** accompanied by the **page number** on which the data appears; the engineer can then turn immediately to the advertiser's technical data and see if the device fits his needs.

Next time, begin with the MASTER.

IC MASTER

Base Number	Source	Device	Page-Line
308	AMD	LM308	2931-31
		LM308A	2919-17
	AD	**AD308**	**★3153**
			2931-32
		AD308A	**★3153**
			2919-18
	Fairchild	uA308AC	2919-19
	Harris	**LH308**	**★3286**
			★3288
			2931-33
		LH308A	**★3286**
			★3288
			2919-20
	Intersil	LM308	2931-34
		LM308A	2919-21
		LM308LN	2931-28
	Motorola	LM308	2931-35
		LM308A	2919-22
	National	LM308	2931-36
		LM308A	2919-23
	PMI	PM308	2931-37
		PM308A	2919-24
	SiliconG	SG308	2931-38
		SG308A	2919-25
	Siliconix	**DG308A**	**★2779**
			★2798
			2417-22
		DG308C	**★2779**
			★2798
			2417-23
3080	National	LM3080	2897-148
		LM3080A	2897-149
	RCA	CA3080	2897-135
			2900-5
			2911-37
			2912-44
			2926-37
		CA3080A	2897-136
			2900-6
			2911-38
			2912-45
			2926-38
			¶ 265-7
	Telefunken	U3080M	2463-63
3081	Aptek	ITT3081	2949-27
	Plessey	SL3081	2890-96
	RCA	CA3081	2890-97
	Signetics	CA3081	2890-98
	SiliconG	SG3081	2890-99
3082	Aptek	ITT3082	2949-28
	Plessey	SL3082	2890-90
	RCA	CA3082	2890-91
	Sanyo	STK3082	2896-74
	Signetics	CA3082	2890-92
	SiliconG	SG3082	2890-93
3083	Plessey	SL3083	2889-158
	RCA	CA3083	2889-160
	SiliconG	SG3083	2889-163
	Telefunken	U3083M	2887-10
3084	Aptek	ITT3084	2949-29
	RCA	CA3084	2889-129
3085	Aptek	ITT3085	2949-30
	RCA	CA3085	2959-14
			¶ 281-3
		CA3085A	2959-60
			¶ 281-3
		CA3085B	2960-10
			¶ 281-3
3086	Fairchild	uA3086M	2889-6
	National	LM3086	2889-11
	Plessey	SL3086	2889-15
	RCA	CA3086	2889-20
	SiliconG	SG3086	2889-30
3088	RCA	CA3088	2900-65
3089	**National**	**LM3089**	**★3325**
			★3327
			2901-33
	RCA	CA3089	2901-48
			¶ 271-8
	Signetics	CA3089	2901-60
3089D2	Signetics	CA3089D2	2901-61
309	Fairchild	uA309C	2952-53
	Motorola	**LM309H**	**★3294**
			2952-21
		LM309K	**★3294**
			2952-56
309	**National**	**LM309H**	**★3299**
			2952-25
		LM309K	**★3299**
			2952-59
	SiliconG	SG309K	2952-65
		SG309T	2952-29
	Siliconix	**DG309A**	**★2779**
			★2800
			2417-24
		DG309C	**★2779**
			★2800
			2417-25
3090	RCA	CA3090A	2901-125
			¶ 265-7
3091	RCA	CA3091	2964-164
3093	RCA	CA3093	2890-154
3094	RCA	CA3094	2896-75
			2909-84
			2911-154
			2912-26
			2913-1
			¶ 265-1
			¶ 279-13
		CA3094A	2911-155
			2912-27
			2913-5
			2929-36
			¶ 265-1
			¶ 279-13
		CA3094B	2911-156
			2912-28
			2913-6
			2929-37
			¶ 265-1
			¶ 279-13
3096	RCA	CA3096	2889-131
		CA3096A	2889-132
		CA3096C	2889-133
3097	RCA	CA3097	2890-153
3098	RCA	CA3098	511-118
			2962-128
3099	RCA	CA3099	511-119
			2962-129
31	Burr-Brown	UAF31	2962-13
	Fujitsu	**FBM31DB**	**★3668**
			3468-4
	National	**HA31**	**★3327**
310	HyComp	HCS310	2420-4
	Intersil	LM310	2908-26
	Intronics	C310	2962-139
	MicroPwr	MP310	2889-74
	Motorola	LM310	2908-27
	National	**COP310C**	**★1361**
			★1364
			1087-62
		COP310L	**★1361**
			★1364
			1087-63
	National	LM310	2908-28
	Signetics	TAA310A	2897-171
	Signetics	**X310**	**★1501**
			★1505
	SiliconG	SG310	2908-23
3100	CalDevices	HC3100	4140-37
	LSILogic	LC-3100	4140-138
	Motorola	**MC3100**	**★ 729**
			492-30
	RCA	CA3100	2913-127
			2929-44
	Signetics	**SMME3100**	**★1968**
		MME3100	**★1968**
	Telmos	TM3100	4141-179
3101	AMD	AM3101	3471-74
		AM3101-1C	3471-11
		AM3101-1M	3471-37
		AM3101AC	3471-12
		AM3101AM	3471-38
	Motorola	MC3101	489-157
	Panasonic	MN3101	2962-66
	Signetics	N3101A	3471-20
		S3101A	3471-46
	TI	TCM3101	2948-103
31013	AMD	31013	3471-98
3102	Motorola	MC3102	494-152
	RCA	CA3102	2889-55
3103	Motorola	MC3103	493-145
3104	Motorola	MC3104	491-158
3105	Motorola	MC3105	491-4
	RCA	**CA3105**	**★3355**
3106	Motorola	MC3106	489-59
3107	Motorola	MC3107	490-156
3108	Motorola	MC3108	477-185
3109	Motorola	MC3109	477-77
311	AMD	LF311	2892-54
		LM311	2892-50
	AD	AD311	2892-35
	Fairchild	uA311C	2892-36
	Intersil	LM311	2892-37
	Intronics	C311	2962-140
	MicroPwr	MP311	2889-75
	Motorola	LM311	2892-38
	National	**CLM-311**	**★1951**
		COP311C	**★1361**
			★1364
			1087-64
		COP311L	**★1361**
			★1364
			1087-65
		LF311	**★3310**
			★3317
			2892-53
		LH311	**★3317**
			2892-39
	NEC-Electron	uPC311	2892-41
	Raytheon	LM311	2892-42
	RCA	CA311	2892-43
	Siemens	TCA311	2909-104
			2935-2
	Signetics	LM311	2892-44
	SiliconG	SG311	2892-45
	TeledyneS	311A/C	472-53
			¶ 233-12
		311B/M	472-54
			¶ 233-12
	TI	LM311	2892-49
	TI	**TL311**	**★3426**
			2892-52
		TL311A	**★3426**
			2892-51
		TL311M	**★3426**
			2892-46
3110	Motorola	MC3110	490-114
	National	**TP3110**	**★3336**
			2948-56
	Sanyo	LA3110	2897-162
3111	Motorola	MC3111	488-176
3112	Motorola	MC3112	490-58
3114	AMD	TMS3114	3491-91
3115	Motorola	MC3115	492-82
	Sanyo	LA3115	2898-1
3116	Motorola	MC3116	492-83
3118	RCA	CA3118	2889-3
		CA3118A	2889-4
312	Intronics	C312	2962-141
	MicroPwr	MP312	2889-76
	National	LM312	2931-30
	PMI	DAC312B	2457-18
		DAC312F	2457-19
	Siemens	TCA312	2909-105
			2933-55
	TeledyneS	312A/C	472-60
			¶ 233-12
		312B/M	472-61
			¶ 233-12
3120	HybridSys	DAC3120B-0	2457-38
		DAC3120C-0	2457-39
	HybridSys	**HS3120B-2**	**★2747**
			2454-24
		HS3120C-2	**★2747**
			2454-25
	Motorola	MC3120	492-160
	National	**TP3120**	**★3336**
			2948-57
	RCA	CA3120	2904-150
	Sanken	SI3120E	2954-43
		SI3120G	2954-67
		SI3120M	2954-68
		SI3120T	2954-44
	Sanyo	LA3120	2897-163
3121	Motorola	MC3121	495-61
	RCA	CA3121	2903-143
3122	Motorola	MC3122	495-85
	Sanyo	LA3122	2898-2
3123	Motorola	MC3123	492-182
	RCA	CA3123	2900-66
3124	Motorola	MC3124	490-17
3125	Motorola	MC3125	490-18
	RCA	CA3125	2903-144
3126	Motorola	MC3126	488-164
	National	LM3126	2903-106
	RCA	CA3126	2903-145
3127	Plessey	SL3127	2889-168
	RCA	CA3127	2889-169
			2901-98
3128	Motorola	MC3128	484-49
	RCA	CA3128	2903-146
3129	Motorola	MC3129	484-51
313	**National**	**LH313**	**★3304**
			2966-10
	Panasonic	AN313	2897-99
	TeledyneS	313A/C	472-62
		313B/M	472-63
3130	**RCA**	**CA3130**	**★3349**
			2913-9
			2934-6
		CA3130A	**★3349**
			2913-10
			2926-41
	Sanyo	LA3130	2897-164
3131	Motorola	MC3131	492-138
	RCA	CA3131	2897-37
3132	Motorola	MC3132	493-58
	RCA	CA3132	2897-38
	TI	TMS3132	1088-64
			1059-2
3133	Sanyo	LA3133	2898-3
3134	RCA	CA3134	2905-21
			¶ 273-15
3135	RCA	CA3135	2903-147
3136	RCA	CA3136	2905-165
3137	RCA	CA3137	2903-148
3138	RCA	CA3138	2889-149
		CA3138A	2889-150
3139	Motorola	CA3139	2903-16
	RCA	CA3139	2903-27
314	Toshiba	TMM314A	3479-47
		TMM314A-1	3478-42
		TMM314AL	3479-48
		TMM314AL-1	3478-43
3140	**HybridSys**	**HS3140B-3**	**★2746**
			2460-36
		HS3140B-4	**★2746**
			2460-26
		HS3140C-3	**★2746**
			2460-37
		HS3140C-4	**★2746**
			2460-27
	MicroPwr	**MP3140B-3**	**★2749**
			2460-39
		MP3140B-4	**★2749**
			2460-34
		MP3140C-3	**★2749**
			2460-40
		MP3140C-4	**★2749**
			2460-35
	RCA	**CA3140**	**★3350**
			2909-45
			2913-4
			2934-5
		CA3140A	**★3350**
			2926-43
3141	RCA	CA3141	2890-149
3142	RCA	CA3142	2904-151
3143	RCA	CA3143	2903-149
			¶ 273-13
3144	RCA	CA3144	2903-150
			¶ 273-13
3145	Plessey	SL3145	2889-16
	RCA	CA3145	2903-151
3146	National	LM3146	2889-12
	Plessey	SL3146	2889-17
	RCA	CA3146	2889-21
		CA3146A	2889-22
	SiliconG	SG3146	2889-31
315	Panasonic	AN315	2897-30
	Siemens	TCA315	2909-106
			2935-3

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
315	Toshiba	TMM315	3481-110
		TMM315-1	3481-79
3150	Sanken	SI3150E	2955-5
		SI3150G	2955-29
		SI3150M	2955-30
		SI3150T	2955-6
	Sanyo	LA3150	2897-165
	Telmos	TM3150	4141-180
3151	Motorola	MC3151	487-86
			¶ 235-7
	RCA	CA3151	2903-152
3152	Motorola	MC3152	487-93
			¶ 235-7
3154	RCA	CA3154	2904-152
			¶ 273-7
3155	Sanyo	LA3155	2898-4
3156	RCA	CA3156	2903-153
3157	RCA	CA3157	2904-77
			¶ 273-7
3158	RCA	CA3158	2903-154
3159	RCA	CA3159	2904-105
316	AMD	LM316A	2924-51
	National	LM316	2932-35
		LM316A	2911-140
			2924-52
	Panasonic	AN316	2902-147
3160	**HybridSys**	**HS3160B-3**	★2746
			2462-15
		HS3160B-4	★2746
			2461-29
		HS3160C-3	★2746
			2462-16
		HS3160C-4	★2746
			2461-30
	Motorola	MC3160	485-83
			¶ 235-7
	RCA	**CA3160**	★3349
			2909-46
			2934-4
		CA3160A	★3349
			2926-40
	Sanyo	LA3160	2898-5
3161	Motorola	MC3161	488-7
	RCA	**CA3161**	★3361
			2438-19
	Sanyo	LA3161	2898-6
3162	Motorola	MC3162	488-8
			¶ 235-7
	RCA	**CA3162**	★3356
			2438-20
3163	RCA	CA3163	511-12
			2946-89
3164	RCA	CA3164	2906-121
		CA3164E	2962-34
3165	RCA	CA3165	2963-58
3166	RCA	CA3166	2887-146
3168	RCA	CA3168	2464-54
3169	**RCA**	**CA3169**	★3362
			2964-115
		CA3169M	★3362
			2964-116
317	Fairchild	uA317	2959-74
	Lambda	LLM317	2959-75
	MicroEng	MCELM317	2959-78
	Motorola	**LM317**	★3295
			2959-81
		LM317L	★3295
			2959-66
		LM317M	★3295
			2959-111
	National	**LM317**	★3299
			2959-84
		LM317L	★3299
			2959-67
	SiliconG	SG317	2959-70
			2959-87
	TI	LM317	2959-89
		TL317	2959-39
3170	RCA	CA3170	2903-155
	Sanyo	LA3170	2897-166
3172	RCA	CA3172	2903-156
3177	RCA	CA3177	2887-147
3179	**RCA**	**CA3179**	★3363
			511-13
			★3363

Base Number	Source	Device	Page-Line
3179	RCA	CA3179	2945-80
			2946-90
318	AMD	LM318	2910-43
			2933-37
	Fairchild	uA318	2910-49
			2933-38
	Harris	**LM318**	★3286
			★3288
			2910-52
			2933-39
	MicroPwr	MP318	2889-61
	National	LM318	2910-57
			2933-40
	Panasonic	AN318	2903-7
	Telefunken	U318	2902-50
	TI	LM318	2910-60
			2933-42
3182	Harris	HS3182	2472-27
3183	Plessey	SL3183	2889-159
	RCA	CA3183	2889-161
	Signetics	CA3183	2889-162
	SiliconG	SG3183	2889-164
		SG3183A	2889-165
3189	**National**	**LM3189**	★3325
			★3327
			2901-34
	RCA	CA3189	2901-49
319	AMD	LM319	2894-13
	National	**LM319**	★3317
			2894-14
	NEC-Electron	uPC319	2894-15
	Signetics	LM319	2894-16
3190	Motorola	TDA3190P	2904-171
	RCA	CA3190	2904-78
	SGS	TDA3190	2905-27
	Toshiba	T3190	1099-54
3191	RCA	CA3191	2905-166
3192	RCA	CA3192	2905-167
3193	**RCA**	**CA3193**	★3351
			2919-33
		CA3193A	★3351
			2916-52
		CA3193B	★3351
			2911-113
			2915-38
3194	RCA	CA3194	2903-157
3195	RCA	CA3195	2901-126
3196	RCA	CA3196	2965-156
3197	RCA	CA3197	2965-157
3198	RCA	CA3198	2965-158
3199	**RCA**	**CA3199**	★3364
			471-9
			★3364
			2945-81
31L01	AMD	31L01C	3471-102
		31L01M	3471-103
32	**AD**	**ADVFC32**	★3176
	AD	ADVFG32	2968-65
	Burr-Brown	MP32	1093-97
			1094-53
			1096-133
			1097-49
			1102-13
		VFC32	2963-80
		VFC32M	2963-81
		VFC32UM	2968-88
		VFC32VM	2968-89
		VFC32WM	2968-90
	Cremenco	**32KBS**	★1920
	FujitsuA	**FBM32DA**	★3668
			3468-5
	GI	SPR-32	3485-68
	MicroEng	**MCEVFC32**	★4440
			4141-6
			★4440
			2968-99
	National	**MA32**	★3327
	Reticon	TAD32A	2967-159
320	AnalogSys	MZ320	2908-39
	Exar	XR320	2951-4
	ITT	DF320	2948-7
	National	COP320	1087-66
		COP320C	1087-67
		COP320L	1087-68
	National	**LM320**	★3301
	Panasonic	AN320	2903-22

Base Number	Source	Device	Page-Line
320	Signetics	TAA320	2887-144
		TAA320A	2887-145
	SiliconG	SG320-05K	2956-123
		SG320-05P	2956-110
		SG320-05R	2956-124
		SG320-05T	2956-104
		SG320-08K	2957-43
		SG320-08P	2957-44
		SG320-08R	2957-45
		SG320-08T	2957-34
		SG320-12K	2957-91
		SG320-12P	2957-80
		SG320-12R	2957-92
		SG320-12T	2957-67
		SG320-15K	2958-2
		SG320-15P	2958-3
		SG320-15R	2957-125
		SG320-15T	2957-110
		SG320-18K	2958-24
		SG320-18P	2958-25
		SG320-18R	2958-26
		SG320-18T	2958-17
		SG320-5	2957-13
			2957-7
			2957-14
			2957-4
	Siliconix	DF320	2948-44
		DF320A	2948-45
3200	CalDevices	CDI3200	4140-18
	Cherry	CS3200L	4140-48
		CS3200LX	4140-49
	Supertex	CM3200-2	3486-22
		CM3200-3	3486-27
		MM3200	3486-23
	Telmos	TM3200	4141-181
32003	**MicroEng**	**MT32003**	★4440
			4141-22
3201	Aptek	ITT3201	2949-93
	RCA	CA3201	2903-158
	Sanyo	LA3201	2902-127
	Sprague	UGN-3201	511-76
3203	Sprague	UGN-3203	511-77
32032	National	NS32032	1083-8
3204	Panasonic	MN3204	2898-22
			2962-49
3205	Siemens	SDA3205	2902-41
3206	Siemens	SDA3206	2902-42
3207	Panasonic	MN3207	2898-23
			2962-50
	RCA	**CA3207**	★3365
	Signetics	3207A	2483-43
		3207A-1	2483-44
3208	**RCA**	**CA3208**	★3365
3209	RCA	CA3209	2901-50
	Siemens	SAB3209	2902-35
320H12	National	LM320H12	2957-64
320H15	National	LM320H15	2957-107
320H5	National	LM320H5	2956-99
320K12	National	LM320K12	2957-75
320K15	National	LM320K15	2957-120
320L05	National	LM320L05	2956-91
320L12	National	LM320L12	2957-59
320L15	National	LM320L15	2957-102
320ML05			
	National	LM320ML05	2956-95
320ML15			
	National	LM320ML15	2957-111
320MP12			
	National	LM320MP12	2957-70
320MP15			
	National	LM320MP15	2957-114
320MP5			
	National	LM320MP5	2956-100
320T12	National	LM320T12	2957-76
320T15	National	LM320T15	2957-121
321	Fairchild	CCD321	2962-73
			3488-9
		CCD321A	2968-52
	National	COP321	1087-69
		COP321C	1087-70
		COP321L	1087-71
		LM321	2888-28
		LM321A	2888-29
	Panasonic	AN321	2903-23
	Siemens	TCA321	2932-2

Base Number	Source	Device	Page-Line
321	TeledyneS	321A/C	472-105
		321B/M	472-106
	Telefunken	U321	2902-51
	TI	TL321C	2913-45
			2940-10
		TL321I	2928-41
		TL321M	2913-46
			2928-42
3210	MicroNet	MN3210	2456-1
	RCA	CA3210	2904-106
	Sanyo	LA3210	2902-128
	Siemens	SAB3210	2902-36
3211	**Emulogic**	**ECL-3211**	★1708
			1621-2
	MicroNet	MN3211	2456-2
	RCA	**CA3211**	★3366
	Siemens	SAB3211	2464-43
	TI	TL3211	2928-40
3212	AMD	3212	1094-153
		M3212	1094-156
	MicroNet	MN3212	2460-6
32128	Signetics	32128-45	3487-36
3215	RCA	CA3215	2901-51
3216	AMD	3216	1094-67
		M3216	1094-71
	National	DP3216	1094-80
	RCA	CA3216	2905-168
	Sanyo	LM3216	2900-12
3217	RCA	CA3217	2903-159
	SiliconG	SG3217	2931-11
3219	**RCA**	**CA3219**	★3367
322	AnalogSys	MA322	2925-44
	National	LM322	2951-15
	Siemens	TCA322	2929-39
	Siliconix	DF322	2948-46
	TeledyneS	322A/C	472-86
		322B/M	472-87
	TI	TL322C	2940-32
		TL322M	2940-20
3220	Sprague	UGN-3220	511-78
			2963-127
3221	Motorola	MC3221	2896-65
	RCA	CA3221	2903-160
3223	RCA	CA3223	2904-79
3226	AMD	3226	1094-68
		M3226	1094-72
	National	DP3226	1094-81
	RCA	CD3226	2906-19
3227	**RCA**	**CA3227**	★3369
			2889-170
323	Fairchild	SH323	2952-109
	Motorola	**LM323**	★3294
			2952-113
	National	**LM323**	★3299
			2952-120
	SiliconG	SG323	2952-126
	TeledyneS	323A/C	472-92
		323B/M	472-93
	Toshiba	TMM323-1	3465-43
3232	Motorola	MC3232A	2481-22
324	AnalogSys	MA324	2931-27
	Fairchild	uA324	2913-58
	Intersil	LM324	2913-60
	Motorola	LM324	2913-63
	National	LM324	2913-66
		LM324A	2941-45
	NEC-Electron	uPC324	2913-68
	Raytheon	LM324	2913-71
	RCA	CA324	2913-74
	Signetics	LM324	2913-77
	SiliconG	SG324	2913-80
	TeledyneS	324A/C	472-107
		324B/M	472-108
	TI	LM324	2913-84
		LM324A	2941-46
3240	**RCA**	**CA3240**	★3350
			2913-54
		CA3240A	★3350
			2938-1
	Sanken	SI3240E	2956-29
		SI3240G	2956-47
		SI3240T	2956-30
			2956-48
3242	Motorola	MC3242A	2481-25
			¶ 286-9
3245	Fairchild	3245	2483-82

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
3245	Intel	3245	2483-84
			¶ 287-11
	National	DS3245	2483-25
3246	**RCA**	**CA3246**	**★3369**
			2889-171
325	National	LM325	2958-78
	NEC-Electron	uPC325	2959-33
	Panasonic	AN325	2903-24
	Siemens	TCA325	2909-107
			2932-3
	TeledyneS	325A/C	472-109
		325B/M	472-110
3250	SiliconG	SG3250	2911-166
			2912-40
			2930-23
3253	SiliconG	SG3253	2912-73
3257	Fairchild	3257	3453-23
3258	Fairchild	3258	3453-18
32581	Fairchild	32581	3453-19
32582	Fairchild	32582	3453-20
326	AnalogSys	MA326	2925-45
	National	LM326	2958-68
	Panasonic	AN326	2903-25
	TeledyneS	326A/C	472-111
		326B/M	472-112
	TI	TL326M	2944-37
3260	Fairchild	3260	3453-56
	RCA	**CA3260**	**★3349**
			2909-47
		CA3260AE	**★3349**
			2937-56
		CA3260AT	**★3349**
			2937-57
		CA3260B	**★3349**
			2936-32
		CA3260E	**★3349**
			2940-35
		CA3260T	**★3349**
			2940-36
3262	Fairchild	3262A	2903-35
		3262B	2903-36
327	AnalogSys	MA327	2917-36
	Telefunken	U327	2902-52
3271	Burr-Brown	3271	2911-69
	Siemens	SAB3271	2902-37
3273	Harris	HS3273	2486-60
328	AnalogSys	MQ328	2968-120
	Siliconix	DF328	2948-47
	Telefunken	U328	2902-53
3280	RCA	CA3280	2937-40
3282	Harris	HS3282	2486-7
329	AnalogSys	MA329	2934-30
	National	**LM1329**	**★3304**
			2966-110
	Raytheon	LM329	2966-114
3290	RCA	CA3290	2894-24
		CA3290A	2894-20
		CA3290B	2893-63
3291	Burr-Brown	3291	2911-70
32X32	Reticon	RA32X32	2963-137
330	**National**	**LM330-5**	**★3299**
3300	GI	CK3300	2899-1
	MicroNet	MN3300	2462-20
	RCA	**CA3300**	**★3357**
			2426-12
	Thomson-CSF	CRN3300	2949-42
3301	Motorola	MC3301	2913-99
	National	LM3301	2913-100
	NEC-Micro	uPD3301	1093-105
			1094-114
			1095-132
	Raytheon	RC3301	2913-101
	Sanyo	LA3301	2901-128
3302	Motorola	MC3302	2895-46
	National	LM3302	2895-50
	Raytheon	RV3302	2895-47
	Signetics	MC3302	2895-48
	SiliconG	SG3302	2895-49
	TI	LM3302	2892-55
3303	Fairchild	uA3303C	2913-87
	Motorola	MC3303	2913-89
		MPQ3303	2889-140
	Signetics	MC3303	2943-58
	TI	MC3303	2943-59
3304	Sprague	ULN-3304M	511-122
			2951-50
3305	Sprague	ULN-3305M	511-124
3306	Sprague	ULN-3306M	511-126
3308	**RCA**	**CA3308**	**★3359**
			2426-30
	Synertek	**SY3308**	**★3954**
			3484-35
331	HybridSys	DAC331B-10	2446-28
		DAC331B-12	2454-30
		DAC331B-14	2460-28
		DAC331B-8	2443-2
		DAC331C-10	2446-29
		DAC331C-12	2454-31
		DAC331C-14	2460-29
		DAC331C-8	2443-3
	National	LM331	2963-94
		LM331A	2963-95
	Panasonic	AN331	2904-148
	SGS	TBA331	2889-23
	Siemens	TCA331	2909-108
			2935-4
	Siliconix	DF331A	2947-116
	TeledyneS	331A/C	473-5
		331B/M	473-6
	TI	TL331C	2892-24
		TL331M	2892-23
	Toshiba	TMM331A	3485-51
3310	MicroNet	MN3310	2461-10
	Motorola	MC3310	2901-7
	SGS	TDA3310	2889-176
3311	Signetics	TCD3311	2948-38
3312	Signetics	TCD3312	2948-39
3316	**Synertek**	**SY3316**	**★3954**
			3484-113
		SY13316	**★ 432**
			3484-115
		SY13316A	**★ 432**
			3484-116
332	AnalogSys	MA332	2929-42
	Siemens	TCA332	2909-109
			2933-56
	Siliconix	DF332A	2947-117
	TeledyneS	332A/C	472-15
		332B/M	472-16
3320	Motorola	MC3320	2896-66
	Signetics	PCD3320	2948-34
3321	Motorola	MC3321	2896-67
	Signetics	PCD3321	2948-35
3322	Signetics	PCD3322	2948-36
3323	Signetics	PCD3323	2948-37
3324	Motorola	MC3324	2894-22
			2965-109
		MC3324A	2894-17
			2965-110
3325	Motorola	MC3325	2898-53
3329	Burr-Brown	3329	2909-87
333	AnalogSys	MA333	2932-32
	TeledyneS	333A/C	473-7
		333B/M	473-8
	Toshiba	TMM333	3486-16
		TSU333-2	3486-17
3330	Motorola	MC3330	2887-32
	Sprague	ULN-3330Y	2964-93
3333	Motorola	MC3333	2898-42
334	AnalogSys	MA334	2932-33
	National	LM334	2968-29
			2962-132
	TeledyneS	334A/C	472-7
	Toshiba	TMM334	3485-52
3340	Motorola	MC3340	2900-8
	Signetics	PCD3340	2947-158
3341	AMD	3341C	3456-30
			¶ 286-14
	Fairchild	3341	3456-31
		3341A	3456-35
		3341M	3456-32
3342	Fairchild	3342	3491-67
3344	Motorola	MC3344	2963-79
3346	Motorola	MC3346	2889-7
3347	AMD	3347	3491-71
	Fairchild	3347	3491-72
3348	Fairchild	3348	3491-44
	MicroNet	MN3348	2455-24
		MN3348H	2455-25
3349	Fairchild	3349	3491-45
	MicroNet	MN3349	2455-26
		MN3349H	2455-27
335	AnalogSys	MJ335	2963-7
	HybridSys	DAC335B-12	2454-4
		DAC335C-12	2454-5
	National	LM335	2968-30
	Siemens	TCA335	2909-110
	TeledyneS	335A/C	472-11
3350	Sanyo	LA3350	2901-129
	Telmos	TM3350	4141-182
3351	Fairchild	3351-3	3456-28
			¶ 288-4
		3351M	3456-26
			¶ 288-4
33511	Fairchild	33511	3456-29
33512	Fairchild	33512	3456-25
3354	Burr-Brown	3354	2911-71
3357	Fairchild	3357-1	3491-80
		3357-2	3491-73
		F3357M	3491-81
	Motorola	MC3357	2901-97
3359	Motorola	MC3359	2901-77
336	AnalogSys	MA336	2940-22
	HybridSys	DAC336B-1	2443-16
		DAC336B-12	2455-11
		DAC336B-8	2443-14
		DAC336C-12	2455-12
		DAC336C-8	2443-15
	National	**LM1336-2**	**★3304**
			2966-61
		LM1336-5	**★3304**
			2966-89
		LM1336B-5	**★3304**
			2966-90
	TI	TL336C	2895-52
		TL336M	2895-53
3360	Motorola	MC3360	2896-84
3361	Sanyo	LA3361	2901-130
3365	Sanyo	LA3365	2901-131
337	Amperex	OM337	2904-119
	AnalogSys	MA337	2917-29
	HybridSys	DAC337B-0	2443-17
		DAC337B-2	2443-18
		DAC337B-3	2447-6
		DAC337B-4	2446-39
		DAC337B-5	2446-40
		DAC337B-6	2443-32
		DAC337B-7	2447-7
		DAC337C-0	2443-19
		DAC337C-1	2443-20
		DAC337C-2	2443-21
		DAC337C-3	2447-8
		DAC337C-4	2446-41
		DAC337C-5	2446-42
		DAC337C-6	2443-33
		DAC337C-7	2447-9
	MicroEng	MCELM337	2960-41
	Motorola	**LM337**	**★3295**
			2960-38
	National	**LM337**	**★3301**
			2960-44
			2960-65
		LM337L	**★3301**
			2960-62
	Panasonic	AN337	2902-145
	SiliconG	SG337	2960-47
	TI	LM337	2960-50
3370	Motorola	MC3370	2968-125
	Sanyo	LA3370	2901-132
3375	Sanyo	LA3375	2901-133
338	**HybridSys**	**DAC338B**	**★2748**
	HybridSys	DAC338B-12-0	2458-2
		DAC338B-12-1	2457-5
		DAC338B-12-2	2454-29
	Lambda	LLM338	2959-59
	National	**LM338**	**★3299**
			2959-54
	Signetics	**X338**	**★1501**
			★1508
3380	Motorola	MC3380	511-103
			2960-113
	Sanyo	LA3380	2901-134
3381	Sanyo	LA3381	2901-135
3386	Motorola	MC3386	2889-8
339	AMD	LM339	2895-13
		LM339A	2894-39
	Amperex	OM339	2904-120
	AnalogSys	MA339	2932-36
339	Fairchild	uA339	2895-15
		uA339A	2894-41
	Intersil	LM339	2895-16
		LM339A	2894-42
	Motorola	LM339	2895-18
		LM339A	2894-44
	National	**LM339**	**★3317**
			2895-20
		LM339A	**★3317**
			2894-46
	NEC-Electron	uPC339	2895-22
	PMI	PM339	2895-25
		PM339A	2894-48
	Raytheon	LM339	2895-27
	RCA	CA339	2895-29
		CA339A	2894-50
	Signetics	LM339	2895-31
	SiliconG	SG339	2895-33
		SG339A	2894-52
	TI	LM339	2895-35
3390	Sanyo	LA3390	2901-136
3393	Motorola	MC3393	2946-83
3396	Motorola	MC3396	2945-69
34	PMI	OP-34	2916-44
340	**Motorola**	**LM340-12**	**★3294**
			2954-57
		LM340-15	**★3294**
			2955-19
		LM340-18	**★3294**
			2955-89
		LM340-24	**★3294**
			2956-42
		LM340-5	**★3294**
			2952-78
		LM340-6	**★3294**
			2953-22
		LM340-8	**★3294**
			2953-88
	National	COP340	1087-72
	National	**LM340-12**	**★3299**
			2954-64
			¶ 281-13
		LM340-15	**★3299**
			2955-26
			¶ 281-13
		LM340-5	**★3299**
			2952-86
			¶ 281-13
		LM340A-12	**★3299**
			2954-65
			¶ 281-13
		LM340A-15	**★3299**
			2955-27
			¶ 281-13
		LM340A-5	**★3299**
			2952-87
			¶ 281-13
		LM340LA-12	**★3299**
			2954-16
			¶ 281-13
		LM340LA-15	**★3299**
			2954-114
			¶ 281-13
	Panasonic	AN340	2905-2
	SiliconG	SG340-05K	2952-91
		SG340-05R	2952-92
		SG340-05T	2952-45
		SG340-06K	2953-29
		SG340-06R	2953-30
		SG340-06T	2953-8
		SG340-08K	2953-95
		SG340-08R	2953-96
		SG340-08T	2953-76
		SG340-12K	2954-73
		SG340-12P	2954-74
		SG340-12R	2954-75
		SG340-12T	2954-34
		SG340-18K	2955-96
		SG340-18R	2955-97
		SG340-18T	2955-70
		SG340-20P	2955-132
		SG340-20R	2955-133
		SG340-20T	2955-121
		SG340-24K	2956-51
		SG340-24P	2956-52

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
340	SiliconG	SG340-24R	2956-53
		SG340-24T	2956-21
	TI	LM340-10	2954-6
		LM340-12	2954-82
		LM340-15	2955-39
		LM340-18	2955-104
		LM340-24	2956-60
		LM340-5	2952-99
		LM340-6	2953-37
		LM340-8	2953-103
3400	GI	ER3400	3455-35
			¶ 284-14
	NCR	NCR3400	3455-36
	SMC	FDC3400	1101-36
34000	Mostek	MK34000-3	3485-20
		MK34000-84	3485-41
34001	Motorola	MC34001	★3293
			2933-3
		MC34001A	★3293
			2922-33
		MC34001B	★3293
			2927-33
34002	Motorola	MC34002	★3293
			2940-23
		MC34002A	★3293
			2936-44
		MC34002B	★3293
			2938-8
34003	Motorola	MC34003A	2935-51
34004	Motorola	MC34004A	★3293
			2941-23
		MC34004B	★3293
			2942-24
34006	MicroEng	MT34006	★4440
			4141-23
34009	MicroEng	MT34009	★4440
			4141-24
			★4440
			464-11
3401	Motorola	MC3401	2913-95
	National	LM3401	2913-96
	Raytheon	RC3401	2913-97
	RCA	CA3401	2913-98
	SiliconG	SG3401	2888-109
3402	SiliconG	SG3402	2965-1
34022	Motorola	MC34022	2936-46
		MC34022A	2935-52
			2936-38
3403	Exar	XR3403	★3207
			2913-85
			¶ 264-1
	Fairchild	uA3403	2944-17
		uA3403C	2913-83
	Motorola	MC3403	2913-90
	Raytheon	RC3403	2913-92
		RC3403A	2943-40
		RV3403	2913-94
	Signetics	MC3403	2944-16
	TI	MC3403	2944-18
3404	Intel	3404	495-21
3405	Motorola	MC3405	2888-3
			2895-45
34060	Motorola	MC34060	★3297
			2960-114
34061	Motorola	MC34061	2965-105
		MC34061A	2965-106
34062	Motorola	MC34062	2965-103
3408	Motorola	MC3403	★2759
			2444-1
341	Fairchild	CCD341A	2963-50
	National	COP341	1087-73
	National	LM341-12	★3300
			2954-29
			¶ 281-13
		LM341-15	★3300
			2954-127
			¶ 281-13
		LM341-5	★3300
			2952-39
			¶ 281-13
	Siliconix	DF341A	2947-56
	TeledyneS	341A/C	472-118
		341B/M	472-119
3410	Motorola	MC3410	★2759
			2445-25
3410	Motorola	MC3410C	★2759
			2447-28
	SGS	TDA3410	2897-168
	Signetics	MC3410	2445-27
		MC3410C	2447-29
3412	MicroNet	MN3412	2455-38
	Motorola	MC3412	★2757
			2452-30
3416	Motorola	MC3416	2423-4
			¶ 262-1
	Toshiba	T3416	1099-56
3417	Exar	XR3417	★3187
			2947-140
	Motorola	MC3417	2947-151
3418	Exar	XR3418	★3187
			2947-141
	Motorola	MC3418	2947-152
	Toshiba	T3418	1099-55
3419	Motorola	MC3419	★2756
			2949-34
		MC3419A	★2756
			2949-35
		MC3419C	★2756
			2949-36
342	AnalogSys	MA342	2926-20
	National	LM342-12	★3299
			2954-24
		LM342-15	★3299
			2954-122
		LM342-5	★3299
			2952-33
	SGS	LS342	2948-149
	Siliconix	DF342A	2947-57
	TeledyneS	342A/C	473-13
		342B/M	473-14
3420	Motorola	MC3420	★3297
			2960-115
	OEI	3420	★3347
			2965-76
	RCA	CA3420	★3352
			2932-29
		CA3420A	★3352
			2926-36
		CA3420B	★3352
			2921-37
	SGS	TDA3420	2897-169
3421	OEI	3421	★3347
			2965-77
3423	Motorola	MC3423	2965-59
	SiliconG	SG3423	2965-63
		SG3423A	2965-64
	TI	MC3423	2965-68
3424	Motorola	MC3424	2894-23
			2965-111
		MC3424A	2894-18
			2965-112
3425	Motorola	MC3425	2965-115
		MC3425A	2965-116
3426	Motorola	MC3426	2906-56
343	AnalogSys	MC343	2965-145
	Harris	LM343	★3286
			★3288
	MicroNet	MN343	2967-98
		MN343H	2967-99
	National	LM343	2910-94
	TeledyneS	343A/C	472-1
		343B/M	472-2
3430	Motorola	MC3430	2485-62
			2894-53
3431	Motorola	MC3431	2485-63
			2894-54
3432	Motorola	MC3432	2485-64
			2894-55
3433	Motorola	MC3433	2485-65
			2894-56
3437	Motorola	MC3437	2473-57
3438	Motorola	MC3438	2476-2
344	AnalogSys	MA344	2924-53
	MicroNet	MN344	2967-100
		MN344H	2967-101
	National	LM344	2910-84
			2932-13
	TeledyneS	344A/C	472-115
3440	Motorola	MC3440A	★2753
			2476-47
3440	RCA	CA3440	★3353
			2932-31
		CA3440A	★3353
			2926-42
		CA3440B	★3353
			2921-43
3441	Motorola	MC3441A	★2753
			2476-48
3442	Motorola	MC3442A	★2753
			1092-70
3443	Motorola	MC3443A	★2753
			2476-49
	TI	MC3443	2476-53
3444	Toshiba	T3444A	1101-14
		T3444B	1100-68
		T3444D	1101-33
3446	Motorola	MC3446A	★2753
			2476-20
	TI	MC3446	2476-21
3447	Motorola	MC3447	★2753
			★2755
			2475-52
3448	AMD	AM3448A	2476-41
	Fairchild	uA3448A	2476-42
	Motorola	MC3448A	★2753
			2476-43
3449	Motorola	MC3449	507-105
345	Amperex	OM345	2904-121
	AnalogSys	MA345	2937-18
	HybridSys	DAC345I-10	2458-1
		DAC345I-12	2454-28
		DAC345V-10	2458-6
		DAC345V-12	2455-16
	National	LM345	★3301
	Panasonic	AN345	2904-149
	Siemens	TCA345	2968-43
3450	Motorola	MC3450	2475-12
			¶ 288-3
3452	Motorola	MC3452	2475-15
			¶ 288-3
3453	Motorola	MC3453A	2472-38
3456	Burr-Brown	3456	2887-118
	Motorola	MC3456	2951-74
3458	Motorola	MC3458	2913-53
3459	Motorola	MC3459	2483-51
			¶ 288-3
345K5	National	LM345K5	2956-131
			2957-21
346	AD	ADX346	2967-61
	AnalogSys	MD346	2480-6
	Exar	XR346	★3207
			2912-79
		XR346-2	★3207
			2943-42
	Harris	LM346	★3286
			★3288
	MicroNet	MN346	2967-102
		MN346H	2967-103
	National	LM346	2912-87
	Raytheon	LM346	2912-90
3460	Motorola	MC3460	2483-52
			¶ 288-3
3461	Motorola	MC3461	2485-61
3466	Motorola	MC3466	2483-85
3467	Fairchild	FQ3467	2889-154
	Motorola	MC3467	2888-39
		MHQ3467	2889-156
	National	DH3467C	2889-157
3468	Fairchild	FQ3468	2889-155
	Motorola	MC3468	2888-40
3469	Motorola	MC3469	★2751
347	Harris	LF347	★3286
			★3288
	HybridSys	DAC347LPB-10B	2446-35
		DAC347LPB-10U	2446-36
		DAC347LPB-12U	2455-34
		DAC347LPC-10B	2446-37
		DAC347LPC-10U	2446-38
		DAC347LPC-12B	2455-35
347	HybridSys	DAC347LPC-12U	2455-36
		HAC347LPB-12B	2455-37
	MicroNet	MN347	2967-104
		MN347H	2967-105
	National	LF347	★3309
			★3326
			2944-8
			¶ 265-10
		LF347B	★3309
			★3326
			2942-25
			¶ 265-10
	TeledyneS	347A/C	473-15
		347B/M	473-16
3470	Exar	XR3470	★3189
			2887-42
	Motorola	MC3470	★2750
			2887-43
	TI	MC3470	2887-44
3471	Motorola	MC3471	★2751
3476	Motorola	MC3476	2912-5
			2912-54
348	AMD	LM348	2943-25
	Fairchild	uA348	2943-27
	Harris	LM348	★3286
			★3288
			2943-28
	HybridSys	DAC348B-10	2446-33
		DAC348B-12	2455-29
		DAC348C-10	2446-34
		DAC348C-12	2455-30
	National	LM348	2943-30
	Raytheon	LM348	2943-32
	TI	LM348	2943-34
3480	Motorola	MC3480	2481-19
			¶ 286-9
			1092-71
			¶ 286-9
3481	Motorola	MC3481	★2753
			2469-42
3482	Motorola	MC3482	★2752
			477-30
		MC3482A	★2752
			477-31
			★2752
			1092-155
		MC3482B	★2752
			477-32
			★2752
			1092-156
3484V2	TI	MC3484V2	2481-55
			2967-174
3484V4	TI	MC3484V4	2481-57
			2967-175
3485	Motorola	MC3485	★2753
			2469-43
3486	Motorola	MC3486	★2753
			2475-18
			¶ 258-16
			¶ 260-3
	National	DS3486	2475-19
	TI	MC3486	2475-20
3487	Motorola	MC3487	2472-34
			¶ 258-16
			¶ 260-3
	National	DS3487	2472-35
	TI	MC3487	2472-36
3488	Motorola	MC3488A	★2753
349	HybridSys	DAC349B-12	2455-31
		DAC349B-3D	2460-3
		DAC349C-12	2455-32
		DAC349C-3D	2460-4
	National	LM349	2943-36
	Raytheon	LM349	2943-38
	TeledyneS	349A/C	473-42
3490	Motorola	MC3490	2465-54
3491	Motorola	MC3491	2465-111
3492	Motorola	MC3492	2465-112
3493	RCA	CA3493	★3351
			2919-34
		CA3493B	★3351
			2915-37
3494	Motorola	MC3494	2465-55

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
35	Motorola	EXORciserDS35	1626-4
	Motorola	**EXORsetDS35**	**★1733**
350	Amperex	OM350	2904-122
	Lambda	LLM350	2959-58
	MasterLogic	ML350	4141-168
	MicroPwr	MP350	2889-87
	MicroEng	**MGB350D**	**★4437**
			4141-11
		MGC350D	**★4437**
			4141-18
	Motorola	**LM350**	**★3295**
			2959-42
	National	**LM350**	**★3299**
			2959-45
	Panasonic	AN350	2905-148
	SiliconG	SG350	2959-50
		SG350A	2959-51
	TeledyneS	350A/C	473-11
			¶ 234-3
3500	Burr-Brown	3500A	2928-11
			¶ 265-14
		3500B	2923-16
			¶ 265-14
		3500C	2921-11
			¶ 265-14
		3500E	2911-72
			2919-40
			¶ 265-14
		3500MP	2936-53
			¶ 265-14
		3500R	2928-12
			¶ 265-14
		3500R/MIL	2928-13
			¶ 265-14
		3500S	2923-17
			¶ 265-14
		3500T	2921-12
			¶ 265-14
		3500U/883B	2928-14
			¶ 265-14
	Cherry	CS3500	4140-50
		CS3500X	4140-51
	National	TDA3500	2903-116
	Sanyo	LB3500	2945-77
	Signetics	**MAN3500**	**★1975**
		SMMAN3500	**★1975**
	Signetics	TDA3500	2903-179
	Siliconix	VN3500	2483-64
	SMC	CCC3500	1100-66
	Telmos	TM3500	4141-183
35001	**Motorola**	**MC35001A**	**★3293**
			2922-32
		MC35001B	**★3293**
			2927-29
35002	**Motorola**	**MC35002**	**★3293**
			2940-24
		MC35002A	**★3293**
			2936-37
		MC35002B	**★3293**
			2938-7
35003	Motorola	MC35003A	2935-49
35004	**Motorola**	**MC35004A**	**★3293**
			2941-14
		MC35004B	**★3293**
			2942-19
3501	Burr-Brown	3501A	2927-46
		3501B	2923-9
		3501C	2923-7
		3501R	2927-47
		3501S	2923-10
	National	ADD3501	2438-10
			¶ 276-13
		TDA3501	2903-117
	Signetics	TDA3501	2903-180
	SiliconG	SG3501A	2958-84
			¶ 281-12
	Siliconix	VN3501	2483-65
	Sprague	UGN-3501	511-79
			2963-128
	Toshiba	TD3501A	480-56
3502	SiliconG	SG3502	2960-76
	Toshiba	TD3502A	474-34
35022	Motorola	MC35022	2936-15
			2936-47
35022	Motorola	MC35022A	2935-50
		MC35022B	2936-24
3503	AMI	S3503	2947-63
	Burr-Brown	3503A	2935-19
		3503B	2934-37
		3503R	2935-20
		3503S	2934-38
	Exar	**XR3503**	**★3207**
			2913-86
	Motorola	MC3503	2913-91
	Raytheon	RM3503	2913-93
		RM3503A	2942-12
	Signetics	MC3503	2942-46
	SiliconG	SG3503	2966-65
	Toshiba	TD3503	3490-126
3504	AMI	S3504	2947-64
3505	AMI	S3505	2947-84
		S3505A	2947-85
	Motorola	MC3505	2888-4
			2895-36
	Signetics	TDA3505	2903-181
	Toshiba	TD3505A	479-45
3506	**AMI**	**S3506**	**★3145**
			2947-59
35060	**Motorola**	**MC35060**	**★3297**
			2960-116
35061	Motorola	MC35061	2965-107
		MC35061A	2965-108
35062	Motorola	MC35062	2965-104
3507	**AMI**	**S3507**	**★3145**
			2947-77
		S3507A	**★3145**
			2947-78
	Burr-Brown	3507J	2910-37
			2933-23
3508	AMI	S3508	2947-62
	Burr-Brown	3508J	2928-8
3509	AMI	S3509	2947-82
		S3509A	2947-83
351	AD	AD351J	2892-31
		AD351K	2892-32
		AD351S	2892-33
	MicroPwr	MP351	2889-88
	National	**LF351**	**★3309**
			2909-44
			2933-2
		LF351A	**★3309**
			2922-34
		LF351B	**★3309**
			2927-34
	TeledyneS	351A/C	473-10
3510	Burr-Brown	3510A	2911-101
			2916-43
		3510B	2911-73
			2916-14
		3510C	2911-23
			2915-11
		3510S	2911-74
			2916-15
		3510V	2916-16
		3510VM	2911-110
	Motorola	**MC3510**	**★2759**
			2445-26
	RIFA	PBD3510	2480-17
	Signetics	MC3510	2447-19
		TDA3510	2903-182
3511	Harris	HS3511RH	2924-37
	National	ADC3511	2438-9
			¶ 253-8
	RIFA	PBD3511	2480-18
3512	**Motorola**	**MC3512**	**★2757**
			2450-18
3513	RIFA	PBD3513	2481-132
3514	AMD	3514	3484-19
	Fairchild	3514	3484-20
3516	Fairchild	F3516-35	3485-17
		F3516-45	3485-38
3517	Exar	XR3517	2947-142
	Motorola	MC3517	2947-153
3518	Exar	XR3518	2947-143
	Motorola	MC3518	2947-154
3519	Motorola	MC3519	2949-37
352	MicroPwr	MP352	2889-89
	National	COP352	1087-95
3520	**Motorola**	**MC3520**	**★3297**
			2960-117
3520	RIFA	PBD3520	2480-13
	Signetics	TDA3520	2903-183
3521	Burr-Brown	3521H	2917-54
			¶ 265-13
		3521J	2917-19
			¶ 265-13
		3521K	2917-18
			¶ 265-13
		3521L	2911-75
			2917-15
			¶ 265-13
		3521R	2917-20
			¶ 265-13
3522	Burr-Brown	3522J	2920-19
		3522K	2911-39
			2917-52
		3522L	2911-29
			2926-35
		3522S	2911-40
			2917-53
3523	Burr-Brown	3523J	2911-18
			2920-11
		3523K	2911-12
			2917-44
		3523L	2911-6
			2917-42
	Motorola	MC3523	2965-60
	SiliconG	SG3523	2965-65
		SG3523A	2965-66
352301	RIFA	PBD352301	2480-72
			2890-34
		RBD352301	2890-37
352302	RIFA	PBD352302	2480-90
			2890-35
		RBD352302	2890-38
352303	RIFA	PBD352303	2480-49
			2890-36
		RBD352303	2890-39
352304	RIFA	PBD352304	2480-34
3524	**Exar**	**XR3524**	**★3190**
			2960-95
	Motorola	MC3524	2894-21
			2965-113
		MC3524A	2894-19
			2965-114
	National	LM3524	2961-7
	RCA	**CA3524**	**★3368**
			2961-17
	Signetics	SG3524	2961-25
	SiliconG	SG3524	2961-37
			¶ 277-15
			¶ 277-17
	TI	SG3524	2961-57
	Unitrode	**UC3524**	**★3444**
			2961-108
		UC3524A	**★3444**
			2961-109
3525	**AMI**	**S3525A**	**★3146**
			2947-19
			2947-36
		S3525B	**★3146**
			2947-20
			2947-37
	Exar	**XR3525A**	**★3191**
			2960-96
	Motorola	MC3525	2965-117
		MC3525A	2965-118
	Motorola	**SG3525**	**★3297**
	SiliconG	SG3525A	2961-38
	Siliconix	SI3525B	2961-48
	TI	SG3525A	2961-58
3526	**AMI**	**S3526A**	**★3147**
			2947-21
		S3526B	**★3147**
			2947-22
	Motorola	**SG3526**	**★3297**
			2960-120
	SiliconG	SG3526	2961-39
3527	Burr-Brown	3527A	2911-41
			2917-51
		3527B	2911-33
			2917-14
		3527C	2911-42
			2911-111
			2917-50
3527	**Exar**	**XR3527A**	**★3191**
			2960-97
	Motorola	**SG3527**	**★3297**
	SiliconG	SG3527	2961-40
		SG3527A	2961-41
	Siliconix	SI3527B	2961-49
	TI	SG3527A	2961-59
	Unitrode	**UC3527A**	**★3445**
			2961-110
3528	Burr-Brown	3528A	2917-45
		3528B	2917-7
		3528C	2911-3
			2917-41
	Fairchild	**F3528-10**	**★3664**
			3480-11
		F3528-12	**★3664**
			3480-26
		F3528-15	**★3664**
			3480-49
		F3528-20	**★3664**
			3480-88
		F3528-35	**★3664**
			3481-12
		F3528L	**★3665**
		F3528L-10	**★3664**
			3480-12
		F3528L-12	**★3664**
			3480-27
		F3528L-15	**★3664**
			3480-50
		F3528L-20	**★3664**
			3480-89
353	National	COP353	1087-96
	National	**LF353**	**★3309**
			★3326
			2940-30
			¶ 265-10
		LF353A	**★3309**
			★3326
			2936-43
			¶ 265-10
		LF353B	**★3309**
			★3326
			2938-12
			¶ 265-10
	Siemens	S353	511-112
	SiliconG	SG353-05	2952-127
		SG353-08	2953-110
		SG353-12	2954-98
		SG353-15	2955-56
		SG353-18	2955-113
3530	Harris	HS3530RH	2924-36
35316	**Fairchild**	**F35316**	**★1281**
3532	**Fairchild**	**F3532-30**	**★1282**
			3485-84
		F3532-35	**★1282**
			3485-98
		F3532-45	**★1282**
			3485-124
	SiliconG	SG3532	2959-117
3533	**Fairchild**	**F3533-30**	**★1282**
			3485-85
		F3533-35	**★1282**
			3485-99
		F3533-45	**★1282**
			3485-125
3534	RIFA	PBD3534	2949-164
3535	RIFA	PBD3535	2949-165
354	NEC-Electron	uPC354	2916-37
	Plessey	SL354	2889-58
3540	**OEI**	**3540**	**★3347**
	Signetics	TDA3540	2905-186
3541	Signetics	TDA3541	2888-103
			2905-187
3542	AD	AD3542J	2934-43
	Burr-Brown	3542J	2934-45
		3542S	2934-46
	SiliconG	SG3542	2965-67
3543	**Exar**	**XR3543**	**★3192**
			2965-91
	SiliconG	SG3543	2965-96
			¶ 280-14
3544	SiliconG	SG3544	2965-97
3546	Harris	HS3546RH	2924-34
3547	SiliconG	SG3547	2965-102
3549	SiliconG	SG3549	2963-6

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
355	AMD	LF355	2932-43
		LF355A	2922-1
	Harris	**LF355**	**★3288**
	Intersil	LF355	2932-44
		LF355A	2922-3
	Motorola	LF355	2932-45
		LF355A	2922-5
		LF355B	2927-5
	National	**LF355**	**★3309**
			2932-46
		LF355A	**★3309**
			2922-7
		LF355B	**★3309**
			2927-8
	Panasonic	AN355	2905-3
	Plessey	SL355	2967-35
	PMI	PM355	2932-47
		PM355A	2922-9
	Signetics	LF355	2932-48
	TeledyneS	355A/C	473-38
			2951-51
		355B/M	2951-52
3550	Burr-Brown	3550J	2910-40
			2920-20
		3550K	2910-34
			2920-22
		3550S	2910-41
			2920-21
3551	Burr-Brown	3551J	2913-137
			2920-44
		3551S	2913-138
			2920-45
	Sanken	SI3551M	2952-72
3552	Sanken	SI3552M	2952-104
3553	Burr-Brown	3553	2887-18
			2908-9
3554	**AD**	**AD3554A**	**★3155**
			2921-44
		AD3554B	**★3155**
			2920-41
		AD3554S	**★3155**
			2920-43
	Burr-Brown	3554A	2909-79
			2913-146
			2922-22
		3554B	2909-80
			2913-147
			2920-40
		3554S	2909-81
			2913-148
			2920-42
	Sanken	SI3554M	2952-121
	TeledyneP	TP3554	2909-83
3556	Motorola	MC3556	2951-75
3558	Motorola	MC3558	2938-39
356	AMD	LF356	2932-49
		LF356A	2922-11
	Harris	**LF356**	**★3288**
			2932-50
		LF356A	**★3288**
			2922-13
	HybridSys	DAC356B-12	2456-5
		DAC356C-12	2456-6
		DAC356LPB-12	2456-7
		DAC356LPC-12	2456-8
	Intersil	LF356	2932-51
		LF356A	2922-15
	Motorola	LF356	2932-52
		LF356A	2922-17
		LF356B	2927-16
	National	**LF356**	**★3309**
			2932-53
		LF356A	**★3309**
			2922-19
		LF356B	**★3309**
			2927-19
	PMI	PM356	2932-54
		PM356A	2922-21
	Signetics	LF356	2932-55
3560	Signetics	TDA3560	2903-184
3561	Signetics	TDA3561	2903-185
3562	Signetics	TDA3562	2903-186
3563	Signetics	TDA3563	2903-187
3564	**Fairchild**	**F3564-25**	**★1282**
			3486-48
3564	**Fairchild**	**F3564-35**	**★1282**
			3486-97
3565	**Fairchild**	**F3565-25**	**★1282**
			3486-65
		F3565-35	**★1282**
			3486-98
3566	**Fairchild**	**F3566**	**★1283**
3568	**Fairchild**	**F3568**	**★1283**
3569	**Fairchild**	**F3569**	**★1283**
357	AMD	LF357	2932-37
		LF357A	2921-46
	Harris	**LF357**	**★3288**
			2932-38
		LF357A	**★3288**
			2921-48
	Intersil	LF357	2932-39
		LF357A	2921-50
	Motorola	LF357	2932-40
		LF357A	2921-52
		LF357B	2926-57
	National	**LF357**	**★3309**
			2932-41
		LF357A	**★3309**
			2921-54
		LF357B	**★3309**
			2926-60
	PMI	PM357	2932-42
		PM357A	2921-56
3570	**Fairchild**	**F3570**	**★1284**
	Signetics	TDA3570	2903-188
3571	Burr-Brown	3571A	2909-67
			2910-67
			2922-38
	Motorola	MC3571	2943-5
3572	Burr-Brown	3572A	2909-68
			2910-68
			2922-39
3573	Burr-Brown	3573	2909-66
			2933-13
3575	Motorola	MC3575	2912-82
358	MicroPwr	MP358	2889-82
	Motorola	LM358	2913-31
			2939-30
	National	LM358	2913-48
		LM358A	2913-35
			2937-37
	NEC-Electron	uPC358	2940-12
	RCA	CA358	2913-49
		CA358A	2937-38
	Signetics	LM358	2913-50
	TI	LM358	2913-51
3580	Burr-Brown	3580J	2909-86
			2910-82
			2932-30
	Sanken	SI3580M	2959-3
3581	Burr-Brown	3581J	2909-96
			2910-66
			2924-40
3582	Burr-Brown	3582J	2910-1
			2910-63
			2924-39
3583	Burr-Brown	3583	2910-2
			2910-64
			2924-41
3584	Burr-Brown	3584	2910-3
			2910-65
			2924-42
359	National	LM359	2935-29
	Siemens	S359	2949-167
3590	Signetics	TDA3590	2903-189
35LS190			
	AMD	AM35LS190M	482-5
36	**National**	**FOR36**	**★3345**
	Signetics	MLA36	4141-114
360	Amperex	OM360	2904-123
	Cybernetic	CY360	2963-120
			1101-44
			1102-42
	DDC	HSDC-360	2967-19
	MicroPwr	MP360	2889-77
	National	**LM360**	**★3317**
			2892-13
	Panasonic	AN360	2897-157
	Plessey	SL360	2889-80
	Universal	HCM360	4141-124
3600	LSIComp	D3600	462-68
3600	RCA	CA3600	464-18
			2890-147
	Signetics	TDA3600	2903-190
	Sprague	UGN-3600	2963-129
	SMC	KR3600	2468-14
			¶ 238-4
		KR3600-PRO	2468-13
			¶ 238-4
	Telmos	TM3600	4141-184
36000	Mostek	MK36000-4	3486-49
		MK36000-5	3486-80
		MKB36000-83	3486-50
		MKB36000-84	3486-81
	SGS	M36000	3486-57
	SMC	ROM36000	3486-60
3601	Sprague	UGN-3601	2963-130
3603	National	DS3603	2474-35
			2485-59
3604	Harris	HS3604	2900-84
	National	DS3604	2474-15
			2485-57
3605	National	DS3605	2485-70
3606	Burr-Brown	3606	2888-35
	National	DS3606	2485-71
3607	Burr-Brown	3607	2888-36
	National	DS3607	2485-72
3608	National	DS3608	2485-73
361	Amperex	OM361	2904-124
	National	**FOR361**	**★3345**
		LM361	**★3317**
			2892-8
	TeledyneS	361A/C	473-27
		361B/M	473-28
3610	AMI	S3610	2902-94
3611	National	DS3611	2482-14
	Sprague	**U-3611M**	**★2843**
		UDN-3611M	**★2843**
			2482-15
	Sprague	UDS-3611H	2482-17
3612	National	DS3612	2482-54
	Sprague	**UDN-3612M**	**★2843**
			2482-55
	Sprague	UDS-3612H	2482-57
3613	National	DS3613	2482-125
	Sprague	**UDN-3613M**	**★2843**
			2482-126
	Sprague	UDS-3613H	2482-128
3614	National	DS3614	2482-89
	Sprague	**U-3614M**	**★2843**
		UDN-3614M	**★2843**
			2482-90
	Sprague	UDS-3614H	2482-92
36143	National	DS36143	2483-26
36144	National	DS36144	2483-55
36147	National	DS36147	2483-31
36149	National	DS36149	485-9
			2483-131
3615	National	DS3615	2962-115
3616	National	DS3616	2962-112
3617	National	DS3617	2962-118
36177	National	DS36177	2483-32
36179	National	DS36179	485-10
			2483-132
3618	National	DS3618	2962-116
362	AD	AD362K	2963-37
		AD362S	2963-38
	Panasonic	AN362	2901-121
	Plessey	SL362	2889-81
			¶ 269-7
	TeledyneS	362A/C	473-31
		362B/M	473-32
3620	**AMI**	**S3620**	**★3149**
			2902-95
3626	Burr-Brown	3626A	2887-72
		3626B	2887-73
		3626C	2887-74
3627	Burr-Brown	3627	2887-108
	SiliconG	SG3627	2480-21
3628	Intel	3628A-1	3462-84
		3628A-3	3463-11
		3628A-4	3463-54
	National	DS3628	2484-4
3629	Burr-Brown	3629	2887-75
		3629A	2914-30
		3629B	2914-27
3629	Burr-Brown	3629C	2914-28
		3629S	2914-29
	National	DS3629	2480-160
	SiliconG	SG3629	2422-87
			2480-157
			2967-177
363	AD	AD363K	2963-16
		AD363S	2963-17
	National	LM363	2887-66
			2916-50
		LM363A	2887-67
			2914-52
	Panasonic	AN363	2901-122
	TeledyneS	363A/C	473-35
		363B/M	473-36
3630	**AMI**	**S3630A**	**★3150**
			3487-31
		S3630A-1	**★3150**
			3487-32
		S3630B	**★3150**
			3487-16
		S3630B-1	**★3150**
			3487-17
	Burr-Brown	3630A	2887-76
		3630B	2887-77
		3630C	2887-78
		3630S	2887-79
	National	DS3630	449-155
3631	National	DS3631	2482-10
3632	Intel	3632	3466-17
		3632-1	3466-15
	National	DS3632	2482-48
3633	National	DS3633	2482-121
3634	National	DS3634	2482-85
3635	SiliconG	SG3635	2480-12
			2964-120
3636	Intel	3636B-1	3464-54
		3636B-2	3464-63
		M3636	3464-111
364	AD	AD364J	2963-18
		AD364K	2963-19
		AD364S	2963-20
		AD364T	2963-21
3644	National	DS3644	2483-56
3645	National	DS3645	2483-143
3647	National	DS3647	2483-33
3648	National	DS3648	2483-37
3649	National	DS3649	2483-139
365	**MicroEng**	**MCETCA365**	**★4440**
			4141-5
			★4440
			2909-56
	National	**LP365**	**★3316**
			2885-142
3650	Burr-Brown	3650HG	2887-109
			¶ 264-9
		3650MG	2887-110
			¶ 264-9
	National	DS3650	2475-14
	Signetics	TDA3650	2905-113
3651	National	DS3651	2485-68
	Signetics	TDA3651	2905-114
		TDA3651A	2905-115
3652	Burr-Brown	3652HG	2887-111
		3652MG	2887-112
	National	DS3652	2475-17
3653	National	DS3653	2485-69
3654	National	DS3654	2481-43
3656	Burr-Brown	3656AG	2887-119
		3656BG	2887-113
			2887-120
		3656HG	2887-114
3658	**National**	**DS3658**	**★2769**
			2483-18
366	Panasonic	AN366	2900-124
3660	Burr-Brown	3660J	2887-80
			¶ 264-6
3662	Burr-Brown	3662	2887-81
	National	DS3662	2476-50
3666	**National**	**DS3666**	**★2768**
			2475-40
3667	National	DS3667	2479-28
367	TeledyneS	367A	2473-43
			¶ 234-3
		367A/C	473-45
			¶ 234-3

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
367	TeledyneS	367B	2473-47
			¶ 234-3
		367B/M	473-46
			¶ 234-3
		367C	2473-48
			¶ 234-3
		367M	2473-44
			¶ 234-3
3671	National	DS3671	2463-33
3674	National	DS3674	2483-57
3675	National	DS3675	2483-144
3677	National	DS3677	2483-34
3678	National	DS3678	2483-38
3679	National	DS3679	2483-140
368	TeledyneS	368A	2473-45
		368A/C	473-47
		368C	2473-46
3680	National	DS3680	2483-49
	TI	DS3680	2483-50
3686	National	DS3686	2481-51
			2949-9
3687	National	DS3687	2481-52
			2949-10
3689	National	DS3689	2475-31
3690	National	DS3690	2475-32
3691	National	DS3691	2469-48
3692	National	DS3692	2472-40
3695	**National**	**DS3695**	**★2770**
			2479-37
3696	**National**	**DS3696**	**★2770**
			2479-38
3697	**National**	**DS3697**	**★2770**
			2479-39
3698	**National**	**DS3698**	**★2770**
			2479-40
37	Burr-Brown	OPA37A	2914-41
		OPA37B	2915-22
		OPA37C	2916-9
		OPA37E	2914-42
		OPA37F	2915-23
		OPA37G	2916-10
	Citel	System37	4001-3
	MicroPwr	OP-37	2915-56
	PMI	OP-37A	2914-34
		OP-37B	2915-16
		OP-37C	2916-1
		OP-37E	2914-35
		OP-37F	2915-17
		OP-37G	2916-2
	Raytheon	OP-37A	2914-33
		OP-37B	2915-12
		OP-37C	2915-57
		OP-37E	2917-24
		OP-37F	2915-13
		OP-37G	2915-58
370	Amperex	OM370	2904-125
	AD	**AD370J**	**★3165**
			2455-44
		AD370K	**★3165**
			2455-45
		AD370S	**★3165**
			2455-46
	HybridSys	DAC370B-16	2461-1
		DAC370B-18	2462-28
		DAC370C-16	2461-2
		DAC370C-18	2462-29
	MicroNet	MN370	2456-11
		MN370H	2456-12
	MicroPwr	**MP370B-18**	**★ 401**
			★2749
			2462-30
		MP370C-18	**★ 401**
			★2749
			2462-31
	National	COP370	1087-108
	Panasonic	AN370	2897-158
	TeledyneS	370A/C	472-49
		370B/M	472-50
3700	Holt	HI3700	4141-141
	Lambda	LAS3700	2959-122
	Signetics	TDA3700	2903-3
37000	Mostek	MK37000-4	3486-62
		MK37000-5	3486-63
		MKB37000-84	3486-51
		MKB37000-85	3486-82
3701	National	ADD3701	2438-39
	Sprague	ULN-3701Z	2897-75
3702	Sprague	ULN-3702Z	2897-76
3703	Sprague	ULN-3703Z	2897-77
3704	Sprague	ULX-3704B	2897-79
3705	**National**	**AM3705**	**★3318**
			2424-51
		AM3705C	**★3318**
			2424-52
	Siliconix	SI3705	2424-45
	Sprague	ULN-3705M	2896-126
3708	Fairchild	3708	2424-53
	Hughes	HNVM3708	3463-91
371	**AD**	**AD371J**	**★3165**
			2455-47
		AD371K	**★3165**
			2457-11
		AD371S	**★3165**
			2457-12
	MicroNet	MN371	2455-42
		MN371H	2455-43
	NEC-Micro	uPD371	1094-98
			1095-130
			1100-67
			¶ 249-1
	TeledyneS	371A/C	472-30
			¶ 233-12
		371B/M	472-31
			¶ 233-12
3711	National	ADC3711	2438-38
			¶ 253-8
			¶ 277-3
3712	Burr-Brown	3712T/R	2963-60
3713	Burr-Brown	3713T/R	2963-61
3714	Burr-Brown	3714T	2963-62
3716	Citel	3716	4001-2
3717	RIFA	PBL3717	2906-96
372	NEC-Micro	uPD372	1101-35
			¶ 249-2
	TeledyneS	372A/C	472-23
			¶ 233-12
		372B/M	472-24
			¶ 233-12
3721	RIFA	PBL3721	2887-138
3724	Fairchild	FQ3724	2889-134
	Sprague	TPQ3724	2889-151
3725	Fairchild	FQ3725	2889-135
	Motorola	MPQ3725	2889-141
		MPQ3725A	2889-142
	National	DH3725C	2889-145
	RIFA	PBL3725	2949-21
	Sprague	TPQ3725	2889-152
		TPQ3725A	2889-153
37256	**OKI**	**MSM37256**	**★3873**
3726	RIFA	PBL3726	2949-22
373	TeledyneS	373A/C	472-27
		373B/M	472-28
3731	SiliconG	SG3731	2906-86
			2964-141
374	Panasonic	AN374	2896-98
	TeledyneS	374A/C	472-19
375	MicroNet	MN375	2967-106
	TeledyneS	375A/C	473-18
			3488-44
		375B/M	473-19
			3488-45
3752	DataTrans	DT3752	1765-7
3754	DataTrans	DT3754	1765-2
3759	Fujitsu	MB3759	2960-108
376	Fairchild	uA376C	2959-114
	National	LM376	2959-115
	TI	TL376C	2488-1
			2964-144
3760	Fujitsu	MB3760	2960-109
3764	**OKI**	**MSM3764-12**	**★3873**
			3469-80
		MSM3764-15	**★3873**
			3470-5
		MSM3764-2	**★3873**
			3470-6
		MSM3764-20	**★3873**
			3470-23
		MSM3764-3	**★3873**
			3470-24
377	**HybridSys**	**DAC377-18**	**★2745**
			2462-32
		DAC377B-18	**★2745**
			2462-33
		DAC377C-18	**★2745**
			2462-34
	MicroPwr	**MP377-18**	**★2749**
		MP377B-18	**★ 401**
			2462-35
		MP377C-18	**★ 401**
			2462-36
	National	LM377	2897-97
	Panasonic	AN377	2901-9
3777	Sprague	ULX-3777W	2897-126
378	**National**	**LM378**	**★3326**
			2897-98
3783	Sprague	ULX-3783M	2897-105
3784	Sprague	ULN-3784B	2897-78
379	**National**	**LM379**	**★3326**
			2897-112
	NEC-Electron	uPC379	2893-62
	NEC-Micro	uPD379	2487-22
			¶ 244-5
			1093-168
			1095-79
			1095-83
			¶ 244-5
380	**AD**	**AD380K**	**★3155**
			2920-58
		AD380L	**★3155**
			2920-59
		AD380S	**★3155**
			2920-60
	Fairchild	F380	4140-81
	MicroNet	MN380	2444-14
		MN380H	2444-15
	National	**F0E380B-1**	**★3345**
			2963-67
		F0E380B-2	**★3345**
			2963-68
		LM380	**★3326**
			2896-88
	Panasonic	AN380	2903-125
	TeledyneS	380A/C	472-42
			¶ 233-12
			2464-61
			¶ 233-12
		380B/M	472-34
			¶ 233-12
			2464-62
			¶ 233-12
3800	Lambda	LAS3800	2960-110
38000	Mostek	MK38000-25	3487-48
		MKB38000-84	3487-49
		MKB38000-85	3487-53
3801	Mostek	MK3801	1101-84
3804	Sprague	ULX-3804A	2900-146
3805	Mostek	MK3805	1090-74
3806	Mostek	MK3806	1090-75
3807	Mostek	MK3807	1090-42
3809	Sprague	ULN-3809A	2901-144
381	**AD**	**AD381J**	**★3155**
			2920-37
		AD381K	**★3155**
			2918-5
		AD381L	**★3155**
			2917-25
		AD381S	**★3155**
			2920-29
		AD381T	**★3155**
			2918-3
	Harris	**HI381**	**★2635**
			★3288
			2415-32
	National	**LM381**	**★3325**
			★3328
			2897-191
	Signetics	LM381A	2898-8
	Siliconix	**DG381A**	**★2779**
			2415-46
		DG381AA	**★2779**
			2415-47
		DG381AB	**★2779**
			2415-48
		DG381AC	**★2779**
			2415-49
		DG381B	**★2779**
			2415-50
381	**Siliconix**	**DG381C**	**★2779**
			2415-51
	TeledyneS	381A/C	472-32
			2464-63
		381B/M	472-33
			2464-64
3810	Signetics	TDA3810	2905-36
	Sprague	ULN-3810A	2901-145
38128	**OKI**	**MSM38128**	**★3873**
3814	Fairchild	3814	511-46
3815	Fairchild	3815	510-48
3816	Fairchild	3816	511-115
3819	Harris	HS3819	2906-22
382	**AD**	**AD382J**	**★3155**
			2920-36
		AD382K	**★3155**
			2918-4
		AD382S	**★3155**
			2920-28
		AD382T	**★3155**
			2918-2
	National	**LM382**	**★3325**
			★3327
			2897-192
	TeledyneS	382A/C	472-36
			2464-68
		382B/M	472-37
			2464-69
3820	**National**	**LM3820**	**★3325**
			★3327
			2900-78
3821	SiliconG	SG3821	2889-32
3822	SiliconG	SG3822	2889-52
3823	SiliconG	SG3823	2889-38
383	**National**	**LM383**	**★3326**
			2897-19
		LM383A	**★3326**
			2897-20
	TeledyneS	383A/C	472-38
			2463-169
		383B/M	472-39
			2463-170
3838	Sprague	ULN-3838A	2900-73
384	**Harris**	**HI384**	**★2635**
			★3288
			2420-37
	National	**LM384**	**★3326**
			★3328
			2897-21
	Siliconix	**DG384A**	**★2780**
			2420-50
		DG384AA	**★2780**
			2420-13
		DG384AB	**★2780**
			2420-14
		DG384AC	**★2780**
			2420-15
		DG384B	**★2780**
			2420-51
		DG384C	**★2780**
			2420-52
3840	Sprague	ULX-3840A	2900-138
	Unitrode	**UC3840**	**★3445**
			2961-111
3846	Fairchild	F3846	2487-20
385	National	LM385	2966-16
		LM385-2	2966-62
3850	Fairchild	3850	1096-104
		3850M	1096-105
	Fairchild	**F3850**	**★1268**
	MicroNet	MN3850	2455-17
		MN3850H	2455-18
	Mostek	MK3850	1096-107
			1067-15
3851	Fairchild	3851	1096-118
		3851A	1096-119
		3851M	1096-120
	Fairchild	**F3851**	**★1268**
	Mostek	MK3851	1096-126
	SiliconG	SG3851	2480-76
			2890-50
38510	Harris	JAN38510/201	3459-59
		JAN38510/207	3459-46
		JAN38510/208	3461-86
		JAN38510/301	3460-1
		JAN38510/302	3460-6

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
38510	Harris	JAN38510/401	3460-101
		JAN38510/402	3460-103
	Hitachi	HD38510	2898-79
38513	Hitachi	HD38513	2898-80
3852	Fairchild	3852	1096-111
	Mostek	MK3852	1096-112
	SiliconG	SG3852	2480-93
			2890-51
3853	Fairchild	3853	1096-127
		3853M	1096-128
	Fairchild	**F3853**	★**1268**
	Mostek	MK3853	1096-129
	SiliconG	SG3853	2480-53
			2890-52
3854	Fairchild	3854	1096-109
	Mostek	MK3854	1096-110
38546	Hitachi	HD38546	2898-81
38550	Hitachi	HD38550	2898-82
3856	Fairchild	3856	1096-121
		3856A	1096-122
	Fairchild	**F3856**	★**1268**
38560	Hitachi	HD38560	2898-83
3857	Fairchild	3857	1096-123
38570	Hitachi	HD38570	2898-84
38580	Hitachi	HD38580	2898-85
38585	Hitachi	HD38585	2898-86
3859	Sprague	ULN-3859A	2901-78
386	**National**	**LM386**	★**3326**
			★**3328**
			2896-89
3860	**AD**	**AD3860K**	★**3166**
			2455-21
		AD3860S	★**3166**
			2455-22
	HybridSys	**HS3860B**	★**2748**
			2455-14
		HS3860C	★**2748**
			2455-15
	MicroNet	MN3860	2455-19
		MN3860H	2455-20
3861	Fairchild	3861	1096-113
		3861M	1096-114
	Fairchild	**F3861**	★**1268**
	Mostek	MK3861	1096-116
3864	Fairchild	F3864	1091-151
387	**Harris**	**HI387**	★**2635**
			★**3288**
			2418-6
	National	**LM387**	★**3325**
			★**3327**
			2897-193
	Panasonic	AN387	2904-132
	Signetics	LM387	2898-9
	Siliconix	**DG387A**	★**2779**
			2418-19
		DG387AA	★**2779**
			2418-20
		DG387AB	★**2779**
			2418-21
		DG387AC	★**2779**
			2418-22
		DG387B	★**2779**
			2418-23
		DG387C	★**2779**
			2418-24
3870	**Fairchild**	**F3870**	★**1253**
			1090-57
			¶ 238-6
			★**1253**
			1061-4
			¶ 238-6
		F3870-PEP	★**1253**
			1765-29
			¶ 238-6
	Mostek	MK3870	1067-16
		MK3870/10	1090-61
		MK3870/12	1090-51
		MK3870/20	1090-62
		MK3870/22	1090-52
		MK3870/30	1090-63
		MK3870/32	1090-53
		MK3870/40	1090-64
		MK3870/42	1090-54
	Motorola	MC3870	1090-55
			1067-24
3870	SGS	M3870	1090-65
	SMC	MPU3870	1090-66
3871	Fairchild	3871	1096-115
	Fairchild	**F3871**	★**1268**
	Mostek	MK3871	1096-117
3872	**Fairchild**	**F3872**	★**1254**
			1090-47
			★**1254**
			1061-5
	SGS	M3872	1090-56
3873	Mostek	MK3873	1067-17
		MK3873/10	1090-67
		MK3873/12	1090-69
		MK3873/20	1090-68
		MK3873/22	1090-70
3875	Mostek	MK3875	1067-18
		MK3875/22	1090-71
		MK3875/42	1090-72
3876	Fairchild	F3876	1090-48
			1061-6
3878	Fairchild	F3878	1090-58
			1061-7
388	**National**	**LM388**	★**3326**
			★**3328**
			2896-90
	TI	LM388	2896-130
3880	Mostek	MK3880	1097-35
			1067-19
3881	Mostek	MK3881	1097-70
3882	Mostek	MK3882	1097-50
3883	Mostek	MK3883	1097-64
3884	Mostek	MK3884	1097-78
3885	KineticSys	3885-ZIA	1765-15
	Mostek	MK3885	1097-79
3886	Mostek	MK3886	1097-94
	SiliconG	SG3886	2889-33
3887	Mostek	MK3887	1097-80
3889	Sprague	ULN-3889A	2901-69
389	**National**	**LM389**	★**3326**
			★**3328**
			2887-13
			2896-91
			¶ 272-8
3891	Mostek	MK3891	1101-83
38980	Hitachi	HD38980	2898-136
38991	Hitachi	HD38991C	2898-137
38C70	**Fairchild**	**F38C70**	★**1257**
			1090-59
			★**1257**
			1061-8
38E70	**Fairchild**	**F38E70**	★**1258**
			1090-43
			1090-60
			★**1258**
			1061-9
38L72	Fairchild	F38L72	1090-49
			1061-10
38L76	Fairchild	F38L76	1090-50
			1061-11
38P70	Mostek	MK38P70	1090-46
		MK38P70/02	1090-44
38P73	Mostek	MK38P73/02	1090-45
38T56	Fairchild	38T56	1096-124
38T57	Fairchild	38T57	1096-125
39	Lambda	LAS39U	2959-5
390	**AD**	**AD390J**	★**3166**
			2456-13
		AD390K	★**3166**
			2455-23
	Harris	**HI390**	★**2635**
			★**3288**
			2419-15
	National	**LM390**	★**3326**
			★**3328**
			2896-92
	Siliconix	**DG390A**	★**2780**
			2419-28
		DG390AA	★**2780**
			2419-29
		DG390AB	★**2780**
			2419-30
		DG390AC	★**2780**
			2419-31
		DG390B	★**2780**
			2419-32
390	**Siliconix**	**DG390C**	★**2780**
			2419-33
	TeledyneS	390	472-67
		390A/C	2482-141
3900	Fujitsu	C3900	4140-92
		C3900H	4141-131
	National	LM3900	2913-103
	Raytheon	LM3900	2913-105
	TI	LM3900	2913-107
3905	Lambda	LAS3905	2952-132
		LAS3905K	2952-133
	National	LM3905	2951-16
3909	National	LM3909	2963-75
391	HybridSys	DAC391B-12	2451-16
		DAC391C-12	2451-17
	National	**LM391**	★**3326**
			★**3328**
			2896-68
	TeledyneS	391	472-66
		391A/C	2481-75
3911	National	LM3911	2968-31
	NEC-Electron	uPC3911	2968-32
3914	National	LM3914	2463-4
			¶ 260-7
	National	**LM3914**	★**3328**
	OKI	**MSM3914A**	★**3873**
			2468-17
	Sprague	ULN-3914A	2904-4
3915	National	LM3915	2463-5
	National	**LM3915**	★**3328**
3916	National	LM3916	2463-31
	National	**LM3916**	★**3328**
392	HybridSys	DAC392B-12	2453-24
		DAC392C-12	2453-25
	National	LM392	2887-150
			2938-38
	TeledyneS	392	472-72
		392A/C	2481-111
3924	National	LM3924	2888-2
393	Fairchild	uA393	2893-54
		uA393A	2893-9
	National	**LM393**	★**3317**
			2893-56
		LM393A	★**3317**
			2893-11
	NEC-Electron	uPC393	2893-61
	Signetics	LM393A	2893-58
	TeledyneS	393	472-120
		393A/C	2481-113
	TI	LM393	2893-60
3930	**OEI**	**3930**	★**3347**
			2968-69
39301	TI	SN39301	483-22
39308	TI	SN39308	495-104
39309	TI	SN39309	497-114
39310	TI	SN39310	480-142
39311	TI	SN39311	484-37
39312	TI	SN39312	499-134
39316	TI	SN39316	478-119
39318	TI	SN39318	508-138
394	National	LM394	2889-79
	TeledyneS	394	472-123
		394A/C	2481-112
395	National	LM395	2962-111
	TeledyneS	395	472-73
		395A/C	2482-142
396	**National**	**LM396**	★**3299**
			2959-7
	TeledyneS	396AC	473-30
397	HybridSys	DAC397B-12	2451-18
		DAC397C-12	2451-19
398	AMD	LF398	2967-52
	Fairchild	uA398	2967-82
	National	COP398	1087-106
		LF398	2967-113
		LF398A	2967-114
	Signetics	LF398	2967-137
399	National	COP399	1087-110
	National	**LM399**	★**3304**
			2966-111
			¶ 282-13
		LM399A	★**3304**
			2966-113
			¶ 282-13
			¶ 282-13
3999	**National**	**LM3999**	★**3304**
			2966-112
	RCA	**CA3999**	★**3361**
3D5	Cromemco	CS-3D5E	1619-3
32	Exar	XR-I32L-CHIP	4140-66
4	AMI	UA-4	4140-13
	Burr-Brown	MPC4D	2423-63
	Cromemco	**4PIO**	★**1928**
	DGM	DSC-4	1757-4
	NEC-Micro	uCOM-4	1053-18
	National	**MF4**	★**3305**
			2962-29
	Rockwell	PPS-4	1055-19
		PPS-4/1	1055-20
			¶ 246-17
			¶ 247-11
		PPS-4/2	1055-21
	Sharp	SM-4	1088-10
			1055-24
	TeledyneC	CDA4A	2417-109
		CLD4	2464-101
40	MicroEng	MCE-A40A	4140-188
	MicroEng	**MCE-A40AS**	★**4437**
			4140-189
	MicroEng	MCE-A40B	4140-190
	MicroEng	**MCE-A40DS**	★**4437**
			4140-191
		MCE-A40D	★**4437**
			4140-192
		MCE-A40DS	★**4437**
			4140-193
	MicroEng	MCE-B40A	4140-197
		MCE-B40B	4140-198
		MCE-P40A	4140-203
	OKI	**EASE-40-I/C**	★**3873**
	RCA	**MSM40**	★**1959**
		MSM40E	★**1959**
	Rockwell	A65/40-1000	1759-2
	Western	WD40	1059-6
400	AnalogSys	MA400	2932-34
	Elind	RP400S	4004-4
	Exar	XR400	4140-71
	Harris	HI400	2415-33
	Motorola	**HDS-400**	★**1732**
			1627-2
		MVME400	★**1941**
	Motorola	XC400	4141-52
	National	LF400	2933-5
	Sprague	UHC/D-400	484-68
			2483-88
	Sprague	**UHP-400**	★**2843**
			484-72
			★**2843**
			2483-92
	Unitrode	PF400	2964-98
		PR400	2964-104
4000	**AMI**	**GA4000D**	★**4307**
			4140-7
	Cherry	CS4000M	4140-52
		CS4000MX	4140-53
	Holt	HI4000	4140-94
	HyComp	DA4000	2457-16
	Motorola	**MC4000**	★ **729**
			498-17
			★ **729**
			2485-1
		SYSTEM4000	★**1945**
	National	CD4000C	458-73
		CD4000M	458-74
	Plessey	SCD-4000	4141-79
		SCD-4000H	4141-80
		SCD-4000L	4141-81
		SCD-4000M	4141-82
	Plessey	**SCD4000H**	★**4510**
		SCD4000L	★**4510**
		SCD4000M	★**4510**
	Plessey	SPD-4000	4141-85
	RCA	**CD4000A**	★ **407**
			★ **748**
			458-75
			¶ 230-15
		CD4000AE	★ **407**
			★ **748**
			458-76
		CD4000B	★ **407**

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
4000	**RCA**	**CD4000B**	★ **748**
			458-77
		CD4000BE	★ **407**
			★ **748**
			458-78
		CD4000UB	★ **407**
			★ **748**
			458-79
		CD4000UBE	★ **407**
			★ **748**
			458-80
	SGS	HCC4000B	458-81
		HCF4000B	458-82
	Signetics	**HE4000B**	★ **804**
	Siliconix	VN4000	2483-66
	SSS	883/4000B	458-83
		SCL4000B	458-84
	Solitron	CM4000A	458-85
		CM4000AE	458-86
	Telmos	TM4000	4141-185
4001	Fairchild	F4001BC	458-151
		F4001BM	458-152
	Motorola	MC4001	482-124
		MHQ4001A	2889-136
	National	CD4001A	458-160
		CD4001BC	458-161
		CD4001BM	458-162
	RCA	**CD4001A**	★ **748**
			458-168
			¶ 228-4
			¶ 230-15
		CD4001AE	★ **748**
			458-169
			¶ 228-4
		CD4001B	★ **748**
			458-170
			¶ 228-4
		CD4001BE	★ **748**
			458-171
			¶ 228-4
		CD4001UB	★ **748**
			458-172
			¶ 228-4
		CD4001UBE	★ **748**
			458-173
			¶ 228-4
	Sanyo	LC4001B	458-176
	SGS	HCC4001B	458-178
		HCF4001B	458-179
	SSS	883/4001B	458-180
		883/4001UB	458-181
		SCL4001B	458-182
		SCL4001UB	458-183
	Solitron	CM4001A	458-184
		CM4001AE	458-185
		CM4001B	458-186
		CM4001BE	458-187
	Toshiba	TC4001B	458-188
		TC4001UB	458-189
40014	Fairchild	F40014AM	465-19
		F40014BC	465-20
4002	Fairchild	F4002BC	458-87
		F4002BM	458-88
	Motorola	MHQ4002A	2889-137
	National	CD4002A	458-96
		CD4002BC	458-97
		CD4002BM	458-98
	RCA	**CD4002A**	★ **748**
			458-101
		CD4002AE	★ **748**
			458-102
		CD4002B	★ **748**
			458-103
		CD4002BE	★ **748**
			458-104
		CD4002UB	★ **748**
			458-105
		CD4002UBE	★ **748**
			458-106
	SGS	HCC4002B	458-109
		HCF4002B	458-110
	SSS	883/4002B	458-111
		SCL4002B	458-112
	Solitron	CM4002A	458-113
		CM4002AE	458-114
	Toshiba	TC4002B	458-115

Base Number	Source	Device	Page-Line
4003	**AMI**	**S4003**	★ **618**
			2898-40
			2899-25
	Motorola	MPQ4003	2889-143
4004	Motorola	MC4004	496-161
			3470-82
		MPQ4004	2889-144
4005	Motorola	MC4005	496-162
			3470-83
4006	Fairchild	F4006BC	463-136
			3489-119
		F4006BM	463-137
		F4006M	3489-123
	Motorola	MC4006	482-110
			¶ 285-10
	National	CD4006A	463-141
			3489-124
		CD4006BC	463-142
		CD4006BM	463-143
	RCA	**CD4006A**	★ **748**
			463-144
		CD4006AE	★ **748**
			463-145
		CD4006B	★ **748**
			463-146
		CD4006BE	★ **748**
			463-147
			★ **748**
			3489-120
	SGS	HCC4006B	463-148
		HCF4006B	463-149
	SSS	883/4006B	463-150
			3489-125
		SCL4006B	463-151
			3489-126
	Solitron	CM4006A	463-152
			3489-121
		CM4006AD	463-153
			3489-118
		CM4006AE	463-154
			3489-122
	Toshiba	TC4006B	463-155
40061	**RCA**	**CD40061**	★**3874**
			460-121
		CD40061A	★**3874**
			460-122
			★**3874**
			3473-30
	RCA	CO40061	3473-33
4007	Fairchild	F4007UBC	450-145
		F4007UBM	450-146
	Mostek	MK4007	3473-34
		MK4007-4	3473-35
	Motorola	MC4007	483-46
			¶ 285-10
	National	CD4007C	450-150
		CD4007M	450-151
	RCA	**CD4007A**	★ **748**
			450-152
			¶ 254-11
		CD4007AE	★ **748**
			450-153
		CD4007UB	★ **748**
			450-154
		CD4007UBE	★ **748**
			450-155
	SGS	HCC4007UB	450-156
		HCF4007UB	450-157
	SSS	883/4007UB	450-158
		SCL4007UB	450-159
	Solitron	CM4007A	450-160
		CM4007AE	450-161
	Toshiba	TC4007UB	450-162
4008	Fairchild	F4008BC	449-31
		F4008BM	449-32
	Motorola	MC4008	508-99
	National	CD4008BC	449-36
		CD4008BM	449-37
	RCA	**CD4008A**	★ **748**
			449-40
			¶ 228-4
		CD4008AE	★ **748**
			449-41
			¶ 228-4
		CD4008B	★ **748**

Base Number	Source	Device	Page-Line
4008	RCA	CD4008B	449-42
			¶ 228-4
		CD4008BE	★ **748**
			449-43
			¶ 228-4
	SGS	HCC4008B	449-44
		HCF4008B	449-45
	SSS	883/4008B	449-46
		SCL4008B	449-47
	Solitron	CM4008A	449-48
		CM4008AE	449-49
	Toshiba	TC4008B	449-50
40085	Fairchild	F40085BC	449-83
		F40085BM	449-84
4009	National	CD4009AC	450-2
		CD4009AM	450-3
	RCA	**CD4009A**	★ **748**
			450-4
			¶ 229-7
		CD4009AE	★ **748**
			450-5
			¶ 229-7
		CD4009UB	★ **748**
			450-6
			¶ 229-7
		CD4009UBE	★ **748**
			450-7
			¶ 229-7
	SSS	883/4009UB	450-8
		SCL4009UB	450-9
	Solitron	CM4009A	450-10
		CM4009AE	450-11
	Toshiba	TC4009UB	450-12
40097	Fairchild	F40097BC	450-92
		F40097BM	450-93
40098	Fairchild	F40098BC	450-169
		F40098BM	450-170
401	Cherry	CS401	2964-70
	Harris	HI401	2416-64
	Motorola	MHW401	2888-44
	Telefunken	U401	2902-114
4010	Hughes	HCTR4010	453-42
	Motorola	MC4010	507-66
	National	CD4010A	450-38
	RCA	**CD4010A**	★ **740**
			★ **748**
			450-39
			¶ 229-7
		CD4010AE	★ **740**
			★ **748**
			450-40
			¶ 229-7
		CD4010B	★ **740**
			★ **748**
			450-41
			¶ 229-7
		CD4010BE	★ **740**
			★ **748**
			450-42
			¶ 229-7
	SSS	883/4010B	450-43
		SCL4010B	450-44
	Solitron	CM4010A	450-45
		CM4010AE	450-46
	Toshiba	TC4010B	450-47
40100	**RCA**	**CD40100B**	★ **749**
			463-158
		CD40100BE	★ **749**
			463-159
	SGS	HCC40100B	463-160
		HCF40100B	463-161
40101	**RCA**	**CD40101B**	★ **749**
			464-43
		CD40101BE	★ **749**
			464-44
	SGS	HCC40101B	464-45
		HCF40101B	464-46
40102	**RCA**	**CD40102B**	★ **749**
			453-1
		CD40102BE	★ **749**
			453-2
	SGS	HCC40102B	453-3
		HCF40102B	453-4
40103	**RCA**	**CD40103B**	★ **749**
			451-112

Base Number	Source	Device	Page-Line
40103	**RCA**	**CD40103BE**	★ **749**
			451-113
	SGS	HCC40103B	451-114
		HCF40103B	451-115
40104	**RCA**	**CD40104B**	★ **749**
			463-29
	SGS	HCC40104B	463-35
		HCF40104B	463-37
40105	**RCA**	**CD40105B**	★ **749**
			460-73
			★ **749**
			3456-1
		CD40105BE	★ **749**
			460-74
			★ **749**
			3456-2
	SGS	HCC40105B	460-75
		HCF40105B	460-76
40106	National	CD40106BC	465-26
		CD40106BM	465-27
	RCA	**CD40106B**	★ **749**
			465-34
		CD40106BE	★ **749**
			465-35
	SGS	HCC40106B	465-39
		HCF40106B	465-40
40107	**RCA**	**CD40107B**	★ **749**
			457-5
		CD40107BE	★ **749**
			457-6
			¶ 229-4
	SGS	HCC40107B	457-7
		HCF40107B	457-8
40108	**RCA**	**CD40108B**	★ **749**
			460-80
		CD40108BE	★ **749**
			460-81
40109	**RCA**	**CD40109B**	★ **749**
			463-185
		CD40109BE	★ **749**
			463-186
	SGS	HCC40109B	463-187
		HCF40109B	463-188
4011	Fairchild	F4011BC	457-88
		F4011BM	457-89
	National	CD4011AC	457-97
		CD4011AM	457-98
		CD4011BC	457-99
		CD4011BM	457-100
	RCA	**CD4011A**	★ **748**
			457-106
			¶ 228-4
		CD4011AE	★ **748**
			457-107
			¶ 228-4
		CD4011B	★ **748**
			457-108
			¶ 228-4
		CD4011BE	★ **748**
			457-109
			¶ 228-4
			★ **748**
			3471-111
			¶ 228-4
		CD4011UB	★ **748**
			457-110
			¶ 228-4
		CD4011UBE	★ **748**
			457-111
			¶ 228-4
	Sanyo	LC4011B	457-114
	SGS	HCC4011B	457-116
		HCF4011B	457-117
	SSS	883/4011B	457-118
		883/4011UB	457-119
		SCL4011B	457-120
		SCL4011UB	457-121
	Solitron	CM4011A	457-122
		CM4011AE	457-123
		CM4011B	457-124
		CM4011BE	457-125
	Toshiba	TC4011B	457-126
		TC4011UB	457-127
40110	**RCA**	**CD40110B**	★ **749**
			453-14

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
40110	RCA	CD40110BE	★ 749
			453-15
40114	RCA	CD40114B	★3874
			460-104
			★3874
			3471-110
		CD40114BE	★3874
			460-105
40116	RCA	CD40116	★ 749
			464-6
40117	RCA	CD40117B	★ 749
			★ 752
			464-116
4012	Fairchild	F4012BC	457-13
		F4012BM	457-14
	Motorola	MC4012	501-81
			3489-31
	National	CD4012A	457-22
		CD4012BC	457-23
		CD4012BM	457-24
	RCA	CD4012A	★ 748
			457-27
		CD4012AE	★ 748
			457-28
		CD4012B	★ 748
			457-29
		CD4012BE	★ 748
			457-30
		CD4012UB	★ 748
			457-31
		CD4012UBE	★ 748
			457-32
	SGS	HCC4012B	457-36
		HCF4012B	457-37
	SSS	883/4012B	457-38
		SCL4012B	457-39
	Solitron	CM4012A	457-40
		CM4012AE	457-41
	Toshiba	TC4012B	457-42
4013	Fairchild	F4013BC	455-88
		F4013BM	455-89
	Motorola	MHQ4013	2889-138
	National	CD4013BC	455-95
		CD4013BM	455-96
	RCA	CD4013A	★ 748
			455-102
			¶ 228-4
		CD4013AE	★ 748
			455-103
			¶ 228-4
		CD4013B	★ 748
			455-104
			¶ 228-4
		CD4013BE	★ 748
			455-105
			¶ 228-4
	Sanyo	LC4013B	455-108
	SGS	HCC4013B	455-110
		HCF4013B	455-111
	SSS	883/4013B	455-112
		SCL4013B	455-113
	Solitron	CM4013A	455-114
		CM4013AE	455-115
		CM4013B	455-116
		CM4013BE	455-117
	Toshiba	TC4013B	455-118
4014	Fairchild	F4014BC	463-113
			3490-73
		F4014BM	463-114
			3490-85
	Motorola	MHQ4014	2889-139
	National	CD4014A	463-118
			3490-77
		CD4014BC	463-119
		CD4014BM	463-120
	RCA	CD4014A	★ 748
			463-121
		CD4014AE	★ 748
			463-122
		CD4014B	★ 748
			463-123
			★ 748
			3490-89
		CD4014BE	★ 748
			463-124

Base Number	Source	Device	Page-Line
4014	RCA	CD4014BE	★ 748
			3490-79
	SGS	HCC4014B	463-125
		HCF4014B	463-126
	SSS	883/4014B	463-127
			3490-91
		SCL4014B	463-128
			3490-81
	Solitron	CM4014A	463-129
			3490-93
		CM4014AE	463-130
	Toshiba	TC4014B	463-131
40147	RCA	CD40147B	★ 749
			466-21
		CD40147BE	★ 749
			466-22
4015	Fairchild	F4015BC	462-114
			3489-91
		F4015BM	462-115
			3489-96
	Motorola	MC4015	485-110
	National	CD4015A	3489-94
		CD4015AC	462-119
		CD4015BC	462-120
		CD4015BM	462-121
	RCA	CD4015A	★ 748
			462-122
		CD4015AE	★ 748
			462-123
		CD4015B	★ 748
			462-124
			★ 748
			3489-97
		CD4015BE	★ 748
			462-125
			★ 748
			3489-95
	SGS	HCC4015B	462-126
		HCF4015B	462-127
	SSS	883/4015B	462-128
			3489-98
		SCL4015B	462-129
			3489-99
	Solitron	CM4015A	462-130
			3489-90
		CM4015AE	462-131
			3489-89
	Toshiba	TC4015B	462-132
4016	Fairchild	F4016C	2417-62
		F4016M	2417-63
	GI	AY6-4016	2424-95
	Motorola	MC4016	482-56
			¶ 237-1
			¶ 278-12
	National	CD4016BC	★3318
			2417-66
		CD4016BM	★3318
			2417-67
	RCA	CD4016A	★ 748
			2417-68
			¶ 259-6
		CD4016AE	★ 748
			2417-69
		CD4016B	★ 748
			2417-70
		CD4016BE	★ 748
			2417-71
	SGS	HCC4016B	2417-72
		HCF4016B	2417-73
	SSS	883/4016B	2417-57
		SCL4016B	2417-58
	Solitron	CM4016A	2417-59
			2417-74
		CM4016AE	2417-60
			2417-75
	TI	TMS4016-12	★3968
			3480-25
		TMS4016-20	★3968
			3480-103
		TMS4016-25	★3968
			3481-9
	Toshiba	TC4016B	2417-61
40160	Fairchild	F40160BC	452-132
		F40160BM	452-133
	National	CD40160BC	452-139
		CD40160BM	452-140

Base Number	Source	Device	Page-Line
40160	RCA	CD40160B	★ 749
			452-145
		CD40160BE	★ 749
			452-146
	SGS	HCC40160B	452-150
		HCF40160B	452-151
	Toshiba	TC40160B	452-154
40161	Fairchild	F40161BC	451-48
		F40161BM	451-49
	National	CD40161BC	451-55
		CD40161BM	451-56
	RCA	CD40161B	★ 749
			451-61
		CD40161BE	★ 749
			451-62
	SGS	HCC40161B	451-66
		HCF40161B	451-67
	Toshiba	TC40161B	451-70
40162	Fairchild	F40162BC	452-104
		F40162BM	452-105
	National	CD40162BC	452-111
		CD40162BM	452-112
	RCA	CD40162B	★ 749
			452-117
		CD40162BE	★ 749
			452-118
	SGS	HCC40162B	452-122
		HCF40162B	452-123
	Toshiba	TC40162B	452-126
40163	Fairchild	F40163BC	451-24
		F40163BM	451-25
	National	CD40163BC	451-31
		CD40163BM	451-32
	RCA	CD40163B	★ 749
			451-37
		CD40163BE	★ 749
			451-38
	SGS	HCC40163	451-42
		HCF40163	451-43
	Toshiba	TC40163B	451-46
4017	Fairchild	F4017BC	452-78
		F4017BM	452-79
	Motorola	MC4017	482-57
	National	CD4017BC	452-85
		CD4017BM	452-86
	RCA	CD4017A	★ 748
			452-87
			¶ 231-15
		CD4017AE	★ 748
			452-88
			¶ 231-15
		CD4017B	★ 748
			452-89
			¶ 231-15
		CD4017BE	★ 748
			452-90
			¶ 231-15
	Sanyo	STK4017	2897-50
	SGS	HCC4017B	452-93
		HCF4017B	452-94
	SSS	883/4017B	452-95
		SCL4017B	452-96
	Solitron	CM4017A	452-97
		CM4017AE	452-98
	Toshiba	TC4017B	452-99
40174	Fairchild	F40174BC	455-163
		F40174BM	455-164
	National	CD40174BC	455-170
		CD40174BM	455-171
	RCA	CD40174B	★ 749
			455-174
		CD40174BE	★ 749
			455-175
	SGS	HCC40174B	455-179
		HCF40174B	455-180
	Toshiba	TC40174B	456-2
40175	Fairchild	F40175BC	455-146
		F40175BM	455-147
	National	CD40175B	455-153
	RCA	CD40175	★ 749
	Toshiba	TC40175B	455-161
4018	Fairchild	F4018BC	453-113
		F4018BM	453-114
	Motorola	MC4018	482-52
			¶ 237-1

Base Number	Source	Device	Page-Line
4018	National	CD4018BC	453-118
		CD4018BM	453-119
	RCA	CD4018A	★ 748
			453-120
			¶ 232-3
		CD4018AE	★ 748
			453-121
			¶ 232-3
		CD4018B	★ 748
			453-122
			¶ 232-3
		CD4018BE	★ 748
			453-123
			¶ 232-3
	SGS	HCC4018B	453-124
		HCF4018B	453-125
	SSS	883/4018B	453-126
		SCL4018B	453-127
	Solitron	CM4018A	453-128
		CM4018AE	453-129
			3490-83
	Toshiba	TC4018B	453-130
40181	RCA	CD40181B	★ 749
			449-63
		CD40181BE	★ 749
			449-64
	SGS	HCC40181B	449-66
		HCF40181B	449-67
40182	RCA	CD40182B	★ 749
			449-75
		CD40182BE	★ 749
			449-76
	SGS	HCC40182	449-77
		HCF40182	449-78
4019	Fairchild	F4019BC	457-165
		F4019BM	457-166
	Motorola	MC4019	482-53
	National	CD4019BC	457-168
		CD4019BM	457-169
	RCA	CD4019A	★ 748
			457-170
			¶ 228-4
		CD4019AE	★ 748
			457-171
			¶ 228-4
		CD4019B	★ 748
			457-172
			¶ 228-4
		CD4019BE	★ 748
			457-173
			¶ 228-4
	Sanyo	STK4019	2897-51
	SGS	HCC4019B	457-174
		HCF4019B	457-175
	SSS	883/4019B	457-176
		SCL4019B	457-177
	Solitron	CM4019A	457-178
		CM4019AE	457-179
	Toshiba	TC4019B	457-180
40192	Fairchild	F40192BC	452-158
		F40192BM	452-159
	National	CD40192BC	452-168
		CD40192BM	452-169
	RCA	CD40192B	★ 749
			452-176
		CD40192BE	★ 749
			452-177
	SGS	HCC40192B	452-183
		HCF40192B	452-185
40193	Fairchild	F40193BC	451-78
		F40193BM	451-79
	National	CD40193BC	451-87
		CD40193BM	451-88
	RCA	CD40193B	★ 749
			451-95
		CD40193BE	★ 749
			451-96
40194	Fairchild	F40194BC	462-147
			3489-66
		F40194BM	462-148
			3489-54
	RCA	CD40194B	★ 749
			463-30
	SGS	HCC40194B	463-6
		HCF40194B	463-7

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
40195	Fairchild	F40195BC	463-10
			3489-67
		F40195BM	463-11
			3489-55
	National	CD40195BC	463-14
		CD40195BM	463-15
402	AnalogSys	MD402	2480-28
	Cherry	CS402	2964-71
	National	COP402	1087-57
			1051-29
		COP402L	1087-58
		COP402M	1087-50
			1051-30
	Sprague	UHC/D-402	484-115
			2483-120
	Sprague	**UHP-402**	★ **2843**
			484-119
			★ **2843**
			2483-124
4020	Fairchild	F4020BC	452-14
		F4020BM	452-15
	National	CD4020BC	452-21
		CD4020BM	452-22
	RCA	**CD4020A**	★ **748**
			452-23
		CD4020AE	★ **748**
			452-24
		CD4020B	★ **748**
			452-25
		CD4020BE	★ **748**
			452-26
	SGS	HCC4020B	452-29
		HCF4020B	452-30
	SSS	883/4020B	452-31
		SCL4020B	452-32
	Solitron	CM4020A	452-33
		CM4020AE	452-34
	Toshiba	TC4020B	452-35
40208	**RCA**	**CD40208B**	★ **749**
			460-82
		CD40208BE	★ **749**
			460-83
	SGS	HCC40208B	460-84
		HCF40208B	460-85
4021	Fairchild	F4021BC	463-44
			3490-74
		F4021BM	463-45
			3490-86
	Motorola	MC4021	474-28
	National	CD4021A	463-49
			3490-78
		CD4021BC	463-50
		CD4021BM	463-51
	RCA	**CD4021A**	★ **748**
			463-52
		CD4021AE	★ **748**
			463-53
		CD4021B	★ **748**
			463-54
			★ **748**
			3490-90
		CD4021BE	★ **748**
			463-55
			★ **748**
			3490-80
	Sanyo	STK4021	2896-170
	SGS	HCC4021B	463-56
		HCF4021B	463-57
	SSS	883/4021B	463-58
			3490-92
		SCL4021B	463-59
			3490-82
	Solitron	CM4021A	463-60
			3490-94
		CM4021AE	463-61
			3490-84
	Toshiba	TC4021B	463-62
4022	Fairchild	F4022BC	453-88
		F4022BM	453-89
	Motorola	MC4022	474-29
	National	CD4022BC	453-92
		CD4022BM	453-93
	RCA	**CD4022A**	★ **748**
			453-94
		CD4022AE	★ **748**
			453-95
4022	**RCA**	**CD4022B**	★ **748**
			453-96
		CD4022BE	★ **748**
			453-97
	SGS	HCC4022B	453-98
		HCF4022B	453-99
	SSS	883/4022B	453-100
		SCL4022B	453-101
	Solitron	CM4022A	453-102
		CM4022AE	453-103
	Toshiba	TC4022B	453-104
4023	Burr-Brown	4023	2965-42
	Fairchild	F4023BC	457-47
		F4023BM	457-48
	Motorola	MC4023	482-77
	National	CD4023BC	457-56
		CD4023BM	457-57
	RCA	**CD4023A**	★ **748**
			457-64
		CD4023AE	★ **748**
			457-65
		CD4023B	★ **748**
			457-66
		CD4023BE	★ **748**
			457-67
		CD4023UB	★ **748**
			457-68
		CD4023UBE	★ **748**
			457-69
	Sanyo	STK4023	2896-171
	SGS	HCC4023B	457-73
		HCF4023B	457-74
	SSS	883/4023B	457-75
		SCL4023B	457-76
	Solitron	CM4023A	457-77
		CM4023AE	457-78
	Toshiba	TC4023B	457-79
4024	Fairchild	F4024BC	451-151
		F4024BM	451-152
	Motorola	MC4024	501-13
			¶ 237-1
			¶ 278-12
			2946-32
			¶ 237-1
			¶ 278-12
	National	CD4024BC	451-158
		CD4024BM	451-159
	RCA	**CD4024A**	★ **748**
			451-160
			¶ 231-15
		CD4024AE	★ **748**
			451-161
			¶ 231-15
		CD4024B	★ **748**
			451-162
			¶ 231-15
		CD4024BE	★ **748**
			451-163
			¶ 231-15
	SGS	HCC4024B	451-166
		HCF4024B	451-167
	SSS	883/4024B	451-168
		SCL4024B	451-169
	Solitron	CM4024A	451-170
		CM4024AE	451-171
	Toshiba	TC4024B	451-172
4025	AMD	MM4025	3488-30
	Burr-Brown	4025	2965-43
	Fairchild	F4025BC	458-118
		F4025BM	458-119
	National	CD4025A	458-127
		CD4025BC	458-128
		CD4025BM	458-129
	RCA	**CD4025A**	★ **748**
			458-132
		CD4025AE	★ **748**
			458-133
		CD4025B	★ **748**
			458-134
		CD4025BE	★ **748**
			458-135
		CD4025UB	★ **748**
			458-136
		CD4025UBE	★ **748**
			458-137
	Sanyo	STK4025	2896-172
4025	SGS	HCC4025B	458-141
		HCF4025B	458-142
	SSS	883/4025B	458-143
		SCL4025B	458-144
	Solitron	CM4025A	458-145
		CM4025AE	458-146
	Toshiba	TC4025B	458-147
40257	**RCA**	**CD40257B**	★ **749**
			461-118
		CD40257BE	★ **749**
			461-119
	SGS	HCC40257B	461-123
		HCF40257B	461-124
4026	AMD	MM4026	3488-31
	RCA	**CD4026A**	★ **748**
			452-54
			¶ 229-7
		CD4026AE	★ **748**
			452-55
			¶ 229-7
		CD4026D	★ **748**
			452.56
			¶ 229-7
		CD4026BE	★ **748**
			452-57
			¶ 229-7
	SGS	HCC4026B	452-58
		HCF4026B	452-59
	SSS	883/4026AB	452-60
		SCL4026AB	452-62
	Solitron	CM4026A	452-64
		CM4026AE	452-65
4027	AMD	MM402[illegible]	3488-36
	Fairchild	F4027BC	456-99
		F4027BM	456-100
	Intersil	MK4027-2	3468-18
		MK4027-3	3468-25
		MK4027-4	3468-37
	ITT	ITT4027-2	3468-19
		ITT4027-3	3468-26
		ITT4027-4	3468-38
		ITT4027-6	3468-53
	Mostek	MK4027-1	3468-15
			¶ 248-14
		MK4027-2	3468-20
			¶ 248-14
		MK4027-3	3468-27
			¶ 248-14
		MK4027-4	3468-39
			¶ 248-14
		MKB4027-83	3468-28
		MKB4027-84	3468-40
	Motorola	MCM4027A-1	3468-16
			¶ 287-17
		MCM4027A-2	3468-21
			¶ 287-17
		MCM4027A-3	3468-29
			¶ 287-17
		MCM4027A-4	3468-41
			¶ 287-17
	National	CD4027BC	456-108
		CD4027BM	456-109
	RCA	**CD4027A**	★ **748**
			456-118
		CD4027AE	★ **748**
			456-119
		CD4027B	★ **748**
			456-120
		CD4027BE	★ **748**
			456-121
	SGS	HCC4027B	456-130
		HCF4027B	456-131
		M4027-2	3468-22
		M4027-3	3468-30
		M4027-4	3468-42
	SSS	883/4027B	456-132
		SCL4027B	456-133
	Solitron	CM4027A	456-134
		CM4027AE	456-135
	Toshiba	TC4027B	456-136
4028	Fairchild	F4028BC	453-161
		F4028BM	453-162
	National	CD4028BC	453-168
		CD4028BM	453-169
	RCA	**CD4028A**	★ **748**
			454-4
4028	**RCA**	**CD4028AE**	★ **748**
			454-5
		CD4028B	★ **748**
			454-6
		CD4028BE	★ **748**
			454-7
	SGS	HCC4028B	454-11
		HCF4028B	454-12
	SSS	883/4028B	454-13
		SCL4028B	454-14
	Solitron	CM4028A	454-15
		CM4028AE	454-16
	Toshiba	TC4028B	454-17
4029	Fairchild	F4029BC	453-131
		F4029BM	453-132
	National	CD4029BC	453-135
		CD4029BM	453-136
	RCA	**CD4029A**	★ **748**
			453-137
		CD4029B	★ **748**
			453-138
		CD4029BE	★ **748**
			453-139
	SGS	HCC4029B	453-140
		HCF4029B	453-141
	SSS	883/4029B	453-142
		SCL4029B	453-143
	Solitron	CM4029A	453-144
		CM4029AE	453-145
	Toshiba	TC4029B	453-146
403	AnalogSys	MA403	2922-42
	Sprague	UHC/D-403	484-116
			2483-121
	Sprague	**UHP-403**	★ **2843**
			484-120
			★ **2843**
			2483-125
4030	Fairchild	F4030BC	459-6
		F4030BM	459-7
	National	CD4030A	459-15
	RCA	**CD4030A**	★ **748**
			459-24
		CD4030AE	★ **748**
			459-25
		CD4030B	★ **748**
			459-26
		CD4030BE	★ **748**
			459-27
	SGS	HCC4030B	459-33
		HCF4030B	459-35
	SSS	883/4030B	459-37
		SCL4030B	459-39
	Solitron	CM4030A	459-41
		CM4030AE	459-42
	Toshiba	TC4030B	459-45
4031	Fairchild	F4031BC	463-164
			3491-46
		F4031BM	463-165
			3491-48
	National	CD4031BC	463-166
			3491-52
		CD4031BM	463-167
			3491-53
	RCA	**CD4031A**	★ **748**
			463-168
		CD4031AE	★ **748**
			463-169
		CD4031B	★ **748**
			463-170
			★ **748**
			3491-49
		CD4031BE	★ **748**
			463-171
			★ **748**
			3491-47
	SGS	HCC4031B	463-173
		HCF4031B	463-174
4032	OKI	MSM4032	449-19
	RCA	**CD4032A**	★ **748**
			449-20
		CD4032AE	★ **748**
			449-21
		CD4032B	★ **748**
			449-22
		CD4032BE	★ **748**
			449-23

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
4032	SGS	HCC4032B	449-24
		HCF4032B	449-25
	Solitron	CM4032A	449-26
		CM4032AE	449-27
	Toshiba	TC4032B	449-28
4033	**RCA**	**CD4033A**	★ **748**
			452-66
			¶ 229-7
		CD4033AE	★ **748**
			452-67
			¶ 229-7
		CD4033B	★ **748**
			452-68
			¶ 229-7
		CD4033BE	★ **748**
			452-69
			¶ 229-7
	SGS	HCC4033B	452-70
		HCF4033B	452-71
	SSS	883/4033AB	452-72
		SCL4033AB	452-74
	Solitron	CM4033A	452-76
		CM4033AE	452-77
4034	Fairchild	F4034BC	463-63
		F4034BM	463-64
	National	CD4034BC	463-68
			3490-36
		CD4034BM	463-69
			3490-37
	RCA	**CD4034A**	★ **748**
			463-70
		CD4034AE	★ **748**
			463-71
		CD4034B	★ **748**
			463-72
			★ **748**
			3490-38
		CD4034BE	★ **748**
			463-73
	SGS	HCC4034B	463-74
		HCF4034B	463-75
	SSS	883/4034B	463-76
			3490-39
		SCL4034B	463-77
			3490-33
	Solitron	CM4034A	463-78
			3490-43
		CM4034AE	463-79
			3490-35
	Toshiba	TC4034	3490-40
4035	Fairchild	F4035BC	463-22
			3489-68
		F4035BM	463-23
			3489-56
	National	CD4035BC	463-27
			3489-59
		CD4035BM	463-28
			3489-70
	RCA	**CD4035A**	★ **748**
			463-31
		CD4035AE	★ **748**
			463-32
		CD4035B	★ **748**
			463-33
			★ **748**
			3489-72
		CD4035BE	★ **748**
			463-34
			★ **748**
			3489-61
	SGS	HCC4035B	463-36
		HCF4035B	463-38
	SSS	883/4035B	463-39
			3489-62
		884/4035B	3489-63
		SCL4035B	463-40
			3489-64
	Solitron	CM4035A	463-41
			3489-73
		CM4035AE	463-42
			3489-65
	Toshiba	TC4035B	463-43
4036	AMI	S4036	2906-54
	RCA	**CD4036A**	★**3875**
			460-86

Base Number	Source	Device	Page-Line
4036	**RCA**	**CD4036A**	★**3875**
			3470-75
		CD4036AE	★**3875**
			460-87
	Solitron	CM4036A	460-88
			3470-73
		CM4036AE	460-89
	Toshiba	TC4036B	460-90
4037	**RCA**	**CD4037A**	★ **748**
			457-161
		CD4037AE	★ **748**
			457-162
	Solitron	CM4037A	457-163
		CM4037AE	457-164
4038	Motorola	MC4038	482-108
			¶ 285-10
	RCA	**CD4038A**	★ **748**
			449-7
		CD4038AE	★ **748**
			449-8
		CD4038B	★ **748**
			449-9
		CD4038BE	★ **748**
			449-10
	SGS	HCC4038B	449-11
		HCF4038B	449-12
	Solitron	CM4038A	449-13
		CM4038AE	449-14
	Toshiba	TC4038B	449-15
4039	Motorola	MC4039	2463-141
	RCA	**CD4039A**	★**3875**
			460-91
			★**3875**
			3470-72
		CD4039AE	★**3875**
			460-92
	Solitron	CM4039A	460-93
			3470-74
		CM4039AE	460-94
	Toshiba	TC4039B	460-95
404	AnalogSys-	MK404	2892-25
	Fairchild	F404BC	451-180
	Ferranti	ZN404	2966-34
	National	COP404	1087-59
		COP404L	1087-51
		COP404LP	1051-31
		COP404LS	1051-32
4040	Fairchild	F4040BM	451-179
	Motorola	MC4040	482-123
			¶ 285-10
	National	CD4040BC	451-186
		CD4040BM	451-187
	RCA	**CD4040A**	★ **748**
			451-188
		CD4040AE	★ **748**
			451-189
		CD4040B	★ **748**
			451-190
		CD4040BE	★ **748**
			451-191
	SGS	HCC4040B	451-194
		HCF4040B	452-1
	Siemens	SDA4040	2945-67
	SSS	883/4040B	452-2
		SCL4040B	452-3
	Solitron	CM4040A	452-4
		CM4040AE	452-5
	Toshiba	TC4040B	452-6
4041	Fairchild	F4041BC	449-136
		F4041BM	449-137
	Motorola	MC4041	507-45
			2467-34
	National	CD4041C	449-138
		CD4041M	449-139
	RCA	**CD4041A**	★ **748**
			449-140
		CD4041AE	★ **748**
			449-141
		CD4041UB	★ **748**
			449-142
		CD4041UBE	★ **748**
			449-143
	SGS	HCC4041UB	449-144
		HCF4041UB	449-145
	Siemens	SDA4041	2945-68

Base Number	Source	Device	Page-Line
4041	SSS	883/4041UB	449-146
		SCL4041UB	449-147
	Solitron	CM4041A	449-148
		CM4041AE	449-149
4042	Fairchild	F4042BC	459-105
		F4042BM	459-106
	Motorola	MC4042	484-65
			2483-80
	National	CD4042BC	459-112
		CD4042BM	459-113
	RCA	**CD4042A**	★ **748**
			459-116
		CD4042AE	★ **748**
			459-117
		CD4042B	★ **748**
			459-118
		CD4042BE	★ **748**
			459-119
	SGS	HCC4042B	459-120
		HCF4042B	459-121
	SSS	883/4042B	459-122
		SCL4042B	459-123
	Solitron	CM4042A	459-124
		CM4042AE	459-125
	Toshiba	TC4042B	459-126
4043	Fairchild	F4043BC	459-146
		F4043BM	459-147
	Motorola	MC4043	2481-92
			¶ 285-10
	National	CD4043A	459-151
		CD4043BC	459-152
		CD4043BM	459-153
	RCA	**CD4043A**	★ **748**
			459-154
		CD4043AE	★ **748**
			459-155
		CD4043B	★ **748**
			459-156
		CD4043BE	★ **748**
			459-157
	SGS	HCC4043B	459-158
		HCF4043B	459-159
	SSS	883/4043B	459-160
		SCL4043B	459-161
	Solitron	CM4043A	459-162
		CM4043AE	459-163
	Toshiba	TC4043B	459-164
4044	AMD	4044-30	3482-65
		4044-45	3482-96
		AM4044-15	3482-6
		AM4044-20	3482-21
		AM4044-25	3482-38
	Fairchild	F4044BC	459-127
		F4044BM	459-128
	Motorola	MC4044	507-3
			¶ 237-1
			¶ 278-12
			2945-63
			¶ 237-1
			¶ 278-12
	National	CD4044A	459-132
		CD4044BC	459-133
		CD4044BM	459-134
	RCA	**CD4044A**	★ **748**
			459-135
		CD4044A/B	★ **748**
			459-136
		CD4044A/BE	★ **748**
			459-137
		CD4044AE	★ **748**
			459-138
		CD4044B	★ **748**
			459-139
	SGS	HCC4044B	459-140
		HCF4044B	459-141
	SSS	883/4044B	459-142
		SCL4044B	459-143
	Solitron	CM4044A	459-144
	TI	TMS4044-12	3483-110
		TMS4044-20	3482-34
		TMS4044-25	3482-50
		TMS4044-45	3482-105
	Toshiba	TC4044B	459-145
4045	**RCA**	**CD4045A**	★ **748**
			462-93

Base Number	Source	Device	Page-Line
4045	**RCA**	**CD4045AE**	★ **748**
			462-94
		CD4045B	★ **748**
			462-95
		CD4045BE	★ **748**
			462-96
	SGS	HCC4045B	462-97
		HCF4045B	462-98
	Solitron	CM4045A	462-101
		CM4045AE	462-102
4046	Fairchild	F4046BC	464-47
			2945-43
		F4046BM	464-48
			2945-44
	National	CD4046BC	464-52
			2945-47
		CD4046BM	464-53
			2945-48
	RCA	**CD4046A**	★ **748**
			464-54
			¶ 279-3
			★ **748**
			2945-49
			¶ 279-3
		CD4046AE	★ **748**
			464-55
			★ **748**
			2945-50
		CD4046B	★ **748**
			464-56
			★ **748**
			2945-51
		CD4046BE	★ **748**
			464-57
			★ **748**
			2945-52
	SGS	HCC4046B	464-58
		HCF4046B	464-59
	SSS	883/4046B	464-60
			2945-53
		SCL4046B	464-62
			¶ 279-4
			2945-55
			¶ 279-4
4047	Fairchild	F4047BC	462-12
		F4047BM	462-13
	National	CD4047BC	462-14
		CD4047BM	462-15
	RCA	**CD4047A**	★ **748**
			462-16
			¶ 231-5
		CD4047AE	★ **748**
			462-17
			¶ 231-5
		CD4047B	★ **748**
			462-18
			¶ 231-5
		CD4047BE	★ **748**
			462-19
			¶ 231-5
	SGS	HCC4047B	462-20
		HCF4047B	462-21
	SSS	883/4047B	462-22
		SCL4047B	462-23
	Solitron	CM4047A	462-24
		CM4047AE	462-25
	Toshiba	TC4047B	462-26
4048	Motorola	MC4048	482-109
	National	CD4048BC	459-72
		CD4048BM	459-73
	RCA	**CD4048A**	★ **748**
			459-74
		CD4048AE	★ **748**
			459-75
		CD4048B	★ **748**
			459-76
		CD4048BE	★ **748**
			459-77
	SGS	HCC4048B	459-78
		HCF4048B	459-79
	Solitron	CM4048A	459-82
		CM4048AE	459-83
4049	**Fairchild**	**4049B**	★ **668**
	Fairchild	F4049BC	450-15
		F4049BM	450-16
	National	CD4049UB	450-20

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
4049	**RCA**	**CD4049A**	★ **748** 450-23
		CD4049AE	★ **748** 450-24
		CD4049UB	★ **748** 450-25
		CD4049UBE	★ **748** 450-26
	SGS	HCC4049UB	450-30
		HCF4049UB	450-31
	SSS	883/4049UB	450-32
		SCL4049UB	450-33
	Solitron	CM4049A	450-34
		CM4049AE	450-35
	Toshiba	TC4049B	450-36
4050	**Fairchild**	**4050B**	★ **668**
	Fairchild	F4050BC	450-50
		F4050BM	450-51
	IPI	IPI4050	2964-9
	Motorola	MC4050	482-73
	National	CD4050BC	450-55
		CD4050BM	450-56
	RCA	**CD4050A**	★ **748** 450-57
		CD4050AE	★ **748** 450-58
		CD4050B	★ **748** 450-59
		CD4050BE	★ **748** 450-60
	SGS	HCC4050B	450-63
		HCF4050B	450-64
	Siemens	TDA4050B	2888-18
	SSS	883/4050B	450-65
		SCL4050B	450-66
	Solitron	CM4050A	450-67
		CM4050AE	450-68
	Toshiba	TC4050B	450-69
4051	Fairchild	F4051BC	2423-90
		F4051BM	2423-91
	Motorola	MC4051	482-74
	RCA	**CD4051B**	★ **748** 2423-97
		CD4051BE	★ **748** 2423-98
	SGS	HCC4051B	2423-99
		HCF4051B	2423-100
	SSS	883/4051B	2423-101
		SCL4051B	2423-102
	Solitron	CM4051A	2423-103
		CM4051AE	2423-104
	Toshiba	TC4051B	2423-105
4052	Fairchild	F4052BC	2423-22
		F4052BM	2423-23
	Motorola	MC4052	481-38
	National	**CD4052BC**	★**3318** 2423-27
		CD4052BM	★**3318** 2423-28
	RCA	**CD4052B**	★ **748** 2423-29
		CD4052BE	★ **748** 2423-30
	SGS	HCC4052B	2423-31
		HCF4052B	2423-32
	SSS	883/4052B	2423-33
		SCL4052B	2423-34
	Solitron	CM4052B	2423-35
		CM4052BE	2423-36
	Toshiba	TC4052B	2423-37
4053	Fairchild	F4053BC	2419-97
		F4053BM	2419-98
	Motorola	MC4053	479-4
	National	**CD4053BC**	★**3318** 2419-102
		CD4053BM	★**3318** 2419-103
	RCA	**CD4053B**	★ **748** 2419-104
		CD4053BE	★ **748** 2419-105
	SGS	HCC4053B	2419-106
		HCF4053B	2419-107
	SSS	883/4053B	2419-108
		SCL4053B	2419-109
4053	Solitron	CM4053A	2419-110
		CM4053AE	2419-111
	Toshiba	TC4053B	2419-112
4054	Motorola	MC4054	482-18
	RCA	**CD4054B**	★ **748** 455-32
			★ **748** 2464-136
		CD4054BE	★ **748** 455-33
	SGS	HCC4054B	455-34
		HCF4054B	455-35
	Toshiba	TC4054B	455-36 2464-137
4055	AMD	AM4055	3491-96
	Motorola	MC4055	480-33
	RCA	**CD4055B**	★ **748** 455-1
			★ **748** 2464-20
		CD4055BE	★ **748** 455-2
			★ **748** 2464-21
	SGS	HCC4055B	455-3
		HCF4055B	455-4
	Toshiba	TC4055B	455-5 2464-22
4056	AMD	AM4056	3491-103
	Motorola	MC4056	474-3
	RCA	**CD4056B**	★ **748** 455-6
			★ **748** 2464-49
		CD4056BE	★ **748** 455-7
			★ **748** 2464-50
	SGS	HCC4056B	455-8
		HCF4056B	455-9
	Toshiba	TC4056B	455-10 2464-53
4057	AMD	AM4057	3491-106
	RCA	CD4057A	449-65
4058	SGS	HCF4058B	459-97
	TeledyneP	4058	2454-23
4059	**RCA**	**CD4059A**	★ **748** 453-73
			¶ 278-9
		CD4059AE	★ **748** 453-74
			¶ 278-9
406	AnalogSys	MA406	2936-45
	Ferranti	ZN406	2966-103
	Sprague	UHC/D-406	484-69 2483-89
	Sprague	**UHP-406**	★**2843** 484-73
			★**2843** 2483-93
4060	IMI	G4060	4141-146
	Motorola	MC4060	506-1
	National	CD4060BC	452-39
		CD4060BM	452-40
	RCA	**CD4060A**	★ **748** 452-41
		CD4060AE	★ **748** 452-42
		CD4060B	★ **748** 452-43
			¶ 275-16
		CD4060BE	★ **748** 452-44
	SGS	HCC4060B	452-47
		HCF4060B	452-48
	SSS	SCL4060B	452-49
4061	**RCA**	**CD4061A**	★**3874** 460-123
			¶ 287-15
4062	Motorola	MC4062	495-86
4063	**RCA**	**CD4063B**	★ **748** 449-92
		CD4063BE	★ **748** 449-93
4063	SGS	HCC4063B	449-98
		HCF4063B	449-99
	Toshiba	TC4063B	449-102
4064	IPI	IPI4064	2964-10
	Motorola	MC4064	3471-92
4065	TeledyneP	4065	2451-21
40650	**RCA**	**PA40650**	★**4518** 4141-104
4066	Fairchild	F4066BC	2417-37
		F4066BM	2417-38
	National	**CD4066BC**	★**3318** 2417-42
		CD4066BM	★**3318** 2417-43
	RCA	**CD4066A**	★ **748** 2417-44
		CD4066AE	★ **748** 2417-45
		CD4066B	★ **748** 2417-46
		CD4066BE	★ **748** 2417-47
	SGS	HCC4066B	2417-48
		HCF4066B	2417-49
	Signetics	N4066A	2417-50
	SSS	883/4066B	2417-51
		SCL4066B	2417-52
	Toshiba	TC4066B	2417-53
4067	Fairchild	F4067BC	2424-103
		F4067BM	2424-104
	RCA	**CD4067B**	★ **748** 2424-105
		CD4067BE	★ **748** 2424-106
	SGS	HCC4067B	2425-1
		HCF4067B	2425-2
4068	Fairchild	F4068BC	457-132
		F4068BM	457-133
	Motorola	MC4068	505-128 2485-48
	RCA	**CD4068B**	★ **748** 457-143
		CD4068BE	★ **748** 457-144
	SGS	HCC4068B	457-148
		HCF4068B	457-149
	SSS	883/4068B	457-150
		SCL4068B	457-151
	Solitron	CM4068A	457-152
		CM4068AE	457-153
	Toshiba	TC4068B	457-154
4069	Fairchild	F4069UBC	450-175
		F4069UBM	450-176
	National	CD4069C	450-182
		CD4069M	450-183
	RCA	**CD4069UB**	★ **748** 451-1
		CD4069UBE	★ **748** 451-2
	Sanyo	LC4069UB	451-5
	SGS	HCC4069UB	451-7
		HCF4069UB	451-8
	SSS	883/4069UB	451-9
		SCL4069UB	451-11
	Solitron	CM4069A	451-13
		CM4069AE	451-14
	Toshiba	TC4069UB	451-15
407	Sprague	UHC/D-407	484-96 2483-99
	Sprague	**UHP-407**	★**2843** 484-100
			★**2843** 2483-103
4070	Fairchild	F4070BC	459-8
		F4070BM	459-9
	National	CD4070BC	459-16
		CD4070BM	459-17
	RCA	**CD4070B**	★ **748** 459-28
		CD4070BE	★ **748** 459-29
	SGS	HCC4070B	459-34
		HCF4070B	459-36
	SSS	883/4070B	459-38
		SCL4070B	459-40
4070	Solitron	CM4070A	459-43
		CM4070AE	459-44
4071	Fairchild	F4071BC	458-44
		F4071BM	458-45
	National	CD4071BC	458-51
		CD4071BM	458-52
	RCA	**CD4071B**	★ **748** 458-57
		CD4071BE	★ **748** 458-58
	Sanyo	LC4071B	458-61
	SGS	HCC4071B	458-63
		HCF4071B	458-64
	SSS	883/4071B	458-65
		SCL4071B	458-66
	Solitron	CM4071A	458-67
		CM4071AE	458-68
	Toshiba	TC4071B	458-69
4072	Fairchild	F4072BC	458-10
		F4072BM	458-11
	National	CD4072BC	458-15
		CD4072BM	458-16
	RCA	**CD4072B**	★ **748** 458-17
		CD4072BE	★ **748** 458-18
	SGS	HCC4072B	458-19
		HCF4072B	458-20
	SSS	883/4072B	458-21
		SCL4072B	458-22
	Toshiba	TC4072B	458-23
4073	Fairchild	F4073BC	456-153
		F4073BM	456-154
	National	CD4073BC	456-160
		CD4073BM	456-161
	RCA	**CD4073B**	★ **748** 456-162
		CD4073BE	★ **748** 456-163
	SGS	HCC4073B	456-167
		HCF4073B	456-168
	SSS	883/4073B	456-169
		SCL4073B	456-170
	Solitron	CM4073A	456-171
		CM4073AE	456-172
4075	Fairchild	F4075BC	458-24
		F4075BM	458-25
	National	CD4075BC	458-31
		CD4075BM	458-32
	RCA	**CD4075B**	★ **748** 458-35
		CD4075BE	★ **748** 458-36
	SGS	HCC4075B	458-37
		HCF4075B	458-38
	SSS	883/4075B	458-39
		SCL4075B	458-40
	Toshiba	TC4075B	458-41
4076	Fairchild	F4076BC	455-122
		F4076BM	455-123
	National	CD4076BC	455-129
		CD4076BM	455-130
	RCA	**CD4076B**	★ **748** 455-133
		CD4076BE	★ **748** 455-134
	SGS	HCC4076B	455-137
		HCF4076B	455-138
	SSS	883/4076B	455-139
		SCL4076B	455-140
	Solitron	CM4076A	455-141
		CM4076AE	455-142
	Toshiba	TC4076B	455-143
4077	Fairchild	F4077BC	459-46
		F4077BM	459-47
	RCA	**CD4077B**	★ **748** 459-53
		CD4077BE	★ **748** 459-54
	SGS	HCC4077B	459-58
		HCF4077B	459-59
	SSS	883/4077B	459-60
		SCL4077B	459-61
	Solitron	CM4077A	459-62
		CM4077AE	459-63

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
4078	Fairchild	F4078BC	458-191
		F4078BM	458-192
	RCA	**CD4078B**	★ **748**
			458-200
		CD4078BE	★ **748**
			458-201
	SGS	HCC4078B	458-202
		HCF4078B	458-203
	SSS	883/4078B	458-204
		SCL4078B	458-205
	Solitron	CM4078A	458-207
		CM4078AE	459-1
	Toshiba	TC4078B	459-3
408	Sprague	UHC/D-408	484-97
			2483-100
	Sprague	**UHP-408**	★**2843**
			484-101
			★**2843**
			2483-104
4080	TeledyneP	4080	2451-39
		4080-83	2451-40
4081	Fairchild	F4081BC	456-176
		F4081BM	456-177
	National	CD4081BC	456-183
		CD4081BM	456-184
	NEC-Electron	uPC4081	2934-26
	RCA	**CD4081B**	★ **748**
			456-190
		CD4081BE	★ **748**
			456-191
	Sanyo	LC4081B	456-194
	SGS	HCC4081B	456-195
		HCF4081B	456-196
	SSS	883/4081B	456-197
		SCL4081B	456-198
	Solitron	CM4081A	457-1
		CM4081AE	457-2
	TeledyneP	4081	2451-41
		4081-83	2451-42
	Toshiba	TC4081B	457-3
4082	Burr-Brown	4082/03	2962-125
	Fairchild	F4082BC	456-138
		F4082BM	456-139
	National	CD4082BC	456-143
		CD4082BM	456-144
	NEC-Electron	uPC4082	2940-45
	RCA	**CD4082B**	★ **748**
			456-145
		CD4082BE	★ **748**
			456-146
	SGS	HCC4082B	456-147
		HCF4082B	456-148
	SSS	883/4082B	456-149
		SCL4082B	456-150
	TeledyneP	4082	2451-43
		4082-83	2451-44
	Toshiba	TC4082B	456-151
4084	NEC-Electron	uPC4084	2944-23
4085	Burr-Brown	4085	2965-69
		4085M	2965-70
	Fairchild	F4085BC	457-183
		F4085BM	457-184
	RCA	**CD4085B**	★ **748**
			457-188
		CD4085BE	★ **748**
			457-189
	SGS	HCC4085B	457-190
		HCF4085B	457-191
	SSS	883/4085B	457-192
		SCL4085B	457-193
	Toshiba	TC4085B	457-194
40850	**RCA**	**PA40850**	★**4518**
			4141-105
4086	Fairchild	F4086BC	458-1
		F4086BM	458-2
	RCA	**CD4086B**	★ **748**
			458-3
		CD4086BE	★ **748**
			458-4
	SGS	HCC4086B	458-5
		HCF4086B	458-6
	SSS	883/4086B	458-7
		SCL4086B	458-8
	Toshiba	TC4086B	458-9
4089	National	CD4089BC	464-88
		CD4089BM	464-89
4089	**RCA**	**CD40893**	★ **748**
			464-90
			¶ 228-5
		CD4089BE	★ **748**
			464-91
			¶ 228-5
	SGS	HCC4089B	464-92
		HCF4089B	464-93
409	AnalogSys	MF409	2964-110
	Datel	**MVD-409**	★**2622**
			2423-16
		MVD-409/1	★**2622**
			2423-17
		MXD-409	★**2622**
			2423-64
		MXD-409/1	★**2622**
			2423-65
	Ferranti	ZN409CE	2967-162
	NEC-Micro	uPB409	3468-12
4093	Fairchild	F4093BC	464-147
		F4093BM	464-148
	National	CD4093BC	465-3
		CD4093BM	465-4
	RCA	**CD4093B**	★ **748**
			465-7
			¶ 229-3
		CD4093BE	★ **748**
			465-8
	SGS	HCC4093B	465-9
		HCF4093B	465-10
	SSS	883/4093B	465-11
		SCL4093B	465-12
	Toshiba	TC4093B	465-13
4094	**RCA**	**CD4094B**	★ **748**
			463-83
			★ **748**
			3491-19
		CD4094BE	★ **748**
			463-84
			★ **748**
			3491-20
	SGS	HCC4094B	463-85
		HCF4094B	463-86
	SSS	883/4094B	463-87
			3491-21
		SCL4094B	463-88
			3491-22
	Toshiba	TC4094B	463-89
			3491-23
4095	**RCA**	**CD4095B**	★ **748**
			456-63
		CD4095BE	★ **748**
			456-64
	RCA	HCF4095B	456-67
	SGS	HCC4095B	456-68
4096	**RCA**	**CD4096B**	★ **748**
			456-65
		CD4096BE	★ **748**
			456-66
	Reticon	SAD4096	2962-54
	SGS	HCC4096B	456-69
		HCF4096B	456-70
4097	**RCA**	**CD4097B**	★ **748**
			2424-59
		CD4097BE	★ **748**
			2424-60
	SGS	HCC4097B	2424-61
		HCF4097B	2424-62
4098	**RCA**	**CD4098B**	★ **749**
			462-36
		CD4098BE	★ **749**
			462-37
	SGS	HCC4098B	462-38
		HCF4098B	462-39
4099	National	CD4099BC	460-50
		CD4099BM	460-51
	RCA	**CD4099B**	★ **749**
			460-58
		CD4099BE	★ **749**
			460-59
	SGS	HCC4099B	460-64
		HCF4099B	460-65
	SSS	883/4099B	460-66
		SCL4099B	460-67
	Toshiba	TC4099B	460-68
40H000	Toshiba	TC40H000	457-128
40H002	Toshiba	TC40H002	458-190
40H004	Toshiba	TC40H004	451-16
40H008	Toshiba	TC40H008	457-4
40H010	Toshiba	TC40H010	457-80
40H011	Toshiba	TC40H011	456-173
40H020	Toshiba	TC40H020	457-43
40H021	Toshiba	TC40H021	456-152
40H027	Toshiba	TC40H027	458-148
40H032	Toshiba	TC40H032	458-70
40H042	Toshiba	TC40H042	454-18
40H051	Toshiba	TC40H051	457-195
40H074	Toshiba	TC40H074	455-119
40H107	Toshiba	TC40H107	456-91
		TC40H107A	456-92
40H138	Toshiba	TC40H138	454-99
40H139	Toshiba	TC40H139	454-73
40H147	Toshiba	TC40H147	464-32
40H148	Toshiba	TC40H148	464-33
40H151	Toshiba	TC40H151	461-141
40H153	Toshiba	TC40H153	461-87
40H157	Toshiba	TC40H157	461-107
40H158	Toshiba	TC40H158	461-111
40H160	Toshiba	TC40H160	452-155
40H162	Toshiba	TC40H162	452.127
40H163	Toshiba	TC40H163	451-47
40H164	Toshiba	TC40H164	463-112
40H166	Toshiba	TC40H166	463-101
40H174	Toshiba	TC40H174	456-3
40H175	Toshiba	TC40H175	455-162
40H192	Toshiba	TC40H192	452-191
40H193	Toshiba	TC40H193	451-110
40H194	Toshiba	TC40H194	463-90
40H241	Toshiba	TC40H241	465-97
40H244	Toshiba	TC40H244	465-61
40H259	Toshiba	TC40H259	460-69
40H367	Toshiba	TC40H367	450-119
40H373	Toshiba	TC40H373	460-3
40H375	Toshiba	TC40H375	459-102
40L44	TI	TMS40L44-12	3483-111
		TMS40L44-20	3482-35
		TMS40L44-25	3482-51
		TMS40L44-45	3482-106
41	Burr-Brown	UAF41	2962-14
	National	**HA41**	★**3327**
	NEC-Electron	uPC41	2896-94
	RCA	**MSIM41**	★**1959**
		MSIM41E	★**1959**
	Signetics	**V41**	★**1516**
410	AnalogSys	MH410	2967-65
	Datel	**AM-410-2C**	★**2622**
			2921-32
	Datel	AM-410-2M	2920-38
	Intronics	C410	2962-142
	Motorola	**MVME410**	★**1941**
	National	**COP410C**	★**1361**
			1087-74
			★**1361**
			1051-33
		COP410L	★**1361**
			1087-75
			★**1361**
			1051-34
	Siemens	SAJ410	2900-19
	Telefunken	U410	2896-128
4100	CalDevices	HC4100	4140-38
	IPI	IPI4100	2964-11
	LSILogic	LC-4100	4140-139
	Sanyo	LA4100	2896-105
41000	**RCA**	**PA41000**	★**4518**
			4141-106
4101	APT	ST4101	1755-22
	Lambda	LPD4101	2482-137
	Sanyo	LA4101	2896-106
4102	APT	ST4102	1755-33
	Lambda	LPD4102	2482-138
	Sanyo	LA4102	2896-107
	Solitron	CM4102	453-44
4103	Lambda	LPD4103	2482-139
4104	**Fairchild**	**4104B**	★ **668**
	Fairchild	F4104BE	464-1
		F4104BM	464-2
	Lambda	LPD4104	2482-140
	Mostek	MK4104-3	3482-29
		MK4104-33	3482-30
		MK4104-34	3482-42
		MK4104-35	3482-71
4104	Mostek	MK4104-4	3482-43
		MK4104-5	3482-72
		MK4104-6	3482-89
		MKB4104-84	3482-44
		MKB4104-85	3482-73
		MKB4104-86	3482-90
	NEC-Micro	uPD4104	3482-78
		uPD4104-1	3482-49
		uPD4104-2	3482-33
4105	Lambda	LPD4105	2481-91
4106	Lambda	LPD4106	2481-80
411	**Datel**	**AM-411-2C**	★**2622**
			2921-33
	Datel	AM-411-2M	2920-39
	Intronics	C411	2962-143
	National	**CIM-411**	★**1952**
		COP411C	★**1361**
			1087-76
			★**1361**
			1051-35
		COP411L	★**1361**
			1087-77
			★**1361**
			1053-1
		LF411	★**3309**
			★**3311**
			2922-43
		LF411A	★**3309**
			★**3311**
			2918-29
	NEC-Micro	uPD411	3468-51
		uPD411-1	3468-45
		uPD411-2	3468-34
		uPD411-3	3468-23
		uPD411-4	3468-17
		uPD411A	3468-52
		uPD411A-1	3468-46
		uPD411A-2	3468-35
	Telefunken	U411	2896-129
4110	Sanyo	LA4110	2896-108
	TI	TCM4110	2947-111
4111	Fujitsu	MB4111	2481-68
4112	Fujitsu	MB4112	2481-69
	IMI	G4112	4141-147
	Sanyo	LA4112	2896-109
4115	Burr-Brown	4115/04	2962-127
4116	Fairchild	F4116-2	3468-91
		F4116-3	3469-3
		F4116-4	3469-22
	ITT	ITT4116-2	3468-94
		ITT4116-3	3469-6
		ITT4116-4	3469-24
	Mostek	MK4116-2	3468-96
			¶ 248-14
		MK4116-3	3469-8
			¶ 248-14
		MK4116-4	3469-25
			¶ 248-14
		MKB4116-82	3468-97
		MKB4116-83	3469-9
		MKB4116-84	3469-26
	Motorola	**MCM4116B-15**	★**3839**
			3468-98
			¶ 286-9
			¶ 287-17
			¶ 287-18
		MCM4116B-20	★**3839**
			3469-10
			¶ 286-9
			¶ 287-17
			¶ 287-18
		MCM4116B-25	★**3839**
			3469-27
			¶ 286-9
			¶ 287-17
			¶ 287-18
		MCM4116B-30	★**3839**
			3469-36
			¶ 286-9
			¶ 287-17
			¶ 287-18
	Panasonic	MN4116	3469-14
	SGS	M4116	3468-103
	Siemens	HYB4116-3	3469-15
		HYB4116-4	3469-30

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
4116	Siemens	HYB4116-P2	3468-104
		HYB4116-P3	3469-16
	Solitron	CM4116A	2417-76
		CM4116AE	2417-77
	TI	TMS4116-15	3468-105
		TMS4116-20	3469-17
		TMS4116-25	3469-31
4117	Motorola	MCM4117-20	3469-19
		MCM4117-25	3469-33
4118	Mostek	MK4118A-1	3479-76
		MK4118A-2	3479-85
		MK4118A-3	3479-96
		MK4118A-4	3479-105
		MKB4118A-82	3479-86
		MKB4118A-83	3479-97
		MKB4118A-84	3479-106
412	**National**	**LF412**	★3309
			★3312
			2937-23
		LF412A	★3309
			★3312
			2936-26
	Siliconix	DF412	455-30
			2464-124
4120	Sanyo	LA4120	2897-102
41200	**RCA**	**PA41200**	★4518
			4141-107
4125	Sanyo	LA4125	2897-103
		LA4125T	2897-104
4126	Sanyo	LA4126	2896-110
4127	Burr-Brown	4127	2887-132
4128	IPI	IPI4128	2964-12
4131	Burr-Brown	4131	2968-40
	Raytheon	RC4131	2928-39
		RM4131	2923-32
4132	Motorola	MCM4132-15	3469-50
		MCM4132-20	3469-55
		MCM4132-25	3469-61
		MCM4132-30	3469-65
	National	NMC4132-1	3469-47
		NMC4132-2	3469-54
	Raytheon	RC4132	2927-52
		RM4132	2925-24
4136	Exar	XR4136C	2943-44
			¶ 264-1
		XR4136M	2942-47
			¶ 264-1
	Fairchild	uA4136C	2943-45
		uA4136M	2942-48
	MicroPwr	**MP4136**	★3292
			2942-49
		MP4136C	★3292
			2943-46
	PMI	PM4136	2942-50
	Raytheon	RC4136	2943-47
		RM4136	2942-51
		RV4136	2943-48
	SiliconG	SG4136	2943-49
		SG4136C	2943-50
	TI	RC4136	2943-51
4137	NEC-Electron	MC4137	2947-138
	Sanyo	LA4137	2896-111
4138	NEC-Electron	MC4138	2947-139
	Sanyo	LA4138	2896-112
414	Ferranti	ZN414	2900-79
4140	Sanyo	LA4140	2897-44
	TeledyneP	4140	2428-43
4143	TeledyneP	4143	2428-44
		4143-01	2428-45
4144	TeledyneP	4144	2431-10
4145	TeledyneP	4145	2435-21
4146	TeledyneP	4146	2436-30
4151	**Exar**	**XR4151**	★3193
			2968-97
			¶ 278-8
		XR4151C	★3193
			2963-88
			¶ 278-8
		XR4151M	★3193
			2963-89
			¶ 278-8
	Raytheon	RC4151	2963-96
			¶ 255-5
			¶ 256-15
		RM4151	2963-99
4151	Raytheon	RM4151	¶ 255-5
			¶ 256-15
		RV4151	2963-102
			¶ 256-15
4152	Raytheon	RC4152	2963-97
		RM4152	2963-100
		RV4152	2963-103
4153	Raytheon	RC4153	2963-98
		RM4153	2963-101
4156	**Harris**	**HA-4156-2**	★3244
			★3287
			2942-1
		HA-4156-5	★3244
			★3287
			2942-37
	Raytheon	RC4156	2942-38
		RM4156	2942-2
		RV4156	2942-39
4157	Raytheon	RC4157	2942-6
		RM4157	2942-7
416	NEC-Micro	uPD416	3469-37
		uPD416-1	3469-29
		uPD416-2	3469-13
		uPD416-3	3468-102
		uPD416-5	3468-85
	Telefunken	U416	2900-140
	Toshiba	TMM416-2	3468-106
		TMM416-3	3469-18
		TMM416-4	3469-32
4160	IMI	G4160	4141-148
	SSS	883/4160B	452-152
		SCL4160B	452-153
4161	SSS	883/4161B	451-68
		SCL4161B	451-69
4162	SSS	883/4162B	452-124
		SCL4162B	452-125
4163	SSS	883/4163B	451-44
		SCL4163B	451-45
4164	**Fairchild**	**F4164**	★3666
			3469-66
		F4164-12	★3666
			3469-73
		F4164-15	★3666
			3469-82
		F4164-20	★3666
			3470-9
	ITT	ITT4164-15	3483-108
		ITT4164-20	3483-109
	National	NMC4164-12	3469-79
			¶ 287-6
		NMC4164-15	3470-3
			¶ 287-6
		NMC4164-20	3470-21
			¶ 287-6
	NEC-Micro	uPD4164-0	3470-22
		uPD4164-1	3470-30
		uPD4164-2	3469-72
		uPD4164-3	3470-4
	TI	**TMS4164-12**	★3958
			3469-81
		TMS4164-15	★3958
			3470-7
		TMS4164-20	★3958
			3470-25
		TMS4164-25	★3958
			3470-31
	Toshiba	TMM4164-3	3470-8
		TMM4164-4	3470-26
4167	Mostek	MKB4167-80	3483-103
		MKB4167-870	3483-86
		MKB4167-885	3483-95
417	Telefunken	U417	2900-141
4170	Sanyo	LA4170	2896-2
4174	SSS	883/4174B	455-181
		SCL4174B	456-1
4175	Sanyo	LA4175	2896-3
4177	Sanyo	LA4177	2896-4
418	Telefunken	U418	2900-142
4180	Sanyo	LA4180	2896-113
	Telefunken	TDA4180	2887-46
			¶ 274-5
4182	Sanyo	LA4182	2896-114
4189	TeledyneP	4189	2431-46
419	Ferranti	ZN419CE	2967-163
4191	Raytheon	RC4191	2961-9
		RM4191	2961-12
4192	Raytheon	RC4192	2961-10
		RM4192	2961-13
	SSS	883/4192B	452-187
		SCL4192B	452-189
4193	Raytheon	RC4193	2961-11
		RM4193	2961-14
	SSS	883/4193B	451-106
		SCL4193B	451-108
4194	Exar	XR4194M	2960-78
	MicroEng	**MCE4194**	★4440
			4140-204
			★4440
			2960-79
	Raytheon	RC4194	2960-80
		RM4194	2960-81
	SiliconG	SG4194	2960-82
		SG4194C	2960-83
4195	Exar	XR4195	2958-76
	Raytheon	RC4195	2958-79
			¶ 281-11
		RM4195	2958-80
			¶ 281-11
42	Burr-Brown	VFC42	2963-82
		VFC42M	2963-83
	FujitsuA	**FDM420A**	★3671
			3468-7
	Hitachi	HMCS42	1087-119
			1051-9
		HMCS42C	1051-10
		HMSC42C	1087-128
	National	**MA42**	★3327
	TeledyneC	CAG42	2416-28
420	**FujitsuA**	**FDM420**	★3671
	Motorola	**MVME420**	★1941
	National	COP420	1087-78
			1053-2
		COP420C	1087-79
			1053-3
		COP420L	1087-80
			1053-4
		COP420R	1087-52
			1087-102
			1053-5
	PMI	OP-420B	2911-127
			2913-109
		OP-420C	2911-128
			2913-110
		OP-420F	2911-129
			2913-111
		OP-420G	2911-130
			2913-112
	Signetics	TCA420A	2901-65
4200	CalDevices	CDI4200	4140-19
	Raytheon	RC4200	2965-34
			¶ 278-2
		RC4200A	2965-35
			¶ 278-2
	Sanyo	LA4200	2896-115
	Siemens	TDA4200	2901-18
4201	Sanyo	LA4201	2896-116
4202	Exar	XR4202	2912-80
			¶ 264-1
		XR4202M	2912-81
			¶ 264-1
	Motorola	MC4202	2942-44
	Sprague	**UCN-4202A**	★2843
			2964-145
42022	Hitachi	HC42022	2899-104
4203	Burr-Brown	4203	2965-23
		4203S	2965-24
42030	Hitachi	HC42030	2899-105
4204	Burr-Brown	4204	2965-25
		4204S	2965-26
	TI	TCM4204	2949-40
4205	Burr-Brown	4205	2965-27
		4205S	2965-28
	TI	TCM4205	2949-41
42050	Micropac	42050-055	2952-131
		42050-109	2954-10
		42050-128	2954-101
		42050-148	2954-108
		42050-158	2955-58
		42050-168	2955-60
		42050-188	2955-114
		42050-208	2956-4
		42050-224	2956-8
42050	Micropac	42050-244	2956-68
		42050-264	2956-70
		42050-284	2956-73
		42050-304	2956-75
		42050-324	2956-77
		42050-344	2956-79
		42050-510	2952-135
		42050-610	2953-46
		42050-710	2953-53
42051	Micropac	42051	2958-66
		42051-055	2957-1
		42051-065	2957-29
		42051-075	2957-30
		42051-085	2957-51
		42051-095	2957-52
		42051-105	2957-56
		42051-124	2957-98
		42051-144	2957-99
		42051-154	2958-10
		42051-164	2958-14
		42051-184	2958-32
		42051-204	2958-46
		42051-223	2958-47
		42051-243	2958-56
		42051-263	2958-57
		42051-283	2958-59
		42051-303	2958-60
		42051-323	2958-62
		42051-363	2958-65
42055	Micropac	42055-1020	2954-11
		42055-1216	2954-102
		42055-1416	2954-109
		42055-1516	2955-59
		42055-1612	2955-61
		42055-1812	2955-115
		42055-2010	2956-5
		42055-2210	2956-9
		42055-2410	2956-69
		42055-2608	2956-71
		42055-2808	2956-74
		42055-720	2953-54
		42055-820	2953-117
		42055-920	2953-130
	Toshiba	42055-1812	2955-116
4206	Burr-Brown	4206	2965-29
4209	Siemens	SAB4209	2902-38
421	**National**	**CIM-421**	★1952
	National	COP421	1087-81
		COP421C	1087-82
		COP421L	1087-83
	National	**MM421**	★3327
	NEC-Micro	uPD421	3479-110
		uPD421-1	3479-107
		uPD421-2	3479-104
		uPD421-3	3479-95
		uPD421-5	3479-84
	PMI	OP-421B	2941-26
		OP-421C	2942-10
		OP-421F	2941-27
		OP-421G	2942-11
		OP-421H	2943-39
4212	Exar	XR4212	2898-19
		XR4212C	2943-41
		XR4212M	2942-45
4213	Burr-Brown	4213	2965-30
		4213S	2965-31
4214	Burr-Brown	4214	2965-32
		4214M	2965-33
422	National	LF422A	2936-21
4220	IMI	G4220	4141-149
	Sanyo	LA4220	2896-117
423	Ferranti	ZN423	2966-30
	NEC-Electron	uPC423	2903-20
4230	Sanyo	LA4230	2897-45
424	Ferranti	ZN424	2931-20
			¶ 265-8
4244	AMD	4244-30	3482-66
		4244-45	3482-97
		AM4244-15	3482-7
		AM4244-20	3482-22
		AM4244-25	3482-39
425	Ferranti	ZN425E-6	2439-33
			¶ 253-3
		ZN425E-7	2439-38
			¶ 253-3

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
425	Ferranti	ZN425E-8	2444-10
			¶ 253-3
		ZN425J-8	2444-11
			¶ 253-3
	Fujitsu	MB425	1093-102
4250	**Harris**	**LM4250**	**★3286**
			★3288
			2912-1
			2912-46
		LM4250C	**★3286**
			★3288
			2911-160
			2912-33
			2927-41
	Intersil	ICL4250	2911-161
			2912-34
			2925-20
		ICL4250C	2911-162
			2912-35
			2927-42
	National	LM4250	2911-164
			2912-38
			2925-21
		LM4250C	2911-165
			2912-39
			2927-43
	NEC-Electron	uPC4250C	2930-36
	Sanyo	LA4250	2897-46
	SiliconG	SG4250	2911-167
			2912-41
			2925-22
		SG4250C	2911-168
			2912-42
			2927-44
	Solitron	UC4250	2911-170
			2925-23
		UC4250C	2911-171
			2927-45
4256	IPI	IPI4256	2964-13
426	Ferranti	ZN426E-6	2439-30
		ZN426E-7	2439-36
		ZN426E-8	2442-44
		ZN426J-8	2442-45
	Fujitsu	MB426	1093-103
	Intersil	DG426A	2421-3
4260	Siemens	SDA4260	2903-29
4264	AMI	S4264	460-139
			3486-76
	IMI	G4264	4141-150
	NEC-Electron	MC4264	2948-77
427	Datel	AM-427-A	2916-3
		AM-427-B	2914-36
		AM-427-M	2916-4
	Datel	**AM-427A**	**★2622**
	Ferranti	ZN427E-8	2427-51
			¶ 254-13
			¶ 255-13
		ZN427J-8	2427-52
			¶ 254-13
			¶ 255-13
428	Ferranti	ZN428E-8	2442-41
			¶ 254-13
			¶ 255-13
		ZN428J-8	2442-42
			¶ 254-13
			¶ 255-13
4280	National	MM4280	3468-47
	Siemens	TDA4280	2905-30
4281	Siemens	TDA4281	2905-31
429	Ferranti	ZN429E-7	2439-37
		ZN429E-8	2442-46
		ZN429J-8	2442-47
	Intersil	DG429A	2420-95
	NEC-Micro	uPB429	3468-13
4290	Siemens	TDA4290	2896-33
4291	Burr-Brown	4291	2963-55
43	**FujitsuA**	**FBM43DA**	**★3671**
			3468-6
	Hitachi	HMCS43	1087-120
			1051-11
		HMCS43C	1087-121
			1051-12
	Toshiba	TLCS-43	1088-13
430	**Datel**	**AM-430A**	**★2622**
			2911-99
			2920-3

Base Number	Source	Device	Page-Line
430	Datel	AM-430B	2911-54
			2917-23
		AM-430M	2911-94
			2920-4
	National	COP430	1087-112
	TI	TL430C	2959-23
4300	**Motorola**	**MC4300**	**★ 729**
			498-18
			★ 729
			2485-2
	Signetics	**SMVME4300**	**★1970**
		VME4300	**★1970**
	Toshiba	TMP4300C	1059-4
4301	Burr-Brown	4301	2964-148
			¶ 278-3
4302	Burr-Brown	4302	2964-149
43032	Hitachi	HC43032	2899-106
4304	Motorola	MC4304	496-163
			3470-84
4305	Motorola	MC4305	496-164
			3470-85
4306	Motorola	MC4306	482-111
4307	Motorola	MC4307	483-47
	National	NSM4307	2464-130
4308	Motorola	MC4308	508-100
431	Fairchild	uA431	2959-61
	National	**COP431**	**★3322**
			1087-113
		NM431	**★3327**
	TI	TL431C	2959-62
		TL431M	2959-63
4310	Motorola	MC4310	507-67
4311	Plessey	MV4311	455-43
43115	Hitachi	HD43115	2898-138
4312	IMI	G4312	4140-134
	Motorola	MC4312	501-82
			3489-32
4315	**Hitachi**	**HM4315**	**★3789**
			461-28
			★3789
			3482-95
4316	Motorola	MC4316	482-58
			¶ 278-12
4317	Motorola	MC4317	482-59
4318	Motorola	MC4318	482-54
4319	Motorola	MC4319	482-55
432	Ferranti	ZN432-10	2430-45
			¶ 255-14
		ZN432-8	2428-2
			¶ 255-14
		ZN432B-10	2430-46
			¶ 255-14
		ZN432B-8	2428-3
			¶ 255-14
		ZN432BJ-9	2430-5
			¶ 255-14
		ZN432C-10	2430-47
			¶ 255-14
		ZN432C-8	2428-4
			¶ 255-14
		ZN432CJ-9	2430-6
			¶ 255-14
		ZN432E-10	2430-48
			¶ 255-14
		ZN432E-8	2428-5
			¶ 255-14
		ZN432E-9	2430-4
			¶ 255-14
		ZN432J-9	2430-7
			¶ 255-14
	DDC	ZN432CK-10	2430-49
		ZN432K-10	2430-50
	Intel	iAPX432GDP	1079-13
		iAPX432IP	1079-14
	National	**COP432**	**★3322**
			1087-114
	Sprague	UHC/D-432	484-104
			2483-110
	Sprague	**UHP-432**	**★2843**
			484-108
			★2843
			2483-114
4320	Mitel	MT4320	2948-8
	TI	TP4320A	462-3
43201	Intel	iAPX43201	1100-58
43202	Intel	iAPX43202	1100-59

Base Number	Source	Device	Page-Line
43203	Intel	iAPX43203	1100-60
4321	IMI	G4321	4141-151
	Motorola	MC4321	474-30
4322	Mitel	MT4322	2948-9
	Motorola	MC4322	474-31
4323	Mitel	MT4323	2948-10
4324	Motorola	MC4324	501-14
			¶ 237-1
			¶ 278-12
			2946-33
			¶ 237-1
			¶ 278-12
4325	Mitel	MT4325	2948-11
4326	Mitel	MT4326	2948-12
4327	Mitel	MT4327	2948-13
433	Ferranti	ZN433BJ-10	2430-15
		ZN433BJ-8	2426-41
		ZN433CJ-10	2430-16
		ZN433CJ-8	2426-42
		ZN433J-10	2430-17
		ZN433J-8	2426-43
	DDC	ZN433BJ-9	2430-1
		ZN433CJ-9	2430-2
		ZN433CK-10	2430-18
		ZN433J-9	2430-3
		ZN433K-10	2430-19
	Intersil	DG433A	2416-11
	Sanyo	STK433	2897-115
	Sprague	UHC/D-433	484-105
			2483-111
	Sprague	**UHP-433**	**★2843**
			484-109
			★2843
			2483-115
4330	Mitel	MD4330B	463-156
			2466-1
			3491-43
	Plessey	MV4330	463-157
4331	Siemens	TBB4331	2944-32
4332	Mitel	MD4332B	463-162
	Mostek	MK4332D-3	3469-59
		MKM4332-83	3469-60
		MKM4332-84	3469-64
	Plessey	MV4332	463-163
	Sanyo	STK4332	2897-52
4334	**Hitachi**	**HM4334**	**★3789**
			461-18
		HM4334-4	**★3789**
			3479-11
4335	Siemens	TBE4335	2944-33
434	Ferranti	ZN434E	2439-3
	Intersil	DG434A	2416-42
	National	**COP434**	**★3322**
			1087-115
4340	Burr-Brown	4340	2967-46
4341	Burr-Brown	4341	2967-47
4344	Motorola	MC4344	507-4
			¶ 237-1
			¶ 278-12
			2945-64
			¶ 237-1
			¶ 278-12
435	Ferranti	ZN435E-8	2444-12
		ZN435J-8	2444-13
	Motorola	**MVME435**	**★1941**
	Sanyo	STK435	2897-116
4350	Motorola	MC4350	482-75
435101	Hitachi	HM435101	460-169
		HM435101-1	3474-82
4352	Motorola	MC4352	481-39
	Sanyo	STK4352	2897-53
4353	Motorola	MC4353	479-5
4354	Motorola	MC4354	482-19
4355	Motorola	MC4355	480-34
4356	Motorola	MC4356	474-4
4362	Sanyo	STK4362	2897-54
4363	Motorola	MC4363	506-2
4364	IMI	G4364	4141-152
4368	Motorola	MC4368	505-129
			2485-49
437	Ferranti	ZN437E-8	2427-31
		ZN437J-8	2427-32
	Sanyo	STK437	2897-132
4372	Sanyo	STK4372	2896-173
438	Ferranti	ZN438	2440-15

Base Number	Source	Device	Page-Line
438	**National**	**COP438**	**★3322**
			1087-116
43802	Hitachi	HC43802	2899-107
43803	Hitachi	HC43803	2899-108
43850	Hitachi	HC43850	2899-94
43890	Hitachi	HD43890	2898-139
439	Intersil	DG439A	2421-51
	Sanyo	STK439	2897-133
4392	Sanyo	STK4392	2896-174
44	Hitachi	HMCS44A	1087-122
			1051-13
		HMCS44C	1087-123
			1051-14
440	Ferranti	ZN440CJ	2426-9
	Intersil	DG440A	2420-78
	National	COP440	1087-84
			1053-6
		COP440R	1087-53
			1087-103
			1053-7
		TBA440	2905-140
		TDA440	2905-144
	Plessey	SL440	2906-72
			2964-131
			¶ 279-12
		TDA440	2905-161
	Siemens	TCA440	2900-67
	Signetics	TCA440	2900-69
	Telefunken	TDA440	2905-188
	TI	TL440C	2968-140
4400	Telefunken	TDA4400	2905-189
44007	Hitachi	HD44007	2903-39
4401	**Sprague**	**UCN-4401A**	**★2843**
			2483-23
	Sprague	UCS-4401H	2480-4
			2483-24
44010	Hitachi	HD44010	2899-29
4402	SSS	883/4402B	459-80
		SCL4402B	459-81
	Solitron	883/4402B	458-206
		SCL4402B	459-2
4404	SSS	883/4404B	451-173
		SCL4404B	451-174
441	Intersil	DG441A	2415-105
	National	COP441	1087-85
			1053-8
		COP441R	1087-54
			1087-104
			1053-9
	National	**LF441**	**★3309**
			★3313
			2927-22
		LF441A	**★3309**
			★3313
			2918-28
	Plessey	SL441	2968-126
	Sanyo	STK441	2897-134
	TI	TL441C	2887-135
		TL441M	2887-136
4410	Telefunken	TDA4410	2905-190
4412	SSS	883/4412B	457-9
		SCL4412B	457-10
4416	SSS	883/4416B	2417-64
		SCL4416B	2417-65
	TI	**TMS4416-15**	**★ 442**
			★3959
			3469-42
		TMS4416-20	**★ 442**
			★3959
			3469-43
		TMS4416-25	**★ 442**
			★3959
			3469-44
442	Ferranti	ZN442E	2430-42
		ZN442J	2430-43
	Intersil	DG442A	2421-57
	National	COP442	1087-86
			1053-10
	National	**LF442**	**★3309**
			★3314
			2911-137
			2938-6
		LF442A	**★3309**
			★3314
			2911-133
			2936-22

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
442	Plessey	SL442	2961-8
	TI	TL442C	2962-86
		TL442M	2962-87
4420	IMI	G4420	4141-153
	Sanyo	LA4420	2897-47
	SGS	TDA4420	2905-173
	Telefunken	TDA4420	2905-191
4421	Telefunken	TDA4421	2905-192
4422	Sanyo	LA4422	2897-48
	Telefunken	TDA4422	2906-1
4423	Burr-Brown	4423	2965-44
4426	SSS	883/4426AB	452-61
		SCL4426AB	452-63
4428	SSS	883/4428B	454-74
		SCL4428B	454-75
443	Intersil	DG443A	2418-94
	Plessey	SL443	2968-127
	Sanyo	STK443	2897-117
4430	Sanyo	LA4430	2896-118
	Telefunken	TDA4430	2906-2
4431	SGS	TDA4431	2904-51
	Telefunken	TDA4431	2906-3
4432	Telefunken	TDA4432	2906-4
4433	SGS	TDA4433	2905-174
	SSS	883/4433AB	452-73
		SCL4433AB	452-75
4434	Hitachi	HM4434-3	3478-69
444	Intersil	DG444A	2418-69
	National	COP444L	1087-87
			1053-11
		COP444LR	1087-55
			1087-105
			1053-12
	National	**LF444**	★3309
			★3315
			2944-7
		LF444A	★3309
			★3315
			2942-18
	NEC-Micro	uPD444-3	3478-4
		uPD444/6514	3479-13
		uPD444/6514-1	3478-72
		uPD444/6514-2	3478-51
		uPD444/6514-3	3478-5
4440	Sanyo	LA4440	2897-49
	Telefunken	TDA4440	2906-5
4441	SSS	883/4441UB	449-134
		SCL4441UB	449-135
4444	Raytheon	RC4444	2423-5
			2947-124
		RM4444	2423-6
			2947-125
4445	SSS	883/4445B	462-99
		SCL4445B	462-100
4446	SSS	883/4446B	464-61
			2945-54
		SCL4446B	464-63
			¶ 279-4
			2945-56
			¶ 279-4
4449	SSS	883/4449UB	451-10
		SCL4449UB	451-12
445	Dionics	DI445	2480-16
	Intersil	DG445A	2421-42
	National	COP445L	1087-88
			1053-13
	NEC-Micro	uPD445L	461-20
			3479-17
		uPD445L-1	3479-60
	Plessey	SL445A	2965-88
4450	Telefunken	TDA4450	2906-6
446	Dionics	DI446	2480-19
	Intersil	DG446A	2418-53
	Plessey	SL446	2968-128
4460	Burr-Brown	CS4460	1617-3
	Sanyo	LA4460	2896-148
4461	Sanyo	LA4461	2896-149
447	DDC	ZN447E-8	2426-22
		ZN447J-8	2426-23
4470	Hitachi	HD4470	1087-117
			1051-7
44790	Hitachi	HD44790	1087-118
			1051-8
448	**CMA**	**CMA448**	★4311
			4140-56

Base Number	Source	Device	Page-Line
448	Ferranti	ZN448E-8	2427-33
		ZN448J-8	2427-34
4480	IMI	G4480	4141-154
4485	NCR	NCR4485	3455-30
449	DDC	ZN449E-8	2429-11
		ZN449J-8	2429-12
45	**Fairchild**	**PEP-45**	★1711
			★1716
			1767-13
	Hitachi	HMCS45	1051-15
		HMCS45A	1087-124
		HMCS45C	1087-125
			1051-16
	TeledyneC	CAG45A	2416-29
	Wintek	MCL45	1759-25
		MCV45	1759-26
450	Burr-Brown	CS450	1617-2
	Cherry	CS450	2964-72
		IC450	2930-44
	Datel	**AM-450-2**	★2622
			2932-20
	Datel	AM-450-2M	2932-21
	Ferranti	ZN450	2438-21
	Interdesign	MSA450	4140-126
	Intersil	MM450	2422-79
	NEC-Micro	uPB450	3458-30
	Plessey	SW450	2905-63
	TeledyneS	**TSC450C**	★2845
			2482-130
		TSC450M	★2845
			2482-131
4500	Motorola	TCA4500	2901-108
	National	ADB4500	511-45
			2438-45
	National	**LM4500A**	★3325
			★3328
			2901-113
	Siemens	TCA4500	2901-137
	TI	**TMS4500A**	★3960
			2480-149
4501	**National**	**CD4501BC**	★3318
			2423-95
		CD4501BM	★3318
			2423-96
	SiliconG	SG4501	2958-73
			2960-37
			2960-77
4502	**RCA**	**CD4502B**	★ 749
			449-161
		CD4502BE	★ 749
			449-162
	SGS	HCC4502B	449-163
		HCF4502B	449-164
	SSS	883/4502B	449-165
		SCL4502B	449-166
4503	National	CD4503BC	450-99
		CD4503BM	450-100
	RCA	**CD4503BD**	★ 749
			450-109
		CD4503BE	★ 749
			450-110
	Toshiba	TM4503	2906-88
4507	National	CD4507BC	459-18
		CD4507BM	459-19
		NSM4507	2464-131
4508	**RCA**	**CD4508B**	★ 749
			459-94
		CD4508BE	★ 749
			459-95
	SGS	HCC4508B	459-96
	SSS	883/4508B	459-98
		SCL4508B	459-99
	Solitron	CM4508	459-100
	Toshiba	TC4508B	459-101
451	Ferranti	ZN451	2438-22
	Intersil	DG451A	2415-108
		MM451	2422-36
	NEC-Electron	uPC451	2943-57
4510	Fairchild	F4510BC	452-160
		F4510BM	452-161
	National	CD4510BC	452-170
		CD4510BM	452-171
	RCA	**CD4510B**	★ 749
			452-178
		CD4510BE	★ 749
			452-179

Base Number	Source	Device	Page-Line
4510	SGS	HCC4510B	452-184
		HCF4510B	452-186
	Siemens	TCA4510	2901-138
	SSS	883/4510B	452-188
		SCL4510B	452-190
	Toshiba	TC4510B	452-192
4511	Fairchild	F4511BC	455-44
			2464-25
		F4511BM	455-45
			2464-26
	National	CD4511BC	455-55
			2464-32
		CD4511BM	455-56
			2464-33
	RCA	**CD4511B**	★ 749
			455-61
			★ 749
			2464-34
		CD4511BE	★ 749
			455-62
			★ 749
			2464-35
	SGS	HCC4511B	455-65
		HCF4511B	455-66
	SSS	883/4511B	455-67
			2464-36
		SCL4511B	455-68
			2464-37
	Solitron	CM4511B	455-69
			2464-38
		CM4511BE	455-70
			2464-39
	Toshiba	TC4511B	455-71
4512	Fairchild	F4512BC	461-142
		F4512BM	461-143
	National	CD4512BC	461-147
		CD4512BM	461-148
	RCA	**CD4512B**	★ 749
			461-149
		CD4512BE	★ 749
			461-150
	SGS	HCC4512B	461-151
		HCF4512B	461-152
	SSS	883/4512B	461-153
		SCL4512B	461-154
	Toshiba	TC4512B	461-155
4514	Fairchild	F4514BC	454-114
		F4514BM	454-115
	National	CD4514BC	454-126
		CD4514BM	454-127
	RCA	**CD4514B**	★ 749
			454-132
		CD4514BE	★ 749
			454-133
	SGS	HCC4514B	454-138
		HCF4514B	454-140
	SSS	883/4514B	454-142
		SCL4514B	454-144
	Solitron	CM4514B	454-146
		CM4514BE	454-147
	Toshiba	TC4514B	454-150
4515	Fairchild	F4515BC	454-116
		F4515BM	454-117
	National	CD4515BC	454-128
		CD4515BM	454-129
	RCA	**CD4515B**	★ 749
			454-134
		CD4515BE	★ 749
			454-135
	SGS	HCC4515B	454-139
		HCF4515B	454-141
	SSS	883/4515B	454-143
		SCL4515B	454-145
	Solitron	CM4515B	454-148
		CM4515BE	454-149
	Toshiba	TC4515B	454-151
4516	Fairchild	F4516BC	451-80
		F4516BM	451-81
	Mostek	MK4516-10	3468-68
		MK4516-12	3468-77
		MK4516-15	3468-89
		MKB4516-60	3469-20
		MKB4516-81	3469-34
		MKB4516-82	3469-38
	National	CD4516BC	451-89
		CD4516BM	451-90

Base Number	Source	Device	Page-Line
4516	**RCA**	**CD4516B**	★ 749
			451-97
		CD4516BE	★ 749
			451-98
	SGS	HCC4516B	451-104
		HCF4516B	451-105
	SSS	883/4516B	451-107
		SCL4516B	451-109
	Toshiba	TC4516B	451-111
4517	**Motorola**	**MCM14517-10**	★3839
			★3844
			3468-69
		MCM14517-12	★3839
			★3844
			3468-78
		MCM14517-15	★3839
			★3844
			3468-90
		MCM14517-20	★3839
			★3844
			3469-1
	RCA	**CD4517B**	★ 749
			462-139
		CD4517BE	★ 749
			462-140
			★ 749
			3491-58
			3491-61
	SSS	883/4517B	462-141
			3491-62
		SCL4517B	462-142
			3491-59
4518	Fairchild	F4518BC	453-20
		F4518BM	453-21
	National	CD4518BC	453-25
		CD4518BM	453-26
	RCA	**CD4518B**	★ 749
			453-27
			¶ 231-15
		CD4518BE	★ 749
			453-28
			¶ 231-15
	SGS	HCC4518B	453-29
		HCF4518B	453-30
	SSS	883/4518B	453-31
		SCL4518B	453-32
	Solitron	CM4518B	453-33
		CM4518BE	453-34
	Toshiba	TC4518B	453-35
4519	Fairchild	F4519BC	461-126
		F4519BM	461-127
	National	CD4519BC	461-131
		CD4519BM	461-132
452	**Datel**	**AM-452-2**	★2622
			2933-30
	Datel	AM-452-2M	2933-31
	Intersil	DG452A	2416-56
		MM452	2422-61
	National	COP452	1087-97
4520	Fairchild	F4520BC	451-125
		F4520BM	451-126
	National	CD4520BC	451-130
		CD4520BM	451-131
	RCA	**CD4520B**	★ 749
			451-132
			¶ 231-6
		CD4520BE	★ 749
			451-133
	SGS	HCC4520B	451-134
		HCF4520B	451-135
	SSS	883/4520B	451-136
		SCL4520B	451-137
	Solitron	CM4520B	451-138
		CM4520BE	451-139
	Toshiba	TC4520B	451-140
4521	**AMI**	**S4521**	★2610
			2466-5
			2480-147
			★2610
			2906-95
	Toshiba	TC4521B	462-110
4522	Fairchild	F4522BC	453-5
		F4522BM	453-6
	National	CD4522BC	453-10
		CD4522BM	453-11

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
4522	SSS	883/4522B	453-12
		SCL4522B	453-13
4526	Fairchild	F4526BC	451-116
		F4526BM	451-117
	National	CD4526BC	451-121
		CD4526BM	451-122
	SSS	883/4526B	451-123
		SCL4526B	451-124
4527	National	CD4527BC	464-99
		CD4527BM	464-100
	RCA	**CD4527B**	★ **749**
			464-101
			¶ 228-5
		CD4527BE	★ **749**
			464-102
			¶ 228-5
	SGS	HCC4527B	464-103
		HCF4527B	464-104
	SSS	883/4527B	464-105
		SCL4527B	464-106
	Toshiba	TC4527B	464-107
4528	Fairchild	F4528BC	462-27
		F4528BM	462-28
	Mostek	MK4528-15	3470-35
		MK4528-20	3470-36
		MK4528-25	3470-38
		MKM4528D-83	3470-37
		MKM4528D-84	3470-39
	National	CD4528BC	462-32
		CD4528BM	462-33
	SSS	883/4528B	462-40
		SCL4528B	462-41
			¶ 231-7
	Toshiba	TC4528B	462-42
4529	**National**	**CD4529B**	★**3318**
	National	CD4529BC	2423-20
			2423-79
		CD4529BM	2423-21
			2423-80
453	**Datel**	**AM-453-2**	★**2622**
	Datel	AM-453-2C	2926-30
		AM-453-2M	2926-31
	Intersil	DG453A	2420-81
	National	COP453	1087-98
4531	Fairchild	F4531BC	466-23
		F4531BM	466-24
	Raytheon	RC4531	2931-21
		RM4531	2929-1
	SSS	883/4531B	466-28
		SCL4531B	466-29
	Toshiba	TC4531B	466-30
4532	Fairchild	F4532BC	466-1
		F4532BM	466-2
	RCA	**CD4532B**	★ **749**
			466-6
		CD4532BE	★ **749**
			466-7
	SGS	HCC4532B	466-8
		HCF4532B	466-9
	SSS	883/4532B	466-10
		SCL4532B	466-11
	Toshiba	TC4532B	466-12
4534	**AMI**	**S4534**	★**2611**
			2465-129
			2480-146
4535	**AMI**	**S4535**	★**2609**
			2466-6
			2480-148
4536	**RCA**	**CD4536B**	★ **749**
			462-75
		CD4536BE	★ **749**
			462-76
4538	National	CD4538BC	462-51
		CD4538BM	462-52
	RCA	**CD4538B**	★ **749**
			462-55
		CD4538BE	★ **749**
			462-56
4539	Fairchild	F4539BC	461-79
		F4539BM	461-80
	Toshiba	TC4539B	461-88
454	Intersil	DG454A	2421-17
	NEC-Electron	uPC454	2935-34
4541	**RCA**	**CD4541**	★ **749**
4543	National	CD4543BC	455-16
		CD4543BM	455-17
4543	**RCA**	**CD4543BD**	★ **749**
			2464-41
		CD4543BE	★ **749**
			2464-42
	SSS	883/4543B	455-18
			2464-51
		SCL4543B	455-19
			2464-52
	Toshiba	TC4543B	455-20
455	Intersil	MM455	2422-13
4550	Signetics	TDA4550	2903-191
4553	Fairchild	F4553BC	453-46
		F4553BM	453-47
4555	Fairchild	F4555BC	454-27
		F4555BM	454-28
	RCA	**CD4555B**	★ **749**
			454-32
		CD4555BE	★ **749**
			454-33
	SGS	HCC4555B	454-34
		HCF4555B	454-35
	SSS	883/4555B	454-36
		SCL4555B	454-37
	Toshiba	TC4555B	454-38
4556	Fairchild	F4556BC	454-39
		F4556BM	454-40
	NEC-Electron	uPC4556	2939-37
	RCA	**CD4556B**	★ **749**
			454-43
		CD4556BE	★ **749**
			454-44
	SGS	HCC4556B	454-45
		HCF4556B	454-46
	SSS	883/4556B	454-47
		SCL4556B	454-48
	Toshiba	TC4556B	454-49
4557	Fairchild	F4557BC	463-175
			3491-54
		F4557BM	463-176
			3491-50
	NEC-Electron	uPC4557	2939-35
4558	Exar	XR4558	2939-63
			¶ 264-1
	Motorola	MC4558	2938-43
		MC4558A	2938-44
		MC4558C	2939-57
		MC4558N	2938-45
		MC4558NC	2939-58
	NEC-Electron	uPC4558	2940-1
	Raytheon	RC4558	2940-2
		RM4558	2938-41
	Signetics	NE4558	2939-59
		SE4558	2938-42
	TI	RC4558	2940-3
4559	NEC-Electron	uPC4559	2939-36
	Raytheon	RC4559	2939-60
		RM4559	2938-46
		RV4559	2939-61
4560	NEC-Electron	uPC4560	2940-5
	Signetics	TDA4560	2903-192
	Toshiba	TC4560B	449-3
4561	Toshiba	TC4561B	449-119
4564	Mostek	MK4564-15	3469-91
		MK4564-20	3470-16
		MK4564-25	3470-28
		MKB4564-82	3470-32
		MKB4564-83	3470-33
		MKB4564-84	3470-34
457	Sanyo	STK457	2897-118
458	Ferranti	ZN458	2966-35
		ZN458A	2966-36
		ZN458B	2966-37
4581	SSS	883/4581B	449-68
		SCL4581B	449-69
4582	Fairchild	F4582BC	449-70
		F4582BM	449-71
	SSS	883/4582B	449-79
		SCL4582B	449-80
4583	Fairchild	F4583BC	464-110
		F4583BM	464-111
	Toshiba	TC4583B	464-115
4584	National	CD4584BC	465-28
		CD4584BM	465-29
	SSS	883/4584B	465-41
		SCL4584B	465-42
4585	**RCA**	**CD4585B**	★ **749**
			449-94
		CD4585BE	★ **749**
			449-95
	SSS	883/4585B	449-100
		SCL4585B	449-101
	Toshiba	TC4585B	449-103
459	Ferranti	ZN459	2897-138
		ZN459C	2897-139
		ZN459CP	2897-140
	Sanyo	STK459	2897-119
4592	GI	AY3-4592	2468-15
46	Hitachi	HMCS46C	1087-126
			1051-17
	Siliconix	VN46AF	2481-37
	Toshiba	TLCS-46	1088-14
460	Cherry	CS460	2898-96
	Datel	**AM-460-2**	★**2622**
			2927-54
	Datel	AM-460-2M	2927-55
	Fairchild	CCD460	3488-39
	Ferranti	ZN460	2897-141
		ZN460C	2897-142
		ZN460CP	2897-143
4600	**Harris**	**HA-4600-2**	★**3246**
			★**3287**
			2941-30
		HA-4600-5	★**3246**
			★**3287**
			2941-31
	Siemens	TDA4600	2961-18
	Toshiba	TCP4600AC	1059-3
4602	**Harris**	**HA-4602-2**	★**3246**
			2941-33
	Harris	HS4602RH	2941-32
4605	**Harris**	**HA-4605-5**	★**3246**
			2942-9
461	Cherry	CS461	2898-97
	Intersil	DG461A	2418-55
	National	**HR461**	★**3327**
	TI	TIED461	2963-65
4610	Siemens	TDA4610	2904-49
462	Cherry	CS462	2898-98
	Datel	AM-462-1	2927-60
		AM-462-1M	2928-1
	Datel	**AM-462-2**	★**2622**
			2928-2
	Datel	AM-462-2M	2928-3
	Intersil	DG462A	2418-108
4620	**Harris**	**HA-4620-2**	★**3248**
			★**3287**
			2941-28
		HA-4620-5	★**3248**
			★**3287**
			2941-29
4622	**Harris**	**HA-4622-2**	★**3248**
			★**3287**
			2942-8
4625	**Harris**	**HA-4625-5**	★**3248**
			★**3287**
			2942-13
462532	**Hitachi**	**HM462532**	★**3789**
			3466-60
462716	**Hitachi**	**HM462716**	★**3789**
			3465-68
		HM462716-2	★**3789**
			3465-45
462732	**Hitachi**	**HM462732**	★**3789**
			3466-61
463	Cherry	CS463	2898-99
	Intersil	DG463A	2421-45
	Sanyo	STK463	2897-120
	TI	TIED463	2963-66
464	Cherry	CS464	2898-100
	Datel	**AM-464-2**	★**2622**
			2910-69
			2930-31
	Datel	AM-464-2M	2910-70
			2930-32
	Fairchild	F464	3488-40
	Intersil	DG464A	2421-63
465	Sanyo	STK465	2897-121
	Telefunken	U465	511-31
46508	**Hitachi**	**HD46508**	★**1345**
		HD46508-1	★**1345**
46508	**Hitachi**	**HD46508A**	★**1345**
		HD46508A-1	★**1345**
46810	Hitachi	HM46810	3472-61
			3472-61
46830	Hitachi	HN46830	3484-80
468A10	Hitachi	HM468A10	3472-56
			3472-56
47	Hitachi	HMCS47C	1087-127
			1051-18
470	Cherry	CS470	2898-101
	Datel	**AM-470-2C**	★**2623**
			2928-16
	Datel	AM-470-2M	2928-17
	National	COP470	454-177
			2464-135
			1087-109
	Plessey	SL470	2902-31
4700	Siemens	TDA4700A	2961-19
	Toshiba	TMP4700C	1059-5
4701	Hitachi	H4701B	3491-112
4702	AMD	4702A	3460-21
	Fairchild	F4702BC	464-13
			2486-28
			1085-41
		F4702BM	464-14
			2486-29
			1085-42
	Harris	**HD4702-2**	★ **669**
			★**1333**
			464-15
			★ **669**
			★**1333**
			2486-30
			★ **669**
			★**1333**
			1085-43
		HD4702-9	★ **669**
			★**1333**
			464-16
			★ **669**
			★**1333**
			2486-31
			★ **669**
			★**1333**
			1085-44
		HD4702A-2	★ **669**
			★**1333**
			1085-45
		HD4702A-9	★ **669**
			★**1333**
			1085-46
	Intersil	IM4702	2486-32
4703	Fairchild	F4703BC	460-96
			1085-37
		F4703BM	460-97
			1085-38
	Intersil	IM4703	2486-33
4704	Fairchild	F4704BC	449-53
			1085-33
		F4704BM	449-54
			1085-34
4705	Fairchild	F4705BC	449-58
			1085-29
		F4705BM	449-59
			1085-30
4706	Fairchild	F4706BC	460-98
			1085-39
		F4706BM	460-99
			1085-40
4707	Fairchild	F4707BC	449-51
			1085-31
		F4707BM	449-52
			1085-32
4708	Analogic	MN4708	2424-26
		MN4708D	2424-88
	Fairchild	F4708C	1085-35
		F4708M	1085-36
4710	Fairchild	F4710BC	460-106
			3471-104
			1085-47
		F4710BM	460-107
			3471-105
			1085-48
4716	Analogic	MN4716	2425-25
	Hitachi	**HM4716A-1**	★**3789**
			3468-81

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
4716	Hitachi	HM4716A-2	★3789
			3468-93
		HM4716A-3	★3789
			3469-5
		HM4716A-4	★3789
			3469-23
472	National	COP472	1087-99
4720	Fairchild	F4720AC	460-112
			3473-27
		F4720AM	460-113
		F4720C	460-114
			3473-28
			1085-51
		F4720M	460-115
			3473-29
			1085-52
4721	Fairchild	F4721BC	460-164
		F4721BM	460-165
472114	Hitachi	HM472114-3	★3789
			3478-93
		HM472114-4	★3789
			3479-31
		HM472114A-1	★3789
			3477-100
		HM472114A-2	★3789
			3478-20
4723	Fairchild	F4723BC	459-84
		F4723BM	459-85
	National	CD4723BC	459-86
		CD4723BM	459-87
4724	Fairchild	F4724BC	460-43
		F4724BM	460-44
	National	CD4724BC	460-52
		CD4724BM	460-53
	RCA	CD4724D	★ 749
			460-60
		CD4724BE	★ 749
			460-61
4725	Fairchild	F4725BC	460-100
			1085-49
		F4725BM	460-101
			1085-50
4726	Fairchild	F4726BC	1085-53
		F4726BM	1085-54
473	Ferranti	ZN473E	2949-62
4731	Fairchild	F4731BC	462-145
			3491-65
		F4731BM	462-146
			3491-66
	TeledyneP	4731	2968-71
		4731-83	2968-72
4732	SMC	ROM4732	3486-10
			¶ 238-4
	TeledyneP	4732	2968-73
		4732-83	2968-74
	TI	TMS4732	3486-15
4733	TeledyneP	4733	2968-75
		4733-83	2968-76
4734	Fairchild	F4734BC	455-46
			2464-59
		F4734BM	455-47
			2464-60
	TeledyneP	4734	2968-77
		4734-83	2968-78
4735	Fairchild	F4735BC	461-13
			1085-55
		F4735BM	461-14
			1085-56
	TeledyneP	4735	2968-79
		4735-83	2968-80
4736	Fairchild	F4736BC	460-146
		F4736BM	460-147
	TeledyneP	4736	2963-119
		4736-83	2968-81
4738	Signetics	HEF4738	1092-68
			1102-47
4739	Exar	XR4739	2897-181
			2940-4
		XR4739M	2897-182
	Raytheon	RC4739	2939-62
	TeledyneP	4739	2968-82
		4739-80	2968-83
4741	Exar	XR4741C	2942-41
		XR4741M	2942-3
	Harris	HA-4741-2	★3250
4741	Harris	HA-4741-2	★3287
			2942-4
		HA-4741-5	★3250
			★3287
			2942-42
	Motorola	MC4741	2943-3
		MC4741C	2943-43
	NEC-Electron	uPC4741	2942-40
	Raytheon	HA4741-2	2942-5
		HA4741-5	2942-43
4743	TeledyneP	4743	2968-84
		4743-80	2968-85
4750	Signetics	HEF4750	2945-133
4751	Signetics	HEF4751	511-114
4761	Siemens	TAA4761	2909-100
4764	TI	TMS4764	3486-120
4765	Siemens	TAA4765	2909-101
4780	TeledyneP	4780	2963-104
4781	TeledyneP	4781	2963-105
4782	TeledyneP	4782	2963-106
48	Intersil	Concept-48	1763-4
	Sunrise	ZAP-48	★4107
	Sunrise	ZAP48	4009-3
	TeledyneC	CAG48A	2416-89
480	Cherry	CS480	2898-102
	Cybernetic	CY480	2481-41
			1101-66
	Sprague	UHP-480	★2843
			2465-17
4801	Mostek	MK4801A-55	3479-64
		MK4801A-70	3479-65
		MK4801A-90	3479-67
		MKB4801A-81	3479-77
		MKB4801A-870	
			3479-66
		MKB4801A-890	
			3479-68
	Sprague	UCN-4801A	★2843
			2484-9
	Sprague	UCS-4801H	2480-5
		UCS4801H	2484-10
48016	Hitachi	HM48016	★3789
			3455-50
4802	Mostek	MKB4802-81	3480-31
4805	Raytheon	RC4805	2891-6
		RC4805A	2891-1
		RM4805	2891-7
		RM4805A	2891-2
	Sprague	UCN-4805A	2463-72
4806	Sprague	UCN-4806A	2463-73
481	Cherry	CS481	2898-103
	Sprague	UHP-481	★2843
			2465-62
4810	Sprague	UCN-4810A	★2843
			2465-130
	Sprague	ULN-4810H	2465-131
	TI	4810A	★2859
		TL4810A	★2859
	TI	UCN4810A	2465-132
4815	Sprague	UCN-4815A	★2843
			2465-72
	Sprague	UCS-4815H	2465-73
4816	Hitachi	HM4816A-7	★3789
			3468-86
482	Cherry	CS482	2898-104
	Sprague	UHP-482	★2843
			2464-121
4821	Sprague	UCN-4821A	★2843
			2484-21
	Sprague	UCS-4821H	2484-24
4822	Sprague	UCN-4822A	★2843
			2484-22
	Sprague	UCS-4822H	2484-25
4823	Sprague	UCN-4823A	★2843
			2484-23
	Sprague	UCS-4823H	2484-26
482764	Hitachi	HM482764	★3789
			3466-100
483	Cherry	CS483	2898-105
484	Cherry	CS484	2898-106
4847	Hitachi	HM4847	3481-93
		HM4847-2	3481-49
		HM4847-3	3481-61
485	Cherry	CS485	2898-107
4856	TeledyneP	4856	2967-141
4857	TeledyneP	4857	2967-142
486	Cherry	CS486	2898-108
4860	TeledyneP	4860	2967-143
		4860-83	2967-144
4864	Hitachi	HM4864-1	★3789
			3469-45
		HM4864-2	★3789
			3469-86
		HM4864-3	★3789
			3470-13
	National	NMC4864	3483-53
487	Cherry	CS487	2898-109
	TI	TL487C	2964-67
488	Cherry	CS488	2898-110
489	Cherry	CS489	2898-111
	TI	TL489C	2964-64
49	OKI	EASE-49-I/C	★3873
	TeledyneC	CAG49	2417-88
			2417-90
490	Datel	AM-490	2915-39
	Datel	AM-490-2A	★2623
			2911-76
			2914-12
	Datel	AM-490-2B	2911-15
			2914-10
		AM-490-2C	2911-8
			2914-9
		AM-490-2M	2911-55
			2914-11
	Plessey	SL490	2902-32
	Sprague	UHD-490	2465-10
	Sprague	UHP-490	★2843
			2465-11
	TI	TL490C	2964-65
4900	Harris	HA-4900-2	★3284
			★3287
			2894-59
4902	Harris	HA-4902-2	★3284
			★3287
			2895-9
	TeledyneP	4902	2963-48
		4902-83	2963-49
4905	Harris	4905-5	★3284
		HA-4905-5	★3284
			★3287
			2895-44
491	Plessey	SL491	2902-33
	Sprague	UHD-491	2465-29
	Sprague	UHP-491	★2843
			2465-30
	TI	TL491C	2964-66
4910	TI	TCM4910	2947-112
4920	Harris	HA-4920	2894-58
4925	Harris	HA-4925	2895-37
493	TI	TL493C	2961-60
	Unitrode	UC493	★3444
			2961-112
494	Exar	XR494	★3189
			2960-98
	Fairchild	uA494	2960-101
		uA494M	2960-102
	Motorola	TL494C	★3297
			2960-121
		TL494M	★3297
			2960-122
	National	NMCOP494	★3867
	TI	TL494C	2961-61
		TL494M	2961-62
	Unitrode	UC494	★3444
			2961-113
4944	National	NSL4944	2964-68
495	Exar	XR495	★3190
			2960-99
	Motorola	TL495C	★3297
			2960-123
		TL495M	★3297
			2961-1
	Sprague	UHP-495	★2843
			2465-31
	TI	TL495C	2961-63
	Unitrode	UC495	★3444
			2961-114
4950	Harris	HA-4950	2891-17
4955	Harris	HA-4955	2892-7
496	TI	TL496C	2965-99
497	TI	TL497AC	2961-64
		TL497AM	2961-65
498	National	COP498	460-132
			1087-107
499	National	COP499	1087-111
4R101	TeledyneC	CS4R101A	2420-109
5	AMI	UA-5	4140-14
	GI	AY-5-8136	2486-46
		AY-5-8136T	2486-47
		AY-5-8816	2486-48
		AY-5-8816T	2486-49
	LSIComp	RED5/6	★ 696
			462-61
			510-85
	National	MF5	★3306
			2962-30
	Sharp	SM-5	1088-11
			1055-25
50	Burr-Brown	PCM50K	2461-5
	Intel	88/50	1065-35
	LSIComp	RED50/60	★ 696
			462-63
			511-2
	MasterLogic	ML50	4141-169
	MicroEng	MGB50	★4437
			4141-12
		MGC50	★4437
			4141-19
	RCA	MSIM50	★1959
	TeledyneC	CAG50	2417-89
500	AMI	GA500	★4307
			4140-8
	AnalogSys	MA500	2888-15
	CalDevices	CDI500	4140-20
	Cybernetic	CY500	2481-26
			1101-46
	Datel	AM-500GC	★2623
			2910-7
			2913-156
			2925-15
	Datel	AM-500MC	2910-8
			2913-157
			2925-16
	Datel	AM-500MM	★2620
			2925-18
	Datel	AM-500MR	2925-17
	Dionics	DI500	2464-108
	Exar	XR500	4140-72
	Fujitsu	B500	4140-89
	MicroEng	MGB500	★4437
			4141-13
		MGC500	★4437
			4141-20
	Motorola	MCA500ALS	★4479
			4141-48
	Quay	500T	1628-2
	Sprague	UHC/D-500	484-70
			2483-90
	Sprague	UHP-500	★2843
			484-74
			★2843
			2483-94
	Zilog	500	★1581
5000	AMI	GA5000D	★4307
			4140-9
	Mitel	MA5000	4141-33
	Plessey	SCD-5000	4141-83
	Plessey	SCD5000	★4510
	Signetics	SAA5000	2902-43
	Siliconix	SD5000	★2824
			2417-80
	Telmos	TM5000	4141-121
	TI	DIDD5000	★ 438
	Toshiba	TC5000	462-135
5001	Intersil	IH5001	2415-15
			¶ 262-16
	Siliconix	SD5001	★2824
			2417-78
	Toshiba	TC5001	453-78
5002	Intersil	IH5002	2415-18
	Mostek	MK5002	510-30
	Siliconix	SD5002	★2824
			2417-79
	Toshiba	TC5002B	454-26
5003	Intersil	IH5003	2416-5
	MicroPwr	MPS5003	2896-8
	Toshiba	TC5003	2906-18
5004	Intersil	IH5004	2416-26

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
5004	MicroPwr	MPS5004	2896-9
	Toshiba	TC5004	462-144
5005	Intersil	IH5005	2415-92
	Mostek	MK5005	510-31
5006	Intersil	IH5006	2416-6
5007	Intersil	IH5007	2416-44
	Mostek	MK5007	510-32
5009	Intersil	IH5009C	2422-23
			¶ 253-16
			¶ 253-16
			¶ 262-16
		IH5009M	2422-24
			¶ 253-16
			¶ 253-16
			¶ 262-16
	Mostek	MK5009	510-39
			¶ 232-8
	National	**AH5009C**	**★3318**
			2422-25
501	**RCA**	**GP501**	**★ 409**
			1086-95
	Siliconix	DG501A	2424-42
			2424-48
		DG501B	2424-43
			2424-49
		DG501C	2424-44
			2424-50
	Thomson-CSF	ESM501	2948-136
5010	**AD**	**AD5010K**	**★3175**
			2426-5
	Intersil	IH5010C	2422-30
		IH5010M	2422-31
	MicroPwr	**MP5010**	**★ 401**
			★3292
			2966-5
		MP5010A	**★ 401**
			★3292
			2966-6
	National	**AH5010C**	**★3318**
			2422-32
	Panasonic	AN5010	2903-78
	Siemens	SDA5010	2426-7
	Toshiba	TC5010	453-77
5011	Intersil	IH5011C	2422-49
		IH5011M	2422-50
	National	**AH5011C**	**★3318**
			2422-51
	Panasonic	AN5011	2903-79
5012	Intersil	IH5012C	2422-56
		IH5012M	2422-57
	National	**AH5012C**	**★3318**
			2422-58
	Signetics	SAA5012	2902-44
	Toshiba	TC5012B	450-120
5013	Intersil	IH5013C	2421-111
		IH5013M	2421-112
5014	Intersil	IH5014C	2422-3
		IH5014M	2422-4
5015	Intersil	IH5015C	2422-7
		IH5015M	2422-8
	SMC	SR5015	3488-41
		SR5015-133	3491-98
		SR5015-80	3491-68
		SR5015-81	3491-82
5016	Intersil	IH5016C	2422-11
		IH5016M	2422-12
	OKI	MSM5016	2899-157
	SMC	COM5016	510-3
			2486-55
		COM5016T	510-4
			2486-56
5017	Intersil	IH5017C	2421-103
		IH5017M	2421-104
	SMC	SR5017	3456-64
			3491-99
5018	Intersil	IH5018C	2421-99
		IH5018M	2421-100
	Signetics	NE5018	2443-6
			1102-16
		SE5018	2443-7
	SMC	SR5018	3456-62
			3491-83
	Toshiba	TC5018	451-18
		TC5018B	465-166
5019	Intersil	IH5019C	2421-95
		IH5019M	2421-96
5019	Signetics	NE5019	2441-12
		SE5019	2441-13
502	AD	AD502J	2930-24
		AD502K	2927-37
		AD502L	2927-36
		AD502S	2927-40
	Dionics	DI502	2464-109
	MicroNet	MN502	2427-37
			¶ 256-5
		MN502H	2427-38
			¶ 256-5
	Sprague	UHC/D-502	484-117
			2483-122
	Sprague	**UHP-502**	**★2843**
			484-121
			★2843
			2483-126
5020	Intersil	IH5020C	2421-107
		IH5020M	2421-108
	Signetics	NE5020	2446-30
		SA5020	2949-53
	Toshiba	TC5020B	464-5
5021	Intersil	IH5021C	2421-82
		IH5021M	2421-83
	OEI	**5021**	**★3347**
			2967-123
5022	Intersil	IH5022C	2421-89
		IH5022M	2421-90
	Toshiba	TC5022B	455-72
5023	Intersil	IH5023C	2421-84
		IH5023M	2421-85
	Toshiba	TC5023	2424-97
5024	Intersil	IH5024C	2421-91
		IH5024M	2421-92
	Toshiba	TC5024	449-150
50240	AMI	S50240	2900-41
			¶ 272-15
	Mostek	MK50240	2900-47
50241	AMI	S50241	2900-42
	Mostek	MK50241	2900-48
50242	AMI	S50242	2900-43
	Mostek	MK50242	2900-49
50243	AMI	S50243	2900-44
50244	AMI	S50244	2900-45
50245	AMI	S50245	2900-46
5025	Intersil	IH5025C	2422-21
			¶ 253-16
			¶ 262-16
		IH5025M	2422-22
			¶ 253-16
			¶ 262-16
	OEI	**5025**	**★3347**
			2967-124
	Signetics	SAA5025A	2949-50
		SAA5025B	2949-51
		SAA5025C	2949-52
	SSS	SND5025	2487-77
	SMC	COM5025	2487-78
	Toshiba	TC5025	449-151
5026	Intersil	IH5026C	2422-28
		IH5026M	2422-29
	SMC	COM5026	510-14
			2486-24
		COM5026T	510-15
			2486-25
	Toshiba	TC5026B	453-149
5027	Intersil	IH5027C	2422-47
		IH5027M	2422-48
	SSS	SND5027	2903-11
			¶ 233-1
			¶ 233-7
			1100-82
			¶ 233-1
			¶ 233-7
	SMC	CRT5027	1100-84
			¶ 239-7
			¶ 240-5
			¶ 240-10
	Toshiba	TC5027B	451-21
5028	Intersil	IH5028C	2422-54
		IH5028M	2422-55
5029	Intersil	IH5029C	2421-109
		IH5029M	2421-110
	Toshiba	TC5029B	457-84
503	**AD**	**AD503J**	**★3153**
			2935-18
503	**AD**	**AD503K**	**★3153**
			2934-53
		AD503S	**★3153**
			2934-54
	Dionics	DI503	2464-126
	MicroNet	MN503	2427-39
		MN503H	2427-40
	Siliconix	DG503A	2424-46
		DG503B	2424-47
	Sprague	UHC/D-503	484-118
			2483-123
	Sprague	**UHP-503**	**★2843**
			484-122
			★2843
			2483-127
5030	Intersil	IH5030C	2422-1
		IH5030M	2422-2
	OEI	**5030A**	**★3347**
			2965-71
	Signetics	SAA5030	2949-54
	Toshiba	TC5030B	457-85
5031	Intersil	IH5031C	2422-5
		IH5031M	2422-6
5032	Intersil	IH5032C	2422-9
		IH5032M	2422-10
	OEI	**5032A**	**★3347**
			2965-72
	Toshiba	TC5032	453-87
5033	Intersil	IH5033C	2421-101
		IH5033M	2421-102
5034	Intersil	IH5034C	2421-97
		IH5034M	2421-98
	Signetics	**NE5034**	**★3396**
			2428-1
	Toshiba	TC5034	452-193
5035	Intersil	IH5035C	2421-93
		IH5035M	2421-94
5036	Intersil	IH5036C	2421-105
		IH5036M	2421-106
	Signetics	NE5036	2426-13
	SMC	COM5036	510-5
			2486-57
		COM5036T	510-6
			2486-58
	Toshiba	TC5036	452-11
5037	Intersil	IH5037C	2421-80
		IH5037M	2421-81
	Signetics	NE5037	2426-14
	SSS	SND5037	2903-12
			1100-83
	SMC	CRT5037	1100-87
			¶ 238-4
			¶ 240-2
			¶ 240-5
			¶ 241-16
	Toshiba	TC5037	453-79
5038	Intersil	IH5038C	2421-87
		IH5038M	2421-88
5039	**Signetics**	**N5039**	**★1523**
		SCN5039	**★1523**
50395	Mostek	MK50395	510-34
			¶ 231-16
50396	Mostek	MK50396	510-35
			¶ 231-16
50397	Mostek	MK50397	510-36
			¶ 231-16
50398	Mostek	MK50398	510-37
50399	Mostek	MK50399	510-38
504	**AD**	**AD504B**	**★3153**
			2434-24
		AD504J	**★3153**
			2924-33
		AD504K	**★3153**
			2921-35
		AD504L	**★3153**
			2911-65
			2919-46
		AD504M	**★3153**
			2911-20
			2919-45
		AD504S	**★3153**
			2911-66
			2919-47
	Dionics	DI504	2464-127
	MicroNet	MN504	2427-41
		MN504H	2427-42
504	**RCA**	**GP504**	**★ 409**
			1086-94
	RTC	MS504	2423-83
5040	**Harris**	**HI5040-2**	**★2643**
			★3288
			2415-5
		HI5040-5	**★2643**
			★3288
			2415-6
	Intersil	IH5040C	2415-8
			¶ 253-16
			¶ 262-16
		IH5040M	2415-7
			¶ 253-16
			¶ 262-16
	Signetics	SAA5040	2949-44
	Siliconix	**DG5040A**	**★2779**
			★2813
			2415-2
		DG5040C	**★2779**
			★2813
			2415-3
5041	**Harris**	**HI5041-2**	**★2643**
			2415-68
		HI5041-5	**★2643**
			2415-69
	Intersil	IH5041C	2415-71
		IH5041M	2415-67
	Siliconix	**DG5041A**	**★2779**
			★2813
			2415-54
		DG5041C	**★2779**
			★2813
			2415-55
5042	**Harris**	**HI5042-2**	**★2643**
			2418-31
		HI5042-5	**★2643**
			2418-32
	Intersil	IH5042C	2418-33
		IH5042M	2418-30
	Siliconix	**DG5042A**	**★2779**
			★2813
			2418-27
		DG5042C	**★2779**
			★2813
			2418-28
	Toshiba	TC5042B	455-73
5043	**Harris**	**HI5043-2**	**★2643**
			★3288
			2419-42
		HI5043-5	**★2643**
			★3288
			2419-43
	Intersil	IH5043C	2419-44
		IH5043M	2419-41
	Siliconix	**DG5043A**	**★2780**
			★2813
			2419-38
		DG5043C	**★2780**
			★2813
			2419-39
5044	**Harris**	**HI5044-2**	**★2643**
			2420-21
		HI5044-5	**★2643**
			2420-22
	Intersil	IH5044C	2420-23
		IH5044M	2420-16
			2420-24
	Signetics	NE5044	2948-160
	Siliconix	**DG5044A**	**★2780**
			★2813
			2420-19
		DG5044C	**★2780**
			★2813
			2420-20
5045	**Harris**	**HI5045-2**	**★2643**
			★3288
			2420-59
		HI5045-5	**★2643**
			★3288
			2420-60
	Intersil	IH5045C	2420-61
		IH5045M	2420-58
	Signetics	NE5045	2949-1
	Siliconix	**DG5045A**	**★2780**

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
5045	**Siliconix**	**DG5045A**	★2813
			2420-55
		DG5045C	★2780
			★2813
			2420-56
5046	**Harris**	**HI5046-2**	★2643
			2421-31
		HI5046-5	★2643
			2421-32
		HI5046A-2	★2643
			2421-28
		HI5046A-5	★2643
			2421-29
	Intersil	IH5046C	2421-33
		IH5046M	2421-30
	Signetics	NE5046	2948-159
	SMC	COM5046	510-16
			2486-26
		COM5046T	510-17
			2486-27
5047	**Harris**	**HI5047-2**	★2643
			2421-75
		HI5047-5	★2643
			2421-76
		HI5047A-2	★2643
			2421-72
		HI5047A-5	★2643
			2421-73
	Intersil	IH5047C	2421-77
		IH5047M	2421-74
	SMC	CRT5047	1100-86
	Toshiba	TC5047A	461-26
		TC5047A-1	3479-57
		TC5047A-2	3479-62
5048	**Harris**	**HI5048-2**	★2643
			2415-52
		HI5048-5	★2643
			2415-53
	Intersil	IH5048C	2415-26
		IH5048M	2415-25
	Toshiba	TC5048	451-150
5049	**Harris**	**HI5049-2**	★2643
			2420-53
		HI5049-5	★2643
			2420-54
	Intersil	IH5049C	2420-33
		IH5049M	2420-32
505	Dionics	DI505	2465-21
	RCA	**GP505**	★ 409
			1086-98
	TI	TL505C	2438-18
5050	**Harris**	**HI5050-2**	★2643
			2418-25
		HI5050-5	★2643
			2418-26
	Intersil	IH5050C	2418-2
		IH5050M	2418-1
	Mitel	MA5050	4141-34
	Nitron	NC5050	4141-56
	Signetics	SAA5050	2949-47
	Toshiba	TC5050	462-143
50500	GTEMicro	G50500	4141-137
5051	**Harris**	**HI5051-2**	★2643
			★3288
			2419-34
		HI5051-5	★2643
			★3288
			2419-35
	Intersil	IH5051C	2419-11
		IH5051M	2419-10
	Signetics	SAA5051	2949-48
	Toshiba	TC5051	453-80
5052	Intersil	IH5052C	2416-112
		IH5052M	2416-106
	Signetics	SAA5052	2949-49
	Toshiba	TC5052	453-81
5053	Intersil	IH5053C	2416-113
		IH5053M	2416-107
	MicroPwr	MPS5053	2896-10
	Toshiba	TC5053	453-82
5054	Siemens	5054	2900-55
	Toshiba	TC5054	453-83
5055	AMD	AM5055	3491-97
	MMI	5055	3453-8
	Signetics	SAA5055	2949-46
5056	AMD	AM5056	3491-104
5057	AMD	AM5057	3491-107
	SMC	CRT5057	1100-85
			¶ 240-5
506	**AD**	**AD506J**	★3153
			2925-48
		AD506K	★3153
			2921-30
		AD506L	★3153
			2911-35
			2920-14
		AD506S	★3153
			2921-31
	Harris	**HI506-2**	★2650
			★3288
			2425-7
		HI506-5	★2650
			★3288
			2425-8
		HI506A	★2652
		HI506A-2	★2650
			★3288
			2425-24
		HI506A-5	★2650
			★3288
			2425-26
	Siliconix	**DG506A**	★2802
			2425-9
			¶ 262-11
		DG506AA	★2802
			2423-51
			¶ 262-11
		DG506AB	★2802
			2423-54
			¶ 262-11
		DG506AC	★2802
			2423-55
			¶ 262-11
		DG506B	★2802
			2425-12
			¶ 262-11
		DG506C	★2802
			2425-13
			¶ 262-11
	Sprague	UHC/D-506	484-71
			2483-91
	Sprague	**UHP-506**	★2843
			484-75
			★2843
			2483-95
	TI	TL506C	2893-64
		TL506M	2893-14
5062	**Harris**	**HA-5062-2**	★3252
			★3287
			2930-16
		HA-5062-5	★3252
			★3287
			2934-25
		HA-5062A-5	★3252
			★3287
			2930-17
		HA-5062B-5	★3252
			★3287
			2925-7
5064	**Harris**	**HA-5064-2**	★3254
			★3287
			2943-8
		HA-5064-5	★3254
			★3287
			2944-30
		HA-5064A-5	★3254
			★3287
			2943-9
		HA-5064B-5	★3254
			★3287
			2941-39
	Toshiba	TC5064B	449-156
5065	MicroNet	MN5065	2428-27
		MN5065H	2428-28
	Toshiba	TC5065B	449-157
5066	MicroNet	MN5066	2428-29
		MN5066H	2428-30
	Toshiba	TC5066B	450-143
5067	Toshiba	TC5067B	450-144
507	**AD**	**AD507J**	★3155
			2913-123
			2930-26
507	**AD**	**AD507K**	★3155
			2913-124
			2925-29
		AD507S	★3155
			2913-125
			2925-55
	Dionics	DI507	2465-22
	Harris	**HI507-2**	★2650
			★3288
			2424-67
		HI507-5	★2650
			★3288
			2424-68
		HI507A	★2652
		HI507A-2	★2650
			★3288
			2424-87
		HI507A-5	★2650
			★3288
			2424-89
	MicroNet	MN507	2427-43
		MN507H	2427-44
	RCA	**GP507**	★ 409
			1086-96
	Sanyo	STK507	2956-14
	Siliconix	**DG507A**	★2802
			2424-69
		DG507AA	★2802
			2424-70
		DG507AB	★2802
			2424-74
		DG507AC	★2802
			2424-75
		DG507B	★2802
			2424-76
		DG507C	★2802
			2424-77
	Sprague	UHC/D-507	484-98
			2483-101
	Sprague	**UHP-507**	★2843
			484-102
			★2843
			2483-105
	TI	TL507C	2426-16
5070	Signetics	SAA5070	2949-124
5071	MicroPwr	MP5071	2901-96
508	Dionics	DI508	2465-47
	Harris	**HI508-2**	★2654
			★3288
			2424-3
		HI508-5	★2654
			★3288
			2424-4
		HI508A	★2656
		HI508A-2	★2654
			★3288
			2424-29
		HI508A-5	★2654
			★3288
			2424-31
	Harris	HS508ARH	2424-30
	Siliconix	**DG508A**	★2804
			2424-13
		DG508AA	★2804
			2424-14
		DG508AB	★2804
			2424-17
		DG508AC	★2804
			2424-18
		DG508B	★2804
			2424-19
		DG508C	★2804
			2424-20
	Sprague	UHC/D-508	484-99
			2483-102
	Sprague	**UHP-508**	★2843
			484-103
			★2843
			2483-106
5080	LSILogic	LSI-5080	4140-144
	OKI	MSM5080	2899-129
	Toshiba	TC5080	453-147
50808	Mostek	MK50808	2428-39
5081	OKI	MSM5081	2899-158
	Toshiba	TC5081	464-29
50816	Mostek	MK50816	2428-40
5082	**Harris**	**HA-5082-2**	★3256
			★3287
			2930-21
		HA-5082-5	★3256
			★3287
			2934-28
		HA-5082A-5	★3256
			★3287
			2930-22
		HA-5082B-5	★3256
			★3287
			2925-10
	Toshiba	TC5082	462-79
		TC5082L	462-78
5084	**Harris**	**HA-5084-2**	★3258
			★3287
			2942-22
		HA-5084-5	★3258
			★3287
			2944-21
		HA-5084A-5	★3258
			★3287
			2942-23
		HA-5084B-5	★3258
			★3287
			2941-24
5086	MMI	5086	497-73
5087	Mitel	MT5087	2949-145
	MMI	5087	497-74
	Mostek	MK5087	2949-149
	SSS	SCT5087	2949-168
	TI	TCM5087	2950-3
5089	ITT	SBA5089	2949-143
	Mitel	MT5089	2949-146
	Mostek	MK5089	2949-150
	SSS	SCT5089	2950-1
	TI	TCM5089	2950-4
509	**AD**	**AD509J**	★3155
			2910-36
			2933-16
		AD509K	★3155
			2910-32
			2932-18
		AD509S	★3155
			2910-33
			2932-19
	Dionics	DI509	2465-48
	Harris	**HI509-2**	★2654
			★3288
			2423-41
		HI509-5	★2654
			★3288
			2423-42
		HI509A	★2656
		HI509A-2	★2654
			★3288
			2423-66
		HI509A-5	★2654
			★3288
			2423-67
	MicroNet	MN509	2427-35
		MN509H	2427-36
	Siliconix	**DG509A**	★2804
			2423-52
		DG509AA	★2804
			2423-53
		DG509AB	★2804
			2423-56
		DG509AC	★2804
			2423-57
		DG509B	★2804
			2423-58
		DG509C	★2804
			2423-59
5090	**OEI**	**5090A**	★3347
			2962-133
	Signetics	NE5090	2480-113
		SE5090	2480-114
	Toshiba	TC5090	2429-32
5091	ITT	SBA5091	2949-144
	Mitel	MT5091	2949-147
	Mostek	MK5091	2949-151
	Toshiba	TC5091	2429-31
5092	Mitel	MT5092	2949-148
	Mostek	MK5092	2949-152
	TI	TCM5092	2950-5

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
5094	Mostek	MK5094	2949-153
50981	Mostek	MK50981	2948-14
50982	Mostek	MK50982	2948-15
50991	Mostek	MK50991	2948-16
50992	Mostek	MK50992	2948-17
50X50	Reticon	RA50X50	2963-138
51	NEC-Electron	UPC51A	2929-46
		uPC51A	2913-121
510	**AD**	**AD510J**	★3153
			2915-48
		AD510K	★3153
			2911-62
			2915-2
		AD510L	★3153
			2911-21
			2914-24
		AD510S	★3153
			2911-63
			2915-3
	Dionics	DI510	2465-75
	National	TBA510	2903-107
	Signetics	NE510	2889-45
		SE510	2889-47
5100	**Harris**	**HA-5100-2**	★3260
			★3287
			2918-25
		HA-5100-5	★3260
			★3287
			2918-26
	MicroNet	MN5100	2426-48
		MN5100H	2426-49
	Mitel	MA5100	4141-35
	Nitron	NC5100	4141-57
	TI	**TMS5100**	★1562
			2902-82
51000	GTEMicro	G51000	4141-138
5101	**AMI**	**S5101-8**	★3614
			3475-1
		S5101L	★3614
			460-163
			★3614
			3474-109
		S5101L-1	★3614
			3474-80
		S5101L-3	★3614
			3474-110
	Datel	**ADC-5101**	★2621
			2426-35
		ADC-5101E	★2621
			2426-36
		ADC-5101H	★2618
			★2621
			2426-37
		ADC5101	★2618
	DDC	DDC-5101	2426-34
	ITT	ITT5101S	3473-39
	MicroNet	MN5101	2426-38
		MN5101H	2426-39
	Motorola	MCM5101	460-172
		MCM5101-65	3474-113
		MCM5101-80	3475-4
	NEC-Micro	uPD5101L	461-6
			3474-115
		uPD5101L-1	3474-85
	Panasonic	MN5101	3475-5
	RCA	**MWS5101**	★3874
	Reticon	R5101	2962-72
	Sharp	LH-5101S	3474-38
		LH-5101W	3475-6
	SSS	883/5101-4	3475-7
		SCM5101	461-9
			¶ 287-16
		SCM5101-1	3474-86
			¶ 287-16
		SCM5101-1A	3474-62
			¶ 287-16
		SCM5101-3	3474-117
			¶ 287-16
		SCM5101-8	3475-8
			¶ 287-16
5101DL3			
	RCA	MWS5101DL3	3474-60
5101EL2			
	RCA	MWS5101EL2	3474-14
5101EL3			
	RCA	MWS5101EL3	3474-61
5102	**Harris**	**HA5102**	★3287
	Mostek	MK5102-5	2949-85
	Sharp	LH-5102	3475-18
5103	Mostek	MK5103-5	2949-86
5104	**Harris**	**HA5104**	★3287
	OKI	**MSM5104**	★3873
			461-31
		MSM5104-2	★3873
			3482-18
		MSM5104-3	★3873
			3482-62
	Reticon	R5104	2962-65
510480	**Fairchild**	**510480**	★3623
5105	**Harris**	**HA-5105-5**	★3260
			★3287
			2921-1
5108	Intersil	IH5108C	2424-24
		IH5108M	2424-23
511	Signetics	NE511	2889-46
		SE511	2889-48
5110	**Harris**	**HA-5110-2**	★3262
			★3287
			2918-24
		HA-5110-5	★3262
			★3287
			2918-27
	Intersil	IH5110	2967-92
	MicroNet	MN5110	2947-114
	TI	**TMS5110**	★1562
			2902-83
5111	Intersil	IH5111	2967-93
	MicroNet	MN5111	2947-115
	Panasonic	AN5111	2905-149
5112	**Harris**	**HA5112**	★3287
	Intersil	IH5112	2967-94
	Sanyo	LA5112	2904-136
5113	Intersil	IH5113	2967-95
5114	GTEMicro	G5114	461-17
	Harris	**HA5114**	★3287
	Intersil	IH5114	2967-96
	OKI	**MSM5114**	★3873
			461-21
		MSM5114-2	★3873
			3478-6
	RCA	**MWS5114-1**	★3874
			3478-75
		MWS5114-2	★3874
			3478-52
		MWS5114-3	★3874
			3478-8
		MWS5114A	★3874
			3479-14
		MWS5114A-5	★3874
			3479-15
	SSS	SCM5114-1	3478-9
		SCM5114-8	3479-16
5115	**Harris**	**HA-5115-5**	★3262
			★3287
			2921-2
	Intersil	IH5115	2967-97
	OKI	**MSM5115**	★3873
			461-22
		MSM5115-2	★3873
			3478-7
5116	Fairchild	5116	2947-94
	Harris	**HC5116A**	★2737
			2947-96
	Mostek	MK5116	2947-99
	National	**TP5116**	★3337
			2947-103
		TP5116A	★3337
			2947-104
	SGS	M5116	2947-108
5117	**Harris**	**HC5117A**	★2737
			2947-88
	National	**TP5117A**	★3337
			2947-91
5118	Signetics	NE5118	2441-26
		SE5118	2441-27
5119	Signetics	NE5119	2441-1
		SE5119	2441-2
512	AD	AD512K	2925-37
		AD512S	2925-39
	Cremenco	**512MSU**	★1914
	Cybernetic	CY512	2481-27
			1101-47
512	Dionics	DI512	2465-76
	GI	SPB512	2902-75
	Harris	**HPROM0512**	★3740
	IPI	M512	2964-20
	Panasonic	MEL512KV	2964-25
		MN512	2964-29
	Reticon	RL512	2964-40
		RL512S	2964-41
		RL512SF	2964-42
		RL512SFX	2963-141
		SAD512	2900-2
			2967-157
		SAD512D	2967-158
	Signetics	MB512	2899-66
5120	GI	RO3-5120	3484-27
	MicroNet	MN5120	2427-19
		MN5120H	2427-20
	Panasonic	AN5120	2905-150
	Signetics	SAA5120	2947-9
5121	MicroNet	MN5121	2427-21
		MN5121H	2427-22
5122	MicroNet	MN5122	2427-23
		MN5122H	2427-24
5123	MicroNet	MN5123	2427-25
		MN5123H	2427-26
5125	Signetics	SAA5125	2947-8
5128	**OKI**	**MSM5128**	★3873
			461-57
			★3873
			3480-85
513	Dionics	DI513	2465-86
	Signetics	MB513	2899-67
5130	**Harris**	**HA-5130-2**	★3264
			★3287
			2914-20
		HA-5130-5	★3264
			★3287
			2911-58
			2914-22
	MicroNet	MN5130	2427-8
		MN5130H	2427-9
5131	HybridSys	HS5131B	2429-9
		HS5131C	2429-10
	MicroNet	MN5131	2427-10
		MN5131H	2427-11
5132	MicroNet	MN5132	2427-12
		MN5132H	2427-13
5133	MicroNet	MN5133	2427-14
		MN5133H	2427-15
	SEEQ	**5133-350**	★3891
			3467-1
5135	**Harris**	**HA-5135-2**	★3264
			★3287
			2914-21
		HA-5135-5	★3264
			★3287
			2911-59
			2914-23
514	AD	AD514J	2935-21
		AD514K	2934-39
		AD514L	2934-36
		AD514S	2934-40
	Dionics	DI514	2465-87
		DI514A	2465-88
	Harris	HA-514A	2930-35
	TI	TL514C	2893-25
		TL514M	2893-1
5140	Dionics	DI5140	2465-13
	Intersil	IH5140C	2415-4
		IH5140M	2415-1
	LSILogic	LSI-5140	4140-145
	MicroNet	MN5140	2426-55
		MN5140H	2427-1
5141	**Harris**	**HA-5141**	★3266
			2931-23
	Intersil	IH5141C	2415-64
		IH5141M	2415-29
	MicroNet	MN5141	2427-2
		MN5141H	2427-3
5142	**Harris**	**HA-5142**	★3266
			2940-9
		HA-5142A	★3266
			2939-27
	Intersil	IH5142C	2418-29
		IH5142M	2418-3
5142	MicroNet	MN5142	2427-4
		MN5142H	2427-5
5143	Intersil	IH5143C	2419-40
		IH5143M	2419-12
	MicroNet	MN5143	2427-6
		MN5143H	2427-7
	SEEQ	**5143**	★3896
			3467-20
5144	**Harris**	**HA-5144**	★3266
			2943-53
		HA-5144A	★3266
			2943-23
	Intersil	IH5144C	2420-17
		IH5144M	2420-18
5145	Intersil	IH5145C	2420-57
		IH5145M	2420-34
515	**AD**	**AD515J**	★3153
			2911-14
			2924-38
		AD515K	★3153
			2911-9
			2920-9
		AD515L	★3153
			2911-4
			2920-8
	Siliconix	DG515A	2420-5
		DG515B	2420-6
		DG515C	2420-7
5150	Harris	HA-5150	2923-11
	MicroNet	MN5150	2427-16
	Mitel	MA5150	4141-36
	Nitron	NC5150	4141-58
	Signetics	SAA5150	2947-6
51500	GTEMicro	G51500	4141-139
5151	Fairchild	5151	2947-95
	Mostek	MK5151	2947-100
	Signetics	SAA5151	2947-5
5155	MMI	5155	3453-9
	Signetics	SAA5155	2947-7
5156	Fairchild	5156	2947-42
	Harris	**HC5156A**	★2737
			2947-43
	Mostek	MK5156	2947-45
	National	**TP5156**	★3337
			2947-47
		TP5156A	★3337
			2947-48
	SGS	M5156	2947-54
516	**Harris**	**HI516-2**	★2663
			★3288
			2425-14
		HI516-5	★2663
			★3288
			2425-15
	Siliconix	DG516A	2420-10
		DG516B	2420-11
		DG516C	2420-12
5160	**Harris**	**HA-5160-2**	★3268
			★3287
			2924-49
		HA-5160-5	★3268
			★3287
			2924-50
5162	**Harris**	**HA-5162-5**	★3260
			★3287
			2934-17
517	**AD**	**AD517J**	★3153
			2916-27
		AD517K	★3153
			2911-67
			2914-47
		AD517L	★3153
			2911-22
			2914-13
		AD517S	★3153
			2911-68
			2914-48
	MicroPwr	MP517J	2916-28
		MP517K	2911-79
			2914-49
		MP517L	2911-24
			2014-14
		MP517S	2911-80
			2914-50
5170	**Harris**	**HA-5170-2**	★3270

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
5170	Harris	HA-5170-2	★3287
			2918-7
		HA-5170-5	★3270
			★3287
			2918-30
	Mostek	MK5170	2947-157
5175	Mostek	MK5175	2948-53
518	AD	AD518	★3155
			2910-44
		AD518J	★3155
			2931-18
		AD518K	★3155
			2926-5
		AD518S	★3155
			2910-45
			2926-6
	Harris	HI518-2	★2666
			★3288
			2424-79
		HI518-5	★2666
			★3288
			2424-80
5180	Dionics	DI5180	2465-14
	Harris	HA-5180-2	★3272
			★3287
			2925-13
		HA-5180-5	★3272
			★3287
			2925-14
		HA-5180A-2	★3272
			★3287
			2918-40
		HA-5180A-5	★3272
			★3287
			2918-41
5181	Motorola	MHW5181	2903-57
5182	Motorola	MHW5182	2903-58
5188	OKI	MSM5188	★3873
5190	Harris	HA-5190	★3275
			★3287
			★3289
			2910-26
			2929-45
			¶ 266-4
			¶ 269-2
5195	Harris	HA-5195	★3275
			★3287
			★3290
			2910-27
			2929-53
			¶ 266-4
			¶ 269-2
51970	Signetics	SFT51970	★1972
		SMSFT51970	★1972
51L01	Motorola	MCM51L01-45	3474-84
		MCM51L01-65	3474-114
52	Burr-Brown	VFC52	2963-84
		VFC52M	2963-85
	Rockwell	A52XX	1088-119
520	Signetics	TCA520B	2930-37
	Telefunken	TBA520	2904-5
	TI	TL520	2429-8
5200	AD	AD5200	★3174
	DDC	DDC-5200-1	2434-39
		DDC5200-3	2434-43
	Intersil	IH5200	2415-57
		IH5200C	2415-73
		IM5200	507-11
			3458-15
	MicroNet	MN5200	2434-47
			¶ 256-5
		MN5200H	2434-48
			¶ 256-5
	Nitron	NC5200	4141-59
	Siliconix	SD5200	★2824
			2417-81
	TI	TMS5200	2902-84
52001	NCR	NCR52001	3455-23
52002	NCR	NCR52002	3455-27
52004	NCR	NCR52004	3455-28
5201	AD	AD5201	2434-55
		AD5201A	2435-41
		AD5201B	2434-25
		AD5201S	2435-42
		AD5201T	2434-26
5201	DDC	DDC-5201-1	2434-40
		DDC5201-3	2434-44
	Intersil	IH5201C	2417-4
		IH5201M	2416-115
	MicroNet	MN5201	2434-49
		MN5201H	2434-50
	OKI	MSM5201	1088-1
5202	AD	AD5202	2435-1
		AD5202A	2435-43
		AD5202B	2434-27
		AD5202S	2435-44
		AD5202T	2434-28
	DDC	DDC-5202-1	2434-41
		DDC5202-3	2434-45
	MicroNet	MN5202	2434-51
		MN5202H	2434-52
5203	AD	AD5203	2435-2
	MicroNet	MN5203	2434-32
		MN5203H	2434-33
5204	AD	AD5204	2435-3
		AD5204A	2435-45
		AD5204S	2435-46
		AD5204T	2434-29
	MicroNet	MN5204	2434-34
		MN5204H	2434-35
	OKI	MSM5204	★3873
5205	AD	AD5205	2435-4
		AD5205A	2435-47
		AD5205B	2434-30
		AD5205S	2435-48
		AD5205T	2434-31
	MicroNet	MN5205	2434-36
		MN5205H	2434-37
	OKI	MSM5205	★3873
52055	Micropac	52055-520	2952-136
		52055-620	2953-47
5206	AD	AD5206	2435-5
	DDC	DDC-5206-1	2434-42
		DDC5206-3	2434-46
	MicroNet	MN5206	2434-53
		MN5206H	2434-54
5208	Intersil	IH5208C	2423-62
		IH5208M	2423-61
521	AD	AD521J	★3158
			2887-68
		AD521K	★3158
			2887-69
		AD521L	★3158
			2887-70
		AD521S	★3158
			2887-71
	Plessey	SL521	2888-128
			¶ 268-14
	Sanyo	STK521	2954-45
	Siemens	TAA521	2932-12
	Signetics	NE521	2894-5
		SE521	2894-6
	TI	TL521	2429-18
5210	AD	AD5210	★3174
			2433-35
	Datel	ADC-5210	★2621
			2433-4
		ADC-5210E	★2621
			2433-5
		ADC-5210H	★2618
			★2621
			2433-6
		ADC5210	★2616
	HybridSys	HS5210B	★2744
			2436-6
		HS5210C	★2744
			2436-7
	DDC	DDC-5210-1	2433-18
		DDC5210-3	2433-22
	MicroNet	MN5210	2433-26
			¶ 256-5
		MN5210H	2433-27
			¶ 256-5
	Panasonic	AN5210	2905-4
	TeledyneP	TP5210	2433-34
5211	AD	AD5211	★3174
			2433-36
	Datel	ADC-5211	★2621
			2433-7
		ADC-5211E	★2621
			2433-8
5211	Datel	ADC-5211H	★2618
			★2621
			2433-9
	HybridSys	HS5211B	★2744
			2436-8
		HS5211C	★2744
			2436-9
	DDC	DDC-5211-1	2433-19
		DDC5211-3	2433-23
	MicroNet	MN5211	2433-28
		MN5211H	2433-29
52116	National	MM52116	3485-42
		MM52116FDW	3453-6
		MM52116FDX	3453-36
5212	AD	AD5212	2433-37
	Datel	ADC-5212	★2621
			2433-10
		ADC-5212E	★2621
			2433-11
		ADC-5212H	★2618
			★2621
			2433-12
	HybridSys	HS5212B	★2744
			2436-10
		HS5212C	★2744
			2436-11
	DDC	DDC-5212-1	2433-20
		DDC5212-3	2433-24
	MicroNet	MN5212	2433-30
		MN5212H	2433-31
5213	AD	AD5213	2433-38
	Datel	ADC-5213	★2621
			2432-34
		ADC-5213E	★2621
			2432-35
		ADC-5213H	★2618
			★2621
			2432-36
	HybridSys	HS5213B	★2744
			2436-12
		HS5213C	★2744
			2436-13
	MicroNet	MN5213	2432-43
		MN5213H	2432-44
	SEEQ	5213-250	★3882
			3455-44
		5213-350	★3882
			3455-53
		5213H	★3882
			3455-45
		E5213	★3889
			3455-46
		M5213	★3889
			3455-54
52132	National	MM52132	3486-2
5214	AD	AD5214	★3174
			2433-39
	Datel	ADC-5214	★2621
			2432-37
		ADC-5214E	★2621
			2432-38
		ADC-5214H	★2618
			★2621
			2432-39
	HybridSys	HS5214B	★2744
			2436-14
		HS5214C	★2744
			2436-15
	MicroNet	MN5214	2432-45
		MN5214H	2433-1
5215	AD	AD5215	2433-40
	Datel	ADC-5215	★2621
			2432-40
		ADC-5215E	★2621
			2432-41
		ADC-5215H	★2618
			★2621
			2432-42
	HybridSys	HS5215B	★2744
			2436-16
		HS5215C	★2744
			2436-17
	MicroNet	MN5215	2433-2
		MN5215H	2433-3
5216	AD	AD5216	2433-41
5216	Datel	ADC-5216	★2621
			2433-13
		ADC-5216E	★2621
			2433-14
		ADC-5216H	★2618
			★2621
			2433-15
	HybridSys	HS5216B	★2744
			2436-18
		HS5216C	★2744
			2436-19
	DDC	DDC-5216-1	2433-21
		DDC5216-3	2433-25
	MicroNet	MN5216	2433-32
		MN5216H	2433-33
52164	National	MM52164	3486-114
5218	OKI	MSM5218	★3873
5219	OKI	MSM5219	★3873
			2465-53
522	AD	AD522A	★3158
			2887-56
			2917-40
			¶ 264-3
		AD522B	★3158
			2887-57
			2916-51
			¶ 264-3
		AD522S	★3158
			2887-58
			2916-55
			¶ 264-3
	Sanyo	STK522	2955-76
	Signetics	NE522	2894-7
		SE522	2894-8
5220	LSILogic	LSI-5220	4140-146
	Panasonic	AN5220	2905-5
	TI	TMS5220	★1562
			2902-85
52201	NCR	NCR52201	3455-32
52210	NCR	NCR52210	3455-11
52212	NCR	NCR52212	3455-24
5223	SEEQ	5223	★3890
			3455-56
523	AD	AD523J	2911-28
			2935-17
		AD523K	2911-17
			2934-35
		AD523L	2911-11
			2934-34
	Plessey	SL523	2888-129
	Sanyo	STK523	2956-31
5233	SSS	SCL5233	2898-41
			2899-68
52332	CSG	MP52332A	3485-83
5238	SSS	SCL5238	2899-69
524	AD	AD524A	★3158
			2917-26
		AD524B	★3158
			2915-47
		AD524C	★3158
			2915-1
		AD524S	★3158
			2915-52
	Harris	HI524-2	★2669
			★3288
			2423-75
		HI524-5	★2669
			★3288
			2423-76
5240	AD	AD5240K	★3175
			2431-43
		AD5240S	★3175
			2431-44
	Dionics	DI5240	2465-15
	DDC	DDC-5240-10	2430-28
		DDC-5240-12	2431-47
			2435-29
	MicroNet	MN5240-10	2430-27
		MN5240-12	2431-45
5245	MicroNet	MN5245	2431-31
5250	MicroNet	MN5250	2435-6
		MN5250H	2435-7
	Panasonic	AN5250	2905-6
5251	MicroNet	MN5251	2435-8
		MN5251H	2435-9

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
5252	MicroNet	MN5252	2435-10
		MN5252H	2435-11
5253	MicroNet	MN5253	2435-12
		MN5253H	2435-13
5255	MMI	5255-1	3484-94
5256	MMI	5256-1	3484-95
5257	National	MM5257	3482-103
			¶ 287-19
		MM5257-25	3482-47
			¶ 287-19
		MM5257-25L	3482-48
			¶ 287-19
		MM5257-3	3482-76
			¶ 287-19
		MM5257-3L	3482-77
			¶ 287-19
		MM5257L	3482-104
			¶ 287-19
5260	MicroNet	MN5260	2436-27
	MMI	5260-1	3484-90
	Panasonic	AN5260	2905-7
5261	MMI	5261-1	3484-91
527	Signetics	NE527	2892-27
		SE527	2892-1
5275	MMI	5275-1	3484-119
5276	MMI	5276-1	3484-120
528	AD	AD528	2910-46
		AD528J	2924-43
		AD528K	2920-23
		AD528S	2910-47
			2920-24
	Siliconix	**DG528A**	★2806
			2424-71
		DG528C	★2806
			2424-78
5280	Dionics	DI5280	2465-16
	MicroNet	MN5280	2437-3
	MMI	5280-1	3484-47
		5280-2	3484-36
	National	MM5280	3468-33
		MM5280-5	3468-48
52801	NCR	NCR52801	3455-3
5281	MMI	5281-1	3484-52
		5281-2	3484-37
52817	NCR	NCR52817	3455-55
5282	MicroNet	MN5282	2437-2
	MMI	5282-1	3484-48
5283	MMI	5283-1	3484-53
52832	NCR	NCR52832	3455-57
5284	SSS	SCL5284	2962-35
5285	SSS	SCL5285	2962-36
529	Harris	HI529	2423-11
	Signetics	NE529	2892-28
		SE529	2892-2
	Siliconix	**DG529A**	★2806
			2423-81
		DG529C	★2806
			2423-82
5290	MMI	5290	3453-37
	National	**MM5290-1**	★3866
			3468-82
			¶ 286-11
		MM5290-2	★3866
			3468-99
			¶ 286-11
		MM5290-3	★3866
			3469-11
			¶ 286-11
		MM5290-4	★3866
			3469-28
			¶ 286-11
5291	MMI	5291	3453-38
5292	MMI	5292	3453-59
5293	MMI	5293	3453-60
5295	National	NMC5295-10	3468-70
			¶ 287-6
		NMC5295-12	3468-83
			¶ 287-6
		NMC5295-15	3468-100
			¶ 287-6
		NMC5295-2	3468-63
			¶ 287-6
		NMC5295-20	3469-12
			¶ 287-6
		NMC5295-4	3468-79
			¶ 287-6
5298	National	MM5298-2	3468-54
		MM5298-3	3468-55
		MM5298-4	3468-56
530	AD	AD530J	2965-3
			¶ 278-5
		AD530K	2965-4
			¶ 278-5
		AD530L	2965-5
			¶ 278-5
		AD530S	2965-6
			¶ 278-5
	National	TBA530	2903-108
	Signetics	NE530	2928-38
		SE530	2923-38
	Telefunken	TBA530	2904-6
	TI	**TL530**	★2665
			2428-41
5300	MMI	5300-1	3460-2
	Mostek	MK5300	2947-81
5301	MMI	5301-1	3460-7
	National	NF5301	2906-120
5303	National	MM5303	2487-64
			¶ 241-8
5304	GI	ER5304	3475-23
5305	MMI	5305-1	3460-93
5306	MMI	5306-1	3460-95
5307	National	MM5307	510-13
			2486-35
5308	MMI	5308-1	3460-31
5309	MMI	5309-1	3460-33
	National	MM5309	2899-35
			¶ 282-10
531	**AD**	**AD531J**	★3161
			2965-7
			¶ 278-5
		AD531K	★3161
			2965-8
			¶ 278-5
		AD531L	★3161
			2965-9
			¶ 278-5
		AD531S	★3161
			2965-10
			¶ 278-5
	Plessey	SL531C	2888-121
	Sanyo	STK531	2954-87
	Signetics	NE531	2931-22
		SE531	2929-3
	TI	**TL531**	★2866
			2429-29
	Zilog	**531**	★1594
5310	Harris	HA-5310	2967-87
	Panasonic	AN5310	2903-126
53100	National	MM53100	2905-71
			¶ 274-4
53104	National	MM53104	2906-23
53105	National	MM53105	2905-72
53107	National	MM53107	462-89
			¶ 274-4
53108	National	MM53108	2898-147
5311	National	MM5311	2899-36
			¶ 282-10
	Panasonic	AN5311	2903-127
53110	National	MM53110	2899-37
53113	National	MM53113	2899-5
5312	National	MM5312	2899-38
			¶ 282-10
53124	National	MM53124	2899-6
53125	National	MM53125	2949-158
5313	National	MM5313	2899-39
53130	National	MM53130	2949-159
5314	National	MM5314	2899-40
53143	National	MM53143	2948-20
53144	National	MM53144	2948-21
5315	Harris	HA-5315	2967-88
	National	MM5315	2899-41
			¶ 282-10
5316	GTEMicro	G5316	461-64
			3485-4
	National	**MM5316**	★3327
			2898-148
5318	National	MM5318	2899-42
53190	National	MM53190	2948-22
532	**AD**	**AD532J**	★3161
			2965-11
			¶ 278-5
532	**AD**	**AD532K**	★3161
			2965-12
			¶ 278-5
		AD532S	★3161
			2965-13
			¶ 278-5
	Plessey	SL532C	2888-122
	Sanyo	STK532	2955-108
	Signetics	NE532	2913-40
			2939-31
		SE532	2913-42
			2938-32
	Sprague	UHC/D-532	484-106
			2483-112
	Sprague	**UHP-532**	★2843
			484-110
			★2843
			2483-116
	TI	**TL532**	★2868
			2428-42
	Thomson-CSF	ESM532	2897-6
5320	**Harris**	**HA-5320-2**	★3277
			★3287
			2967-89
		HA-5320-5	★3277
			★3287
			2967-90
	LSILogic	LSI-5320	4140-147
	Panasonic	AN5320	2903-128
5321	National	MM5321	2903-40
5322	National	MM5322	2899-76
53226	National	MM53226	2901-169
53256	**OKI**	**MSM53256**	★3873
533	**AD**	**AD533J**	★3161
			2965-14
			¶ 278-5
		AD533K	★3161
			2965-15
			¶ 278-5
		AD533L	★3161
			2965-16
			¶ 278-5
		AD533S	★3161
			2965-17
			¶ 278-5
	Sanyo	STK533	2956-65
	Sprague	UHC/D-533	484-107
			2483-113
	Sprague	**UHP-533**	★2843
			484-111
			★2843
			2483-117
	TI	**TL533**	★2867
			2429-30
5330	MMI	5330-1	3459-47
	Panasonic	AN5330	2903-129
5331	MMI	5331-1	3459-48
	SSS	SCL5331	2962-37
		SCL5331-5	2906-122
		SCL5331-6	2906-123
5332	**RCA**	**CDP5332**	★3878
	Toshiba	TC5332	3485-113
5333	**RCA**	**CDP5333**	★3878
	Toshiba	TC5333	3485-114
5334	Toshiba	TC5334	3485-115
5335	Toshiba	TC5335	3485-116
534	**AD**	**AD534J**	★3161
			2965-18
			¶ 278-5
		AD534K	★3161
			2965-19
			¶ 278-5
		AD534L	★3161
			2965-20
			¶ 278-5
		AD534S	★3161
			2965-21
			¶ 278-5
		AD534T	★3161
			2965-22
			¶ 278-5
5340	MMI	5340-1	3461-75
		5340-2	3461-87
5341	MMI	5341-1	3461-79
		5341-2	3461-68
	SSS	SCL5341	2906-124
5348	MMI	5348-1	3461-74
5349	MMI	5349-1	3461-77
535	AD	AD535J	2963-53
		AD535K	2963-54
	Signetics	NE535	2913-41
			2930-38
		SE535	2913-43
			2926-4
5350	Nitron	NC5350	4141-60
5351	Reticon	R5351	2962-39
536	**AD**	**AD536A**	★3161
			2967-38
			¶ 278-5
		AD536AJ	★3161
			2967-39
			¶ 278-5
		AD536AK	★3161
			2967-40
			¶ 278-5
		AD536AS	★3161
			2967-41
			¶ 278-5
	Signetics	NE536	2935-25
		SU536	2934-49
5364	GTEMicro	G5364-3	3486-73
		G5364-4	3486-110
5365	GTEMicro	G5365-3	3486-74
		G5365-4	3486-111
5368	National	MM5368	462-111
5369	National	MM5369	462-112
537	**AD**	**AD537J**	★3176
			2968-61
			¶ 253-2
		AD537K	★3176
			2968-62
			¶ 253-2
		AD537S	★3176
			2968-63
			¶ 253-2
5373545373			
	Signetics	**5373545373**	★ 783
5374545374			
	Signetics	**5374545374**	★ 783
5378	National	MM5378	2899-43
538	Signetics	NE538	2928-43
		SE538	2923-37
5380	MMI	5380-1	3463-65
		5380-2	3463-45
	Mostek	MK5380	2949-154
5381	MMI	5381-1	3463-66
		5381-2	3463-13
5382	Mostek	MK5382	2949-155
5387	**National**	**MM5387**	★3327
			2898-149
5388	MMI	5388-1	3464-36
	NEC-Electron	uPD5388	2898-154
5389	MMI	5389-1	3464-37
		5389-2	3464-16
	Mostek	MK5389	2949-156
539	**AD**	**AD539J**	★3161
			2964-150
		AD539K	★3161
			2964-151
		AD539S	★3161
			2964-152
	Harris	**HI539-2**	★2674
			★3288
			2423-12
		HI539-5	★2674
			★3288
			2423-13
5393	National	MM5393	2948-23
5394	National	MM5394	2948-24
5395	National	MM5395	2949-160
53LS140			
	MMI	53LS140	3460-3
53LS141			
	MMI	53LS141	3460-8
53LS240			
	MMI	53LS240	3460-94
53LS241			
	MMI	53LS241	3460-96
53RS881			
	MMI	53RS881	3462-89
53S080	**MMI**	**53S080**	★3827
			3459-15

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
53S081	**MMI**	**53S081**	**★3827**
			3459-19
53S140	MMI	53S140	3459-90
53S141	MMI	53S141	3459-93
53S1641			
	MMI	**53S1641**	**★3836**
			3466-9
		53S1641A	**★3836**
			3466-3
53S1681			
	MMI	53S1681	3464-96
		53S1681A	3464-78
53S240	MMI	53S240	3460-61
53S241	MMI	53S241	3460-63
53S441	**MMI**	**53S441**	**★3830**
			3462-13
			3462-13
53S841	**MMI**	**53S841**	**★3833**
			3463-119
		53S841A	**★3833**
			3463-112
54 ,	**National**	**MM54HCXXX**	**★ 734**
	Signetics	**54F-TTL**	**★ 775**
540	**AD**	**AD540J**	**★3153**
			2935-22
		AD540K	**★3153**
			2934-42
		AD540S	**★3153**
			2934-44
	National	TBA540	2903-109
	Signetics	NE540	2896-70
		SE540	2896-71
		TBA540	2903-171
	Telefunken	TBA540	2904-7
	Universal	HCM540	4141-125
5400	CalDevices	HC5400	4140-39
	Fairchild	5400	491-194
	Ferranti	ZN5400	491-196
	LSILogic	LC-5400	4140-140
	Motorola	MC5400	492-2
	National	DM5400	492-4
	Signetics	5400	492-7
	TI	**SN5400**	**★ 833**
			492-9
5401	Fairchild	5401	491-119
	Ferranti	ZN5401	491-123
	Motorola	MC5401	491-129
	National	DM5401	491-133
	Reticon	R5401	2962-135
	TI	**SN5401**	**★ 833**
			491-140
54016	TI	TM54016-15	3480-65
5402	Fairchild	5402	494-81
	Ferranti	ZN5402	494-83
	Motorola	MC5402	494-88
	National	DM5402	494-90
	National	**MM5402**	**★3327**
			2898-150
	Signetics	5402	494-92
	TI	**SN5402**	**★ 833**
			494-96
5403	Fairchild	5403	491-120
	Ferranti	ZN5403	491-124
	Motorola	MC5403	491-130
	National	DM5403	491-134
	Reticon	R5403	2962-134
	Signetics	5403	491-138
	TI	**SN5403**	**★ 834**
			491-141
5404	Fairchild	5404	477-153
	Ferranti	ZN5404	477-155
	Motorola	MC5404	477-158
	National	DM5404	477-160
	Reticon	R5404	2962-137
	Signetics	5404	477-163
	TI	**SN5404**	**★ 834**
			477-165
5405	Fairchild	5405	477-55
	Ferranti	ZN5405	477-57
	Motorola	MC5405	477-60
	National	DM5405	477-62
		MM5405	2898-151
	Reticon	R5405	2962-138
	TI	**SN5405**	**★ 834**
			477-66
5406	Fairchild	5406	484-158
5406	Motorola	MC5406	484-161
	National	DM5406	485-2
	Reticon	R5406	2962-136
	TI	**SN5406**	**★ 835**
			485-5
5407	Fairchild	5407	484-134
	Motorola	MC5407	484-137
	National	DM5407	484-139
	TI	**SN5407**	**★ 835**
			484-142
5408	Fairchild	5408	489-122
	Ferranti	ZN5408	489-124
	Motorola	MC5408	489-127
	National	DM5408	489-129
	Signetics	5408	489-131
	TI	**SN5408**	**★ 835**
			489-133
5409	Fairchild	5409	489-86
	Ferranti	ZN5409	489-88
	Motorola	MC5409	489-91
	National	DM5409	489-93
	TI	**SN5409**	**★ 836**
			489-95
541	HybridSys	ADC541B-8	2426-51
		ADC541C-8	2426-52
	Plessey	SL541	2888-87
	Sanyo	STK541	2954-46
5410	Fairchild	5410	490-166
	Ferranti	ZN5410	490-168
	Motorola	MC5410	490-171
	National	DM5410	490-174
	Panasonic	AN5410	2904-72
	Signetics	5410	490-177
	Signetics	**NE5410**	**★3413**
			2447-20
		SE5410	**★3413**
			2447-21
	TI	**SN5410**	**★ 836**
			490-179
54100	Motorola	MC54100	495-107
	TI	**SN54100**	**★ 867**
			495-109
54104	Fairchild	54104	487-94
54105	Fairchild	54105	487-95
54107	Fairchild	54107	487-162
	Ferranti	ZN54107	487-166
	Motorola	MC54107	487-172
	National	DM54107	487-176
	Signetics	54107	487-180
	TI	**SN54107**	**★ 869**
			487-184
54109	National	DM54109	487-115
	Signetics	54109	487-117
	TI	**SN54109**	**★ 870**
			487-119
5411	Fairchild	5411	489-36
	National	DM5411	489-39
	Panasonic	AN5411	2904-73
	Signetics	5411	489-41
	SSS	SCL5411	462-84
54110	**TI**	**SN54110**	**★ 870**
			487-70
54111	**TI**	**SN54111**	**★ 871**
			488-34
54116	Signetics	54116	495-101
	TI	**SN54116**	**★ 872**
			495-105
54118	Ferranti	ZN54118	496-1
54119	Ferranti	ZN54119	496-2
5412	Fairchild	5412	490-144
	Ferranti	ZN5412	490-146
	TI	**SN5412**	**★ 837**
			490-149
54120	Motorola	MC54120	507-46
	TI	**SN54120**	**★ 873**
			507-48
54121	Fairchild	54121	500-94
	Ferranti	ZN54121	500-96
	Motorola	MC54121	500-99
	National	DM54121	500-101
	Signetics	54121	500-103
	TI	**SN54121**	**★ 873**
			500-105
54122	Fairchild	54122	500-118
	Ferranti	ZN54122	500-120
	Motorola	MC54122	500-122
54122	**TI**	**SN54122**	**★ 873**
			500-124
54123	Fairchild	54123	500-154
	Ferranti	ZN54123	500-156
	Motorola	MC54123	500-159
	National	DM54123	500-161
	Signetics	54123	500-163
	TI	**SN54123**	**★ 874**
			500-165
54125	Fairchild	54125	476-130
	National	DM54125	476-133
	Signetics	54125	476-137
	TI	**SN54125**	**★ 875**
			476-139
54126	Fairchild	54126	476-106
	Signetics	54126	476-111
	TI	**SN54126**	**★ 875**
			476-113
54128	Signetics	54128	2472-32
	TI	**SN54128**	**★ 876**
			484-113
			★ 876
			2472-33
5413	Fairchild	5413	507-68
	Ferranti	ZN5413	507-70
	Motorola	MC5413	507-73
	National	5413	507-75
	Signetics	5413	507-77
	TI	**SN5413**	**★ 837**
			507-79
54132	Fairchild	54132	507-118
	Motorola	MC54132	507-121
	National	DM54132	507-123
	Signetics	54132	507-125
	TI	**SN54132**	**★ 877**
			507-127
54136	Motorola	MC54136	494-167
	TI	**SN54136**	**★ 878**
			494-170
5414	Fairchild	5414	507-148
	Motorola	MC5414	507-151
	National	DM5414	507-153
	Signetics	5414	507-155
	TI	**SN5414**	**★ 837**
			507-157
54141	Fairchild	54141	2464-70
	Motorola	MC54141	2464-73
	National	DM54141	2464-75
54143	**TI**	**SN54143**	**★ 882**
			482-67
54144	**TI**	**SN54144**	**★ 882**
			482-69
54145	Fairchild	54145	482-139
	Motorola	MC54145	482-142
	National	DM54145	482-144
	Signetics	54145	482-146
	TI	**SN54145**	**★ 882**
			482-148
54147	National	DM54147	509-29
	Signetics	54147	509-31
	TI	**SN54147**	**★ 882**
			509-33
54148	National	DM54148	508-131
	Signetics	54148	508-135
	TI	**SN54148**	**★ 883**
			508-139
54150	Fairchild	54150	500-74
	Ferranti	ZN54150	500-76
	Motorola	MC54150	500-79
	National	DM54150	500-81
	Signetics	54150	500-83
	TI	**SN54150**	**★ 883**
			500-85
54151	Fairchild	54151	499-142
	Ferranti	ZN54151	499-144
	Motorola	MC54151	499-147
	National	DM54151A	499-149
	Signetics	54151	499-151
	TI	**SN54151A**	**★ 884**
			499-153
54152	Fairchild	54152	500-3
	Motorola	MC54152	500-4
	TI	**SN54152A**	**★ 884**
			500-10
54153	Fairchild	54153	498-12
	Ferranti	ZN54153	498-14
54153	Motorola	MC54153	498-19
	National	DM54153	498-21
	Signetics	54153	498-23
	TI	**SN54153**	**★ 884**
			498-25
54154	Fairchild	54154	484-20
	Ferranti	ZN54154	484-23
	Motorola	MC54154	484-26
	National	DM54154	484-30
	Signetics	54154	484-34
	TI	**SN54154**	**★ 885**
			484-38
			★ 885
			2473-54
54155	Fairchild	54155	483-120
	Ferranti	ZN54155	483-122
	Motorola	MC54155	483-125
	National	DM54155	483-127
	Signetics	54155	483-129
	TI	**SN54155**	**★ 886**
			483-131
54156	Fairchild	54156	483-90
	Motorola	MC54156	483-93
	National	DM54156	483-95
	Signetics	54156	483-97
	TI	**SN54156**	**★ 886**
			483-99
54157	Fairchild	54157	499-1
	Ferranti	ZN54157	499-5
	Motorola	MC54157	499-7
	National	DM54157	499-11
	Signetics	54157	499-17
	TI	**SN54157**	**★ 887**
			499-22
54158	Signetics	54158	498-116
54159	**TI**	**SN54159**	**★ 888**
			484-44
5416	Fairchild	5416	484-145
	Motorola	MC5416	484-148
	National	DM5416	484-150
	Signetics	5416	484-154
	TI	**SN5416**	**★ 838**
			484-156
54160	Fairchild	54160	480-125
	Motorola	MC54160	480-130
	National	DM54160A	480-134
	Signetics	54160	480-138
	TI	**SN54160**	**★ 889**
			480-143
54161	Fairchild	54161	478-99
	Ferranti	ZN54161	478-103
	Motorola	MC54161	478-107
	National	DM54161A	478-111
	Signetics	54161	478-115
	TI	**SN54161**	**★ 889**
			478-120
54162	Fairchild	54162	480-178
	Motorola	MC54162	480-181
	National	DM54162A	480-183
	TI	**SN54162**	**★ 890**
			480-185
54163	Fairchild	54163	478-156
	Ferranti	ZN54163	478-158
	Motorola	MC54163A	478-161
	National	DM54163	478-163
	Signetics	54163	478-165
	TI	**SN54163**	**★ 890**
			478-167
54164	Fairchild	54164	502-13
			3490-102
	Ferranti	ZN54164	502-15
			3490-106
	National	DM54164	502-18
			3490-112
	Signetics	54164	502-22
			3490-118
	TI	**SN54164**	**★ 891**
			502-24
			★ 891
			3490-122
54165	Fairchild	54165	502-65
			3490-46
	Ferranti	ZN54165	502-67
	Motorola	MC54165	502-69
			3490-48

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
54165	National	DM54165	502-71
			3490-50
	Signetics	54165	502-73
			3490-52
	TI	**SN54165**	★ **891**
			502-75
			★ **891**
			3490-54
54166	Fairchild	54166	502-86
			3490-56
	Ferranti	ZN54166	502-88
	National	DM54166	502-91
			3490-63
	Signetics	54166	502-93
			3490-65
	TI	**SN54166**	★ **891**
			502-95
			★ **891**
			3490-67
54167	Fairchild	54167	507-19
	Motorola	MC54167	507-20
	TI	**SN54167**	★ **892**
5417	Fairchild	5417	484-123
	Motorola	MC5417	484-126
	National	DM5417	484-128
	Signetics	5417	484-130
	TI	**SN5417**	★ **838**
			484-132
54170	Fairchild	54170	496-167
			3470-44
		ZN54170	3470-48
	Ferranti	ZN54170	496-169
	National	DM54170	3470-52
	Signetics	54170	496-172
	TI	**SN54170**	★ **893**
			497-1
			★ **893**
			3470-58
54173	Fairchild	54173	486-17
	National	DM54173	486-20
	Signetics	54173	486-26
	TI	**SN54173**	★ **894**
			486-30
54174	Fairchild	54174	486-42
	Ferranti	ZN54174	486-45
	Motorola	MC54174	486-48
	National	DM54174	486-50
	Signetics	54174	486-52
	TI	**SN54174**	★ **895**
			486-54
54175	Fairchild	54175	485-111
	Ferranti	ZN54175	485-113
	Motorola	MC54175	485-116
	National	DM54175	485-118
	Signetics	54175	485-120
	TI	**SN54175**	★ **895**
			485-122
54176	Fairchild	54176	480-79
	Motorola	MC54176	480-85
	National	DM54176	480-90
	TI	**SN54176**	★ **895**
			480-104
54177	Fairchild	54177	478-41
	Motorola	MC54177	478-47
	National	DM54177	478-53
	TI	**SN54177**	★ **896**
			478-67
54178	Fairchild	54178	501-103
			3488-64
	TI	**SN54178**	★ **896**
			501-108
			★ **896**
			3488-87
54179	Fairchild	54179	501-110
			3488-65
	TI	**SN54179**	★ **897**
			501-118
			★ **897**
			3488-88
54180	Fairchild	54180	508-153
	Ferranti	ZN54180	508-155
	Motorola	MC54180	508-158
	National	DM54180	508-160
	Signetics	54180	508-164
	TI	**SN54180**	★ **897**
			509-2
54181	Fairchild	54181	475-1
	Ferranti	ZN54181	475-4
	Motorola	MC54181	475-5
	National	DM54181	475-7
	Signetics	54181	475-8
	TI	**SN54181**	★ **897**
			475-10
54182	Fairchild	54182	475-67
	Motorola	MC54182	475-71
	National	DM54182	475-73
	TI	**SN54182**	★ **898**
			475-75
54184	Ferranti	ZN54184	507-39
	National	DM54184	507-41
	TI	**SN54184**	★ **440**
			★ **899**
			507-43
			★ **440**
			★ **899**
			3454-6
		SN54184A	★ **440**
54185	National	DM54185A	507-33
	TI	**SN54185A**	★ **900**
			507-36
			★ **900**
			3454-1
54187	**TI**	**SN54187**	★ **900**
54188	TI	SN54188A	3459-44
5419	SSS	SCL5419	462-107
54190	Fairchild	54190	481-163
	Motorola	MC54190	481-166
	National	DM54190	481-168
	Signetics	54190	481-170
	TI	**SN54190**	★ **901**
			481-172
54191	Fairchild	54191	479-122
	Ferranti	ZN54191	479-124
	Motorola	MC54191	479-127
	National	DM54191	479-129
	Signetics	54191	479-131
	TI	**SN54191**	★ **901**
			479-133
54192	Fairchild	54192	481-124
	Ferranti	ZN54192	481-126
	Motorola	MC54192	481-129
	National	DM54192	481-131
	TI	**SN54192**	★ **902**
			481-136
54193	Fairchild	54193	479-170
	Ferranti	ZN54193	479-172
	Motorola	MC54193	479-175
	National	DM54193	479-177
	Signetics	54193	479-181
	TI	**SN54193**	★ **902**
			480-1
54194	Fairchild	54194	501-139
			3488-66
	Ferranti	ZN54194	501-141
	Motorola	MC54194	501-144
			3488-76
	National	DM54194	501-146
			3488-78
	Signetics	54194	501-148
			3488-82
	TI	**SN54194**	★ **902**
			501-150
			★ **902**
			3488-89
54195	Fairchild	54195	501-34
			3488-102
	Motorola	MC54195	501-39
			3488-128
	National	DM54195	501-43
			3489-10
	Signetics	54195	501-47
	TI	**SN54195**	★ **903**
			501-50
			★ **903**
			3489-19
54196	Fairchild	54196	480-80
	Motorola	MC54196	480-86
	National	DM54196	480-91
	TI	**SN54196**	★ **903**
			480-105
54197	Fairchild	54197	478-42
	Motorola	MC54197	478-48
54197	National	DM54197	478-54
	TI	**SN54197**	★ **904**
			478-68
54198	Fairchild	54198	502-47
			3490-2
	National	DM54198	502-50
			3490-8
	TI	**SN54198**	★ **904**
			502-52
			★ **904**
			3490-13
54199	Fairchild	54199	502-54
			3490-3
	National	DM54199	502-57
			3490-9
	Signetics	54199	502-59
	TI	**SN54199**	★ **905**
			502-61
			★ **905**
			3490-14
542	**AD**	**AD542J**	★**3153**
			2921-42
			¶ 266-7
		AD542K	★**3153**
			2920-32
			¶ 266-7
		AD542L	★**3153**
			2918-6
			¶ 266-7
		AD542S	★**3153**
			2920-31
			¶ 266-7
	Datel	**AM-542MC**	★**2623**
			2887-92
			2915-9
		AM-542MM	★**2620**
			2887-93
			2915-4
	Datel	AM-542MR	2887-94
			2915-5
	Datel	**AM542**	★**2613**
			★**2614**
	HybridSys	ADC542B-8	2426-53
		ADC542C-8	2426-54
	Sanyo	STK542	2955-77
	Signetics	**HE542**	★**3393**
			2898-10
5420	Fairchild	5420	490-82
	Ferranti	ZN5420	490-84
	LSILogic	LSI-5420	4140-148
	Motorola	MC5420	490-87
	National	DM5420	490-89
	Signetics	5420	490-92
	TI	**SN5420**	★ **839**
			490-94
5421	Fairchild	5421	488-165
	Signetics	5421	488-167
5422	Fairchild	5422	490-46
	TI	**SN5422**	★ **840**
			490-49
54221	Signetics	54221	500-138
	TI	**SN54221**	★ **906**
			500-140
5423	Fairchild	5423	494-4
	Motorola	MC5423	494-7
	National	DM5423	494-9
	TI	**SN5423**	★ **840**
			494-11
54240	National	MM54240	2486-14
54246	**TI**	**SN54246**	★ **913**
			2464-14
54247	**TI**	**SN54247**	★ **913**
			2463-171
54248	**TI**	**SN54248**	★ **914**
			2463-130
54249	**TI**	**SN54249**	★ **914**
			2463-96
5425	Fairchild	5425	493-172
	Ferranti	ZN5425	493-174
	Motorola	MC5425	493-177
	National	DM5425	493-179
		MM5425	2902-20
	Signetics	5425	493-181
	TI	SN5425	494-2
54251	National	DM54251	500-31
54251	**TI**	**SN54251**	★ **915**
			500-33
54259	National	DM54259	496-25
	TI	**SN54259**	★ **917**
			496-31
5426	Fairchild	5426	484-78
	Motorola	MC5426	484-81
	National	DM5426	484-83
	Signetics	5426	484-89
	TI	**SN5426**	★ **841**
			484-91
54265	**TI**	**SN54265**	★ **918**
			507-114
5427	Fairchild	5427	494-30
	Ferranti	ZN5427	494-32
	Motorola	MC5427	494-35
	National	DM5427	494-37
	Signetics	5427	494-39
	TI	**SN5427**	★ **842**
			494-41
54273	**TI**	**SN54273**	★ **919**
54276	**TI**	**SN54276**	★ **920**
			488-161
54278	**TI**	**SN54278**	★ **921**
			508-56
54279	Fairchild	54279	495-161
	Signetics	54279	495-164
	TI	**SN54279**	★ **921**
			495-166
5428	Ferranti	ZN5428	494-84
	Signetics	5428	494-93
	TI	**SN5428**	★ **842**
			494-97
54283	Fairchild	54283	476-44
	Ferranti	ZN54283A	476-48
	TI	**SN54283**	★ **922**
			476-60
54284	National	DM54284	475-111
	TI	**SN54284**	★ **923**
			475-112
54285	**TI**	**SN54285**	★ **923**
			475-109
54290	Motorola	MC54290	480-44
	TI	**SN54290**	★ **924**
			480-52
54293	Fairchild	54293	479-23
	Motorola	MC54293	479-33
	TI	**SN54293**	★ **925**
			479-41
54298	Fairchild	54298	499-68
	Motorola	MC54298	499-70
	Signetics	54298	499-72
	TI	**SN54298**	★ **926**
			499-74
543	**Datel**	**AM-543MC**	★**2623**
			2887-95
			2914-45
		AM-543MM	★**2620**
			2887-96
			2914-43
	Datel	AM-543MR	2887-97
			2914-44
	Datel	**AM543**	★**2614**
5430	Fairchild	5430	492-60
	Ferranti	ZN5430	492-62
	Motorola	MC5430	492-65
	National	DM5430	492-67
		MM5430	2900-111
	Panasonic	AN5430	2904-74
	Signetics	5430	492-69
	TI	**SN5430**	★ **842**
			492-71
54301	SSS	SCL54301	2899-143
5431	National	MM5431	2900-112
	Panasonic	AN5431	2904-75
5432	Fairchild	5432	493-120
	Ferranti	ZN5432	493-122
	National	DM5432	493-125
	Signetics	5432	493-127
	TI	**SN5432**	★ **843**
			493-129
5433	Signetics	5433	494-63
	TI	**SN5433**	★ **843**
			494-65
5435	Panasonic	AN5435	2904-76
54365	National	DM54365	476-157

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
54365	Signetics	54365A	165
			485-18
	TI	SN54365A	★ 935
			169
			485-22
54366	National	DM54366	105
			485-15
	Signetics	54366A	113
			485-19
	TI	SN54366A	★ 935
			117
			485-23
54367	National	DM54367	158
			485-16
	Signetics	54367A	166
			485-20
	TI	SN54367A	★ 936
			170
			485-24
54368	National	DM54368	706
			485-15
	Signetics	54368A	114
			485-19
	TI	SN54368A	★ 936
			118
			485-23
5437	Fairchild	5437	491-82
	Ferranti	ZN5437	491-84
	Motorola	MC5437	491-87
	National	DM5437	491-89
		MM5437	2896-42
	Signetics	5437	491-93
	TI	SN5437	★ 844
			491-95
54376	TI	SN54376	★ 939
			488-159
5438	Fairchild	5438	491-32
	Ferranti	ZN5438	491-35
	Motorola	MC5438	491-38
	National	DM5438	491-40
	TI	SN5438	★ 844
			491-45
5439	Signetics	5439	491-42
	TI	SN5439	★ 844
			491-46
54390	TI	SN54390	★ 943
			481-40
54393	TI	SN54393	★ 943
			479-8
544	AD	AD544J	★3153
			2921-45
			¶ 266-7
		AD544K	★3153
			2920-27
			¶ 266-7
		AD544L	★3153
			2918-1
			¶ 266-7
		AD544S	★3153
			2920-30
			¶ 266-7
	Intel	iSBC544	1765-6
	Signetics	NE544	2906-113
5440	Fairchild	5440	489-186
	Ferranti	ZN5440	489-188
	Motorola	MC5440	489-191
	National	DM5440	490-2
	Signetics	5440	490-5
	TI	SN5440	★ 845
			490-7
54408	Motorola	MC54408	508-101
5441	National	DM5441A	2464-66
544167	TI	SN544167	507-22
5442	Fairchild	5442	482-153
	Ferranti	ZN5442	483-3
	Motorola	MC5442	483-6
	National	DM5442	483-10
	Signetics	5442	483-18
	TI	SN5442A	★ 845
			483-23
54425	TI	SN54425	★ 946
			476-140
54426	TI	SN54426	★ 946
			476-114
5443	Fairchild	5443	482-100
	Motorola	MC5443	482-103
5443	TI	SN5443A	★ 846
			482-105
5444	Fairchild	5444	482-93
	Motorola	MC5444	482-95
	TI	SN5444A	★ 846
			482-97
5445	Fairchild	5445	482-129
	Motorola	MC5445	482-132
	National	DM5445	482-134
	National	MM5445	★ 735
			2464-94
	TI	SN5445	★ 846
			482-137
54452	Motorola	MC54452	481-66
54453	Motorola	MC54453	479-6
54454	Motorola	MC54454	482-20
54455	Motorola	MC54455	480-35
54456	Motorola	MC54456	474-5
5446	Fairchild	5446	2464-5
	Motorola	MC5446	2464-10
	National	DM5446A	2464-12
			¶ 259-15
	National	MM5446	★ 735
			2464-95
	TI	SN5446A	★ 847
			2464-15
54460	Motorola	MC54460	506-3
54468	Motorola	MC54468	505-130
			2485-50
5447	Fairchild	5447	2463-147
	Motorola	MC5447	2463-157
	National	DM5447A	2463-163
			¶ 259-15
	National	MM5447	★ 735
			2464-96
	TI	SN5447A	★ 847
			2463-172
5448	Fairchild	5448	2463-104
	Motorola	MC5448	2463-113
	National	DM5448	2463-121
	National	MM5448	★ 735
			2464-97
	TI	SN5448	★ 847
			2463-131
5449	Fairchild	5449	2463-79
	Motorola	MC5449	2463-85
	TI	SN5449	★ 847
			2463-97
54490	TI	SN54490	★ 955
			481-41
545	AD	AD545J	★3153
			2920-13
		AD545K	★3153
			2920-12
		AD545L	★3153
			2917-47
		AD545M	★3153
			2917-13
	Signetics	NE545B	2896-55
5450	Fairchild	5450	492-143
	Ferranti	ZN5450	492-145
	Motorola	MC5450	492-148
	National	DM5450	492-150
	National	MM5450	★ 735
			2464-92
	Signetics	5450	492-153
	SSS	SCL5450	2899-144
	TI	SN5450	★ 848
			492-155
5451	Fairchild	5451	492-165
	Ferranti	ZN5451	492-167
	Motorola	MC5451	492-170
	National	DM5451	492-172
	National	MM5451	★ 735
			2464-93
	SGS	LS5451	493-5
	Signetics	5451	492-174
	TI	SN5451	★ 848
			492-176
5452	National	MM5452	★ 735
			2466-2
5453	Fairchild	5453	493-75
	Ferranti	ZN5453	493-77
	Motorola	MC5453	493-80
	National	DM5453	493-82
5453	National	MM5453	★ 735
			2466-3
	TI	SN5453	★ 849
			493-84
5454	Fairchild	5454	493-63
	Ferranti	ZN5454	493-65
	Motorola	MC5454	493-68
	National	DM5454	493-70
	TI	SN5454	★ 850
			493-72
5455	National	MM5455	2899-7
	SSS	SCL5455	2899-70
5456	National	MM5456	★3327
			2899-8
5457	National	MM5457	★3327
			2899-9
545740	TI	SN545740	503-108
5458	National	MM5458	★ 735
	SSS	SCL5458	2899-24
5459	National	MM5459	★ 735
545C239			
	Mitel	MD545C239	454-54
546	NEC-Micro	uPD546	1088-70
5460	Fairchild	5460	493-19
	Motorola	MC5460	493-22
	National	DM5460	493-24
	Signetics	5460	493-26
	TI	SN5460	★ 852
			493-27
5462	National	MM5462	2899-10
5463	National	MM5463	2899-11
	SSS	SCL5463	2899-71
5464	National	MM5464	★3327
			2899-12
5465	National	MM5465	2899-13
5466	National	MM5466	★ 735
			2899-14
547	AD	AD547J	★3151
			★3153
			2920-35
		AD547K	★3151
			★3153
			2917-55
		AD547L	★3151
			★3153
			2917-21
		AD547S	★3151
			★3153
			2917-56
	NEC-Micro	uPD547	1088-71
		uPD547L	1088-72
5470	Fairchild	5470	487-59
	Ferranti	ZN5470	487-61
	Motorola	MC5470	487-63
	National	DM5470	487-65
	SSS	SCL5470	2899-175
	TI	SN5470	★ 855
			487-68
5471	SSS	SCL5471	2899-176
5472	Fairchild	5472	487-72
	Ferranti	ZN5472	487-74
	Motorola	MC5472	487-77
	National	DM5472	487-79
	SSS	SCL5472	2899-177
	TI	SN5472	★ 856
			487-81
5473	Fairchild	5473	487-163
	Ferranti	ZN5473	487-167
	Motorola	MC5473	487-173
	National	DM5473	487-177
	Signetics	5473	487-161
	TI	SN5473	★ 856
			487-185
5474	Fairchild	5474	485-54
	Ferranti	ZN5474	485-56
	Motorola	MC5474	485-59
	National	DM5474	485-61
		MM5474	2464-88
	Signetics	5474	485-63
	SSS	SCL5474	2899-72
	TI	SN5474	★ 857
			485-65
5475	Fairchild	5475	495-117
	Ferranti	ZN5475	495-119
	Motorola	MC5475	495-122
	National	DM5475	495-124
5475	Signetics	5475	495-126
	TI	SN5475	★ 858
			495-128
5476	Fairchild	5476	488-36
	Ferranti	ZN5476	488-38
	Motorola	MC5476	488-41
	National	DM5476	488-43
		MM5476	2464-89
	Signetics	5476	488-45
	TI	SN5476	★ 858
			488-47
5477	Fairchild	5477	495-149
	Motorola	MC5477	495-150
	National	MM5477	2464-90
	TI	SN5477	★ 859
			495-152
5478	National	MM5478	2464-91
	SSS	SCL5478	2899-145
548	NEC-Micro	uPD548	1088-73
5480	Fairchild	5480	474-141
	Motorola	MC5480	474-142
	TI	SN5480	★ 860
			474-144
5481	SSS	SCL5481	2899-170
	TI	SN5481	★ 860
5482	Fairchild	5482	474-157
	Ferranti	ZN5482	474-159
	SSS	SCL5482	2899-146
	TI	SN5482	★ 860
			474-162
5483	Fairchild	5483	476-45
	Ferranti	ZN5483A	476-49
	Motorola	MC5483	476-54
	National	DM5483	476-56
			¶ 228-7
		MM5483	2466-14
	Signetics	5483	476-58
	SSS	SCL5483	2899-147
	TI	SN5483A	★ 861
			476-61
5484	National	MM5484	2465-144
	SSS	SCL5484	2899-103
	TI	SN5484	★ 861
5485	Fairchild	5485	474-35
	Ferranti	ZN5485	474-41
	Motorola	MC5485	474-45
	National	DM5485	474-51
		MM5485	2465-134
	Signetics	5485	474-57
	SSS	SCL5485	2899-171
	TI	SN5485	★ 862
			474-62
5486	Fairchild	5486	495-6
	Ferranti	ZN5486	495-8
	Motorola	MC5486	495-11
	National	DM5486	495-15
		MM5486	2463-54
	Signetics	5486	495-20
	SSS	SCL5486	2899-172
	TI	SN5486	★ 862
			495-22
5488	TI	SN5488	★ 863
5489	AMD	AM5489	3471-75
		AM5489-1	3471-39
	Ferranti	ZN5489	497-36
5490	Fairchild	5490	480-37
	Ferranti	ZN5490A	480-40
	Motorola	MC5490	480-45
	National	DM5490	480-48
	Signetics	5490	480-50
	TI	SN5490A	★ 864
			480-53
5491	Fairchild	5491	502-121
			3491-3
	Ferranti	ZN5491A	502-123
			3491-5
	Motorola	MC5491	502-126
		MC5491A	3491-7
	National	DM5491A	502-128
		SN5491A	3491-9
	Signetics	5491	502-130
			3491-11
	TI	SN5491A	★ 864
			502-132
			★ 864
			3491-13

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
5492	Fairchild	5492	482-26
	Ferranti	ZN5492A	482-28
	Motorola	MC5492	482-31
	National	DM5492A	482-33
	RIFA	SN5492A	482-35
	Signetics	5492	482-36
	TI	**SN5492A**	★ **864** 482-38
5493	Fairchild	5493	479-24
	Ferranti	ZN5493A	479-29
	Motorola	MC5493	479-34
	National	DM5493A	479-37
	Signetics	5493	479-39
	TI	**SN5493A**	★ **865** 479-42
5494	Fairchild	5494	501-131 3489-77
	Ferranti	ZN5494	3489-79
	Motorola	MC5494	501-134 3489-81
	Signetics	5494	3489-83
	TI	**SN5494**	★ **865** 501-137 ★ **865** 3489-85
5495	Fairchild	5495	501-77 3488-67
	Ferranti	ZN5495A	501-80 3488-72
	Motorola	MC5495A	501-83 3489-27
	National	DM5495	501-85 3488-79
	Signetics	5495A	501-87 3488-83
	TI	**SN5495A**	★ **866** 501-89 ★ **866** 3488-90
5496	Fairchild	5496	501-178 3489-101
	Ferranti	ZN5496	501-180 3489-103
	Motorola	MC5496	501-183 3489-106
	National	DM5496	501-185 3489-108
	Signetics	5496	501-187 3489-110
	TI	**SN5496**	★ **866** 502-2 ★ **866** 3489-114
5497	Fairchild	5497	508-75
	Motorola	MC5497	508-77
	TI	**SN5497**	★ **866** 508-79
54ALS00			
	Motorola	**SN54ALS00**	★ **732** 492-11
	National	DM54ALS00	492-13
	TI	**SN54ALS00**	★ **833** 492-15
54ALS01			
	Motorola	**SN54ALS01**	★ **732** 491-145
	TI	**SN54ALS01**	★ **833** 491-149
54ALS02			
	Motorola	**SN54ALS02**	★ **732** 494-100
	National	DM54ALS02	494-104
	TI	**SN54ALS02**	★ **833** 494-106
54ALS03			
	Motorola	**SN54ALS03**	★ **732** 491-146
	TI	**SN54ALS03**	★ **834** 491-150
54ALS04			
	Motorola	**SN54ALS04**	★ **732** 477-168
	National	DM54ALS04	477-170
	TI	**SN54ALS04**	★ **834** 477-172
54ALS05			
	Motorola	**SN54ALS05**	★ **732** 477-68
	TI	**SN54ALS05**	★ **834** 477-70
54ALS08			
	Motorola	**SN54ALS08**	★ **732** 489-135
	National	DM54ALS08	489-139
	TI	**SN54ALS08**	★ **835** 489-143
54ALS09			
	Motorola	**SN54ALS09**	★ **732** 489-97
	TI	**SN54ALS09**	★ **836** 489-99
54ALS10			
	Motorola	**SN54ALS10**	★ **732** 490-182
	TI	**SN54ALS10**	★ **836** 490-184
54ALS1000			
	TI	**SN54ALS1000**	★ **1013** 492-16
54ALS1002			
	TI	**SN54ALS1002**	★ **1013** 494-107
54ALS1003			
	TI	**SN54ALS1003**	★ **1014** 491-151
54ALS1004			
	TI	**SN54ALS1004**	★ **1014** 477-173
54ALS1005			
	TI	**SN54ALS1005**	★ **1014** 477-71
54ALS1008			
	TI	**SN54ALS1008**	★ **1015** 489-144
54ALS1010			
	TI	**SN54ALS1010**	★ **1015** 490-185
54ALS1011			
	TI	**SN54ALS1011**	★ **1015** 489-45
54ALS1020			
	TI	**SN54ALS1020**	★ **1016** 490-99
54ALS1032			
	TI	**SN54ALS1032**	★ **1016** 493-135
54ALS1034			
	TI	**SN54ALS1034**	★ **1017** 174 485-25
54ALS1035			
	TI	**SN54ALS1035**	★ **1017** 476-155
54ALS109			
	Motorola	**SN54ALS109**	★ **732** 487-121
	National	DM54ALS109	487-123
	TI	**SN54ALS109**	★ **870** 487-125
54ALS11			
	Motorola	**SN54ALS11**	★ **732** 489-43
	TI	**SN54ALS11**	★ **836** 489-46
54ALS112			
	TI	**SN54ALS112**	★ **871** 488-104
54ALS113			
	National	DM54ALS113	488-70
	TI	**SN54ALS113**	★ **871** 488-71
54ALS114			
	TI	**SN54ALS114**	★ **872** 488-135
54ALS12			
	Motorola	**SN54ALS12**	★ **732** 490-151
	TI	**SN54ALS12**	★ **837** 490-153
54ALS1240			
	TI	**SN54ALS1240**	★ **1018** 503-120
54ALS1241			
	TI	**SN54ALS1241**	★ **1018** 504-25
54ALS1242			
	TI	**SN54ALS1242**	★ **1018** 503-39
54ALS1243			
	TI	**SN54ALS1243**	★ **1019** 503-40
54ALS1244			
	TI	**SN54ALS1244**	★ **1019** 504-26
54ALS1245			
	TI	**SN54ALS1245**	★ **1019** 504-167
54ALS13			
	Motorola	**SN54ALS13**	★ **732**
54ALS131			
	TI	**SN54ALS131**	★ **876** 484-18
54ALS132			
	Motorola	**SN54ALS132**	★ **732**
54ALS133			
	TI	**SN54ALS133**	★ **877** 492-117
54ALS137			
	TI	**SN54ALS137**	★ **879** 484-11
54ALS138			
	Motorola	**SN54ALS138**	★ **732** 483-148
	TI	**SN54ALS138**	★ **880** 483-152
54ALS139			
	Motorola	**SN54ALS139**	★ **732** 483-54
	TI	**SN54ALS139**	★ **880** 483-56
54ALS14			
	Motorola	**SN54ALS14**	★ **732**
54ALS15			
	Motorola	**SN54ALS15**	★ **732** 489-11
	TI	**SN54ALS15**	★ **838** 489-13
54ALS151			
	Motorola	**SN54ALS151**	★ **732** 499-155
	TI	**SN54ALS151**	★ **884** 499-157
54ALS153			
	Motorola	**SN54ALS153**	★ **732** 498-27
	TI	**SN54ALS153**	★ **884** 498-29
54ALS157			
	Motorola	**SN54ALS157**	★ **732** 499-24
	TI	**SN54ALS157**	★ **887** 499-26
54ALS158			
	Motorola	**SN54ALS158**	★ **732** 498-118
	TI	**SN54ALS158**	★ **887** 498-120
54ALS160			
	Motorola	**SN54ALS160**	★ **732** 480-145
	National	DM54ALS160	480-147
	TI	**SN54ALS160**	★ **889** 480-149
54ALS161			
	Motorola	**SN54ALS161**	★ **732** 478-122
	National	DM54ALS161	478-124
	TI	**SN54ALS161**	★ **889** 478-126
54ALS1616			
	TI	**SN54ALS1616**	★ **1020**
54ALS162			
	Motorola	**SN54ALS162**	★ **732** 480-187
	National	DM54ALS162	481-2
	TI	**SN54ALS162**	★ **890** 481-8
54ALS1620			
	TI	**SN54ALS1620**	★ **1021** 505-103
54ALS1621			
	TI	**SN54ALS1621**	★ **1021** 505-83
54ALS1622			
	TI	**SN54ALS1622**	★ **1021** 505-84
54ALS1623			
	TI	**SN54ALS1623**	★ **1021** 505-104
54ALS163			
	Motorola	**SN54ALS163**	★ **732** 478-169
	National	DM54ALS163	478-171
	TI	**SN54ALS163**	★ **890** 478-173
54ALS1638			
	TI	**SN54ALS1638**	★ **1022** 504-83
54ALS1639			
	TI	**SN54ALS1639**	★ **1022** 504-84
54ALS164			
	Motorola	**SN54ALS164**	★ **732** 502-26
	TI	**SN54ALS164**	★ **891** 502-28
54ALS1640			
	TI	**SN54ALS1640**	★ **1023** 504-117
54ALS1641			
	TI	SN54ALS1641	504-149
54ALS1642			
	TI	**SN54ALS1642**	★ **1023** 504-97
54ALS1643			
	TI	**SN54ALS1643**	★ **1023** 504-118
54ALS1644			
	TI	**SN54ALS1644**	★ **1023** 505-30
54ALS1645			
	TI	**SN54ALS1645**	★ **1023** 504-168 ★ **1023** 2478-43
54ALS165			
	TI	**SN54ALS165**	★ **891** 502-77
54ALS166			
	TI	**SN54ALS166**	★ **891** 502-97
54ALS168			
	Motorola	**SN54ALS168**	★ **732** 481-94
	TI	**SN54ALS168**	★ **892** 481-96
54ALS169			
	Motorola	**SN54ALS169**	★ **732** 479-93
	TI	**SN54ALS169**	★ **892** 479-95
54ALS16L8			
	TI	FP54ALS16L8	506-91
54ALS16R4			
	TI	FP54ALS16R4	506-93 3457-1
	TI	**SN54ALS16R4**	★ **1025**
54ALS16R6			
	TI	FP54ALS16R6	506-94 3457-2
54ALS16R8			
	TI	FP54ALS16R8	506-95 3457-3
54ALS174			
	Motorola	MC54ALS174	486-56
	TI	**SN54ALS174**	★ **895** 486-58
54ALS175			
	TI	**SN54ALS175**	★ **895** 485-124
54ALS190			
	Motorola	**SN54ALS190**	★ **732** 481-174

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
54ALS190			
	TI	SN54ALS190 ★	901
			481-176
54ALS191			
	Motorola	SN54ALS191 ★	732
			479-135
	TI	SN54ALS191 ★	901
			479-144
54ALS192			
	Motorola	SN54ALS192 ★	732
			481-138
	TI	SN54ALS192 ★	902
			481-140
54ALS193			
	Motorola	SN54ALS193 ★	732
			480-3
	TI	SN54ALS193 ★	902
			480-5
54ALS20			
	Motorola	SN54ALS20 ★	732
			490-97
	TI	SN54ALS20 ★	839
			490-100
54ALS21			
	TI	SN54ALS21 ★	839
			488-169
54ALS217			
	TI	SN54ALS217 ★	440
		★	905
			497-69
54ALS218			
	TI	SN54ALS218 ★	440
		★	906
			497-65
54ALS22			
	Motorola	SN54ALS22 ★	732
			490-51
	TI	SN54ALS22 ★	840
			490-53
54ALS238			
	Motorola	SN54ALS238 ★	732
54ALS239			
	Motorola	SN54ALS239 ★	732
54ALS240			
	Motorola	SN54ALS240 ★	732
			503-116
	National	DM54ALS240	503-118
	TI	SN54ALS240 ★	910
			503-121
		★	910
			2471-20
54ALS241			
	Motorola	SN54ALS241 ★	732
			504-21
	National	DM54ALS241	504-23
	TI	SN54ALS241 ★	911
			504-27
		★	911
			2470-50
54ALS242			
	Motorola	SN54ALS242 ★	732
			503-31
	National	DM54ALS242	503-35
	TI	SN54ALS242 ★	911
			503-41
		★	911
			2476-35
54ALS243			
	Motorola	SN54ALS243 ★	732
			503-32
	National	DM54ALS243	503-36
	TI	SN54ALS243 ★	912
			503-42
		★	912
			2476-36
54ALS244			
	Motorola	SN54ALS244 ★	732
			503-110
	National	DM54ALS244	503-112
	TI	SN54ALS244 ★	912
			503-165
		★	912
			2470-51
54ALS245			
	Motorola	SN54ALS245 ★	732
			504-163
	National	DM54ALS245	504-165
	TI	SN54ALS245 ★	913

Base Number	Source	Device	Page-Line
54ALS245			504-169
	TI	SN54ALS245 ★	913
			2478-44
54ALS251			
	Motorola	SN54ALS251 ★	732
			500-35
	TI	SN54ALS251 ★	915
			500-37
54ALS253			
	Motorola	SN54ALS253 ★	732
			497-139
	TI	SN54ALS253 ★	915
			497-140
54ALS257			
	Motorola	SN54ALS257 ★	732
			498-156
	TI	SN54ALS257 ★	916
			498-158
54ALS258			
	Motorola	SN54ALS258 ★	732
			498-78
	TI	SN54ALS258 ★	917
			498-80
54ALS259			
	TI	SN54ALS259 ★	917
			496-33
54ALS260			
	TI	SN54ALS260	494-13
54ALS27			
	Motorola	SN54ALS27 ★	732
			494-43
	TI	SN54ALS27 ★	842
			494-45
54ALS273			
	Motorola	SN54ALS273 ★	732
			486-146
	National	DM54ALS273	486-148
	TI	SN54ALS273 ★	919
			486-150
54ALS28			
	Motorola	SN54ALS28 ★	732
			494-101
	TI	SN54ALS28 ★	842
			494-108
54ALS299			
	TI	SN54ALS299 ★	927
			502-144
54ALS30			
	TI	SN54ALS30 ★	842
			492-74
54ALS317			
	TI	SN54ALS317 ★	440
		★	928
			497-67
54ALS318			
	TI	SN54ALS318 ★	440
		★	928
			497-63
54ALS32			
	Motorola	SN54ALS32 ★	732
			493-131
	National	DM54ALS32	493-133
	TI	SN54ALS32 ★	843
			493-136
54ALS323			
	TI	SN54ALS323 ★	930
			502-145
54ALS33			
	Motorola	SN54ALS33 ★	732
			494-67
	TI	SN54ALS33 ★	843
			494-69
54ALS352			
	Motorola	SN54ALS352 ★	732
			497-115
	TI	SN54ALS352 ★	932
			497-117
54ALS353			
	Motorola	SN54ALS353 ★	732
			497-84
	TI	SN54ALS353 ★	933
			497-85
54ALS366			
	TI	SN54ALS366	477-52
54ALS367			
	TI	SN54ALS367	175
			485-25

Base Number	Source	Device	Page-Line
54ALS37			
	Motorola	SN54ALS37 ★	732
			491-97
	TI	SN54ALS37 ★	844
			491-99
54ALS373			
	Motorola	SN54ALS373 ★	732
			496-48
	National	DM54ALS373	496-52
	TI	SN54ALS373	496-56
54ALS374			
	Motorola	SN54ALS374 ★	732
			486-171
	National	DM54ALS374	486-175
	TI	SN54ALS374	486-179
54ALS377			
	Motorola	SN54ALS377 ★	732
			487-38
	National	DM54ALS377	487-40
54ALS38			
	Motorola	SN54ALS38 ★	732
			491-49
	TI	SN54ALS38 ★	844
			491-51
54ALS40			
	Motorola	SN54ALS40 ★	732
			490-9
	TI	SN54ALS40 ★	845
			490-11
54ALS465			
	TI	SN54ALS465 ★	952
54ALS466			
	TI	SN54ALS466 ★	952
54ALS467			
	TI	SN54ALS467 ★	952
54ALS468			
	TI	SN54ALS468 ★	952
54ALS474			
	TI	SN54ALS474	1094-106
54ALS518			
	TI	SN54ALS518 ★	956
			474-94
54ALS519			
	TI	SN54ALS519 ★	956
			474-95
54ALS520			
	TI	SN54ALS520 ★	956
			474-80
54ALS521			
	TI	SN54ALS521 ★	956
			474-81
54ALS522			
	TI	SN54ALS522 ★	956
			474-82
54ALS533			
	Motorola	SN54ALS533 ★	732
			496-106
	TI	SN54ALS533 ★	957
			496-114
54ALS534			
	Motorola	SN54ALS534 ★	732
			486-115
	TI	SN54ALS534 ★	957
			486-119
54ALS537			
	Motorola	SN54ALS537 ★	732
54ALS538			
	Motorola	SN54ALS538 ★	732
			483-149
	TI	SN54ALS538 ★	958
			483-153
54ALS539			
	Motorola	SN54ALS539 ★	732
			483-50
	TI	SN54ALS539 ★	959
			483-52
54ALS540			
	Motorola	SN54ALS540 ★	732
	TI	SN54ALS540 ★	960
54ALS541			
	Motorola	SN54ALS541 ★	732
	TI	SN54ALS541 ★	960
54ALS560			
	Motorola	SN54ALS560 ★	732
			481-68
	TI	SN54ALS560 ★	961
			481-70

Base Number	Source	Device	Page-Line
54ALS561			
	Motorola	SN54ALS561 ★	732
			482-78
	TI	SN54ALS561	482-80
54ALS563			
	Motorola	SN54ALS563 ★	732
			496-107
	TI	SN54ALS563 ★	962
			496-115
54ALS564			
	Motorola	SN54ALS564 ★	732
			486-116
	TI	SN54ALS564 ★	962
			486-120
54ALS568			
	Motorola	SN54ALS568 ★	732
			481-90
	TI	SN54ALS568 ★	963
			481-92
54ALS569			
	Motorola	SN54ALS569 ★	732
			479-86
	TI	SN54ALS569 ★	963
			479-87
54ALS573			
	Motorola	SN54ALS573 ★	732
			496-49
	National	DM54ALS573	496-53
	TI	SN54ALS573 ★	964
			496-57
54ALS574			
	Motorola	SN54ALS574 ★	732
			486-172
	National	DM54ALS574	486-176
	TI	SN54ALS574 ★	964
			486-180
54ALS575			
	TI	SN54ALS575 ★	964
			486-181
54ALS576			
	Motorola	SN54ALS576 ★	732
			489-136
	National	DM54ALS576	489-140
	TI	SN54ALS576 ★	965
			486-121
54ALS577			
	TI	SN54ALS577 ★	965
			486-182
54ALS580			
	Motorola	SN54ALS580 ★	732
			496-108
	National	DM54ALS580	496-112
	TI	SN54ALS580 ★	966
			496-116
54ALS620			
	Motorola	SN54ALS620 ★	732
			505-93
	National	DM54ALS620	505-97
	TI	SN54ALS620 ★	976
			505-105
54ALS621			
	Motorola	SN54ALS621 ★	732
			505-81
	TI	SN54ALS621 ★	976
			505-85
54ALS622			
	Motorola	SN54ALS622 ★	732
			505-79
	National	DM54ALS622	505-98
	TI	SN54ALS622 ★	976
			505-86
54ALS623			
	Motorola	SN54ALS623 ★	732
			505-94
	National	DM54ALS623	505-99
	TI	SN54ALS623 ★	976
54ALS632			
	TI	SN54ALS632	509-49
54ALS633			
	TI	SN54ALS633	509-50
54ALS634			
	TI	SN54ALS634	509-51
54ALS635			
	TI	SN54ALS635	509-52
54ALS636			
	TI	SN54ALS636	508-95

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
54ALS637			
	TI	SN54ALS637	508-96
54ALS638			
	Motorola	SN54ALS638 ★	732
			504-79
	TI	SN54ALS638 ★	983
			504-85
54ALS639			
	Motorola	SN54ALS639 ★	732
			504-80
	TI	SN54ALS639 ★	983
			504-86
54ALS640			
	Motorola	SN54ALS640 ★	732
			504-110
	TI	SN54ALS640 ★	984
			504-119
54ALS641			
	Motorola	SN54ALS641 ★	732
			504-145
	National	DM54ALS641	504-147
	TI	SN54ALS641 ★	984
			504-150
54ALS642			
	Motorola	SN54ALS642 ★	732
			504-93
	National	DM54ALS642	504-95
	TI	SN54ALS642 ★	984
			504-98
54ALS643			
	Motorola	SN54ALS643 ★	732
			504-111
	National	DM54ALS643	504-114
	TI	SN54ALS643 ★	984
			504-120
54ALS644			
	Motorola	SN54ALS644 ★	732
			505-26
	National	DM54ALS644	505-28
	TI	SN54ALS644 ★	984
			505-31
54ALS645			
	TI	SN54ALS645 ★	984
			504-170
		★	984
			2478-45
54ALS646			
	Motorola	SN54ALS646 ★	732
			505-134
	National	DM54ALS646	505-138
	TI	SN54ALS646 ★	986
			505-61
54ALS647			
	Motorola	SN54ALS647 ★	732
			505-45
	National	DM54ALS647	505-49
	TI	SN54ALS647 ★	986
			505-55
54ALS648			
	Motorola	SN54ALS648 ★	732
			505-135
	National	DM54ALS648	505-139
	TI	SN54ALS648 ★	986
			505-62
54ALS649			
	Motorola	SN54ALS649 ★	732
			505-46
	National	DM54ALS649	505-50
	TI	SN54ALS649	505-56
54ALS651			
	TI	SN54ALS651 ★	988
			504-171
			505-63
54ALS652			
	TI	SN54ALS652 ★	988
			504-172
			505-64
54ALS653			
	TI	SN54ALS653 ★	989
			505-39
54ALS654			
	TI	SN54ALS654 ★	989
			505-42
54ALS671			
	Motorola	SN54ALS671 ★	732
			501-16
54ALS672			
	Motorola	SN54ALS672 ★	732
			501-17
54ALS677			
	TI	SN54ALS677 ★	993
			474-18
54ALS678			
	TI	SN54ALS678 ★	993
			474-19
54ALS679			
	TI	SN54ALS679 ★	994
			474-20
54ALS680			
	TI	SN54ALS680 ★	994
			474-21
54ALS688			
	TI	SN54ALS688 ★	998
			474-114
54ALS689			
	TI	SN54ALS689 ★	998
			474-96
54ALS690			
	Motorola	SN54ALS690 ★	732
			480-188
	National	DM54ALS690	481-3
54ALS691			
	Motorola	SN54ALS691 ★	732
			478-85
	National	DM54ALS691	478-89
54ALS692			
	Motorola	SN54ALS692 ★	732
			480-189
	National	DM54ALS692	481-4
54ALS693			
	Motorola	SN54ALS693 ★	732
			478-86
	National	DM54ALS693	478-90
54ALS694			
	Motorola	SN54ALS694 ★	732
54ALS695			
	Motorola	SN54ALS695 ★	732
54ALS696			
	Motorola	SN54ALS695 ★	732
			481-76
	National	DM54ALS696	481-80
54ALS697			
	Motorola	SN54ALS697 ★	732
			479-136
	National	DM54ALS697	479-140
54ALS698			
	Motorola	SN54ALS698 ★	732
			481-77
	National	DM54ALS698	481-81
54ALS699			
	Motorola	SN54ALS699 ★	732
	National	DM54ALS699	479-141
54ALS74			
	Motorola	SN54ALS74 ★	732
			485-67
	National	DM54ALS74	485-69
	TI	SN54ALS74 ★	857
			485-71
54ALS790			
	Motorola	SN54ALS790 ★	732
54ALS804			
	TI	SN54ALS804 ★	1002
54ALS805			
	TI	SN54ALS805 ★	1003
			494-153
54ALS808			
	TI	SN54ALS808 ★	1003
			489-182
54ALS832			
	TI	SN54ALS832 ★	1004
			493-168
54ALS857			
	TI	SN54ALS857 ★	1004
54ALS86			
	TI	SN54ALS86 ★	862
			495-24
54ALS873			
	Motorola	SN54ALS873 ★	732
			495-111
	National	DM54ALS873	495-113
	TI	SN54ALS873 ★	1008
			495-115
54ALS874			
	Motorola	SN54ALS874 ★	732
			485-33
	TI	SN54ALS874 ★	1008
			485-40
54ALS876			
	Motorola	SN54ALS876 ★	732
			485-34
	National	DM54ALS876	485-37
	TI	SN54ALS876 ★	1009
			485-41
54ALS878			
	TI	SN54ALS878 ★	1010
			485-42
54ALS879			
	TI	SN54ALS879 ★	1010
			485-43
54ALS880			
	Motorola	SN54ALS880 ★	732
			496-5
	National	DM54ALS880	496-7
	TI	SN54ALS880 ★	1011
			496-9
54ALSK1641			
	TI	SN54ALSK1641 ★	1023
54AS00	TI	SN54AS00 ★	833
			492-19
54AS02	TI	SN54AS02 ★	833
			494-112
54AS08	TI	SN54AS08 ★	835
			489-147
54AS10	TI	SN54AS10 ★	836
			490-188
54AS1002			
	TI	SN54AS1002 ★	1013
54AS1032			
	TI	SN54AS1032 ★	1016
54AS1034			
	TI	SN54AS1034 ★	1017
			177
			485-25
54AS109			
	TI	SN54AS109 ★	870
			487-127
54AS11	TI	SN54AS11 ★	836
			489-49
54AS112			
	TI	SN54AS112 ★	871
			488-106
54AS113			
	TI	SN54AS113 ★	871
			488-73
54AS114			
	TI	SN54AS114 ★	872
			488-137
54AS1242			
	TI	SN54AS1242	503-47
54AS1243			
	TI	SN54AS1243	503-48
54AS151			
	TI	SN54AS151 ★	884
			499-159
54AS153			
	TI	SN54AS153 ★	884
			498-31
54AS160			
	TI	SN54AS160 ★	889
			480-151
54AS161			
	TI	SN54AS161 ★	889
			478-128
54AS162			
	TI	SN54AS162 ★	890
			481-10
54AS163			
	TI	SN54AS163 ★	890
			478-175
54AS168			
	TI	SN54AS168	481-98
54AS169			
	TI	SN54AS169 ★	892
			479-97
54AS174			
	TI	SN54AS174 ★	895
			486-60
54AS175			
	TI	SN54AS175 ★	895
54AS181			
	TI	SN54AS181 ★	897
			475-12
54AS20	TI	SN54AS20 ★	839
			490-103
54AS21	TI	SN54AS21 ★	840
			488-171
54AS230			
	TI	SN54AS230 ★	910
			503-167
54AS231			
	TI	SN54AS231 ★	910
54AS240			
	TI	SN54AS240 ★	910
54AS241			
	TI	SN54AS241 ★	911
			504-30
54AS242			
	TI	SN54AS242 ★	911
			503-49
54AS243			
	TI	SN54AS243 ★	912
			503-50
54AS244			
	TI	SN54AS244 ★	912
			504-31
54AS251			
	TI	SN54AS251 ★	915
			500-39
54AS253			
	TI	SN54AS253 ★	915
			497-142
54AS27	TI	SN54AS27 ★	842
			494-47
54AS280			
	TI	SN54AS280 ★	921
			509-4
54AS30	TI	SN54AS30 ★	842
			492-76
54AS352			
	TI	SN54AS352 ★	932
			497-119
54AS353			
	TI	SN54AS353 ★	933
			497-86
54AS373			
	TI	SN54AS373	496-60
54AS374			
	TI	SN54AS374	486-187
54AS533			
	TI	SN54AS533 ★	957
			496-120
54AS534			
	TI	SN54AS534 ★	957
			486-122
54AS573			
	TI	SN54AS573 ★	964
54AS574			
	TI	SN54AS574 ★	964
54AS575			
	TI	SN54AS575 ★	964
			486-188
54AS576			
	TI	SN54AS576 ★	965
54AS577			
	TI	SN54AS577 ★	965
			486-189
54AS580			
	TI	SN54AS580 ★	966
54AS74	TI	SN54AS74 ★	857
			485-73
54AS800			
	TI	SN54AS800 ★	1001
54AS802			
	TI	SN54AS802 ★	1002
54AS804			
	TI	SN54AS804 ★	1002
			492-58
54AS805			
	TI	SN54AS805	494-155
54AS808			
	TI	SN54AS808	489-184
54AS832			
	TI	SN54AS832	493-170
54AS839			
	TI	FP54AS839	506-99
			3458-5

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
54AS840			
	TI	FP54AS840	506-100
			3458-3
54AS857			
	TI	**SN54AS857**	★ **1004**
54AS866			
	TI	**SN54AS866**	★ **1005**
54AS867			
	TI	**SN54AS867**	★ **1005**
			479-88
54AS869			
	TI	**SN54AS869**	★ **1005**
			479-89
54AS870			
	TI	**SN54AS870**	★ **1006**
			496-151
54AS871			
	TI	**SN54AS871**	★ **1007**
			496-152
54AS873			
	TI	**SN54AS873**	★ **1008**
54AS874			
	TI	**SN54AS874**	★ **1008**
54AS876			
	TI	**SN54AS876**	★ **1009**
54AS877			
	TI	**SN54AS877**	★ **1009**
			508-124
54AS878			
	TI	**SN54AS878**	★ **1010**
54AS879			
	TI	**SN54AS879**	★ **1010**
			485-48
54AS880			
	TI	**SN54AS880**	★ **1011**
54AS881			
	TI	**SN54AS881**	★ **1011**
			475-13
54AS882			
	TI	**SN54AS882**	★ **1012**
			475-77
54AS885			
	TI	**SN54AS885**	★ **1012**
			474-116
54AS894			
	TI	SN54AS894	476-21
54C00	National	MM54C00	457-101
54C02	National	MM54C02	458-163
54C04	National	MM54C04	450-184
54C08	National	MM54C08	456-185
54C10	National	MM54C10	457-58
54C107	National	MM54C107	456-79
54C137	Supertex	M54C137	454-110
54C138	Supertex	M54C138	454-95
54C139	Supertex	M54C139	454-69
54C14	National	MM54C14	465-30
			¶ 237-10
54C150	National	MM54C150	462-1
54C151	National	MM54C151	461-135
54C154	National	MM54C154	454-156
54C157	National	MM54C157	461-100
54C160	National	MM54C160	452-141
54C161	National	MM54C161	451-57
54C162	National	MM54C162	452-113
54C163	National	MM54C163	451-33
54C164	National	MM54C164	463-106
			3490-130
54C165	National	MM54C165	463-95
			3490-95
54C173	National	MM54C173	455-131
54C174	National	MM54C174	455-172
54C175	National	MM54C175	455-154
54C192	National	MM54C192	452-172
54C193	National	MM54C193	451-91
54C195	National	MM54C195	463-16
			3489-60
54C20	National	MM54C20	457-25
54C200	National	MM54C200	460-119
			3473-31
54C221	National	MM54C221	462-53
			¶ 237-13
54C237	Supertex	M54C237	454-111
54C238	Supertex	M54C238	454-96
54C239	Supertex	M54C239	454-70
54C240	National	MM54C240	465-69
	Supertex	M54C240	465-79
54C241	Supertex	M54C241	465-95
54C242	Supertex	M54C242	464-130
54C243	Supertex	M54C243	464-139
54C244	National	MM54C244	465-50
	Supertex	M54C244	465-59
54C245	Supertex	M54C245	465-145
54C30	National	MM54C30	457-139
54C32	National	MM54C32	458-53
54C373	Supertex	M54C373	459-192
54C374	National	MM54C374	456-41
	Supertex	M54C374	456-59
54C42	National	MM54C42	453-170
54C48	National	MM54C48	454-24
54C533	Supertex	M54C533	460-29
54C534	Supertex	M54C534	456-24
54C540	Supertex	M54C540	450-139
54C541	Supertex	M54C541	450-140
54C563	Supertex	M54C563	460-30
54C564	Supertex	M54C564	456-25
54C573	Supertex	M54C573	459-193
54C574	Supertex	M54C574	456-60
54C73	National	MM54C73	456-80
54C74	National	MM54C74	455-97
54C76	National	MM54C76	456-110
54C83	National	MM54C83	449-38
54C85	National	MM54C85	449-90
54C86	National	MM54C86	459-20
54C89	National	MM54C89	460-102
			3471-108
54C90	National	MM54C90	452-128
54C901	National	MM54C901	450-80
			¶ 261-4
54C902	National	MM54C902	450-82
			¶ 261-4
54C903	National	MM54C903	450-74
			¶ 261-4
54C904	National	MM54C904	450-76
			¶ 261-4
54C905	National	MM54C905	464-72
54C906	National	MM54C906	450-70
54C907	National	MM54C907	450-72
54C909	National	MM54C909	464-26
			2895-10
54C910	National	MM54C910	460-133
			3472-16
54C914	National	MM54C914	465-31
54C915	National	MM54C915	455-84
			2465-70
54C920	National	MM54C920	460-173
			¶ 286-8
			3474-25
			¶ 286-8
54C921	National	MM54C921	461-1
			¶ 286-8
			3474-24
			¶ 286-8
54C922	National	MM54C922	2468-1
			¶ 232-5
54C923	National	MM54C923	2468-6
54C929	National	MM54C929	460-152
			¶ 286-8
			3476-66
			¶ 286-8
54C93	National	MM54C93	451-19
54C930	National	MM54C930	460-153
			¶ 286-8
			3476-67
			¶ 286-8
54C941	National	MM54C941	450-131
			2470-45
54C95	National	MM54C95	462-154
			3489-75
54C989	National	MM54C989	3471-106
54F-TTL			
	Signetics	**54F-TTL**	★ **775**
54F00	Fairchild	54F00	492-21
	Motorola	**MC54F00**	★ **731**
			492-23
	Signetics	54F00	492-25
54F02	Fairchild	54F02	494-114
	Motorola	**MC54F02**	★ **731**
			494-116
54F04	Fairchild	54F04	477-176
	Motorola	**MC54F04**	★ **731**
			477-178
	Signetics	54F04	477-180
54F08	Fairchild	54F08	489-149
54F08	**Motorola**	**MC54F08**	★ **731**
			489-151
54F10	Fairchild	54F10	490-190
	Motorola	**MC54F10**	★ **731**
			490-172
54F109	Fairchild	54F109	487-129
	Motorola	**MC54F109**	★ **731**
			487-131
54F11	Fairchild	54F11	489-51
	Motorola	**MC54F11**	★ **731**
			489-53
54F112	**Motorola**	**MC54F112**	★ **731**
54F113	**Motorola**	**MC54F113**	★ **731**
54F114	**Motorola**	**MC54F114**	★ **731**
54F138	Fairchild	54F138	483-156
	Motorola	**MC54F138**	★ **731**
			483-158
54F139	Fairchild	54F139	483-58
	Motorola	**MC54F139**	★ **731**
			483-60
	Signetics	54F139	483-62
54F151	Fairchild	54F151	499-161
	Motorola	**MC54F151**	★ **731**
			499-163
54F153	Fairchild	54F153	498-33
	Motorola	**MC54F153**	★ **731**
			498-35
54F157	Fairchild	54F157	499-28
	Motorola	**MC54F157**	★ **731**
			499-30
	Signetics	54F157	499-32
54F158	Fairchild	54F158	498-122
	Motorola	**MC54F158**	★ **731**
			498-124
	Signetics	54F158	498-126
54F160	Fairchild	54F160	480-153
	Motorola	**MC54F160**	★ **731**
			480-155
54F161	Fairchild	54F161	478-130
	Motorola	**MC54F161**	★ **731**
			478-132
54F162	Fairchild	54F162	481-12
	Motorola	**MC54F162**	★ **731**
			481-14
54F163	Fairchild	54F163	478-177
	Motorola	**MC54F163**	★ **731**
			478-179
54F168	**Motorola**	**MC54F168**	★ **731**
54F169	**Motorola**	**MC54F169**	★ **731**
54F174	**Motorola**	**MC54F174**	★ **731**
54F175	Fairchild	54F175	485-126
	Motorola	**MC54F175**	★ **731**
			485-128
54F181	**Fairchild**	**54F181**	★ **619**
			475-16
	Motorola	**MC54F181**	★ **731**
			475-22
	Signetics	54F181	475-28
54F182	Fairchild	54F182	475-79
	Motorola	**MC54F182**	★ **731**
			475-81
54F190	**Fairchild**	**54F190**	★ **623**
			481-178
	Motorola	**MC54F190**	★ **731**
			482-2
54F191	**Fairchild**	**54F191**	★ **623**
			479-146
	Motorola	**MC54F191**	★ **731**
			479-148
54F192	**Fairchild**	**54F192**	★ **627**
			481-142
	Motorola	**MC54F192**	★ **731**
			481-144
54F193	**Fairchild**	**54F193**	★ **627**
			480-7
	Motorola	**MC54F193**	★ **731**
			480-9
54F194	Fairchild	54F194	501-152
	Motorola	**MC54F194**	★ **731**
			501-154
54F195	**Motorola**	**MC54F195**	★ **731**
54F20	Fairchild	54F20	490-105
	Motorola	**MC54F20**	★ **731**
			490-107
	Signetics	54F20	490-109
54F240	**Fairchild**	**54F240**	★ **630**
54F240	**Fairchild**	**54F240**	★ **630**
			503-124
			★ **630**
			2470-68
	Motorola	**MC54F240**	★ **731**
			503-126
54F241	**Fairchild**	**54F241**	★ **630**
			504-33
	Motorola	**MC54F241**	★ **731**
			504-35
	Signetics	54F241	504-37
54F242	Fairchild	54F242	503-54
	Motorola	**MC54F242**	★ **731**
			503-58
	Signetics	54F242	503-62
54F243	Fairchild	54F243	503-55
	Motorola	**MC54F243**	★ **731**
			503-59
	Signetics	54F243	503-63
54F244	**Fairchild**	**54F244**	★ **630**
			503-170
	Motorola	**MC54F244**	★ **731**
			503-172
	Signetics	54F244	503-174
54F245	Fairchild	54F245	504-178
	Motorola	**MC54F245**	★ **731**
			504-182
54F251	Fairchild	54F251	500-41
	Motorola	**MC54F251**	★ **731**
			500-43
54F253	Fairchild	54F253	497-144
	Motorola	**MC54F253**	★ **731**
			497-146
54F257	Fairchild	54F257	498-160
	Motorola	**MC54F257**	★ **731**
			498-162
	Signetics	54F257	498-164
54F258	Fairchild	54F258	498-82
	Motorola	**MC54F258**	★ **731**
			498-84
	Signetics	54F258	498-86
54F280	Fairchild	54F280	509-6
	Motorola	**MC54F280**	★ **731**
			509-8
54F283	**Motorola**	**MC54F283**	★ **731**
54F2960			
	Motorola	**MC54F2960**	★ **731**
54F2968			
	Motorola	**MC54F2968**	★ **731**
54F2969			
	Motorola	**MC54F2969**	★ **731**
54F2970			
	Motorola	**MC54F2970**	★ **731**
54F299	Fairchild	54F299	502-148
	Motorola	**MC54F299**	★ **731**
			502-152
54F32	Fairchild	54F32	493-139
	Motorola	**MC54F32**	★ **731**
			493-141
54F322	Fairchild	54F322	502-110
54F323	Fairchild	54F323	502-149
54F350	**Motorola**	**MC54F350**	★ **731**
54F352	Fairchild	54F352	497-121
	Motorola	**MC54F352**	★ **731**
			497-123
54F353	Fairchild	54F353	497-89
	Motorola	**MC54F353**	★ **731**
			497-91
54F373	**Fairchild**	**54F373**	★ **632**
			496-62
	Motorola	**MC54F373**	★ **731**
			496-64
	Signetics	54F373	496-66
54F374	**Fairchild**	**54F374**	★ **634**
			487-1
	Motorola	**MC54F374**	★ **731**
			487-3
	Signetics	54F374	487-5
54F378	**Motorola**	**MC54F378**	★ **731**
54F379	Fairchild	54F379	485-176
	Motorola	**MC54F379**	★ **731**
			485-178
54F381	Fairchild	54F381	475-17
	Motorola	**MC54F381**	★ **731**
			475-23
54F382	Fairchild	54F382	475-18

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
54F382	**Motorola**	**MC54F382**	★ **731**
			475-24
54F398	Fairchild	54F398	499-76
54F399	Fairchild	54F399	499-77
54F401	**Fairchild**	**54F401**	★ **636**
54F402	**Fairchild**	**54F402**	★ **638**
54F403	**Fairchild**	**54F403**	★ **643**
54F418	**Fairchild**	**54F418**	★ **650**
54F433	**Fairchild**	**54F433**	★ **643**
54F500	**Fairchild**	**54F500**	★ **655**
54F510	Fairchild	54F510	508-63
54F521	Fairchild	54F521	474-86
	Motorola	**MC54F521**	★ **731**
			474-88
	Signetics	54F521	474-90
54F524	Fairchild	54F524	474-26
54F526	Fairchild	54F526	505-114
54F533	Fairchild	54F533	496-122
	Motorola	**MC54F533**	★ **731**
			496-124
	Signetics	54F533	496-126
54F534	Fairchild	54F534	486-127
	Motorola	**MC54F534**	★ **731**
			486-129
	Signetics	54F534	486-131
54F537	Fairchild	54F537	483-40
	Motorola	**MC54F537**	★ **731**
			483-42
54F538	Fairchild	54F538	484-5
	Motorola	**MC54F538**	★ **731**
			484-7
54F539	Fairchild	54F539	483-115
	Motorola	**MC54F539**	★ **731**
			483-117
54F545	Fairchild	54F545	504-179
54F557	Fairchild	54F557	476-3
54F558	Fairchild	54F558	475-154
54F559	Fairchild	54F559	475-93
54F570	Fairchild	54F570	497-32
54F571	Fairchild	54F571	497-30
54F588	Fairchild	54F588	506-110
54F610	**Fairchild**	**54F610**	★ **656**
54F612	**Fairchild**	**54F612**	★ **656**
54F620	**Motorola**	**MC54F620**	★ **731**
54F623	**Motorola**	**MC54F623**	★ **731**
54F64	Fairchild	54F64	493-99
	Motorola	**MC54F64**	★ **731**
			493-101
	Signetics	54F64	493-103
54F640	**Motorola**	**MC54F640**	★ **731**
54F643	**Motorola**	**MC54F643**	★ **731**
54F645	**Motorola**	**MC54F645**	★ **731**
54F74	Fairchild	54F74	485-75
	Motorola	**MC54F74**	★ **731**
			485-77
54F86	Fairchild	54F86	495-26
	Motorola	**MC54F86**	★ **731**
			495-28
	Signetics	54F86	495-30
54H00	Fairchild	54H00	492-27
	National	DM54H00	492-31
	TI	**SN54H00**	★ **833**
54H01	Fairchild	54H01	491-155
	National	DM54H01	491-159
	TI	**SN54H01**	★ **833**
			491-161
54H04	Fairchild	54H04	477-182
	National	DM54H04	477-186
	TI	**SN54H04**	★ **834**
			478-1
54H05	Fairchild	54H05	477-74
	National	DM54H05	477-78
	TI	**SN54H05**	★ **834**
			477-80
54H08	Fairchild	54H08	489-154
	National	DM54H08	489-158
54H09	Fairchild	54H09	489-101
54H10	Fairchild	54H10	491-1
	National	DM54H10	491-5
	TI	**SN54H10**	★ **836**
			491-7
54H101	Fairchild	54H101	487-107
	TI	**SN54H101**	★ **868**
			487-109
54H102	Fairchild	54H102	487-104
54H102	**TI**	**SN54H102**	★ **868**
			487-105
54H103	Fairchild	54H103	488-98
	National	DM54H103	488-100
	TI	**SN54H103**	★ **868**
			488-102
54H106	Fairchild	54H106	488-108
	National	DM54H106	488-110
	TI	**SN54H106**	★ **869**
			488-112
54H108	Fairchild	54H108	488-64
	National	DM54H108	488-66
	TI	**SN54H108**	★ **870**
			488-68
54H11	Fairchild	54H11	489-56
	National	DM54H11	489-60
	TI	**SN54H11**	★ **836**
			489-62
54H15	**TI**	**SN54H15**	★ **838**
			489-15
54H183	Fairchild	54H183	474-150
	TI	**SN54H183**	★ **898**
			474-153
54H20	Fairchild	54H20	490-111
	National	DM54H20	490-115
	TI	**SN54H20**	★ **839**
			490-117
54H21	Fairchild	54H21	488-173
	National	DM54H21	488-177
	TI	**SN54H21**	★ **840**
			488-179
54H22	Fairchild	54H22	490-55
	National	DM54H22	490-59
	TI	**SN54H22**	★ **840**
			490-61
54H30	Fairchild	54H30	492-78
	National	DM54H30	492-84
	TI	**SN54H30**	★ **842**
			492-86
54H40	Fairchild	54H40	490-13
	National	DM54H40	490-19
	TI	**SN54H40**	★ **845**
			490-21
54H453	**TI**	**SN54H453**	★ **849**
54H50	Fairchild	54H50	492-157
	National	DM54H50	492-161
	TI	**SN54H50**	★ **848**
			492-163
54H51	Fairchild	54H51	492-179
	National	DM54H51	492-183
	TI	**SN54H51**	★ **848**
			★ **849**
			492-185
54H52	Fairchild	54H52	492-135
	National	DM54H52	492-139
	TI	SN54H52	492-141
54H53	Fairchild	54H53	493-55
	National	DM54H53	493-59
	TI	**SN54H53**	★ **849**
			493-61
54H54	Fairchild	54H54	493-48
	National	DM54H54	493-50
	TI	**SN54H54**	★ **850**
			493-52
54H55	Fairchild	54H55	493-42
	National	DM54H55	493-44
	TI	**SN54H55**	★ **851**
			493-46
54H60	Fairchild	54H60	507-100
	National	DM54H60	507-101
	TI	**SN54H60**	★ **852**
			507-103
54H61	Fairchild	54H61	507-107
	National	DM54H61	507-109
	TI	**SN54H61**	★ **852**
			507-111
54H62	Fairchild	54H62	508-2
	National	DM54H62	508-4
	TI	**SN54H62**	★ **853**
			508-6
54H71	Fairchild	54H71	487-99
	National	DM54H71	487-100
	TI	**SN54H71**	★ **855**
			487-102
54H72	Fairchild	54H72	487-83
	National	DM54H72	487-87
54H72	**TI**	**SN54H72**	★ **856**
			487-89
54H73	Fairchild	54H73	488-3
	National	DM54H73	488-9
	TI	**SN54H73**	★ **856**
			488-11
54H74	Fairchild	54H74	485-80
	National	DM54H74	485-84
	TI	**SN54H74**	★ **857**
			485-86
54H76	Fairchild	54H76	488-49
	National	DM54H76	488-50
	TI	**SN54H76**	★ **858**
			488-52
54H78	Fairchild	54H78	487-150
	National	DM54H78	487-151
	TI	**SN54H78**	★ **859**
			487-153
54H87	Fairchild	54H87	508-68
	Motorola	MC54H87	508-70
	TI	**SN54H87**	★ **863**
			508-72
54HC00	**Fairchild**	**54HC00**	★ **665**
			457-86
	Motorola	**MC54HC00**	★ **733**
			457-95
	National	MM54HC00	457-102
	RCA	**CD54HC00**	★ **740**
			457-112
54HC02	**Fairchild**	**54HC02**	★ **665**
			458-149
	Motorola	MC54HC02	458-158
	National	MM54HC02	458-164
	RCA	**CD54HC02**	★ **740**
			458-174
54HC03	Motorola	MC54HC03	457-82
54HC04	**Fairchild**	**54HC04**	★ **667**
	Motorola	MC54HC04	450-180
	National	MM54HC04	450-185
	RCA	**CD54HC04**	★ **740**
			451-3
54HC07	**Fairchild**	**54HC07**	★ **667**
			450-121
54HC08	**Fairchild**	**54HC08**	★ **665**
			456-174
	Motorola	MC54HC08	456-181
	National	MM54HC08	456-186
	RCA	**CD54HC08**	★ **740**
			456-192
54HC10	**Fairchild**	**54HC10**	★ **665**
			457-45
	Motorola	MC54HC10	457-54
	National	MM54HC10	457-59
	RCA	**CD54HC10**	★ **740**
			457-70
54HC107			
	Fairchild	**54HC107**	★ **666**
	Motorola	MC54HC107	456-75
	National	MM54HC107	456-81
	RCA	**CD54HC107**	★ **739**
			456-85
54HC109			
	Fairchild	**54HC109**	★ **666**
			456-93
	Motorola	MC54HC109	456-104
	National	MM54HC109	456-111
	RCA	**CD54HC109**	★ **739**
			456-122
54HC11	**Fairchild**	**54HC11**	★ **665**
	Motorola	MC54HC11	456-158
	RCA	**CD54HC11**	★ **740**
			456-164
54HC112			
	Fairchild	**54HC112**	★ **666**
			456-94
	Motorola	MC54HC112	456-72
	National	MM54HC112	456-112
	RCA	**CD54HC112**	★ **739**
			456-123
54HC123			
	National	MM54HC123	462-34
	RCA	**CD54HC123**	★ **740**
54HC125			
	Fairchild	**54HC125**	★ **667**
			449-152
54HC132			
	Fairchild	**54HC132**	★ **665**
			464-145
	Motorola	MC54HC132	465-1
	National	MM54HC132	465-5
	RCA	**CD54HC132**	★ **740**
54HC133			
	Fairchild	**54HC133**	★ **665**
			457-155
	National	MM54HC133	457-157
	RCA	**CD54HC133**	★ **740**
			457-159
54HC138			
	Fairchild	**54HC138**	★ **666**
			454-76
	Motorola	MC54HC138	454-84
	National	MM54HC138	454-86
	RCA	**CD54HC138**	★ **739**
			454-89
54HC139			
	Fairchild	**54HC139**	★ **666**
			454-50
	Motorola	MC54HC139	454-59
	National	MM54HC139	454-61
	RCA	**CD54HC139**	★ **739**
			454-64
54HC14	**Fairchild**	**54HC14**	★ **667**
			450-163
	Motorola	MC54HC14	465-24
	National	MM54HC14	465-17
	RCA	**CD54HC14**	★ **740**
			465-36
54HC147			
	Fairchild	**54HC147**	★ **666**
			466-17
	Motorola	MC54HC147	454-163
	National	MM54HC147	466-19
	RCA	**CD54HC147**	★ **739**
			454-166
54HC151			
	Fairchild	**54HC151**	★ **666**
			461-133
	National	MM54HC151	461-136
	RCA	**CD54HC151**	★ **740**
			461-139
54HC153			
	Fairchild	**54HC153**	★ **666**
			461-158
	Motorola	MC54HC153	461-84
	National	MM54HC153	461-94
	RCA	**CD54HC153**	★ **740**
			461-96
54HC154			
	Fairchild	**54HC154**	★ **666**
			454-152
	National	MM54HC154	454-157
	RCA	**CD54HC154**	★ **739**
			454-160
54HC157			
	Motorola	MC54HC157	461-98
	National	MM54HC157	461-101
	RCA	**CD54HC157**	★ **740**
54HC158			
	Motorola	MC54HC158	461-108
	National	MM54HC158	461-102
	RCA	**CD54HC158**	★ **740**
54HC160			
	Fairchild	**54HC160**	★ **668**
			452-130
	Motorola	MC54HC160	452-137
	National	MM54HC160	452-142
	RCA	**CD54HC160**	★ **739**
			452-147
54HC161			
	Fairchild	**54HC161**	★ **668**
	Motorola	MC54HC161	451-53
	National	MM54HC161	451-58
	RCA	**CD54HC161**	★ **739**
			451-63
54HC162			
	Fairchild	**54HC162**	★ **668**
			452-102
	Motorola	MC54HC162	452-109
	National	MM54HC162	452-114
	RCA	**CD54HC162**	★ **739**
			452-119

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device		Page-Line
54HC163				
	Fairchild	**54HC163**	★	**668**
				451-22
	Motorola	MC54HC163		451-29
	National	MM54HC163		451-34
	RCA	**CD54HC163**	★	**739**
				451-39
54HC164				
	Fairchild	**54HC164**	★	**665**
				463-102
	Motorola	MC54HC164		463-104
	National	MM54HC164		463-107
	RCA	**CD54HC164**	★	**740**
				463-110
54HC165				
	Fairchild	**54HC165**	★	**665**
				463-91
	Motorola	MC54HC165		463-93
				466-31
	National	MM54HC165		463-96
	RCA	**CD54HC165**	★	**740**
				463-99
54HC166				
	RCA	**CD54HC166**	★	**740**
54HC173				
	Fairchild	**54HC173**	★	**665**
				455-120
	Motorola	MC54HC173		455-127
	RCA	**CD54HC173**	★	**739**
				455-135
54HC174				
	Fairchild	**54HC174**	★	**666**
	Motorola	MC54HC174		455-168
	RCA	**CD54HC174**	★	**739**
				455-176
54HC175				
	Fairchild	**54HC175**	★	**666**
				455-144
	Motorola	MC54HC175		455-151
	National	MM54HC175		455-155
	RCA	**CD54HC175**	★	**739**
				455-158
54HC191				
	RCA	**CD54HC191**	★	**739**
				451-99
54HC192				
	Fairchild	**54HC192**	★	**668**
				452-156
	Motorola	MC54HC192		452-166
	National	MM54HC192		452-173
	RCA	**CD54HC192**	★	**739**
				452-180
54HC193				
	Fairchild	**54HC193**	★	**668**
				451-72
	Motorola	MC54HC193		451-85
	National	MM54HC193		451-92
	RCA	**CD54HC193**	★	**739**
				451-100
54HC194				
	Fairchild	**54HC194**	★	**665**
	Motorola	MC54HC194		462-152
	National	MM54HC194		463-1
	RCA	**CD54HC194**	★	**740**
				463-4
54HC195				
	Fairchild	**54HC195**	★	**665**
				463-8
	Motorola	MC54HC195		463-12
	National	MM54HC195		463-17
	RCA	**CD54HC195**	★	**740**
				463-20
54HC20	**Fairchild**	**54HC20**	★	**665**
				457-11
	Motorola	MC54HC20		457-20
	National	MM54HC20		457-60
	RCA	**CD54HC20**	★	**740**
				457-33
54HC221				
	Fairchild	**54HC221**	★	**668**
				462-43
	RCA	**CD54HC221**	★	**740**
				462-57
54HC238				
	RCA	**CD54HC238**	★	**739**

Base Number	Source	Device		Page-Line
54HC240				
	Fairchild	**54HC240**	★	**667**
				465-62
	Motorola	MC54HC240		465-67
	National	MM54HC240		465-70
	RCA	**CD54HC240**	★	**740**
				465-73
54HC241				
	Fairchild	**54HC241**	★	**667**
				465-81
	Motorola	MC54HC241		465-86
	National	MM54HC241		465-88
	RCA	**CD54HC241**	★	**740**
				465-90
54HC242				
	Fairchild	**54HC242**	★	**667**
				464-121
	Motorola	MC54HC242		464-123
	National	MM54HC242		464-125
	RCA	**CD54HC242**	★	**739**
				464-127
54HC243				
	Fairchild	**54HC243**	★	**667**
				464-132
	Motorola	MC54HC243		464-134
	RCA	**CD54HC243**	★	**739**
				464-136
54HC244				
	Fairchild	**54HC244**	★	**667**
				465-43
	Motorola	MC54HC244		465-48
	National	MM54HC244		465-51
	RCA	**CD54HC244**	★	**740**
				465-54
54HC245				
	Fairchild	**54HC245**	★	**667**
				465-126
	Motorola	MC54HC245		465-134
	RCA	**CD54HC245**	★	**739**
				465-138
54HC251				
	Fairchild	**54HC251**	★	**666**
				461-159
	Motorola	MC54HC251		461-172
	National	MM54HC251		466-15
	RCA	**CD54HC251**	★	**740**
				461-178
54HC253				
	Fairchild	**54HC253**	★	**666**
				461-77
	Motorola	MC54HC253		461-89
	National	MM54HC253		461-91
	RCA	**CD54HC253**	★	**740**
54HC257				
	Fairchild	**54HC257**	★	**666**
				461-112
	Motorola	MC54HC257		461-114
	National	MM54HC257		461-116
	RCA	**CD54HC257**	★	**740**
				461-120
54HC259				
	Fairchild	**54HC259**	★	**665**
				460-41
	Motorola	MC54HC259		460-48
	National	MM54HC259		460-54
	RCA	**CD54HC259**	★	**739**
				460-62
54HC266				
	Fairchild	**54HC266**	★	**665**
	Motorola	MC54HC266		459-51
	National	MM54HC266		458-33
	RCA	**CD54HC266**	★	**740**
				459-55
54HC27	**Fairchild**	**54HC27**	★	**665**
				458-116
	Motorola	MC54HC27		458-125
	National	MM54HC27		458-130
	RCA	**CD54HC27**	★	**740**
				458-138
54HC273				
	Fairchild	**54HC273**	★	**665**
				456-4
	RCA	**CD54HC273**	★	**739**
54HC280				
	Fairchild	**54HC280**	★	**667**
				449-106
	Motorola	MC54HC280		449-108

Base Number	Source	Device		Page-Line
54HC280				
	National	MM54HC280		449-110
	RCA	**CD54HC280**	★	**739**
				449-112
54HC283				
	Fairchild	**54HC283**	★	**667**
				449-29
54HC297				
	RCA	**CD54HC297**	★	**740**
54HC299				
	Fairchild	**54HC299**	★	**665**
				463-132
	National	MM54HC299		463-134
	RCA	**CD54HC299**	★	**740**
54HC30	**Fairchild**	**54HC30**	★	**665**
				457-130
	Motorola	MC54HC30		457-137
	National	MM54HC30		457-140
	RCA	**CD54HC30**	★	**740**
				457-145
54HC32	**Fairchild**	**54HC32**	★	**665**
				458-42
	Motorola	MC54HC32		458-49
	National	MM54HC32		458-54
	RCA	**CD54HC32**	★	**740**
				458-59
54HC354				
	Motorola	MC54HC354		461-173
	National	MM54HC354		461-164
	RCA	**CD54HC354**	★	**740**
				461-168
54HC356				
	Motorola	MC54HC356		461-174
	National	MM54HC356		461-165
	RCA	**CD54HC356**	★	**740**
				461-169
54HC365				
	Fairchild	**54HC365**	★	**667**
				450-88
	National	MM54HC365		450-101
	RCA	**CD54HC365**	★	**740**
				450-111
54HC366				
	Fairchild	**54HC366**	★	**667**
				449-167
	National	MM54HC366		450-84
	RCA	**CD54HC366**	★	**740**
				450-112
54HC367				
	Fairchild	**54HC367**	★	**667**
				450-89
	Motorola	MC54HC367		450-97
	National	MM54HC367		450-102
	RCA	**CD54HC367**	★	**740**
				450-113
54HC368				
	Fairchild	**54HC368**	★	**667**
				449-168
	National	MM54HC368		450-85
	RCA	**CD54HC368**	★	**740**
				450-114
54HC373				
	Fairchild	**54HC373**	★	**665**
				459-165
	Motorola	MC54HC373		459-173
	National	MM54HC373		459-177
	RCA	**CD54HC373**	★	**739**
				459-182
54HC374				
	Fairchild	**54HC374**	★	**666**
				456-28
	Motorola	MC54HC374		456-37
	National	MM54HC374		456-42
	RCA	**CD54HC374**	★	**739**
				456-49
54HC377				
	RCA	**CD54HC377**	★	**739**
54HC384				
	RCA	**CD54HC384**	★	**739**
				449-115
54HC390				
	Fairchild	**54HC390**	★	**668**
				453-38
	National	MM54HC390		453-36
	RCA	**CD54HC390**	★	**739**
				453-40

Base Number	Source	Device		Page-Line
54HC393				
	Fairchild	**54HC393**	★	**668**
				451-141
	National	MM54HC393		451-143
	RCA	**CD54HC393**	★	**739**
				451-145
54HC4002				
	Motorola	MC54HC4002		458-94
	National	MM54HC4002		458-99
	RCA	**CD54HC4002**	★	**740**
				458-107
54HC40104				
	RCA	**CD54HC40104**	★	**740**
54HC40105				
	RCA	**CD54HC40105**	★	**740**
54HC4017				
	Fairchild	**54HC4017**	★	**668**
				452-50
	Motorola	MC54HC4017		452-83
	National	MM54HC4017		452-52
	RCA	**CD54HC4017**	★	**739**
				452-91
54HC4018				
	National	MM54HC4018		458-198
54HC4020				
	Fairchild	**54HC4020**	★	**668**
				452-12
	Motorola	MC54HC4020		452-19
	National	MM54HC4020		452-7
	RCA	**CD54HC4020**	★	**739**
				452-27
54HC4024				
	Motorola	MC54HC4024		451-156
	RCA	**CD54HC4024**	★	**739**
				451-164
54HC4040				
	Fairchild	**54HC4040**	★	**668**
				451-177
	Motorola	MC54HC4040		451-184
	National	MM54HC4040		451-175
	RCA	**CD54HC4040**	★	**739**
				451-192
54HC4046				
	Fairchild	**54HC4046**	★	**668**
				462-8
54HC4047				
	Fairchild	**54HC4047**	★	**668**
				462-9
54HC4049				
	Fairchild	**54HC4049**	★	**667**
				450-13
	National	MM54HC4049		450-21
	RCA	CD54HC4049		450-27
54HC4050				
	Fairchild	**54HC4050**	★	**667**
				450-48
	National	MM54HC4050		450-123
	RCA	**CD54HC4050**	★	**740**
				450-61
54HC4051				
	Fairchild	**54HC4051**	★	**666**
				466-13
	RCA	**CD54HC4051**	★	**740**
54HC4052				
	Fairchild	**54HC4052**	★	**666**
				464-117
	RCA	**CD54HC4052**	★	**740**
54HC4053				
	Fairchild	**54HC4053**	★	**666**
				464-119
	RCA	**CD54HC4053**	★	**740**
54HC4060				
	Motorola	MC54HC4060		452-37
	National	MM54HC4060		452-8
	RCA	**CD54HC4060**	★	**739**
				452-45
54HC407				
	Motorola	MC54HC407B		458-196
54HC4075				
	Motorola	MC54HC4075		458-29
54HC4099				
	RCA	CD54HC4099		450-28
54HC42	**Fairchild**	**54HC42**	★	**666**
				453-159
	Motorola	MC54HC42		453-166
	National	MM54HC42		454-1

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
54HC42	RCA	CD54HC42 ★	739
			454-8
54HC4301			
	National	MM54HC4301	460-35
54HC4302			
	National	MM54HC4302	460-33
54HC4303			
	National	MM54HC4303	456-8
54HC4304			
	National	MM54HC4304	456-6
54HC4305			
	National	MM54HC4305	450-125
54HC4510			
	Fairchild	54HC4510 ★	668
			453-16
54HC4511			
	Motorola	MC54HC4511	455-53
	National	MM54HC4511	455-57
	RCA	CD54HC4511 ★	739
			455-63
54HC4512			
	Fairchild	54HC4512 ★	666
			461-160
54HC4514			
	Fairchild	54HC4514 ★	666
			454-153
	Motorola	MC54HC4514	454-124
	National	MM54HC4514	454-130
	RCA	CD54HC4514 ★	739
			454-136
54HC4516			
	Fairchild	54HC4516 ★	665
		★	668
			451-73
54HC4520			
	RCA	CD54HC4520 ★	739
			451-147
54HC4538			
	Fairchild	54HC4538 ★	668
			462-44
	Motorola	MC54HC4538	462-49
	RCA	CD54HC4538 ★	740
			462-58
54HC4543			
	Motorola	MC54HC4543	455-14
	National	MM54HC4543	455-58
54HC4703			
	Fairchild	54HC4703 ★	665
			464-37
54HC51	Motorola	MC54HC51	457-196
54HC533			
	Fairchild	54HC533 ★	665
			460-4
	Motorola	MC54HC533	460-13
	National	MM54HC533	460-17
	RCA	CD54HC533 ★	739
			460-23
54HC534			
	Fairchild	54HC534 ★	666
			456-10
	National	MM54HC534	456-14
	RCA	CD54HC534 ★	739
			456-18
54HC540			
	RCA	CD54HC540 ★	740
			450-127
54HC541			
	RCA	CD54HC541 ★	740
			450-128
54HC543			
	Fairchild	54HC543 ★	665
		★	667
			465-149
54HC544			
	Fairchild	54HC544 ★	665
		★	667
			465-150
54HC550			
	Fairchild	54HC550 ★	665
		★	667
			465-155
			465-161
54HC551			
	Fairchild	54HC551 ★	665
		★	667
			465-156
			465-162
54HC563			
	Fairchild	54HC563 ★	665
			460-5
	Motorola	MC54HC563	460-14
	National	MM54HC563	460-18
	RCA	CD54HC563 ★	739
			460-24
54HC564			
	Fairchild	54HC564 ★	666
			456-11
	National	MM54HC564	456-15
	RCA	CD54HC564 ★	739
			456-19
54HC568			
	Fairchild	54HC568 ★	668
			453-18
54HC569			
	Fairchild	54HC569 ★	668
			451-74
54HC573			
	Fairchild	54HC573 ★	665
			459-166
	Motorola	MC54HC573	459-174
	National	MM54HC573	459-178
	RCA	CD54HC573 ★	739
			459-183
54HC574			
	Fairchild	54HC574 ★	666
			456-29
	Motorola	MC54HC574	456-38
	National	MM54HC574	456-43
	RCA	CD54HC574 ★	739
			456-50
54HC58	Motorola	MC54HC58	457-181
54HC640			
	Fairchild	54HC640 ★	667
			465-116
	Motorola	MC54HC640	465-118
	RCA	CD54HC640 ★	739
			465-122
54HC643			
	Fairchild	54HC643 ★	667
			465-114
	Motorola	MC54HC643	465-119
	RCA	CD54HC643 ★	739
			465-123
54HC645			
	Fairchild	54HC645 ★	667
			465-147
	Motorola	MC54HC645	465-135
	RCA	CD54HC645 ★	739
			465-139
54HC646			
	Fairchild	54HC646 ★	665
		★	667
			465-106
			465-157
	Motorola	MC54HC646	465-108
	National	MM54HC646	465-110
	RCA	CD54HC646 ★	739
			465-112
54HC648			
	Fairchild	54HC648 ★	665
		★	667
			465-98
			465-153
	Motorola	MC54HC648	465-100
	National	MM54HC648	465-102
	RCA	CD54HC648 ★	739
			465-104
54HC670			
	RCA	CD54HC670 ★	739
54HC688			
	Fairchild	54HC688 ★	667
			449-104
	National	MM54HC688	464-34
	RCA	CD54HC688 ★	739
			449-55
54HC73	Fairchild	54HC73 ★	666
	Motorola	MC54HC73	456-76
	RCA	CD54HC73 ★	739
			456-86
54HC74	Fairchild	54HC74 ★	666
			455-86
	Motorola	MC54HC74	455-93
	National	MM54HC74	455-98
54HC74	RCA	CD54HC74 ★	739
			455-106
54HC75	Fairchild	54HC75 ★	665
			459-103
	Motorola	MC54HC75	459-110
	National	MM54HC75	459-114
	RCA	CD54HC75 ★	739
54HC76	Fairchild	54HC76 ★	666
			456-95
	Motorola	MC54HC76	456-105
	National	MM54HC76	456-113
	RCA	CD54HC76 ★	739
			456-124
54HC77	Motorola	MC54HC77	459-91
	National	MM54HC77	460-55
54HC85	Fairchild	54HC85 ★	667
			449-81
	Motorola	MC54HC85	449-88
	RCA	CD54HC85 ★	739
			449-96
54HC86	Fairchild	54HC86 ★	665
			459-4
	Motorola	MC54HC86	459-13
	National	MM54HC86	459-21
	RCA	CD54HC86 ★	740
			459-30
54HCT00			
	RCA	CD54HCT00 ★	740
54HCT02			
	RCA	CD54HCT02 ★	740
54HCT04			
	Fairchild	54HCT04 ★	667
			450-165
	RCA	CD54HCT04 ★	740
54HCT07			
	Fairchild	54HCT07 ★	667
			450-78
54HCT08			
	RCA	CD54HCT08 ★	740
54HCT10			
	RCA	CD54HCT10 ★	740
54HCT107			
	RCA	CD54HCT107 ★	739
54HCT109			
	RCA	CD54HCT109 ★	739
54HCT11			
	RCA	CD54HCT11 ★	740
54HCT112			
	RCA	CD54HCT112 ★	739
54HCT123			
	RCA	CD54HCT123 ★	740
54HCT132			
	RCA	CD54HCT132 ★	740
54HCT133			
	RCA	CD54HCT133 ★	740
54HCT138			
	RCA	CD54HCT138 ★	739
54HCT139			
	RCA	CD54HCT139 ★	739
54HCT14			
	RCA	CD54HCT14 ★	740
54HCT147			
	RCA	CD54HCT147 ★	739
54HCT151			
	RCA	CD54HCT151 ★	740
54HCT153			
	RCA	CD54HCT153 ★	740
54HCT154			
	RCA	CD54HCT154 ★	739
54HCT157			
	RCA	CD54HCT157 ★	740
54HCT158			
	RCA	CD54HCT158 ★	740
54HCT160			
	RCA	CD54HCT160 ★	739
54HCT161			
	RCA	CD54HCT161 ★	739
54HCT162			
	RCA	CD54HCT162 ★	739
54HCT163			
	RCA	CD54HCT163 ★	739
54HCT164			
	RCA	CD54HCT164 ★	740
54HCT165			
	RCA	CD54HCT165 ★	740
54HCT166			
	RCA	CD54HCT166 ★	740
54HCT173			
	RCA	CD54HCT173 ★	739
54HCT174			
	RCA	CD54HCT174 ★	739
54HCT175			
	RCA	CD54HCT175 ★	739
54HCT191			
	RCA	CD54HCT191 ★	739
54HCT192			
	RCA	CD54HCT192 ★	739
54HCT193			
	RCA	CD54HCT193 ★	739
54HCT194			
	RCA	CD54HCT194 ★	740
54HCT195			
	RCA	CD54HCT195 ★	740
54HCT20			
	RCA	CD54HCT20 ★	740
54HCT221			
	RCA	CD54HCT221 ★	740
54HCT238			
	RCA	CD54HCT238 ★	739
54HCT240			
	RCA	CD54HCT240 ★	740
54HCT241			
	RCA	CD54HCT241 ★	740
54HCT242			
	RCA	CD54HCT242 ★	739
54HCT243			
	RCA	CD54HCT243 ★	739
54HCT244			
	RCA	CD54HCT244 ★	740
54HCT245			
	RCA	CD54HCT245 ★	739
54HCT251			
	RCA	CD54HCT251 ★	740
54HCT253			
	RCA	CD54HCT253 ★	740
54HCT257			
	RCA	CD54HCT257 ★	740
54HCT259			
	RCA	CD54HCT259 ★	739
54HCT266			
	RCA	CD54HCT266 ★	740
54HCT27			
	RCA	CD54HCT27 ★	740
54HCT273			
	RCA	CD54HCT273 ★	739
54HCT280			
	RCA	CD54HCT280 ★	739
54HCT297			
	RCA	CD54HCT297 ★	740
54HCT299			
	RCA	CD54HCT299 ★	740
54HCT30			
	RCA	CD54HCT30 ★	740
54HCT32			
	RCA	CD54HCT32 ★	740
54HCT354			
	RCA	CD54HCT354 ★	740
54HCT356			
	RCA	CD54HCT356 ★	740
54HCT365			
	RCA	CD54HCT365 ★	740
54HCT366			
	RCA	CD54HCT366 ★	740
54HCT367			
	RCA	CD54HCT367 ★	740
54HCT368			
	RCA	CD54HCT368 ★	740
54HCT373			
	RCA	CD54HCT373 ★	739
54HCT374			
	RCA	CD54HCT374 ★	739
54HCT377			
	RCA	CD54HCT377 ★	739
54HCT384			
	RCA	CD54HCT384 ★	739
54HCT390			
	RCA	CD54HCT390 ★	739
54HCT393			
	RCA	CD54HCT393 ★	739
54HCT4002			
	RCA	CD54HCT4002 ★	740
54HCT40104			
	RCA	CD54HCT40104 ★	740
54HCT40105			
	RCA	CD54HCT40105 ★	740

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
54HCT4017			
	RCA	CD54HCT4017 ★	739
54HCT4020			
	RCA	CD54HCT4020 ★	739
54HCT4024			
	RCA	CD54HCT4024 ★	739
54HCT4040			
	RCA	CD54HCT4040 ★	739
54HCT4051			
	RCA	CD54HCT4051 ★	740
54HCT4052			
	RCA	CD54HCT4052 ★	740
54HCT4053			
	RCA	CD54HCT4053 ★	740
54HCT4060			
	RCA	CD54HCT4060 ★	739
54HCT42			
	RCA	CD54HCT42 ★	739
54HCT4511			
	RCA	CD54HCT4511 ★	739
54HCT4514			
	RCA	CD54HCT4514 ★	739
54HCT4520			
	RCA	CD54HCT4520 ★	739
54HCT4538			
	RCA	CD54HCT4538 ★	740
54HCT533			
	RCA	CD54HCT533 ★	739
54HCT534			
	RCA	CD54HCT534 ★	739
54HCT540			
	RCA	CD54HCT540 ★	740
54HCT541			
	RCA	CD54HCT541 ★	740
54HCT563			
	RCA	CD54HCT563 ★	739
54HCT564			
	RCA	CD54HCT564 ★	739
54HCT573			
	RCA	CD54HCT573 ★	739
54HCT574			
	RCA	CD54HCT574 ★	739
54HCT640			
	RCA	CD54HCT640 ★	739
54HCT643			
	RCA	CD54HCT643 ★	739
54HCT645			
	RCA	CD54HCT645 ★	739
54HCT646			
	RCA	CD54HCT646 ★	739
54HCT648			
	RCA	CD54HCT648 ★	739
54HCT670			
	RCA	CD54HCT670 ★	739
54HCT688			
	RCA	CD54HCT688 ★	739
54HCT73			
	RCA	CD54HCT73 ★	739
54HCT74			
	RCA	CD54HCT74 ★	739
54HCT75			
	RCA	CD54HCT75 ★	739
54HCT76			
	RCA	CD54HCT76 ★	739
54HCT85			
	RCA	CD54HCT85 ★	739
54HCT86			
	RCA	CD54HCT86 ★	740
54HCU04			
	Motorola	MC54HCU04	450-167
54HCU4049			
	RCA	CD54HCU4049 ★	740
54L00	TI	SN54L00 ★	833
54L02	TI	SN54L02 ★	833
54L03	TI	SN54L03 ★	834
			491-142
54L04	TI	SN54L04 ★	834
			477-166
54L10	TI	SN54L10 ★	836
			490-180
54L121	TI	SN54L121 ★	873
54L122	TI	SN54L122 ★	873
54L123	TI	SN54L123 ★	874
54L153	TI	SN54L153 ★	884
54L154	TI	SN54L154 ★	885
54L157	TI	SN54L157 ★	887
54L164	National	DM54L164A	3490-97
54L164	TI	SN54L164 ★	891
			3490-99
54L192	TI	SN54L192 ★	902
			481-146
54L193	TI	SN54L193 ★	902
			480-11
54L196	TI	SN54L196	480-121
54L20	TI	SN54L20 ★	839
			490-95
54L30	TI	SN54L30 ★	842
			492-72
54L42	TI	SN54L42 ★	845
			483-24
54L43	TI	SN54L43 ★	846
			482-106
54L44	TI	SN54L44 ★	846
			482-98
54L46	TI	SN54L46 ★	847
			467-136
54L47	TI	SN54L47 ★	847
			467-119
54L51	TI	SN54L51 ★	848
			492-177
54L54	TI	SN54L54 ★	850
			493-73
54L55	TI	SN54L55 ★	851
			493-30
54L71	TI	SN54L71 ★	855
54L72	TI	SN54L72 ★	856
			487-90
54L73	TI	SN54L73 ★	856
			487-186
54L74	TI	SN54L74 ★	857
54L75	TI	SN54L75 ★	858
54L77	TI	SN54L77 ★	859
54L78	TI	SN54L78 ★	859
54L85	TI	SN54L85 ★	862
54L86	TI	SN54L86 ★	862
54L90	TI	SN54L90 ★	864
54L91	National	DM54L91	3491-1
	TI	SN54L91 ★	864
			3490-132
54L93	TI	SN54L93 ★	865
54L95	National	DM54L95	3488-46
	TI	SN54L95 ★	866
			3488-91
54L96	TI	SN54L96 ★	866
54L98	TI	SN54L98 ★	867
54L99	TI	SN54L99 ★	867
			3488-92
54LS00	Fairchild	54LS00	492-34
	Motorola	SN54LS00	492-38
	National	DM54LS00	492-40
	SGS	54LS00	492-42
	Signetics	54LS00	492-44
	TI	SN54LS00 ★	833
			492-46
54LS01	Motorola	SN54LS01	491-168
	National	DM54LS01	491-172
	Signetics	54LS01	491-178
	TI	SN54LS01 ★	833
			491-181
54LS02	Fairchild	54LS02	494-119
	Motorola	SN54LS02	494-125
	National	DM54LS02	494-129
	SGS	54LS02	494-131
	Signetics	54LS02	494-135
	TI	SN54LS02 ★	833
			494-138
54LS03	Fairchild	54LS03	491-163
	Motorola	SN54LS03	491-169
	National	DM54LS03	491-173
	SGS	54LS03	491-176
	Signetics	54LS03	491-179
	TI	SN54LS03 ★	834
			491-182
54LS04	Fairchild	54LS04	478-3
	Motorola	SN54LS04	478-7
	National	DM54LS04	478-9
	SGS	54LS04	478-11
	Signetics	54LS04	478-13
	TI	SN54LS04 ★	834
			478-15
54LS05	Fairchild	54LS05	477-82
	Motorola	SN54LS05	477-86
	National	DM54LS05	477-88
54LS05	SGS	54LS05	477-90
	Signetics	54LS05	477-92
	TI	SN54LS05 ★	834
			477-94
54LS08	Fairchild	54LS08	489-160
	Motorola	SN54LS08	489-164
	National	DM54LS08	489-166
	SGS	54LS08	489-168
	Signetics	54LS08	489-170
	TI	SN54LS08 ★	835
			489-172
54LS09	Fairchild	54LS09	489-103
	Motorola	SN54LS09	489-107
	National	DM54LS09	489-109
	SGS	54LS09	489-112
	Signetics	54LS09	489-114
	TI	SN54LS09 ★	836
			489-116
54LS10	Fairchild	54LS10	491-9
	Motorola	SN54LS10	491-13
	National	DM54LS10	491-15
	SGS	54LS10	491-17
	Signetics	54LS10	491-19
	TI	SN54LS10 ★	836
			491-21
54LS104			
	TI	SN54LS104	506-7
54LS105			
	TI	SN54LS105	506-8
54LS107			
	Motorola	SN54LS107A	488-18
	National	DM54LS107A	488-22
	Signetics	54LS107	488-26
	TI	SN54LS107A ★	869
			488-30
54LS109			
	Fairchild	54LS109	487-134
	Motorola	SN54LS109A	487-138
	National	DM54LS109	487-140
	SGS	54LS109	487-142
	Signetics	54LS109	487-144
	TI	SN54LS109A ★	870
			487-146
54LS11	Fairchild	54LS11	489-64
	Motorola	SN54LS11	489-67
	National	DM54LS11	489-69
	SGS	54LS11	489-71
	Signetics	54LS11	489-73
	TI	SN54LS11 ★	836
			489-75
54LS112			
	Fairchild	54LS112	488-114
	Motorola	SN54LS112A	488-118
	National	DM54LS112	488-120
	SGS	54LS112	488-147
	Signetics	54LS112	488-122
	TI	SN54LS112A ★	871
			488-124
54LS113			
	Fairchild	54LS113	488-75
	Motorola	SN54LS113A	488-79
	National	DM54LS113A	488-81
	SGS	54LS113	488-83
	Signetics	54LS113	488-85
	TI	SN54LS113A ★	871
			488-87
54LS114			
	Fairchild	54LS114	488-139
	Motorola	SN54LS114A	488-143
	National	DM54LS114A	488-145
	SGS	T54LS114	488-149
	TI	SN54LS114A	488-151
54LS12	Motorola	SN54LS12	490-159
	National	DM54LS12	490-161
	TI	SN54LS12 ★	837
			490-163
54LS122			
	Motorola	SN54LS122	500-127
	National	DM54LS122	500-129
	TI	SN54LS122 ★	873
			500-131
54LS123			
	Motorola	SN54LS123	500-168
	National	DM54LS123	500-170
	TI	SN54LS123 ★	874
54LS123			
	TI	SN54LS123	500-172
			¶ 237-11
54LS125			
	Motorola	SN54LS125A	476-145
	National	DM54LS125A	476-147
	SGS	54LS125A	476-149
	Signetics	54LS125A	476-151
	TI	SN54LS125A ★	875
			476-153
54LS126			
	Fairchild	54LS126	476-117
	Motorola	SN54LS126A	476-120
	National	DM54LS126	476-122
	SGS	54LS126	476-124
	Signetics	54LS126A	476-126
	TI	SN54LS126A	476-128
54LS13	Fairchild	54LS13	507-81
	Motorola	SN54LS13	507-85
	National	DM54LS13	507-87
	SGS	T54LS13	507-91
	Signetics	54LS13	507-93
	TI	SN54LS13 ★	837
			507-95
54LS132			
	Motorola	SN54LS132	507-132
	National	DM54LS132	507-134
	SGS	54LS132	507-89
	Signetics	54LS132	507-136
	TI	SN54LS132 ★	877
			507-138
54LS133			
	Fairchild	54LS133	492-119
	Motorola	SN54LS133	492-122
	SGS	54LS133	492-124
54LS136			
	Fairchild	54LS136	494-172
	Motorola	SN54LS136	494-176
	National	DM54LS136	494-178
	SGS	54LS136	494-180
	Signetics	54LS136	494-182
	TI	SN54LS136 ★	878
			495-1
54LS137			
	TI	SN54LS137 ★	879
			484-13
54LS138			
	AMD	SN54LS138	483-168
	Fairchild	54LS138	483-169
	Motorola	SN54LS138	483-173
	National	DM54LS138	483-175
	SGS	54LS138	483-177
	Signetics	54LS138	483-179
	TI	SN54LS138 ★	880
			483-181
54LS139			
	AMD	SN54LS139	483-66
	Fairchild	54LS139	483-67
	Motorola	SN54LS139	483-70
	National	DM54LS139	483-72
	SGS	54LS139	483-74
	Signetics	54LS139	483-76
	TI	SN54LS139 ★	880
			483-78
54LS14	Fairchild	54LS14	507-159
	Motorola	SN54LS14	507-163
	National	DM54LS14	507-165
	SGS	54LS14	507-167
	Signetics	54LS14	507-169
	TI	SN54LS14 ★	837
			507-171
54LS145			
	TI	SN54LS145 ★	882
			482-151
54LS147			
	TI	SN54LS147 ★	882
			509-35
54LS148			
	AMD	SN54LS148	508-147
	TI	SN54LS148 ★	883
			508-149
54LS15	Fairchild	54LS15	489-17
	Motorola	SN54LS15	489-21
	National	DM54LS15	489-23
	SGS	54LS15	489-25
	TI	SN54LS15 ★	838
			489-27

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
54LS151			
	AMD	SN54LS151	499-167
	Fairchild	54LS151	499-168
	Motorola	SN54LS151	499-172
	National	DM54LS151	499-174
	SGS	54LS151	499-176
	Signetics	54LS151	499-178
	TI	**SN54LS151** ★	**884**
			499-180
54LS152			
	Fairchild	54LS152	500-11
	Motorola	SN54LS152	500-13
	TI	**SN54LS152** ★	**884**
			500-16
		SN54LS152A ★	**884**
			500-17
54LS153			
	AMD	SN54LS153	498-39
	Fairchild	54LS153	498-40
	Motorola	SN54LS153	498-44
	National	DM54LS153	498-46
	SGS	54LS153	498-48
	Signetics	54LS153	498-50
	TI	**SN54LS153** ★	**884**
			498-52
54LS154			
	National	DM54LS154	484-40
	Signetics	54LS154	484-42
54LS155			
	Fairchild	54LS155	483-133
	Motorola	SN54LS155	483-136
	National	DM54LS155	483-138
	SGS	54LS155	483-140
	Signetics	54LS155	483-142
	TI	**SN54LS155** ★	**886**
			483-144
54LS156			
	Fairchild	54LS156	483-101
	Motorola	SN54LS156	483-104
	National	DM54LS156	483-106
	SGS	54LS156	483-108
	Signetics	54LS156	483-110
	TI	**SN54LS156** ★	**886**
			483-112
54LS157			
	AMD	SN54LS157	499-36
	Fairchild	54LS157	499-37
	Motorola	SN54LS157	499-41
	National	DM54LS157	499-43
	SGS	54LS157	499-45
	Signetics	54LS157	499-47
	TI	**SN54LS157** ★	**887**
			499-49
54LS158			
	AMD	SN54LS158	498-130
	Fairchild	54LS158	498-131
	Motorola	SN54LS158	498-135
	National	DM54LS158	498-137
	SGS	54LS158	498-139
	Signetics	54LS158	498-141
	TI	**SN54LS158** ★	**887**
			498-143
54LS160			
	AMD	SN54LS160	480-159
	Motorola	SN54LS160A	480-162
	National	DM54LS160A	480-164
	SGS	54LS160	480-166
	Signetics	54LS160A	480-168
	TI	**SN54LS160A** ★	**889**
			480-170
54LS161			
	Fairchild	54LS161	478-137
	Motorola	SN54LS161A	478-140
	National	DM54LS161A	478-142
	SGS	54LS161	478-144
	Signetics	54LS161A	478-146
	TI	**SN54LS161A** ★	**889**
			478-148
54LS162			
	AMD	SN54LS162	481-18
	Motorola	SN54LS162A	481-21
	National	DM54LS162	481-23
	SGS	54LS162	481-25
	Signetics	54LS162A	481-27
	TI	**SN54LS162A** ★	**890**
			481-29
54LS163			
	AMD	SN54LS163	478-182
	National	DM54LS163A	479-1
	TI	**SN54LS163** ★	**890**
54LS164			
	AMD	SN54LS164	502-32
			3490-101
	Fairchild	54LS164	502-33
			3490-103
	Motorola	SN54LS164	502-37
			3490-110
	National	DM54LS164	502-39
			3490-113
	SGS	54LS164	502-41
	Signetics	54LS164	502-43
			3490-119
	TI	**SN54LS164** ★	**891**
			502-45
		★	**891**
			3490-123
54LS165			
	Fairchild	54LS165	502-79
			3490-57
	Motorola	SN54LS165	502-82
			3490-61
	TI	**SN54LS165** ★	**891**
			502-84
		★	**891**
			3490-68
54LS166			
	Motorola	SN54LS166	502-100
	National	DM54LS166	502-102
	TI	**SN54LS166** ★	**891**
			502-104
		★	**891**
			3490-69
54LS168			
	AMD	SN54LS168A	481-102
	Fairchild	54LS168	481-103
	Motorola	SN54LS168	481-106
	National	DM54LS168A	481-108
	SGS	T54LS168	481-110
	Signetics	54LS168A	481-112
	TI	SN54LS168	481-115
54LS169			
	AMD	SN54LS169A	479-101
	Fairchild	54LS169	479-102
	Motorola	SN54LS169	479-105
	National	DM54LS169A	479-107
	SGS	T54LS169	479-109
	Signetics	54LS169A	479-111
	TI	SN54LS169	479-113
		SN54LS169A	479-114
54LS170			
	Fairchild	54LS170	497-3
			3470-45
	Motorola	SN54LS170	3470-50
	National	DM54LS170	497-7
			3470-53
	SGS	54LS170	497-9
	Signetics	54LS170	3470-56
	TI	**SN54LS170** ★	**893**
			497-12
		★	**893**
			3470-59
54LS171			
	TI	**SN54LS171** ★	**893**
			485-174
54LS173			
	Fairchild	54LS173A	486-32
	Motorola	SN54LS173A	486-34
	National	DM54LS173	486-36
	Signetics	54LS173	486-38
	TI	**SN54LS173A** ★	**894**
			486-40
54LS174			
	AMD	SN54LS174	486-64
	Fairchild	54LS174	486-65
	National	DM54LS174	486-70
	SGS	54LS174	486-72
	Signetics	54LS174	486-74
	TI	**SN54LS174** ★	**895**
			486-76
54LS175			
	AMD	SN54LS175	485-132
	Fairchild	54LS175	485-133
	Motorola	SN54LS175	485-137
54LS175			
	National	DM54LS175	485-139
	SGS	54LS175	485-141
	Signetics	54LS175	485-143
	TI	**SN54LS175** ★	**895**
			485-145
54LS18	**TI**	**SN54LS18** ★	**839**
			507-96
54LS181			
	AMD	SN54LS181	475-36
	Fairchild	54LS181	475-39
	Motorola	SN54LS181	475-42
	SGS	54LS181	475-44
	Signetics	54LS181	475-46
	TI	**SN54LS181** ★	**897**
			475-48
54LS183			
	TI	**SN54LS183** ★	**898**
			474-155
54LS189			
	Fairchild	54LS189	3471-65
	Motorola	SN54LS189	3471-66
	TI	**SN54LS189A** ★	**440**
		★	**900**
			3471-87
54LS19	**TI**	**SN54LS19** ★	**839**
			507-172
54LS190			
	AMD	SN54LS190	482-6
	Motorola	SN54LS190	482-9
	National	DM54LS190	482-11
	SGS	54LS190	482-13
	Signetics	54LS190	482-15
	TI	**SN54LS190** ★	**901**
			482-16
54LS191			
	AMD	SN54LS191	479-152
	Motorola	SN54LS191	479-155
	National	DM54LS191	479-157
	SGS	54LS191	479-159
	Signetics	54LS191	479-161
	TI	**SN54LS191** ★	**901**
			479-163
54LS192			
	AMD	SN54LS192	481-149
	Fairchild	54LS192	481-150
	Motorola	SN54LS192	481-153
	National	DM54LS192	481-155
	SGS	54LS192	481-157
	Signetics	54LS192	481-159
	TI	**SN54LS192** ★	**902**
			481-161
54LS193			
	AMD	SN54LS193	480-14
	Fairchild	54LS193	480-15
	Motorola	SN54LS193	480-18
	National	DM54LS193	480-20
	SGS	54LS193	480-22
	Signetics	54LS193	480-24
	TI	**SN54LS193** ★	**902**
			480-26
54LS194			
	AMD	SN54LS194A	501-158
	Fairchild	54LS194A	501-159
			3488-103
	Motorola	SN54LS194A	501-162
			3488-130
	National	DM54LS194A	501-164
	Signetics	54LS194A	501-166
	TI	**SN54LS194A** ★	**902**
			501-168
		★	**902**
			3488-93
54LS195			
	AMD	SN54LS195A	501-55
			3488-101
	Fairchild	54LS195	501-56
		54LS195A	3488-104
	Motorola	SN54LS195A	501-60
			3489-1
	National	DM54LS195A	501-62
	Signetics	54LS195A	3489-16
	TI	**SN54LS195A** ★	**903**
			501-65
		★	**903**
			3489-20
54LS196			
	Fairchild	54LS196	480-108
	Motorola	SN54LS196	480-111
	National	DM54LS196	480-113
	S&S	54LS196	480-115
	TI	**SN54LS196** ★	**903**
			480-117
54LS197			
	Fairchild	54LS197	478-71
	Motorola	SN54LS197	478-74
	National	DM54LS197	478-76
	SGS	54LS197	478-78
	TI	**SN54LS197** ★	**904**
			478-81
54LS20	Fairchild	54LS20	490-119
	Motorola	SN54LS20	490-123
	National	DM54LS20	490-125
	SGS	54LS20	490-127
	Signetics	54LS20	490-129
	TI	**SN54LS20** ★	**839**
			490-131
54LS21	Fairchild	54LS21	488-181
	Motorola	SN54LS21	489-1
	National	DM54LS21	489-3
	SGS	54LS21	489-5
	Signetics	54LS21	489-7
	TI	**SN54LS21** ★	**840**
			489-9
54LS210			
	MMI	**SN54LS210** ★	**715**
			503-137
54LS211			
	TI	SN54LS211	3471-116
54LS212			
	TI	SN54LS212	3471-117
54LS213			
	TI	SN54LS213	3471-120
54LS216			
	TI	SN54LS216	3472-23
54LS217			
	TI	SN54LS217	3472-24
54LS218			
	TI	SN54LS218	3471-125
54LS219			
	TI	**SN54LS219A** ★	**440**
		★	**906**
			3471-88
54LS22	Fairchild	54LS22	490-63
	Motorola	SN54LS22	490-67
	National	DM54LS22	490-69
	SGS	54LS22	490-71
	TI	**SN54LS22** ★	**840**
			490-73
54LS221			
	Motorola	SN54LS221	500-143
	National	DM54LS221	500-145
	Signetics	54LS221	500-147
	TI	**SN54LS221** ★	**906**
			500-148
54LS222			
	TI	**SN54LS222** ★	**907**
			3456-3
54LS224			
	TI	**SN54LS224** ★	**907**
			3456-4
54LS227			
	TI	**SN54LS227** ★	**909**
			3456-7
54LS228			
	TI	**SN54LS228** ★	**909**
			3456-8
54LS24	**TI**	**SN54LS24** ★	**841**
			507-139
54LS240			
	AMD	SN54LS240	503-131
			2470-64
	Fairchild	54LS240	503-133
			2470-69
	MMI	**SN54LS240** ★	**715**
			503-138
		★	**715**
			2471-6
	Motorola	SN54LS240	503-143
			2471-11
	National	DM54LS240	503-147
	Signetics	54LS240	503-159
	TI	**SN54LS240** ★	**910**

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
54LS240			
	TI	SN54LS240	503-150
			★ 910
			2471-21
54LS241			
	AMD	SN54LS241	504-41
			2470-7
	Fairchild	54LS241	504-43
			2470-15
	MMI	SN54LS241	★ 715
			504-48
			★ 715
			2470-23
	Motorola	SN54LS241	504-54
			2470-37
	National	DM54LS241	504-58
	TI	SN54LS241	★ 911
			504-65
			★ 911
			2470-52
54LS242			
	AMD	SN54LS242	503-70
			2476-27
	Fairchild	54LS242	2476-31
	Motorola	SN54LS242	503-78
			2476-33
	National	DM54LS242	503-82
	TI	SN54LS242	★ 911
			503-88
			★ 911
			2476-37
54LS243			
	AMD	SN54LS243	503-71
			2476-28
	Fairchild	54LS243	2476-32
	Motorola	SN54LS243	503-79
			2476-34
	National	DM54LS243	503-83
	TI	SN54LS243	★ 912
			503-89
			★ 912
			2476-38
54LS244			
	AMD	SN54LS244	503-178
			2470-8
	Fairchild	54LS244	503-180
	MMI	SN54LS244	★ 715
			504-3
			★ 715
			2470-24
	Motorola	SN54LS244	504-7
			2470-38
	National	DM54LS244	504-59
	Signetics	54LS244	504-9
	TI	SN54LS244	★ 912
			504-11
			★ 912
			2470-53
54LS245			
	Fairchild	54LS245	504-186
			2479-15
	MMI	SN54LS245	★ 715
			505-1
			★ 715
			2470-25
	Motorola	SN54LS245	505-7
			2479-16
	National	DM54LS245	505-11
	Signetics	54LS245	★ 779
			505-13
	TI	SN54LS245	★ 913
			505-19
54LS247			
	Fairchild	54LS247	2463-148
	Motorola	SN54LS247	2463-159
	National	DM54LS247	2463-164
	TI	SN54LS247	★ 913
			2463-173
		SN54LS247A	★ 913
			2463-174
54LS248			
	Motorola	SN54LS248	2463-117
	National	DM54LS248	2463-122
	TI	SN54LS248	★ 914
			2463-132
54LS249			
	Fairchild	54LS249	2463-80
	Motorola	SN54LS249	2463-87
	National	DM54LS249	2463-91
	TI	SN54LS249	★ 914
			2463-98
54LS251			
	AMD	SN54LS251	500-47
	Fairchild	54LS251	500-48
	Motorola	SN54LS251	500-52
	National	DM54LS251	500-54
	SGS	54LS251	500-56
	Signetics	54LS251	500-67
		54LS251A	500-58
	TI	SN54LS251	★ 915
			500-60
			★ 915
			1098-97
54LS253			
	AMD	SN54LS253	497-150
	Fairchild	54LS253	497-151
	Motorola	SN54LS253	497-155
	National	DM54LS253	497-157
	SGS	54LS253	497-159
	Signetics	54LS253	497-161
	TI	SN54LS253	498-2
54LS256			
	Fairchild	54LS256	495-89
	Motorola	SN54LS256	495-92
	SGS	T54LS256	495-94
	Signetics	54LS256	498-100
54LS257			
	AMD	SN54LS257	498-168
	Motorola	SN54LS257A	498-172
	National	DM54LS257B	498-174
	SGS	54LS257	498-176
	Signetics	54LS257	498-178
	TI	SN54LS257A	★ 916
			498-180
54LS258			
	AMD	SN54LS258	498-90
	Motorola	SN54LS258A	498-94
	National	DM54LS258B	498-96
	SGS	54LS258	498-98
	Signetics	54LS258	498-101
	TI	SN54LS258A	★ 917
			498-103
54LS259			
	Fairchild	54LS259	496-35
	Motorola	SN54LS259	496-38
	National	DM54LS259	496-40
	SGS	54LS259	496-42
	Signetics	54LS259	496-44
	TI	SN54LS259	★ 917
			496-46
			★ 917
			1098-82
54LS26	Fairchild	54LS26	491-69
	Motorola	SN54LS26	491-71
	National	DM54LS26	491-73
	Signetics	54LS26	491-76
	TI	SN54LS26	★ 841
			491-78
54LS260			
	Fairchild	54LS260	494-14
	Motorola	SN54LS260	494-16
	SGS	T54LS260	494-18
	Signetics	54LS260A	494-20
	TI	SN54LS260A	494-22
54LS261			
	Signetics	54LS261	475-105
	TI	SN54LS261	★ 918
			475-106
54LS266			
	Fairchild	54LS266	495-70
	Motorola	SN54LS266	495-73
	National	DM54LS266	495-75
	SGS	54LS266	495-77
	TI	SN54LS266	★ 918
			495-81
54LS27	Fairchild	54LS27	494-49
	Motorola	SN54LS27	494-53
	National	DM54LS27	494-55
	SGS	54LS27	494-57
	Signetics	54LS27	494-59
	TI	SN54LS27	★ 842
			494-61
54LS273			
	AMD	SN54LS273	★ 1227
			486-155
	Fairchild	54LS273	486-157
	MMI	SN54LS273	★ 715
			486-160
	Motorola	SN54LS273	486-162
	Signetics	54LS273	486-165
	TI	SN54LS273	★ 919
			486-167
54LS275			
	TI	SN54LS275	★ 920
			476-94
54LS279			
	Fairchild	54LS279	495-168
	Motorola	SN54LS279	495-172
	National	DM54LS279	495-174
	SGS	54LS279	495-176
	Signetics	54LS279	495-178
	TI	SN54LS279	★ 921
			495-179
54LS28	Fairchild	54LS28	494-120
	Motorola	SN54LS28	494-126
	SGS	T54LS28	494-133
	Signetics	54LS28	494-136
	TI	SN54LS28	★ 842
			494-139
54LS280			
	TI	SN54LS280	★ 921
			509-11
54LS283			
	Fairchild	54LS283	476-64
	Motorola	SN54LS283	476-71
	National	DM54LS283	476-75
	SGS	54LS283	476-79
	Signetics	54LS283	476-83
	TI	SN54LS283	★ 922
			476-87
54LS289			
	Fairchild	54LS289	3471-61
	Motorola	SN54LS289	3471-63
	TI	SN54LS289A	★ 440
			★ 924
			3471-79
54LS290			
	Fairchild	54LS290	480-57
	Motorola	SN54LS290	480-59
	National	DM54LS290	480-63
	SGS	54LS290	480-67
	Signetics	54LS290	480-71
	TI	SN54LS290	★ 924
			480-75
54LS292			
	TI	SN54LS292	★ 924
			482-89
54LS293			
	Fairchild	54LS293	479-46
	Motorola	SN54LS293	479-52
	National	DM54LS293	479-56
	SGS	54LS293	479-60
	Signetics	54LS293	479-64
	TI	SN54LS293	★ 925
			479-68
54LS294			
	TI	SN54LS294	★ 925
			482-76
54LS295			
	Fairchild	54LS295A	3488-105
	Motorola	SN54LS295A	501-26
			3489-2
	SGS	54LS295A	501-28
	Signetics	54LS295B	501-30
	TI	SN54LS295B	★ 925
			501-32
			★ 925
			3489-21
54LS297			
	TI	SN54LS297	★ 926
			506-176
			★ 926
			2945-41
54LS298			
	AMD	SN54LS298	499-84
	Fairchild	54LS298	499-87
	Motorola	SN54LS298	499-93
	National	DM54LS298	499-99
	SGS	54LS298	499-101
54LS298			
	Signetics	54LS298	499-103
	TI	SN54LS298	★ 926
			499-105
54LS299			
	AMD	SN54LS299	★ 1227
			502-158
			★ 1227
			3489-131
	Fairchild	54LS299	502-162
			3490-23
	Motorola	SN54LS299	502-169
	TI	SN54LS299	★ 927
			502-173
			★ 927
			3490-27
54LS30	Fairchild	54LS30	492-88
	Motorola	SN54LS30	492-92
	National	DM54LS30	492-94
	SGS	54LS30	492-96
	Signetics	54LS30	492-98
	TI	SN54LS30	★ 842
			492-100
54LS301			
	Signetics	S54LS301	497-60
			3473-17
54LS31	TI	SN54LS31	★ 843
			506-19
54LS310			
	MMI	SN54LS310	★ 715
			504-49
54LS311			
	TI	SN54LS311	3471-112
54LS312			
	TI	SN54LS312	3471-113
54LS313			
	TI	SN54LS313	3470-86
54LS316			
	TI	SN54LS316	3472-19
54LS317			
	TI	SN54LS317	3472-20
54LS318			
	TI	SN54LS318	3471-123
54LS319			
	TI	SN54LS319A	★ 440
			★ 929
			3471-80
54LS32	Fairchild	54LS32	493-146
	Motorola	SN54LS32	493-150
	National	DM54LS32	493-152
	SGS	54LS32	493-154
	Signetics	54LS32	493-156
	TI	SN54LS32	★ 843
			493-158
54LS320			
	TI	SN54LS320	★ 929
			506-171
54LS321			
	TI	SN54LS321	★ 929
			506-172
54LS322			
	AMD	SN54LS322	476-100
	Motorola	SN54LS322	476-102
	TI	SN54LS322A	★ 930
			476-104
54LS323			
	AMD	SN54LS323	502-159
			3490-21
	Fairchild	54LS323	502-163
			3490-24
	Motorola	SN54LS323	502-170
	TI	SN54LS323	★ 930
			502-174
			★ 930
			3490-28
54LS324			
	TI	SN54LS324	2945-163
54LS325			
	TI	SN54LS325	507-50
			2946-34
54LS326			
	TI	SN54LS326	507-51
			2946-35
54LS327			
	TI	SN54LS327	507-52
			2946-36
54LS33	Fairchild	54LS33	494-71
	Motorola	SN54LS33	494-73

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
54LS33	SGS	T54LS33	494-75
	Signetics	54LS33	494-77
	TI	**SN54LS33**	★ **843**
			494-79
54LS333			
	TI	FP54LS333	506-103
			3457-89
		SN54LS333	3458-11
54LS334			
	TI	SN54LS334	3458-12
54LS335			
	TI	FP54LS335	506-104
			3457-87
		SN54LS335	3458-7
54LS336			
	TI	SN54LS336	3458-8
54LS341			
	MMI	**SN54LS341**	★ **715**
54LS340			
	MMI	**SN54LS340**	★ **715**
			503-139
			★ **715**
			2471-7
54LS341			
	MMI	**SN54LS341**	★ **715**
			504-50
			★ **715**
			2470-26
54LS344			
	MMI	**SN54LS344**	★ **715**
			504-4
			★ **715**
			2470-27
54LS347			
	Fairchild	54LS347	2463-138
	TI	**SN54LS347**	★ **931**
			2463-143
54LS348			
	TI	**SN54LS348**	★ **931**
			508-150
54LS352			
	Fairchild	54LS352	497-126
	Motorola	SN54LS352	497-129
	National	DM54LS352	497-131
	SGS	T54LS352	497-133
	TI	**SN54LS352**	★ **932**
			497-135
54LS353			
	Fairchild	54LS353	497-94
	Motorola	SN54LS353	497-97
	National	DM54LS353	497-99
	SGS	T54LS353	497-101
	TI	**SN54LS353**	★ **933**
			497-103
54LS354			
	TI	**SN54LS354**	★ **933**
			500-26
54LS355			
	TI	**SN54LS355**	★ **934**
			500-22
54LS356			
	TI	**SN54LS356**	★ **934**
			500-27
54LS357			
	TI	**SN54LS357**	★ **935**
			500-23
54LS360			
	TI	SN54LS360	505-161
54LS361			
	TI	SN54LS361	505-160
54LS362			
	TI	SN54LS362	1098-91
54LS363			
	Signetics	54LS363	496-84
54LS365			
	Fairchild	54LS365	178
			485-25
	Motorola	SN54LS365A	477-4
	National	DM54LS365A	477-8
	SGS	54LS365	477-12
	Signetics	54LS365A	477-16
	TI	**SN54LS365A**	★ **935**
			477-20
			★ **935**
			2471-28
54LS366			
	Fairchild	54LS366	477-121
54LS366			
	Motorola	SN54LS366A	477-128
	National	DM54LS366A	477-132
	SGS	54LS366	477-136
	Signetics	54LS366A	477-140
	TI	**SN54LS366A**	★ **935**
			477-144
			★ **935**
			2471-32
54LS367			
	Fairchild	54LS367	179
			485-25
	Motorola	SN54LS367A	477-5
	National	DM54LS367A	477-9
	SGS	54LS367	477-13
	Signetics	54LS367A	477-17
	TI	**SN54LS367A**	★ **936**
			477-21
			★ **936**
			2471-29
54LS368			
	Fairchild	54LS368	477-122
	Motorola	SN54LS368A	477-129
	National	DM54LS368A	477-133
	SGS	54LS368	477-137
	Signetics	54LS368A	477-141
	TI	**SN54LS368A**	★ **936**
			477-145
			★ **936**
			2471-33
54LS37	Fairchild	54LS37	491-101
	Motorola	SN54LS37	491-105
	National	DM54LS37	491-107
	SGS	54LS37	491-109
	Signetics	54LS37	491-111
	TI	**SN54LS37**	★ **844**
			491-113
54LS373			
	AMD	**SN54LS373**	★**1227**
			496-70
	MMI	**SN54LS373**	★ **715**
			496-75
	Motorola	SN54LS373	496-77
	National	DM54LS373	496-81
	Signetics	**54LS373**	★ **783**
			496-85
	TI	**SN54LS373**	★ **937**
			496-90
54LS374			
	AMD	**SN54LS374**	★**1227**
			487-9
	MMI	**SN54LS374**	★ **715**
			487-14
	Motorola	SN54LS374	487-16
	National	DM54LS374	487-20
	Signetics	**54LS374**	★ **783**
			487-23
	TI	**SN54LS374**	★ **938**
			487-25
54LS375			
	Fairchild	54LS375	495-130
	Motorola	SN54LS375	495-135
	Signetics	54LS375	495-141
	TI	**SN54LS375**	★ **938**
			495-145
54LS377			
	AMD	**SN54LS377**	★**1227**
			487-45
	Fairchild	54LS377	487-47
	MMI	**SN54LS377**	★ **715**
			487-50
	Motorola	SN54LS377	487-52
	National	DM54LS377	495-153
	Signetics	54LS377	487-55
	TI	**SN54LS377**	★ **939**
			487-57
54LS378			
	AMD	SN54LS378	486-93
	Fairchild	54LS378	486-95
	Motorola	SN54LS378	486-97
	SGS	T54LS378	486-99
	Signetics	54LS378	486-101
	TI	**SN54LS378**	★ **939**
			486-103
54LS379			
	AMD	SN54LS379	486-1
	Fairchild	54LS379	486-3
54LS379			
	Motorola	SN54LS379	486-5
	SGS	T54LS379	486-7
	TI	SN54LS379	486-9
54LS38	Fairchild	54LS38	491-53
	Motorola	SN54LS38	491-57
	National	DM54LS38	491-59
	SGS	54LS38	491-189
	Signetics	54LS38	491-61
	TI	**SN54LS38**	★ **844**
			491-63
54LS380			
	MMI	SN54LS380	502-140
54LS381			
	AMD	**SN54LS381**	★**1227**
			475-37
	TI	**SN54LS381**	★ **940**
			475-49
54LS382			
	TI	**SN54LS382**	★ **941**
			475-50
54LS384			
	AMD	SN54LS384	475-164
	Motorola	SN54LS384	475-166
	TI	**SN54LS384**	★ **941**
			476-1
54LS385			
	AMD	SN54LS385	474-9
	Motorola	SN54LS385	474-11
	TI	**SN54LS385**	★ **942**
			474-13
54LS386			
	Motorola	SN54LS386	495-37
	National	DM54LS386	495-41
	TI	**SN54LS386**	★ **942**
			495-48
54LS388			
	AMD	SN54LS388	485-168
54LS390			
	Fairchild	54LS390	481-44
	Motorola	SN54LS390	481-48
	National	DM54LS390	481-52
	SGS	T54LS390	481-54
	Signetics	54LS390	481-58
	TI	**SN54LS390**	★ **943**
			481-62
54LS393			
	Fairchild	54LS393	479-10
	Motorola	SN54LS393	479-13
	National	DM54LS393	479-15
	SGS	T54LS393	479-17
	Signetics	54LS393	479-19
	TI	**SN54LS393**	★ **943**
			479-21
54LS395			
	Fairchild	54LS395	3488-106
	Motorola	SN54LS395	3489-3
		SN54LS395A	501-123
	SGS	T54LS395	501-125
			3489-14
	Signetics	54LS395A	501-127
	TI	**SN54LS395A**	★ **943**
			501-129
			★ **943**
			3489-22
54LS396			
	TI	**SN54LS396**	★ **944**
			496-155
54LS398			
	Motorola	SN54LS398	499-94
	TI	**SN54LS398**	★ **944**
			499-106
54LS399			
	AMD	SN54LS399	499-85
	Motorola	SN54LS399	499-95
	TI	**SN54LS399**	★ **944**
			499-107
54LS40	Fairchild	54LS40	490-23
	Motorola	SN54LS40	490-27
	National	DM54LS40	490-29
	SGS	54LS40	490-31
	Signetics	54LS40	490-33
	TI	**SN54LS40**	★ **845**
			490-35
54LS42	Fairchild	54LS42	483-26
	Motorola	SN54LS42	483-29
	National	DM54LS42	483-31
	SGS	54LS42	483-33
54LS42	Signetics	54LS42	483-35
	TI	**SN54LS42**	★ **845**
			483-37
54LS422			
	TI	**SN54LS422**	★ **945**
			500-116
54LS423			
	TI	**SN54LS423**	★ **945**
			500-150
54LS424			
	TI	SN54LS424	1094-107
54LS440			
	TI	**SN54LS440**	★ **947**
			2476-8
54LS441			
	TI	**SN54LS441**	★ **947**
			2476-9
54LS442			
	TI	**SN54LS442**	★ **947**
			503-100
			★ **947**
			2476-11
54LS443			
	TI	**SN54LS443**	★ **947**
			503-101
			★ **947**
			2476-12
54LS444			
	TI	**SN54LS444**	★ **947**
			503-102
			★ **947**
			2476-13
54LS445			
	Signetics	54LS445	482-125
	TI	**SN54LS445**	★ **947**
			482-127
54LS446			
	TI	**SN54LS446**	★ **950**
			2476-39
54LS447			
	TI	**SN54LS447**	★ **950**
			2463-144
54LS448			
	TI	**SN54LS448**	★ **951**
			503-103
			★ **951**
			2476-10
54LS449			
	TI	**SN54LS449**	★ **951**
			2476-40
54LS450			
	MMI	SN54LS450	500-87
54LS451			
	MMI	SN54LS451	498-64
54LS453			
	MMI	SN54LS453	499-119
54LS461			
	MMI	SN54LS461	482-83
54LS465			
	TI	**SN54LS465**	★ **952**
			477-46
54LS466			
	TI	**SN54LS466**	★ **952**
			478-35
54LS467			
	TI	**SN54LS467**	★ **952**
			477-47
54LS468			
	TI	**SN54LS468**	★ **952**
			478-36
54LS47	Motorola	SN54LS47	2463-160
	National	DM54LS47	2463-165
	TI	**SN54LS47**	★ **847**
			2463-175
54LS471			
	National	**DM54LS471**	★**3850**
			3460-28
54LS48	Fairchild	54LS48	2463-105
	Motorola	SN54LS48	2463-118
	National	DM54LS48	2463-123
	TI	**SN54LS48**	★ **847**
			2463-133
54LS49	Motorola	SN54LS49	2463-88
	National	DM54LS49	2463-92
	TI	**SN54LS49**	★ **847**
			2463-99

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
54LS490			
	Fairchild	54LS490	481-45
	Motorola	SN54LS490	481-49
	SGS	T54LS490	481-55
	Signetics	54LS490	481-59
	TI	**SN54LS490**	★ **955** 481-63
54LS491			
	MMI	SN54LS491	482-86
54LS498			
	MMI	SN54LS498	502-138
54LS502			
	Motorola	SN54LS502	508-120
54LS503			
	Fairchild	54LS503	508-117
	Motorola	SN54LS503	508-121
54LS504			
	Motorola	SN54LS504	509-43
54LS51	Fairchild	54LS51	492-187
	Motorola	SN54LS51	493-1
	National	DM54LS51	493-3
	Signetics	54LS51	493-7
	TI	**SN54LS51**	★ **848** 493-9
54LS533			
	AMD	**SN54LS533**	★**1227** 496-128
	MMI	**SN54LS533**	★ **715** 496-131
54LS534			
	AMD	**SN54LS534**	★**1227** 486-133
	MMI	**SN54LS534**	★ **715** 486-136
54LS54	Fairchild	54LS54	493-86
	Motorola	SN54LS54	493-89
	National	DM54LS54	493-91
	SGS	54LS54	493-93
	Signetics	54LS54	493-95
	TI	**SN54LS54**	★ **850** 493-97
54LS540			
	Fairchild	54LS540	2471-1
	Motorola	SN54LS540	503-144 2471-12
	Signetics	**54LS540**	★**2775** 2471-17
	TI	**SN54LS540**	★ **960** 503-151 ★ **960** 2471-22
54LS541			
	Fairchild	54LS541	2470-16
	Motorola	SN54LS541	504-55 2470-39
	Signetics	**54LS541**	★**2775** 504-62
	TI	**SN54LS541**	★ **960** 504-66 ★ **960** 2470-54
54LS55	Fairchild	54LS55	493-31
	Motorola	SN54LS55	493-34
	National	DM54LS55	493-36
	SGS	54LS55	493-38
	TI	**SN54LS55**	★ **851** 493-40
54LS56	**TI**	**SN54LS56**	★ **851** 509-57
54LS568			
	Motorola	SN54LS568	481-122
54LS569			
	Motorola	SN54LS569	479-167
54LS57	**TI**	**SN54LS57**	★ **852** 509-59
54LS573			
	Motorola	SN54LS573	496-78
54LS574			
	Motorola	SN54LS574	487-17
54LS590			
	TI	**SN54LS590**	★ **966** 479-76
54LS591			
	TI	**SN54LS591**	★ **966** 479-77
54LS592			
	TI	**SN54LS592**	★ **967** 479-72
54LS593			
	TI	**SN54LS593**	★ **967** 479-73
54LS594			
	TI	**SN54LS594**	★ **968** 502-113
54LS595			
	TI	**SN54LS595**	★ **968** 502-114
54LS596			
	TI	**SN54LS596**	★ **968** 502-115
54LS597			
	TI	**SN54LS597**	★ **969** 502-106
54LS598			
	TI	**SN54LS598**	★ **969** 502-107
54LS599			
	TI	**SN54LS599**	★ **970** 502-116
54LS600			
	TI	**SN54LS600**	★ **440** ★ **971** 506-21
54LS601			
	TI	**SN54LS601**	★ **440** ★ **971** 506-22
54LS602			
	TI	**SN54LS602**	★ **440** ★ **972** 506-23
54LS603			
	TI	**SN54LS603**	★ **440** ★ **972** 506-24
54LS604			
	TI	**SN54LS604**	★ **973** 496-11
54LS605			
	TI	**SN54LS605**	★ **973** 496-12
54LS606			
	TI	**SN54LS606**	★ **973** 496-13
54LS607			
	TI	**SN54LS607**	★ **973** 496-14
54LS608			
	TI	**SN54LS608**	★ **974** 496-15
54LS610			
	TI	**SN54LS610**	★ **975** 506-143
54LS611			
	TI	**SN54LS611**	★ **975** 506-144
54LS612			
	TI	**SN54LS612**	★ **975** 506-145
54LS613			
	TI	**SN54LS613**	★ **975** 506-146
54LS620			
	TI	**SN54LS620**	★ **976** 2478-46
54LS621			
	TI	**SN54LS621**	★ **976** 2478-22
54LS622			
	TI	**SN54LS622**	★ **976** 2478-23
54LS623			
	Signetics	54LS623	505-111
	TI	**SN54LS623**	★ **976** 2478-47
54LS624			
	TI	**SN54LS624**	★ **977** 507-28 ★ **977** 2945-164
54LS625			
	TI	**SN54LS625**	★ **977** 507-57
54LS625			
	TI	**SN54LS625**	★ **977** 2946-37
54LS626			
	TI	**SN54LS626**	★ **977** 507-58 ★ **977** 2946-38
54LS627			
	TI	**SN54LS627**	★ **978** 507-59 ★ **978** 2946-39
54LS628			
	TI	**SN54LS628**	★ **978** 507-29 ★ **978** 2945-165
54LS629			
	TI	**SN54LS629**	★ **978** 507-60 ★ **978** 2946-40
54LS63	**TI**	**SN54LS63**	★ **853** 507-146
54LS630			
	TI	**SN54LS630**	★ **440** ★ **979** 2467-19 ¶ 285-8
54LS631			
	TI	**SN54LS631**	★ **440** ★ **979** 2467-20 ¶ 285-8
54LS632			
	TI	**SN54LS632**	★ **980**
54LS633			
	TI	**SN54LS633**	★ **980**
54LS634			
	TI	**SN54LS634**	★ **981**
54LS635			
	TI	**SN54LS635**	★ **981**
54LS636			
	TI	**SN54LS636**	★ **982**
54LS637			
	TI	**SN54LS637**	★ **982**
54LS638			
	TI	**SN54LS638**	★ **983**
54LS639			
	TI	**SN54LS639**	★ **983**
54LS640			
	Motorola	SN54LS640	504-131 2479-17
	TI	**SN54LS640**	★ **984** 504-137 ★ **984** 2478-48
54LS641			
	Motorola	SN54LS641	504-155 2479-11
	Signetics	**54LS641**	★**2772** 504-157 ★**2772** 2478-16
	TI	**SN54LS641**	★ **984** 504-160 ★ **984** 2478-24
54LS642			
	Motorola	SN54LS642	504-103 2479-12
	Signetics	**54LS642**	★**2772** 2478-17
	TI	**SN54LS642**	★ **984** 504-107 ★ **984** 2478-25
54LS643			
	TI	**SN54LS643**	★ **984** 504-138 ★ **984** 2478-49
54LS644			
	TI	**SN54LS644**	★ **984** 505-36 ★ **984** 2478-26
54LS645			
	MMI	**SN54LS645**	★ **715** 505-2 ★ **715** 2478-33
		SN54LS645-1	★ **715** 505-3 ★ **715** 2478-34
	Motorola	SN54LS645	505-8 2479-18
	Signetics	54LS645	505-14
	TI	**SN54LS645**	★ **984** 505-20 ★ **984** 2478-50
54LS646			
	TI	**SN54LS646**	★ **986** 2479-19
54LS647			
	TI	**SN54LS647**	★ **986** 2479-13
54LS648			
	TI	**SN54LS648**	★ **986** 2479-20
54LS649			
	TI	**SN54LS649**	★ **986** 2479-14
54LS651			
	TI	**SN54LS651**	★ **988** 505-21 505-65
54LS652			
	TI	**SN54LS652**	★ **988** 505-22 505-66
54LS653			
	TI	**SN54LS653**	★ **989**
54LS654			
	TI	**SN54LS654**	★ **989**
54LS668			
	TI	**SN54LS668**	★ **990** 481-116
54LS669			
	TI	**SN54LS669**	★ **990** 479-115
54LS670			
	Fairchild	54LS670	497-14 3470-62
	Motorola	SN54LS670	497-17 3470-64
	National	DM54LS670	497-19 3470-66
	SGS	54LS670	497-21
	Signetics	54LS670	497-23 3470-68
	TI	**SN54LS670**	★ **990** 497-25 ★ **990** 3470-70
54LS671			
	TI	**SN54LS671**	★ **991** 501-20
54LS672			
	TI	**SN54LS672**	★ **991** 501-21
54LS673			
	TI	**SN54LS673**	★ **992** 503-27
54LS674			
	TI	**SN54LS674**	★ **992** 503-25
54LS68	**TI**	**SN54LS68**	★ **854** 482-64
54LS681			
	TI	**SN54LS681**	★ **995** 476-16
54LS682			
	Motorola	SN54LS682	474-118
	TI	**SN54LS682**	★ **996** 474-127
54LS683			
	Motorola	SN54LS683	474-100
	TI	**SN54LS683**	★ **996** 474-108
54LS684			
	Motorola	SN54LS684	474-119

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
54LS684			
	TI	SN54LS684	★ 996
			474-128
54LS685			
	Motorola	SN54LS685	474-101
	TI	SN54LS685	★ 996
			474-109
54LS686			
	Motorola	SN54LS686	474-120
	TI	SN54LS686	★ 997
			474-129
54LS687			
	Motorola	SN54LS687	474-102
	TI	SN54LS687	★ 997
54LS688			
	Motorola	SN54LS688	474-121
	TI	SN54LS688	★ 998
			474-130
54LS689			
	Motorola	SN54LS689	474-103
	TI	SN54LS689	★ 998
			474-110
54LS69	TI	SN54LS69	★ 854
			482-62
54LS690			
	TI	SN54LS690	★ 999
			481-30
54LS691			
	TI	SN54LS691	★ 999
			478-93
54LS692			
	TI	SN54LS692	★ 999
			481-31
54LS693			
	TI	SN54LS693	★ 999
			478-94
54LS696			
	TI	SN54LS696	★1000
			481-84
54LS697			
	TI	SN54LS697	★1000
			479-81
54LS698			
	TI	SN54LS698	★1000
			481-85
54LS699			
	TI	SN54LS699	★1000
			479-82
54LS73	Motorola	SN54LS73A	488-19
	National	DM54LS73A	488-23
	Signetics	54LS73	488-27
	TI	SN54LS73A	★ 856
			488-31
54LS74	Fairchild	54LS74	485-88
	Motorola	SN54LS74A	485-92
	National	DM54LS74	485-94
	SGS	54LS74	485-96
	Signetics	54LS74A	485-98
	TI	SN54LS74A	★ 857
			485-100
54LS75	Motorola	SN54LS75	495-136
	National	DM54LS75	495-139
	Signetics	54LS75	495-142
	TI	SN54LS75	★ 858
			495-146
54LS76	Motorola	SN54LS76A	488-56
	National	DM54LS76	488-58
	Signetics	54LS76	488-60
	TI	SN54LS76A	★ 858
			488-62
54LS77	TI	SN54LS77	★ 859
			495-155
54LS78	Motorola	SN54LS78A	487-156
	National	DM54LS78	487-158
	TI	SN54LS78A	★ 859
			487-160
54LS83	Fairchild	54LS83	476-65
	Motorola	SN54LS83A	476-72
	National	DM54LS83A	476-76
	SGS	54LS83A	476-80
	Signetics	54LS83A	476-84
	TI	SN54LS83A	★ 861
			476-88
54LS85	Fairchild	54LS85	474-36
	Motorola	SN54LS85	474-49
	National	DM54LS85	474-52
	SGS	54LS85	474-55
54LS85	Signetics	54LS85	474-58
	TI	SN54LS85	474-63
54LS86	Motorola	SN54LS86	495-38
	National	DM54LS86	495-42
	SGS	54LS86	495-44
	Signetics	54LS86	495-46
	TI	SN54LS86	★ 862
			495-49
54LS89	Fairchild	54LS89	3471-62
	Motorola	SN54LS89	3471-64
54LS90	Motorola	SN54LS90	480-60
	National	DM54LS90	480-64
	SGS	54LS90	480-68
	Signetics	54LS90	480-72
	TI	SN54LS90	★ 864
			480-76
54LS91	TI	SN54LS91	★ 864
			502-136
			★ 864
			3491-14
54LS92	Motorola	SN54LS92	482-42
	National	DM54LS92	482-44
	SGS	54LS92	482-46
	Signetics	54LS92	482-48
	TI	SN54LS92	★ 864
			482-50
54LS93	Fairchild	54LS93	479-47
	Motorola	SN54LS93	479-53
	National	DM54LS93	479-57
	SGS	54LS93	479-61
	Signetics	54LS93	479-65
	TI	SN54LS93	★ 865
			479-69
54LS95	Fairchild	54LS95B	501-91
			3488-107
	Motorola	SN54LS95B	501-95
			3489-4
	SGS	54LS95B	501-97
	Signetics	54LS95B	501-99
	TI	SN54LS95B	★ 866
			501-101
			★ 866
			3488-94
54LS96	Signetics	54LS96	502-5
			3489-111
	TI	SN54LS96	★ 866
			502-7
			★ 866
			3489-116
54PL16L8			
	TI	SN54PL16L8	★1025
54PL16R6			
	TI	SN54PL16R6	★1026
54PL16R8			
	TI	SN54PL16R8	★1026
54PL20L8			
	TI	SN54PL20L8	★1027
54PL20R4			
	TI	SN54PL20R4	★1027
54PL20R6			
	TI	SN54PL20R6	★1028
54PL20R8			
	TI	SN54PL20R8	★1028
54PL333			
	TI	SN54PL333	★1029
54PL335			
	TI	SN54PL335	★1029
54PL839			
	TI	SN54PL839	★1030
54PL840			
	TI	SN54PL840	★1030
54PLR19L8			
	TI	SN54PLR19L8	★1031
54PLR19R4			
	TI	SN54PLR19R4	★1031
54PLR19R6			
	TI	SN54PLR19R6	★1032
54PLR19R8			
	TI	SN54PLR19R8	★1032
54PLT19L8			
	TI	SN54PLT19L8	★1033
54PLT19R4			
	TI	SN54PLT19R4	★1033
54PLT19R6			
	TI	SN54PLT19R6	★1034
54PLT19R8			
	TI	SN54PLT19R8	★1034
54S00	Fairchild	54S00	492-48
	National	DM54S00	492-51
	Signetics	54S00	492-53
	TI	SN54S00	★ 833
			492-55
54S02	Fairchild	54S02	494-142
	National	DM54S02	494-145
	Signetics	54S02	494-147
	TI	SN54S02	★ 833
			494-149
54S03	National	DM54S03	491-187
	TI	SN54S03	★ 834
			491-192
54S04	Fairchild	54S04	478-17
	National	DM54S04	478-20
	Signetics	54S04	478-22
	TI	SN54S04	★ 834
			478-25
54S05	Fairchild	54S05	477-96
	National	DM54S05	477-99
	Signetics	54S05	477-101
	TI	SN54S05	★ 834
			477-103
54S08	Fairchild	54S08	489-174
	National	DM54S08	489-176
	Signetics	54S08	489-178
	TI	SN54S08	★ 835
			489-180
54S09	Fairchild	54S09	489-118
	National	DM54S09	489-119
	TI	SN54S09	★ 836
			489-120
54S10	Fairchild	54S10	491-23
	National	DM54S10	491-26
	Signetics	54S10	491-28
	TI	SN54S10	★ 836
			491-30
54S109	Fairchild	54S109	487-148
54S11	Fairchild	54S11	489-77
	National	DM54S11	489-80
	Signetics	54S11	489-82
	TI	SN54S11	★ 836
			489-84
54S112	Fairchild	54S112	488-126
	National	DM54S112	488-129
	Signetics	54S112	488-131
	TI	SN54S112	★ 871
			488-133
54S113	Fairchild	54S113	488-89
	National	DM54S113	488-92
	Signetics	54S113	488-94
	TI	SN54S113	★ 871
			488-96
54S114	Fairchild	54S114	488-153
	National	DM54S114	488-155
	TI	SN54S114	★ 872
			488-157
54S124	TI	SN54S124	★ 874
			2946-41
54S13	Signetics	54S13	507-99
54S132	Fairchild	54S132	507-142
	TI	SN54S132	★ 877
			507-144
54S133	Fairchild	54S133	492-126
	National	DM54S133	492-129
	Signetics	54S133	492-131
	TI	SN54S133	★ 877
			492-133
54S134	Fairchild	54S134	492-108
	National	DM54S134	492-111
	Signetics	54S134	492-113
	TI	SN54S134	★ 877
			492-115
54S135	Fairchild	54S135	494-157
	National	DM54S135	494-160
	Signetics	54S135	494-162
	TI	SN54S135	★ 878
			494-164
54S136	National	DM54S136	495-3
54S137	Fairchild	54S137	484-15
54S138	AMD	SN54S138	483-183
	Fairchild	54S138	483-185
	National	DM54S138	483-187
	TI	SN54S138	★ 880
			484-1
54S139	AMD	SN54S139	483-80
54S139	Fairchild	54S139	483-82
	National	DM54S139	483-84
	Signetics	54S139	483-86
	TI	SN54S139	★ 880
			483-88
54S140	Fairchild	54S140	484-52
			2471-49
	National	DM54S140	484-55
	Signetics	54S140	484-57
			2471-55
	TI	SN54S140	★ 881
			484-59
			★ 881
			2471-58
54S15	Fairchild	54S15	489-29
	National	DM54S15	489-32
	TI	SN54S15	★ 838
			489-34
54S151	AMD	SN54S151	499-182
	Fairchild	54S151	499-184
	National	DM54S151	499-189
	Signetics	54S151	499-191
	TI	SN54S151	★ 884
			499-193
54S153	AMD	SN54S153	498-54
	Fairchild	54S153	498-56
	National	DM54S153	498-58
	Signetics	54S153	498-60
	TI	SN54S153	★ 884
			498-62
54S157	AMD	SN54S157	499-51
	Fairchild	54S157	499-53
	National	DM54S157	499-56
	Signetics	54S157	499-58
	TI	SN54S157	★ 887
			499-60
54S158	AMD	SN54S158	498-145
	Fairchild	54S158	498-147
	National	DM54S158	498-150
	Signetics	54S158	498-152
	TI	SN54S158	★ 887
			498-154
54S160	AMD	SN54S160	★1227
			480-174
54S161	AMD	SN54S161	★1227
			478-152
54S162	National	DM54S162	481-34
	TI	SN54S162	★ 890
			481-36
54S163	TI	SN54S163	★ 890
			479-2
54S167	Fairchild	54S167	507-24
54S168	TI	SN54S168	★ 892
			481-118
54S169	TI	SN54S169	★ 892
			479-120
54S172	Signetics	54S172	497-28
54S174	AMD	SN54S174	486-78
			¶ 289-8
	Fairchild	54S174	486-80
	National	DM54S174	486-83
	Signetics	54S174	486-85
	TI	SN54S174	★ 895
			486-87
54S175	AMD	SN54S175	485-147
			¶ 289-8
	Fairchild	54S175	485-149
	National	DM54S175	485-152
	Signetics	54S175	485-154
	TI	SN54S175	★ 895
			485-156
54S181	AMD	SN54S181	475-54
	Signetics	54S181	475-61
	TI	SN54S181	★ 897
			475-63
54S182	MMI	SN54S182	475-86
	Signetics	54S182	475-89
	TI	SN54S182	★ 898
			475-91
54S188	National	DM54S188	3459-28
54S189	AMD	AM54S189	3471-49
		SN54S189	3471-50
	Fairchild	54S189	3471-51
	National	DM54S189	3471-52
	Signetics	54S189	3471-54

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
54S189	TI	SN54S189A	900
			3471-55
54S194	AMD	SN54S194	501-170
			¶ 289-8
			3489-33
			¶ 289-8
	Fairchild	54S194	501-172
			3489-37
	National	DM54S194	501-174
	TI	SN54S194	★ 902
			501-176
			★ 902
			3489-43
54S195	AMD	SN54S195	501-67
			¶ 289-8
			3489-34
			¶ 289-8
	National	DM54S195	501-71
	Signetics	54S195	501-73
	TI	SN54S195	★ 903
			501-75
			★ 903
			3489-44
54S196	National	DM54S196	480-119
	TI	SN54S196	★ 903
54S197	TI	SN54S197	★ 904
			478-83
54S20	Fairchild	54S20	490-133
	National	DM54S20	490-136
	Signetics	54S20	490-138
	TI	SN54S20	★ 839
			490-140
54S210	MMI	SN54S210	★ 715
			478-39
54S22	Fairchild	54S22	490-75
	National	DM54S22	490-78
	TI	SN54S22	★ 840
			490-80
54S226	TI	SN54S226	★ 908
			508-54
54S240	AMD	SN54S240	503-154
			2470-65
	MMI	SN54S240	★ 715
			503-157
			★ 715
			2471-8
	National	DM54S240	2471-15
	Signetics	54S240	503-160
	TI	SN54S240	★ 910
			503-162
			★ 910
			2471-23
54S241	AMD	SN54S241	504-69
			2470-9
	MMI	SN54S241	★ 715
			504-71
			★ 715
			2470-28
	National	DM54S241	2470-43
	Signetics	54S241	504-73
	TI	SN54S241	★ 911
			504-75
			★ 911
			2470-55
54S242	AMD	SN54S242	503-92
			2476-29
	National	DM54S242	503-96
54S243	AMD	SN54S243	503-93
			2476-30
	National	DM54S243	503-97
54S244	AMD	SN54S244	504-13
			2470-10
	MMI	SN54S244	★ 715
			504-15
			★ 715
			2470-29
	Signetics	54S244	504-17
	TI	SN54S244	★ 912
			504-19
54S251	AMD	SN54S251	500-62
	National	DM54S251	500-65
	Signetics	54S251	500-68
	TI	SN54S251	★ 915
			500-70
54S253	AMD	SN54S253	498-4
	Fairchild	54S253	498-6
54S253	National	DM54S253	498-8
	Signetics	54S253	498-10
	TI	SN54S253	★ 915
54S257	AMD	SN54S257	498-182
	National	DM54S257	498-186
	Signetics	54S257	498-188
	TI	SN54S257	★ 916
			498-190
54S258	AMD	SN54S258	498-105
	Fairchild	54S258	498-107
	National	DM54S258	498-110
	Signetics	54S258	498-112
	TI	SN54S258	★ 917
			498-114
54S260	Fairchild	54S260	494-23
	Signetics	54S260	494-26
	TI	SN54S260	★ 918
			494-28
54S270	TI	SN54S270	★ 919
54S271	TI	SN54S271	★ 919
54S273	Signetics	54S273	486-169
54S274	TI	SN54S274	★ 920
54S275	TI	SN54S275	476-96
54S280	Fairchild	54S280	509-15
	National	DM54S280	509-19
	Signetics	54S280	509-21
	TI	SN54S280	★ 921
			509-24
54S281	TI	SN54S281	★ 922
			476-19
54S283	TI	SN54S283	★ 922
			476-91
54S287	National	DM54S287	3459-110
54S288	National	DM54S288	3459-29
54S289	AMD	AM54S289	3471-40
		SN54S289	3471-42
	Fairchild	54S289	3471-43
	National	DM54S289	3471-44
	TI	SN54S289A	★ 924
			3471-47
54S299	National	DM54S299	502-177
	TI	SN54S299	★ 927
			502-179
			★ 927
			3490-31
54S30	Fairchild	54S30	492-102
	National	DM54S30	492-104
	TI	SN54S30	★ 842
			492-106
54S301	Signetics	54S301	3473-16
54S32	Fairchild	54S32	493-160
	National	DM54S32	493-162
	Signetics	54S32	493-164
	TI	SN54S32	★ 843
			493-166
54S350	AMD	SN54S350	508-59
	Signetics	54S350	508-61
54S37	Signetics	54S37	491-115
	TI	SN54S37	★ 844
			491-117
54S370	TI	SN54S370	★ 936
54S371	TI	SN54S371	★ 937
54S373	AMD	SN54S373	★1227
			496-92
	MMI	SN54S373	★ 715
			496-94
	National	DM54S373	496-98
	Signetics	54S373	496-100
	TI	SN54S373	★ 937
			496-102
54S374	AMD	SN54S374	★1227
			487-27
	MMI	SN54S374	★ 715
			487-29
	National	DM54S374	487-32
	Signetics	54S374	487-34
	TI	SN54S374	★ 938
			487-36
54S378	AMD	SN54S378	486-107
54S379	AMD	SN54S379	486-13
54S38	Signetics	54S38	491-65
	TI	SN54S38	★ 844
			491-67
54S381	MMI	SN54S381	475-59
	TI	SN54S381	★ 940
			475-64
54S387	National	DM54S387	3459-102
54S388	AMD	SN54S388	485-172
54S399	AMD	SN54S399	499-113
54S40	Fairchild	54S40	490-37
	National	DM54S40	490-40
	Signetics	54S40	490-42
	TI	SN54S40	★ 845
			490-44
54S412	TI	SN54S412	★ 945
			496-103
			★ 945
			1094-165
54S436	TI	SN54S436	★ 947
			485-11
			★ 947
			2483-133
54S437	TI	SN54S437	★ 947
			485-12
			★ 947
			2483-134
54S455	TI	SN54S455	3463-98
54S472	National	DM54S472	3461-35
		DM54S472A	3461-36
		DM54S472B	3461-37
54S473	National	DM54S473	3461-48
		DM54S473A	3461-31
54S474	National	DM54S474	3461-71
		DM54S474A	3461-38
		DM54S474B	3461-39
54S475	National	DM54S475	3461-50
		DM54S475A	3461-33
54S482	TI	SN54S482	★ 954
			506-165
			★ 954
			1086-84
54S484	TI	SN54S484	★ 955
54S485	TI	SN54S485	★ 955
54S508	MMI	SN54S508	474-1
54S51	Fairchild	54S51	493-11
	National	DM54S51	493-13
	Signetics	54S51	493-15
	TI	SN54S51	★ 848
			493-17
54S516	MMI	SN54S516	★ 716
			475-95
54S531	MMI	SN54S531	496-95
54S533	AMD	SN54S533	★1227
			496-133
	MMI	SN54S533	★ 715
			496-135
54S534	AMD	SN54S534	★1227
			486-138
	MMI	SN54S534	★ 715
			486-140
	Signetics	54S534	★ 789
			486-143
54S557	MMI	SN54S557	★ 719
			475-97
54S558	MMI	SN54S558	★ 719
			475-98
54S570	National	DM54S570	3460-82
54S571	National	DM54S571	3460-83
		DM54S571A	3460-84
		DM54S571B	3460-85
54S572	National	DM54S572A	3461-99
			3461-99
54S573	National	DM54S573A	3461-100
			3461-100
54S64	Fairchild	54S64	493-104
	National	DM54S64	493-107
	Signetics	54S64	493-109
	TI	SN54S64	★ 853
			493-111
54S65	National	DM54S65	493-115
	Signetics	54S65	493-117
	TI	SN54S65	★ 853
			493-118
54S700	MMI	SN54S700	★ 728
			2483-150
54S730	MMI	SN54S730	★ 728
			2483-151
54S731	MMI	SN54S731	★ 728
			2483-152
54S734	MMI	SN54S734	★ 728
			2483-153
54S74	Fairchild	54S74	485-102
54S74	Signetics	54S74	485-106
	TI	SN54S74	★ 857
			485-108
54S744	TI	SN54S744	503-114
54S85	Signetics	54S85	474-66
	TI	SN54S85	★ 862
			474-68
54S86	Fairchild	54S86	495-52
	Signetics	54S86	495-56
	TI	SN54S86	★ 862
			495-58
54SC103			
	GTEMicro	G54SC103	1063-12
54SC137			
	Mitel	MD54SC137	★ 697
			454-102
54SC138			
	Mitel	MD54SC138	★ 697
			454-80
54SC139			
	Mitel	MD54SC139	★ 697
			454-55
54SC237			
	Mitel	MD54SC237	★ 697
			454-103
54SC238			
	Mitel	MD54SC238	★ 697
			454-81
54SC239			
	Mitel	MD54SC239	★ 697
			454-56
54SC240			
	Mitel	MD54SC240	★ 702
			465-65
	SPI	SP54SC240	465-75
54SC241			
	Mitel	MD54SC241	★ 702
			465-84
	SPI	SP54SC241	465-92
54SC244			
	Mitel	MD54SC244	★ 702
			465-46
	SPI	SP54SC244	465-56
54SC245			
	Mitel	MD54SC245	★ 706
			465-130
			★ 706
			2475-48
	SPI	SP54SC245	465-142
54SC373			
	Mitel	MD54SC373	★ 710
			459-170
	SPI	SP54SC373	459-186
54SC374			
	Mitel	MD54SC374	★ 710
			456-33
	SPI	SP54SC374	456-53
54SC533			
	Mitel	MD54SC533	★ 710
			460-8
54SC534			
	Mitel	MD54SC534	★ 710
54SC540			
	Mitel	MD54SC540	★ 702
			450-133
54SC541			
	Mitel	MD54SC541	★ 702
			450-134
54SC545			
	Mitel	MD54SC545	★ 706
			465-131
			★ 706
			2475-49
54SC563			
	Mitel	MD54SC563	★ 710
			460-9
54SC564			
	Mitel	MD54SC564	★ 710
54SC573			
	Mitel	MD54SC573	★ 710
			459-171
	SPI	SP54SC573	459-187
54SC574			
	Mitel	MD54SC574	★ 710
			456-34
	SPI	SP54SC574	456-54

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
54SL170			
	Motorola	SN54SL170	497-5
54SL245			
	TI	SN54SL245	2478-51
55	NEC-Electron	uPC55A	2929-41
550	Intersil	MM550	2422-80
	MicroPwr	MP550Z	2439-5
	National	TAA550	2956-76
			2956-78
			2956-80
			2958-61
			2958-63
			2958-64
	NEC-Micro	uPD550	1088-74
		uPD550L	1088-75
	Plessey	SL550	2888-88
	SGS	TAA550	2907-14
	Signetics	NE550	2959-123
		SE550	2959-116
5500	Nitron	NC5500	4141-61
	Siemens	SDA5500	2905-175
		TDA5500	2905-178
	Signetics	**MAN5500**	★**1975**
		SMMAN5500	★**1975**
5501	Harris	HC5501	2949-31
	MicroPwr	**MP5501A**	★ **401**
			★**3292**
			2919-52
		MP5501C	★ **401**
			★**3292**
			2928-21
		MP5501E	★ **401**
			★**3292**
			2923-20
		MP5501F	★ **401**
			★**3292**
			2923-21
		MP5501G	★ **401**
			★**3292**
			2928-22
		MP5501H	★ **401**
			★**3292**
			2919-53
	Reticon	R5501	2963-51
	TI	TMS5501	1095-35
			¶ 247-10
			¶ 247-14
	Toshiba	TC5501	461-10
			3474-87
		TC5501-1	3474-118
5502	**Harris**	**HC5502**	★**2735**
			★**3287**
	MicroPwr	**MP5502**	★ **401**
			★**3292**
			2909-30
			2923-26
		MP5502A	★ **401**
			★**3292**
			2919-26
		MP5502B	★ **401**
			★**3292**
			2928-29
		MP5502D	★ **401**
			★**3292**
			2928-30
		MP5502E	★ **401**
			★**3292**
			2919-27
	Reticon	R5502	2963-52
5504	**Harris**	**HC5504**	★**2736**
	Toshiba	TC5504	461-32
		TC5504-1	3482-111
		TC5504-2	3482-112
		TC5504A-2	3482-20
		TC5504A-3	3482-64
5505	**MicroPwr**	**MP5505A**	★ **401**
			★**3292**
			2911-25
			2911-81
			2916-25
		MP5505B	★ **401**
			★**3292**
			2919-9
		MP5505C	★ **401**
			★**3292**
5505	MicroPwr	MP5505C	2911-100
			2921-24
		MP5505E	★ **401**
			★**3292**
			2919-14
5507	**MicroPwr**	**MP5507A**	★ **401**
			★**3292**
			2911-46
			2911-51
			2914-17
		MP5507B	★ **401**
			★**3292**
			2911-96
			2915-28
		MP5507C	★ **401**
			★**3292**
			2911-108
			2916-35
		MP5507D	★ **401**
			★**3292**
			2916-41
		MP5507E	★ **401**
			★**3292**
			2911-52
			2911-93
			2915-34
5508	**MicroPwr**	**MP5508**	★ **401**
			★**3292**
			2917-38
	Toshiba	TC5508	460-161
			3476-91
		TC5508-1	3477-10
		TC5508-4	3476-98
5509	**MicroPwr**	**MP5509A**	★ **401**
			★**3292**
			2941-15
		MP5509E	★ **401**
			★**3292**
			2941-16
	OKI	**MSM5509**	★**3873**
			2899-48
551	Intersil	MM551	2422-37
	Siemens	S551	2898-50
5510	**Harris**	**HC5510**	★**3287**
	MicroPwr	**MP5510A**	★ **401**
			★**3292**
			2911-87
		MP5510B	★ **401**
			★**3292**
			2911-88
		MP5510C	★ **401**
			★**3292**
			2936-30
		MP5510E	★ **401**
			★**3292**
			2911-89
	Panasonic	AN5510	2905-96
55107	Fairchild	55107A	2474-18
	Motorola	MC55107	2474-21
	National	DS55107	2474-23
			2474-37
	TI	SN55107A	2474-25
		SN55107B	2474-39
55108	Motorola	MC55108	2474-28
	National	DS55108	2474-30
			2474-42
		MM55108	2945-115
	TI	SN55108A	2474-32
		SN55108B	2474-44
55109	TI	SN55109A	2472-14
5511	**Harris**	**HC5511**	★**3287**
	MicroPwr	**MP5511A**	★ **401**
			★**3292**
			2941-17
		MP5511E	★ **401**
			★**3292**
			2941-18
55110	Fairchild	55110A	2472-16
	National	MM55110	2945-116
	TI	SN55110A	2472-21
55113	National	DS55113	2472-3
	TI	SN55113	2472-5
55114	National	DS55114	2471-42
	TI	SN55114	2471-45
55115	National	DS55115	2474-58
	TI	SN55115	2474-61
55116	TI	SN55116	2479-41
55117	TI	SN55117	2479-47
55118	TI	SN55118	2479-43
55119	TI	SN55119	2479-45
5512	**Harris**	**HC5512**	★**2738**
			★**3287**
			2948-71
		HC5512A	★**2738**
			★**3287**
			2948-72
	MicroPwr	**MP5512**	★ **401**
			★**3292**
			2917-37
	Panasonic	AN5512	2905-97
	Signetics	NE5512	2909-10
			2938-15
		SE5512	2909-12
			2937-25
55121	National	DS55121	2469-8
		MM55121	2945-117
	TI	SN55121	2469-13
55122	National	DS55122	2473-14
	TI	SN55122	2473-17
55123	National	MM55123	2945-118
55124	National	MM55124	2945-119
55126	National	MM55126	2945-120
55128	TI	SN55128	2471-47
55138	SiliconG	SG55138	2477-51
	TI	SN55138	2477-52
5514	OKI	MSM5514-3	3478-73
	Signetics	NE5514	2909-11
		SE5514	2909-13
	SSS	SCM5514-3	3478-76
		SCM5514-5	3478-77
	Toshiba	TC5514	3479-18
		TC5514-1	3479-61
		TC5514-2	3479-63
		TC5514A-2	3478-11
		TC5514A-3	3478-79
		TC5514AL-2	3478-12
		TC5514AL-3	3478-80
55140	TI	SN55140	2473-1
55141	TI	SN55141	2473-2
55142	TI	SN55142A	2472-56
55143	TI	SN55143A	2472-57
5515	OKI	MSM5515	2899-150
		MSM5515-3	3478-74
55150	TI	SN55150	2469-22
55152	TI	SN55152	2475-4
55154	Fairchild	55154	2473-49
	SiliconG	SG55154	2473-52
55157	TI	SN55157	2474-52
5516	Toshiba	TC5516	3480-114
		TC5516A	3480-115
		TC5516A-2	3480-116
		TC5516AL	3480-117
		TC5516AL-2	3481-1
5517	OKI	MSM5517	2899-130
	Signetics	NE5517	2938-16
		NE5517A	2938-17
	Toshiba	TC5517A	3481-2
		TC5517AL	3481-3
		TC5517AL-2	3481-4
5518	OKI	MSM5518	2899-166
	Toshiba	TC5518A-2	3481-5
		TC5518B	3481-6
		TC5518BL	3481-7
55180	TI	SN55180	505-148
55182	TI	SN55182	2475-5
55183	TI	SN55183	2471-59
55188	TI	SN55188	2469-61
55189	TI	SN55189	2473-27
		SN55189A	2473-36
5519	OKI	MSM5519	2899-167
552	Intersil	MM552	2422-62
	NEC-Micro	uPD552	1088-76
	Siemens	S552	2898-51
5520	**MicroPwr**	**MP5520A**	★ **401**
			★**2749**
			2439-13
		MP5520B	★ **401**
			★**2749**
			2439-14
		MP5520C	★ **401**
			★**2749**
			2439-15
5520	**MicroPwr**	**MP5520D**	★ **401**
			★**2749**
			2439-31
		MP5520F	★ **401**
			★**2749**
			2439-16
		MP5520H	★ **401**
			★**2749**
			2439-17
	Panasonic	AN5520	2905-98
	Signetics	**NE5520**	★**3372**
			2964-113
			2964-135
		SE5520	★**3372**
			2964-114
	SiliconG	SG5520	2485-6
	TI	SN5520	2485-10
5521	SiliconG	SG5521	2485-7
5522	SiliconG	SG5522	2485-42
	TI	SN5522	2485-46
5523	OKI	MSM5523	2899-15
	SiliconG	SG5523	2485-43
55232	TI	SN55232	2485-24
55234	TI	SN55234	2485-17
55236	SiliconG	SG55236	2485-11
	TI	SN55236	2485-13
55237	TI	SN55237	2485-14
5524	**MicroPwr**	**MP5524**	★ **401**
			★**3292**
			2916-47
	OKI	**MSM5524**	★**3873**
			2899-16
	SiliconG	SG5524	2485-32
	TI	SN5524	2485-36
5525	**OKI**	**MSM5525**	★**3873**
			2900-98
	SiliconG	SG5525	2485-33
5527	**MicroPwr**	**MP5527**	★ **401**
			★**3292**
			2914-7
	OKI	MSM5527	2900-93
5528	**OKI**	**MSM5528**	★**3873**
			2899-49
	SiliconG	SG5528	2485-37
	TI	SN5528	2485-41
5529	OKI	MSM5529	2899-50
	SiliconG	SG5529	2485-38
553	NEC-Micro	uPD553	1088-77
5530	Epson	SVM5530	2899-88
	Panasonic	MN5530	2898-70
	Signetics	NE5530	2938-24
		SE5530	2936-55
5531	**MicroPwr**	**MP5531**	★ **401**
			★**3292**
			2966-70
5532	**Exar**	**XR5532**	★**3208**
			2937-50
	MicroPwr	**MP5532**	★ **401**
			★**3292**
			2966-145
	Signetics	NE5532	2937-52
		NE5532A	2937-53
		SE5532	2937-11
		SE5532A	2937-12
	TI	NE5532	2937-48
		NE5532A	2937-49
55325	Motorola	MC55325	2480-161
	National	DS55325	2480-163
	SiliconG	SG55325	2480-165
	TI	SN55325	2481-2
55326	SiliconG	SG55326	2481-4
	TI	SN55326	2481-8
55327	SiliconG	SG55327	2481-5
	TI	SN55327	2481-9
55329	TI	SN55329	2485-74
5533	**Exar**	**XR5533**	★**3208**
			2937-51
	Signetics	NE5533	2937-54
		NE5533A	2937-55
		SE5533	2937-13
		SE5533A	2937-14
5534	**Exar**	**XR5534**	★**3209**
			2926-23
		XR5534C	★**3209**
			2926-24

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
5534	**Exar**	**XR5534M**	★3209
			2924-14
	MicroPwr	**MP5534**	★ 401
			★3292
			2916-45
	Raytheon	RC5534	2926-25
		RM5534	2924-15
	Signetics	NE5534	2926-26
		NE5534A	2926-27
		SE5534	2924-16
		SE5534A	2924-17
	SiliconG	SG5534	2485-20
	TI	NE5534	2926-28
		NE5534A	2926-29
		SE5534	2924-18
5535	Signetics	NE5535	2939-28
		SE5535	2937-41
	SiliconG	SG5535	2485-21
55355	TI	SN55355	2483-45
55363	TI	SN55363	2481-77
55365	TI	SN55365	2483-46
55369	TI	SN55369	2481-106
5537	**MicroPwr**	**MP5537**	★ 401
			★3292
			2914-8
	Signetics	NE5537	2967-138
		SE5537	2967-139
5538	Signetics	NE5538	2938-34
		SE5538	2936-54
	SiliconG	SG5538	2485-25
5539	Signetics	NE5539	2913-160
			2929-54
		SE5539	2913-161
			2929-55
	SiliconG	SG5539	2485-26
554	National	MM554	2423-74
	NEC-Electron	uPC554	2901-115
	NEC-Micro	uPD554	1088-78
		uPD554L	1088-79
5540	MicroPwr	MP5540	2966-46
	Panasonic	MN5540	2898-71
5541	**Harris**	**HC5541**	★2740
			2949-125
	MicroPwr	MP5541	2966-71
5542	MicroPwr	MP5542	2966-146
55426	TI	SN55426B	2464-78
55427	TI	SN55427B	2464-79
5543	MicroPwr	MP5543	2966-72
5544	MicroPwr	MP5544	2966-115
5545	MicroPwr	MP5545	2966-147
55450	Fairchild	55450B	2481-114
	National	DS55450	2481-126
	SiliconG	SG55450	2481-133
		SG55450B	2481-134
	TI	SN55450B	2481-145
55451	National	DS55451	2481-127
	SiliconG	SG55451	2481-135
	TI	SN55451B	2481-146
55452	Fairchild	55452B	2482-19
	National	DS55452	2482-28
	SiliconG	SG55452	2482-32
	TI	SN55452B	2482-36
55453	National	DS55453	2482-99
	SiliconG	SG55453	2482-103
	TI	SN55453B	2482-107
55454	National	DS55454	2482-64
	SiliconG	SG55454	2482-68
	TI	SN55454B	2482-72
55460	SiliconG	SG55460	2481-136
		SG55460B	2481-137
	TI	SN55460	2481-147
55461	National	DS55461	2481-128
	SiliconG	SG55461	2481-138
	TI	SN55461	2481-148
55462	National	DS55462	2482-29
	SiliconG	SG55462	2482-33
	TI	SN55462	2482-37
55463	National	DS55463	2482-100
	SiliconG	SG55463	2482-104
	TI	SN55463	2482-108
55464	National	DS55464	2482-65
	SiliconG	SG55464	2482-69
	TI	SN55464	2482-73
55470	TI	SN55470	2481-149
55471	TI	SN55471	2481-150
55472	TI	SN55472	2482-38
55473	TI	SN55473	2482-109
55474	TI	SN55474	2482-74
5549	OKI	MSM5549	2899-17
55492	Fairchild	55492A	2465-34
55493	National	DS55493	2464-140
55494	National	PS55494	2465-42
555	Exar	XR555C	2951-31
		XR555M	2951-32
		XRL555	2951-33
	Fairchild	uA555C	2951-34
	Intersil	MM555	2422-14
		NE555	2951-35
		SE555	2951-36
	National	LM555C	2951-39
	Raytheon	RC555	2951-41
		RM555	2951-42
	RCA	CA555	2951-43
		CA555C	2951-44
	Signetics	NE555	2951-45
		SE555	2951-46
		SE555C	2951-47
	SiliconG	SG555	2951-48
		SG555C	2951-49
	TI	NE555	2951-53
		SE555	2951-54
5550	**OKI**	**MSM5550**	★3873
			2898-157
			2899-18
	Panasonic	MN5550	2898-72
	Signetics	TEA5550	2900-71
55516	**Harris**	**HC55516-2**	★2739
			★3287
			2947-144
			¶ 270-3
		HC55516-8	★2739
			★3287
			2947-145
			¶ 270-3
		HC55516-9	★2739
			★3287
			2947-146
			¶ 270-3
55532	Harris	HC55532-2	2947-147
			¶ 270-3
		HC55532-8	2947-148
			¶ 270-3
		HC55532-9	2947-149
			¶ 270-3
55536	Harris	HC55536	2947-150
5556	Panasonic	MN5556	2898-73
5557	**OKI**	**MSM5557**	★3873
			2899-23
5558	**OKI**	**MSM5558**	★3873
			2899-51
5559	OKI	MSM5559	2899-52
556	Exar	XR556C	2951-67
		XR556M	2951-68
		XRL556C	2951-69
		XRL556M	2951-70
	Fairchild	uA556C	2951-71
	Intersil	NE556	2951-72
		SE556	2951-73
	National	LM556	2951-76
		LM556C	2951-77
	Raytheon	RC556	2951-78
		RM556	2951-79
	Signetics	NE556	2951-80
		NE556-1	2951-81
		SE556	2951-82
		SE556-1	2951-83
		SE556-1C	2951-84
	SiliconG	SG556	2951-85
		SG556C	2951-86
	TI	NE556	2951-87
		SE556	2951-88
5560	**MicroPwr**	**MP5560A**	★2749
			2445-40
		MP5560B	★2749
			2447-34
		MP5560C	★2749
			2448-24
			2448-25
		MP5560D	★2749
			2449-17
	Panasonic	AN5560	2905-99
5560	**Signetics**	**NE5560**	★3402
			2961-20
		SE5560	★3402
			2961-22
	Signetics	TEA5560	2901-20
5561	Signetics	NE5561	2961-21
		SE5561	2961-23
5564	Toshiba	TC5564	3483-44
		TC5564-1	3483-50
		TC5564L	3483-45
		TC5564L-1	3483-51
5565	Toshiba	TC5565	3483-46
		TC5565-1	3483-52
		TC5565L	3483-47
557	**Intel**	**IMDX557**	★1725
	NEC-Micro	uPD557L	1088-80
558	**AD**	**AD558J**	★3164
			2443-1
			¶ 255-7
		AD558K	★3164
			2441-11
			¶ 255-7
		AD558S	★3164
			2443-34
			¶ 255-7
		AD558T	★3164
			2441-16
			¶ 255-7
	Exar	XR558C	2951-89
		XR558M	2951-90
	NEC-Electron	uPC558	2898-113
			2964-107
	Signetics	NE558	2951-91
		SE558	2951-92
5581	**OKI**	**MSM5581**	★3873
559	Exar	XR559C	2951-93
		XR559M	2951-94
	Motorola	MHW559	2903-59
55S20	Fairchild	55S20	2485-4
55S234	Fairchild	55S234	2485-15
55S24	Fairchild	55S24	2485-29
560	AdaptSci	560	1761-4
	Cherry	CS560	2968-42
	Hitachi	SAS560	2906-130
	Motorola	MHW560	2903-60
	National	TBA560	2903-110
	Plessey	SL560	2888-89
			¶ 270-9
	Siemens	SAS560	2906-133
	Telefunken	TBA560	2904-8
	TI	TL560C	2964-73
5600	Intersil	IM5600C	3459-50
	LSILogic	LSI-5600	4140-149
	Nitron	NC5600	4141-62
	Siemens	TDA5600	2905-179
5601	Reticon	R5601-1	2968-49
			¶ 284-3
		R5601-2	2968-50
			¶ 284-3
	SSS	SCL5601	2899-73
5602	Reticon	R5602	2947-10
5603	Intersil	IM5603C	3459-114
		IM5603M	3460-10
5604	Intersil	IM5604C	3460-99
		IM5604M	3460-105
	Reticon	R5604	2947-11
5605	Reticon	R5605	2947-12
5606	Reticon	R5606	2947-13
5607	Harris	HI5607-2	2439-43
		HI5607-5	2439-44
		HI5607-8	2439-45
5608	Harris	HI5608-2	2439-46
			¶ 254-8
		HI5608-5	2440-1
			¶ 254-8
		HI5608-8	2440-2
			¶ 254-8
5609	Harris	HI5609-2	2439-40
		HI5609-5	2439-41
		HI5609-8	2439-42
	Reticon	R5609	2947-14
561	**AD**	**AD561J**	★3164
			2445-30
		AD561K	★3164
			2445-12
561	**AD**	**AD561S**	★3164
			2445-31
		AD561T	★3164
			2445-13
	MicroPwr	MP561J	2445-32
		MP561K	2445-14
		MP561S	2445-33
		MP561T	2445-15
	Motorola	MHW561	2903-61
	Plessey	SL561	2897-159
		SL561B	2897-160
		SL561C	2897-161
	Signetics	MB561	2898-168
5610	**Harris**	**HI5610-2**	★2683
			★3288
			2445-6
			¶ 254-8
		HI5610-4	★2683
			★3288
			2445-7
			¶ 254-8
		HI5610-5	★2683
			★3288
			2445-8
			¶ 254-8
		HI5610-8	★2683
			★3288
			2445-9
			¶ 254-8
	Intersil	IM5610C	3459-49
		IM5610M	3459-54
	Panasonic	AN5610	2905-151
	Reticon	R5610	2947-15
	Siemens	TDA5610	2905-180
5611	Reticon	R5611	2947-16
	Siemens	TDA5611	2905-181
5612	Harris	HI5612-2	2451-22
		HI5612-4	2451-23
		HI5612-5	2451-24
		HI5612-8	2451-25
	Reticon	R5612	2947-17
5613	Reticon	R5613	2947-18
	Sanyo	LC5613	2899-153
5618	**Harris**	**HI5618A**	★2686
		HI5618A-2	★2686
			★3288
			2440-19
		HI5618A-5	★2686
			★3288
			2440-20
		HI5618B-2	★2686
			★3288
			2441-22
		HI5618B-5	★2686
			★3288
			2441-23
562	**AD**	**AD562A/BCD**	★3166
			★3168
			2455-9
		AD562A/BIN	★3166
			★3168
			2455-10
		AD562K/BCD	★3166
			★3168
			2460-7
		AD562K/BIN	★3166
			★3168
			2454-7
		AD562S/BCD	★3166
			★3168
			2460-8
		AD562S/BIN	★3166
			★3168
			2450-41
	Analogic	MN562-AD-BCD	2459-31
		MN562-AD-BIN	2454-12
		MN562-ID-BCD	2459-32
		MN562-ID-BIN	2454-13
		MN562-KD-BCD	2459-33
		MN562-KD-BIN	2454-14
		MN562-SD-BCD	2460-13
		MN562-SD-BIN	2451-2

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
562	**Datel**	**DAC-562C**	★2621
			2452-29
	Datel	DAC-562M	2450-17
	Harris	**HI562A**	★2677
		HI562A-2	★3288
			2450-31
			¶ 254-8
		HI562A-4	★3288
			2453-3
			¶ 254-8
		HI562A-5	★3288
			2453-4
			¶ 254-8
		HI562A-8	★3288
			2450-32
			¶ 254-8
	MicroPwr	AD562S/BIN	2450-42
	MicroPwr	**MP562**	★ 401
			★2749
			2451-1
	Motorola	**AD562**	★2759
			2453-19
	Motorola	MHW562	2903-62
	NEC-Electron	uPC562	2903-120
	Signetics	MB562	2898-169
5620	Panasonic	AN5620	2903-130
5621	Sanyo	LC5621	2899-137
	Synertek	**SY5621**	★1528
5623	Intersil	IM5623C	3459-116
		IM5623M	3460-11
5624	Intersil	IM5624C	3460-98
		IM5624M	3460-104
563	**AD**	**AD563J**	★3165
			2454-6
		AD563J/BCD	★3165
			2460-9
		AD563J/BIN	★3165
			2454-8
		AD563K/BCD	★3165
			2460-10
		AD563K/BIN	★3165
			2450-43
		AD563S/BCD	★3165
			2460-11
		AD563S/BIN	★3165
			2450-44
		AD563T/BCD	★3165
			2460-12
		AD563T/BIN	★3165
			2450-45
	Analogic	MN563-JD-BCD	
			2459-34
		MN563-JD-BIN	2454-15
		MN563-KD-BCD	
			2460-1
		MN563-KD-BIN	2454-16
		MN563-SD-BCD	
			2460-14
		MN563-SD-BIN	2451-3
		MN563-TD-BCS	
			2460-2
		MN563-TD-BIN	2454-17
	Motorola	**AD563**	★2759
			2453-20
5630	Panasonic	AN5630	2903-131
5632	Reticon	R5632	2948-125
5633	Reticon	R5633	2948-124
564	Siemens	SM564	2904-61
	Signetics	NE564	2945-39
		SE564	2945-40
565	**AD**	**AD565AJ**	★3165
			2451-35
		AD565AK	★3165
			2450-15
		AD565AS	★3165
			2451-36
		AD565AT	★3165
			2450-16
		AD565J	★3165
			2452-41
		AD565K	★3165
			2450-27
		AD565S	★3165
			2452-42
		AD565T	★3165
			2450-28

Base Number	Source	Device	Page-Line
565	**Harris**	**HI565A**	★2680
	Harris	HI565AJ	2453-15
		HI565AK	2450-36
		HI565AS	2453-16
		HI565AT	2450-37
	MicroEng	**MCE565A**	★4440
			4140-205
	MicroEng	MCE565AJ	2451-37
		MCE565AS	2451-38
		MCE565J	2452-35
		MCE565K	2450-29
		MCE565S	2452-36
		MCE565T	2450-30
	Motorola	LM565	2946-1
		NE565	2946-2
	National	LM565	2946-3
		LM565C	2946-4
	Plessey	SL565	2913-122
	Signetics	NE565	2946-5
		SE565	2946-6
	Zilog	**565**	★1592
566	**AD**	**AD566AJ**	★3166
			2452-31
		AD566AK	★3166
			2450-19
		AD566AS	★3166
			2452-32
		AD566AT	★3166
			2450-20
		AD566J	★3166
			2452-33
		AD566K	★3166
			2450-21
		AD566S	★3166
			2452-34
		AD566T	★3166
			2450-22
	MicroEng	**MCE566A**	★4440
			4140-206
	MicroEng	MCE566AJ	2452-37
		MCE566AK	2450-23
		MCE566AS	2452-38
		MCE566AT	2450-24
		MCE566J	2452-39
		MCE566K	2450-25
		MCE566S	2452-40
		MCE566T	2450-26
	National	LM566	2946-12
		LM566C	2946-13
	NEC-Electron	uPC566	2897-153
	Siemens	S566A	2906-160
		S566B	2906-161
	Signetics	NE566	2946-16
		SE566	2946-17
5660	**Harris**	**HI5660**	★2730
			2452-27
567	**AD**	**AD567J**	★3166
			2453-17
		AD567K	★3166
			2450-38
		AD567S	★3166
			2453-18
	Exar	**XR567C**	★3194
			2945-147
			2949-65
			¶ 269-15
		XR567M	★3194
			2945-148
			2949-66
			¶ 269-15
		XRL567C	★3194
			2945-149
		XRL567M	★3194
			2945-150
	National	LM567	2945-151
		LM567C	2945-152
			2949-67
	Signetics	NE567	2945-155
			2949-70
		SE567	2945-156
			2949-71
5680	**Harris**	**HI5680I-5**	★2689
			2451-47
		HI5680V-5	★2689
			2455-4
	Siemens	SDA5680	2900-99

Base Number	Source	Device	Page-Line
5685	**Harris**	**HI5685I-4**	★2696
			2452-1
		HI5685V-4	★2696
			2455-5
5687	**Harris**	**HI5687I-2**	★2700
			2452-2
		HI5687V-2	★2700
			2455-6
569	Intel	iSBC569	1765-14
5690	Siemens	SDA5690	2900-154
570	**AD**	**AD570J**	★3174
			2428-12
		AD570S	★3174
			2428-13
	Hitachi	SAS570	2906-131
	MicroEng	**MCE570**	★4440
			4140-207
		MCE570J	★4440
			2428-14
		MCE570S	★4440
			2428-15
	Motorola	MHW570	2903-63
	NEC-Electron	uPC570	2904-96
	Plessey	TAA570	2905-11
	Siemens	SAS570	2906-134
	Signetics	**NE570**	★3391
			2947-119
	Signetics	SE570	2947-123
		TBA570A	2900-129
5700	MicroNet	MN5700	2435-16
	Panasonic	AN5700	2905-76
	Sanyo	LA5700	2965-98
	Signetics	TDA5700	2900-130
5701	Panasonic	MN5701	2898-74
	Reticon	R5701	2962-74
	Signetics	TDA5701	2900-131
5703	**Sprague**	**UDN-5703A**	★2843
			2483-118
	Sprague	UDS-5703H	2483-119
5706	**Sprague**	**UDN-5706A**	★2843
			484-76
			★2843
			2483-86
	Sprague	UDS-5706H	484-77
			2483-87
5707	**Sprague**	**UDN-5707A**	★2843
			2483-96
	Sprague	UDS-5707H	2483-97
571	**AD**	**AD571J**	★3174
			2431-17
		AD571K	★3174
			2431-3
		AD571S	★3174
			2431-18
	MicroPwr	MP571J	2431-19
		MP571K	2431-4
		MP571S	2431-20
	MicroEng	**MCE571**	★4440
			4140-208
		MCE571J	★4440
			2431-21
		MCE571S	★4440
			2431-22
	NEC-Electron	uPC571	2897-27
	Signetics	**NE571**	★3391
			2947-120
		SA571	★3391
			2947-122
	Signetics	SE571	2940-31
5710	Panasonic	AN5710	2905-152
		MN5710	2898-75
57109	National	MM57109	1087-8
			¶ 246-14
5711	**Sprague**	**N-5711M**	★2843
		UDN-5711M	★2843
			2482-16
	Sprague	UDS-5711H	2482-18
5712	**Harris**	**HI5712-2**	★2704
			★3288
			★3291
			2432-27
		HI5712-5	★2704
			★3288
			★3291
			2432-28
		HI5712-7	★2704

Base Number	Source	Device	Page-Line
5712	**Harris**	**HI5712-7**	★3288
			★3291
			2432-29
		HI5712-8	★2704
			★3288
			★3291
			2432-30
		HI5712A	★2704
		HI5712A-2	★2704
			★3288
			★3291
			2432-31
		HI5712A-7	★2704
			★3288
			★3291
			2432-32
		HI5712A-8	★2704
			★3288
			★3291
			2432-33
	Sprague	**UDN-5712M**	★2843
			2482-56
	Sprague	UDS-5712H	2482-58
57126	National	MM57126	1087-7
5713	**Sprague**	**N-5713**	★2843
		UDN-5713M	★2843
			2482-127
	Sprague	UDS-5713H	2482-129
5714	**Sprague**	**N-5714M**	★2843
		UDN-5714M	★2843
			2482-91
	Sprague	UDS-5714H	2482-93
57140	National	MM57140	1087-9
			1053-14
5716	**GI**	**ER5716**	★3683
			3455-47
57190	National	MM57190	2945-85
572	**AD**	**AD572A**	★3174
			2433-52
		AD572B	★3174
			2434-1
		AD572S	★3174
			2434-2
	Motorola	MHW572	2903-64
	Siemens	S572	2906-78
	Signetics	NE572	2947-121
5720	Panasonic	AN5720	2905-153
5722	Sprague	UDN-5722M	2482-50
573	**AD**	**AD573J**	★3174
			2431-16
		AD573K	★3174
			2430-40
		AD573S	★3174
			2430-41
	NEC-Electron	uPC573	2897-154
	OKI	MSM573A	3474-116
5730	Panasonic	AN5730	2905-8
5733	**Sprague**	**UDN-5733A**	★2843
			2483-107
		UDN-5733M	★2843
			2483-108
	Sprague	UDS-5733H	2483-109
574	**AD**	**AD574AJ**	★3174
			2435-33
		AD574AK	★3174
			2433-49
		AD574AS	★3174
			2435-34
		AD574J	★3174
			2435-35
		AD574K	★3174
			2434-6
		AD574L	★3174
			2434-7
		AD574S	★3174
			2434-8
		AD574T	★3174
			2434-9
		AD574U	★3174
			2434-10
		AD574ZJ	★3174
			2435-37
		AD574ZK	★3174
			2435-38
		AD574ZL	★3174
			2434-16

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
574	AD	AD574ZS	★3174
			2434-17
		AD574ZT	★3174
			2434-18
		AD574ZU	★3174
			2434-19
	Harris	HI574A	★2712
			2433-48
	HybridSys	HS574J	★2743
			2431-29
		HS574K	★2743
			2433-42
		HS574L	★2743
			2433-43
		HS574S	★2743
			2431-30
		HS574S/B	★2743
		HS574T	★2743
			2435-30
		HS574T/B	★2743
		HS574U	★2743
			2435-31
		HS574U/B	★2743
	MicroEng	MCD574K	2434-11
	MicroEng	MCE574	★4440
			4141-1
		MCE574AS	★4440
			2435-32
		MCE574J	★4440
			2435-36
		MCE574L	★4440
			2434-12
		MCE574S	★4440
			2434-13
		MCE574T	★4440
			2434-14
		MCE574U	★4440
			2434-15
		MCE574Z	★4440
		MCE574ZJ	★4440
			2435-39
		MCE574ZK	★4440
			2435-40
		MCE574ZL	★4440
			2434-20
		MCE574ZS	★4440
			2434-21
		MCE574ZT	★4440
			2434-22
		MCE574ZU	★4440
			2434-23
57401	MMI	C57401	★ 722
			3456-38
		C57401A	★ 722
			3456-41
57402	MMI	57402	3456-47
	MMI	C57402	★ 722
			3456-48
		C57402A	★ 722
			3456-49
57499	National	MM57499	511-88
575	NEC-Electron	uPC575	2904-173
5750	Panasonic	AN5750	2904-97
		MN5750	2898-76
5752	Panasonic	MN5752	2898-77
57558	MMI	57558	475-150
		57558-1	475-151
576	NEC-Electron	uPC576	2904-174
	Siemens	S576A	2906-162
		S576B	2906-163
		S576C	2907-1
5760	Panasonic	AN5760	2904-98
577	NEC-Electron	uPC577	2900-104
578	AD	AD578J	★3172
			★3175
			2431-49
		AD578K	★3172
			★3175
			2431-41
		AD578L	★3172
			★3175
			2431-37
		AD578S	★3172
			★3175
			2431-50
		AD578T	★3172

Base Number	Source	Device	Page-Line
578	AD	AD578T	★3175
			2431-42
	NEC-Electron	uPC578	2897-28
5781	National	MM5781	1087-10
			1053-15
5782	National	MM5782	1087-11
			1053-16
579	AD	AD579B	★3175
			2430-23
		AD579J	★3175
			2430-26
		AD579K	★3175
			2430-24
		AD579T	★3175
			2430-25
5790	Sprague	UDS-5790H	★2843
			511-106
			★2843
			2483-58
			★2843
			2965-80
5791	Sprague	UDS-5791H	★2843
			511-107
			★2843
			2483-59
			★2843
			2965-81
5799	National	MM5799	1087-12
			1053-17
580	AD	AD580J	★3178
			2966-40
		AD580K	★3178
			2966-41
		AD580L	★3178
			2966-42
		AD580S	★3178
			2966-43
		AD580T	★3178
			2966-44
		AD580U	★3178
			2966-45
	AWI	AW580	2463-25
	Cherry	CS580	2898-112
	Motorola	MHW580	2903-65
	NEC-Electron	UPC580	2903-118
	Siemens	SAS580	2906-135
5800	Siemens	SAS5800	2906-136
5803	OKI	MSM5803	★3873
			2899-131
581	AD	AD581J	★3178
			2966-127
		AD581K	★3178
			2966-128
		AD581L	★3178
			2966-129
		AD581S	★3178
			2966-130
		AD581T	★3178
			2966-131
		AD581U	★3178
			2966-132
	HybridSys	ADC581B-12	2433-44
		ADC581C-12	2433-45
5810	OKI	MSM5810	2906-89
58106	National	MM58106	2899-78
5811	OKI	MSM5811	2906-90
5812	Harris	HI5812	2434-5
5814	OKI	MSM5814	2906-91
58142	National	MM58142	2899-79
58143	National	MM58143	★3327
			2898-152
58144	National	MM58144	2898-153
58147	National	MM58147	★ 735
5815	OKI	MSM5815	2906-92
5816	GI	ER5816	3455-51
		ER5816HR	3455-52
	OKI	MSM5816	★3873
			2906-93
58167	National	MM58167	★ 735
5819	OKI	MSM5819	★3873
			2906-71
582	AD	AD582K	★3181
			2967-53
		AD582S	★3181
			2967-54

Base Number	Source	Device	Page-Line
582	HybridSys	ADC582B-12	2433-16
		ADC582C-12	2433-17
	Signetics	NE582-1	2465-43
			2483-145
5820	Panasonic	AN5820	2905-9
58201	National	MM58201	2463-66
5821	Panasonic	AN5821	2905-10
5822	Panasonic	AN5822	2905-58
58250	National	MM58250	2902-21
58275	Mitsubishi	M58275-15	3480-54
58282	OKI	MSM58282	★3873
			1088-5
58283	OKI	MSM58283	★3873
			1088-6
5829	OKI	MSM5829G	2465-12
58291	OKI	MSM58291G	2465-9
58292	OKI	MSM58292	★3873
			1088-7
58293	OKI	MSM58293	★3873
			1088-8
583	AD	AD583K	★3181
			2967-55
		AD583S	★3181
			2967-56
5832	OKI	MSM5832	★3873
			1087-135
			1102-73
58321	OKI	58321	★3873
	OKI	MSM58321	1087-136
		MSM58321R	1102-74
5837	National	MM5837	2900-25
			2965-37
	OKI	MSM5837	1088-4
58371	OKI	MSM58371	★3873
5838	OKI	MSM5838	★3873
			1088-3
5839	OKI	MSM5839	★3873
			1088-2
584	AD	AD584J	2965-161
		AD584K	2965-162
		AD584L	2965-163
		AD584S	2965-164
		AD584T	2965-165
		AD584U	2965-166
5840	OKI	MSM5840	★3873
			1087-131
		MSM5840R	★3873
			1087-132
		MSM5840RS	★3873
			1053-20
5842	OKI	MSM5842R	★3873
			1087-133
		MSM5842RS	★3873
			1053-23
58421	OKI	MSM58421	★3873
			1087-129
		MSM58421GSK	★3873
			1053-21
58422	OKI	MSM58422	★3873
			1087-130
		MSM58422RS	★3873
			1053-22
58438	National	MM58438	2466-7
5845	OKI	MSM5845R	★3873
			1087-134
		MSM5845RS	★3873
			1053-24
5846	OKI	MSM5846	★3873
585	AD	AD585J	★3179
			★3181
			2967-57
		AD585S	★3179
			★3181
			2967-58
	NEC-Electron	uPC585	2901-116
5865	National	MM5865	2951-62
			¶ 282-5
			¶ 282-6
587	NEC-Electron	uPC587	2901-117
	Signetics	NE587	2464-56
5870	OKI	MSM5870	1088-9
58725	Mitsubishi	M58725	3480-91
58735	Mitsubishi	M58735	3466-56
589	AD	AD589J	★3178
			2966-18

Base Number	Source	Device	Page-Line
589	AD	AD589K	★3178
			2966-19
		AD589L	★3178
			2966-20
		AD589M	★3178
			2966-21
		AD589S	★3178
			2966-22
		AD589T	★3178
			2966-23
		AD589U	★3178
			2966-24
	NEC-Electron	uPC589	2898-114
	Signetics	NE589	2464-40
58981	Mitsubishi	M58981-45	3479-12
590	AdaptSci	590	1761-19
	AD	AD590I	2968-11
		AD590J	2968-12
		AD590K	2968-13
		AD590L	2968-14
		AD590M	2968-15
	Intersil	AD590I	2968-16
		AD590J	2968-17
		AD590K	2968-18
		AD590L	2968-19
		AD590M	2968-20
	Motorola	MHW590	2888-45
	Siemens	SAS590	2906-137
	Signetics	NE590	2480-1
			1102-6
		SE590	2480-3
5900	Harris	HI5900-2	★2713
			★3288
			★3291
			2963-10
		HI5900-5	★2713
			★3288
			★3291
			2963-11
	Siemens	SAS5900	2906-138
5901	GI	ER5901	★3687
			3455-21
		ER5901HR	★3687
			3455-22
	Harris	HI5901	★2715
			★3288
			★3291
			2963-12
5902	OEI	5902	★3347
			2965-73
5905	OEI	5905	★3347
			2965-74
591	Motorola	MHW591	2888-46
	Signetics	NE591	2480-2
			1102-7
5912	Mostek	MK5912	2948-83
	SGS	M5912	2948-93
5916	GI	ER5916	3455-48
		ER5916HR	3455-49
592	Motorola	MHW592	2888-47
		NE592	2888-80
		SE592	2888-81
	NEC-Electron	uPC592	2897-155
	Signetics	NE592	2888-101
		SE592	2888-102
	TI	NE592	2888-112
	TI	TL592	★3435
			2888-113
593	Motorola	MHW593	2888-48
	TI	TL593C	★3428
			2961-66
594	Motorola	MHW594	2903-66
	Signetics	NE594	2465-91
		SA594	2465-92
	TI	TL594C	★3429
			2961-67
		TL594M	★3429
			2961-68
5945	TI	AC5945	2900-147
5947	TI	AC5947	2465-145
595	Motorola	MHW595	2903-67
	NEC-Electron	uPC595	2905-145
	TI	TL595C	★3430
			2961-69
596	NEC-Electron	uPC596	2905-146
5970	OKI	MSM5970	2899-151

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
5972	OKI	MSM5972	2899-168
5976	OKI	MSM5976	2899-152
5977	OKI	MSM5977	2899-132
5C6847	Mitsubishi	M5C6847-1	1101-108
5H453	**TI**	**SN5H453**	★ **849**
5K4116	Mitsubishi	M5K4116-2	3468-95
		M5K4116-3	3469-7
5K4164	Mitsubishi	M5K4164-15	3469-90
		M5K4164-20	3470-15
5L2114	Mitsubishi	M5L2114L	3479-32
		M5L2114L-2	3478-25
		M5L2114L-3	3478-95
5L2716	Mitsubishi	M5L2716	3465-72
5L2732	Mitsubishi	M5L2732	3466-64
5L2764	Mitsubishi	M5L2764	3467-11
5L5101	Mitsubishi	M5L5101L-1	3474-83
5L8035	Mitsubishi	M5L8035	1067-6
5L8039	Mitsubishi	M5L8039	1093-29
			1067-7
5L8041	Mitsubishi	M5L8041A	1094-10
5L8048	Mitsubishi	M5L8048	1093-62
			1067-8
5L8049	Mitsubishi	M5L8049	1093-63
			1067-9
5L8080	Mitsubishi	M5L8080A	1067-10
5L8085	Mitsubishi	M5L8085A	1095-119
		M5L8085AP	1067-11
5L8086	Mitsubishi	M5L8086	1098-4
		M5L8086S	1079-19
5L80C49			
	Mitsubishi	M5L80C49	1093-64
			1067-12
5L8155	Mitsubishi	M5L8155	1096-45
5L8156	Mitsubishi	M5L8156	1096-46
5L8212	Mitsubishi	M5L8212	1094-159
5L8216	Mitsubishi	M5L8216	1094-79
5L8228	Mitsubishi	M5L8228	1095-91
5L8243	Mitsubishi	M5L8243	1095-154
5L8251	Mitsubishi	M5L8251A	1096-3
5L8253	Mitsubishi	M5L8253-5	1096-24
5L8255	Mitsubishi	M5L8255A-5	1096-30
5L8257	Mitsubishi	M5L8257-5	1096-8
5L8259	Mitsubishi	M5L8259A	1096-20
5L8279	Mitsubishi	M5L8279	1095-6
		M5L8279-5	1095-7
5L8282	Mitsubishi	M5L8282	1098-54
5L8283	Mitsubishi	M5L8283	1098-48
5L8284	Mitsubishi	M5L8284A	1098-24
5L8286	Mitsubishi	M5L8286	1098-43
5L8287	Mitsubishi	M5L8287	1098-37
5L8288	Mitsubishi	M5L8288	1098-18
5L8289	Mitsubishi	M5L8289	1098-14
5L8748	Mitsubishi	M5L8748	1093-16
			1067-13
5M2167			
	Mitsubishi	M5M2167-55	3468-61
		M5M2167-70	3468-62
5M5116			
	Mitsubishi	M5M5116	3480-82
		M5M5116-12	3480-21
		M5M5116-15	3480-43
5M5117			
	Mitsubishi	M5M5117	3480-83
		M5M5117-12	3480-22
		M5M5117-15	3480-44
5M5118			
	Mitsubishi	M5M5118	3480-84
		M5M5118-12	3480-23
		M5M5118-15	3480-45
5M8050			
	Mitsubishi	M5M8050	1067-14
5T4044	Mitsubishi	M5T4044-20	3482-28
		M5T4044-30	3482-70
5W1791			
	Mitsubishi	M5W1791-02	1101-1
5X08	Intersil	IM5X08-1	3476-25
6	AMI	UA-6	4140-15
	Datel	**SHM-6MC**	★ **2622**
		SHM-6MM	★ **2620**
			2967-72
	LSIComp	D6	462-62
	National	**MF6**	★ **3307**
			2962-31
	TeledyneC	CAG6	2415-9
6	TeledyneC	CAG6-10	2415-11
		CDA6	2417-111
	Western	SMP-E6	1765-13
60	Burr-Brown	ADC60-12	2431-40
	LSIComp	D60	462-64
	MicroEng	MCE60	2930-13
	Unitrode	PF60	2964-99
		PR60	2964-105
600	Burr-Brown	OPA600/MIL	2913-168
		OPA600N	2922-35
		OPA600U	2927-30
		OPA600U/883B	2927-31
		OPA600V/883B	2922-36
		OPA600V/MIL	2922-37
	Cybernetic	CY600	2480-8
			2963-9
			1102-8
	LSILogic	LCA-600-ECL	4140-143
	MasterLogic	ML600	4140-158
	MicroEng	**MGB600**	★ **4437**
			4141-14
		MGC600	★ **4437**
			4141-21
	Motorola	**MCA600ECL**	★ **4479**
			4141-49
		MVME600	★ **1941**
	Unitrode	**PIC600**	★ **3446**
			2961-70
6000	ITT	SAA6000	1087-14
	Omnibyte	OB6000	1761-29
	Telmos	TM6000	4141-186
6001	Fujitsu	MB6001	2948-62
6002	Fujitsu	MB6002	2948-63
	ITT	SAA6002	2947-156
6004	Panasonic	MN6004	2900-20
6005	Panasonic	MN6005	2900-21
601	Motorola	MHW601	2888-49
	SGS	L601	2890-133
	TeledyneC	CAM601A	2423-84
	TI	TL601C	2419-8
		TL601I	2419-2
		TL601M	2419-3
	Unitrode	**PIC601**	★ **3446**
			2961-71
6010	Hughes	HCTR6010	453-43
6012	**AMD**	**AM6012C**	★ **3101**
			2453-11
			¶ 252-8
		AM6012M	★ **3101**
			2453-12
			¶ 252-8
	MicroEng	**MCE6012**	★ **4440**
			4141-2
		MCE6012C	★ **4440**
			2453-13
		MCE6012M	★ **4440**
			2453-14
	Signetics	**AM6012**	★ **3383**
			2457-32
60150	**RCA**	**MA60150**	★ **4518**
			4141-94
602	DataGen	MN602	1100-54
		mN602	1077-25
	Motorola	MHW602	2888-50
	National	**CIM-602**	★ **1953**
	SGS	L602	2890-134
	Unitrode	**PIC602**	★ **3446**
			2961-72
6020	**AD**	**AD6020K**	★ **3175**
			2426-6
	Siemens	SDA6020	2426-8
6021	Panasonic	MN6021	2902-24
6025	Panasonic	MN6025	2902-25
60250	**RCA**	**MA60250**	★ **4518**
			4141-95
603	Dionics	DI603A	2465-23
	Motorola	MHW603	2888-51
	NEC-Electron	uPC603	2439-18
	Panasonic	AN603	2907-7
	SGS	L603	2890-135
6031	Panasonic	MN6031	510-44
6032	Panasonic	MN6032	511-44
604	Dionics	DI604A	2465-24
	National	**CIM-604**	★ **1953**
	SGS	L604	2890-136
	Supertex	SW-604	2899-154
604	TeledyneC	CAM604A	2417-86
	TI	TL604C	2418-119
		TL604I	2418-117
		TL604M	2418-118
6040	Panasonic	MN6040	2945-122
		MN6040A	2945-123
		MN6040Z	2945-124
60400	**RCA**	**MA60400**	★ **4518**
			4141-96
6041	Panasonic	MN6041A	2945-125
6043	Panasonic	MN6043	2945-87
		MN6043A	2945-126
		MN6043B	2945-127
6044	Panasonic	MN6044	2904-64
6049	Panasonic	MN6049	2904-65
605	Burr-Brown	OPA605	2910-35
			2913-155
		OPA605A	2920-33
		OPA605B	2918-10
		OPA605C	2918-8
		OPA605H	2920-34
		OPA605J	2918-11
		OPA605K	2918-9
	Dionics	DI605A	2465-25
	Motorola	**MVME605**	★ **1941**
	Panasonic	AN605	511-128
			511-128
6052	Panasonic	MN6052	2898-158
			2899-53
6053	Panasonic	MN6053	2898-159
			2899-54
6054	Panasonic	MN6054	2898-160
6055	MMI	6055	3453-10
60550	**RCA**	**MA60550**	★ **4518**
			4141-97
6056	MMI	6056	3453-21
	Panasonic	MN6056	2898-161
6057	Panasonic	MN6057	2899-55
6058	Panasonic	MN6058	2899-56
6059	Panasonic	MN6059	2899-57
606	MicroTech	MC606	4141-171
	Panasonic	AN606	2888-83
6060	Panasonic	MN6060	2903-41
6061	MMI	6061	3453-11
	Panasonic	MN6061A	2902-146
6062	MMI	6062	3453-22
	Panasonic	MN6062	2906-24
6063	Panasonic	MN6063	2903-42
6064	Panasonic	MN6064	2903-43
60650	**RCA**	**PA60650**	★ **4518**
			4141-108
607	Panasonic	AN607	2888-84
	TI	TL607C	2419-9
		TL607I	2419-4
		TL607M	2419-5
6070	AMD	AM6070AC	2444-23
			2459-3
		AM6070AM	2444-24
			2459-4
		AM6070C	2444-31
			2459-6
		AM6070M	2444-32
			2459-7
	Panasonic	MN6070	2899-58
6071	MMI	6071	3453-39
	TI	**TMAM6071**	★ **1560**
6072	AMD	AM6072C	2444-21
			2459-1
		AM6072M	2444-22
			2459-2
	MMI	6072	3453-40
6073	**TI**	**TMAM6073**	★ **1560**
6075	Panasonic	MN6075	2898-162
	TI	**TMAM6075**	★ **1560**
6076	Panasonic	MN6076	2898-163
6078	**RCA**	**CA6078A**	★ **3354**
			2912-7
608	**Datel**	**DAC-608**	★ **2621**
	Panasonic	AN608	2888-85
6080	AMD	AM6080AC	2440-45
		AM6080AM	2440-46
		AM6080C	2442-8
		AM6080M	2442-9
	Panasonic	MN6080	2898-120
60800	**RCA**	**MA60800**	★ **4518**
			4141-98
6081	AMD	AM6081AC	2440-47
		AM6081AM	2440-48
		AM6081C	2442-10
		AM6081M	2442-11
	TI	**TMAM6081**	★ **1560**
6086	MMI	6086	497-75
6087	MMI	6087	497-76
6091	Panasonic	MN6091	2898-164
6092	Panasonic	MN6092	2898-165
6093	Panasonic	MN6093	2899-59
61	Siemens	SM61C	2947-93
610	**Datel**	**DAC-610**	★ **2621**
	Motorola	**MVME610**	★ **1941**
	National	**CIM-610**	★ **1953**
	NEC-Electron	uPC610	2449-35
	Panasonic	AN610	2962-96
	Plessey	SL610C	2888-90
	TI	TL610C	2415-24
		TL610I	2415-22
		TL610M	2415-23
	Unitrode	**PIC610**	★ **3446**
			2961-73
6100	CalDevices	CDI6100	4140-21
	Harris	HM6100	1077-11
			¶ 242-14
			¶ 242-15
			¶ 247-12
		HM6100-2	1099-1
			¶ 242-14
			¶ 242-15
			¶ 247-12
		HM6100C-9	1099-2
			¶ 242-14
			¶ 242-15
			¶ 247-12
	Intersil	IM6100	1077-12
			¶ 241-5
		IM6100-1I	1099-3
			¶ 241-5
		IM6100-1M	1099-4
			¶ 241-5
		IM6100AI	1099-5
			¶ 241-5
		IM6100AM	1099-6
			¶ 241-5
		IM6100I	1099-7
			¶ 241-5
	TI	**TMS6100**	★ **1563**
			2902-96
	Toshiba	TD6100	482-23
61000	Harris	HB61000-1	1767-3
			¶ 250-14
61001	TI	VM61001	2902-63
61002	**TI**	**VM61002**	★ **1563**
			2902-64
61003	**TI**	**VM61003**	★ **1563**
			2902-65
61004	**TI**	**VM61004**	★ **1563**
			2902-66
61005	**TI**	**VM61005**	★ **1563**
			2902-67
61006	**TI**	**VM61006**	★ **1563**
6101	Harris	HD6101-2	1099-23
		HD6101-9	1099-24
		HD6101C-9	1099-25
	Intersil	IM6101-1I	1099-26
		IM6101-1M	1099-27
		IM6101AI	1099-28
		IM6101AM	1099-29
		IM6101I	1099-30
	Zilog	05-6101-01	1767-30
6102	Intersil	IM6102-1I	1099-18
		IM6102-1M	1099-19
		IM6102AI	1099-20
		IM6102AM	1099-21
		IM6102I	1099-22
	Toshiba	TD6102	2945-71
			2946-64
6103	Intersil	IM6103AI	1099-49
		IM6103AM	1099-50
		IM6103C	1099-51
		IM6103I	1099-52
		IM6103M	1099-53
6104	Toshiba	TD6104	2901-95
6108	**AMD**	**AM6108**	★ **3103**
			2426-46

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
6108	Intersil	IH6108C	2424-12
		IH6108M	2424-5
611	National	CIM-611	★1954
	Plessey	SL611C	2888-91
	Unitrode	PIC611	★3446
			2961-74
6112	AMD	AM6112	★3106
6116	Harris	HM6116-2	★ 669
			★1333
			★3777
			3480-14
	Hitachi	HM6116-2	★3789
			3480-15
		HM6116-3	★3789
			3480-37
		HM6116-4	★3789
			3480-74
		HM6116L-2	★3789
			3480-16
		HM6116L-3	★3789
			3480-38
		HM6116L-4	★3789
			3480-75
	IDT	IDT6116	★3793
	Intersil	IH6116C	2425-16
		IH6116M	2425-17
	MicroPwr	MP6116-20	3480-76
		MP6116-25	3480-108
	RCA	CDM6116	★3874
			★3880
	SSS	SCM6116-2	3480-24
		SCM6116-3	3480-47
		SCM6116-4	3480-86
	Sprague	UDN-6116	★2843
			2465-49
6116L120			
	IDT	IDT6116L120	★3793
			3480-17
			3480-18
6116L150			
	IDT	IDT6116L150	★3793
			3480-39
			3480-40
6116L90			
	IDT	IDT6116L90	★3793
			3480-2
			3480-3
6116S120			
	IDT	IDT6116S120	★3793
			3480-19
			3480-20
6116S150			
	IDT	IDT6116S150	★3793
			3480-41
			3480-42
6116S70			
	IDT	IDT6116S70	★3793
			3479-117
6116S90			
	IDT	IDT6116S90	★3793
			3480-4
			3480-5
6117	MicroPwr	MP6117-20	3480-77
		MP6117-25	3480-109
6118	Exar	XR6118	★3205
			2465-89
	MicroPwr	MP6118-20	3480-78
		MP6118-25	3480-110
	SiliconG	SG6118	2465-93
	Sprague	UDN-6118	★2843
			2465-94
612	AD	AD612A	★3158
			2887-59
			2916-56
		AD612B	★3158
			2887-60
			2917-1
		AD612C	★3158
			2887-61
			2917-2
	Datel	DAC-612	★2621
	Panasonic	AN612	2962-97
	Plessey	SL612C	2888-92
	RTC	MS612	463-172
			3491-56
612	Unitrode	PIC612	★3446
			2961-75
6120	Harris	HD6120	★ 669
			★1333
			★1341
			1077-10
61200	RCA	PA61200	★4518
			4141-109
6121	Harris	HD6121	★ 669
			★1333
			★1342
6125	OEI	6125A	2963-143
	TI	TMS6125	★1563
			2902-97
6126	Sprague	UDN-6126	★2843
			2465-50
6128	Exar	XR6128	★3205
			2465-90
	Sprague	UDN-6128	★2843
			2465-95
6135	Panasonic	AN6135	2896-61
6138	Sprague	UDN-6138	★2843
			2465-96
614	AD	AD614A	★3158
			2887-62
			2917-3
		AD614B	★3158
			2887-63
			2917-4
	Panasonic	AN614	2903-33
6140	Panasonic	AN6140	2898-118
		MN6140	2945-128
6141	Panasonic	MN6141	2945-88
6142	Panasonic	MN6142	2945-129
6143	Panasonic	MN6143	2945-89
6147	Hitachi	HM6147	★3789
			461-29
			★3789
			3481-83
		HM6147-3	★3789
			3481-53
		HM6147-6	★3789
			3481-112
		HM6147H-35	★3789
			3481-33
		HM6147HL-35	★3789
			3481-34
		HM6147HL-45	★3789
			3481-46
		HM6147L	★3789
			3481-84
		HM6147L-3	★3789
			3481-54
6148	Hitachi	HM6148	★3789
			3477-67
		HM6148-6	★3789
			3477-86
		HM6148L	★3789
			3477-68
		HM6148L-6	★3789
			3477-87
	Sprague	UDN-6148	★2843
			2465-97
615	Motorola	MVME615	★1941
6155	MMI	6155	3453-12
6156	MMI	6156	3453-13
616	MicroTech	MC616	4141-172
	Panasonic	AN616	2903-34
6161	MMI	6161	3453-14
6162	MMI	6162	3453-15
6164	Sprague	UDN-6164	★2843
			2465-28
6167	Hitachi	HM6167	★3789
			3483-78
		HM6167-6	★3789
			3483-89
		HM6167-8	★3789
			3483-96
		HM6167L-6	★3789
			3483-90
		HM6167L-8	★3789
			3483-97
	IDT	IDT6167	★3799
6167L100			
	IDT	IDT6167L100	★3799
6167L100			
	IDT	IDT6167L100	3483-99
			3483-100
6167L45			
	IDT	IDT6167L45	★3799
			3483-67
6167L55			
	IDT	IDT6167L55	★3799
			3483-71
6167L70			
	IDT	IDT6167L70	★3799
			3483-79
6167L85			
	IDT	IDT6167L85	★3799
			3483-91
			3483-92
6167S100			
	IDT	IDT6167S100	★3799
			3483-98
6167S45			
	IDT	IDT6167S45	★3799
			3483-68
6167S55			
	IDT	IDT6167S55	★3799
			3483-72
			3483-73
6167S70			
	IDT	IDT6167S70	★3799
			3483-80
6167S85			
	IDT	IDT6167S85	★3799
			3483-93
			3483-94
6168	IDT	IDT6168	★3804
	Zilog	05-6168-01	1767-26
6168L100			
	IDT	IDT6168L100	★3804
			3483-35
			3483-36
6168L45			
	IDT	IDT6168L45	★3804
			3482-114
			3482-115
6168L55			
	IDT	IDT6168L55	★3804
			3483-5
			3483-6
6168L70			
	IDT	IDT6168L70	★3804
			3483-13
			3483-14
6168L85			
	IDT	IDT6168L85	★3804
			3483-27
			3483-28
6168S100			
	IDT	IDT6168S100	★3804
			3483-37
6168S45			
	IDT	IDT6168S45	★3804
			3482-116
			3482-117
6168S55			
	IDT	IDT6168S55	★3804
			3483-7
			3483-8
6168S70			
	IDT	IDT6168S70	★3804
			3483-15
			3483-16
6168S85			
	IDT	IDT6168S85	★3804
			3483-29
			3483-30
6170	Motorola	MC6170	2948-128
6172	Motorola	MC6172	★3298
6173	Motorola	MC6173	★3298
			2948-148
6174	Teltone	TT6174	2949-92
6177	Teltone	TT6177	2947-40
618	RTC	MS618	463-180
			3456-12
6184	Sprague	UDN-6184	★2843
			2465-82
6190	Motorola	MC6190	2905-90
6191	Motorola	MC6191	2905-91
6192	Motorola	MC6192	2905-92
6193	Motorola	MC6193	2905-93
6194	Motorola	MC6194	2905-94
6195	Motorola	MC6195	2903-18
			2945-111
620	Motorola	MVME620	★1941
	Plessey	SL620C	2887-5
6200	Panasonic	MN6200	2899-60
6201	Intersil	IH6201C	2481-86
		IH6201M	2481-87
6202	OKI	MSM6202	★3873
6208	Intersil	IH6208C	2423-48
		IH6208M	2423-43
621	Plessey	SL621C	2887-4
6216	Intersil	IH6216C	2424-81
		IH6216M	2424-82
623	Plessey	SL623C	2900-82
624	AD	AD624A	★3156
			★3158
			2887-104
			2917-27
		AD624B	★3156
			★3158
			2887-105
			2915-51
		AD624C	★3156
			★3158
			2887-106
			2915-6
		AD624S	★3156
			★3158
			2887-107
			2916-11
	NEC-Electron	uPC624	2441-49
	Plessey	SL624C	2900-126
6249	Panasonic	AN6249	2902-136
625	Motorola	MVME625	★1941
	RTC	MS625	463-181
			3491-86
	Unitrode	PIC625	★3446
			2961-76
6250	Panasonic	AN6250	2902-137
		MN6250	2899-61
6251	Panasonic	AN6251	2902-138
		MN6251	2899-62
6252	Panasonic	MN6252	2899-63
6255	MMI	6255-1	3484-92
6256	MMI	6256-1	3484-93
	Motorola	MCM6256-10	★3841
			3470-40
		MCM6256-20	★3841
			3470-41
626	MicroTech	MC626	4141-173
	Unitrode	PIC626	★3446
			2961-77
6260	MMI	6260-1	3484-88
6261	MMI	6261-1	3484-89
6264	Hitachi	HM6264-10	3483-43
		HM6264-12	3483-48
		HM6264-15	3483-49
627	Unitrode	PIC627	★3446
			2961-78
6270	Plessey	SL6270	2887-6
6275	MMI	6275-1	3484-117
6276	MMI	6276-1	3484-118
6280	MMI	6280-1	3484-41
		6280-2	3484-32
6281	MMI	6281-1	3484-43
		6281-2	3484-33
6282	MMI	6282-1	3484-42
6283	MMI	6283-1	3484-44
629	DataGen	MN629	1100-56
6290	MMI	6290	3453-41
6291	MMI	6291	3453-42
6292	MMI	6292	3453-61
6293	MMI	6293	3453-62
63	Burr-Brown	DAC63	2451-10
			¶ 253-9
630	AD	AD630	★3160
			★3161
			2962-89
	National	CIM-630	★1954
6300	AMD	AM6300	★3112
			2965-87
	Lambda	LAS6300	2960-111
	MMI	6300-1	★3826
			3459-91
	Panasonic	AN6300	2903-13

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
6301	**AMD**	**AM6301**	★3115
			2960-84
	Hitachi	HD6301	1063-31
	Lambda	LAS6301	2960-112
	MMI	**6301-1**	★3826
			3459-94
	Toshiba	TD6301A	2900-94
6301V0	**Hitachi**	**HD6301V0**	★1345
6303	**Hitachi**	**HD6303**	★1345
			1091-105
			★1345
			1063-32
6304	Toshiba	TD6304	2902-112
6305	**MMI**	**6305-1**	★3826
			3460-73
6306	**MMI**	**6306-1**	★3826
			3460-79
6308	**MMI**	**6308-1**	★3826
			3460-24
	Toshiba	TD6308	2902-113
6309	**MMI**	**6309-1**	★3826
			3460-27
6310	Plessey	SL6310	2887-142
63105	DDC	BUS-63105	2487-25
6312	Intersil	IM6312-1I	3484-101
		IM6312-1M	3484-102
		IM6312AI	3484-96
		IM6312AM	3484-97
		IM6312I	3484-103
		IM6312M	3484-104
6316	Intersil	IM6316I	3485-10
		IM6316M	3485-11
6320	National	SLX6320	4141-53
	Panasonic	AN6320	2902-154
6321	Panasonic	AN6321	2902-152
6322	Harris	HM6322-2	3484-99
		HM6322-9	3484-98
		HM6322C-9	3484-100
6324	National	SCX6324	4141-176
		SLX6324	4141-177
63256	**Motorola**	**MCM63256**	★3840
			★3849
6330	**MMI**	**6330-1**	★3826
			3459-34
	Panasonic	AN6330	2902-155
6331	**MMI**	**6331-1**	★3826
			3459-41
	Panasonic	AN6331	2902-153
6333	**Hitachi**	**HD6333**	★1345
			1063-33
6335	**MMI**	**6335-1**	★3826
			3460-26
6336	**MMI**	**6336-1**	★3826
			3460-30
6340	**MMI**	**6340-1**	★3826
			3461-60
		6340-2	★3826
6341	**MMI**	**6341-1**	★3826
			3461-69
		6341-2	★3826
			3461-27
	Panasonic	AN6341	2903-8
6342	Panasonic	AN6342	2903-9
6344	Panasonic	AN6344	2903-10
6348	**MMI**	**6348-1**	★3826
			3461-56
		6348-2	★3826
6349	**MMI**	**6349-1**	★3826
			3461-61
	MMI	6349-2	3461-23
635	**Unitrode**	**PIC635**	★3446
			2961-79
6350	MMI	6350-1	3462-17
6352	**MMI**	**6352-1**	★3826
			3462-18
6353	**MMI**	**6353-1**	★3826
	MMI	6353-2	3462-14
			3462-14
636	**AD**	**AD636J**	★3161
			2967-42
		AD636K	★3161
			2967-43
	DataGen	MN636	1100-57
	MicroTech	MC636	4141-174
	Unitrode	**PIC636**	★3446
			2961-80

Base Number	Source	Device	Page-Line
6360	National	SLX6360	4141-54
637	**AD**	**AD637J**	★3159
			★3161
			2967-44
		AD637K	★3159
			★3161
			2967-45
	Unitrode	**PIC637**	★3447
			2961-81
6376	National	DH6376C	2889-146
6380	**MMI**	**6380-1**	★3826
			3463-46
		6380-2	★3826
			3462-117
6381	**MMI**	**6381-1**	★3826
			3463-55
		6381-2	★3826
			3462-90
6388	**MMI**	**6388-1**	★3826
			3464-12
6389	**MMI**	**6389-1**	★3826
			3464-17
		6389-2	★3826
			3463-120
63A01V0			
	Hitachi	**HD63A01V0**	★1345
63A03	**Hitachi**	**HD63A03**	★1345
63A33	**Hitachi**	**HD63A33**	★1345
63B01V0			
	Hitachi	**HD63B01V0**	★1345
63B03	**Hitachi**	**HD63B03**	★1345
63B33	**Hitachi**	**HD63B33**	★1345
63L05	**Hitachi**	**HD63L05**	★1345
			1063-34
63LS140			
	MMI	**63LS140**	★3826
			3459-92
63LS141			
	MMI	**63LS141**	★3826
			3459-95
63LS240			
	MMI	**63LS240**	★3826
			3460-74
63LS241			
	MMI	**63LS241**	★3826
			3460-80
63RA441			
	MMI	**63RA441**	★3826
			3462-7
			3462-7
63RS881			
	MMI	63RS881	3462-70
63S080	**MMI**	**63S080**	★3826
			3459-11
63S081	**MMI**	**63S081**	★3826
			3459-13
63S140	**MMI**	**63S140**	★3826
			3459-79
63S141	**MMI**	**63S141**	★3826
			3459-83
63S1641			
	MMI	**63S1641**	★3826
			★3836
			3466-4
		63S1641A	★3826
			★3836
			3465-96
63S1681			
	MMI	63S1681	3464-79
		63S1681A	3464-55
63S240	**MMI**	**63S240**	★3826
			3460-48
63S241	**MMI**	**63S241**	★3826
			3460-50
63S441	**MMI**	**63S441**	★3826
			★3830
			3461-119
			3461-119
		63S441A	★3826
			★3830
			3461-106
			3461-106
63S841	**MMI**	**63S841**	★3826
			★3833
			3463-113
		63S841A	★3826

Base Number	Source	Device	Page-Line
63S841	**MMI**	**63S841A**	★3833
			3463-97
64	**Cromemco**	**64KZ**	★1919
	Fairchild	F64K-12	3469-74
		F64K-15	3469-83
		F64K-20	3470-10
	Harris	**HD64XX**	★ 669
			★1333
	MicroTech	CCD64	2962-67
	Panasonic	MEL64A	2964-26
	Reticon	RL64	2964-43
		R064	2963-149
	Siliconix	VN64GA	2481-38
			¶ 280-3
640	GI	SPB640	2902-76
	National	**CIM-640**	★1955
	Plessey	SL640C	2962-98
	Signetics	TCA640	2903-172
6400	Supertex	CM6400-2	3487-12
		CM6400-3	3487-14
		MM6400	3487-13
64000	HP	HP64000	1622-4
6401	National	SHM6401	2967-121
6402	**Harris**	**HD6402-2**	★ 669
			★ 672
			★1333
			2487-42
			★ 669
			★ 672
			★1333
			1099-31
		HD6402-9	★ 669
			★ 672
			★1333
			2487-43
			★ 669
			★ 672
			★1333
			1099-32
		HD6402A-2	★ 669
			★ 672
			★1333
			2487-52
		HD6402A-9	★ 669
			★ 672
			★1333
			2487-53
		HD6402C-9	★ 669
			★ 672
			★1333
			2487-39
			★ 669
			★ 672
			★1333
			1099-33
	Intersil	IM6402	2487-44
			1099-34
		IM6402-1I	1099-35
		IM6402-1M	1099-36
		IM6402AI	1099-37
		IM6402AM	1099-38
		IM6402M	2487-45
	RCA	**CDP6402D**	★1476
			464-86
			★1476
			2487-48
		CDP6402E	★1476
			464-87
			★1476
			2487-49
	Sanyo	LM6402	1087-15
			1055-22
6403	Harris	HD6403A-2	2487-56
		HD6403A-9	2487-57
	Intersil	IM6403	2487-46
			1099-39
		IM6403-1I	1099-40
		IM6403AI	1099-41
		IM6403AM	1099-42
		IM6403M	2487-47
6404	National	NMC6404-9	3482-59
6405	Sanyo	LM6405	1087-16
			1055-23
6408	**Harris**	**HD6408**	★ 669
			★ 675

Base Number	Source	Device	Page-Line
6408	**Harris**	**HD6408**	★1333
			2486-17
		HD6408-9	★ 669
			★ 675
			★1333
			464-12
6409	**Harris**	**HD6409**	★ 669
			★ 680
			★1333
			464-68
		HD6409-2	★ 669
			★ 680
			★1333
			2486-84
		HD6409-9	★ 669
			★ 680
			★1333
			2486-85
641	Fairchild	TBA641	2896-76
	Plessey	SL641C	2962-99
	Signetics	**LS641**	★2772
6414	National	NMC6414	461-19
642	**AD**	**AD642J**	★3153
			2936-39
		AD642K	★3153
			2936-18
		AD642L	★3153
			2935-47
		AD642S	★3153
			2936-19
6431	**Harris**	**HD6431-2**	★1343
			454-171
			★1343
			1099-10
		HD6431-9	★1343
			454-172
			★1343
			1099-11
		HD6431A-2	★1343
			454-173
		HD6431A-9	★1343
			454-174
6432	**Harris**	**HD6432-2**	★1343
			454-169
			★1343
			1099-8
		HD6432-9	★1343
			454-170
			★1343
			1099-9
6433	**Harris**	**HD6433-2**	★1343
			454-175
			★1343
			1099-16
		HD6433-9	★1343
			454-176
			★1343
			1099-17
6434	**Harris**	**HD6434-2**	★1344
			1099-14
		HD6434-9	★1344
			1099-15
6435	Harris	HD6435-2	1099-12
		HD6435-9	1099-13
6436	**Harris**	**HD6436-2**	★1344
			1099-45
		HD6436-9	★1344
			1099-46
644	**AD**	**AD644J**	★3153
			2936-40
		AD644K	★3153
			2936-20
		AD644L	★3153
			2935-46
		AD644S	★3153
			2935-48
	Signetics	NE644	2906-114
6440	**Harris**	**HD6440-2**	★1344
			455-79
			★1344
			1099-47
		HD6440-9	★1344
			455-80
			★1344
			1099-48
645	Signetics	NE645	2896-56

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
645	**Unitrode**	**PIC645**	★**3446**
			2961-82
646	Signetics	NE646	2896-57
	Unitrode	**PIC646**	★**3446**
			2961-83
647	**AD**	**AD647J**	★**3151**
			★**3153**
			2936-23
		AD647K	★**3151**
			★**3153**
			2935-43
		AD647L	★**3151**
			★**3153**
			2935-39
		AD647S	★**3151**
			★**3153**
			1073-17
			2935-44
		AD647S/883B	★**3151**
			★**3153**
			2935-45
	Unitrode	**PIC647**	★**3446**
			2961-84
648	NEC-Electron	uPC648	2453-2
	Signetics	NE648	2896-58
6482	Motorola	MC6482	477-33
		MC6482A	477-34
		MC6482B	477-35
649	NEC-Electron	uPC649	2967-122
	Signetics	NE649	2896-59
6495	**Harris**	**HD6495-2**	★**1344**
			455-77
			★**1344**
			1099-43
		HD6495-9	★**1344**
			455-78
			★**1344**
			1099-44
64LS299			
	TI	SN64LS299	3490-29
64x64	Panasonic	MEL64x64	2964-27
65	RCIData	CMC65/04	1759-9
	Rockwell	AIM65	1759-3
		RM65-1000	1759-4
		System65	1630-3
650	**AD**	**AD650**	★**3176**
			2968-64
	Burr-Brown	DAC650-CBI-I	2452-3
		DAC650-CBI-V	2452-4
	NEC-Micro	uPD650	1088-81
	Plessey	SL650	2946-19
			¶ 279-1
	Signetics	NE650	2896-60
		TCA650	2903-173
6500	CSG	MPS6500	1059-31
		MPS6500/1	1090-79
		MPS6500/1A	1090-80
			1059-32
	Cubit	6500	1757-30
	Rockwell	6500	1630-4
		R6500	1090-132
			¶ 246-2
			¶ 246-3
			¶ 247-2
			¶ 247-3
			¶ 247-7
			1073-14
			¶ 246-2
			¶ 246-3
			¶ 247-2
			¶ 247-3
			¶ 247-7
		R6500/1	1073-15
			¶ 246-2
			¶ 246-3
			¶ 247-2
			¶ 247-3
			¶ 247-7
		R6500/1-10	1090-81
			¶ 246-2
			¶ 246-3
			¶ 247-2
			¶ 247-3
			¶ 247-7
		R6500/11	1090-82
			¶ 246-2
			¶ 246-3

Base Number	Source	Device	Page-Line
6500	Rockwell	R6500/11	¶ 247-2
			¶ 247-3
			¶ 247-7
			1073-16
			¶ 246-2
			¶ 246-3
			¶ 247-2
			¶ 247-3
			¶ 247-7
		R6500/12	1090-83
			¶ 246-2
			¶ 246-3
			¶ 247-2
			¶ 247-3
			¶ 247-7
			1073-17
			¶ 246-2
			¶ 246-3
			¶ 247-2
			¶ 247-3
			¶ 247-7
		R6500/13	1090-84
			¶ 246-2
			¶ 246-3
			¶ 247-2
			¶ 247-3
			¶ 247-7
		R6500/41	1049-20
			¶ 246-2
			¶ 246-3
			¶ 247-2
			¶ 247-3
			¶ 247-7
		R6500/42	1049-21
			¶ 246-2
			¶ 246-3
			¶ 247-2
			¶ 247-3
			¶ 247-7
		R6500/43	1049-22
			¶ 246-2
			¶ 246-3
			¶ 247-2
			¶ 247-3
			¶ 247-7
6501	AMI	S6501-8	3475-2
		S6501L	3474-111
		S6501L-3	3474-112
		S6501L-8	3475-3
6501L1	AMI	S6501L1	3474-81
6502	CGRS	6502PDS	1617-4
		6502PDS-8	1618-1
	CSG	MPS6502	1090-87
			1059-33
		MPS6502A	1090-88
		MPS6502B	1090-89
	Rockwell	R6502	1090-133
			¶ 247-4
			1073-19
			¶ 247-4
	Synertek	SY6502	1090-143
			1073-37
		SY6502A	1090-144
		SY6502B	1090-145
		SY6502C	1090-146
6503	CSG	MPS6503	1090-90
		MPS6503A	1090-91
		MPS6503B	1090-92
	Harris	HM6503-5	3479-113
		HM6503-9	3479-111
	National	NMC6503-5	3479-114
		NMC6503-9	3479-112

Base Number	Source	Device	Page-Line
6503	Rockwell	R6503	1090-134
	Synertek	SY6503	1090-147
			1073-38
		SY6503A	1090-148
6504	AMI	S6504	460-140
			3482-83
	CSG	MPS6504	1090-93
		MPS6504A	1090-94
		MPS6504B	1090-95
	Epson	SRM6504	461-27
			3482-37
	Harris	**HM6504-2**	★ **669**
			★**1333**
			★**3762**
		HM6504-5	★ **669**
			★**1333**
			★**3762**
		HM6504-9	★ **669**
			★**1333**
			★**3762**
		HM6504B-2	★ **669**
			★**1333**
			★**3762**
		HM6504B-9	★ **669**
			★**1333**
			★**3762**
		HM6504C-9	★ **669**
			★**1333**
			★**3762**
	Harris	HS6504RH	3482-11
	Intersil	IM6504C	3482-16
		IM6504M	3482-17
	National	NMC6504	461-30
		NMC6504-2	3482-60
		NMC6504-5	3482-87
		NMC6504-9	3482-61
	Rockwell	R6504	1090-135
	SSS	SCM6504-1	3482-19
		SCM6504-3	3482-63
		SCM6504-5	3482-88
	Synertek	SY6504	1090-149
			1073-39
		SY6504A	1090-150
6505	CSG	MPS6505	1090-96
		MPS6505A	1090-97
		MPS6505B	1090-98
	Harris	HM6505-2	3482-57
			¶ 287-1
		HM6505-5	3482-86
			¶ 287-1
		HM6505-9	3482-58
			¶ 287-1
		HM6505B-2	3482-14
			¶ 287-1
		HM6505B-9	3482-15
			¶ 287-1
	Rockwell	R6505	1090-136
	Synertek	SY6505	1090-151
			1073-40
		SY6505A	1090-152
6506	CSG	MPS6506	1090-99
		MPS6506A	1090-100
		MPS6506B	1090-101
	Rockwell	R6506	1090-137
	Synertek	SY6506	1090-153
			1073-41
		SY6506A	1090-154
6507	CSG	MPS6507	1090-102
	Rockwell	R6507	1090-138
	Synertek	SY6507	1090-155
			1073-42
		SY6507A	1090-156
6508	AMI	S6508	460-141
			3477-3
		S6508-1	3476-68
		S6508A	460-142
			3476-80
	CSG	MMS6508-1	1759-10
		MMS6508-2	1759-11
		MPS6508	1090-86

Base Number	Source	Device	Page-Line
6508	**Harris**	**HM6508**	★ **669**
			★**1333**
			★**3754**
			460-148
		HM6508-2	★ **669**
			★**1333**
			★**3754**
			3476-41
		HM6508-5	★ **669**
			★**1333**
			★**3754**
			3476-69
		HM6508-9	★ **669**
			★**1333**
			★**3754**
			3476-42
		HM6508B-2	★ **669**
			★**1333**
			★**3754**
			3476-23
		HM6508B-9	★ **669**
			★**1333**
			★**3754**
			3476-24
		HM6508BZ	★**3755**
	Harris	HS6508RH	3476-65
	Motorola	MCM6508	460-150
		MCM6508-25	3476-45
		MCM6508-30	3476-71
		MCM6508-40	3476-96
	National	NMC6508	460-156
		NMC6508-2	3476-37
		NMC6508-5	3476-46
		NMC6508-9	3476-27
		NMC6508B-2	3476-21
6508B9	**Harris**	**HM6508B9**	★**3755**
651	IMS	SBC651	1757-29
	NEC-Micro	uPD651	1088-82
	Plessey	SL651	2946-18
			¶ 279-1
6510	CSG	MPS6510	1090-85
	Sprague	**UDN-6510A**	★**2843**
			2480-158
6511	Rockwell	R6511	1073-20
		R6511Q	1073-21
65116	**Motorola**	**MCM65116-12**	★**3839**
			3480-56
		MCM65116-15	★**3839**
			3480-46
6512	CSG	MPS6512	1090-103
			1061-1
		MPS6512A	1090-104
		MPS6512B	1090-105
	Harris	HM6512-2	3472-40
			3472-40
		HM6512-9	3472-41
			3472-41
		HM6512C-9	3472-39
			3472-39
	Intersil	IM6512	460-135
		IM6512AI	3472-37
			3472-37
		IM6512AM	3472-38
			3472-38
		IM6512C	3472-44
			3472-44
		IM6512I	3472-42
			3472-42
		IM6512M	460-136
			3472-43
			3472-43
	Rockwell	R6512	1090-139
	Synertek	SY6512	1090-157
			1073-43
		SY6512A	1090-158
6513	CSG	MPS6513	1090-106
	Harris	HM6513-5	3475-21
		HM6513-9	3475-19
	National	NMC6513-5	3475-22
		NMC6513-9	3475-20
	Rockwell	R6513	1090-140
	Synertek	SY6513	1091-1
			1073-44
		SY6513A	1091-2
6514	AMI	S6514	3478-64
	CSG	MPS6514	1090-107

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
6514	CSG	MPS6514A	1090-108
		MPS6514B	1090-109
	Epson	SRM6514	461-16
			3478-50
	Harris	**HM6514-2**	★1333
			★3767
			3478-66
		HM6514-5	★1333
			★3767
			3479-4
		HM6514-9	★1333
			★3767
			3478-67
		HM6514B-2	★1333
			★3767
			3478-1
		HM6514B-9	★1333
			★3767
			3478-2
		HM6514C-9	★1333
			★3767
			3478-68
	Harris	HS6514RH	3478-3
	Intersil	IM6514C	3477-110
		IM6514M	3477-111
	National	NMC6514-2	3478-70
		NMC6514-5	3479-5
		NMC6514-9	3478-71
	Rockwell	R6514	1090-141
	SSS	SCM6514-1	3478-10
		SCM6514-3	3478-78
		SCM6514-5	3479-6
	Sprague	**UDN-6514A**	★2843
			2480-159
	Synertek	SY6514	1091-3
			1075-1
		SY6514A	1091-4
65147	**Motorola**	**MCM65147-55**	★3839
			★3845
			3481-55
		MCM65147-70	★3839
			★3845
			3481-85
		MCM65147-85	★3839
			★3845
			3481-86
6515	CSG	MPS6515	1090-110
		MPS6515A	1090-111
		MPS6515B	1090-112
	Harris	HM6515-9	3479-103
	Rockwell	R6515	1090-142
	Synertek	SY6515	1091-5
			1075-2
		SY6515A	1091-6
6516	AMI	S6516	460-143
			3480-36
	Harris	**HM6516B-2**	★ 669
			★1333
			★3772
			3480-28
		HM6516B-9	★ 669
			★1333
			★3772
			3480-29
	National	NMC6516	460-157
65161	**Harris**	**HM65161-5**	★ 669
			★1333
			★3774
			3479-116
		HM65161B-5	★ 669
			★1333
			★3774
			3479-115
6518	**Harris**	**HM6518**	★ 669
			★1333
			★3756
			460-149
		HM6518-2	★ 669
			★1333
			★3756
			3476-48
		HM6518-5	★ 669
			★1333
			★3756
			3476-72
		HM6518-9	★ 669

Base Number	Source	Device	Page-Line
6518	**Harris**	**HM6518-9**	★1333
			★3756
			3476-49
		HM6518B-2	★ 669
			★1333
			★3756
			3476-28
		HM6518B-9	★ 669
			★1333
			★3756
			3476-29
	Motorola	MCM6518	460-151
		MCM6518-25	3476-52
		MCM6518-30	3476-73
		MCM6518-46	3477-4
	National	NMC6518	460-158
		NMC6518-2	3476-38
		NMC6518-5	3476-53
		NMC6518-9	3476-32
		NMC6518B-2	3476-22
		NMC6518B-9	3476-20
652	NEC-Micro	uPD652	1088-83
	Plessey	SL652	2945-36
6520	CSG	MPS6520	1092-79
			1102-51
	Rockwell	R6520	1091-31
	Synertek	**SY6520**	★1527
			1092-94
			1102-60
		SY6520A	★1527
			1091-33
6521	Synertek	SY6521	1091-34
		SY6521A	1091-35
6522	CSG	MPS6522	1091-29
			1102-52
	Rockwell	R6522	1091-32
	Synertek	**SY6522**	★1529
			1091-36
			1102-61
		SY6522A	★1529
			1091-37
			1102-62
6523	CSG	MPS6523	1091-48
65245	CSG	MPS65245	504-185
6525	CSG	MPS6525	1091-49
			1102-81
65256	**Motorola**	**MCM65256**	★3840
			3487-50
6526	CSG	MPS6526	1091-30
6528	AMI	S6528	460-144
6529	CSG	MPS6529	1091-50
6530	CSG	MPS6530	1091-39
	Rockwell	R6530	1091-40
	Synertek	**SY6530**	★1529
			1091-41
6531	Rockwell	R6531	1091-45
			¶ 247-4
6532	CSG	MPS6532	1091-42
	Synertek	**SY6532**	★1531
			1091-43
		SY6532A	★1531
			1091-44
6541	Rockwell	R6541Q	1049-23
6545	CSG	MPS6545-1	1091-13
			1092-24
	Rockwell	R6545	1091-14
	Synertek	**SY6545-1**	★1533
			1091-15
		SY6545E	★1533
			1091-16
		SY6545R	★1532
			1091-17
		SY6545RA	★1533
			1091-18
655	**Unitrode**	**PIC655**	★3446
			2961-85
6550	Panasonic	AN6550	2939-48
6551	**AMI**	**S6551**	★1249
			2486-1
	CSG	MPS6551	1091-8
			1091-162
	Harris	**HM6551**	★ 669
			★1333
			★3758
			460-166
		HM6551-2	★ 669

Base Number	Source	Device	Page-Line
6551	**Harris**	**HM6551-2**	★1333
			★3758
			3474-33
		HM6551-5	★ 669
			★1333
			★3758
			3474-58
		HM6551-9	★ 669
			★1333
			★3758
			3474-34
		HM6551B-2	★ 669
			★1333
			★3758
			3474-1
		HM6551B-9	★ 669
			★1333
			★3758
	Harris	HS6551RH	3474-9
	National	NMC6551	461-4
		NMC6551-2	3474-13
		NMC6551-5	3474-37
		NMC6551-9	3473-103
		NMC6551B-2	3473-101
		NMC6551B-9	3473-96
	Panasonic	AN6551	2939-49
	Rockwell	R6551	1091-9
			¶ 245-13
	Synertek	**SY6551**	★1536
			1091-10
			¶ 260-11
		SY6551A	★1536
			1091-11
			¶ 260-11
65516	**Motorola**	**MCM65516**	★3840
			1092-124
		MCM65516-43	★3840
			3485-27
		MCM65516-55	★3840
			3485-54
	RCA	**CDP65516**	★3878
6552	National	NMC6552	461-5
		NMC6552-2	3474-11
		NMC6552-5	3474-32
		NMC6552-9	3473-102
		NMC6552B-2	3473-100
		NMC6552B-9	3473-95
	Panasonic	AN6552	2939-50
656	**Unitrode**	**PIC656**	★3446
			2961-86
6560	CSG	MPS6560	1101-110
6561	CSG	MPS6561	1101-111
	Harris	**HM6561**	★ 669
			★1333
			★3760
			460-167
		HM6561-2	★ 669
			★1333
			★3760
			3474-28
		HM6561-5	★ 669
			★1333
			★3760
			3474-56
		HM6561-9	★ 669
			★1333
			★3760
			3474-29
		HM6561B-2	★ 669
			★1333
			★3760
			3473-109
		HM6561B-9	★ 669
			★1333
			★3760
			3473-110
6562	Harris	HM6562	460-168
		HM6562-2	3474-26
		HM6562-5	3474-55
		HM6562-9	3474-27
		HM6562B-2	3473-107
		HM6562B-9	3473-108
6564	**Harris**	**HM5-6564-2**	★3779
			3483-58
			3483-104

Base Number	Source	Device	Page-Line
6564	**Harris**	**HM5-6564-5**	★3779
			3483-61
			3483-107
		HM5-6564-8	★3779
			3483-59
			3483-105
		HM5-6564-9	★3779
			3483-60
			3483-106
		HM6564	★ 669
	Harris	HS6564RH	3483-56
657	**Unitrode**	**PIC657**	★3446
			2961-87
6591	**Synertek**	**SY6591**	★1537
			1091-25
		SY6591A	★1537
			1091-26
6592	Rockwell	R6592	1091-19
6593	Synertek	SY6593	1091-27
65C02	CSG	MPS65C02	1090-113
			1061-2
65SC02	GTEMicro	G65SC02	1090-114
			1063-13
65SC03	GTEMicro	G65SC03	1090-115
			1063-14
65SC04	GTEMicro	G65SC04	1090-116
			1063-15
65SC05	GTEMicro	G65SC05	1090-117
			1063-16
65SC06	GTEMicro	G65SC06	1090-118
			1063-17
65SC07	GTEMicro	G65SC07	1090-119
			1063-18
65SC102			
	GTEMicro	G65SC102	1090-120
			1063-19
65SC103			
	GTEMicro	G65SC103	1090-121
65SC104			
	GTEMicro	G65SC104	1090-122
			1063-20
65SC105			
	GTEMicro	G65SC105	1090-123
			1063-21
65SC106			
	GTEMicro	G65SC106	1090-124
			1063-22
65SC107			
	GTEMicro	G65SC107	1090-125
			1063-23
65SC112			
	GTEMicro	G65SC112	1090-126
			1063-24
65SC115			
	GTEMicro	G65SC115	1090-127
			1063-25
65SC12	GTEMicro	G65SC12	1090-128
			1063-26
65SC13	GTEMicro	G65SC13	1090-129
			1063-27
65SC14	GTEMicro	G65SC14	1090-130
			1063-28
65SC15	GTEMicro	G65SC15	1090-131
			1063-29
65SC150			
	GTEMicro	G65SC150	1063-30
65SC22	Mitel	MD65SC22	1091-38
65SC51	Mitel	MD65SC51	1091-12
65X08	Intersil	IM65X08	3476-43
		IM65X08-1M	3476-26
		IM65X08A	3476-33
		IM65X08A-1	3476-14
		IM65X08A-1I	3476-15
		IM65X08AM	3476-34
		IM65X08C	3476-70
		IM65X08M	3476-44
65X18	Intersil	IM65X18-1	3476-30
		IM65X18-1M	3476-31
		IM65X18A	3476-35
		IM65X18A-1	3476-17
		IM65X18A-1M	3476-18
		IM65X18AM	3476-36
		IM65X18C	3476-50
		IM65X18M	3476-51
65X51	Intersil	IM65X51	3474-35
		IM65X51-1	3474-3

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
65X51	Intersil	IM65X51-1M	3474-4
		IM65X51A	3474-7
		IM65X51AM	3474-8
		IM65X51C	3474-59
		IM65X51M	3474-36
65X61	Intel	IM65X61-1	3473-111
	Intersil	IM65X61	3474-30
		IM65X61-1	3473-112
		IM65X61-1M	3473-113
		IM65X61A	3474-5
		IM65X61AM	3474-6
		IM65X61C	3474-57
		IM65X61M	3474-31
66	MicroEng	MCE66	2930-11
	Rockwell	A66XX	1088-120
	Siliconix	VN66AF	2481-39
660	**Motorola**	**MC660**	★ **729**
			472-76
	National	**CIM-660**	★**1955**
	PC/M	660	4007-4
	Signetics	TCA660B	2903-174
	Telefunken	SAS660	2906-141
			¶ 274-5
	Unitrode	**PIC660**	★**3446**
			2961-88
6600	**Harris**	**HD6600-2**	★**3745**
			507-116
		HD6600-5	★**3745**
			507-117
	Telefunken	SAS6600	2906-142
66016	**Synertek**	**SY66016**	★**1549**
			475-119
661	Motorola	MC661	472-77
	Plessey	TAA661	2901-38
			2905-12
	Unitrode	**PIC661**	★**3446**
			2961-89
6610	Telefunken	SAS6610	2906-143
6611	Harris	HM6611	460-137
		HM6611-2	3460-12
		HM6611-9	3460-13
6616	**Harris**	**HM6616-2**	★ **669**
			★**1333**
			★**3786**
			3464-121
		HM6616-9	★ **669**
			★**1333**
			★**3786**
			3464-122
662	Motorola	MC662	472-44
	Unitrode	**PIC662**	★**3446**
			2961-90
663	Motorola	MC663	472-64
6632	Motorola	MCM6632-15	3469-51
		MCM6632-20	3469-56
		MCM6632-25	3469-62
		MCM6632A-12	3469-46
		MCM6632A-15	3469-52
		MCM6632A-20	3469-57
6633	Motorola	MCM6633-15	3469-53
		MCM6633-20	3469-58
		MCM6633-25	3469-63
664	Motorola	MC664	472-65
6640	Plessey	SL6640	2901-79
			¶ 271-12
6641	**Harris**	**HM6641**	★ **669**
			★**1333**
			★**3783**
			460-110
			¶ 286-2
		HM6641-2	★ **669**
			★**1333**
			★**3783**
			3461-91
			¶ 286-2
		HM6641-9	★ **669**
			★**1333**
			★**3783**
			3461-92
			¶ 286-2
	Motorola	MCM6641-20	3482-31
		MCM6641-25	3482-45
		MCM6641-30	3482-74
		MCM6641-45	3482-101
6646	Harris	HM6646	3466-11
665	Motorola	MC665	473-33
6650	Plessey	SL6650	2901-80
			¶ 271-12
6654	Intersil	IM6654	3461-96
		IM6654-1	3461-95
		IM6654A	3461-93
		IM6654M	3461-97
6657	Intersil	IM6657	3464-40
		IM6657M	3464-41
6658	Intel	IM6658	3463-75
		IM6658M	3463-76
666	Motorola	MC666	473-34
6661	Harris	HM6661	3460-14
		HM6661-5	3460-15
6664	**Motorola**	**MCM6664-15**	★**3839**
			★**3842**
			3469-92
			¶ 287-17
			¶ 287-18
		MCM6664-20	★**3839**
			★**3842**
			3470-17
			¶ 287-17
			¶ 287-18
		MCM6664-25	★**3839**
			★**3842**
			3470-29
			¶ 287-17
			¶ 287-18
		MCM6664A-12	★**3839**
			★**3842**
			3469-71
			¶ 287-17
			¶ 287-18
		MCM6664A-15	★**3839**
			★**3842**
			3469-93
			¶ 287-17
			¶ 287-18
		MCM6664A-20	★**3839**
			★**3842**
			3470-18
			¶ 287-17
			¶ 287-18
6665	**Motorola**	**MCM6665-15**	★**3839**
			★**3843**
			3470-1
		MCM6665-20	★**3839**
			★**3843**
			3470-19
		MCM6665A-12	★**3839**
			★**3843**
			3469-78
		MCM6665A-15	★**3839**
			★**3843**
			3470-2
		MCM6665A-20	★**3839**
			★**3843**
			3470-20
667	Motorola	MC667	473-12
6670	**Motorola**	**MCM6670**	★**3840**
			3453-16
66700	**Motorola**	**MCM66700**	★**3840**
			3453-43
66710	**Motorola**	**MCM66710**	★**3840**
			3453-44
66714	**Motorola**	**MCM66714**	★**3840**
			3453-45
66720	**Motorola**	**MCM66720**	★**3840**
			3453-46
66730	**Motorola**	**MCM66730**	★**3840**
			3453-47
66734	**Motorola**	**MCM66734**	★**3840**
			3453-48
6674	**Motorola**	**MCM6674**	★**3840**
			3453-17
66740	**Motorola**	**MCM66740**	★**3840**
			3453-49
66750	**Motorola**	**MCM66750**	★**3840**
			3453-50
66751	Motorola	MCM66751	3453-51
66760	**Motorola**	**MCM66760**	★**3840**
			3453-52
66770	**Motorola**	**MCM66770**	★**3840**
			3453-53
66780	**Motorola**	**MCM66780**	★**3840**
			3453-54
66790	**Motorola**	**MCM66790**	★**3840**
			3453-55
668	Motorola	MC668	472-97
6688	**AMD**	**AM6688**	★**3109**
			2965-147
		AM6688L-6	★**3109**
			2965-148
		AM6688L-7	★**3109**
			2965-149
		AM6688L-8	★**3109**
			2965-150
		AM6688M-6	★**3109**
			2965-151
		AM6688M-7	★**3109**
			2965-152
		AM6688M-8	★**3109**
			2965-153
669	Motorola	MC669	473-4
6690	Plessey	SL6690	2901-81
			¶ 271-12
66L41	Motorola	MCM66L41-20	3482-32
		MCM66L41-25	3482-46
		MCM66L41-30	3482-75
		MCM66L41-45	3482-102
67	Motorola	MC67B	472-18
670	Motorola	MC670	472-88
	Telefunken	SAS670	2906-144
	Unitrode	**PIC670**	★**3446**
			2961-91
6700	Telefunken	SAS6700	2906-145
6701	MMI	6701	1049-11
671	Motorola	MC671	472-89
	Siemens	TCA671	2889-24
	Unitrode	**PIC671**	★**3446**
			2961-92
6710	Telefunken	SAS6710	2906-146
6716	Harris	HM6716-2	3465-33
		HM6716-9	3465-34
	National	NMC6716	3465-81
		NMC6716-1	3465-41
		NMC6716-2	3465-50
672	Motorola	MC672	472-98
	Unitrode	**PIC672**	★**3446**
			2961-93
673	**AD**	**AD673J**	★**3174**
			2428-6
		AD673S	★**3174**
			2428-7
	Motorola	MC673	472-116
			¶ 276-9
	Plessey	TBA673	2967-36
	Signetics	TBA673	2967-37
674	Motorola	MC674	472-117
67401	MMI	67401A	3456-53
	MMI	**C67401**	★ **722**
			3456-42
		C67401A	★ **722**
			3456-43
		C67401B	★ **722**
			3456-44
67402	**MMI**	**C67402**	★ **722**
			3456-50
		C67402A	★ **722**
			3456-51
			3456-54
		C67402B	★ **722**
			3456-52
6741	RCA	CA6741	2929-20
675	HybridSys	R675B-1	2966-140
		R675B-3	2967-3
		R675B-4	2966-141
		R675B-5	2966-142
		R675C-1	2966-143
		R675C-3	2967-4
		R675C-5	2966-144
	Motorola	MC675	473-41
67558	MMI	67558	475-152
		67558-1	475-153
6758	Harris	HM6758-9	3463-69
676	Motorola	MC676	472-35
			2465-116
677	Motorola	MC677	472-8
678	Motorola	MC678	472-4
			472-17
6780	Panasonic	AN6780	2951-5
68	ApplSys	ACS/68	1759-16
68	**Fairchild**	**PEP68**	★**1718**
			1622-3
	Heurikon	MLZ-68	1769-4
	Motorola	**M68BSAC**	★**1729**
		M68BSAE	★**1729**
		M68EDITM	★**1736**
		M68KEXOR	★**1733**
		M68KOFORTRAN	★**1734**
		M68KOPASCALH	★**1734**
		M68KOUDOSH	★**1734**
		M68KOVDOS	★**1936**
		M68MDOC	★**1736**
		M68XDOC	★**1736**
	Motorola	MEX68KDM	1767-34
	Motorola	**MEX68RR**	★**1940**
	National	VMC68K/15	1767-31
	RCIData	CMC68/04	1761-8
		CMC68/04A	1761-9
		CMC68/15	1759-20
		CMC68/15B	1759-30
		CMC68/15C	1759-21
		CMC68/15G	1759-22
	Sunrise	**ZAP-68**	★**4107**
	Sunrise	ZAP68	4009-3
680	AWI	SSC680	1100-51
	Motorola	MC680	472-12
	Plessey	SL680	2963-2
	RTC	MS680	2899-133
6800	AMI	S6800	1091-133
			1059-20
	Digitek	DK-6800	1759-15
	Fairchild	**F6800**	★**1253**
			★**1269**
			★**1278**
			1091-136
			★**1253**
			★**1269**
			★**1278**
			1061-12
	Fujitsu	MBL6800	1091-139
			1061-24
	Hitachi	**HD6800**	★**1345**
			1091-140
			★**1345**
			1063-35
	Mostek	MK6800	1100-16
	Motorola	**M6800**	★**1351**
		M6800EXOR	★**1735**
		MS800UPDWNLD	
			★**1736**
		MC6800	★**1351**
			1091-143
			¶ 286-13
			¶ 238-15
			¶ 239-5
			¶ 243-5
			¶ 244-15
			¶ 245-3
			¶ 248-2
			★**1351**
			1067-25
			¶ 286-13
			¶ 238-15
			¶ 239-5
			¶ 243-5
			¶ 244-15
			¶ 245-3
			¶ 248-2
		MC6800M	★**1351**
			1091-144
			¶ 286-13
			¶ 238-15
			¶ 239-5
			¶ 243-5
			¶ 244-15
			¶ 245-3
			¶ 248-2
		MC6800NS	★**1351**
			1091-145
			¶ 286-13
			¶ 238-15
			¶ 239-5
			¶ 243-5
			¶ 244-15

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
6800	Motorola	MC6800NS	¶ 245-3
			¶ 248-2
	Siemens	SAS6800	2906-139
68000	Hitachi	HD68000	1100-19
	Hitachi	**HD68000-10**	**★1345**
			1100-20
		HD68000-4	**★1345**
			1100-21
		HD68000-6	**★1345**
			1100-22
		HD68000-8	**★1345**
			1100-23
	Hitachi	HD68000R-10	1079-4
		HD68000R-4	1079-5
		HD68000R-6	1079-6
		HD68000R-8	1079-7
	Mostek	MK68000	1079-20
		MK68000-10	1100-24
		MK68000-4	1100-25
		MK68000-6	1100-26
		MK68000-8	1100-27
		MKB68000	1079-22
	Motorola	**M68000**	**★1354**
			★1731
			1627-3
		MC68000-10	**★1355**
			★1730
			1100-28
			¶ 287-18
			¶ 239-4
			¶ 241-3
			¶ 241-4
			¶ 241-11
			¶ 241-12
		MC68000-12	**★1355**
			★1730
			1100-29
			¶ 287-18
			¶ 239-4
			¶ 241-3
			¶ 241-4
			¶ 241-11
			¶ 241-12
		MC68000-4	**★1355**
			★1730
			1100-30
			¶ 287-18
			¶ 239-4
			¶ 241-3
			¶ 241-4
			¶ 241-11
			¶ 241-12
		MC68000-6	**★1355**
			★1730
			1100-31
			¶ 287-18
			¶ 239-4
			¶ 241-3
			¶ 241-4
			¶ 241-11
			¶ 241-12
		MC68000-8	**★1355**
			★1730
			1100-32
			¶ 287-18
			¶ 239-4
			¶ 241-3
			¶ 241-4
			¶ 241-11
			¶ 241-12
		MC68000MPU	**★1935**
	Rockwell	R68000	1100-33
	Signetics	**S68000**	**★1975**
		SCN68000	**★1524**
			1081-9
68000L10			
	Motorola	MC68000L10	1079-23
68000L12			
	Motorola	MC68000L12	1079-24
68000L4			
	Motorola	MC68000L4	1079-25
68000L6			
	Motorola	MC68000L6	1079-26
68000L8			
	Motorola	MC68000L8	1079-27
68008	**Motorola**	**MC68008**	**★1356**

Base Number	Source	Device	Page-Line
68008	Motorola	MC68008	1100-17
			★1356
			1067-26
6801	AMI	S6801	1091-72
			1059-21
	Fairchild	**F6801**	**★1270**
			1091-74
			★1270
			1061-13
		F6801E	**★1270**
			1091-61
	Hitachi	HD6801	1091-75
			1065-1
	Motorola	**M6801**	**★1351**
		MC6801	**★1351**
			★1730
			1091-77
			¶ 238-5
			¶ 240-3
			¶ 241-2
			★1351
			★1730
			1067-27
			¶ 238-5
			¶ 240-3
			¶ 241-2
		MC6801-1	**★1351**
			★1730
			1091-78
			¶ 238-5
			¶ 240-3
			¶ 241-2
		MC6801C	**★1351**
			★1730
			1091-79
			¶ 238-5
			¶ 240-3
			¶ 241-2
		MEX6801	**★1737**
	MRC	MBK6801	1759-32
68010	**Motorola**	**MC68010**	**★1356**
			1100-18
			★1356
			1079-28
6801DS351			
	Motorola	**M6801DS351N**	**★1735**
6801S0	**Hitachi**	**HD6801S0**	**★1345**
6801S5	**Hitachi**	**HD6801S5**	**★1345**
6801U4	Motorola	MC6801U4	1091-80
			1067-29
		MC6801U4-1	1067-30
6801V0	**Hitachi**	**HD6801V0**	**★1345**
6801V5	**Hitachi**	**HD6801V5**	**★1345**
6802	AMI	S6802	1091-98
			¶ 240-17
			¶ 244-9
			1059-22
			¶ 240-17
			¶ 244-9
	Fairchild	**F6802**	**★1278**
			1091-101
			★1278
			1061-14
	Fujitsu	MBL6802	1091-104
			1061-25
	Hitachi	**HD6802**	**★1345**
			1091-106
			★1345
			1065-2
		HD6802W	**★1345**
	Motorola	**MC6802**	**★1351**
			1091-107
			¶ 243-6
			★1351
			1067-31
			¶ 243-6
68020	**Motorola**	**MC68020**	**★1356**
			1083-7

Base Number	Source	Device	Page-Line
6803	AMI	S6803	1091-63
			1059-23
		S6803N/R	1091-64
	Fairchild	**F6803**	**★1270**
			1091-65
			★1270
			1061-15
	Hitachi	**HD6803**	**★1345**
			1091-62
			★1345
			1065-3
		HD6803-1	**★1345**
	Motorola	**MC6803**	**★1351**
			1091-66
			¶ 241-2
			★1351
			1067-32
			¶ 241-2
		MC6803-1	**★1351**
			1091-67
			¶ 241-2
			★1351
			1067-33
			¶ 241-2
		MC6803C	**★1351**
			1091-68
			¶ 241-2
		MC6803E	**★1351**
			1067-34
			¶ 241-2
		MC6803E-1	**★1351**
			1067-35
			¶ 241-2
6803U4	Motorola	MC6803U4	1091-81
			1067-36
		MC6803U4-1	1067-37
6804	**Motorola**	**MC6804**	**★1351**
68045	**AMI**	**S68045**	**★1250**
			1092-21
	Synertek	**SY68045**	**★1535**
			1092-36
68047	AMI	S68047	2906-44
			¶ 238-1
			1092-146
			1101-106
			¶ 238-1
6804P2	Motorola	MC6804P2	1067-38
6805	**AMI**	**S6805**	**★1248**
			1091-73
			★1248
			1059-24
	Hitachi	HD6805	1091-76
			1065-4
	Motorola	**M6805**	**★1351**
		M6805FIM	**★1737**
		MC6805	**★1351**
		MEX6805	**★1737**
	RCA	**CDP6805**	**★1487**
	Synapse	CPU-6805	1757-18
68051	**AMI**	**S68051**	**★1249**
			2486-2
6805E2	RCA	CDP6805E2	1073-9
6805F2	RCA	CDP6805F2	1073-10
6805G2	RCA	CDP6805G2	1073-11
6805P2	Motorola	MC6805P2	1091-82
			1069-1
6805P4	Motorola	MC6805P4	1091-83
			1069-2
6805P6	Motorola	MC6805P6	1069-3
6805R2	Motorola	MC6805R2	1091-71
			1069-4
	Motorola	**MEX6805R2**	**★1737**
6805R3	Motorola	MC6805R3	1069-5
6805S1	**Hitachi**	**HD6805S1**	**★1345**
6805T2	Motorola	MC6805T2	1091-51
			1069-6
6805U1	**Hitachi**	**HD6805U1**	**★1345**
6805U2	Motorola	MC6805U2	1091-84
			1069-7
6805U3	Motorola	MC6805U3	1069-8
6805V1	**Hitachi**	**HD6805V1**	**★1345**
6805W0			
	Hitachi	**HD6805W0**	**★1345**
6805X0	**Hitachi**	**HD6805X0**	**★1345**
6808	AMI	S6808	1091-125
	Fairchild	**F6808**	**★1278**

Base Number	Source	Device	Page-Line
6808	Fairchild	F6808	1091-128
			★1278
			1061-16
	Hitachi	HD6808	1091-129
			1065-5
	Motorola	**MC6808**	**★1351**
			1091-130
			★1351
			1069-9
		MEX6808-22	**★1940**
6809	**AMI**	**S6809**	**★1247**
			1091-110
			★1247
			1059-25
		S6809(E)	**★1247**
			1091-89
	Fairchild	**F6809**	**★1272**
			1091-113
			★1272
			1061-17
		F6809E	**★1272**
			★1274
			1091-92
			★1272
			★1274
			1061-18
	Fujitsu	MBL6809	1091-116
			1061-26
	Hitachi	**HD6809**	**★1345**
			1091-119
			★1345
			1065-6
		HD6809E	**★1345**
			1065-7
	Motorola	**M6809**	**★1352**
		M6809BASMR	**★1736**
		M6809EXOR	**★1735**
		M6809FORTRN	**★1736**
		M6809MPL	**★1736**
		M6809PASCLC	**★1736**
		M6809SA	**★1737**
		M6809SETPAS	**★1735**
		M6809UPDOWNLD	
			★1736
		MC6809	**★1352**
			1091-122
			¶ 238-7
			¶ 241-7
			★1352
			1069-10
			¶ 238-7
			¶ 241-7
		MC6809E	**★1352**
			1091-05
			¶ 238-7
			¶ 241-7
			★1352
			1069-11
			¶ 238-7
			¶ 241-7
681	IMS	SBC681	1761-13
	Motorola	MC681	472-5
	RTC	MS681	2899-134
6810	AMI	S6810	3472-59
			3472-59
		S6810-1	3472-53
			3472-53
	Fairchild	**F6810**	**★1278**
			3472-60
			3472-60
	Motorola	**MCM6810**	**★1351**
			★3839
			3472-62
			3472-62
	Siemens	SAS6810	2906-140
6811	Panasonic	AN6811	510-77
68120	**Motorola**	**MC68120**	**★1352**
			★1357
			★1730
			1100-37
			★1352
			★1357
			★1730
			1069-12
		MC68120-1	**★1352**
			★1357

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
68120	Motorola	MC68120-1	★1730
			1069-13
	Signetics	SCN68120C	★1524
			1100-39
68121	Motorola	MC68121	★1357
			1100-38
			★1357
			1069-14
		MC68121-1	★1357
			1069-15
68122	Motorola	MC68122	1092-19
			1100-34
		MC68122-1	1092-20
			1100-35
6816	Motorola	MEX6816-1HR	★1940
		MEX6816-22D	★1940
		MEX6816-22S	★1940
6818	RCA	CDP6818	★1491
682	Motorola	MC682	473-9
	Motorola	MVMC682-114	★1942
		MVMC682-114H	★1942
		MVMC682-118	★1942
		MVMC682-118H	★1942
	RTC	MS682	2899-135
6820	Fairchild	F6820	1092-83
			1102-53
	Motorola	MEX6820	★1940
	Panasonic	AN6820	510-122
	Synertek	SY6820	★1527
			1092-95
68200	Motorola	MC68200	1081-1
6821	AMI	S6821	1092-80
			1102-48
	Fairchild	F6821	★1279
			1092-84
			1102-54
	Hitachi	HD6821	★1345
			1092-87
	Motorola	MC6821	★1351
			1092-91
			1102-57
			¶ 239-5
			¶ 246-5
		MEX6821-2	★1940
	Panasonic	AN6821	510-123
	Synertek	SY6821	★1528
			1092-96
6822	Motorola	MC6822	★1351
			1092-69
6823	RCA	CPP6823	★1491
68230	Motorola	MC68230	★1357
	Signetics	SCN68230C	★1524
			1100-47
68230L10			
	Motorola	MC68230L10	1100-45
68230L8			
	Motorola	MC68230L8	1100-46
68230P10			
	Mostek	MK68230P10	1100-43
68230P8			
	Mostek	MK68230P8	1100-44
6828	Motorola	MC6828	★1351
			1092-100
			1102-67
6829	Motorola	MC6829	★1351
			1092-73
683	Motorola	MC683	473-1
	RTC	MS683	2899-136
6831	AMI	S6831B	3485-34
68316	Fairchild	F68316	★1281
			3485-18
	Motorola	MCM68316	3454-4
6832	Datel	ST-6832	★1933
	Motorola	MEX6832-1HR	★1940
		MEX6832-22	★1940
68332	AMI	S68332	★3612
			3485-121
	Fairchild	F68332	★1282
			3486-21
6835	Motorola	MC6835	★1351
			1092-29
	Panasonic	DN6835	511-56
			2963-121
68364	Motorola	MCM68364	★3840
			3486-30
68364	Motorola	MCM68364-25	★3840
			3486-52
		MCM68364-30	★3840
			3486-83
68365	Motorola	MCM68365-25	★3840
			3486-53
		MCM68365-35	★3840
			3486-101
68366	Motorola	MCM68366-25	★3840
			3486-54
		MCM68366-35	★3840
			3486-102
6837	Panasonic	DN6837	511-57
			2963-122
6838	Panasonic	DN6838	511-58
6839	Motorola	MC6839	★1351
			1092-53
	Panasonic	DN6839	511-59
684	Motorola	MC684	472-29
6840	AMI	S6840	1092-102
	Fairchild	F6840	★1279
			1092-105
	Hitachi	HD6840	★1345
			1092-108
	Motorola	MC6840	★1351
			1092-111
		MC6840M	★1351
			1092-112
6842	Motorola	MPQ6842	1092-12
6843	Hitachi	HD6843	★1345
			1092-57
	Motorola	MC6843	★1351
			1092-59
68430	Signetics	B68430	★1525
		SCB68430	★1525
6844	Fairchild	F6844	★1279
			1092-42
	Hitachi	HD6844	★1345
			1092-43
	Motorola	MC6844	★1351
			1092-46
			¶ 241-7
		MC6844M	★1351
			1092-47
			¶ 241-7
68440	Motorola	MC68440	★1358
			1101-128
6845	Fairchild	F6845	★1276
			1092-25
		F6845A	★1276
	Hitachi	HD6845	★1345
			1092-26
	Motorola	MC6845	★1351
			1092-30
		MC6845M	★1351
			1092-31
	Synertek	SY6845R	★1532
			1092-37
68450	Hitachi	HD68450	★1345
			1100-36
	Motorola	MC68450	★1358
68451	Motorola	MC68451	★1358
			1100-41
	Signetics	N68451	★1525
		SCN68451	★1525
68452	Motorola	MC68452	★1359
6846	AMI	S6846	1092-117
			¶ 244-9
	Fairchild	F6846	★1280
			1092-118
	Hitachi	HD6846	★1345
	Motorola	MC6846	★1351
			1092-119
			¶ 243-6
		MC6846M	★1351
			1092-120
			¶ 243-6
6847	Fairchild	F6847	1101-107
	Motorola	MC6847	★1351
			2906-45
			¶ 238-5
			¶ 238-7
			¶ 241-13
			★1351
			1092-147
			1100-49
6847	Motorola	MC6847	1101-109
			¶ 238-5
			¶ 238-7
			¶ 241-13
		MC6847Y	★1351
			1100-50
			¶ 238-5
			¶ 238-7
			¶ 241-13
68478	Motorola	MC68478	1092-148
6848	Motorola	MEX6848-1HR	★1940
		MEX6848-22	★1940
68488	AMI	S68488	1092-62
			1102-43
			¶ 245-12
	Fairchild	F68488	★1280
			1092-63
	Motorola	MC68488	★1351
			1092-64
		MC68488M	★1351
			1092-65
685	AMD	685L	2891-18
			¶ 270-15
		685M	2891-19
			¶ 270-15
	Motorola	MC685	472-20
6850	AMI	S6850	2486-3
			1091-159
			1102-25
	Fairchild	F6850	★1280
			2486-4
			★1280
			1091-163
			1102-28
	Hitachi	HD6850	★1345
			1092-3
	Motorola	MC6850	★1351
			2486-5
			¶ 258-1
			¶ 241-3
			★1351
			1092-5
			1102-30
			¶ 258-1
			¶ 241-3
		MC6850M	★1351
			1092-6
			¶ 258-1
			¶ 241-3
		MEX6850	★1940
		MEX6850-2	★1940
6852	AMI	S6852	1092-134
	Fairchild	F6852	★1281
			1092-137
			1102-78
	Hitachi	HD6852	★1345
			1092-140
	Motorola	MC6852	★1351
			2487-23
			¶ 241-12
			★1351
			1092-142
			1102-79
			¶ 241-12
		MC6852M	★1351
			1092-143
			¶ 241-12
6854	AMI	S6854	1091-148
	Fairchild	F6854	★1281
			1091-152
	Motorola	MC6854	★1351
			1091-156
6855	Motorola	MC6855	1092-50
6856	Fairchild	F6856	★1277
			2487-21
			★1277
			1091-153
68562	Motorola	MC68562	★1359
68564	Mostek	MK68564	1100-48
	Motorola	MC68564	★1359
6859	Motorola	MC6859	★1351
			510-66
			★1351
			1092-40
68590	Mostek	MK68590	1100-40
			1101-52
686	AMD	686C	507-26
			¶ 270-15
			2891-36
			¶ 270-15
		686M	507-27
			¶ 270-15
			2891-20
			¶ 270-15
	Motorola	MC686	473-17
			3489-88
6860	Motorola	MC6860	★1351
			★3298
			2486-63
			¶ 258-8
			¶ 258-9
			★1351
			★3298
			2948-134
			¶ 258-8
			¶ 258-9
			★1351
			★3298
			1092-75
			¶ 258-8
			¶ 258-9
		MC6860L	★1351
			★3298
			1092-76
			¶ 258-8
			¶ 258-9
6862	Motorola	MC6862	★1351
			2948-133
			★1351
			1092-41
6864	Motorola	MEX6864-1HR	★1940
		MEX6864-22	★1940
68652	Motorola	MC68652	★1359
			2486-95
		MC68652-2	★1359
			2486-96
	Signetics	68652	★1520
68653	Motorola	MC68653	★1360
			2467-30
	Signetics	68653	★1520
68661	Motorola	MC68661A	★1360
			2486-71
			★1360
			1100-104
		MC68661B	★1360
			2486-73
			★1360
			1100-105
		MC68661C	★1360
			2486-72
			★1360
			1100-106
	Signetics	68661	★1521
68681	Motorola	MC68681	★1360
			2487-79
	Signetics	68681	2486-67
	Signetics	SCN68681C	★1525
			1100-52
687	AMD	687AL	2893-12
			¶ 270-15
		687AM	2892-58
			¶ 270-15
		687L	2893-13
			¶ 270-15
		687M	2892-59
			¶ 270-15
6870	Motorola	MC6870	1092-17
68701	Motorola	MC68701	★1351
			★1730
			1091-55
			¶ 241-2
			¶ 243-4
			★1351
			★1730
			1069-16
			¶ 241-2
			¶ 243-4
		MC68701-1	★1351
			★1730
			1091-56
			¶ 241-2
			¶ 243-4

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
68701	**Motorola**	**MC68701-1**	★1351
			★1730
			1069-17
			¶ 241-2
			¶ 243-4
		MC68701C	★1351
			★1730
			1091-57
			¶ 241-2
			¶ 243-4
		MC68701C-1	★1351
			★1730
			1091-58
			¶ 241-2
			¶ 243-4
68701U4			
	Motorola	MC68701U4	1069-18
		MC68701U4-1	1069-19
68705	**Motorola**	**MC68705**	★1351
			★1730
68705P3			
	Motorola	MC68705P3	1091-59
			1069-20
68705R3			
	Motorola	MC68705R3	1091-54
			1069-21
68705U3			
	Motorola	MC68705U3	1091-60
			1069-22
68708	Fairchild	F68708	3463-82
	Motorola	MCM68708	3463-84
6871	Motorola	MC6871	1092-18
68716	Fairchild	F68716	3465-66
6874	Motorola	MCM6874-35	3466-103
6875	Motorola	MC6875	1092-13
			¶ 244-15
			¶ 246-4
		MC6875A	1092-14
			¶ 244-15
			¶ 246-4
	Panasonic	AN6875	2463-6
68764	**Motorola**	**MCM68764**	★3839
			3467-3
68766	**Motorola**	**MCM68766**	★3839
			3467-4
		MCM68766-35	★3839
			3466-104
688	Motorola	MC688	472-59
			¶ 276-9
6880	Motorola	MC6880	2477-13
		MC6880A	1092-10
	Panasonic	AN6880	2967-164
6881	Motorola	MC6881	507-106
			1092-149
6882	**Fairchild**	**F6882**	★1278
			1091-102
	Motorola	**MC6882A**	★2752
			1092-157
		MC6882B	★2752
			1092-158
6883	Motorola	MC6883	497-82
			1092-131
6885	Motorola	MC6885	1092-151
6886	Motorola	MC6886	1092-152
6887	Motorola	MC6887	1092-153
6888	Motorola	MC6888	1092-154
68881	**Motorola**	**MC68881**	★1357
6889	Motorola	MC6889	508-24
			2477-27
			1092-11
689	Motorola	MC689	472-6
6890	**Motorola**	**MC6890**	★2758
			2442-12
			★2758
			1092-38
		MC6890A	★2758
			2441-38
			★2758
			1092-39
68901	Mostek	MK68901	1100-42
	Motorola	**MC68901**	★1360
68A00	AMI	S68A00	1091-134
	Fairchild	F68A00	1091-137
	Hitachi	**HD68A00**	★1345
			1091-141
	Motorola	MC68A00	1091-146

Base Number	Source	Device	Page-Line
68A01	**Motorola**	**MC68A01**	★1351
			1091-85
			★1351
			1069-23
68A02	AMI	S68A02	1091-99
			1059-26
	Fairchild	F68A02	1091-103
	Motorola	MC68A02	1091-108
68A03	**Motorola**	**MC68A03**	★1351
			1091-69
			★1351
			1069-24
68A045	**AMI**	**S68A045**	★1250
			1092-22
68A08	AMI	S68A08	1091-126
			1059-27
	Motorola	MC68A08	1091-131
68A09	**AMI**	**S68A09**	★1247
			1091-111
			★1247
			1059-28
		S68A09(E)	★1247
			1091-90
	Fairchild	**F68A09**	★1272
			1091-114
			★1272
			1061-19
		F68A09E	★1272
			★1274
			1091-93
			★1272
			★1274
			1061-20
	Fujitsu	MBL68A09	1091-117
			1061-27
	Hitachi	**HD68A09**	★1345
			1091-120
		HD68A09E	★1345
	Motorola	MC68A09	1091-123
		MC68A09E	1091-96
68A10	AMI	S68A10	3472-54
			3472-54
	Fairchild	F68A10	3472-55
			3472-55
	Motorola	**MCM68A10**	★3839
			3472-57
			3472-57
68A21	AMI	S68A21	1092-81
			1102-49
	Fairchild	F68A21	1092-85
			1102-55
	Hitachi	**HD68A21**	★1345
			1092-88
	Motorola	MC68A21	1092-92
			1102-58
68A29	Motorola	C68A29	1092-72
68A30	Motorola	MCM68A30A	3484-71
68A308	**Motorola**	**MCM68A308**	★3840
			3484-73
68A308P7			
	Motorola	MCM68A308P7	3484-74
68A316	**AMI**	**S68A316**	★3611
			3485-35
	Motorola	**MCM68A316A**	★3840
			3485-21
		MCM68A316E	★3840
			3485-22
		MCM68A316E-91	
			★3840
			3454-5
68A316EP91			
	Motorola	MCM68A316EP91	
			3485-23
68A332	AMI	S68A332	3485-96
	Fairchild	F68A332	3485-100
	Motorola	**MCM68A332**	★3840
			3485-103
68A332P2			
	Motorola	**MCM68A332P2**	★3840
			3485-104
68A35	Motorola	MC68A35	1092-32
68A364	**AMI**	**S68A364**	★3613
			3486-95
	Motorola	MCM68A364	3486-103
68A364P3			
	Motorola	MCM68A364P3	3486-104

Base Number	Source	Device	Page-Line
68A39	Motorola	MC68A39	1092-54
68A40	AMI	S68A40	1092-103
	Fairchild	F68A40	1092-106
	Hitachi	**HD68A40**	★1345
			1092-109
	Motorola	MC68A40	1092-113
68A43	**Hitachi**	**HD68A43**	★1345
			1092-58
68A44	**Hitachi**	**HD68A44**	★1345
			1092-44
	Motorola	MC68A44	1092-48
68A45	**Hitachi**	**HD68A45**	★1345
			1092-27
	Motorola	MC68A45	1092-33
68A46	Motorola	MC68A46	1092-121
68A488	Motorola	MC68A488	1092-66
68A50	AMI	S68A50	1091-160
			1102-26
	Fairchild	F68A50	1092-1
			1102-29
	Hitachi	**HD68A50**	★1345
			1092-4
	Motorola	MC68A50	1092-7
			1102-31
68A52	AMI	S68A52	1092-135
	Fairchild	F68A52	1092-138
	Hitachi	**HD68A52**	★1345
			1092-141
	Motorola	MC68A52	1092-144
68A54	AMI	S68A54	1091-149
	Fairchild	F68A54	1091-154
	Motorola	MC68A54	1091-157
68A708	Motorola	MCM68A708	3463-71
68B00	AMI	S68B00	1091-135
	Fairchild	F68B00	1091-138
	Hitachi	**HD68B00**	★1345
			1091-142
	Motorola	MC68B00	1091-147
68B01	**Motorola**	**MC68B01**	★1351
			1091-86
			★1351
			1069-25
68B02	AMI	S68B02	1091-100
	Motorola	MC68B02	1091-109
68B03	**Motorola**	**MC68B03**	★1351
			1091-70
			★1351
			1069-26
68B045	**AMI**	**S68B045**	★1250
			1092-23
68B08	AMI	S68B08	1091-127
	Motorola	MC68B08	1091-132
68B09	**AMI**	**S68B09**	★1247
			1091-112
			★1247
			1059-29
		S68B09(E)	★1247
			1091-91
	Fairchild	**F68B09**	★1272
			1091-115
			★1272
			1061-21
		F68B09E	★1272
			★1274
			1091-94
			★1272
			★1274
			1061-22
	Fujitsu	MBL68B09	1091-118
			1061-28
	Hitachi	**HD68B09**	★1345
			1091-121
		HD68B09E	★1345
	Motorola	MC68B09	1091-124
			¶ 248-10
		MC68B09E	1091-97
			¶ 248-10
			¶ 248-10
68B10	AMI	S68B10	3472-49
			3472-49
	Fairchild	F68B10	3472-50
			3472-50
	Motorola	**MCM68B10**	★3839
			3472-51
			3472-51

Base Number	Source	Device	Page-Line
68B20	**Synertek**	**SY68B20**	★1527
			1092-97
68B21	AMI	S68B21	1092-82
			1102-50
	Fairchild	F68B21	1092-86
			1102-56
	Hitachi	**HD68B21**	★1345
			1092-89
	Motorola	MC68B21	1092-93
			1102-59
	Synertek	**SY68B21**	★1528
			1092-98
68B29	Motorola	MC68B29	1092-74
68B30	Motorola	MCM68B30A	3484-56
68B308	Fairchild	F68B308	3484-54
	Motorola	**MCM68B308**	★3840
			3484-55
68B316	AMI	S68B316	3485-36
68B35	Motorola	MC68B35	1092-34
68B364	AMI	S68B364	460-145
			3486-47
	Motorola	MCM68B364	3486-55
68B39	Motorola	MC68B39	1092-55
68B40	AMI	S68B40	1092-104
	Fairchild	F68B40	1092-107
	Hitachi	**HD68B40**	★1345
			1092-110
	Motorola	MC68B40	1092-114
68B44	**Hitachi**	**HD68B44**	★1345
			1092-45
	Motorola	MC68B44	1092-49
68B45	**Hitachi**	**HD68B45**	★1345
			1092-28
	Motorola	MC68B45	1092-35
68B46	Motorola	MC68B46	1092-122
68B488	Motorola	MC68B488	1092-67
68B50	AMI	S68B50	1091-161
			1102-27
	Fairchild	F68B50	1092-2
	Motorola	MC68B50	1092-8
			1102-32
68B52	AMI	S68B52	1092-136
	Fairchild	F68B52	1092-139
	Motorola	MC68B52	1092-145
68B54	AMI	S68B54	1091-150
	Fairchild	F68B54	1091-155
	Motorola	MC68B54	1091-158
68BASR010			
	Motorola	**M68BASR010M**	★1736
68BSA1	**Motorola**	**M68BSA1**	★1729
68BSA2	**Motorola**	**M68BSA2**	★1729
68BSA4	**Motorola**	**M68BSA4**	★1729
68BSA5	**Motorola**	**M68BSA5**	★1729
68BSA6	**Motorola**	**M68BSA6**	★1729
68DSK2	**Motorola**	**M68DSK2**	★1738
68DSK3	**Motorola**	**M68DSK3**	★1738
68FTNR012			
	Motorola	**M68FTNR012M**	★1736
68K1	Omnibyte	OB68K1	1765-32
68KEXOR16			
	Motorola	**M68KEXOR16**	★1733
68KEXOR32			
	Motorola	**M68KEXOR32**	★1733
68KEXOR96			
	Motorola	**M68KEXOR96**	★1733
68KFD1102			
	Motorola	**M68KFD1102**	★1738
68KHDS16			
	Motorola	**M68KHDS16-1**	★1738
68KHDS32			
	Motorola	**M68KHDS32-1**	★1738
68KHDS96			
	Motorola	**M68KHDS96-1**	★1738
68KORMS68			
	Motorola	**M68KORMS68K**	★1936
68KVM01			
	Motorola	**M68KVM01A**	★1937
68KVM02			
	Motorola	**M68KVM02**	★1937
			1767-33
68KVM10			
	Motorola	**M68KVM10**	★1938
68KVM11			
	Motorola	**M68KVM11**	★1938
68KVM20			
	Motorola	**M68KVM20**	★1938

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
68KVM21			
	Motorola	M68KVM21	★1938
68KVM30			
	Motorola	M68KVM30	★1938
68KVM31			
	Motorola	M68KVM31	★1938
68KVM40			
	Motorola	M68KVM40	★1938
68KVM60			
	Motorola	M68KVM60	★1938
68KVM80			
	Motorola	M68KVM80	★1938
68L764	Motorola	MCM68L764-35	3466-105
68MM01			
	Motorola	M68MM01	★1939 1759-17
		M68MM01B	★1939 1761-5
		M68MM01D	★1939 1759-19
68MM01A2			
	Motorola	M68MM01A2	★1939 1759-18
68MM01B1			
	Motorola	M68MM01B1A	★1939 1761-6
68MM03			
	Motorola	M68MM03	★1940
68MM04			
	Motorola	M68MM04	★1940
		M68MM04-A	★1940
68MM05			
	Motorola	M68MM05A	★1940
		M68MM05B	★1940
		M68MM05C	★1940
68MM06			
	Motorola	M68MM06	★1940
68MM07			
	Motorola	M68MM07	★1940
68MM09			
	Motorola	M68MM09	★1940
68MM11			
	Motorola	M68MM11	★1940
68MM12			
	Motorola	M68MM12	★1940
		M68MM12-1	★1940
		M68MM12A	★1940
68MM13			
	Motorola	M68MM13A	★1940
		M68MM13B	★1940
		M68MM13C	★1940
		M68MM13D	★1940
68MM15			
	Motorola	M68MM15A	★1940
		M68MM15B	★1940
		M68MM15BEX	★1940
		M68MM15CI	★1940
		M68MM15CV	★1940
68MM15A1			
	Motorola	M68MM15A1	★1940
68MM16			
	Motorola	M68MM16-1	★1940
		M68MM16-2	★1940
		M68MM16-3	★1940
68MM17			
	Motorola	M68MM17	★1939 1761-21
68MM18			
	Motorola	M68MM18	★1940
68MM19			
	Motorola	M68MM19	1761-22
	Motorola	M68MM19-1	★1939
		M68MM19A	★1939 1761-32
68MM21			
	Motorola	M68MM21	★1940
		M68MM21-1	★1940
68MM22			
	Motorola	M68MM22	★1940
68MMCC05			
	Motorola	M68MMCC05	★1940
68MMCC10			
	Motorola	M68MMCC10	★1940
68MMFLC1			
	Motorola	M68MMFLC1	★1940
68MMLC1			
	Motorola	M68MMLC1	★1940
68MMO1			
	Motorola	M68MMO1D	★1939
68MMS1			
	Motorola	M68MMS1-1	★1940
68MMSC1			
	Motorola	M68MMSC1	★1940
68MPLR020			
	Motorola	M68MPLR020M	★1736
68P01	Hitachi	HD68P01	1065-8
68P01S0			
	Hitachi	HD68P01S0	★1345
68P01V05			
	Hitachi	HD68P01V05	★1345
68P01V07			
	Hitachi	HD68P01V07	★1345
68P05	Hitachi	HD68P05	1065-9
68P05V05			
	Hitachi	HD68P05V05	★1345
68P05V07			
	Hitachi	HD68P05V07	★1345
68PP3	Motorola	M68PP3	★1737
68RAD1			
	Motorola	M68RAD1	★1941
68RFDC1			
	Motorola	M68RFDC1	★1941
68RIO1	Motorola	M68RIO1	★1941
68RMS68			
	Motorola	M68RMS68K	★1935
68RSC1	Motorola	M68RSC1	★1938
68RTFR02			
	Motorola	M68RTFR02M	★1736
68RWIN1			
	Motorola	M68RWIN1-1	★1941
		M68RWIN1-2	★1941
68SA2	Motorola	MEX68SA2	★1737
68SC02	Mitel	MD68SC02	1091-87 1067-5
68SC21	Mitel	MD68SC21	1092-99
68SC40	Mitel	MD68SC40	1092-150
68SC49	Mitel	MD68SC49	1092-9
68SETDS351			
	Motorola	M68SETDS351	★1735
68SP702C10			
	Motorola	M68SP702C10	★1738
68SXD10155			
	Motorola	M68SXD10155	★1738
68UCANA1			
	Motorola	M68UCANA1	★1737
69	RCIData	CMC69/04	1761-31
		CMC69/04A	1763-2
		CMC69/15	1761-30
690	Motorola	MC690	472-13
691	Motorola	MC691	473-37
6910	OKI	MSM6910	★3873
6912	OKI	MSM6912	★3873
	Panasonic	AN6912	2895-23
6917	OKI	MSM6917	★3873
693	Motorola	MC693	472-94 2483-98
696	Motorola	MC696	473-29
697	Motorola	MC697	472-14
699	Motorola	MC699	472-43
60V12	Lambda	L60V12	2965-53
60V15	Lambda	L60V15	2965-54
60V24	Lambda	L60V24	2965-55
60V28	Lambda	L60V28	2965-56
60V5	Lambda	L60V5	2965-57
60V6	Lambda	L60V6	2965-58
7	Cromemco	DT7A	★1922
	Datel	SHM-7MC	★2622 2967-73
	Datel	SHM-7MR	2967-74
	Datel	SHM7	★2614
	Supertex	DC-7	464-67
	TeledyneC	CAG7	2418-34
		CAG7-10	2418-35
70	Burr-Brown	DAC70/CCD	2462-21
		DAC70/COB	2462-11
		DAC70/CSB	2462-9
		DAC70C/CCD	2462-22
		DAC70C/COB	2462-12
		DAC70C/CSB	2462-10
	Intel	BPK70	★3808 3468-3
	MicroEng	MCE70	2934-22
700	AnalogSys	MA700	2933-45
	ITT	TCA700	2898-52
700	Signetics	C700	★4524
		SCC700	★4524 4141-115
	TeledyneS	TSC700A	★2846 2464-133
	TI	STL700	★ 438
7000	Holt	HI7000	2899-155
	Panasonic	AN7000	2900-125
	Rockwell	RC7000	1088-113
	Signetics	SAA7000	2896-39
	TI	TMS7000	★1556 1093-2
			★1556 1075-19
70003	MicroEng	MT70003	★4440 4141-25
			★4440 464-9
7001	NEC-Micro	uPD7001	2429-28 1094-55 1102-14
70014	MicroEng	MT70014	★4440 4141-26
			★4440 464-10
7002	NEC-Micro	uPD7002	2435-20 1094-56 1102-15
7004	SMC	CRT7004	3453-57
7005	MasterLogic	ML7005	4140-159
7010	MasterLogic	ML7010	4140-160
	Signetics	SAA7010	2896-40
7011	Sanyo	LA7011	2968-39
7015	MasterLogic	ML7015	4140-161
702	NEC-Electron	uPC702	2913-118 2929-47
	SGS	L702	2889-92
	TI	TL702C	2913-119 2933-50
		TL702M	2913-120 2929-48
		uA702M	2923-8
7020	Holt	HI7020	2899-159
	MasterLogic	ML7020	4140-162
	Signetics	SAA7020	2896-41
	TI	TMS7020	★1556 1093-3
			★1556 1075-20
70200	IMI	G70200	4141-155
7027	Intersil	IM7027-1	3468-14
		IM7027-3	3468-24
		IM7027-4	3468-36
703	Motorola	MPRINT703	★1738
7030	LSIComp	LS7030	★ 696 510-58
7031	LSIComp	LS7031	★ 696 510-55
7033	NCR	NCR7033	3455-4
	Nitron	NC7033	3455-5
			¶ 285-3
			¶ 243-9
70360	IMI	G70360	4141-156
7038	Intersil	ICM7038A	462-85 2898-143
		ICM7038B	462-86 2898-144
		ICM7038C	462-87
		ICM7038D	462-88
		ICM7038E	462-90
		ICM7038F	462-91
		ICM7038G	462-92
7040	Fairchild	FCM7040	2906-49
	LSIComp	LS7040	★ 696 510-45
	TI	TMS7040	★1556 1092-123 1093-4
			★1556 1075-21
7041	TI	TMS7041	★1556 1093-6
			★1556 1075-22
7045	Intersil	ICM7045	511-49
7045	Intersil	ICM7045	2899-74 2899-90
		ICM7045A	511-47 2951-17
7047	Intersil	ICM7047	2899-95
7049	Intersil	ICM7049A	462-103 2898-145
7050	IPI	IPI7050	2964-14
	Intersil	ICM7050	462-104 2898-146
	LSIComp	LS7050	★ 696 510-49
7051	Intersil	ICM7051A	462-83 2899-30
		ICM7051B	462-105 2899-31
	Nitron	NC7051	3455-8
	Toshiba	TA7051	2905-48
7052	Intersil	ICM7052	462-106 2899-32
7055	LSIComp	LS7055/56	★ 696 510-50
	Nitron	NC7055	3455-16
7060	LSIComp	LS7060	★ 696 510-61
			¶ 260-5
7061	LSIComp	LS7061	★ 696 510-62
			¶ 260-5
	Toshiba	TA7061A	2888-116
7062	LSIComp	LS7062	★ 696 510-46
7063	Toshiba	TA7063	2897-172
7064	IPI	IPI7064	2964-15
70640	IMI	G70640	4141-157
7069	Toshiba	TA7069	2906-10
707	MicroTech	MC707	4141-29
7070	Panasonic	AN7070	2896-69
	Toshiba	TA7070	2903-31
7071	Panasonic	AN7071	2896-62
7072	Fujitsu	MB7072E	★3681 469-5
			★3681 3473-48
		MB7072N	★3681 469-6
			★3681 3473-52
	Toshiba	TA7072	2905-49
7073	Toshiba	TA7073A	2905-50
7074	Toshiba	TA7074	2906-11
7075	Toshiba	TA7075	2906-12
7076	Toshiba	TA7076	2906-13
7080	LSILogic	LSI-7080	4140-150
7085	Toshiba	TA7085A	2960-33
7089	Toshiba	TA7089	2959-57
709	Fairchild	uA709AM	2924-9
		uA709C	2932-9
		uA709M	2929-4
	Motorola	MHW709	2888-52
	National	LM709	2929-6
		LM709A	2924-11
		LM709C	2932-10
	Raytheon	RC709	2932-11
		RM709	2925-41
		RM709A	2921-19
	TI	uA709AM	2924-13
		uA709C	2932-5
		uA709M	2929-38
7090	National	DM7090	495-87
7091	National	DM7091	491-90
7092	GI	ACF7092C	2962-20
	National	DM7092	490-142
7093	National	DM7093	476-134
			¶ 236-15
7094	National	DM7094	476-109
7095	National	DM7095	159 485-16
7096	National	DM7096	107 485-15
7097	National	DM7097	160 485-16
7098	National	DM7098	108 485-15
7099	National	DM7099	491-80
70C20	TI	TMS70C20	★1556

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
70C95	National	MM70C95	450-103
70C96	National	MM70C96	450-171
70C97	National	MM70C97	450-104
70C98	National	MM70C98	450-172
70E40	**TI**	**TMS70E40**	★1556
			1093-1
			★1556
			1075-23
70L22	TI	TMS70L22	1093-5
			1075-24
71	**AD**	**ADADC71J**	★3173
			2436-45
		ADADC71K	★3173
			2436-39
		ADDAC71-COB-I	★3166
			2461-25
		ADDAC71-COB-V	★3166
			2461-37
		ADDAC71-CSB-I	★3166
			2461-26
		ADDAC71-CSB-V	★3166
			2461-38
	Burr-Brown	ADC71J	2437-4
		ADC71K	2436-47
		DAC71/CCD	2462-27
		DAC71/COB	2462-1
		DAC71/CSB	2462-2
	Datel	DAC-71-CCD-I	2462-23
		DAC-71-CCD-V	2462-25
		DAC-71-COB-I	2461-20
		DAC-71-COB-V	2461-33
		DAC-71-CSB-I	2461-21
		DAC-71-CSB-V	2461-34
	NEC-Electron	uPC71	2892-18
710	Fairchild	uA710C	2892-15
		uA710M	2891-24
	Motorola	MHW710	2888-53
	National	**LM710**	★3317
			2891-26
		LM710C	★3317
			2892-17
	SiliconG	SG710	2891-27
		SG710C	2892-19
	TI	TL710C	2892-34
		TL710M	2892-21
		uA710M	2891-28
7100	IPI	IPI7100	2964-16
	LSIComp	**LS7100**	★ 696
			2464-46
	MicroNet	MN7100	2427-27
			2963-22
		MN7100H	2427-28
			2963-23
	Synertek	**7100**	★4536
		SY7100	★4536
			4141-118
71000	IMI	G71000	4141-158
	LSILogic	LSI-71000	4140-151
71001	TI	VM71001	2902-68
71002	TI	VM71002	2902-69
71003	**TI**	**VM71003**	★1563
			2902-70
71004	**TI**	**VM71004**	★1563
71005	**TI**	**VM71005**	★1563
7101	Intersil	ICL7101	2438-23
7103	Intersil	ICL7103	2438-24
		ICL7103A	2438-42
			¶ 253-16
			¶ 276-11
			¶ 277-1
7104	Intersil	ICL7104-12	2436-20
			¶ 253-16
			¶ 256-16
			¶ 248-1
		ICL7104-14	2436-28
			¶ 253-16
			¶ 256-16
			¶ 248-1
		ICL7104-16	2437-5
			¶ 253-16
			¶ 256-16
			¶ 248-1
	MicroPwr	MP7104A	511-43
7106	Intersil	ICL7106	2438-1
			¶ 256-20
			¶ 257-1
7106	Intersil	ICL7106	¶ 276-15
			¶ 277-5
			¶ 277-10
	TeledyneS	TSC7106	2438-13
7107	Intersil	ICL7107	2438-2
			¶ 256-20
			¶ 257-1
			¶ 277-10
	Nitron	NC7107	510-51
	TeledyneS	TSC7107	2438-14
7109	Intersil	ICL7109	2435-25
			¶ 253-16
			¶ 257-1
	TeledyneS	**TSC7109C**	★2847
			2435-26
		TSC7109M	★2847
			2435-27
711	**Datel**	**ST-711**	★1933
	Fairchild	uA711C	2893-47
		uA711M	2893-28
	National	**LM711**	★3317
			2893-29
		LM711C	★3317
			2893-49
	SiliconG	SG711	2893-30
		SG711C	2893-50
	TI	uA711C	2893-51
7110	**AD**	**AD7110K**	★3166
			2896-27
	Intel	7110	3468-2
	LSIComp	**LS7110**	★ 696
			511-95
			★ 696
			2424-96
	Panasonic	AN7110	2896-99
	Synertek	**7110**	★4537
		SY7110	★4537
			4141-119
7111	**AD**	**AD7111K**	★3166
			2896-21
		AD7111L	★3166
			2896-22
		AD7111T	★3166
			2896-23
		AD7111U	★3166
			2896-24
	Synertek	**7111**	★4537
		SY7111	★4537
			4141-120
7114	Panasonic	AN7114	2896-100
7115	**AD**	**AD7115K**	★3163
			2896-20
	Panasonic	AN7115	2896-101
7116	Intersil	ICL7116	2438-3
			¶ 256-20
	TeledyneS	TSC7116	2438-15
7117	Intersil	ICL7117	2438-4
			¶ 256-20
	TeledyneS	TSC7117	2438-16
7118	**AD**	**AD7118K**	★3166
			2896-28
		AD7118L	★3166
			2896-29
		AD7118T	★3166
			2896-25
		AD7118U	★3166
			2896-26
711RLY16			
	Datel	**ST-711RLY16D**	★1933
711RLY8			
	Datel	**ST-711RLY8D**	★1933
712	TI	TL712	2965-154
7120	MicroNet	MN7120	2427-29
			2963-24
		MN7120H	2427-30
			2963-25
	Panasonic	AN7120	2896-102
	Sanyo	LC7120	2898-125
	Toshiba	TA7120	2897-173
7121	**Fujitsu**	**MB7121E**	★3679
			3461-115
			3461-115
		MB7121H	★3679
			3461-103
			3461-103
	National	DM7121	500-1
7122	**Fujitsu**	**MB7122E**	★3679
			3461-118
			3461-118
		MB7122H	★3679
			3461-105
			3461-105
	Toshiba	TA7122A	2897-174
		TA7122B	2897-175
7123	**Fujitsu**	**MB7123E**	★3679
			3461-5
		MB7123H	★3679
			3460-117
	National	DM7123	499-66
7124	**Fujitsu**	**MB7124E**	★3679
			3461-10
		MB7124H	★3679
			3460-120
	Toshiba	TA7124	2906-14
7125	Toshiba	TA7125	2905-74
7126	Intersil	ICL7126	2438-5
			¶ 256-20
	TeledyneS	**TSC7126**	★2848
			2438-17
	Toshiba	TA7126	2904-133
7127	**Fujitsu**	**MB7127H**	★3679
			3463-105
7128	**Fujitsu**	**MB7128**	★3679
			497-77
		MB7128E	★3679
			3463-117
		MB7128E-W	★3679
			3463-118
		MB7128H	★3679
			3463-107
	IPI	IPI7128	2964-17
7129	Toshiba	TA7129	2897-176
		TA7129A	2897-177
7130	Fujitsu	MB7130E	3484-30
		MB7130H	3484-31
	MicroNet	MN7130	2967-107
			¶ 253-7
		MN7130H	2967-108
			¶ 253-7
	National	DM7130	474-135
	Panasonic	AN7130	2896-103
	Toshiba	TA7130	2905-51
7131	**Fujitsu**	**MB7131**	★3679
			497-71
		MB7131E	★3679
			3462-87
		MB7131H	★3679
			3462-73
	National	DM7131	474-76
	Sanyo	LC7131	2898-132
7132	**Fujitsu**	**MB7132**	★3679
			497-72
		MB7132E	★3679
			3462-88
		MB7132H	★3679
			3462-76
		MB7132Y	★3679
			3462-67
7133	Toshiba	TA7133	2946-7
7134	**Fujitsu**	**MB7134E**	★3679
			3485-67
		MB7134H	★3679
			3485-66
	Toshiba	TA7134	2904-134
7135	Intersil	ICL7135	2438-40
	Sanyo	LC7135	2898-133
	TeledyneS	**TSC7135**	★2850
			2438-41
	Toshiba	TA7135	2904-135
7136	Fujitsu	MB7136E	3484-109
		MB7136H	3484-108
	National	DM7136	474-78
	Toshiba	TA7136A	2897-178
7137	**Fujitsu**	**MB7137H**	★3679
			3464-59
	Toshiba	TA7137	2902-102
		TA7137-ST	2902-103
		TDA7137	2896-18
		TDA7137-ST	2896-19
7138	**Fujitsu**	**MB7138E**	★3679
			3464-90
		MB7138E-W	★3679
7138	Fujitsu	MB7138E-W	497-78
			★3679
			3484-110
		MB7138H	★3679
			3464-62
	MicroPwr	**MP7138**	★ 401
			★2749
			2438-6
		MP7138A	★ 401
			★2749
			2438-7
7139	MicroPwr	MP7139	2898-126
714	Fairchild	uA714	2911-56
			2915-27
		uA714C	2911-107
			2916-34
		uA714E	2915-33
7140	LSILogic	LSI-7140	4140-152
	MicroNet	MN7140	2963-26
		MN7140H	2963-27
	Toshiba	TA7140	2896-137
7141	**Fujitsu**	**MB7141E**	★3679
			3466-21
		MB7141H	★3679
			3466-19
	Intersil	IM7141	3482-98
		IM7141-2	3482-25
		IM7141-2M	3482-26
		IM7141-3	3482-67
		IM7141-3M	3482-68
		IM7141L	3482-99
		IM7141L-2	3482-27
		IM7141L-3	3482-69
		IM7141M	3482-100
	Toshiba	TA7141A	2904-22
7142	**Fujitsu**	**MB7142E**	★3679
			3466-22
		MB7142E-W	★3679
			497-79
			★3679
			3466-24
			3485-69
		MB7142H	★3679
			3466-20
7143	**Fujitsu**	**MB7143H**	★3678
			3466-77
7144	**Fujitsu**	**MB7144H**	★3678
			3466-78
71440	IMI	G71440	4141-159
7145	Panasonic	AN7145H	2897-129
		AN7145L	2897-100
		AN7145M	2897-113
	Toshiba	TA7145	2906-15
7146	Panasonic	AN7146H	2897-130
		AN7146M	2897-101
	Toshiba	TA7146	2905-52
7147	Toshiba	TA7147	2906-16
7148	Toshiba	TA7148	2904-23
7149	MicroPwr	MP7149	2898-127
			2945-141
	Toshiba	TA7149	2904-24
715	Fairchild	uA715C	2913-144
			2932-4
		uA715M	2913-145
			2929-40
7150	MicroPwr	MP7150	2899-165
	Panasonic	AN7150	2897-31
	Toshiba	TA7150	2904-25
7151	Panasonic	AN7151	2897-32
	Toshiba	TA7151	2904-118
7152	Panasonic	AN7152	2897-33
	Toshiba	TA7152	2905-119
7154	Panasonic	AN7154	2897-34
7155	Panasonic	AN7155	2897-35
7156	MicroPwr	MP7156	2898-124
			2945-84
	Panasonic	AN7156	2897-114
		AN7156N	2897-131
7157	Toshiba	TA7157A	2901-153
7158	Toshiba	TA7158	2965-2
716	**Datel**	**ST-716**	★1933
7160	MicroPwr	MP7160	2899-149
	National	DM7160	474-70
7161	Toshiba	TA7161	2904-26
7162	MicroPwr	MP7162	2906-116
	Toshiba	TA7162	2906-17

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
7163	ITT	ITT7163	2481-54
7164	ITT	ITT7164	2481-55
7165	Toshiba	TA7165	2907-9
7167	Toshiba	TA7167	2904-27
71671L70			
	IDT	**IDT71671L70**	★**3805**
7168	**IDT**	**IDT7168**	★**3805**
	Toshiba	TA7168	2904-28
71681L100			
	IDT	**IDT71681L100**	★**3805**
			3483-38
			3483-39
71681L45			
	IDT	**IDT71681L45**	★**3805**
			3482-118
			3483-1
71681L55			
	IDT	**IDT71681L55**	★**3805**
			3483-9
			3483-10
71681L70			
	IDT	IDT71681L70	3483-17
			3483-18
71681L85			
	IDT	**IDT71681L85**	★**3805**
			3483-31
			3483-32
71681S100			
	IDT	**IDT71681S100**	★**3805**
			3483-40
			3483-41
71681S45			
	IDT	**IDT71681S45**	★**3805**
			3483-2
			3483-3
71681S55			
	IDT	**IDT71681S55**	★**3805**
			3483-11
			3483-12
71681S70			
	IDT	**IDT71681S70**	★**3805**
			3483-19
			3483-20
71681S85			
	IDT	**IDT71681S85**	★**3805**
			3483-33
			3483-34
7169	Toshiba	TA7169	2904-29
717	MicroTech	MC717	4141-30
7171	Toshiba	TA7171	2903-89
7172	Toshiba	TA7172	2903-90
7173	Toshiba	TA7173	2904-30
7174	Toshiba	TA7174	2904-31
7176	Toshiba	TA7176A	2905-53
7177	Toshiba	TA7177	2903-91
7178	Toshiba	TA7178	2903-92
7179	Toshiba	TA7179	2958-81
7180	**Sprague**	**UDN-7180**	★**2843**
			2465-115
7181	Sanyo	LC7181	2898-121
7183	**Sprague**	**UDN-7183**	★**2843**
			2464-118
7184	Sanyo	LC7184	2898-122
	Sprague	**UDN-7184**	★**2843**
			2464-119
7186	**Sprague**	**UDN-7186**	★**2843**
			2464-120
7189	MicroPwr	MP7189	2898-128
7191	Sanyo	LC7191	2898-123
7192	Toshiba	TA7192	2904-32
7193	Toshiba	TA7193	2904-33
71960	IMI	G71960	4141-160
71LS95	AMD	DM71LS95	477-38
	National	DM71LS95	477-42
71LS96	AMD	DM71LS96	478-27
71LS97	AMD	DM71LS97	477-39
	National	DM71LS97	477-43
71LS98	AMD	DM71LS98	478-28
71S96	National	DM71S96	478-31
71S98	National	DM71S98	478-32
72	**AD**	**ADADC72J**	★**3173**
			2436-46
		ADADC72K	★**3173**
			2436-40
		ADDAC72-COB-I	★**3166**
			2461-27
72	**AD**	**ADDAC72-COB-V**	★**3166**
			2461-39
		ADDAC72-CSB-I	★**3166**
			2461-28
		ADDAC72-CSB-V	★**3166**
			2461-40
	Burr-Brown	ADC72	2436-48
		DAC72/COB	2462-3
		DAC72/CSB	2462-4
	Datel	DAC-72C-CCD-I	
			2462-24
		DAC-72C-CCD-V	
			2462-26
		DAC-72C-COB-I	
			2461-22
		DAC-72C-COB-V	
			2461-35
		DAC-72C-CSB-I	2461-23
		DAC-72C-CSB-V	
			2461-36
	Datel	**DAC72**	★**2615**
	Intel	**BPK72**	★**3809**
	MicroEng	MCE72	2940-25
720	ITT	TCA720	2907-13
	Reticon	RO720A	2963-150
	Universal	HCM720	4141-126
7200	LSILogic	LSI-7200	4140-153
	National	DM7200	474-32
	Sanyo	LC7200	2900-148
7201	Intersil	ICM7201	2964-112
	NEC-Electron	uPD7201	2486-97
	NEC-Micro	uPD7201	1094-145
			1096-58
			1098-30
			1101-61
	Sanyo	LC7201	2900-149
7203	Sanyo	LC7203	2900-150
	Toshiba	TA7203	2897-106
7205	Intersil	ICM7205	2899-92
	Toshiba	TA7205A	2897-87
7206	Intersil	ICM7206A	2949-139
		ICM7206B	2949-140
		ICM7206C	2949-141
		ICM7206D	2949-142
7207	Intersil	ICM7207	462-80
		ICM7207A	462-81
			¶ 277-2
	Sanyo	LC7207	2900-151
	Toshiba	TA7207	2896-138
7208	Intersil	ICM7208	452-100
			¶ 277-2
	Toshiba	TA7208	2896-139
7209	Intersil	ICM7209	462-77
			2480-7
721	TI	TL721	2965-155
7210	Intersil	ICM7210	2899-112
		ICM7210C	2899-113
		ICM7210M	2899-114
		ICM7210MC	2899-115
	LSIComp	**LS7210**	★ **696**
			464-64
			★ **696**
			2951-26
	National	DM7210	500-6
			¶ 235-12
	NEC-Micro	uPD7210	1102-46
	Sanyo	LC7210	2900-90
			2945-130
	Toshiba	TA7210	2897-7
7211	Intersil	ICM7211	455-26
			2464-122
		ICM7211A	455-27
			2464-123
		ICM7211AM	455-21
			2464-111
		ICM7211M	455-22
			2464-112
	National	DM7211	500-7
	SSS	SCL7211	2464-110
	TeledyneS	**TSC7211A**	★**2852**
			2464-132
7212	Intersil	ICM7212	455-37
			2464-114
		ICM7212A	455-38
			2464-115
7212	Intersil	ICM7212AM	455-39
			2464-116
		ICM7212M	455-40
			2464-117
	TeledyneS	**TSC7212**	★**2852**
7213	Intersil	ICM7213	462-82
	Panasonic	AN7213	2900-156
7214	Intersil	ICM7214	2899-178
		ICM7214A	2899-179
	National	DM7214	497-137
			¶ 236-15
	Toshiba	TA7214	2897-107
7215	Intersil	ICM7215	511-48
			2899-93
	Toshiba	TA7215	2897-108
7216	Intersil	ICM7216	453-108
		ICM7216A	510-40
		ICM7216B	510-41
		ICM7216C	510-56
		ICM7216D	510-57
	MicroPwr	MP7216	2899-156
7217	Intersil	ICM7217	453-63
		ICM7217A	453-64
		ICM7217B	453-65
			2951-95
		ICM7217C	453-66
			2951-96
	Toshiba	TA7217A	2897-88
7218	Intersil	ICM7218A	511-90
			2463-57
		ICM7218B	511-91
			2463-58
		ICM7218C	511-92
			2463-59
		ICM7218D	511-93
			2463-60
		ICM7218E	511-94
			2463-61
	Panasonic	AN7218	2900-107
7219	National	DM7219	500-89
722	Burr-Brown	722	2960-85
7220	Intel	7220	1100-64
		7220-1	2962-113
	Intersil	ICM7220	2899-116
		ICM7220A	2899-160
			¶ 275-3
		ICM7220B	2899-117
		ICM7220C	2899-148
		ICM7220FA	2899-161
		ICM7220M	2899-118
		ICM7220MA	2899-119
		ICM7220MC	2899-120
		ICM7220MFA	2899-162
	LSIComp	**LS7220**	★ **696**
			2906-50
			¶ 231-10
	National	DM7220	509-26
	Sanyo	LC7220	2900-91
			2945-131
7221	Intersil	ICM7221	2899-163
7222	Intersil	ICM7222	2899-164
	Toshiba	TA7222A	2897-89
7223	Intersil	ICM7223	2899-2
		ICM7223A	2899-3
		ICM7223VF	2899-4
	National	DM7223	483-146
	Toshiba	TA7223	2902-98
7224	Intersil	ICM7224	453-52
		ICM7224A	453-53
	Toshiba	TA7224	2902-124
7225	Intersil	ICM7225	453-54
		ICM7225A	453-55
	LSIComp	**LS7225**	★ **696**
			2906-51
	Sanyo	LC7225	2900-92
			2945-132
	Toshiba	TA7225	2902-123
7226	Intersil	ICM7226	453-109
		ICM7226A	510-42
		ICM7226B	510-43
7227	Intersil	ICM7227	453-67
		ICM7227A	453-68
		ICM7227B	453-69
			2951-97
7227	Intersil	ICM7227C	453-70
			2951-98
	Toshiba	TA7227	2897-128
7229	**LSIComp**	**LS7229**	★ **696**
	Toshiba	TA7229	2902-125
723	Fairchild	uA723C	2959-90
		uA723M	2959-91
	Intersil	uA723	2959-92
	Lambda	LAS723	2959-119
		LAS723B	2960-14
	National	LM723	2959-95
		LM723C	2959-96
	Raytheon	RC723	2959-97
		RM723	2959-98
	RCA	CA723	2959-99
		CA723C	2959-100
	Signetics	uA723	2959-101
		uA723C	2959-102
	SiliconG	SG723	2959-103
		SG723C	2959-104
	TI	uA723C	2959-105
		uA723M	2959-106
7230	Intel	7230	2962-114
	National	DM7230	482-91
			¶ 236-15
7231	Intersil	ICM7231	2465-98
	LSIComp	LS7231	2906-154
7232	Intersil	ICM7232	2465-133
	LSIComp	LS7232	2906-155
7233	Intersil	ICM7233	2464-103
	LSIComp	LS7233	2906-156
7234	Intersil	ICM7234	2465-8
	LSIComp	LS7234	2906-157
7235	Intersil	ICM7235	2464-104
		ICM7235A	2464-105
		ICM7235AM	2464-106
		ICM7235M	2464-107
	LSIComp	LS7235	2906-158
7236	Intersil	ICM7236	453-57
		ICM7236A	453-51
	LSIComp	LS7236	2906-159
7238	Toshiba	TA7238	2897-90
724	Burr-Brown	724	2960-86
7240	Intersil	ICM7240	2951-22
	LSIComp	LS7240	510-25
7241	Motorola	MC7241	495-12
7242	Intel	7242	2485-47
			2962-119
			2962-120
	Intersil	ICM7242	2951-23
	Motorola	MC7242	495-64
	Toshiba	TA7242	2905-120
7243	Toshiba	TA7243	2905-54
7245	Intersil	ICM7245	2899-96
725	AMD	SSS725A	2911-53
			2915-54
		SSS725B	2920-7
	Fairchild	uA725A	2911-77
		uA725AM	2919-41
		uA725C	2924-27
		uA725E	2911-78
		uA725M	2921-17
	National	LM725	2921-18
		LM725A	2911-64
			2921-34
		LM725C	2924-28
	NEC-Electron	uPC725	2924-29
	PMI	PM725	2921-15
			¶ 271-2
		PM725C	2924-30
			¶ 271-2
		SSS725	2919-42
			¶ 266-2
		SSS725A	2915-53
			¶ 266-2
		SSS725C	2911-106
			2921-29
			¶ 266-2
	Raytheon	RC725	2924-31
		RM725	2921-16
7250	Intersil	ICM7250	2951-24
	Motorola	MC7250	482-112
	Sanyo	LC7250	2900-152
	Siliconix	**SI7250**	★**2830**
			2962-117
7253	Sanyo	LC7253	2900-95

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
7254	Siliconix	VQ7254	2483-75
7255	NEC-Micro	uPD7255	2466-13
7256	IPI	IPI7256	2964-18
7257	Sanyo	LC7257	2900-96
7258	Sanyo	LC7258	2900-97
726	Fairchild	uA726C	2968-9
		uA726M	2968-10
7260	Intersil	ICM7260	2951-25
	Motorola	MC7260	474-168
7261	Motorola	MC7261	474-137
7262	**LSIComp**	**LS7262**	★ 696
7263	**LSIComp**	**LS7263**	★ 696
7266	Motorola	MC7266	498-68
	Panasonic	AN7266	2900-108
7267	Motorola	MC7267	499-62
7269	Intersil	ICM7269	2899-121
727	Fairchild	uA727C	2888-30
		uA727M	2888-31
	MicroTech	MC727	4141-31
7270	Intersil	ICM7270	2899-122
	LSIComp	LS7270	1102-70
	Motorola	MC7270	501-104
			3488-55
	SGS	TDA7270	2902-122
			¶ 272-13
7271	Intersil	ICM7271	2899-173
	Motorola	MC7271	501-112
			3488-56
7272	Intersil	ICM7272	2899-123
7273	Intersil	ICM7273	2899-174
728	**Datel**	**ST-728**	★ 1933
7280	Motorola	MC7280	480-87
	National	DM7280	480-92
7281	Motorola	MC7281	478-49
	National	DM7281	478-55
7288	National	DM7288	482-24
7290	National	DM7290	480-93
7291	National	DM7291	478-56
72C19	National	MM72C19	462-6
72HM185			
	Intersil	72HM185C	3484-105
73	Burr-Brown	ADC73J	2436-43
		ADC73K	2436-37
		DAC73	2461-13
		DAC73C	2461-14
730	Signetics	TCA730A	2896-35
	Unitrode	**PIC730**	★ 3446
			2961-94
7301	GI	ACF7301C	2962-21
7302	GI	ACF7302C	2962-22
	Toshiba	TA7302	2901-24
7303	AMD	AM7303	2478-27
	National	DP7303	2478-35
	Toshiba	TA7303	2901-25
7304	AMD	AM7304B	2478-13
	National	DP7304	1094-82
		DP7304B	2478-36
7306	Toshiba	TA7306	2900-76
7307	AMD	AM7307	2478-28
	National	DP7307	2478-37
7308	AMD	AM7308	2478-29
	National	DP7308	2478-38
731	Burr-Brown	ADC731J	2436-42
		ADC731K	2436-36
7310	National	DP7310	2483-159
7311	National	DP7311	2483-160
	Panasonic	AN7311	2897-195
7312	Toshiba	TA7312	2898-16
73128	NEC-EA	uPD73128	3487-41
7314	Toshiba	TA7314	2905-55
7315	Toshiba	TA7315	2905-78
7316	Toshiba	TA7316	2952-5
7317	**National**	**MM7317**	★ 3327
	Toshiba	TA7317	2906-111
7318	Toshiba	TA7318	2906-108
732	**Datel**	**ST-732**	★ 1933
7320	LSILogic	LSI-7320	4140-154
	Toshiba	TA7320	2962-108
7322	Toshiba	TA7322	2897-179
7324	Toshiba	TA7324	2896-44
7325	Toshiba	TA7325	2898-17
7326	Toshiba	TA7326	2951-55
7327	Toshiba	TA7327	2951-56
733	Fairchild	uA733C	2888-71
		uA733M	2888-72

Base Number	Source	Device	Page-Line
733	Intersil	uA733	2888-73
		uA733C	2888-74
	National	LM733	2888-82
	Signetics	uA733	2888-104
		uA733C	2888-105
	SiliconG	SG733	2888-110
		SG733C	2888-111
	TI	uA733C	2888-114
		uA733M	2888-115
7330	Toshiba	TA7330	2902-131
7331	Toshiba	TA7331	2902-126
7332	Fairchild	uA7332	2896-140
	Intersil	IM7332	3485-86
		IM7332C	3485-6
	Toshiba	TA7332	2906-109
7335	Toshiba	TA7335	2901-2
734	Fairchild	uA734C	2892-22
		uA734M	2891-37
7343	Toshiba	TA7343	2901-157
736	Burr-Brown	DAC736	2461-11
7364	Intersil	IM7364C	3486-100
737	MicroTech	MC737	4141-32
738	SGS	M738	2900-15
739	Fairchild	UA739	2897-183
		uA739	2897-184
			2940-8
7392	Fairchild	uA7392	2906-69
			2964-129
			¶ 276-10
73ALS519			
	TI	SN73ALS519	474-97
73HC42	Fairchild	73HC42	453-160
73LS333			
	TI	FP73LS333	3457-90
74	Burr-Brown	DAC74	2461-12
	MicroEng	MCL74	2943-6
	National	**MM74HCXXX**	★ 734
	Signetics	**74F-TTL**	★ 775
	SPI	**SP74HCXXX**	★ 764
	TI	SN74-ALS569	479-90
740	Intersil	uA740	2934-56
		uA740C	2935-26
	SGS	M740	2900-16
	Signetics	TCA740A	2896-36
		uA740C	2934-55
	Unitrode	**PIC740**	★ 3446
			2961-95
7400	Fairchild	7400	491-195
	Ferranti	ZN7400	491-197
	Hitachi	HD7400	492-1
	Motorola	MC7400	492-3
	National	DM7400	492-5
			¶ 259-4
	Signetics	7400	492-8
	TI	**SN7400**	★ 833
			492-10
			¶ 261-5
	Toshiba	TC7400B	457-129
7401	Fairchild	7401	491-121
	Ferranti	ZN7401	491-125
	Hitachi	HD7401	491-127
	Motorola	MC7401	491-131
	National	DM7401	491-135
	TI	**SN7401**	★ 833
			491-143
	Toshiba	TA7401A	2901-154
7402	Fairchild	7402	494-82
	Ferranti	ZN7402	494-85
	Hitachi	HD7402	494-87
	Motorola	MC7402	494-89
	National	DM7402	494-91
	Signetics	7402	494-94
	TI	**SN7402**	★ 833
			494-98
	Toshiba	TA7402	2900-85
7403	Fairchild	7403	491-122
	Ferranti	ZN7403	491-126
	Hitachi	HD7403	491-129
	Motorola	MC7403	491-
	National	DM7403	
	Signetics	7403	
	TI	**SN7403**	
7404	Fairchild	7404	
	Ferranti	ZN	
	Hitachi		

Base Number	Source	Device	Page-Line
7404	Motorola	MC7404	477-159
	National	DM7404	477-161
	Signetics	7404	477-164
	TI	**SN7404**	★ 834
			477-167
	Toshiba	TC7404UB	451-17
7405	Fairchild	7405	477-56
	Ferranti	ZN7405	477-58
	Hitachi	HD7405	477-59
	Motorola	MC7405	477-61
	National	DM7405	477-63
	Signetics	7405	477-64
	TI	**SN7405**	★ 834
			477-67
7406	Fairchild	7406	484-159
	Hitachi	HD7406	484-160
	Motorola	MC7406	485-1
	National	DM7406	485-3
	Signetics	7406	485-4
	TI	**SN7406**	★ 835
			485-6
7407	Fairchild	7407	484-135
	Hitachi	HD7407	484-136
	Motorola	MC7407	484-138
	National	DM7407	484-140
	Signetics	7407	484-141
	TI	**SN7407**	★ 835
			484-143
7408	Fairchild	7408	489-123
	Ferranti	ZN7408	489-125
	Hitachi	HD7408	489-126
	Motorola	MC7408	489-128
	National	DM7408	489-130
	Signetics	7408	489-132
	TI	**SN7408**	★ 835
			489-134
7409	Fairchild	7409	489-87
	Ferranti	ZN7409	489-89
	Hitachi	HD7409	489-90
	Motorola	MC7409	489-92
	National	DM7409	489-94
	TI	**SN7409**	★ 836
			489-96
741	AMD	SSS741	2923-19
		SSS741C	2928-20
	AD	**AD741**	★ 3153
			2909-27
			2929-8
		AD741C	★ 3153
			2930-43
		AD741J	★ 3153
			2925-38
		AD741K	★ 3153
			2924-8
		AD741L	★ 3155
			2919-39
		AD741S	★ 3153
			2923
	Fairchild	uA741	29
		uA741AM	2911-45
		uA741C	2911-9
		uA741E	2920-4
		uA741	2929-9
		uA	2929-29
		u	2929-10
	Intersil		2911-6
		ICL741CHS	2911-13
		ICL741CL	2929-18
		ICL741G	2929-2
		IC	2909-32
			2929-12
	National	LM741A	2925-34
		LM741C	2930-48
		LM741	2925-3
	Signetics	uPC741	2909
		PM741	
		P	
	Raytheon	R	

Base Number	Source	Device	Pag-
741	Signetics	uA741	2909
			2929
		uA741C	2930
	SiliconG	SG741	2909-
			2929-
		SG741C	2930-5
		SG741S	2929-2
		SG741SC	2931-9
	TI	uA741C	2930-5
		uA741M	2929-17
	Thomson-CSF	SFC741C	2930-57
7410	Fairchild	7410	490-16
	Ferranti	ZN7410	490-169
	Hitachi	HD7410	490-170
	Motorola	MC7410	490-173
	National	DM7410	490-175
	Signetics	7410	490-178
	TI	**SN7410**	★ 836
			490-181
	Toshiba	TC7410B	457-81
74100	Motorola	MC74100	495-108
	TI	**SN74100**	★ 867
			495-110
74107	Fairchild	74107	487-164
	Ferranti	ZN74107	487-168
	Hitachi	HD74107	487-170
	Motorola	MC74107	487-174
	National	DM74107	487-178
	Signetics	74107	487-182
	TI	**SN74107**	★ 869
			488-1
74109	National	DM74109	487-116
	Signetics	74109	487-118
	TI	**SN74109**	★ 870
			487-120
		SN74109A	★ 870
			2472-15
7411	Fairchild	7411	489-37
	National	DM7411	489-40
	Signetics	7411	489-42
74110	**TI**	**SN74110**	★ 870
			487-71
74111	**TI**	**SN74111**	★ 871
			488-35
74116	Signetics	74116	495-102
	TI	**SN74116**	★ 872
			495-106
74118	Ferranti	ZN74118	496-3
74119	Ferranti	ZN74119	496-4
7412	Fairchild	7412	490-145
	Ferranti	ZN7412	490-147
	Hitachi	HD7412	490-148
	Motorola	MC7412	490-150
	National	SN7412	507-47
74120	TI	MC74120	507-47
		SN74120	★ 873
7412	Fairchild	74121	507-49
	Ferranti	ZN74121	500-95
	Hitachi	HD74121	500-97
	Motorola	MC74121	500-98
	National	DM74121	500-100
	Signetics	74121	500-102
	TI	SN74121	500-103
74122	Fairchild	7412	500-107
	Ferranti	ZN74122	500-109
	Motorola	MC74122	500-111
	TI	SN74122	500-113
74123	Fairchild	74123	500-115
	Ferranti	ZN74123	500-117
	Motorola	MC74123	500-119
	TI	SN74123	500-121

RCA

SGS

...ber in Application Note
...al data is provided on the

134

© IC MASTER 1983

Base Number	Source	Device	Page-Line
	TI	SN74126	★ 875
			476-115
8	Signetics	74128	484-112
			2472-30
	TI	SN74128	★ 876
			484-114
			★ 876
			2472-31
13	Fairchild	7413	507-69
	Ferranti	ZN7413	507-71
	Hitachi	HD7413	507-72
	Motorola	MC7413	507-74
	National	DM7413	507-76
	Signetics	7413	507-78
	TI	SN7413	★ 837
			507-80
74132	Fairchild	74132	507-119
	Hitachi	HD74132	507-120
	Motorola	MC74132	507-122
	National	DM74132	507-124
	Signetics	74132	507-126
	TI	SN74132	★ 877
			507-128
74136	Hitachi	HD74136	494-166
	Motorola	MC74136	494-168
	TI	SN74136	★ 878
			494-171
7414	Fairchild	7414	507-149
	Hitachi	HD7414	507-150
	Motorola	MC7414	507-152
	National	DM7414	507-154
	Signetics	7414	507-156
	TI	SN7414	★ 837
			507-158
74141	Fairchild	74141	2464-71
	Hitachi	HD74141	2464-72
	Motorola	MC74141	2464-74
	National	DM74141	2464-76
	TI	SN74141	★ 881
			2464-77
74142	TI	SN74142	★ 881
			482-66
74143	TI	SN74143	★ 882
			482-68
74144	TI	SN74144	★ 882
			482-70
74145	Fairchild	74145	482-140
	Hitachi	HD74145	482-141
	Motorola	MC74145	482-143
	National	DM74145	482-145
	Signetics	74145	482-147
	TI	SN74145	★ 882
74147	Hitachi	HD74147	509-149
	National	DM74147	509
	Signetics	74147	509-3
	TI	SN74147	★ 882
			509-34
	Hitachi	HD74148	508-128
	National	DM74148	508-132
	Signetics	74148	508-136
		SN74148	★ 883
			508-140
		74150	500-75
		ZN74150	500-77
		HD74150	500-78
		74150	500-80
		74150	500-82
			500-84
			★ 883
			500-86
			499-143
			499-145
			499-146
			499-148
74154			499-150
74155			499-152

Base Number	Source	Device	Page-Line
74153	TI	SN74153	★ 884
			498-26
74154	Ferranti	ZN74154	484-24
	Hitachi	HD74154	484-25
	Motorola	MC74154	484-27
	National	DM74154	484-31
	Signetics	74154	484-35
	TI	SN74154	★ 885
			484-39
74155	Fairchild	74155	483-121
	Ferranti	ZN74155	483-123
	Hitachi	HD74155	483-124
	Motorola	MC74155	483-126
	National	DM74155	483-128
	Signetics	74155	483-130
	TI	SN74155	★ 886
			483-132
74156	Fairchild	74156	483-91
	Hitachi	HD74156	483-92
	Motorola	MC74156	483-94
	National	DM74156	483-96
	Signetics	74156	483-98
	TI	SN74156	★ 886
			483-100
74157	Fairchild	74157	499-2
	Hitachi	HD74157	499-6
	Motorola	MC74157	499-8
	National	DM74157	499-12
	Signetics	74157	499-18
	TI	SN74157	★ 887
			499-23
74158	Signetics	74158	498-117
74159	Hitachi	HD74159	484-46
	TI	SN74159	★ 888
			484-45
7416	Fairchild	7416	484-146
	Hitachi	HD7416	484-147
	Motorola	MC7416	484-149
	National	DM7416	484-151
	Signetics	7416	484-155
	TI	SN7416	★ 838
			484-157
74160	Fairchild	74160	480-126
	Hitachi	HD74160	480-129
	Motorola	MC74160	480-131
	National	DM74160A	480-135
	Signetics	74160	480-139
	TI	SN74160	★ 889
			480-144
			¶ 232-0
74161	Fairchild	74161	478-100
	Ferranti	ZN74161	478-104
	Hitachi	HD74161	478-105
	Motorola	MC74161	478-108
	National	DM74161A	478-112
	Signetics	74161	478-116
	TI	SN74161	★ 889
			478-121
74162			¶ 232-0
		74162	480-179
		HD74162	480-180
		MC74162	480-182
		M74162A	480-184
		162	★ 890
74163		74163	480-186
		ZN74163	¶ 232-0
		HD74163	478-157
		MC74163A	478-159
		M74163	478-160
		163	478-162
		163	478-164
			★ 890
74164	Fairchild		478-168
			¶ 232-0
	Ferranti	ZN	502-14
			3490-104
	Hitachi	HD7416	502-16
	National	DM74164	107
	Signetics	74164	
		SN74164	★ 87

Base Number	Source	Device	Page-Line
74164	TI	SN74164	502-25
			★ 891
			3490-124
74165	Fairchild	74165	502-66
			3490-47
	Ferranti	ZN74165	502-68
	Motorola	MC74165	502-70
			3490-49
	National	DM74165	502-72
			3490-51
	Signetics	74165	502-74
			3490-53
	TI	SN74165	★ 891
			502-76
			★ 891
			3490-55
74166	Fairchild	74166	502-87
			3490-58
	Ferranti	ZN74166	502-89
	Hitachi	HD74166	502-90
			3490-60
	National	DM74166	502-92
			3490-64
	Signetics	74166	502-94
			3490-66
	TI	SN74166	★ 891
			502-96
			★ 891
			3490-70
74167	Motorola	MC74167	507-21
	TI	SN74167	★ 892
			507-23
7417	Fairchild	7417	484-124
	Hitachi	HD7417	484-125
	Motorola	MC7417	484-127
	National	DM7417	484-129
	Signetics	7417	484-131
	TI	SN7417	★ 838
			484-133
74170	Fairchild	74170	496-168
			3470-46
	Ferranti	ZN74170	496-170
			3470-49
	National	DM74170	496-171
			3470-54
	Signetics	74170	496-173
	TI	SN74170	★ 893
			497-2
			★ 893
			3470-60
74172	TI	SN74172	★ 894
			497-27
			★ 894
			3470-79
74173	Fairchild	74173	486-18
	Hitachi	HD74173	486-19
	National	DM74173	486-21
	Signetics	74173	486-27
	TI	SN74173	★ 894
			486-31
74174	Fairchild	74174	486-43
	Ferranti	ZN74174	486-46
	Hitachi	HD74174	486-47
	Motorola	MC74174	486-49
	National	DM74174	486-51
	Signetics	74174	486-53
	TI	SN74174	★ 895
			486-55
74175	Fairchild	74175	485-112
	Ferranti	ZN74175	485-114
	Hitachi	HD74175	485-115
	Motorola	MC74175	485-117
	National	DM74175	485-119
	Signetics	74175	485-121
	TI	SN74175	★ 895
			485-123
74176	Fairchild	74176	480-81
	Hitachi	HD74176	480-83
	Motorola	MC74176	480-88
	National	DM74176	480-94
	TI	SN74176	★ 896
			480-106
74177	Fairchild	74177	478-43
	Hitachi	HD74177	478-45
	Motorola	MC74177	478-50
	National	DM74177	478-57

Base Number	Source	Device	Page-Line
74177	TI	SN74177	★ 896
			478-69
74178	Fairchild	74178	3488-68
	TI	SN74178	★ 896
			501-109
			★ 896
			3488-95
74179	Fairchild	74179	501-111
			3488-69
	TI	SN74179	★ 897
			501-119
			★ 897
			3488-96
74180	Fairchild	74180	508-154
	Ferranti	ZN74180	508-156
	Hitachi	HD74180	508-157
	Motorola	MC74180	508-159
	National	DM74180	508-161
	Signetics	74180	508-165
	TI	SN74180	★ 897
			509-3
74181	Motorola	MC74181	475-6
	Signetics	74181	475-9
	TI	SN74181	★ 897
			475-11
74182	Hitachi	HD74182	475-70
	Motorola	MC74182	475-72
	National	DM74182	475-74
	TI	SN74182	★ 898
			475-76
			¶ 288-12
74184	Ferranti	ZN74184	507-40
	National	DM74184	507-42
	TI	SN74184	★ 899
			507-44
			★ 899
			3454-7
74185	National	DM74185A	507-34
	TI	SN74185A	★ 900
			507-37
			★ 900
			3454-2
74186	TI	SN74186	3459-57
74187	TI	SN74187	★ 900
			3484-4
74188	TI	SN74188A	3459-45
74190	Fairchild	74190	481-164
	Hitachi	HD74190	481-165
	Motorola	MC74190	481-167
	National	DM74190	481-169
	Signetics	74190	481-171
	TI	SN74190	★ 901
			481-173
74191	Fairchild	74191	479-123
	Ferranti	ZN74191	479-125
	Hitachi	HD74191	479-126
	Motorola	MC74191	479-128
	National	DM74191	479-130
	Signetics	74191	479-132
	TI	SN74191	★ 901
			479-134
74192	Fairchild	74192	481-125
	Ferranti	ZN74192	481-127
	Hitachi	HD74192	481-128
	Motorola	MC74192	481-130
	National	DM74192	481-132
	Signetics	74192	481-135
	TI	SN74192	★ 902
			481-137
74193	Fairchild	74193	479-171
	Ferranti	ZN74193	479-173
	Hitachi	HD74193	479-194
	Motorola	MC74193	479-176
	National	DM74193	479.178
	Signetics	74193	479-182
	TI	SN74193	★ 902
			480-2
74194	Fairchild	74194	501-140
			3488-70
	Ferranti	ZN74194	501-142
	Hitachi	HD74194	501-143
			3488-74
	Motorola	MC74194	501-145
			3488-77
	National	DM74194	501-147
			3488-80

PART NUMBER

Arranged alphan

ght.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
74194	Signetics	74194	501-149
			3488-84
	TI	SN74194	★ 902
			501-151
			★ 902
			3488-97
74195	Fairchild	74195	501-35
			3488-108
	Hitachi	HD74195	501-38
			3488-126
	Motorola	MC74195	501-40
			3488-129
	National	DM74195	501-44
			3489-11
	Signetics	74195	501-48
			3489-17
	TI	SN74195	★ 903
			501-51
			★ 903
			3489-23
74196	Fairchild	74196	480-82
	Hitachi	HD74196	480-84
	Motorola	MC74196	480-89
	National	DM74196	480-95
	TI	SN74196	★ 903
			480-107
74197	Fairchild	74197	478-44
	Hitachi	HD74197	478-46
	Motorola	MC74197	478-51
	National	DM74197	478-58
	TI	SN74197	★ 904
			478-70
74198	Fairchild	74198	502-48
			3490-4
	Hitachi	HD74198	502-49
			3490-6
	National	DM74198	502-51
			3490-10
	TI	SN74198	★ 904
			502-53
			★ 904
			3490-15
74199	Fairchild	74199	502-55
			3490-5
	Hitachi	HD74199	502-56
			3490-7
	National	DM74199	502-58
			3490-11
	Signetics	74199	502-60
			3490-12
	TI	SN74199	★ 905
			502-62
			★ 905
			3490-16
7420	Fairchild	7420	490-83
	Ferranti	ZN7420	490-85
	Hitachi	HD7420	490-86
	LSILogic	LSL-7420	4140-155
	Motorola	MC7420	490-88
	National	DM7420	490-90
	Signetics	7420	490-93
	TI	SN7420	★ 839
			490-96
	Toshiba	TC7420B	457-44
74201	TI	SN74201	★ 440
7421	Fairchild	7421	488-166
	Signetics	7421	488-168
7422	Fairchild	7422	490-47
	Hitachi	HD7422	490-48
	TI	SN7422	▲ 840
			490-50
74221	Hitachi	HD74221	500-137
	Signetics	74221	500-139
	TI	SN74221	▲ 905
			500-141
7423	Fairchild	7423	494-5
	Hitachi	HD7423	494-6
	Motorola	MC7423	494-8
	National	DM7423	494-10
	TI	SN7423	▲ 840
			494-12
74246	TI	SN74246	▲ 913
			2464-16
74247	TI	SN74247	▲ 913
			2463-176

Base Number	Source	Device	Page-Line
74248	TI	SN74248	★ 914
			2463-134
74249	TI	SN74249	★ 914
			2463-100
7425	Fairchild	7425	493-173
	Ferranti	ZN7425	493-175
	Hitachi	HD7425	493-176
	Motorola	MC7425	493-178
	National	DM7425	493-180
	Signetics	7425	494-1
	TI	SN7425	★ 841
			494-3
74251	Hitachi	HD74251	500-30
	National	DM74251	500-32
	TI	SN74251	★ 915
			500-34
74259	National	DM74259	496-26
	TI	SN74259	★ 917
			496-32
7426	Fairchild	7426	484-79
	Hitachi	HD7426	484-80
	Motorola	MC7426	484-82
	National	DM7426	484-84
	Signetics	7426	484-90
	TI	SN7426	★ 841
			484-92
74265	TI	SN74265	★ 918
			507-115
7427	Fairchild	7427	494-31
	Ferranti	ZN7427	494-33
	Hitachi	HD7427	494-34
	Motorola	MC7427	494-36
	National	DM7427	494-38
	Signetics	7427	494-40
	TI	SN7427	★ 842
			494-42
74273	TI	SN74273	★ 919
			486-145
74276	TI	SN74276	★ 920
			488-162
74278	TI	SN74278	★ 921
			508-57
74279	Fairchild	74279	495-162
	Hitachi	HD74279	495-163
	Signetics	74279	495-165
	TI	SN74279	★ 921
			495-167
7428	Ferranti	ZN7428	494-86
	Signetics	7428	494-95
	TI	SN7428	▲ 842
			494-99
74283	Fairchild	74283	476-46
	Ferranti	ZN74283A	476-50
	Hitachi	HD74283	476-52
	TI	SN74283	★ 922
			476-62
			¶ 288-12
74284	TI	SN74284	★ 923
			475-113
			¶ 288-12
74285	TI	SN74285	★ 923
			475-110
			¶ 288-12
74290	Fairchild	74290	480-38
	Hitachi	HD74290	480-42
	Motorola	MC74290	480-46
	TI	SN74290	★ 924
			480-54
74293	Fairchild	74293	479-25
	Hitachi	HD74293	479-31
	Motorola	MC74293	479-35
	TI	SN74293	▲ 925
			479
74298	Fairchild	74298	
	Motorola	MC74298	
	Signetics	74298	
	TI	SN74	
742C241			
	GTEMi		
7430	Fairchild		
	F		

Base Number	Source	Device	Page-Line
7430	TI	SN7430	★ 842
			492-73
7432	Fairchild	7432	493-121
	Ferranti	ZN7432	493-123
	Hitachi	HD7432	493-124
	National	DM7432	493-126
	Signetics	7432	493-128
	TI	SN7432	★ 843
			493-130
7433	Signetics	7433	494-64
	TI	SN7433	★ 843
			494-66
74351	TI	SN74351	★ 932
			498-66
74365	National	DM74365	109
			485-15
	Signetics	74365A	166
			485-20
	TI	SN74365A	★ 935
			171
			485-24
74366	National	DM74366	161
			485-17
	Signetics	74366A	115
			485-21
	TI	SN74366A	★ 935
			119
			485-23
74367	National	DM74367	162
			485-18
	Signetics	74367A	168
			485-22
	TI	SN74367A	★ 936
			172
			485-25
74368	National	DM74368	110
			485-15
	Signetics	74368A	117
			485-21
	TI	SN74368A	★ 936
			120
			485-23
7437	Fairchild	7437	491-83
	Ferranti	ZN7437	491-85
	Hitachi	HD7437	491-86
	Motorola	MC7437	491-88
	National	DM7437	491-91
	Signetics	7437	491-94
	TI	SN7437	★ 844
			491-96
74376	TI	SN74376	★ 939
			484-160
7438	Fairchild	7438	491-33
	Ferranti	ZN7438	491-36
	Hitachi	HD7438	491-37
	Motorola	MC7438	491-39
	National	DM7438	491-41
	Signetics	7438	491-43
	TI	SN7438	★ 844
			491
7439	Fairchild	7439	
	Signetics	7439	
	TI	SN7439	
			479-9
74390	TI		489-187
			489-189
74393	TI		489-190
			490-1
7440			490-3
	SN7440		490-6
			▲ 845
		MC74408	490-8
		7441	508-102
		DM7441A	2464-65
		TSC7441S	2464-67
		7442	2456-29
		ZN7442	482-154
		HD7442A	483-4
		MC7442	483-5
		DM7442	483-7
		7442	483-11
			483-19

Base Number	Source	Device	Page-Line
7442	TI	SN7442A	★ 845
			483-
74425	TI	SN74425	★ 946
			476-
74426	TI	SN74426	★ 946
			476-1
7443	Fairchild	7443	482-1
	Hitachi	HD7443A	482-10
	Motorola	MC7443	482-10
	TI	SN7443A	★ 846
			482-107
7444	Hitachi	HD7444A	482-94
	Motorola	MC7444	482-96
	TI	SN7444A	★ 846
			482-99
7445	Fairchild	7445	482-130
	Hitachi	HD7445	482-131
	Motorola	MC7445	482-133
	National	DM7445	482-135
	Signetics	7445	482-136
	TI	SN7445	★ 846
			482-138
74452	Motorola	MC74452	481-67
74453	Motorola	MC74453	479-7
74454	Motorola	MC74454	482-21
74455	Motorola	MC74455	480-36
74456	Motorola	MC74456	474-6
7446	Fairchild	7446	2464-6
	Hitachi	HD7446A	2464-9
	Motorola	MC7446	2464-11
	National	DM7446A	2464-13
			¶ 259-15
	TI	SN7446A	★ 847
			2464-17
74460	Motorola	MC74460	506-4
74468	Motorola	MC74468	505-131
			2485-51
7447	Fairchild	7447	2463-149
	Hitachi	HD7447A	2463-154
	Motorola	MC7447	2463-150
	National	DM7447A	2463-14
			¶ 259
	TI	SN7447A	★ 84
			24
7448	Fairchild	7448	106
	Motorola	MC7448	3-114
	National	DM7448	3-124
	TI	SN7448	7
			83-135
7449	Motorola	MC7449	463-86
	TI	SN7449	847
			2463-101
74490	TI	SN744	★ 955
			481-43
749	Fairchild	749	492-144
	Ferranti		492-146
	Hitachi		492-147
	Motorola		492-149
	National		492-151
	Signetics	7450	492-154
	TI		★ 848
			492-156
		7451	492-166
		ZN7451	492-168
		HD7451	492-169
		MC7451	492-171
		DM7451	492-173
		NC7451	3455-37
		LS7451	493-6
		7451	492-17
		SN7451	★ 848
7453			492
		7453	493
		ZN7453	49
		HD7453	49
		MC7453	
		DM7453	
		SN7453	★
7454			
		7454	
		ZN7454	
		HD7454	
		MC7454	
		DM7454	
		SN7454	

PART NUMBER

Number in Application Note Directory.
Additional data is provided on the page noted.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
'40	TI	SN745740	503-109
)	Fairchild	7460	493-20
	Hitachi	HD7460	493-21
	Motorola	MC7460	493-23
	National	DM7460	493-25
	TI	**SN7460**	★ **852**
			493-28
47	AMD	SSS747C	2938-18
	Fairchild	uA747AM	2937-32
		uA747C	2939-41
		uA747EC	2937-33
		uA747M	2938-49
	National	LM747	2938-53
		LM747A	2937-34
		LM747C	2939-45
		LM747E	2937-35
	PMI	PM747	2938-55
		PM747C	2939-51
	Raytheon	RC747	2939-52
		RM747	2938-57
	RCA	CA747	2938-59
		CA747C	2939-53
	SGS	M747	2900-18
	Signetics	uA747	2938-61
		uA747C	2939-54
	SiliconG	SG747	2939-2
		SG747C	2939-55
	TI	uA747C	2939-56
		uA747M	2939-4
7470	Fairchild	7470	487-60
	Ferranti	ZN7470	487-62
	Motorola	MC7470	487-64
	National	DM7470	487-66
	TI	**SN7470**	★ **855**
			487-69
7472	Fairchild	7472	487-73
	Ferranti	ZN7472	487-75
	Hitachi	HD7472	487-76
	Motorola	MC7472	487-78
	National	DM7472	487-80
	TI	**SN7472**	★ **856**
			487-82
747	Fairchild	7473	487-165
	Ferranti	ZN7473	487-169
	Hitachi	HD7473	487-171
	Motorola	MC7473	487-175
	National	DM7473	487-179
	Signetics	7473	487-183
	TI	**SN7473**	★ **856**
			488-2
7474	Fairchild	7474	485-55
	Ferranti	ZN7474	485-57
	Hitachi	HD7474	485-58
	Motorola	MC7474	485-60
	National	DM7474	485-62
	Signetics	7474	485-64
	TI	**SN7474**	★ **857**
			485-66
7475	Fairchild	7475	488-18
	Ferranti	ZN7475	495-12
	Hitachi	HD7475	488-37
	Motorola	MC7475	488-39
	National	DM7475	488-40
	Signetics	7475	488-42
	TI	**SN7475**	★ **858**
			488-44
7476	Fairchild	7476	488-46
	Ferranti	ZN7476	488-48
	Hitachi	HD7476	495-137
	Motorola	MC7476	495-151
	National	DM7476	2930-58
	Signetics	7476	2929-24
	TI	**SN7476**	2930-59
74[illegible]		TC7476B	2929-26
74[illegible]		MC7477	2929-27
[illegible]		uA748C	2930-61
		uA748M	2929-28
		LM748	2929-29
		LM748C	2931-1
		[illegible]L748	
		[illegible]748A	
		[illegible]748	
		[illegible]18C	

Base Number	Source	Device	Page-Line
748	Signetics	uA748	2929-30
		uA748C	2931-2
	SiliconG	SG748	2929-31
		SG748C	2931-3
	TI	uA748C	2931-4
		uA748M	2929-32
	Thomson-CSF	SFC748C	2931-5
7480	Motorola	MC7480	474-143
	TI	**SN7480**	★ **860**
			474-145
7481	**TI**	**SN7481A**	★ **860**
			496-165
			★ **860**
			3470-80
7482	Fairchild	7482	474-158
	Ferranti	ZN7482	474-160
	Motorola	MC7482	474-161
	TI	**SN7482**	★ **860**
			474-163
7483	Fairchild	7483	476-47
	Ferranti	ZN7483A	476-51
	Hitachi	HD7483A	476-53
	Motorola	MC7483	476-55
	National	DM7483	476-57
			¶ 228-7
	Signetics	7483	476-59
	TI	**SN7483A**	★ **861**
			476-63
7484	**TI**	**SN7484A**	★ **861**
			496-166
			★ **861**
			3470-81
748481	**TI**	**SN748481**	★ **953**
7485	Fairchild	7485	474-37
	Ferranti	ZN7485	474-42
	Hitachi	HD7485	474-43
	Motorola	MC7485	474-46
	National	DM7485	474-53
	Signetics	7485	474-59
	TI	**SN7485**	★ **862**
			474-64
7486	Fairchild	7486	495-7
	Ferranti	ZN7486	495-9
	Hitachi	HD7486	495-10
	Motorola	MC7486	495-13
	National	DM7486	495-16
	Signetics	7486	495-21
	TI	**SN7486**	★ **862**
			495-23
7488	**TI**	**SN7488A**	★ **863**
			3484-1
7489	AMD	AM7489	3471-41
		AM7489-1	3471-13
	Ferranti	ZN7489	497-37
	Hitachi	HD7489	3471-91
	National	DM7489B	497-38
	TI	**SN7489**	★ **440**
			★ **863**
			497-41
			★ **440**
			★ **863**
			3471-93
	Fairchild	uA749	2897-185
		uA749C	2937-39
		uA749D	2940-34
	Fairchild	7490	480-39
	Ferranti	ZN7490A	480-41
	Hitachi	HD7490A	480-43
	Motorola	MC7490	480-47
	National	DM7490	480-49
7491	Fairchild	7491	¶ 236-15
			480-51
	Ferranti	ZN7491A	★ **864**
	Hitachi	HD7491A	480-55
	Motorola	MC7491	2-122
			M
	National	DM7491	
		SN74[illegible]491	
	Signetics	7491	
	TI	SN7491A	

Base Number	Source	Device	Page-Line
7491	TI	SN7491A	502-133
			★ **864**
			3491-15
7492	Fairchild	7492	482-27
	Ferranti	ZN7492A	482-29
	Hitachi	HD7492A	482-30
	Motorola	MC7492	482-32
	National	DM7492A	482-34
	Signetics	7492	482-37
	TI	**SN7492A**	★ **864**
			482-39
74920	National	MM74920-3	3474-52
74921	National	MM74921-3	3474-51
7493	Fairchild	7493	479-26
	Ferranti	ZN7493A	479-30
	Hitachi	HD7493A	479-32
	Motorola	MC7493	479-36
	National	DM7493A	479-38
	Signetics	7493	479-40
	TI	**SN7493A**	★ **865**
			479-44
7494	Fairchild	7494	501-132
			3489-78
	Ferranti	ZN7494	3489-80
		ZN7494A	501-133
	Motorola	MC7494	501-135
			3489-82
	Signetics	7494	501-136
			3489-84
	TI	**SN7494**	★ **865**
			501-138
			★ **865**
			3489-86
7495	Fairchild	7495	501-78
			3488-71
	Ferranti	ZN7495A	3488-73
	Motorola	MC7495A	501-84
			3489-28
	National	DM7495	501-86
			3488-81
	Signetics	7495A	501-88
			3488-85
	TI	**SN7495A**	★ **866**
			501-90
			★ **866**
			3488-98
7496	Fairchild	7496	501-179
			3489-102
	Ferranti	ZN7496	501-181
			3489-104
	Hitachi	HD7496	501-182
			3489-105
	Motorola	MC7496	501-184
			3489-107
	National	DM7496	501-186
			3489-109
	Signetics	7496	502-1
			3489-112
	TI	**SN7496**	★ **866**
			502-3
			★ **866**
			3489-115
7497	Fairchild	7497	508-76
	Motorola	MC7497	508-78
	TI	**SN7497**	★ **866**
			508-80
74AL867			
	TI	SN74AL867	479-91
74AL869			
	TI	SN74AL869	479-92
74ALS00			
	Motorola	**SN74ALS00**	★ **732**
			492-12
	National	DM74ALS00	492-14
	TI	**SN74ALS00**	★ **833**
			492-17
74ALS01			
	Motorola	**SN74ALS01**	★ **732**
			491-147
		SN74ALS01	★ **833**
			491-152
		SN74ALS02	★ **732**
			494-102
		74ALS02	494-105

Base Number	Source	Device	Page-Line
74ALS02			
	TI	**SN74ALS02**	★ **833**
			494-109
74ALS03			
	Motorola	**SN74ALS03**	★ **732**
			491-148
	TI	**SN74ALS03**	★ **834**
			491-153
74ALS04			
	Motorola	**SN74ALS04**	★ **732**
			477-169
	National	DM74ALS04	477-171
	TI	**SN74ALS04**	★ **834**
			477-174
74ALS05			
	Motorola	**SN74ALS05**	★ **732**
			477-69
	TI	**SN74ALS05**	★ **834**
			477-72
74ALS08			
	Motorola	**SN74ALS08**	★ **732**
			489-137
	National	DM74ALS08	489-141
	TI	**SN74ALS08**	★ **835**
			489-145
74ALS09			
	Motorola	**SN74ALS09**	★ **732**
			489-98
	TI	**SN74ALS09**	★ **836**
			489-100
74ALS10			
	Motorola	**SN74ALS10**	★ **732**
			490-183
	TI	**SN74ALS10**	★ **836**
			490-186
74ALS1000			
	TI	**SN74ALS1000**	★ **1013**
			492-18
74ALS1002			
	TI	**SN74ALS1002**	★ **1013**
			494-110
74ALS1003			
	TI	**SN74ALS1003**	★ **1014**
			491-154
74ALS1004			
	TI	**SN74ALS1004**	★ **1014**
			477-175
74ALS1005			
	TI	**SN74ALS1005**	★ **1014**
			477-73
74ALS1008			
	TI	**SN74ALS1008**	★ **1015**
			489-146
74ALS1010			
	TI	**SN74ALS1010**	★ **1015**
			490-187
74ALS1011			
	TI	**SN74ALS1011**	★ **1015**
			489-47
74ALS1020			
	TI	**SN74ALS1020**	★ **1016**
			490-101
74ALS1032			
	TI	**SN74ALS1032**	★ **1016**
			493-137
74ALS1034			
	TI	SH74ALS1034	173
			485-25
	TI	**SN74ALS1034**	★ **1017**
74ALS1035			
	TI	**SN74ALS1035**	★ **1017**
			476-156
74ALS109			
	Motorola	**SN74ALS109**	★ **732**
			487-122
	National	DM74ALS109	487-124
	TI	**SN74ALS109**	★ **870**
			487-126
74ALS11			
	Motorola	**SN74ALS11**	★ **732**
			489-44
	TI	**SN74ALS11**	★ **836**
			489-48
74ALS112			
	TI	**SN74ALS112**	★ **871**
			488-105

Arranged a[illegible]

© IC MASTER 1983

Base Number	Source	Device	Page-Line
74ALS113			
	TI	SN74ALS113 ★	871
			488-72
74ALS114			
	TI	SN74ALS114 ★	872
			488-136
74ALS12			
	Motorola	SN74ALS12 ★	732
			490-152
	TI	SN74ALS12 ★	837
			490-154
74ALS1240			
	TI	SN74ALS1240 ★	1018
			503-122
74ALS1241			
	TI	SN74ALS1241 ★	1018
			504-28
74ALS1242			
	TI	SN74ALS1242 ★	1018
			503-43
74ALS1243			
	TI	SN74ALS1243 ★	1019
			503-44
74ALS1244			
	TI	SN74ALS1244 ★	1019
			503-166
74ALS1245			
	TI	SN74ALS1245 ★	1019
			504-173
74ALS13			
	Motorola	SN74ALS13 ★	732
74ALS131			
	TI	SN74ALS131 ★	876
			484-19
74ALS132			
	Motorola	SN74ALS132 ★	732
74ALS133			
	TI	SN74ALS133 ★	877
			492-118
74ALS137			
	TI	SN74ALS137 ★	879
			484-12
74ALS138			
	Motorola	SN74ALS138 ★	732
			483-150
	TI	SN74ALS138 ★	880
			483-154
74ALS139			
	Motorola	SN74ALS139 ★	732
			483-55
	TI	SN74ALS139 ★	880
			483-57
74ALS14			
	Motorola	SN74ALS14 ★	732
74ALS15			
	Motorola	SN74ALS15 ★	732
			489-12
	TI	SN74ALS15 ★	838
			489-14
74ALS151			
	Motorola	SN74ALS151 ★	732
			499-156
	TI	SN74ALS151 ★	884
			499-158
74ALS153			
	Motorola	SN74ALS153 ★	732
			498-28
	TI	SN74ALS153 ★	884
			498-30
74ALS157			
	Motorola	SN74ALS157 ★	732
			499-25
	TI	SN74ALS157 ★	887
			499-27
74ALS158			
	Motorola	SN74ALS158 ★	732
			498-119
	TI	SN74ALS158 ★	887
			498-121
74ALS160			
	Motorola	SN74ALS160 ★	732
			480-146
	National	DM74ALS160	480-148
	TI	SN74ALS160 ★	889
			480-150
74ALS161			
	Motorola	SN74ALS161 ★	732
			478-123
	National	DM74ALS161	478-125
	TI	SN74ALS161 ★	889
			478-127
74ALS1616			
	TI	SN74ALS1616 ★	1020
74ALS162			
	Motorola	SN74ALS162 ★	732
			480-190
	National	DM74ALS162	481-5
	TI	SN74ALS162 ★	890
			481-9
74ALS1620			
	TI	SN74ALS1620 ★	1021
			505-106
		SN74ALS1620-1 ★	1021
			505-107
74ALS1621			
	TI	SN74ALS1621 ★	1021
			505-87
		SN74ALS1621-1 ★	1021
			505-88
74ALS1622			
	TI	SN74ALS1622 ★	1021
			505-89
		SN74ALS1622-1 ★	1021
			505-90
74ALS1623			
	TI	SN74ALS1623 ★	1021
			505-108
		SN74ALS1623-1 ★	1021
			505-109
74ALS163			
	Motorola	SN74ALS163 ★	732
			478-170
	National	DM74ALS163	478-172
	TI	SN74ALS163 ★	890
			478-174
74ALS1638			
	TI	SN74ALS1638 ★	1022
			504-87
		SN74ALS1638-1 ★	1022
			504-88
74ALS1639			
	TI	SN74ALS1639 ★	1022
			504-89
		SN74ALS1639-1 ★	1022
			504-90
74ALS164			
	Motorola	SN74ALS164 ★	732
			502-27
	TI	SN74ALS164 ★	891
			502-29
74ALS1640			
	TI	SN74ALS1640 ★	1023
			504-121
		SN74ALS1640-1 ★	1023
			504-122
74ALS1641			
	TI	SN74ALS1641 ★	1023
			504-151
		SN74ALS1641-1 ★	1023
			504-152
74ALS1642			
	TI	SN74ALS1642 ★	1023
			504-99
		SN74ALS1642-1 ★	1023
			504-100
74ALS1643			
	TI	SN74ALS1643 ★	1023
			504-123
		SN74ALS1643-1 ★	1023
			504-124
74ALS1644			
	TI	SN74ALS1644 ★	1023
			505-32
		SN74ALS1644-1 ★	1023
			505-33
74ALS1645			
	TI	SN74ALS1645 ★	1023
			504-174
			★ 1023
			2479-32
		SN74ALS1645-1 ★	1023
			504-175
74ALS165			
	TI	SN74ALS165 ★	891
			502-78
74ALS166			
	TI	SN74ALS166 ★	891
			502-98
74ALS168			
	Motorola	SN74ALS168 ★	732
			481-95
	TI	SN74ALS168 ★	892
			481-97
74ALS169			
	Motorola	SN74ALS169 ★	732
			479-94
	TI	SN74ALS169 ★	892
			479-96
74ALS16L8			
	TI	FP74ALS16L8	506-92
74ALS16R4			
	TI	FP74ALS16R4	506-96
			3457-4
	TI	SN74ALS16R4 ★	1025
74ALS16R6			
	TI	FP74ALS16R6	506-97
			3457-5
74ALS16R8			
	TI	FP74ALS16R8	506-98
			3457-6
74ALS174			
	Motorola	MC74ALS174	486-57
	TI	SN74ALS174 ★	895
			486-59
74ALS175			
	TI	SN74ALS175 ★	895
			485-125
74ALS190			
	Motorola	SN74ALS190 ★	732
			481-175
	TI	SN74ALS190 ★	901
			481-177
74ALS191			
	Motorola	SN74ALS191 ★	732
			479-137
	TI	SN74ALS191 ★	901
			479-145
74ALS192			
	Motorola	SN74ALS192 ★	732
			481-139
	TI	SN74ALS192 ★	902
			481-141
74ALS193			
	Motorola	SN74ALS193 ★	732
			480-4
	TI	SN74ALS193 ★	902
			480-6
74ALS20			
	Motorola	SN74ALS20 ★	732
			490-98
	TI	SN74ALS20 ★	839
			490-102
74ALS21			
	TI	SN74ALS21 ★	840
			488-170
74ALS217			
	TI	SN74ALS217 ★	905
			497-70
74ALS218			
	TI	SN74ALS218 ★	906
			497-66
74ALS22			
	Motorola	SN74ALS22 ★	732
			490-52
	TI	SN74ALS22 ★	840
			490-54
74ALS238			
	Motorola	SN74ALS238 ★	732
74ALS239			
	Motorola	SN74ALS239 ★	732
74ALS240			
	Motorola	SN74ALS240 ★	732
			503-117
	National	DM74ALS240	503-119
	TI	SN74ALS240 ★	910
			503-123
		★	910
			2471-24
74ALS241			
	Motorola	SN74ALS241 ★	732
			504-22
	National	DM74ALS241	504-24
	TI	SN74ALS241 ★	911
			504-29
		★	911
			2470-56
74ALS242			
	Motorola	SN74ALS242 ★	732
			503-33
	National	DM74ALS242	503-37
	TI	SN74ALS242 ★	911
			503-45
		★	911
			2477-4
74ALS243			
	Motorola	SN74ALS243 ★	732
			503-34
	National	DM74ALS243	503-38
	TI	SN74ALS243 ★	912
			503-46
		★	912
			2477-5
74ALS244			
	Motorola	SN74ALS244 ★	732
			503-111
	National	DM74ALS244	503-113
	TI	SN74ALS244 ★	912
			2470-57
74ALS245			
	Motorola	SN74ALS245	504-164
	National	DM74ALS245	504-166
	TI	SN74ALS245 ★	913
			504-176
		★	913
			2479-33
74ALS251			
	Motorola	SN74ALS251 ★	732
			500-36
	TI	SN74ALS251 ★	915
			500-38
74ALS253			
	Motorola	SN74ALS253 ★	732
	TI	SN74ALS253 ★	915
			497-141
74ALS257			
	Motorola	SN74ALS257 ★	732
			498-157
	TI	SN74ALS257 ★	916
			498-159
74ALS258			
	Motorola	SN74ALS258 ★	732
			498-79
	TI	SN74ALS258 ★	917
			498-81
74ALS259			
	TI	SN74ALS259 ★	917
			496-34
74ALS27			
	Motorola	SN74ALS27 ★	732
			494-44
	TI	SN74ALS27 ★	842
			494-46
74ALS273			
	Motorola	SN74ALS273 ★	732
			486-147
	National	DM74ALS273	486-149
	TI	SN74ALS273 ★	919
			486-151
74ALS28			
	Motorola	SN74ALS28 ★	732
			494-103
	TI	SN74ALS28 ★	842
			494-111
74ALS299			
	TI	SN74ALS299 ★	927
			502-146
74ALS30			
	TI	SN74ALS30 ★	842
			492-75
74ALS317			
	TI	SN74ALS317 ★	928
			497-68
74ALS318			
	TI	SN74ALS318 ★	928
			497-64

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
74ALS32			
	Motorola	SN74ALS32 ★	732
			493-132
	National	DM74ALS32	493-134
	TI	SN74ALS32 ★	843
			493-138
74ALS323			
	TI	SN74ALS323 ★	930
			502-147
74ALS33			
	Motorola	SN74ALS33 ★	732
			494-68
	TI	SN74ALS33 ★	843
			494-70
74ALS352			
	Motorola	SN74ALS352 ★	732
			497-116
	TI	SN74ALS352 ★	932
			497-118
74ALS353			
	Motorola	SN74ALS353 ★	732
	TI	SN74ALS353 ★	933
			497-87
74ALS366			
	TI	SN74ALS366	477-53
		SN74ALS366-1	477-54
74ALS367			
	TI	SN74ALS367	176
			485-25
74ALS37			
	Motorola	SN74ALS37 ★	732
			491-98
	TI	SN74ALS37 ★	844
			491-100
74ALS373			
	Motorola	SN74ALS373 ★	732
			496-50
	National	DM74ALS373	496-54
	TI	SN74ALS373	496-58
74ALS374			
	Motorola	SN74ALS374 ★	732
			486-173
	National	DM74ALS374	486-177
	TI	SN74ALS374	486-183
74ALS377			
	Motorola	SN74ALS377 ★	732
			487-39
	National	DM74ALS377	487-41
74ALS38			
	Motorola	SN74ALS38 ★	732
			491-50
	TI	SN74ALS38 ★	844
			491-52
74ALS40			
	Motorola	SN74ALS40 ★	732
			490-10
	TI	SN74ALS40 ★	845
			490-12
74ALS465			
	TI	SN74ALS465 ★	952
74ALS466			
	TI	SN74ALS466 ★	952
74ALS467			
	TI	SN74ALS467 ★	952
74ALS468			
	TI	SN74ALS468 ★	952
74ALS518			
	TI	SN74ALS518 ★	956
			474-98
74ALS519			
	TI	SN74ALS519 ★	956
74ALS520			
	TI	SN74ALS520 ★	956
			474-83
74ALS521			
	TI	SN74ALS521 ★	956
			474-84
74ALS522			
	TI	SN74ALS522 ★	956
			474-85
74ALS533			
	Motorola	SN74ALS533 ★	732
			496-109
	TI	SN74ALS533 ★	957
			496-117
74ALS534			
	Motorola	SN74ALS534 ★	732
			486-117
	TI	SN74ALS534 ★	957
			486-123
74ALS537			
	Motorola	SN74ALS537 ★	732
74ALS538			
	Motorola	SN74ALS538 ★	732
			483-151
	TI	SN74ALS538 ★	958
			483-155
74ALS539			
	Motorola	SN74ALS539 ★	732
			483-51
	TI	SN74ALS539 ★	959
			483-53
74ALS540			
	Motorola	SN74ALS540 ★	732
	TI	SN74ALS540 ★	960
74ALS541			
	Motorola	SN74ALS541 ★	732
	TI	SN74ALS541 ★	960
74ALS560			
	Motorola	SN74ALS560 ★	732
			481-69
	TI	SN74ALS560 ★	961
			481-71
74ALS561			
	Motorola	SN74ALS561 ★	732
			482-79
	TI	SN74ALS561 ★	961
			482-81
74ALS563			
	Motorola	SN74ALS563 ★	732
			496-110
	TI	SN74ALS563 ★	962
			496-118
74ALS564			
	Motorola	SN74ALS564 ★	732
			486-118
	TI	SN74ALS564 ★	962
			486-124
74ALS568			
	Motorola	SN74ALS568 ★	732
			481-91
	TI	SN74ALS568 ★	963
			481-93
74ALS569			
	Motorola	SN74ALS569 ★	732
	TI	SN74ALS569 ★	963
74ALS573			
	Motorola	SN74ALS573 ★	732
			496-51
	National	DM74ALS573	496-55
	TI	SN74ALS573 ★	964
			496-59
74ALS574			
	Motorola	SN74ALS574	486-174
	National	DM74ALS574	486-178
	TI	SN74ALS574 ★	964
			486-184
74ALS575			
	TI	SN74ALS575 ★	964
			486-185
74ALS576			
	Motorola	SN74ALS576 ★	732
			489-138
	National	DM74ALS576	489-142
	TI	SN74ALS576 ★	965
			486-125
74ALS577			
	TI	SN74ALS577 ★	965
			486-186
74ALS580			
	Motorola	SN74ALS580 ★	732
			496-111
	National	DM74ALS580	496-113
	TI	SN74ALS580 ★	966
			496-119
74ALS620			
	Motorola	SN74ALS620 ★	732
			505-95
	National	DM74ALS620	505-100
	TI	SN74ALS620 ★	976
			505-110
74ALS621			
	Motorola	SN74ALS621 ★	732
			505-82
	TI	SN74ALS621 ★	976
			505-91
74ALS622			
	Motorola	SN74ALS622 ★	732
			505-80
	National	DM74ALS622	505-101
	TI	SN74ALS622 ★	976
			505-92
74ALS623			
	Motorola	SN74ALS623 ★	732
			505-96
	National	DM74ALS623	505-102
	TI	SN74ALS623 ★	976
74ALS632			
	TI	SN74ALS632	509-53
74ALS633			
	TI	SN74ALS633	509-54
74ALS634			
	TI	SN74ALS634	509-55
74ALS635			
	TI	SN74ALS635	509-56
74ALS636			
	TI	SN74ALS636	508-97
74ALS637			
	TI	SN74ALS637	508-98
74ALS638			
	Motorola	SN74ALS638 ★	732
			504-81
	TI	SN74ALS638 ★	983
			504-91
74ALS639			
	Motorola	SN74ALS639 ★	732
			504-82
	TI	SN74ALS639 ★	983
			504-92
74ALS640			
	Motorola	SN74ALS640 ★	732
			504-112
	National	DM74ALS640	504-115
	TI	SN74ALS640 ★	984
			504-125
74ALS641			
	Motorola	SN74ALS641 ★	732
			504-146
	National	DM74ALS641	504-148
	TI	SN74ALS641 ★	984
			504-153
74ALS642			
	Motorola	SN74ALS642 ★	732
			504-94
	National	DM74ALS642	504-96
	TI	SN74ALS642 ★	984
			504-101
74ALS643			
	Motorola	SN74ALS643 ★	732
			504-113
	National	DM74ALS643	504-116
	TI	SN74ALS643 ★	984
			504-126
74ALS644			
	Motorola	SN74ALS644 ★	732
			505-27
	National	DM74ALS644	505-29
	TI	SN74ALS644 ★	984
			505-34
		SN74ALS644-1 ★	984
74ALS645			
	TI	SN74ALS645 ★	984
			504-177
		★	984
			2479-34
74ALS646			
	Motorola	SN74ALS646 ★	732
			505-136
	National	DM74ALS646	505-140
	TI	SN74ALS646 ★	986
			505-67
		SN74ALS646-1 ★	986
			505-68
74ALS647			
	Motorola	SN74ALS647 ★	732
			505-47
	National	DM74ALS647	505-51
74ALS647			
	TI	SN74ALS647 ★	986
			505-57
		SN74ALS647-1 ★	986
			505-58
74ALS648			
	Motorola	SN74ALS648 ★	732
			505-137
	National	DM74ALS648	505-141
	TI	SN74ALS648 ★	986
			505-69
		SN74ALS648-1 ★	986
			505-70
74ALS649			
	Motorola	SN74ALS649 ★	732
			505-48
	National	DM74ALS649	505-52
	TI	SN74ALS649	505-59
		SN74ALS649-1	505-60
74ALS651			
	TI	SN74ALS651 ★	988
			504-127
			505-71
		SN74ALS651-1 ★	988
			505-72
74ALS652			
	TI	SN74ALS652 ★	988
			504-128
			505-73
		SN74ALS652-1 ★	988
			505-74
74ALS653			
	TI	SN74ALS653 ★	989
			505-40
		SN74ALS653-1 ★	989
			505-41
74ALS654			
	TI	SN74ALS654 ★	989
			505-43
		SN74ALS654-1 ★	989
			505-44
74ALS671			
	Motorola	SN74ALS671 ★	732
			501-18
74ALS672			
	Motorola	SN74ALS672 ★	732
			501-19
74ALS677			
	TI	SN74ALS677 ★	993
			474-22
74ALS678			
	TI	SN74ALS678 ★	993
			474-23
74ALS679			
	TI	SN74ALS679 ★	994
			474-24
74ALS680			
	TI	SN74ALS680 ★	994
			474-25
74ALS688			
	TI	SN74ALS688 ★	998
			474-115
74ALS689			
	TI	SN74ALS689 ★	998
			474-99
74ALS690			
	Motorola	SN74ALS690 ★	732
			480-191
	National	DM74ALS690	481-6
74ALS691			
	Motorola	SN74ALS691 ★	732
			478-87
	National	DM74ALS691	478-91
74ALS692			
	Motorola	SN74ALS692 ★	732
			481-1
	National	DM74ALS692	481-7
74ALS693			
	Motorola	SN74ALS693 ★	732
			478-88
	National	DM74ALS693	478-92
74ALS694			
	Motorola	SN74ALS694 ★	732
74ALS696			
	Motorola	SN74ALS696 ★	732
			481-78
	National	DM74ALS696	481-82

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
74ALS697			
	Motorola	SN74ALS697 ★	732
			479-138
	National	DM74ALS697	479-142
74ALS698			
	Motorola	SN74ALS698 ★	732
			481-79
	National	DM74ALS698	481-83
74ALS699			
	Motorola	SN74ALS699 ★	732
			479-139
	National	DM74ALS699	479-143
74ALS74			
	Motorola	SN74ALS74 ★	732
			485-68
	National	DM74ALS74	485-70
	TI	SN74ALS74 ★	857
			485-72
74ALS790			
	Motorola	SN74ALS790 ★	732
			506-30
		★	732
			2467-18
74ALS804			
	TI	SN74ALS804 ★	1002
			492-57
74ALS805			
	TI	SN74ALS805 ★	1003
			494-154
74ALS808			
	TI	SN74ALS808 ★	1003
			489-183
74ALS832			
	TI	SN74ALS832 ★	1004
			493-169
74ALS857			
	TI	SN74ALS857 ★	1004
74ALS86			
	TI	SN74ALS86 ★	862
			495-25
74ALS873			
	Motorola	SN74ALS873 ★	732
			495-112
	National	DM74ALS873	495-114
	TI	SN74ALS873 ★	1008
			495-116
74ALS874			
	Motorola	SN74ALS874 ★	732
			485-35
	National	DM74ALS874	485-38
	TI	SN74ALS874 ★	1008
			485-44
74ALS876			
	Motorola	SN74ALS876 ★	732
			485-36
	National	DM74ALS876	485-39
	TI	SN74ALS876 ★	1009
			485-45
74ALS878			
	TI	SN74ALS878 ★	1010
			485-46
74ALS879			
	TI	SN74ALS879 ★	1010
			485-47
74ALS880			
	Motorola	SN74ALS880 ★	732
			496-6
	National	DM74ALS880	496-8
	TI	SN74ALS880 ★	1011
			496-10
74AS00	TI	SN74AS00 ★	833
			492-20
74AS02	TI	SN74AS02 ★	833
			494-113
74AS08	TI	SN74AS08 ★	835
			489-148
74AS10	TI	SN74AS10 ★	836
			490-189
74AS1002			
	TI	SN74AS1002 ★	1013
74AS1032			
	TI	SN74AS1032 ★	1016
74AS1034			
	TI	SN74AS1034 ★	1017
74AS109			
	TI	SN74AS109 ★	870
			487-128
74AS11	TI	SN74AS11 ★	836
			489-50
74AS112			
	TI	SN74AS112 ★	871
			488-107
74AS113			
	TI	SN74AS113 ★	871
			488-74
74AS114			
	TI	SN74AS114 ★	872
			488-138
74AS1242			
	TI	SN74AS1242	503-51
74AS1243			
	TI	SN74AS1243	507-113
74AS151			
	TI	SN74AS151 ★	884
			499-160
74AS153			
	TI	SN74AS153 ★	884
			498-32
74AS160			
	TI	SN74AS160 ★	889
			480-152
74AS161			
	TI	SN74AS161 ★	889
			478-129
74AS162			
	TI	SN74AS162 ★	890
			481-11
74AS163			
	TI	SN74AS163 ★	890
			478-176
74AS168			
	TI	SN74AS168	481-99
74AS169			
	TI	SN74AS169 ★	892
			479-98
74AS174			
	TI	SN74AS174 ★	895
			486-61
74AS175			
	TI	SN74AS175 ★	895
74AS181			
	TI	SN74AS181 ★	897
			475-14
74AS20	TI	SN74AS20 ★	839
			490-104
74AS21	TI	SN74AS21 ★	840
			488-172
74AS230			
	TI	SN74AS230 ★	910
			503-168
74AS231			
	TI	SN74AS231 ★	910
74AS240			
	TI	SN74AS240 ★	910
74AS241			
	TI	SN74AS241 ★	911
			504-32
74AS242			
	TI	SN74AS242 ★	911
			503-52
74AS243			
	TI	SN74AS243 ★	912
			503-53
74AS244			
	TI	SN74AS244 ★	912
			503-169
74AS251			
	TI	SN74AS251 ★	915
			500-40
74AS253			
	TI	SN74AS253 ★	915
			497-143
74AS27	TI	SN74AS27 ★	842
			494-48
74AS280			
	TI	SN74AS280 ★	921
			509-5
74AS30	TI	SN74AS30 ★	842
			492-77
74AS352			
	TI	SN74AS352 ★	932
			497-120
74AS353			
	TI	SN74AS353 ★	933
			497-88
74AS373			
	TI	SN74AS373	496-61
74AS374			
	TI	SN74AS374	486-190
74AS533			
	TI	SN74AS533 ★	957
			496-121
74AS534			
	TI	SN74AS534 ★	957
			486-126
74AS573			
	TI	SN74AS573 ★	964
74AS574			
	TI	SN74AS574 ★	964
74AS575			
	TI	SN74AS575 ★	964
			486-191
74AS576			
	TI	SN74AS576 ★	965
74AS577			
	TI	SN74AS577 ★	965
			486-192
74AS580			
	TI	SN74AS580 ★	966
74AS74	TI	SN74AS74 ★	857
			485-74
74AS800			
	TI	SN74AS800 ★	1001
74AS802			
	TI	SN74AS802 ★	1002
74AS804			
	TI	SN74AS804 ★	1002
			492-59
74AS805			
	TI	SN74AS805	494-156
74AS808			
	TI	SN74AS808	489-185
74AS832			
	TI	SN74AS832	493-171
74AS839			
	TI	FP74AS839	506-101
			3458-6
74AS840			
	TI	FP74AS840	506-102
			3458-4
74AS857			
	TI	SN74AS857 ★	1004
74AS866			
	TI	SN74AS866 ★	1005
74AS867			
	TI	SN74AS867 ★	1005
74AS869			
	TI	SN74AS869 ★	1005
74AS870			
	TI	SN74AS870 ★	1006
			496-153
74AS871			
	TI	SN74AS871 ★	1007
			496-154
74AS873			
	TI	SN74AS873 ★	1008
74AS874			
	TI	SN74AS874 ★	1008
74AS876			
	TI	SN74AS876 ★	1009
74AS877			
	TI	SN74AS877 ★	1009
			508-125
74AS878			
	TI	SN74AS878 ★	1010
74AS879			
	TI	SN74AS879 ★	1010
			485-49
74AS880			
	TI	SN74AS880 ★	1011
74AS881			
	TI	SN74AS881 ★	1011
			475-15
74AS882			
	TI	SN74AS882 ★	1012
			475-78
74AS885			
	TI	SN74AS885 ★	1012
			474-117
74AS894			
	TI	SN74AS894	476-22
74C00	National	MM74C00	457-103
		¶	229-11
74C02	National	MM74C02	458-165
		¶	229-11
74C04	National	MM74C04	450-186
		¶	229-11
74C08	National	MM74C08	456-187
74C10	National	MM74C10	457-61
74C107	National	MM74C107	456-82
74C137	Supertex	HS74C137	454-108
		S74C137	454-112
74C138	Supertex	HS74C138	454-93
		S74C138	454-97
74C139	Supertex	HS74C139	454-67
		S74C139	454-71
74C14	National	MM74C14	465-32
		¶	237-10
74C150	National	MM74C150	462-2
74C151	National	MM74C151	461-137
74C154	National	MM74C154	454-158
74C157	National	MM74C157	461-103
74C160	National	MM74C160	452-143
74C161	National	MM74C161	451-59
74C162	National	MM74C162	452-115
74C163	National	MM74C163	451-35
74C164	National	MM74C164	463-108
			3490-131
74C165	National	MM74C165	463-97
			3490-96
74C173	National	MM74C173	455-132
74C174	National	MM74C174	455-173
74C175	National	MM74C175	455-156
74C192	National	MM74C192	452-174
74C193	National	MM74C193	451-93
74C195	National	MM74C195	463-18
			3489-71
74C20	National	MM74C20	457-26
74C200	National	MM74C200	460-120
			3473-32
74C221	National	MM74C221	462-54
		¶	237-13
74C237	Supertex	HS74C237	454-109
		S74C237	454-113
74C238	Supertex	HS74C238	454-94
		S74C238	454-98
74C239	Supertex	HS74C239	454-68
		S74C239	454-72
74C240	National	MM74C240	465-71
	Supertex	HS74C240	465-78
		S74C240	465-80
74C241	Supertex	HS74C241	465-94
		S74C241	465-96
74C242	Supertex	HS74C242	464-129
		S74C242	464-131
74C243	Supertex	HS74C243	464-138
		S74C243	464-140
74C244	National	MM74C244	465-52
	Supertex	HS74C244	465-58
		S74C244	465-60
74C245	Supertex	HS74C245	465-144
		S74C245	465-146
74C30	National	MM74C30	457-141
74C32	National	MM74C32	458-55
74C373	Supertex	HS74C373	459-190
		S74C373	460-1
74C374	National	MM74C374	456-44
	Supertex	HS74C374	456-57
		S74C374	456-61
74C42	National	MM74C42	454-2
74C48	National	MM74C48	454-25
74C533	Supertex	HS74C533	460-27
		S74C533	460-31
74C534	Supertex	HS74C534	456-22
		S74C534	456-26
74C540	Supertex	HS74C540	450-137
		S74C540	450-141
74C541	Supertex	HS74C541	450-138
		S74C541	450-142
74C563	Supertex	HS74C563	460-28
		S74C563	460-32
74C564	Supertex	HS74C564	456-23
		S74C564	456-27
74C573	Supertex	HS74C573	459-191
		S74C573	460-2
74C574	Supertex	HS74C574	456-58
		S74C574	456-62
74C73	National	MM74C73	456-83
74C74	National	MM74C74	455-99

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
74C76	National	MM74C76	456-114
74C83	National	MM74C83	449-39
74C85	National	MM74C85	449-91
74C86	National	MM74C86	459-22
74C89	National	MM74C89	460-103
			3471-109
74C90	National	MM74C90	452-129
74C901	National	MM74C901	450-81
			¶ 261-4
74C902	National	MM74C902	450-83
			¶ 261-4
74C903	National	MM74C903	450-75
			¶ 261-4
74C904	National	MM74C904	450-77
			¶ 261-4
74C905	National	MM74C905	464-73
74C906	National	MM74C906	450-71
74C907	National	MM74C907	450-73
74C908	National	MM74C908	455-75
			¶ 230-3
74C909	National	MM74C909	464-27
			2895-11
74C910	National	MM74C910	460-134
			¶ 287-13
			3472-17
			¶ 287-13
74C911	**National**	**MM74C911**	★ **735**
			455-81
			★ **735**
			2464-128
74C912	**National**	**MM74C912**	★ **735**
			455-82
			★ **735**
			2465-51
74C914	National	MM74C914	465-33
74C915	National	MM74C915	455-85
			2465-71
74C917	**National**	**MM74C917**	★ **735**
			455-83
			★ **735**
			2465-52
74C918	National	MM74C918	455-76
			¶ 230-3
74C920	National	MM74C920	461-2
			¶ 286-8
			3474-12
			¶ 286-8
		MM74C920-3	3474-53
			¶ 286-8
74C921	National	MM74C921	461-3
			¶ 286-8
			3474-10
			¶ 286-8
		MM74C921-3	3474-54
			¶ 286-8
74C922	National	MM74C922	2468-2
			¶ 232-5
74C923	National	MM74C923	2468-7
74C925	National	MM74C925	453-75
74C926	National	MM74C926	453-76
74C927	National	MM74C927	453-60
74C928	National	MM74C928	453-59
74C929	National	MM74C929	460-154
			¶ 286-8
			3476-39
			¶ 286-8
		MM74C929-3	3476-78
			¶ 286-8
74C93	National	MM74C93	451-20
74C930	National	MM74C930	460-155
			¶ 286-8
			3476-40
			¶ 286-8
		MM74C930-3	3476-79
			¶ 286-8
74C932	National	MM74C932	464-28
74C941	National	MM74C941	450-132
			2470-46
74C945	**National**	**MM74C945**	★ **735**
			453-61
74C946	**National**	**MM74C946**	★ **735**
			453-56
74C947	**National**	**MM74C947**	★ **735**
			453-62
74C95	National	MM74C95	463-2
			3489-76
74C956	National	MM74C956	455-41
			2464-129
			1100-95
74C989	National	MM74C989	3471-107
74F11	**Motorola**	**MC74F11**	★ **731**
74F-TTL			
	Signetics	**74F-TTL**	★ **775**
74F00	Fairchild	74F00	492-22
	Motorola	**MC74F00**	★ **731**
			492-24
	Signetics	74F00	492-26
74F02	Fairchild	74F02	494-115
	Motorola	**MC74F02**	★ **731**
			494-117
	Signetics	74F02	494-118
74F04	Fairchild	74F04	477-177
	Motorola	**MC74F04**	★ **731**
			477-179
	Signetics	74F04	477-181
74F08	Fairchild	74F08	489-150
	Motorola	**MC74F08**	★ **731**
			489-152
	Signetics	74F08	489-153
74F10	Fairchild	74F10	490-191
	Motorola	**MC74F10**	★ **731**
			490-192
	Signetics	74F10	490-193
74F109	Fairchild	74F109	487-130
	Motorola	**MC74F109**	★ **731**
			487-132
	Signetics	74F109	487-133
74F11	Fairchild	74F11	489-52
	Motorola	**MC74F11**	★ **731**
			489-54
	Signetics	74F11	489-55
74F112	**Motorola**	**MC74F112**	★ **731**
74F113	**Motorola**	**MC74F113**	★ **731**
74F114	**Motorola**	**MC74F114**	★ **731**
74F138	Fairchild	74F138	483-157
	Motorola	**MC74F138**	★ **731**
			483-159
	Signetics	74F138	483-160
74F139	Fairchild	74F139	483-59
	Motorola	**MC74F139**	★ **731**
			483-61
	Signetics	74F139	483-63
74F151	Fairchild	74F151	499-162
	Motorola	**MC74F151**	★ **731**
			499-164
74F153	Fairchild	74F153	498-34
	Motorola	**MC74F153**	★ **731**
			498-36
	Signetics	74F153	497-80
74F157	Fairchild	74F157	499-29
	Motorola	**MC74F157**	★ **731**
			499-31
	Signetics	74F157	499-33
74F158	Fairchild	74F158	498-123
	Motorola	**MC74F158**	★ **731**
			498-125
	Signetics	74F158	498-127
74F160	Fairchild	74F160	480-154
	Motorola	**MC74F160**	★ **731**
			480-156
74F161	Fairchild	74F161	478-131
	Motorola	**MC74F161**	★ **731**
			478-133
74F162	Fairchild	74F162	481-13
	Motorola	**MC74F162**	★ **731**
			481-15
74F163	Fairchild	74F163	478-178
	Motorola	**MC74F163**	★ **731**
			478-180
74F168	**Motorola**	**MC74F168**	★ **731**
74F169	**Motorola**	**MC74F169**	★ **731**
74F174	**Motorola**	**MC74F174**	★ **731**
74F175	Fairchild	74F175	485-127
	Motorola	**MC74F175**	★ **731**
			485-129
74F181	**Fairchild**	**74F181**	★ **619**
			475-19
	Motorola	**MC74F181**	★ **731**
			475-25
	Signetics	74F181	475-29
74F182	Fairchild	74F182	475-80
74F182	**Motorola**	**MC74F182**	★ **731**
			475-82
74F190	**Fairchild**	**74F190**	★ **623**
			482-1
	Motorola	**MC74F190**	★ **731**
			482-3
	Signetics	74F190	481-75
74F191	**Fairchild**	**74F191**	★ **623**
			479-147
	Motorola	**MC74F191**	★ **731**
			479-149
	Signetics	74F191	479-80
74F192	**Fairchild**	**74F192**	★ **627**
			481-143
	Motorola	**MC74F192**	★ **731**
			481-145
74F193	**Fairchild**	**74F193**	★ **627**
			480-8
	Motorola	**MC74F193**	★ **731**
			480-10
74F194	Fairchild	74F194	501-153
	Motorola	**MC74F194**	★ **731**
			501-155
74F195	**Motorola**	**MC74F195**	★ **731**
	Signetics	74F195	501-52
74F20	Fairchild	74F20	490-106
	Motorola	**MC74F20**	★ **731**
			490-108
	Signetics	74F20	490-110
74F240	**Fairchild**	**74F240**	★ **630**
			503-125
			★ **630**
			2471-2
	Motorola	**MC74F240**	★ **731**
			503-127
	Signetics	74F240	503-128
74F241	**Fairchild**	**74F241**	★ **630**
			504-34
	Motorola	**MC74F241**	★ **731**
			504-36
	Signetics	74F241	504-38
74F242	Fairchild	74F242	503-56
	Motorola	**MC74F242**	★ **731**
			503-60
	Signetics	74F242	503-64
74F243	Fairchild	74F243	503-57
	Motorola	**MC74F243**	★ **731**
			503-61
	Signetics	74F243	503-65
74F244	**Fairchild**	**74F244**	★ **630**
			503-171
	Motorola	**MC74F244**	★ **731**
			503-173
	Signetics	74F244	503-175
74F245	Fairchild	74F245	504-180
	Motorola	**MC74F245**	★ **731**
			504-183
	Signetics	74F245	503-29
74F251	Fairchild	74F251	500-42
	Motorola	**MC74F251**	★ **731**
			500-44
74F253	Fairchild	74F253	497-145
	Motorola	**MC74F253**	★ **731**
			497-147
	Signetics	74F253	497-81
74F257	Fairchild	74F257	498-161
	Motorola	**MC74F257**	★ **731**
			498-163
	Signetics	74F257	498-165
74F258	Fairchild	74F258	498-83
	Motorola	**MC74F258**	★ **731**
			498-85
	Signetics	74F258	498-87
74F280	Fairchild	74F280	509-7
	Motorola	**MC74F280**	★ **731**
			509-9
	Signetics	74F280	505-158
74F283	**Motorola**	**MC74F283**	★ **731**
74F2960			
	Motorola	**MC74F2960**	★ **731**
74F2968			
	Motorola	**MC74F2968**	★ **731**
74F2969			
	Motorola	**MC74F2969**	★ **731**
74F2970			
	Motorola	**MC74F2970**	★ **731**
74F299	Fairchild	74F299	502-150
	Motorola	**MC74F299**	★ **731**
			502-153
74F32	Fairchild	74F32	493-140
	Motorola	**MC74F32**	★ **731**
			493-142
	Signetics	74F32	493-143
74F322	Fairchild	74F322	502-111
74F323	Fairchild	74F323	502-151
74F350	**Motorola**	**MC74F350**	★ **731**
	Signetics	74F350	508-58
74F352	Fairchild	74F352	497-122
	Motorola	**MC74F352**	★ **731**
			497-124
	Signetics	74F352	497-125
74F353	Fairchild	74F353	497-90
	Motorola	**MC74F353**	★ **731**
			497-92
	Signetics	74F353	497-93
74F373	**Fairchild**	**74F373**	★ **632**
			496-63
	Motorola	**MC74F373**	★ **731**
			496-65
	Signetics	74F373	496-67
74F374	**Fairchild**	**74F374**	★ **634**
			487-2
	Motorola	**MC74F374**	★ **731**
			487-4
	Signetics	74F374	487-6
74F378	**Motorola**	**MC74F378**	★ **731**
74F379	Fairchild	74F379	485-177
	Motorola	**MC74F379**	★ **731**
			485-179
74F381	Fairchild	74F381	475-20
	Motorola	**MC74F381**	★ **731**
			475-26
74F382	Fairchild	74F382	475-21
	Motorola	**MC74F382**	★ **731**
			475-27
74F398	Fairchild	74F398	499-78
74F399	Fairchild	74F399	499-79
74F401	**Fairchild**	**74F401**	★ **636**
74F402	**Fairchild**	**74F402**	★ **638**
74F403	**Fairchild**	**74F403**	★ **643**
74F418	**Fairchild**	**74F418**	★ **650**
74F433	**Fairchild**	**74F433**	★ **643**
74F500	**Fairchild**	**74F500**	★ **655**
74F510	Fairchild	74F510	508-64
74F521	Fairchild	74F521	474-87
	Motorola	**MC74F521**	★ **731**
			474-89
	Signetics	74F521	474-91
74F524	Fairchild	74F524	474-27
74F526	Fairchild	74F526	505-115
74F533	Fairchild	74F533	496-123
	Motorola	**MC74F533**	★ **731**
			496-125
	Signetics	74F533	496-127
74F534	Fairchild	74F534	486-128
	Motorola	**MC74F534**	★ **731**
			486-130
	Signetics	74F534	486-132
74F537	Fairchild	74F537	483-41
	Motorola	**MC74F537**	★ **731**
			483-43
74F538	Fairchild	74F538	484-6
	Motorola	**MC74F538**	★ **731**
			484-8
74F539	Fairchild	74F539	483-116
	Motorola	**MC74F539**	★ **731**
			483-118
74F545	Fairchild	74F545	504-181
	Signetics	74F545	503-30
74F557	Fairchild	74F557	476-4
74F558	Fairchild	74F558	475-155
74F559	Fairchild	74F559	475-94
74F570	Fairchild	74F570	497-33
74F571	Fairchild	74F571	497-31
74F581	Signetics	74F581	477-36
74F582	Signetics	74F582	477-37
74F585	Signetics	74F585	507-175
74F588	Fairchild	74F588	506-111
	Signetics	74F588	504-78
74F610	**Fairchild**	**74F610**	★ **656**
74F612	**Fairchild**	**74F612**	★ **656**
74F620	**Motorola**	**MC74F620**	★ **731**

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device		Page-Line
74F623	Motorola	MC74F623	★	731
74F64	Fairchild	74F64		493-100
	Motorola	MC74F64	★	731
				493-102
74F640	Motorola	MC74F640	★	731
74F643	Motorola	MC74F643	★	731
74F645	Motorola	MC74F645	★	731
74F646	Signetics	74F646		505-77
74F647	Signetics	74F647		505-53
74F648	Signetics	74F648		505-78
74F649	Signetics	74F649		505-54
74F74	Fairchild	74F74		485-76
	Motorola	MC74F74	★	731
				485-78
	Signetics	74F74		485-79
74F86	Fairchild	74F86		495-27
	Motorola	MC74F86	★	731
				495-29
	Signetics	74F86		495-31
74H00	Fairchild	74H00		492-28
	National	DM74H00		492-32
	TI	SN74H00	★	833
				492-33
74H01	Fairchild	74H01		491-156
	National	DM74H01		491-160
	TI	SN74H01	★	833
				491-162
74H04	Fairchild	74H04		477-183
	National	DM74H04		477-187
	TI	SN74H04	★	834
				478-2
74H05	Fairchild	74H05		477-75
	National	DM74H05		477-79
	TI	SN74H05	★	834
				477-81
74H08	Fairchild	74H08		489-155
	National	DM74H08		489-159
74H09	Fairchild	74H09		489-102
74H10	Fairchild	74H10		491-2
	National	DM74H10		491-6
	TI	SN74H10	★	836
				491-8
74H101	Fairchild	74H101		487-108
	TI	SN74H101	★	868
				487-110
74H102	TI	SN74H102	★	868
				487-106
74H103	Fairchild	74H103		488-99
	National	DM74H103		488-101
	TI	SN74H103	★	868
				488-103
74H106	Fairchild	74H106		488-109
	National	DM74H106		488-111
	TI	SN74H106	★	869
				488-113
74H108	Fairchild	74H108		488-65
	National	DM74H108		488-67
	TI	SN74H108	★	870
				488-69
74H11	Fairchild	74H11		489-57
	National	DM74H11		489-61
	TI	SN74H11	★	836
				489-63
74H15	TI	SN74H15	★	838
				489-16
74H183	Fairchild	74H183		474-151
	Hitachi	HD74H183		474-152
	TI	SN74H183	★	898
				474-154
			¶	288-12
74H20	Fairchild	74H20		490-112
	National	DM74H20		490-116
	TI	SN74H20	★	839
				490-118
74H21	Fairchild	74H21		488-174
	National	DM74H21		488-178
	TI	SN74H21	★	840
				488-180
74H22	Fairchild	74H22		490-56
	National	DM74H22		490-60
	TI	SN74H22	★	840
				490-62
74H30	Fairchild	74H30		492-79
	National	DM74H30		492-85
	TI	SN74H30	★	842
				492-87
74H40	Fairchild	74H40		490-14
	National	DM74H40		490-20
	TI	SN74H40	★	845
				490-22
74H50	Fairchild	74H50		492-158
	National	DM74H50		492-162
	TI	SN74H50	★	848
				492-164
74H51	Fairchild	74H51		492-180
	National	DM74H51		492-184
	TI	SN74H51	★	848
			★	849
				492-186
74H52	Fairchild	74H52		492-136
	National	DM74H52		492-140
	TI	SN74H52		492-142
74H53	Fairchild	74H53		493-56
	National	DM74H53		493-60
	TI	SN74H53	★	849
				493-62
74H54	Fairchild	74H54		493-49
	National	DM74H54		493-51
	TI	SN74H54	★	850
				493-53
74H55	Fairchild	74H55		493-43
	National	DM74H55		493-45
	TI	SN74H55	★	851
				493-47
74H60	National	DM74H60		507-102
	TI	SN74H60	★	852
				507-104
74H61	Fairchild	74H61		507-108
	National	DM74H61		507-110
	TI	SN74H61	★	852
				507-112
74H62	Fairchild	74H62		508-3
	National	DM74H62		508-5
	TI	SN74H62	★	853
				508-7
74H71	National	DM74H71		487-101
	TI	SN74H71	★	855
				487-103
74H72	Fairchild	74H72		487-84
	National	DM74H72		487-88
	TI	SN74H72	★	856
				487-91
74H73	Fairchild	74H73		488-4
	National	DM74H73		488-10
	TI	SN74H73	★	856
				488-12
74H74	Fairchild	74H74		485-81
	National	DM74H74		485-85
	TI	SN74H74	★	857
				485-87
74H76	National	DM74H76		488-51
	TI	SN74H76	★	858
				488-53
74H78	National	DM74H78		487-152
	TI	SN74H78	★	859
				487-154
74H87	Fairchild	74H87		508-69
	Motorola	MC74H87		508-71
	TI	SN74H87	★	863
				508-73
74HC00	Fairchild	74HC00	★	665
				457-87
	Motorola	MC74HC00	★	733
				457-96
	National	MM74HC00		457-104
	RCA	CD74HC00	★	740
				457-113
	SPI	SP74HC00	★	766
				457-115
74HC02	Fairchild	74HC02	★	665
				458-150
	Motorola	MC74HC02		458-159
	National	MM74HC02		458-166
	RCA	CD74HC02	★	740
				458-175
	SPI	SP74HC02	★	766
				458-177
74HC03	Motorola	MC74HC03		457-83
74HC04	Fairchild	74HC04	★	667
	Motorola	MC74HC04		450-181
	National	MM74HC04		450-187
74HC04	RCA	CD74HC04	★	740
				451-4
	SPI	SP74HC04	★	766
				451-6
74HC07	Fairchild	74HC07	★	667
				450-122
74HC08	Fairchild	74HC08	★	665
				456-175
	Motorola	MC74HC08		456-182
	National	MM74HC08		456-188
	RCA	CD74HC08	★	740
				456-193
74HC10	Fairchild	74HC10	★	665
				457-46
	Motorola	MC74HC10		457-55
	National	MM74HC10		457-62
	RCA	CD74HC10	★	740
				457-71
	SPI	SP74HC10	★	766
				457-72
74HC107				
	Fairchild	74HC107	★	666
	Motorola	MC74HC107		456-77
	National	MM74HC107		456-84
	RCA	CD74HC107	★	739
				456-87
	SPI	SP74HC107	★	768
				456-89
74HC109				
	Fairchild	74HC109	★	666
				456-96
	Motorola	MC74HC109		456-106
	National	MM74HC109		456-115
	RCA	CD74HC109	★	739
				456-125
	SPI	SP74HC109	★	768
				456-128
74HC11	Fairchild	74HC11	★	665
	Motorola	MC74HC11		456-159
	RCA	CD74HC11	★	740
				456-165
	SPI	SP74HC11	★	766
				456-166
74HC112				
	Fairchild	74HC112	★	666
				456-97
	Motorola	MC74HC112		456-73
	National	MM74HC112		456-116
	RCA	CD74HC112	★	739
				456-126
	SPI	SP74HC112	★	768
				456-74
74HC113				
	SPI	SP74HC113	★	768
				456-71
74HC123				
	National	MM74HC123		462-35
	RCA	CD74HC123	★	740
74HC125				
	Fairchild	74HC125	★	667
				449-153
	SPI	SP74HC125	★	768
				449-133
74HC126				
	SPI	SP74HC126	★	768
				449-132
74HC132				
	Fairchild	74HC132	★	665
				464-146
	Motorola	MC74HC132		465-2
	National	MM74HC132		465-6
	RCA	CD74HC132	★	740
74HC133				
	Fairchild	74HC133	★	665
				457-156
	National	MM74HC133		457-158
	RCA	CD74HC133	★	740
				457-160
74HC138				
	Fairchild	74HC138	★	666
				454-77
	Motorola	MC74HC138		454-85
	National	MM74HC138		454-87
	RCA	CD74HC138	★	739
				454-90
	SPI	SP74HC138	★	769
74HC139				
	Fairchild	74HC139	★	666
				454-51
	Motorola	MC74HC139		454-60
	National	MM74HC139		454-62
	RCA	CD74HC139	★	739
				454-65
	SPI	SP74HC139	★	769
				454-66
74HC14	Fairchild	74HC14	★	667
				450-164
	Motorola	MC74HC14		465-25
	National	MM74HC14		465-18
	RCA	CD74HC14	★	740
				465-37
	SPI	SP74HC14	★	766
				465-38
74HC147				
	Fairchild	74HC147	★	666
				466-18
	Motorola	MC74HC147		454-164
	National	MM74HC147		466-20
	RCA	CD74HC147	★	739
				454-167
	SPI	SP74HC147	★	769
				454-165
74HC148				
	SPI	SP74HC148	★	769
				454-162
74HC151				
	Fairchild	74HC151	★	666
				461-134
	National	MM74HC151		461-138
	RCA	CD74HC151	★	740
				461-140
74HC153				
	Fairchild	74HC153	★	666
				461-161
	Motorola	MC74HC153		461-85
	National	MM74HC153		461-95
	RCA	CD74HC153	★	740
				461-97
	SPI	SP74HC153	★	769
				461-86
74HC154				
	Fairchild	74HC154	★	666
				454-154
	National	MM74HC154		454-159
	RCA	CD74HC154	★	739
				454-161
74HC157				
	Motorola	MC74HC157		461-99
	National	MM74HC157		461-104
	RCA	CD74HC157	★	740
	SPI	SP74HC157	★	769
				461-106
74HC158				
	Motorola	MC74HC158		461-109
	National	MM74HC158		461-105
	RCA	CD74HC158	★	740
	SPI	SP74HC158	★	769
				461-110
74HC160				
	Fairchild	74HC160	★	668
				452-131
	Motorola	MC74HC160		452-138
	National	MM74HC160		452-144
	RCA	CD74HC160	★	739
				452-148
	SPI	SP74HC160	★	769
				452-149
74HC161				
	Fairchild	74HC161	★	668
	Motorola	MC74HC161		451-54
	National	MM74HC161		451-60
	RCA	CD74HC161	★	739
				451-64
	SPI	SP74HC161	★	770
				451-65
74HC162				
	Fairchild	74HC162	★	668
				452-103
	Motorola	MC74HC162		452-110
	National	MM74HC162		452-116
	RCA	CD74HC162	★	739
				452-120

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device		Page-Line
74HC162				
	SPI	SP74HC162	★	770
				452-121
74HC163				
	Fairchild	74HC163	★	668
				451-23
	Motorola	MC74HC163		451-30
	National	MM74HC163		451-36
	RCA	CD74HC163	★	739
				451-40
	SPI	SP74HC163	★	770
				451-41
74HC164				
	Fairchild	74HC164	★	665
				463-103
	Motorola	MC74HC164		463-105
	National	MM74HC164		463-109
	RCA	CD74HC164	★	740
				463-111
74HC165				
	Fairchild	74HC165	★	665
				463-92
	Motorola	MC74HC165		463-94
	National	MM74HC165		463-98
	RCA	CD74HC165	★	740
				463-100
74HC166				
	RCA	CD74HC166	★	740
74HC173				
	Fairchild	74HC173	★	665
				455-121
	Motorola	MC74HC173		455-128
	RCA	CD74HC173	★	739
				455-136
74HC174				
	Fairchild	74HC174	★	666
	Motorola	MC74HC174		455-169
	RCA	CD74HC174	★	739
				455-177
	SPI	SP74HC174	★	770
				455-178
74HC175				
	Fairchild	74HC175	★	666
				455-145
	Motorola	MC74HC175		455-152
	National	MM74HC175		455-157
	RCA	CD74HC175	★	739
				455-159
	SPI	SP74HC175	★	770
				455-160
74HC191				
	RCA	CD74HC191	★	739
				451-101
74HC192				
	Fairchild	74HC192	★	668
				452-157
	Motorola	MC74HC192		452-167
	National	MM74HC192		452-175
	RCA	CD74HC192	★	739
				452-181
	SPI	SP74HC192	★	770
				452-182
74HC193				
	Fairchild	74HC193	★	668
				451-75
	Motorola	MC74HC193		451-86
	National	MM74HC193		451-94
	RCA	CD74HC193	★	739
				451-102
	SPI	SP74HC193	★	770
				451-103
74HC194				
	Fairchild	74HC194	★	665
	Motorola	MC74HC194		462-153
	National	MM74HC194		463-3
	RCA	CD74HC194	★	740
				463-5
74HC195				
	Fairchild	74HC195	★	665
				463-9
	Motorola	MC74HC195		463-13
	National	MM74HC195		463-19
	RCA	CD74HC195	★	740
				463-21
74HC20	Fairchild	74HC20	★	665
				457-12
	Motorola	MC74HC20		457-21
	National	MM74HC20		457-63
74HC20	RCA	CD74HC20	★	740
				457-34
	SPI	SP74HC20	★	766
				457-35
74HC200				
	Western	WD74HC200	★	3997
				460-111
74HC221				
	Fairchild	74HC221	★	668
				462-45
	RCA	CD74HC221	★	740
				462-59
74HC238				
	RCA	CD74HC238	★	739
74HC240				
	Fairchild	74HC240	★	667
				465-63
	Motorola	MC74HC240		465-68
	National	MM74HC240		465-72
	RCA	CD74HC240	★	740
				465-74
	SPI	SP74HC240	★	770
				465-76
74HC241				
	Fairchild	74HC241	★	667
				465-82
	Motorola	MC74HC241		465-87
	National	MM74HC241		465-89
	RCA	CD74HC241	★	740
				465-91
74HC242				
	Fairchild	74HC242	★	667
				464-122
	Motorola	MC74HC242		464-124
	National	MM74HC242		464-126
	RCA	CD74HC242	★	739
				464-128
74HC243				
	Fairchild	74HC243	★	667
				464-133
	Motorola	MC74HC243		464-135
	RCA	CD74HC243	★	739
				464-137
74HC244				
	Fairchild	74HC244	★	667
				465-44
	Motorola	MC74HC244		465-49
	National	MM74HC244		465-53
	RCA	CD74HC244	★	740
				465-55
74HC245				
	Fairchild	74HC245	★	667
				465-127
	Motorola	MC74HC245		465-136
	RCA	CD74HC245	★	739
				465-140
74HC251				
	Fairchild	74HC251	★	666
				461-162
	Motorola	MC74HC251		461-175
	National	MM74HC251		466-16
	RCA	CD74HC251	★	740
				461-179
74HC253				
	Fairchild	74HC253	★	666
				461-78
	Motorola	MC74HC253		461-90
	National	MM74HC253		461-92
	RCA	CD74HC253	★	740
	SPI	SP74HC253	★	771
				461-93
74HC257				
	Fairchild	74HC257	★	666
				461-113
	Motorola	MC74HC257		461-115
	National	MM74HC257		461-117
	RCA	CD74HC257	★	740
				461-121
	SPI	SP74HC257	★	771
				461-122
74HC258				
	SPI	SP74HC258	★	771
				461-125
74HC259				
	Fairchild	74HC259	★	665
				460-42
	Motorola	MC74HC259		460-49
74HC259	National	MM74HC259		460-56
	RCA	CD74HC259	★	739
				460-63
74HC266				
	Fairchild	74HC266	★	665
	Motorola	MC74HC266		459-52
	National	MM74HC266		458-34
	RCA	CD74HC266	★	740
				459-56
	SPI	SP74HC266	★	771
				459-57
74HC27	Fairchild	74HC27	★	665
				458-117
	Motorola	MC74HC27		458-126
	National	MM74HC27		458-131
	RCA	CD74HC27	★	740
				458-139
	SPI	SP74HC27	★	766
				458-140
74HC273				
	Fairchild	74HC273	★	665
				456-5
	RCA	CD74HC273	★	739
74HC280				
	Fairchild	74HC280	★	667
				449-107
	Motorola	MC74HC280		449-109
	National	MM74HC280		449-111
	RCA	CD74HC280	★	739
				449-113
	SPI	SP74HC280	★	771
				449-114
74HC283				
	Fairchild	74HC283	★	667
				449-30
74HC297				
	RCA	CD74HC297	★	740
74HC299				
	Fairchild	74HC299	★	665
				463-133
	National	MM74HC299		463-135
	RCA	CD74HC299	★	740
74HC30	Fairchild	74HC30	★	665
				457-131
	Motorola	MC74HC30		457-138
	National	MM74HC30		457-142
	RCA	CD74HC30	★	740
				457-146
	SPI	SP74HC30	★	767
				457-147
74HC32	Fairchild	74HC32	★	665
				458-43
	Motorola	MC74HC32		458-50
	National	MM74HC32		458-56
	RCA	CD74HC32	★	740
				458-60
	SPI	SP74HC32	★	767
				458-62
74HC354				
	Motorola	MC74HC354		461-176
	National	MM74HC354		461-166
	RCA	CD74HC354	★	740
				461-170
74HC356				
	Motorola	MC74HC356		461-177
	National	MM74HC356		461-167
	RCA	CD74HC356	★	740
				461-171
74HC365				
	Fairchild	74HC365	★	667
				450-90
	National	MM74HC365		450-105
	RCA	CD74HC365	★	740
				450-115
	SPI	SP74HC365	★	771
				465-14
74HC366				
	Fairchild	74HC366	★	667
				449-169
	National	MM74HC366		450-86
	RCA	CD74HC366	★	740
				450-116
74HC367				
	Fairchild	74HC367	★	667
				450-91
	Motorola	MC74HC367		450-98
	National	MM74HC367		450-106
74HC367	RCA	CD74HHC367	★	740
				450-117
74HC368				
	Fairchild	74HC368	★	667
				449-170
	National	MM74HC368		450-87
	RCA	CD74HC368	★	740
				450-118
74HC373				
	Fairchild	74HC373	★	665
				459-167
	Motorola	MC74HC373		459-175
	National	MM74HC373		459-179
	RCA	CD74HC373	★	739
				459-184
74HC374				
	Fairchild	74HC374	★	666
				456-30
	Motorola	MC74HC374		456-39
	National	MM74HC374		456-45
	RCA	CD74HC374	★	739
				456-51
74HC377				
	RCA	CD74HC377	★	739
74HC384				
	RCA	CD74HC384	★	739
				449-116
74HC390				
	Fairchild	74HC390	★	668
				453-39
	National	MM74HC390		453-37
	RCA	CD74HC390	★	739
				453-41
74HC393				
	Fairchild	74HC393	★	668
				451-142
	National	MM74HC393		451-144
	RCA	CD74HC393	★	739
				451-146
74HC4002				
	Motorola	MC74HC4002		458-95
	National	MM74HC4002		458-100
	RCA	CD74HC4002	★	740
				458-108
74HC40104				
	RCA	CD74HC40104	★	740
74HC40105				
	RCA	CD74HC40105	★	740
74HC4017				
	Fairchild	74HC4017	★	668
				452-51
	Motorola	MC74HC4017		452-84
	National	MM74HC4017		452-53
	RCA	CD74HC4017	★	739
				452-92
74HC4018				
	National	MM74HC4018		458-199
74HC4020				
	Fairchild	74HC4020	★	668
				452-13
	Motorola	MC74HC4020		452-20
	National	MM74HC4020		452-9
	RCA	CD74HC4020	★	739
				452-28
74HC4024				
	Motorola	MC74HC4024		451-157
	RCA	CD74HC4024	★	739
				451-165
74HC4040				
	Fairchild	74HC4040	★	668
				451-178
	Motorola	MC74HC4040		451-185
	National	MM74HC4040		451-176
	RCA	CD74HC4040	★	739
				451-193
74HC4046				
	Fairchild	74HC4046	★	668
				462-10
74HC4047				
	Fairchild	74HC4047	★	668
				462-11
74HC4049				
	Fairchild	74HC4049	★	667
				450-14
	National	MM74HC4049		450-22
	RCA	CD74HC4049		450-29

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
74HC4050			
	Fairchild	**74HC4050** ★	**667**
			450-49
	National	MM74HC4050	450-124
	RCA	**CD74HC4050** ★	**740**
			450-62
74HC4051			
	Fairchild	**74HC4051** ★	**666**
			466-14
	RCA	**CD74HC4051** ★	**740**
74HC4052			
	Fairchild	**74HC4052** ★	**666**
			464-118
	RCA	**CD74HC4052** ★	**740**
74HC4053			
	Fairchild	**74HC4053** ★	**666**
			464-120
	RCA	**CD74HC4053** ★	**740**
74HC4060			
	Motorola	MC74HC4060	452-38
	National	MM74HC4060	452-10
	RCA	**CD74HC4060** ★	**739**
			452-46
74HC4075			
	Motorola	MC74HC4075	458-30
74HC4078			
	Motorola	MC74HC4078	458-197
74HC42	**Fairchild**	**74HC42** ★	**666**
	Motorola	MC74HC42	453-167
	National	MM74HC42	454-3
	RCA	**CD74HC42** ★	**739**
			454-9
	SPI	**SP74HC42** ★	**767**
			454-10
74HC4301			
	National	MM74HC4301	460-36
74HC4302			
	National	MM74HC4302	460-34
74HC4303			
	National	MM74HC4303	456-9
74HC4304			
	National	MM74HC4304	456-7
74HC4305			
	National	MM74HC4305	450-126
74HC4510			
	Fairchild	**74HC4510** ★	**668**
			453-17
74HC4511			
	Motorola	MC74HC4511	455-54
	National	MM74HC4511	455-59
	RCA	**CD74HC4511** ★	**739**
			455-64
74HC4512			
	Fairchild	**74HC4512** ★	**666**
			461-163
74HC4514			
	Fairchild	**74HC4514** ★	**666**
			454-155
	Motorola	MC74HC4514	454-125
	National	MM74HC4514	454-131
	RCA	**CD74HC4514** ★	**739**
			454-137
74HC4516			
	Fairchild	**74HC4516** ★	**668**
			451-76
74HC4520			
	RCA	**CD74HC4520** ★	**739**
			451-148
74HC4538			
	Fairchild	**74HC4538** ★	**668**
			462-46
	Motorola	MC74HC4538	462-50
	RCA	**CD74HC4538** ★	**740**
			462-60
74HC4543			
	Motorola	MC74HC4543	455-15
	National	MM74HC4543	455-60
74HC4703			
	Fairchild	**74HC4703** ★	**665**
			464-38
74HC51	Motorola	MC74HC51	457-197
74HC533			
	Fairchild	**74HC533** ★	**665**
			460-6
	Motorola	MC74HC533	460-15
	National	MM74HC533	460-19
74HC533			
	RCA	**CD74HC533** ★	**739**
			460-25
74HC534			
	Fairchild	**74HC534** ★	**666**
			456-12
	National	MM74HC534	456-16
	RCA	**CD74HC534** ★	**739**
			456-20
74HC540			
	RCA	**CD74HC540** ★	**740**
			450-129
74HC541			
	RCA	**CD74HC541** ★	**740**
			450-130
74HC543			
	Fairchild	**74HC543** ★	**665**
		★	**667**
			465-151
74HC544			
	Fairchild	**74HC544** ★	**665**
		★	**667**
			465-152
74HC550			
	Fairchild	**74HC550** ★	**665**
		★	**667**
			465-158
			465-163
74HC551			
	Fairchild	**74HC551** ★	**665**
		★	**667**
			465-159
			465-164
74HC563			
	Fairchild	**74HC563** ★	**665**
			460-7
	Motorola	MC74HC563	460-16
	National	MM74HC563	460-20
	RCA	**CD74HC563** ★	**739**
			460-26
74HC564			
	Fairchild	**74HC564** ★	**666**
			456-13
	National	MM74HC564	456-17
	RCA	**CD74HC564** ★	**739**
			456-21
74HC568			
	Fairchild	**74HC568** ★	**668**
			453-19
74HC569			
	Fairchild	**74HC569** ★	**668**
			451-77
74HC573			
	Fairchild	**74HC573** ★	**665**
			459-168
	Motorola	MC74HC573	459-176
	National	MM74HC573	459-180
	RCA	**CD74HC573** ★	**739**
			459-185
74HC574			
	Fairchild	**74HC574** ★	**666**
			456-31
	Motorola	MC74HC574	456-40
	National	MM74HC574	456-46
	RCA	**CD74HC574** ★	**739**
			456-52
74HC58	Motorola	MC74HC58	457-182
74HC640			
	Fairchild	**74HC640** ★	**667**
			465-117
	Motorola	MC74HC640	465-120
	RCA	**CD74HC640** ★	**739**
			465-124
74HC643			
	Fairchild	**74HC643** ★	**667**
			465-115
	Motorola	MC74HC643	465-121
	RCA	**CD74HC643** ★	**739**
			465-125
74HC645			
	Fairchild	**74HC645** ★	**667**
			465-148
	Motorola	MC74HC645	465-137
	RCA	**CD74HC645** ★	**739**
			465-141
74HC646			
	Fairchild	**74HC646** ★	**665**
		★	**667**
74HC646			
	Fairchild	74HC646	465-107
			465-160
	Motorola	MC74HC646	465-109
	National	MM74HC646	465-111
	RCA	**CD74HC646** ★	**739**
			465-113
74HC648			
	Fairchild	**74HC648** ★	**665**
		★	**667**
			465-99
			465-154
	Motorola	MC74HC648	465-101
	National	MM74HC648	465-103
	RCA	**CD74HC648** ★	**739**
			465-105
74HC670			
	RCA	**CD74HC670** ★	**739**
74HC688			
	Fairchild	**74HC688** ★	**667**
			449-105
	National	MM74HC688	464-35
	RCA	**CD74HC688** ★	**739**
			449-56
74HC73	**Fairchild**	**74HC73** ★	**666**
	Motorola	MC74HC73	456-78
	RCA	**CD74HC73** ★	**739**
			456-88
	SPI	**SP74HC73** ★	**767**
			456-90
74HC74	**Fairchild**	**74HC74** ★	**666**
			455-87
	Motorola	MC74HC74	455-94
	National	MM74HC74	455-100
	RCA	**CD74HC74** ★	**739**
			455-107
	SPI	**SP74HC74** ★	**767**
			455-109
74HC75	**Fairchild**	**74HC75** ★	**665**
			459-104
	Motorola	MC74HC75	459-111
	National	MM74HC75	459-115
	RCA	**CD74HC75** ★	**739**
74HC76	**Fairchild**	**74HC76** ★	**666**
			456-98
	Motorola	MC74HC76	456-107
	National	MM74HC76	456-117
	RCA	**CD74HC76** ★	**739**
			456-127
	SPI	**SP74HC76** ★	**767**
			456-129
74HC77	Motorola	MC74HC77	459-92
	National	MM74HC77	460-57
74HC80	**SPI**	**SP74HC80** ★	**767**
			449-57
74HC85	**Fairchild**	**74HC85** ★	**667**
			449-82
	Motorola	MC74HC85	449-89
	RCA	**CD74HC85** ★	**739**
			449-97
74HC86	**Fairchild**	**74HC86** ★	**665**
			459-5
	Motorola	MC74HC86	459-14
	National	MM74HC86	459-23
	RCA	**CD74HC86** ★	**740**
			459-31
	SPI	**SP74HC86** ★	**767**
			459-32
74HC90	**SPI**	**SP74HC90** ★	**768**
			452-101
74HC93	**SPI**	**SP74HC93** ★	**768**
			451-149
74HC942			
	National	**MM74HC942** ★	**736**
74HCT00			
	RCA	**CD74HCT00** ★	**740**
74HCT02			
	RCA	**CD74HCT02** ★	**740**
74HCT04			
	Fairchild	**74HCT04** ★	**667**
			450-166
	RCA	**CD74HCT04** ★	**740**
74HCT07			
	Fairchild	**74HCT07** ★	**667**
			450-79
74HCT08			
	RCA	**CD74HCT08** ★	**740**
74HCT10			
	RCA	**CD74HCT10** ★	**740**
74HCT107			
	RCA	**CD74HCT107** ★	**739**
74HCT109			
	RCA	**CD74HCT109** ★	**739**
74HCT11			
	RCA	**CD74HCT11** ★	**740**
74HCT112			
	RCA	**CD74HCT112** ★	**739**
74HCT123			
	RCA	**CD74HCT123** ★	**740**
74HCT132			
	RCA	**CD74HCT132** ★	**740**
74HCT133			
	RCA	**CD74HCT133** ★	**740**
74HCT138			
	RCA	**CD74HCT138** ★	**739**
74HCT139			
	RCA	**CD74HCT139** ★	**739**
74HCT14			
	RCA	**CD74HCT14** ★	**740**
74HCT147			
	RCA	**CD74HCT147** ★	**739**
74HCT151			
	RCA	**CD74HCT151** ★	**740**
74HCT153			
	RCA	**CD74HCT153** ★	**740**
74HCT154			
	RCA	**CD74HCT154** ★	**739**
74HCT157			
	RCA	**CD74HCT157** ★	**740**
74HCT158			
	RCA	**CD74HCT158** ★	**740**
74HCT160			
	RCA	**CD74HCT160** ★	**739**
74HCT161			
	RCA	**CD74HCT161** ★	**739**
74HCT162			
	RCA	**CD74HCT162** ★	**739**
74HCT163			
	RCA	**CD74HCT163** ★	**739**
74HCT164			
	RCA	**CD74HCT164** ★	**740**
74HCT165			
	RCA	**CD74HCT165** ★	**740**
74HCT166			
	RCA	**CD74HCT166** ★	**740**
74HCT173			
	RCA	**CD74HCT173** ★	**739**
74HCT174			
	RCA	**CD74HCT174** ★	**739**
74HCT175			
	RCA	**CD74HCT175** ★	**739**
74HCT191			
	RCA	**CD74HCT191** ★	**739**
74HCT192			
	RCA	**CD74HCT192** ★	**739**
74HCT193			
	RCA	**CD74HCT193** ★	**739**
74HCT194			
	RCA	**CD74HCT194** ★	**740**
74HCT195			
	RCA	**CD74HCT195** ★	**740**
74HCT20			
	RCA	**CD74HCT20** ★	**740**
74HCT221			
	RCA	**CD74HCT221** ★	**740**
74HCT238			
	RCA	**CD74HCT238** ★	**739**
74HCT240			
	RCA	**CD74HCT240** ★	**740**
74HCT241			
	RCA	**CD74HCT241** ★	**740**
74HCT242			
	RCA	**CD74HCT242** ★	**739**
74HCT243			
	RCA	**CD74HCT243** ★	**739**
74HCT244			
	RCA	**CD74HCT244** ★	**740**
74HCT245			
	RCA	**CD74HCT245** ★	**739**
74HCT251			
	RCA	**CD74HCT251** ★	**740**
74HCT253			
	RCA	**CD74HCT253** ★	**740**
74HCT257			
	RCA	**CD74HCT257** ★	**740**

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
74HCT259			
	RCA	CD74HCT259 ★	739
74HCT266			
	RCA	CD74HCT266 ★	740
74HCT27			
	RCA	CD74HCT27 ★	740
74HCT273			
	RCA	CD74HCT273 ★	739
74HCT280			
	RCA	CD74HCT280 ★	739
74HCT297			
	RCA	CD74HCT297 ★	740
74HCT299			
	RCA	CD74HCT299 ★	740
74HCT30			
	RCA	CD74HCT30 ★	740
74HCT32			
	RCA	CD74HCT32 ★	740
74HCT354			
	RCA	CD74HCT354 ★	740
74HCT356			
	RCA	CD74HCT356 ★	740
74HCT365			
	RCA	CD74HCT365 ★	740
74HCT366			
	RCA	CD74HCT366 ★	740
74HCT367			
	RCA	CD74HCT367 ★	740
74HCT368			
	RCA	CD74HCT368 ★	740
74HCT373			
	RCA	CD74HCT373 ★	739
74HCT374			
	RCA	CD74HCT374 ★	739
74HCT377			
	RCA	CD74HCT377 ★	739
74HCT384			
	RCA	CD74HCT384 ★	739
74HCT390			
	RCA	CD74HCT390 ★	739
74HCT393			
	RCA	CD74HCT393 ★	739
74HCT4002			
	RCA	CD74HCT4002 ★	740
74HCT40104			
	RCA	CD74HCT40104 ★	740
74HCT40105			
	RCA	CD74HCT40105 ★	740
74HCT4017			
	RCA	CD74HCT4017 ★	739
74HCT4020			
	RCA	CD74HCT4020 ★	739
74HCT4024			
	RCA	CD74HCT4024 ★	739
74HCT4040			
	RCA	CD74HCT4040 ★	739
74HCT4051			
	RCA	CD74HCT4051 ★	740
74HCT4052			
	RCA	CD74HCT4052 ★	740
74HCT4053			
	RCA	CD74HCT4053 ★	740
74HCT4060			
	RCA	CD74HCT4060 ★	739
74HCT42			
	RCA	CD74HCT42 ★	739
74HCT4511			
	RCA	CD74HCT4511 ★	739
74HCT4514			
	RCA	CD74HCT4514 ★	739
74HCT4520			
	RCA	CD74HCT4520 ★	739
74HCT533			
	RCA	CD74HCT533 ★	739
74HCT534			
	RCA	CD74HCT534 ★	739
74HCT538			
	RCA	CD74HCT538 ★	740
74HCT540			
	RCA	CD74HCT540 ★	740
74HCT541			
	RCA	CD74HCT541 ★	740
74HCT563			
	RCA	CD74HCT563 ★	739
74HCT564			
	RCA	CD74HCT564 ★	739
74HCT573			
	RCA	CD74HCT573 ★	739
74HCT574			
	RCA	CD74HCT574 ★	739
74HCT640			
	RCA	CD74HCT640 ★	739
74HCT643			
	RCA	CD74HCT643 ★	739
74HCT645			
	RCA	CD74HCT645 ★	739
74HCT646			
	RCA	CD74HCT646 ★	739
74HCT648			
	RCA	CD74HCT648 ★	739
74HCT670			
	RCA	CD74HCT670 ★	739
74HCT688			
	RCA	CD74HCT688 ★	739
74HCT73			
	RCA	CD74HCT73 ★	739
74HCT74			
	RCA	CD74HCT74 ★	739
74HCT75			
	RCA	CD74HCT75 ★	739
74HCT76			
	RCA	CD74HCT76 ★	739
74HCT85			
	RCA	CD74HCT85 ★	739
74HCT86			
	RCA	CD74HCT86 ★	740
74HCU04			
	Motorola	MC74HCU04	450-168
74HCU4049			
	RCA	CD74HCU4049 ★	740
74L00	TI	SN74L00 ★	833
74L157	TI	SN74L157 ★	887
74L164	National	DM74L164A	3490-98
	TI	SN74L164	3490-100
74L47	TI	SN74L47	2464-2
74L91	National	DM74L91	3491-2
	TI	SN74L91	3490-133
74L95	National	DM74L95	3488-47
	TI	SN74L95	3488-42
74L99	TI	SN74L99	3488-43
74LS00	Fairchild	74LS00	492-35
	Hitachi	HD74LS00	492-36
	Mitsubishi	M74LS00	492-37
	Motorola	SN74LS00	492-39
	National	DM74LS00	492-41
	SGS	74LS00	492-43
	Signetics	74LS00	492-45
	TI	SN74LS00 ★	833
			492-47
74LS01	Hitachi	HD74LS01	491-165
	Motorola	SN74LS01	491-170
	National	DM74LS01	491-174
	Signetics	74LS01	491-180
	TI	SN74LS01 ★	833
			491-183
74LS02	Fairchild	74LS02	494-121
	Hitachi	HD74LS02	494-123
	Mitsubishi	M74LS02	494-124
	Motorola	SN74LS02	494-127
	National	DM74LS02	494-130
	SGS	74LS02	494-132
	Signetics	74LS02	494-137
	TI	SN74LS02 ★	833
			494-140
74LS03	Fairchild	74LS03	491-164
	Hitachi	HD74LS03	491-166
	Mitsubishi	M74LS03	491-167
	Motorola	SN74LS03	491-171
	National	DM74LS03	491-175
	SGS	74LS03	491-177
	TI	SN74LS03 ★	834
			491-184
74LS04	Fairchild	74LS04	478-4
	Hitachi	HD74LS04	478-5
	Mitsubishi	M74LS04	478-6
	Motorola	SN74LS04	478-8
	National	DM74LS04	478-10
	SGS	74LS04	478-12
	Signetics	74LS04	478-14
	TI	SN74LS04 ★	834
			478-16
74LS05	Fairchild	74LS05	477-83
	Hitachi	HD74LS05	477-84
	Mitsubishi	M74LS05	477-85
	Motorola	SN74LS05	477-87
74LS05	National	DM74SL05	477-89
	SGS	74LS05	477-91
	Signetics	74LS05	477-93
	TI	SN74LS05 ★	834
			477-95
74LS08	Fairchild	74LS08	489-161
	Hitachi	HD74LS08	489-162
	Mitsubishi	M74LS08	489-163
	Motorola	SN74LS08	489-165
	National	DM74LS08	489-167
	SGS	74LS08	489-169
	Signetics	74LS08	489-171
	TI	SN74LS08 ★	835
			489-173
74LS09	Fairchild	74LS09	489-104
	Hitachi	HD74LS09	489-105
	Mitsubishi	M74LS09	489-106
	Motorola	SN74LS09	489-108
	National	DM74LS09	489-110
	SGS	74LS09	489-113
	Signetics	74LS09	489-115
	TI	SN74LS09 ★	836
			489-117
74LS10	Fairchild	74LS10	491-10
	Hitachi	HD74LS10	491-11
	Mitsubishi	M74LS10	491-12
	Motorola	SN74LS10	491-14
	National	DM74LS10	491-16
	SGS	74LS10	491-18
	Signetics	74LS10	491-20
	TI	SN74LS10 ★	836
			491-22
74LS104			
	TI	SN74LS104	506-9
74LS105			
	TI	SN74LS105	506-10
74LS107			
	Fairchild	74LS107	488-13
	Hitachi	HD74LS107	488-14
	Mitsubishi	M74LS107A	488-16
	Motorola	SN74LS107A	488-20
	National	DM74LS107A	488-24
	Signetics	74LS107	488-28
	TI	SN74LS107A ★	869
			488-32
74LS109			
	Fairchild	74LS109	487-135
	Hitachi	HD74LS109	487-136
	Mitsubishi	M74LS109A	487-137
	Motorola	SN74LS109A	487-139
	National	DM74LS109	487-141
	SGS	74LS109	487-143
	Signetics	74LS109	487-145
	TI	SN74LS109A ★	870
			487-147
74LS11	Fairchild	74LS11	489-65
	Hitachi	HD74LS11	489-38
	Mitsubishi	M74LS11	489-66
	Motorola	SN74LS11	489-68
	National	DM74LS11	489-70
	SGS	74LS11	489-72
	Signetics	74LS11	489-74
	TI	SN74LS11 ★	836
			489-76
74LS112			
	Fairchild	74LS112	488-115
	Hitachi	HD74LS112	488-116
	Mitsubishi	M74LS112A	488-117
	Motorola	SN74LS112A	488-119
	National	DM74LS112	488-121
	SGS	74LS112	488-148
	Signetics	74LS112	488-123
	TI	SN74LS112A ★	871
			488-125
74LS113			
	Fairchild	74LS113	488-76
	Hitachi	HD74LS113	488-77
	Mitsubishi	M74LS113A	488-78
	Motorola	SN74LS113A	488-80
	National	DM74LS113A	488-82
	SGS	74LS113	488-84
	Signetics	74LS113	488-86
	TI	SN74LS113A ★	871
			488-88
74LS114			
	Fairchild	74LS114	488-140
	Hitachi	HD74LS114	488-141
	Mitsubishi	M74LS114A	488-142
	Motorola	SN74LS114A	488-144
	National	DM74LS114A	488-146
	SGS	T74LS114	488-150
	TI	SN74LS114A	488-152
74LS12	Hitachi	HD74LS12	490-157
	Mitsubishi	M74LS12	490-158
	Motorola	SN74LS12	490-160
	National	DM74LS12	490-162
	TI	SN74LS12 ★	837
			490-164
74LS122			
	Hitachi	HD74LS122	500-126
	Motorola	SN74LS122	500-128
	National	DM74LS122	500-130
	TI	SN74LS122 ★	873
			500-132
74LS123			
	Hitachi	HD74LS123	500-167
	Motorola	SN74LS123	500-169
	National	DM74LS123	500-171
	TI	SN74LS123 ★	874
			500-173
		¶	237-11
74LS124			
	TI	SN74LS124	507-53
			2946-42
74LS125			
	Fairchild	74LS125	476-143
	Mitsubishi	M74LS125A	476-144
	National	DM74LS125A	476-148
	SGS	74LS125A	476-150
	Signetics	74LS125A	476-152
	TI	SN74LS125A ★	875
			476-154
74LS126			
	Fairchild	74LS126	476-118
	Mitsubishi	M74LS126A	476-119
	Motorola	SN74LS126A	476-121
	National	DM74LS126	476-123
	SGS	74LS126	476-125
	Signetics	74LS126A	476-127
	TI	SN74LS126A ★	875
			476-129
74LS13	Fairchild	74LS13	507-82
	Hitachi	HD74LS13	507-83
	Mitsubishi	M74LS13	507-84
	Motorola	SN74LS13	507-86
	National	DM74LS13	507-88
	SGS	T74LS13	507-92
	Signetics	74LS13	507-94
	TI	SN74LS13 ★	837
			507-97
74LS132			
	Fairchild	74LS132	507-129
	Hitachi	HD74LS132	507-130
	Mitsubishi	M74LS132	507-131
	Motorola	SN74LS132	507-133
	National	DM74LS132	507-135
	SGS	74LS132	507-90
	Signetics	74LS132	507-137
	TI	SN74LS132	507-140
74LS133			
	Fairchild	74LS133	492-120
	Mitsubishi	M74LS133	492-121
	Motorola	SN74LS133	492-123
	SGS	74LS133	492-125
74LS136			
	Fairchild	74LS136	494-173
	Hitachi	HD74LS136	494-174
	Mitsubishi	M74LS136	494-175
	Motorola	SN74LS136	494-177
	National	DM74LS136	494-179
	SGS	74LS136	494-181
	Signetics	74LS136	494-183
	TI	SN74LS136 ★	878
			495-2
74LS137			
	TI	SN74LS137 ★	879
			484-14
74LS138			
	Fairchild	74LS138	483-170
	Hitachi	HD74LS138	483-171
	Mitsubishi	M74LS138	483-172
	Motorola	SN74LS138	483-174

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
74LS138			
	National	DM74LS138	483-176
			1094-126
	SGS	74LS138	483-178
	Signetics	74LS138	483-180
	TI	**SN74LS138**	★ **880**
			483-182
			★ **880**
			1094-128
74LS139			
	Fairchild	74LS139	483-68
	Hitachi	HD74LS139	483-69
	Motorola	SN74LS139	483-71
	National	DM74LS139	483-73
	SGS	74LS139	483-75
	Signetics	74LS139	483-77
	TI	**SN74LS139**	★ **880**
			483-79
74LS14	Fairchild	74LS14	507-160
	Hitachi	HD74LS14	507-161
	Mitsubishi	M74LS14	507-162
	Motorola	SN74LS14	507-164
	National	DM74LS14	507-166
	SGS	74LS14	507-168
	Signetics	74LS14	507-170
	TI	**SN74LS14**	★ **837**
			507-173
74LS145			
	Fairchild	74LS145	482-150
	TI	**SN74LS145**	★ **882**
			482-152
74LS147			
	TI	**SN74LS147**	★ **882**
			509-36
74LS148			
	Hitachi	HD74LS148	508-148
	TI	**SN74LS148**	★ **883**
			508-151
			★ **803**
			1098-113
74LS15	Fairchild	74LS15	489-18
	Hitachi	HD74LS15	489-19
	Mitsubishi	M74LS15	489-20
	Motorola	SN74LS15	489-22
	National	DM74LS15	489-24
	SGS	74LS15	489-26
	TI	**SN74LS15**	★ **838**
			489-28
74LS151			
	Fairchild	74LS151	499-169
	Hitachi	HD74LS151A	499-170
	Mitsubishi	M74LS151	499-171
	Motorola	SN74LS151	499-173
	National	DM74LS151	499-175
	SGS	74LS151	499-177
	Signetics	74LS151	499-179
	TI	**SN74LS151**	★ **884**
			499-181
74LS152			
	Hitachi	HD74LS152	500-12
	Motorola	SN74LS152	500-14
	SGS	T74LS152	500-15
74LS153			
	Fairchild	74LS153	498-41
	Hitachi	HD74LS153	498-42
	Mitsubishi	M74LS153	498-43
	Motorola	SN74LS153	498-45
	National	DM74LS153	498-47
	SGS	74LS153	498-49
	Signetics	74LS153	498-51
	TI	**SN74LS153**	★ **884**
			498-53
74LS154			
	National	DM74LS154	484-41
	Signetics	74LS154	484-43
74LS155			
	Fairchild	74LS155	483-134
	Hitachi	HD74LS155	483-135
	Motorola	SN74LS155	483-137
	National	DM74LS155	483-139
	SGS	74LS155	483-141
	Signetics	74LS155	483-143
	TI	**SN74LS155**	★ **886**
			483-145
74LS156			
	Fairchild	74LS156	483-102
	Hitachi	HD74LS156	483-103
74LS156			
	Motorola	SN74LS156	483-105
	National	DM74LS156	483-107
	SGS	74LS156	483-109
	Signetics	74LS156	483-111
	TI	**SN74LS156**	★ **886**
			483-113
74LS157			
	Fairchild	74LS157	499-38
	Hitachi	HD74LS157	499-39
	Mitsubishi	M74LS157	499-40
	Motorola	SN74LS157	499-42
	National	DM74LS157	499-44
	SGS	74LS157	499-46
	Signetics	74LS157	499-48
	TI	**SN74LS157**	★ **887**
			499-50
74LS158			
	Fairchild	74LS158	498-132
	Hitachi	HD74LS158	498-133
	Mitsubishi	M74LS158	498-134
	Motorola	SN74LS158	498-136
	National	DM74LS158	498-138
	SGS	74LS158	498-140
	Signetics	74LS158	498-142
	TI	**SN74LS158**	★ **887**
			498-144
74LS160			
	Fairchild	74LS160	480-160
	Hitachi	HD74LS160A	480-161
	Motorola	SN74LS160A	480-163
	National	DM74LS160A	480-165
	SGS	74LS160	480-167
	Signetics	74LS160A	480-169
	TI	**SN74LS160A**	★ **889**
			480-171
74LS161			
	AMD	SN74LS161	478-136
	Fairchild	74LS161	478-138
	Hitachi	HD74LS161A	478-139
	Mitsubishi	M74LS161	478-106
	Motorola	SN74LS161A	478-141
	National	DM74LS161A	478-143
	SGS	74LS161	478-145
	Signetics	74LS161A	478-147
	TI	**SN74LS161A**	★ **889**
			478-149
74LS162			
	Fairchild	74LS162	481-19
	Hitachi	HD74LS162A	481-20
	Motorola	SN74LS162A	481-22
	National	DM74LS162	481-24
	SGS	74LS162	481-26
	Signetics	74LS162A	481-28
	TI	**SN74LS162**	★ **890**
74LS163			
	Fairchild	74LS163	478-183
	Hitachi	HD74LS163A	478-184
	Mitsubishi	M74LS163	478-185
	Motorola	SN74LS163A	478-186
			¶ 246-5
	National	DM74LS163A	478-187
	SGS	74LS163	478-188
	Signetics	74LS163A	478-189
	TI	**SN74LS163A**	★ **890**
			478-190
74LS164			
	Fairchild	74LS164	502-34
			3490-105
	Hitachi	HD74LS164	502-35
			3490-109
	Mitsubishi	M74LS164	502-36
	Motorola	SN74LS164	502-38
			3490-111
	National	DM74LS164	502-40
			3490-115
	SGS	74LS164	502-42
	Signetics	74LS164	502-44
			3490-121
	TI	**SN74LS164**	★ **891**
			502-46
			★ **891**
			3490-125
74LS165			
	Fairchild	74LS165	502-80
			3490-59
	Mitsubishi	M74LS165	502-81
74LS165			
	Motorola	SN74LS165	502-83
			¶ 246-5
			3490-62
			¶ 246-5
	TI	**SN74LS165**	★ **891**
			502-85
			★ **891**
			3490-71
74LS166			
	Mitsubishi	M74LS166	502-99
	Motorola	SN74LS166	502-101
	National	DM74LS166	502-103
	TI	**SN74LS166**	★ **891**
			502-105
			★ **891**
			3490-72
74LS168			
	Fairchild	74LS168	481-104
	Hitachi	HD74LS168	481-105
	Motorola	SN74LS168	481-107
	National	DM74LS168A	481-109
	SGS	T74LS168	481-111
	Signetics	74LS168A	481-113
74LS169			
	Fairchild	74LS169	479-103
	Hitachi	HD74LS169	479-104
	Motorola	SN74LS169	479-106
	National	DM74LS169A	479-108
	SGS	T74LS169	479-110
	Signetics	74LS169A	479-112
	TI	SN74LS169A	479-116
		SN74LS169B	479-117
74LS170			
	Fairchild	74LS170	497-4
			3470-47
	Motorola	SN74LS170	497-6
			3470-51
	National	DM74LS170	497-8
			3470-55
	SGS	74LS170	497-10
	Signetics	74LS170	497-11
			3470-57
	TI	**SN74LS170**	★ **893**
			497-13
			★ **893**
			3470-61
74LS171			
	TI	**SN74LS171**	★ **893**
			485-175
74LS173			
	Fairchild	74LS173A	486-33
	Motorola	SN74LS173A	486-35
	National	DM74LS173	486-37
	Signetics	74LS173	486-39
	TI	**SN74LS173A**	★ **894**
			486-41
74LS174			
	Fairchild	74LS174	486-66
	Hitachi	HD74LS174	486-67
	Mitsubishi	M74LS174	486-68
	Motorola	SN74LS174	486-69
	National	DM74LS174	486-71
	SGS	74LS174	486-73
	Signetics	74LS174	486-75
	TI	**SN74LS174**	★ **895**
			486-77
74LS175			
	Fairchild	74LS175	485-134
	Hitachi	HD74LS175	485-135
	Mitsubishi	M74LS175	485-136
	Motorola	SN74LS175	485-138
			¶ 246-5
	National	DM74LS175	485-140
			1097-3
	SGS	74LS175	485-142
	Signetics	74LS175	485-144
	TI	**SN74LS175**	★ **895**
			485-146
74LS18	Hitachi	HD74LS18	475-41
	TI	**SN74LS18**	★ **839**
			507-98
74LS181			
	Fairchild	74LS181	475.40
	Motorola	SN74LS181	475-43
	SGS	74LS181	475-45
	Signetics	74LS181	475-47
74LS181			
	TI	**SN74LS181**	★ **897**
			475-51
74LS183			
	TI	**SN74LS183**	★ **898**
			474-156
74LS189			
	Fairchild	74LS189	3471-33
	Motorola	SN74LS189	3471-34
	TI	**SN74LS189A**	★ **900**
			3471-89
74LS19	**TI**	**SN74LS19**	★ **839**
			507-174
74LS190			
	Fairchild	74LS190	482-7
	Hitachi	HD74LS190	482-8
	Motorola	SN74LS190	482-10
	National	DM74LS190	482-12
	SGS	74LS190	482-14
	TI	**SN74LS190**	★ **901**
			482-17
74LS191			
	Fairchild	74LS191	479-153
	Hitachi	HD74LS191	479-154
	Motorola	SN74LS191	479-156
	National	DM74LS191	479-158
	SGS	74LS191	479-160
	Signetics	74LS191	479-162
	TI	**SN74LS191**	★ **901**
			479-164
74LS192			
	Fairchild	74LS192	481-151
	Hitachi	HD74LS192	481-152
	Motorola	SN74LS192	481-154
	National	DM74LS192	481-156
	SGS	74LS192	481-158
	Signetics	74LS192	481-160
	TI	**SN74LS192**	★ **902**
			481-162
74LS193			
	Fairchild	74LS193	480-16
	Hitachi	HD74LS193	480-17
	Motorola	SN74LS193	480-19
	National	DM74LS193	480-21
	SGS	74LS193	480-23
	Signetics	74LS193	480-25
	TI	**SN74LS193**	★ **902**
			480-27
74LS194			
	AMD	SN74LS194A	3488-63
	Fairchild	74LS194A	3488-109
	Hitachi	HD74LS194A	501-160
			3488-75
	Mitsubishi	M74LS194A	501-161
	Motorola	SN74LS194A	501-163
			3489-5
	National	DM74LS194A	501-165
	Signetics	74LS194A	501-167
	TI	**SN74LS194A**	★ **902**
			501-169
			★ **902**
			3488-99
74LS195			
	Fairchild	74LS195	501-57
		74LS195A	3488-110
	Hitachi	HD74LS195A	501-58
			3488-127
	Mitsubishi	M74LS195A	501-59
	Motorola	SN74LS195A	501-61
			3489-6
	National	DM74LS195A	501-63
	Signetics	74LS195A	501-64
			3489-18
	TI	**SN74LS195A**	★ **903**
			501-66
			★ **903**
			3489-24
74LS196			
	Fairchild	74LS196	480-109
	Hitachi	HD74LS196	480-110
	Motorola	SN74LS196	480-112
	National	DM74LS196	480-114
	SGS	74LS196	480-116
	TI	**SN74LS196**	★ **903**
			480-118
74LS197			
	Fairchild	74LS197	478-72

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
74LS197			
	Hitachi	HD74LS197	478-73
	Motorola	SN74LS197	478-75
	National	DM74LS197	478-77
	SGS	74LS197	478-79
	Signetics	74LS197	478-80
	TI	**SN74LS197**	**★ 904**
			478-82
74LS20	Fairchild	74LS20	490-120
	Hitachi	HD74LS20	490-121
	Mitsubishi	M74LS20	490-122
	Motorola	SN74LS20	490-124
	National	DM74LS20	490-126
	SGS	74LS20	490-128
	Signetics	74LS20	490-130
	TI	**SN74LS20**	**★ 839**
			490-132
74LS21	Fairchild	74LS21	488-182
	Hitachi	HD74LS21	488-183
	Mitsubishi	M74LS21	488-184
	Motorola	SN74LS21	489-2
	National	DM74LS21	489-4
	SGS	74LS21	489-6
	Signetics	74LS21	489-8
	TI	**SN74LS21**	**★ 840**
			489-10
74LS210			
	MMI	**SN74LS210**	**★ 715**
			503-140
74LS211			
	TI	SN74LS211	3471-118
74LS212			
	TI	SN74LS212	3471-119
74LS213			
	TI	SN74LS213	3471-121
74LS214			
	TI	SN74LS214	3476-13
74LS215			
	TI	SN74LS215	3475-102
74LS216			
	TI	SN74LS216	3472-25
74LS217			
	TI	SN74LS217	3472-26
74LS218			
	TI	SN74LS218	3471-126
74LS219			
	TI	**SN74LS219A**	**★ 906**
			3471-90
74LS22	Fairchild	74LS22	490-64
	Hitachi	HD74LS22	490-65
	Mitsubishi	M74LS22	490-66
	Motorola	SN74LS22	490-68
	National	DM74LS22	490-70
	SGS	74LS22	490-72
	TI	**SN74LS22**	**★ 840**
			490-74
74LS221			
	Hitachi	HD74LS221	500-142
	Motorola	SN74LS221	500-144
	National	DM74LS221	500-146
	TI	**SN74LS221**	**★ 906**
			500-149
74LS222			
	TI	**SN74LS222**	**★ 907**
			3456-5
74LS224			
	TI	**SN74LS224**	**★ 907**
			3456-6
74LS227			
	TI	**SN74LS227**	**★ 909**
			3456-9
74LS228			
	TI	**SN74LS228**	**★ 909**
			3456-10
74LS24	**TI**	**SN74LS24**	**★ 840**
			★ 841
			507-141
74LS240			
	AMD	SN74LS240	503-132
			2470-66
	Fairchild	74LS240	503-134
			2471-3
	Hitachi	HD74LS240	503-136
	Mitsubishi	M74LS240	503-156
			2471-5
	MMI	**SN74LS240**	**★ 715**
			503-141

Base Number	Source	Device	Page-Line
74LS240			
	MMI	**SN74LS240**	**★ 715**
			2471-9
	Motorola	SN74LS240	503-145
			2471-13
	National	DM74LS240	503-148
	Signetics	74LS240	503-149
			2471-18
	TI	**SN74LS240**	**★ 910**
			503-152
			★ 910
			2471-25
74LS241			
	AMD	SN74LS241	504-42
			2470-11
	Fairchild	74LS241	504-44
			2470-17
	Hitachi	HD74LS241	504-46
			2470-20
	Mitsubishi	M74LS241	504-47
	MMI	**SN74LS241**	**★ 715**
			504-51
			★ 715
			2470-30
	Motorola	SN74LS241	504-56
			2470-40
	National	DM74LS241	504-60
	Signetics	74LS241	504-63
			2470-47
	TI	**SN74LS241**	**★ 911**
			504-67
			★ 911
			2470-58
74LS242			
	AMD	SN74LS242	503-72
			2476-60
	Fairchild	74LS242	503-74
			2476-64
	Mitsubishi	M74LS242	503-76
	Motorola	SN74LS242	503-80
			2476-66
	National	DM74LS242	503-84
	Signetics	74LS242	503-86
			2477-2
	TI	**SN74LS242**	**★ 911**
			503-90
			★ 911
			2477-6
74LS243			
	AMD	SN74LS243	503-73
			2476-61
	Fairchild	74LS243	503-75
			2476-65
	Mitsubishi	M74LS243	503-77
	Motorola	SN74LS243	503-81
			2477-1
	National	DM74LS243	503-85
	Signetics	74LS243	503-87
			2477-3
	TI	**SN74LS243**	**★ 912**
			503-91
			★ 912
			2477-7
74LS244			
	AMD	SN74LS244	503-179
			2470-12
	Fairchild	74LS244	503-181
			2470-18
	Hitachi	HD74LS244	504-1
			2470-21
	Mitsubishi	M74LS244	504-2
			2470-22
	MMI	**SN74LS244**	**★ 715**
			504-5
			★ 715
			2470-31
	Motorola	SN74LS244	504-8
			2470-41
	National	DM74LS244	504-61
	Signetics	74LS244	504-10
			2470-48
	TI	**SN74LS244**	**★ 912**
			504-12
			★ 912
			2470-59

Base Number	Source	Device	Page-Line
74LS245			
	Fairchild	74LS245	504-187
			2479-23
	Mitsubishi	M74LS245	504-188
			2479-24
	MMI	**SN74LS245**	**★ 715**
			505-4
			★ 715
			2470-32
	Motorola	SN74LS245	505-9
			2479-25
	National	DM74LS245	505-12
	Signetics	**74LS245**	**★ 779**
			505-15
			★ 779
			2479-29
	TI	**SN74LS245**	**★ 913**
			505-23
			★ 913
			2479-2
74LS247			
	Fairchild	74LS247	2463-150
	Hitachi	HD74LS247	2463-155
	Motorola	SN74LS247	2463-161
	National	DM74LS247	2463-167
	TI	**SN74LS247**	**★ 913**
			2464-3
74LS248			
	Fairchild	74LS248	2463-107
	Hitachi	HD74LS248	2463-111
	Motorola	SN74LS248	2463-119
	National	DM74LS248	2463-125
	TI	**SN74LS248**	**★ 914**
			2463-136
74LS249			
	Fairchild	74LS249	2463-81
	Hitachi	HD74LS249	2463-83
	Motorola	SN74LS249	2463-89
	National	DM74LS249	2463-93
	TI	**SN74LS249**	**★ 914**
			2463-102
74LS251			
	Fairchild	74LS251	500-49
	Hitachi	HD74LS251	500-50
	Mitsubishi	M74LS251	500-51
	Motorola	SN74LS251	500-53
	National	DM74LS251	500-55
	SGS	74LS251	500-57
	Signetics	74LS251A	500-59
	TI	**SN74LS251**	**★ 915**
			500-61
			★ 915
			1098-98
74LS253			
	Fairchild	74LS253	497-152
	Hitachi	HD74LS253	497-153
	Mitsubishi	M74LS253	497-154
	Motorola	SN74LS253	497-156
	National	DM74LS253	497-158
	SGS	74LS253	497-160
	Signetics	74LS253	498-1
	TI	SN74LS253	498-3
74LS256			
	Fairchild	74LS256	495-90
	Mitsubishi	M74LS256	495-91
	Motorola	SN74LS256	495-93
	SGS	T74LS256	495-95
	Signetics	74LS256	495-96
74LS257			
	Fairchild	74LS257	498-169
	Hitachi	HD74LS257	498-170
	Mitsubishi	M74LS257	498-171
	Motorola	SN74LS257A	498-173
	National	DM74LS257B	498-175
	SGS	74LS257	498-177
	Signetics	74LS257A	498-179
	TI	**SN74LS257A**	**★ 916**
			498-181
74LS258			
	Fairchild	74LS258	498-91
	Hitachi	HD74LS258	498-92
	Mitsubishi	M74LS258	498-93
	Motorola	SN74LS258A	498-95
	National	DM74LS258B	498-97
	SGS	74LS258	498-99
	Signetics	74LS258A	498-102

Base Number	Source	Device	Page-Line
74LS258			
	TI	**SN74LS258A**	**★ 917**
			498-104
74LS259			
	Fairchild	74LS259	496-36
	Mitsubishi	M74LS259	496-37
	Motorola	SN74LS259	496-39
	National	DM74LS259	496-41
	SGS	74LS259	496-43
	Signetics	74LS259	496-45
	TI	**SN74LS259**	**★ 917**
			496-47
			★ 917
			1098-83
74LS26	Fairchild	74LS26	491-70
	Motorola	SN74LS26	491-72
	National	DM74LS26	491-74
	SGS	T74LS26	491-75
	Signetics	74LS26	491-77
	TI	**SN74LS26**	**★ 841**
			491-79
74LS260			
	Fairchild	74LS260	494-15
	Motorola	SN74LS260	494-17
	SGS	T74LS260	494-19
	Signetics	74LS260	494-21
74LS261			
	TI	**SN74LS261**	**★ 918**
			475-107
74LS266			
	Fairchild	74LS266	495-71
	Mitsubishi	M74LS266	495-72
	Motorola	SN74LS266	495-74
	National	DM74LS266	495-76
	SGS	74LS266	495-78
	TI	**SN74LS266**	**★ 918**
			495-82
74LS27	Fairchild	74LS27	494-50
	Hitachi	HD74LS27	494-51
	Mitsubishi	M74LS27	494-52
	Motorola	SN74LS27	494-54
	National	DM74LS27	494-56
	SGS	74LS27	494-58
	Signetics	74LS27	494-60
	TI	**SN74LS27**	**★ 842**
			494-62
74LS273			
	AMD	**SN74LS273**	**★1227**
			486-156
	Fairchild	74LS273	486-158
	Mitsubishi	M74LS273	486-159
	MMI	**SN74LS273**	**★ 715**
			486-161
	Motorola	SN74LS273	486-163
	SGS	T74LS273	486-164
	Signetics	74LS273	486-166
	TI	**SN74LS273**	**★ 919**
			486-168
74LS275			
	TI	**SN74LS275**	**★ 920**
			476-95
74LS279			
	Fairchild	74LS279	495-169
	Hitachi	HD74LS279	495-170
	Mitsubishi	M74LS279	495-171
	Motorola	SN74LS279	495-173
	National	DM74LS279	495-175
	SGS	74LS279	495-177
	TI	**SN74LS279**	**★ 921**
			495-180
74LS28	Fairchild	74LS28	494-122
	Motorola	SN74LS28	494-128
	SGS	T74LS28	494-134
	TI	**SN74LS28**	**★ 842**
			494-141
74LS280			
	Hitachi	HD74LS280	509-10
	TI	**SN74LS280**	**★ 921**
			509-12
74LS283			
	Fairchild	74LS283	476-66
	Hitachi	HD74LS283A	476-68
	Mitsubishi	M74LS283	476-70
	Motorola	SN74LS283	476-73
	National	DM74LS283	476-77
	SGS	74LS283	476-81
	Signetics	74LS283	476-85

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
74LS283			
	TI	SN74LS283	★ 922
			476-89
74LS289			
	Fairchild	74LS289	3471-30
	Motorola	SN74LS289	3471-31
	TI	SN74LS289A	★ 924
			3471-81
74LS290			
	Hitachi	HD74LS290	480-58
	Motorola	SN74LS290	480-61
	National	DM74LS290	480-65
	SGS	74LS290	480-69
	Signetics	74LS290	480-73
	TI	SN74LS290	★ 924
			480-77
74LS292			
	TI	SN74LS292	★ 924
			482-90
74LS293			
	Fairchild	74LS293	479-48
	Hitachi	HD74LS293	479-50
	Motorola	SN74LS293	479-54
	National	DM74LS293	479-58
	SGS	74LS293	479-62
	Signetics	74LS293	479-66
	TI	SN74LS293	★ 925
			479-70
74LS294			
	TI	SN74LS294	★ 925
			482-88
74LS295			
	Fairchild	74LS295	501-24
		74LS295A	3488-111
	Mitsubishi	M74LS295B	501-25
	Motorola	SN74LS295A	501-27
			3489-7
	SGS	74LS295A	501-29
	Signetics	74LS295B	501-31
	TI	SN74LS295B	★ 925
			501-33
			★ 925
			3489-25
74LS297			
	TI	SN74LS297	★ 926
			506-177
			★ 926
			2945-42
74LS298			
	Fairchild	74LS298	499-88
	Hitachi	HD74LS298	499-91
	Mitsubishi	M74LS298	499-92
	Motorola	SN74LS298	499-96
	National	DM74LS298	499-100
	SGS	74LS298	499-102
	Signetics	74LS298	499-104
	TI	SN74LS298	★ 926
			499-108
74LS299			
	AMD	SN74LS299	★1227
			502-160
			★1227
			3490-1
	Fairchild	74LS299	502-164
			3490-25
	Hitachi	HD74LS299	502-166
	Mitsubishi	M74LS299	502-167
	Motorola	SN74LS299	502-171
	TI	SN74LS299	★ 927
			502-175
74LS310			
	MMI	SN74LS310	★ 715
74LS30	Fairchild	74LS30	492-89
	Hitachi	HD74LS30	492-90
	Mitsubishi	M74LS30	492-91
	Motorola	SN74LS30	492-93
	National	DM74LS30	492-95
	SGS	74LS30	492-97
	Signetics	74LS30	492-99
	TI	SN74LS30	★ 842
			492-101
74LS301			
	Signetics	N74LS301	497-59
74LS31	TI	SN74LS31	★ 843
			506-20
74LS310			
	MMI	SN74LS310	★ 715
			504-52
74LS311			
	TI	SN74LS311	3471-114
74LS312			
	TI	SN74LS312	3471-115
74LS314			
	TI	SN74LS314	3476-12
74LS315			
	TI	SN74LS315	3475-101
74LS316			
	TI	SN74LS316	3472-21
74LS317			
	TI	SN74LS317	3472-22
74LS318			
	TI	SN74LS318	3471-124
74LS319			
	TI	SN74LS319A	★ 929
			3471-82
74LS32	Fairchild	74LS32	493-147
	Hitachi	HD74LS32	493-148
	Mitsubishi	M74LS32	493-149
	Motorola	SN74LS32	493-151
	National	DM74LS32	493-153
	SGS	74LS32	493-155
	Signetics	74LS32	493-157
	TI	SN74LS32	★ 843
			493-159
74LS320			
	TI	SN74LS320	★ 929
			506-173
74LS321			
	TI	SN74LS321	★ 929
			506-174
74LS322			
	AMD	SN74LS322	476-101
	Fairchild	74LS322	502-112
	Motorola	SN74LS322	476-103
	TI	SN74LS322A	★ 930
			476-105
74LS323			
	AMD	SN74LS323	502-161
			3490-22
	Fairchild	74LS323	502-165
			3490-26
	Mitsubishi	M74LS323	502-168
	Motorola	SN74LS323	502-172
	TI	SN74LS323	★ 930
			502-176
			★ 930
			3490-30
74LS324			
	TI	SN74LS324	507-30
74LS325			
	TI	SN74LS325	507-54
			2946-43
74LS326			
	TI	SN74LS326	507-55
			2946-44
74LS327			
	TI	SN74LS327	507-56
			2946-45
74LS328			
	TI	SN74LS328	507-61
			2946-46
74LS33	Fairchild	74LS33	494-72
	Motorola	SN74LS33	494-74
	SGS	T74LS33	494-76
	Signetics	74LS33	494-78
	TI	SN74LS33	★ 843
			494-80
74LS333			
	TI	FP74LS333	506-105
		SN74LS333	3458-13
74LS334			
	TI	SN74LS334	3458-14
74LS335			
	TI	FP74LS335	506-106
			3457-88
		SN74LS335	3458-9
74LS336			
	TI	SN74LS336	3458-10
74LS340			
	MMI	SN74LS340	★ 715
			503-142
74LS341			
	MMI	SN74LS341	★ 715
			504-53
74LS341			
	MMI	SN74LS341	★ 715
			2470-33
74LS344			
	MMI	SN74LS344	★ 715
			504-6
			★ 715
			2470-34
74LS347			
	Fairchild	74LS347	2463-139
	TI	SN74LS347	★ 931
			2463-145
74LS348			
	TI	SN74LS348	★ 931
			508-152
			★ 931
			1098-115
74LS352			
	Fairchild	74LS352	497-127
	Mitsubishi	M74LS352	497-128
	Motorola	SN74LS352	497-130
	National	DM74LS352	497-132
	SGS	T74LS352	497-134
	TI	SN74LS352	★ 932
			497-136
74LS353			
	Fairchild	74LS353	497-95
	Mitsubishi	M74LS353	497-96
	Motorola	SN74LS353	497-98
	National	DM74LS353	497-100
	SGS	T74LS353	497-102
	TI	SN74LS353	★ 933
			497-104
74LS354			
	TI	SN74LS354	★ 933
			500-28
74LS355			
	TI	SN74LS355	★ 934
			500-24
74LS356			
	TI	SN74LS356	★ 934
			500-29
74LS357			
	TI	SN74LS357	★ 935
			500-25
74LS363			
	Signetics	74LS363	496-86
74LS365			
	Fairchild	74LS365	180
			485-25
	Mitsubishi	M74LS365A	477-2
	Motorola	SN74LS365A	477-6
	National	DM74LS365A	477-10
	SGS	74LS365	477-14
	Signetics	74LS365A	477-18
	TI	SN74LS365A	★ 935
			477-22
			★ 935
			2471-30
74LS366			
	Fairchild	74LS366	477-123
	Mitsubishi	M74LS366A	477-126
	Motorola	SN74LS366A	477-130
	National	DM74LS366A	477-134
	SGS	74LS366	477-138
	Signetics	74LS366A	477-142
	TI	SN74LS366A	★ 935
			477-146
			★ 935
			2471-34
74LS367			
	Fairchild	74LS367	476-181
	Hitachi	HD74LS367	477-1
			485-26
	Mitsubishi	M74LS367A	477-3
			484-144
	Motorola	SN74LS367A	477-7
	National	DM74LS367A	477-11
	SGS	74LS367	477-15
	Signetics	74LS367A	477-19
	TI	SN74LS367A	★ 936
			477-23
			★ 936
			2471-31
74LS368			
	Fairchild	74LS368	477-124
	Hitachi	HD74LS368	477-125
	Mitsubishi	M74LS368A	477-127
	Motorola	SN74LS368A	477-131
	National	DM74LS368A	477-135
	SGS	74LS368	477-139
	Signetics	74LS368A	477-143
	TI	SN74LS368A	★ 936
			477-147
			★ 936
			2471-35
74LS37	Fairchild	74LS37	491-102
	Hitachi	HD74LS37	491-103
	Mitsubishi	M74LS37	491-104
	Motorola	SN74LS37	491-106
	National	DM74LS37	491-108
	SGS	74LS37	491-110
	Signetics	74LS37	491-112
	TI	SN74LS37	★ 844
			491-114
74LS373			
	AMD	SN74LS373	★1227
			496-71
	Fairchild	74LS373	496-72
	Mitsubishi	M74LS373	496-74
	MMI	SN74LS373	★ 715
			496-76
	Motorola	SN74LS373	496-79
	National	DM74LS373	496-82
	SGS	T74LS373	496-83
	Signetics	74LS373	★ 783
			496-87
	TI	SN74LS373	★ 937
			496-91
74LS374			
	AMD	SN74LS374A	★1227
			487-10
	Fairchild	74LS374	487-11
	Mitsubishi	M74LS374	487-13
	MMI	SN74LS374	★ 715
			487-15
	Motorola	SN74LS374	487-18
			¶ 246-5
	National	DM74LS374	487-21
	SGS	T74LS374	487-22
	Signetics	74LS374	487-24
	TI	SN74LS374	★ 938
			487-26
74LS375			
	Fairchild	74LS375	495-131
	Hitachi	HD74LS375	495-132
	Mitsubishi	M74LS375	495-133
	Motorola	SN74LS375	495-137
	Signetics	74LS375	495-143
	TI	SN74LS375	★ 938
			495-147
74LS377			
	AMD	SN74LS377	★1227
			487-46
	Fairchild	74LS377	487-48
	Mitsubishi	M74LS377	487-49
	MMI	SN74LS377	★ 715
			487-51
	Motorola	SN74LS377	487-53
			¶ 246-5
	SGS	T74LS377	487-54
	Signetics	74LS377	487-56
	TI	SN74LS377	★ 939
			487-58
74LS378			
	AMD	SN74LS378	486-94
	Fairchild	74LS378	486-96
	Motorola	SN74LS378	486-98
	SGS	T74LS378	486-100
	Signetics	74LS378	486-102
	TI	SN74LS378	★ 939
			486-104
74LS379			
	AMD	SN74LS379	486-2
	Fairchild	74LS379	486-4
	Motorola	SN74LS379	486-6
	SGS	T74LS379	486-8
	TI	SN74LS379	★ 940
			486-10
74LS38	Fairchild	74LS38	491-54
	Hitachi	HD74LS38	491-55
	Mitsubishi	M74LS38	491-56
	Motorola	SN74LS38	491-58
	National	DM74LS38	491-60

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
74LS38	SGS	74LS38	491-190
	Signetics	74LS38	491-62
	TI	**SN74LS38**	★ **844**
			491-64
74LS380			
	MMI	SN74LS380	502-141
74LS381			
	AMD	**SN74LS381**	★**1227**
			475-38
	TI	**SN74LS381**	★ **940**
			475-52
74LS382			
	TI	**SN74LS382**	★ **941**
			475-53
74LS384			
	AMD	SN74LS384	475-165
	Motorola	SN74LS384	475-167
	TI	**SN74LS384**	★ **941**
			476-2
74LS385			
	AMD	SN74LS385	474-10
	Motorola	SN74LS385	474-12
	TI	**SN74LS385**	★ **942**
			474-14
74LS386			
	Hitachi	HD74LS386	495-33
	Mitsubishi	M74LS386	495-35
	Motorola	SN74LS386	495-39
	National	DM74LS386	495-17
	TI	**SN74LS386**	★ **942**
			495-50
74LS388			
	AMD	SN74LS388	485-169
74LS390			
	Fairchild	74LS390	481-46
	Motorola	SN74LS390	481-50
	National	DM74LS390	481-53
	SGS	T74LS390	481-56
	Signetics	74LS390	481-60
	TI	**SN74LS390**	★ **943**
			481-64
74LS393			
	Fairchild	74LS393	479-11
	Mitsubishi	M74LS393	479-12
	Motorola	SN74LS393	479-14
	National	DM74LS393	479-16
	SGS	T74LS393	479-18
	Signetics	74LS393	479-20
	TI	**SN74LS393**	★ **943**
			479-22
74LS395			
	Fairchild	74LS395	501-121
			3488-112
	Mitsubishi	M74LS395A	501-122
	Motorola	SN74LS395	3489-8
		SN74LS395A	501-124
	SGS	T74LS395	501-126
			3489-15
	Signetics	74LS395A	501-128
	TI	**SN74LS395A**	★ **943**
			501-130
			★ **943**
			3489-26
74LS396			
	TI	**SN74LS396**	★ **944**
			496-156
74LS398			
	Motorola	SN74LS398	499-97
	TI	**SN74LS398**	★ **944**
			499-109
74LS399			
	AMD	SN74LS399	499-86
	Motorola	SN74LS399	499-98
	TI	**SN74LS399**	★ **944**
			499-110
74LS40	Fairchild	74LS40	490-24
	Hitachi	HD74LS40	490-25
	Mitsubishi	M74LS40	490-26
	Motorola	SN74LS40	490-28
	National	DM74LS40	490-30
	SGS	74LS40	490-32
	Signetics	74LS40	490-34
	TI	**SN74LS40**	★ **845**
			490-36
74LS42	Fairchild	74LS42	483-27
	Hitachi	HD74LS42	483-28
	Motorola	SN74LS42	483-30
74LS42	National	DM74LS42	483-32
	SGS	74LS42	483-34
	Signetics	74LS42	483-36
	TI	**SN74LS42**	★ **845**
			483-38
74LS422			
	TI	**SN74LS422**	★ **945**
			500-117
74LS423			
	TI	**SN74LS423**	★ **945**
			500-151
74LS424			
	TI	SN74LS424	1094-108
74LS440			
	TI	**SN74LS440**	★ **947**
			2476-14
74LS441			
	TI	**SN74LS441**	★ **947**
			2476-15
74LS442			
	TI	**SN74LS442**	★ **947**
			503-104
			★ **947**
			2476-17
74LS443			
	TI	**SN74LS443**	★ **947**
			503-105
			★ **947**
			2476-18
74LS444			
	TI	**SN74LS444**	★ **947**
			503-106
			★ **947**
			2476-19
74LS445			
	Signetics	74LS445	482-126
	TI	**SN74LS445**	★ **947**
			482-128
74LS446			
	TI	**SN74LS446**	★ **950**
			2476-44
74LS447			
	Fairchild	74LS447	2463-140
	TI	**SN74LS447**	★ **950**
			2463-146
74LS448			
	TI	**SN74LS448**	★ **951**
			503-107
			★ **951**
			2476-16
74LS449			
	TI	**SN74LS449**	★ **951**
			2476-45
74LS450			
	MMI	SN74LS450	500-88
74LS451			
	MMI	SN74LS451	498-65
74LS453			
	MMI	SN74LS453	499-120
74LS461			
	MMI	SN74LS461	482-84
74LS462			
	TI	SN74LS462	506-31
			1098-128
74LS463			
	TI	SN74LS463	506-32
			1098-122
74LS465			
	TI	**SN74LS465**	★ **952**
			477-48
74LS466			
	TI	**SN74LS466**	★ **952**
			478-37
74LS467			
	TI	**SN74LS467**	★ **952**
			477-49
74LS468			
	TI	**SN74LS468**	★ **952**
			478-38
74LS47	Fairchild	74LS47	2463-151
	Hitachi	HD74LS47	2463-156
	Motorola	SN74LS47	2463-162
	National	DM74LS47	2463-168
	TI	**SN74LS47**	★ **847**
			2464-4
74LS471			
	National	**DM74LS471**	★**3850**
			3460-23
74LS48	Fairchild	74LS48	2463-108
	Hitachi	HD74LS48	2463-112
	Motorola	SN74LS48	2463-120
	National	DM74LS48	2463-126
	TI	**SN74LS48**	★ **847**
			2463-137
74LS481			
	TI	**SN74LS481**	★ **953**
			1086-82
			★ **953**
			1049-17
74LS49	Fairchild	74LS49	2463-82
	Hitachi	HD74LS49	2463-84
	Motorola	SN74LS49	2463-90
	National	DM74LS49	2463-94
	TI	**SN74LS49**	★ **847**
			2463-103
74LS490			
	Fairchild	74LS490	481-47
	Motorola	SN74LS490	481-51
	SGS	T74LS490	481-57
	Signetics	74LS490	481-61
	TI	**SN74LS490**	★ **955**
			481-65
74LS491			
	MMI	SN74LS491	482-87
74LS498			
	MMI	SN74LS498	502-139
74LS502			
	Fairchild	74LS502	508-118
	Motorola	SN74LS502	508-122
74LS503			
	Fairchild	74LS503	508-119
	Motorola	SN74LS503	508-123
74LS504			
	Motorola	SN74LS504	509-44
74LS51	Fairchild	74LS51	492-188
	Hitachi	HD74LS51	492-189
	Motorola	SN74LS51	493-2
	National	DM74LS51	493-4
	Signetics	74LS51	493-8
	TI	**SN74LS51**	★ **848**
			493-10
74LS533			
	AMD	**SN74LS533**	★**1227**
			496-129
	Fairchild	74LS533	496-130
	MMI	**SN74LS533**	★ **715**
			496-132
74LS534			
	AMD	**SN74LS534**	★**1227**
			486-134
	Fairchild	74LS534	486-135
	MMI	**SN74LS534**	★ **715**
			486-137
74LS54	Fairchild	74LS54	493-87
	Hitachi	HD74LS54	493-88
	Motorola	SN74LS54	493-90
	National	DM74LS54	493-92
	SGS	74LS54	493-94
	Signetics	74LS54	493-96
	TI	**SN74LS54**	★ **850**
			493-98
74LS540			
	Fairchild	74LS540	503-135
			2471-4
	Motorola	SN74LS540	503-146
			2471-14
	Signetics	**74LS540**	★**2775**
			2471-19
	TI	**SN74LS540**	★ **960**
			503-153
			★ **960**
			2471-26
74LS541			
	Fairchild	74LS541	504-45
			2470-19
	Motorola	SN74LS541	504-57
			2470-42
	Signetics	**74LS541**	★**2775**
			504-64
			★**2775**
			2470-49
	TI	**SN74LS541**	★ **960**
74LS541			
	TI	**SN74LS541**	504-68
			★ **960**
			2470-60
74LS55	Fairchild	74LS55	493-32
	Hitachi	HD74LS55	493-33
	Motorola	SN74LS55	493-35
	National	DM74LS55	493-37
	SGS	74LS55	493-39
	TI	**SN74LS55**	★ **851**
			493-41
74LS56	**TI**	**SN74LS56**	★ **851**
			509-58
74LS568			
	Motorola	SN74LS568	481-123
74LS569			
	Motorola	SN74LS569	479-168
	Signetics	74LS569	479-169
74LS57	**TI**	**SN74LS57**	★ **852**
			509-60
74LS573			
	Fairchild	74LS573	496-73
	Motorola	SN74LS573	496-80
74LS574			
	Fairchild	74LS574	487-12
	Motorola	SN74LS574	487-19
74LS590			
	TI	**SN74LS590**	★ **966**
			479-78
74LS591			
	TI	**SN74LS591**	★ **966**
			479-79
74LS592			
	TI	**SN74LS592**	★ **967**
			479-74
74LS593			
	TI	**SN74LS593**	★ **967**
			482-85
74LS594			
	TI	**SN74LS594**	★ **968**
			502-117
74LS595			
	TI	**SN74LS595**	★ **968**
			502-118
74LS596			
	TI	**SN74LS596**	★ **968**
			502-119
74LS597			
	TI	**SN74LS597**	★ **969**
			502-108
74LS598			
	TI	**SN74LS598**	★ **969**
			502-109
74LS599			
	TI	**SN74LS599**	★ **970**
			502-120
74LS600			
	TI	**SN74LS600**	★ **971**
			506-25
74LS601			
	TI	**SN74LS601**	★ **971**
			506-26
74LS602			
	TI	**SN74LS602**	★ **972**
			506-27
74LS603			
	TI	**SN74LS603**	★ **972**
			506-28
74LS604			
	TI	**SN74LS604**	★ **973**
			496-16
74LS605			
	TI	**SN74LS605**	★ **973**
			496-17
74LS606			
	TI	**SN74LS606**	★ **973**
			496-18
74LS607			
	TI	**SN74LS607**	★ **973**
			496-19
74LS608			
	TI	**SN74LS608**	★ **974**
			496-20
74LS610			
	TI	**SN74LS610**	★ **975**
			506-147

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
74LS611			
	TI	SN74LS611	★ 975
			506-148
74LS612			
	TI	SN74LS612	★ 975
			506-149
74LS613			
	TI	SN74LS613	★ 975
			506-150
74LS62	National	DM74LS62	496-147
74LS620			
	Signetics	74LS620	505-112
	TI	SN74LS620	★ 976
			2479-3
74LS621			
	TI	SN74LS621	★ 976
			2478-52
74LS622			
	TI	SN74LS622	★ 976
			2478-53
74LS623			
	Signetics	74LS623	505-113
	TI	SN74LS623	★ 976
			2479-4
74LS624			
	TI	SN74LS624	★ 977
			507-31
			★ 977
			2945-166
74LS625			
	TI	SN74LS625	★ 977
			507-62
			★ 977
			2946-47
74LS626			
	TI	SN74LS626	★ 977
			507-63
			★ 977
			2946-48
74LS627			
	TI	SN74LS627	★ 978
			507-64
			★ 978
			2946-49
74LS628			
	TI	SN74LS628	★ 978
			507-32
			★ 978
			2945-167
74LS629			
	TI	SN74LS629	★ 978
			507-65
			★ 978
			2946-50
74LS63	TI	SN74LS63	★ 853
			507-147
74LS630			
	TI	SN74LS630	★ 979
			2467-21
			¶ 285-8
74LS631			
	TI	SN74LS631	★ 979
			2467-22
			¶ 285-8
74LS632			
	TI	SN74LS632	★ 980
74LS633			
	TI	SN74LS633	★ 980
74LS634			
	TI	SN74LS634	★ 981
74LS635			
	TI	SN74LS635	★ 981
74LS636			
	TI	SN74LS636	★ 982
74LS637			
	TI	SN74LS637	★ 982
74LS638			
	TI	SN74LS638	★ 983
74LS639			
	TI	SN74LS639	★ 983
74LS640			
	Mitsubishi	M74LS640-1	504-129
	Motorola	SN74LS640	504-132
			2479-26
	Signetics	74LS640	504-133
			2478-62
74LS640			
	Signetics	74LS640-1	504-134
			2478-63
	TI	SN74LS640	★ 984
			504-139
			★ 984
			2479-5
		SN74LS640-1	★ 984
			504-140
			★ 984
			2479-6
74LS641			
	Mitsubishi	M74LS641	504-154
	Motorola	SN74LS641	504-156
			2479-21
	Signetics	74LS641	504-158
			2478-18
		74LS641-1	504-159
			2478-19
	TI	SN74LS641	★ 984
			504-161
			★ 984
			2478-54
		SN74LS641-1	★ 984
			504-162
			★ 984
			2478-55
74LS642			
	Mitsubishi	M74LS642-1	504-102
	Motorola	SN74LS642	504-104
			2479-22
	Signetics	74LS642	★2772
			504-105
			★2772
			2478-20
		74LS642-1	★2772
			504-106
			★2772
			2478-21
	TI	SN74LS642	★ 984
			504-108
			★ 984
			2478-56
		SN74LS642-1	★ 984
			504-109
			★ 984
			2478-57
74LS643			
	Mitsubishi	M74LS643-1	504-130
	TI	SN74LS643	★ 984
			504-141
			★ 984
			2479-7
		SN74LS643-1	★ 984
			504-142
			★ 984
			2479-8
74LS644			
	Mitsubishi	M74LS644-1	505-35
	TI	SN74LS644	★ 984
			505-37
			★ 984
			2478-58
		SN74LS644-1	★ 984
			505-38
			★ 984
			2478-59
74LS645			
	Mitsubishi	M74LS645-1	504-189
	MMI	SN74LS645	★ 715
			505-5
			★ 715
			2478-60
		SN74LS645-1	★ 715
			505-6
			★ 715
			2478-61
	Motorola	SN74LS645	505-10
			2479-27
	Signetics	74LS645	505-16
			2479-1
	TI	SN74LS645	★ 984
			505-24
			★ 984
			2479-9
		SN74LS645-1	★ 984
			505-25
74LS645			
	TI	SN74LS645-1	★ 984
			2479-10
74LS646			
	TI	SN74LS646	★ 986
			2479-35
74LS647			
	TI	SN74LS647	★ 986
			2475-44
74LS648			
	TI	SN74LS648	★ 986
			2479-36
74LS649			
	TI	SN74LS649	★ 986
			2475-45
74LS651			
	TI	SN74LS651	★ 988
			504-143
			505-75
74LS652			
	TI	SN74LS652	★ 988
			504-144
			505-76
74LS653			
	TI	SN74LS653	★ 989
74LS654			
	TI	SN74LS654	★ 989
74LS668			
	TI	SN74LS668	★ 990
			481-117
74LS669			
	TI	SN74LS669	★ 990
			479-118
74LS670			
	Fairchild	74LS670	497-15
			3470-63
	Mitsubishi	M74LS670	497-16
	Motorola	SN74LS670	497-18
			3470-65
	National	DM74LS670	497-20
			3470-67
	SGS	74LS670	497-22
	Signetics	74LS670	497-24
			3470-69
	TI	SN74LS670	★ 990
			497-26
			★ 990
			3470-71
74LS671			
	TI	SN74LS671	★ 991
			501-22
74LS672			
	TI	SN74LS672	★ 991
			501-23
74LS673			
	TI	SN74LS673	★ 992
			503-28
74LS674			
	TI	SN74LS674	★ 992
			503-26
74LS68	TI	SN74LS68	★ 854
			482-65
74LS681			
	TI	SN74LS681	★ 995
			476-17
74LS682			
	Motorola	SN74LS682	474-122
	TI	SN74LS682	★ 996
			474-131
74LS683			
	Motorola	SN74LS683	474-104
	TI	SN74LS683	★ 996
			474-111
74LS684			
	Motorola	SN74LS684	474-123
	Signetics	SN74LS684	474-126
	TI	SN74LS684	★ 996
			474-132
74LS685			
	Motorola	SN74LS685	474-105
	TI	SN74LS685	★ 996
			474-112
74LS686			
	Motorola	SN74LS686	474-124
	TI	SN74LS686	★ 997
			474-133
74LS687			
	Motorola	SN74LS687	474-106
	TI	SN74LS687	★ 997
74LS688			
	Motorola	SN74LS688	474-125
	TI	SN74LS688	★ 998
			474-134
74LS689			
	Motorola	SN74LS689	474-107
	TI	SN74LS689	★ 998
			474-113
74LS69	TI	SN74LS69	★ 854
			482-63
74LS690			
	TI	SN74LS690	★ 999
			481-32
74LS691			
	TI	SN74LS691	★ 999
			478-95
74LS692			
	TI	SN74LS692	★ 999
			481-33
74LS693			
	TI	SN74LS693	★ 999
			478-96
74LS696			
	TI	SN74LS696	★1000
			481-86
74LS697			
	TI	SN74LS697	★1000
			479-83
74LS698			
	TI	SN74LS698	★1000
			481-87
74LS699			
	TI	SN74LS699	★1000
			479-84
74LS73	Hitachi	HD74LS73	488-15
	Mitsubishi	M74LS73A	488-17
	Motorola	SN74LS73A	488-21
	National	DM74LS73A	488-25
	Signetics	74LS73	488-29
	TI	SN74LS73A	★ 856
			488-33
74LS74	Fairchild	74LS74	485-89
	Hitachi	HD74LS74A	485-90
	Mitsubishi	M74LS74	485-91
	Motorola	SN74LS74A	485-93
	National	DM74LS74	485-95
	SGS	74LS74	485-97
	Signetics	74LS74A	485-99
	TI	SN74LS74A	★ 857
			485-101
74LS75	Mitsubishi	M74LS75	495-134
	Motorola	SN74LS75	495-138
	National	DM74LS75	495-140
	Signetics	74LS75	495-144
	TI	SN74LS75	★ 858
			495-148
74LS76	Hitachi	HD74LS76	488-54
	Mitsubishi	M74LS76A	488-55
	Motorola	SN74LS76A	488-57
	National	DM74LS76	488-59
	Signetics	74LS76	488-61
	TI	SN74LS76A	★ 858
			488-63
74LS77	National	DM74LS77	495-154
74LS78	Hitachi	HD74LS78	487-155
	Motorola	SN74LS78A	487-157
	National	DM74LS78	487-159
	TI	SN74LS78A	★ 859
			487-161
74LS783			
	Motorola	SN74LS783	497-83
			1092-132
74LS83	Fairchild	74LS83	476-67
	Hitachi	HD74LS83A	476-69
	Motorola	SN74LS83A	476-74
	National	DM74LS83A	476-78
	SGS	74LS83A	476-82
	Signetics	74LS83A	476-86
	TI	SN74LS83A	★ 861
			476-90
74LS85	Fairchild	74LS85	474-38
	Hitachi	HD74LS85	474-44
	Motorola	SN74LS85	474-50
	National	DM74LS85	474-54

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
74LS85	SGS	74LS85	474-56
	Signetics	74LS85	474-60
	TI	SN74LS85	★ 862
			474-65
74LS86	Fairchild	74LS86	495-32
	Hitachi	HD74LS86	495-34
	Mitsubishi	M74LS86	495-36
	Motorola	SN74LS86	495-40
	National	DM74LS86	495-43
	SGS	74LS86	495-45
	Signetics	74LS86	495-47
	TI	SN74LS86	★ 862
			495-51
74LS89	Motorola	SN74LS89	3471-32
74LS90	Motorola	SN74LS90	480-62
	National	DM74LS90	480-66
	SGS	74LS90	480-70
	Signetics	74LS90	480-74
	TI	SN74LS90	★ 864
			480-78
74LS91	Hitachi	HD74LS91	502-134
	Mitsubishi	M74LS91	502-135
	TI	SN74LS91	★ 864
			502-137
			★ 864
			3491-16
74LS92	Fairchild	74LS92	482-40
	Hitachi	HD74LS92	482-41
	Motorola	SN74LS92	482-43
	National	DM74LS92	482-45
	SGS	74LS92	482-47
	Signetics	74LS92	482-49
	TI	SN74LS92	★ 864
			482-51
74LS93	Fairchild	74LS93	479-49
	Hitachi	HD74LS93	479-51
	Motorola	SN74LS93	479-55
	National	DM74LS93	479-59
	SGS	74LS93	479-63
	Signetics	74LS93	479-67
	TI	SN74LS93	★ 865
			479-71
74LS95	Fairchild	74LS95B	501-92
			3488-113
	Hitachi	HD74LS95B	501-93
	Mitsubishi	M74LS95B	501-94
	Motorola	SN74LS95B	501-96
			3489-9
	SGS	74LS95B	501-98
	Signetics	74LS95B	501-100
			3488-86
	TI	SN74LS95B	★ 866
			501-102
			★ 866
			3488-100
74LS96	Mitsubishi	M74LS96	502-4
	Signetics	74LS96	502-6
			3489-113
	TI	SN74LS96	★ 866
			502-8
			★ 866
			3489-117
74PC00	National	MM74PC00	457-105
74PC02	National	MM74PC02	458-167
74PC04	National	MM74PC04	450-188
74PC08	National	MM74PC08	456-189
74PC138			
	National	MM74PC138	454-88
74PC74	National	MM74PC74	455-101
74PL16L8			
	TI	SN74PL16L8	★ 1025
74PL16R6			
	TI	SN74PL16R6	★ 1026
74PL16R8			
	TI	SN74PL16R8	★ 1026
74PL20L8			
	TI	SN74PL20L8	★ 1027
74PL20R6			
	TI	SN74PL20R6	★ 1028
74PL20R8			
	TI	SN74PL20R8	★ 1028
74PL333			
	TI	SN74PL333	★ 1029
74PL335			
	TI	SN74PL335	★ 1029
74PL839			
	TI	SN74PL839	★ 1030
74PL840			
	TI	SN74PL840	★ 1030
74PLR19L8			
	TI	SN74PLR19L8	★ 1031
74PLR19R4			
	TI	SN74PLR19R4	★ 1031
74PLR19R6			
	TI	SN74PLR19R6	★ 1032
74PLR19R8			
	TI	SN74PLR19R8	★ 1032
74PLT19L8			
	TI	SN74PLT19L8	★ 1033
74PLT19R4			
	TI	SN74PLT19R4	★ 1033
74PLT19R6			
	TI	SN74PLT19R6	★ 1034
74PLT19R8			
	TI	SN74PLT19R8	★ 1034
74S00	Fairchild	74S00	492-49
	Hitachi	HD74S00	492-50
	National	DM74S00	492-52
	Signetics	74S00	492-54
	TI	SN74S00	★ 833
			492-56
74S02	Fairchild	74S02	494-143
	Hitachi	HD74S02	494-144
	National	DM74S02	494-146
	Signetics	74S02	494-148
	TI	SN74S02	★ 833
			494-150
74S03	Fairchild	74S03	491-185
	Hitachi	HD74S03	491-186
	National	DM74S03	491-188
	Signetics	74S03	491-191
	TI	SN74S03	★ 834
			491-193
74S04	Fairchild	74S04	478-18
	Hitachi	HD74S04	478-19
	National	DM74S04	478-21
	Signetics	74S04	478-23
	TI	SN74S04	★ 834
			478-26
74S05	Fairchild	74S05	477-97
	Hitachi	HD74S05	477-98
	National	DM74S05	477-100
	Signetics	74S05	477-102
	TI	SN74S05	★ 834
			477-104
74S08	Fairchild	74S08	489-175
	National	DM74S08	489-177
	Signetics	74S08	489-179
	TI	SN74S08	★ 835
			489-181
74S09	National	DM74S09	489-111
	TI	SN74S09	★ 836
			489-121
74S10	Fairchild	74S10	491-24
	Hitachi	HD74S10	491-25
	National	DM74S10	491-27
	Signetics	74S10	491-29
	TI	SN74S10	★ 836
			491-31
74S109	Fairchild	74S109	487-149
74S11	Fairchild	74S11	489-78
	Hitachi	HD74S11	489-79
	National	DM74S11	489-81
	Signetics	74S11	489-83
	TI	SN74S11	★ 836
			489-85
74S112	Fairchild	74S112	488-127
	Hitachi	HD74S112	488-128
	National	DM74S112	488-130
	Signetics	74S112	488-132
	TI	SN74S112	★ 871
			488-134
74S113	Fairchild	74S113	488-90
	Hitachi	HD74S113	488-91
	National	DM74S113	488-93
	Signetics	74S113	488-95
	TI	SN74S113	★ 871
			488-97
74S114	Hitachi	HD74S114	488-154
	National	DM74S114	488-156
74S114	TI	SN74S114	★ 872
			488-158
74S12	Hitachi	HD74S12	490-165
74S124	TI	SN74S124	★ 874
			2946-51
74S132	Fairchild	74S132	507-143
	TI	SN74S132	★ 877
			507-145
74S133	Fairchild	74S133	492-127
	Hitachi	HD74S133	492-128
	National	DM74S133	492-130
	Signetics	74S133	492-132
	TI	SN74S133	★ 877
			492-134
74S134	Fairchild	74S134	492-109
	Hitachi	HD74S134	492-110
	National	DM74S134	492-112
	Signetics	74S134	492-114
	TI	SN74S134	★ 877
			492-116
74S135	Fairchild	74S135	494-158
	Hitachi	HD74S135	494-159
	National	DM74S135	494-161
	Signetics	74S135	494-163
	TI	SN74S135	★ 878
			494-165
74S136	National	DM74S136	495-4
74S138	AMD	SN74S138	483-184
	Fairchild	74S138	483-186
	National	DM74S138	483-188
	Signetics	74S138	483-189
	TI	SN74S138	★ 880
			484-2
74S139	AMD	SN74S139	483-81
	Fairchild	74S139	483-83
	National	DM74S139	483-85
	Signetics	74S139	483-87
	TI	SN74S139	★ 880
			483-89
74S140	Fairchild	74S140	484-53
			2471-50
	Hitachi	HD74S140	484-54
			2471-51
	National	DM74S140	484-56
			2471-52
	Signetics	74S140	484-58
			2471-56
	TI	SN74S140	★ 881
			484-60
			★ 881
			2471-60
74S15	Fairchild	74S15	489-30
	Hitachi	HD74S15	489-31
	National	DM74S15	489-33
	TI	SN74S15	★ 838
			489-35
74S151	AMD	SN74S151	499-183
	Fairchild	74S151	499-185
	Hitachi	HD74S151	499-188
	National	DM74S151	499-190
	Signetics	74S151	499-192
	TI	SN74S151	★ 884
			499-194
74S153	AMD	SN74S153	498-55
	Fairchild	74S153	498-57
	National	DM74S153	498-59
	Signetics	74S153	498-61
	TI	SN74S153	★ 884
			498-63
74S157	AMD	SN74S157	499-52
	Fairchild	74S157	499-54
	Hitachi	HD74S157	499-55
	National	DM74S157	499-57
	Signetics	74S157	499-59
	TI	SN74S157	★ 887
			499-61
74S158	AMD	SN74S158	498-146
	Fairchild	74S158	498-148
	Hitachi	HD74S158	498-149
	National	DM74S158	498-151
	Signetics	74S158	498-153
	TI	SN74S158	★ 887
			498-155
74S160	AMD	SN74S160	★ 1227
			480-175
74S161	AMD	SN74S161	★ 1227
			478-153
74S162	National	DM74S162	481-35
	TI	SN74S162	★ 890
			481-37
74S163	TI	SN74S163	★ 890
			479-3
74S167	Fairchild	74S167	507-25
74S168	Signetics	74S168	481-114
	TI	SN74S168	★ 892
			481-119
74S169	Signetics	74S169	479-119
	TI	SN74S169	★ 892
			479-121
74S172	Signetics	74S172	497-29
			3470-78
74S174	AMD	SN74S174	486-79
			¶ 289-8
	Fairchild	74S174	486-81
	Hitachi	HD74S174	486-82
	National	DM74S174	486-84
	Signetics	74S174	486-86
	TI	SN74S174	★ 895
			486-88
74S175	AMD	SN74S175	485-148
			¶ 289-8
	Fairchild	74S175	485-150
	Hitachi	HD74S175	485-151
	National	DM74S175	485-153
	Signetics	74S175	485-155
	TI	SN74S175	★ 895
			485-157
74S181	AMD	SN74S181	475-55
	Hitachi	HD74S181	475-58
	Signetics	74S181	475-62
	TI	SN74S181	475-65
74S182	Hitachi	HD74S182	475-85
	MMI	SN74S182	475-87
	National	DM74S182	475-88
			¶ 245-10
	Signetics	74S182	475-90
	TI	SN74S182	★ 898
			475-92
74S187	TI	SN74S187	★ 897
74S188	National	DM74S188	3459-16
74S189	AMD	AM74S189	3471-23
		SN74S189	3471-24
	Fairchild	74S189	3471-25
	Hitachi	HD74S189	3471-26
	National	DM74S189	497-49
			3471-27
	TI	SN74S189A	★ 900
			3471-28
74S194	AMD	SN74S194	501-171
			¶ 289-8
			3489-35
			¶ 289-8
	Fairchild	74S194	501-173
			3489-38
	National	DM74S194	501-175
	Signetics	74S194	3489-41
	TI	SN74S194	★ 902
			501-177
			★ 902
			3489-45
74S195	AMD	SN74S195	501-68
			¶ 289-8
			3489-36
			¶ 289-8
	National	DM74S195	501-72
	Signetics	74S195	501-74
			3489-42
	TI	SN74S195	★ 903
			501-76
			★ 903
			3489-46
74S196	National	DM74S196	480-120
	TI	SN74S196	★ 903
			480-122
74S197	TI	SN74S197	★ 904
			478-84
74S20	Fairchild	74S20	490-134
	Hitachi	HD74S20	490-135
	National	DM74S20	490-137
	Signetics	74S20	490-139

Arranged alphanumerically from left to right.

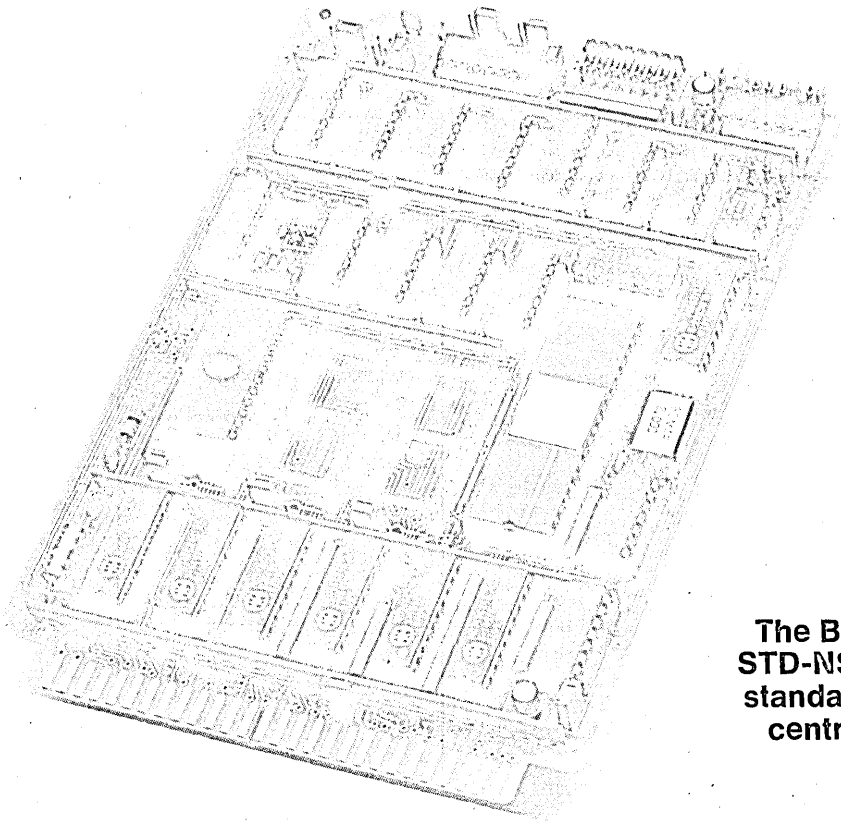
© IC MASTER 1983

Base Number	Source	Device	Page-Line
74S20	TI	**SN74S20**	★ 839
			490-141
74S200	National	DM74S200	497-62
74S201	TI	**SN74S201**	★ 440
			★ 905
			3473-14
74S206	National	DM74S206	497-61
			3473-7
74S207	TI	SN74S207	3473-69
74S208	TI	SN74S208	3473-70
74S210	MMI	**SN74S210**	★ 715
			478-40
74S214	TI	SN74S214	3476-11
		SN74S214A	3475-89
74S22	Fairchild	74S22	490-76
	National	DM74S22	490-79
	TI	**SN74S22**	★ 840
			490-81
74S225	TI	**SN74S225**	★ 908
			497-58
			★ 908
			1086-90
74S226	TI	**SN74S226**	★ 908
			508-55
			★ 908
			2476-57
74S240	AMD	SN74S240	503-155
			2470-67
	MMI	**SN74S240**	★ 715
			503-158
			★ 715
			2471-10
	National	DM74S240	2471-16
	Signetics	74S240	503-161
	TI	**SN74S240**	★ 910
			503-163
			★ 910
			2471-27
74S241	AMD	SN74S241	504-70
			2470-13
	MMI	**SN74S241**	★ 715
			504-72
			★ 715
			2470-35
	National	DM74S241	2470-44
	Signetics	74S241	504-74
	TI	**SN74S241**	★ 911
			504-76
			★ 911
			2470-61
74S242	AMD	SN74S242	503-94
			2476-62
	National	DM74S242	503-98
74S243	AMD	SN74S243	503-95
			2476-63
	National	DM74S243	503-99
74S244	AMD	SN74S244	504-14
			2470-14
	MMI	**SN74S244**	★ 715
			504-16
			★ 715
			2470-36
	Signetics	74S244	504-18
	TI	**SN74S244**	★ 912
74S251	AMD	SN74S251	500-63
	Hitachi	HD74S251	500-64
	National	DM74S251	500-66
	Signetics	74S251	500-69
	TI	**SN74S251**	★ 915
			500-71
74S253	AMD	SN74S253	498-5
	Fairchild	74S253	498-7
	National	DM74S253	498-9
	Signetics	74S253	498-11
	TI	**SN74S253**	★ 915
74S257	AMD	SN74S257	498-183
	Fairchild	74S257	498-184
	Hitachi	HD74S257	498-185
	National	DM74S257	498-187
	Signetics	74S257	498-189
	TI	**SN74S257**	★ 916
			498-191
74S258	AMD	SN74S258	498-106
	Fairchild	74S258	498-108
	Hitachi	HD74S258	498-109
	National	DM74S258	498-111
74S258	Signetics	74S258	498-113
	TI	**SN74S258**	★ 917
			498-115
74S260	Fairchild	74S260	494-24
	National	DM74S260	494-25
	Signetics	74S260	494-27
	TI	**SN74S260**	★ 918
			494-29
74S270	TI	**SN74S270**	★ 919
			3484-7
74S2708			
	TI	SN74S2708	3462-101
74S271	TI	**SN74S271**	★ 919
			3484-5
74S273	Signetics	74S273	486-170
74S274	TI	**SN74S274**	★ 920
			475-114
74S275	TI	SN74S275	476-97
74S280	Hitachi	HD74S280	509-18
	National	DM74S280	509-20
	Signetics	74S280	509-22
	TI	**SN74S280**	★ 921
			509-25
74S281	National	DM74S281	476-18
	TI	**SN74S281**	★ 922
			476-20
74S283	TI	**SN74S283**	★ 922
			476-92
74S287	National	DM74S287	3459-88
			¶ 286-4
74S288	National	DM74S288	3459-17
74S289	AMD	AM74S289	3471-14
		SN74S289	3471-15
	Fairchild	74S289	3471-16
	Hitachi	HD74S289	3471-17
	National	DM74S289	497-42
			3471-18
	TI	**SN74S289A**	★ 924
			3471-21
74S299	National	DM74S299	502-178
	TI	**SN74S299**	★ 927
			502-180
			★ 927
			3490-32
74S30	Fairchild	74S30	492-103
	National	DM74S30	492-105
	TI	**SN74S30**	★ 842
			492-107
74S301	TI	**SN74S301**	★ 927
			3473-12
74S314	TI	SN74S314	3476-7
		SN74S314A	3475-88
74S32	Fairchild	74S32	493-161
	National	DM74S32	493-163
	Signetics	74S32	493-165
	TI	**SN74S32**	★ 843
			493-167
74S330	TI	SN74S330	507-16
			3458-29
			1086-88
74S331	TI	SN74S331	507-17
			3458-28
			1086-89
74S340	TI	SN74S340	503-164
74S341	TI	SN74S341	504-77
74S344	TI	SN74S344	504-20
74S350	AMD	SN74S350	508-60
	Signetics	74S350	508-62
74S37	Signetics	74S37	491-116
	TI	**SN74S37**	★ 844
			491-118
74S370	TI	**SN74S370**	★ 936
			3484-8
74S371	TI	**SN74S371**	★ 937
			3484-6
74S373	AMD	**SN74S373**	★1227
			496-93
	MMI	**SN74S373**	★ 715
			496-96
	National	DM74S373	496-99
	Signetics	74S373	496-101
	TI	**SN74S373**	★ 937
			496-104
74S374	AMD	**SN74S374**	★1227
			487-28
74S374	MMI	**SN74S374**	★ 715
			487-30
	National	DM74S374	487-33
	Signetics	74S374	487-35
	TI	**SN74S374**	★ 938
			487-37
74S378	AMD	SN74S378	486-108
74S379	AMD	SN74S379	486-14
74S38	Signetics	74S38	491-66
	TI	**SN74S38**	★ 844
			491-68
74S381	MMI	SN74S381	475-60
	TI	**SN74S381**	★ 940
			475-66
74S387	National	DM74S387	3459-86
74S388	AMD	SN74S388	485-173
74S399	AMD	SN74S399	499-114
74S40	Fairchild	74S40	490-38
	Hitachi	HD74S40	490-39
	National	DM74S40	490-41
	Signetics	74S40	490-43
	TI	**SN74S40**	★ 845
			490-45
74S408	MMI	**SN74S408**	★ 727
			2480-152
		SN74S408-3	★ 727
			★ 727
			2480-153
74S409	MMI	**SN74S409**	★ 724
74S4093			
	MMI	**SN74S4093**	★ 724
74S412	TI	**SN74S412**	★ 945
			496-105
			★ 945
			1094-166
74S428	TI	**SN74S428**	★ 946
			1095-16
74S436	TI	**SN74S436**	★ 947
			485-13
			★ 947
			2483-135
74S437	TI	**SN74S437**	★ 947
			485-14
			★ 947
			2483-136
74S438	TI	**SN74S438**	★ 946
			1095-17
74S455	TI	SN74S455	3463-99
74S472	National	DM74S472	3461-40
		DM74S472A	3461-12
74S473	National	DM74S473	3461-32
		DM74S473A	3461-6
74S474	National	DM74S474	3461-55
		DM74S474A	3461-16
		DM74S474B	3461-13
74S475	National	DM74S475	3461-51
		DM74S475A	3461-8
74S481	TI	SN74S481	476-41
			1086-83
			1049-18
74S482	TI	**SN74S482**	★ 954
			506-166
			★ 954
			1086-85
74S484	TI	**SN74S484**	★ 955
74S485	TI	**SN74S485**	★ 955
74S508	MMI	SN74S508	474-2
74S51	Fairchild	74S51	493-12
	National	DM74S51	493-14
	Signetics	74S51	493-16
	TI	**SN74S51**	★ 848
			493-18
74S516	MMI	**SN74S516**	★ 716
			475-96
74S531	MMI	**SN74S531**	★ 715
			496-97
74S532	MMI	**SN74S532**	★ 715
			487-31
74S533	AMD	**SN74S533**	★1227
			496-134
	MMI	**SN74S533**	★ 715
			496-136
74S534	AMD	**SN74S534**	★1227
			486-139
	MMI	**SN74S534**	★ 715
			486-141
74S534	Signetics	**74S534**	★ 789
			486-144
74S535	MMI	**SN74S535**	★ 715
			496-137
74S536	MMI	**SN74S536**	★ 715
			486-142
74S557	MMI	**SN74S557**	★ 719
			475-99
74S558	MMI	**SN74S558**	★ 719
			475-100
74S570	National	DM74S570	3460-62
74S571	National	DM74S571	3460-64
		DM74S571A	3460-65
		DM74S571B	3460-66
74S572	National	DM74S572A	3461-116
			3461-116
74S573	National	DM74S573A	3462-1
			3462-1
74S593	TI	SN74S593	479-75
74S64	Fairchild	74S64	493-105
	Hitachi	HD74S64	493-106
	National	DM74S64	493-108
	Signetics	74S64	493-110
	TI	**SN74S64**	★ 853
			493-112
74S65	Fairchild	74S65	493-113
	Hitachi	HD74S65	493-114
	National	DM74S65	493-116
	TI	**SN74S65**	★ 853
			493-119
74S700	MMI	**SN74S700**	★ 728
			2483-154
74S730	MMI	**SN74S730**	★ 728
			2483-155
74S731	MMI	**SN74S731**	★ 728
			2483-156
74S734	MMI	**SN74S734**	★ 728
			2483-157
74S74	Fairchild	74S74	485-103
	Hitachi	HD74S74	485-104
	National	DM74S74	485-105
	Signetics	74S74	485-107
	TI	**SN74S74**	★ 857
			485-109
74S744	TI	SN74S744	503-115
74S85	Signetics	74S85	474-67
	TI	**SN74S85**	★ 862
			474-69
74S86	Fairchild	74S86	495-53
	Hitachi	HD74S86	495-54
	National	DM74S86	495-55
	Signetics	74S86	495-57
	TI	**SN74S86**	★ 862
			495-59
74SC137			
	GTEMicro	G74SC137	454-100
	Mitel	**MD74SC137**	★ 697
			454-104
	Plessey	MV74SC137	454-106
	SPI	**SP74SC137**	★ 761
74SC138			
	GTEMicro	G74SC138	454-78
	Mitel	**MD74SC138**	★ 697
			454-82
	SPI	**SP74SC138**	★ 761
74SC139			
	GTEMicro	G74SC139	454-52
	Mitel	**MD74SC139**	★ 697
			454-57
	SPI	**SP74SC139**	★ 761
74SC237			
	GTEMicro	G74SC237	454-101
	Mitel	**MD74SC237**	★ 697
			454-105
	Plessey	MV74SC237	454-107
74SC238			
	GTEMicro	G74SC238	454-79
	Mitel	**MD74SC238**	★ 697
			454-83
	SPI	**SP74SC238**	★ 761
74SC239			
	GTEMicro	G74SC239	454-53
	Mitel	**MD74SC239**	★ 697
			454-58
	Plessey	MV74SC239	454-63
	SPI	**SP74SC239**	★ 761

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

© IC MASTER 1983

For Key Data On Every IC On This Board, The Place To Look Is...



The Blue Chip Computer STD-NSC800 is a CMOS standard bus compatible central processor card.

Equipment and system design often require the use of a wide variety of integrated circuits in order to obtain optimum performance. One way for an engineer to be certain that he hasn't overlooked the best device for his application is to refer to the pages of IC MASTER.

Surveys conducted by IC MASTER, integrated circuit manufacturers, and independent research agencies confirm that four out of five IC MASTER users have specified one or more products as the result of using IC MASTER.

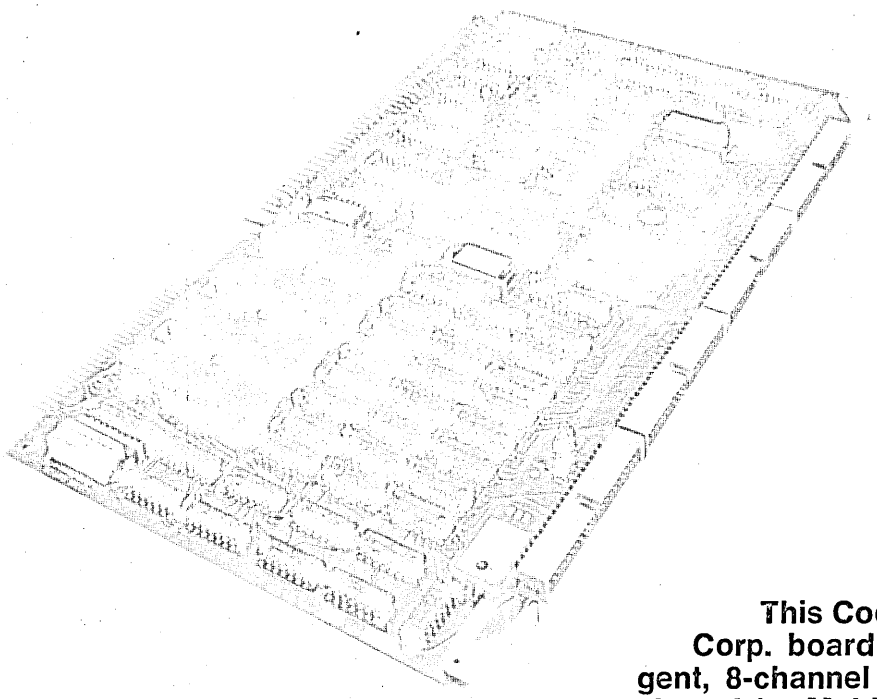
Device No.	Description
NMC27C16	Erasable CMOS PROM
NSC800	8-bit Microprocessor
74SC245	3-State Octal Bus Driver
MD74SC373	Noninverted D-Type Transparent Latch
ICL8212C	Micropower Voltage Detector
MM74PC00	Quad 2-Input NAND Gate
MM74PC32	Quad 2-Input OR Gate
MM74PC08	Quad 2-Input AND Gate
MD74SC139	Octal Decoder/Demultiplexer
MM74PC74	Dual Type-D Flip-Flop
MSC74PC07	Hex Inverter
MM74C30	8-Input NAND Gate

Representative list of ICs on the Blue Chip Computer STD-NSC800 card. Key specifications for all of these ICs can be found in IC MASTER.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

For Key Data On Every IC On This Board, The Place To Look Is...



This Codata Systems Corp. board is an intelligent, 8-channel serial input/output board for Multibus systems.

Equipment and system design often require the use of a wide variety of integrated circuits in order to obtain optimum performance. One way for an engineer to be certain that he hasn't overlooked the best device for his application is to refer to the pages of IC MASTER.

Surveys conducted by IC MASTER, integrated circuit manufacturers, and independent research agencies confirm that four out of five IC MASTER users have specified one or more products as the result of using IC MASTER.

Device No.	Description
AM25LS2521	8-Bit, Equal-to Comparator
AM26LS29	Line Driver, Single-Ended
AM26LS32	Line Receiver, Differential
74LS02	Quad 2-Input NOR Gate
74LS08	Quad 2-Input AND Gate
74LS32	Quad 2-Input OR Gate
74LS74	Dual D-Type Positive Edge Triggered Flip-Flop with Preset and Clear
74LS138	3 Line to 8 Line Decoder/Demultiplexer
74LS164	8-Bit Gated Serial-In, Parallel-Out Shift Register
74LS244	Octal Bus Driver (Schmitt trigger) Non-Inverting, 3-State, Complementary Control
74LS273	Octal D-Type Edge-Triggered Flip-Flop
MBM2716	Fujitsu 248 by 8 PROM
SN74LS04	Hex Inverter
SN74LS133	13-Input NAND Gate
SN74S240	Octal Buffer/Line Driver/Line Receiver Inverted 3-State Outputs
Z80A	Zilog 8-Bit Microprocessor
Z8530	Zilog Serial Communications Controller

Representative list of ICs on Codata Systems Corp. board for data communications equipment.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

Base Number	Source	Device	Page-Line
74SC240			
	GTEMicro	G74SC240	465-64
	Mitel	**MD74SC240**	★ **702**
			465-66
	SPI	**SP74SC240**	★ **761**
			465-77
74SC241			
	Mitel	**MD74SC241**	★ **702**
			465-85
	SPI	**SP74SC241**	★ **761**
			465-93
74SC244			
	GTEMicro	G74SC244	465-45
	Mitel	**MD74SC244**	★ **702**
			465-47
	SPI	**SP74SC244**	★ **761**
			465-57
74SC245			
	GTEMicro	G74SC245	465-128
			2475-46
	Mitel	**MD74SC245**	★ **702**
			★ **706**
			465-132
			★ **702**
			★ **706**
			2475-50
	SPI	**SP74SC245**	★ **761**
			465-143
74SC373			
	GTEMicro	G74SC373	459-169
	Mitel	**MD74SC373**	★ **710**
			460-10
	SPI	**SP74SC373**	★ **761**
			459-188
74SC374			
	GTEMicro	G74SC374	456-32
	Mitel	**MD74SC374**	★ **710**
			456-35
	Plessey	MV74SC374	456-47
	SPI	**SP74SC374**	★ **761**
			456-55
74SC533			
	Mitel	**MD74SC533**	★ **710**
			460-11
	Plessey	MV74SC533	460-21
74SC534			
	Mitel	**MD74SC534**	★ **710**
74SC540			
	Mitel	**MD74SC540**	★ **702**
			450-135
	SPI	**SP74SC540**	★ **761**
74SC541			
	Mitel	**MD74SC541**	★ **702**
			450-136
	SPI	**SP74SC541**	★ **761**
74SC545			
	GTEMicro	G74SC545	465-129
			2475-47
	Mitel	**MD74SC545**	★ **706**
			465-133
			★ **706**
			2475-51
74SC563			
	Mitel	**MD74SC563**	★ **710**
			460-12
	Plessey	MV74SC563	460-22
74SC564			
	Mitel	**MD74SC564**	★ **710**
74SC573			
	Mitel	**MD74SC573**	★ **710**
			459-172
	Plessey	MV74SC573	459-181
	SPI	**SP74SC573**	★ **761**
			459-189
74SC574			
	Mitel	**MD74SC574**	★ **710**
			456-36
	Plessey	MV74SC574	456-48
	SPI	**SP74SC574**	★ **761**
			456-56
75	Burr-Brown	PCM75J	2437-1
		PCM75K	2436-44
	MasterLogic	ML75	4141-170
	MicroEng	A75X	4140-164
		A75XS	4140-165
	MicroEng	**MCE-A75X**	★**4437**
		MCE-A75XS	★**4437**

Base Number	Source	Device	Page-Line
75	NEC-Micro	uCOM-75	1088-84
	Rockwell	MM75	1088-87
			1055-12
750	Cybernetic	CY750	1101-71
	OKI	MSA750	2899-47
	Plessey	TBA750	2901-40
			2905-14
	Signetics	TBA750C	2901-64
			2905-34
7500	Sanyo	LC7500	2896-31
7501	**AD**	**AD7501J**	★**3176**
			2423-106
		AD7501K	★**3176**
			2423-107
		AD7501S	★**3176**
			2423-108
	MicroPwr	**MP7501DIJ**	★ **401**
			★**2749**
			2424-6
		MP7501DIK	★ **401**
			★**2749**
			2424-7
		MP7501DIS	★ **401**
			★**2749**
			2423-85
7502	**AD**	**AD7502J**	★**3176**
			2423-38
		AD7502K	★**3176**
			2423-39
		AD7502S	★**3176**
			2423-40
	MicroPwr	**MP7502DIJ**	★ **401**
			★**2749**
			2423-44
		MP7502DIK	★ **401**
			★**2749**
			2423-45
		MP7502DIS	★ **401**
			★**2749**
			2423-14
	NEC-Micro	uPD7502	1088-85
	Toshiba	TA7502	2928-53
		TA7502A	2928-54
		TA7502B	2921-20
7503	**AD**	**AD7503J**	★**3176**
			2423-109
		AD7503K	★**3176**
			2424-1
		AD7503S	★**3176**
			2424-2
	MicroPwr	**MP7503DIJ**	★ **401**
			★**2749**
			2424-8
		MP7503DIK	★ **401**
			★**2749**
			2424-9
		MP7503DIS	★ **401**
			★**2749**
			2423-86
7504	Toshiba	TA7504	2909-41
7506	**AD**	**AD7506J**	★**3176**
			2425-10
		AD7506K	★**3176**
			2425-11
		AD7506S	★**3176**
			2425-5
		AD7506T	★**3176**
			2425-6
	MicroPwr	**MP7506DIJ**	★ **401**
			★**2749**
			2425-3
		MP7506DIK	★ **401**
			★**2749**
			2425-4
		MP7506DIS	★ **401**
			★**2749**
			2424-99
	Toshiba	TA7506	2909-26
75064	TI	SN75064	2482-143
75065	TI	SN75065	2483-5
75066	TI	SN75066	2482-144
75067	TI	SN75067	2483-6
75068	TI	SN75068	2482-145
75069	TI	SN75069	2483-7
7507	**AD**	**AD7507J**	★**3176**
			2424-72

Base Number	Source	Device	Page-Line
7507	**AD**	**AD7507K**	★**3176**
			2424-73
		AD7507S	★**3176**
			2424-65
		AD7507T	★**3176**
			2424-66
	MicroPwr	**MP7507DIJ**	★ **401**
			★**2749**
			2424-63
		MP7507DIK	★ **401**
			★**2749**
			2424-64
		MP7507DIS	★ **401**
			★**2749**
			2424-54
7508	**MicroPwr**	**MP7508DI**	★**2749**
		MP7508DIJ	★ **401**
			2424-10
		MP7508DIK	★ **401**
			2424-11
		MP7508DIS	★ **401**
			2423-87
7509	**MicroPwr**	**MP7509DI**	★**2749**
		MP7509DIJ	★ **401**
			2423-46
		MP7509DIK	★ **401**
			2423-47
		MP7509DIS	★ **401**
			2423-15
751	NEC-Electron	uPC751	2480-9
	SGS	M751	2949-166
7510	**AD**	**AD7510DIJ**	★**3176**
			2417-5
		AD7510DIK	★**3176**
			2417-6
		AD7510DIS	★**3176**
			2417-7
	MicroPwr	**MP7510DI**	★**2749**
		MP7510DIJ	★ **401**
			2417-15
		MP7510DIK	★ **401**
			2417-16
		MP7510DIS	★ **401**
			2417-17
	PMI	SW7510A	2417-91
		SW7510B	2417-92
		SW7510E	2417-93
		SW7510F	2417-94
	Sanyo	LC7510	2902-107
75107	Fairchild	75107A	2474-19
		75107B	2474-36
	Hitachi	HD75107A	2474-20
	Motorola	MC75107	2474-22
			¶ 257-7
			¶ 260-3
	National	DS75107	2474-24
			2474-38
	TI	SN75107A	2474-26
		SN75107B	2474-40
75108	Fairchild	75108B	2474-41
	Hitachi	HD75108A	2474-27
	Motorola	MC75108	2474-29
	National	DS75108	2474-31
			2474-43
	TI	SN75108A	2474-33
		SN75108B	2474-45
75109	Hitachi	HD75109	2472-12
	Motorola	MC75109	2472-13
7511	**AD**	**AD7511DIJ**	★**3176**
			2417-8
		AD7511DIK	★**3176**
			2417-9
		AD7511DIS	★**3176**
			2417-10
		AD7511DIT	★**3176**
			2417-11
	MicroPwr	**MP7511DI**	★**2749**
		MP7511DIJ	★ **401**
			2417-18
		MP7511DIK	★ **401**
			2417-19
		MP7511DIS	★ **401**
			2417-20
		MP7511DIT	★ **401**
			2417-21
	National	DM7511	485-50

Base Number	Source	Device	Page-Line
7511	PMI	SW7511A	2417-95
		SW7511B	2417-96
		SW7511E	2417-97
		SW7511F	2417-98
	Telaris	7511-01	2947-1
75110	Fairchild	75110A	2472-17
	Hitachi	HD75110	2472-18
	Motorola	MC75110	2472-19
			¶ 260-3
	TI	SN75110A	2472-22
75112	TI	SN75112	2472-23
75113	National	DS75113	2472-4
	TI	SN75113	2472-6
75114	National	DS75114	2471-43
	TI	SN75114	2471-46
75115	National	DS75115	2474-59
	TI	SN75115	2474-62
75116	TI	SN75116	2479-42
75117	TI	SN75117	2479-48
75118	TI	SN75118	2479-44
75119	TI	SN75119	2479-46
7512	**AD**	**AD7512DIJ**	★**3176**
			2419-45
		AD7512DIK	★**3176**
			2419-46
		AD7512DIS	★**3176**
			2419-47
		AD7512DIT	★**3176**
			2419-48
	MicroPwr	**MP7512DI**	★**2749**
		MP7512DIJ	★ **401**
			2419-49
		MP7512DIK	★ **401**
			2419-50
		MP7512DIS	★ **401**
			2419-51
		MP7512DIT	★ **401**
			2419-52
	National	DM7512	487-111
	Sanyo	LC7512	2902-108
	TI	**7512A**	★**2860**
		SN7512A	★**2860**
75121	National	DS75121	2469-9
	TI	SN75121	2469-14
75122	National	DS75122	2473-15
	TI	SN75122	2473-18
75123	National	DS75123	2469-2
	TI	SN75123	2469-6
75124	National	DS75124	2473-9
	TI	SN75124	2473-11
75125	**Motorola**	**MC75125**	★**2753**
			2473-61
	National	DS75125	2473-63
	TI	SN75125	2474-2
75126	**Motorola**	**MC75126**	★**2753**
	TI	SN75126	2469-44
75127	**Motorola**	**MC75127**	★**2753**
			2473-62
	National	DS75127	2474-1
	TI	SN75127	2474-3
75128	**Motorola**	**MC75128**	★**2753**
			2474-4
	National	DS75128	2474-6
	TI	SN75128	2474-8
75129	**Motorola**	**MC75129**	★**2753**
			2474-5
	National	DS75129	2474-7
	TI	SN75129	2474-9
75130	TI	SN75130	2469-45
75136	TI	SN75136	508-22
			2477-22
75138	SiliconG	SG75138	2478-11
	TI	SN75138	2478-12
75140	Motorola	MC75140	2472-60
	TI	SN75140	2473-3
75141	TI	SN75141	2473-4
75142	TI	SN75142A	2472-58
75143	TI	SN75143A	2472-59
75150	Fairchild	75150	2469-20
	National	DS75150	2469-21
	TI	SN75150	2469-23
75151	TI	SN75151	2472-51
75152	TI	SN75152	2475-11
75153	TI	SN75153	2472-52
75154	Fairchild	75154	2473-50
	Hitachi	HD75154	2473-22

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
75154	National	DS75154	2473-51
	SiliconG	SG75154	2473-53
	TI	SN75154	2473-55
75157	TI	SN75157	2474-53
75158	TI	SN75158	2471-48
75159	TI	SN75159	2472-10
7516	Telaris	7516-01	2949-82
75160	**National**	**DS75160A**	★2768
			2475-41
	TI	SN75160	2475-53
		SN75160A	2475-54
75161	**National**	**DS75161A**	★2768
			2475-42
	TI	SN75161	2475-55
		SN75161A	2475-56
75162	**National**	**DS75162A**	★2768
			2475-43
	TI	SN75162	2475-57
		SN75162A	2475-58
75163	TI	SN75163	2475-59
75172	**Motorola**	**SN75172**	★2753
	TI	SN75172	2469-47
75173	**Motorola**	**SN75173**	★2753
	TI	SN75173	2475-27
75174	**Motorola**	**SN75174**	★2753
	TI	SN75174	2469-46
75175	**Motorola**	**SN75175**	★2753
	TI	SN75175	2475-28
75176	**Motorola**	**SN75176**	★2753
	TI	**75176**	★2858
		SN75176	★2858
75177	**Motorola**	**SN75177**	★2753
	TI	**75177**	★2858
		SN75177	★2858
75178	**Motorola**	**SN75178**	★2753
	TI	**75178**	★2858
		SN75178	★2858
75182	TI	SN75182	2475-6
75183	TI	SN75183	2471-61
75188	Hitachi	HD75188	2469-55
	TI	SN75188	2469-62
75189	Hitachi	HD75189	2473-31
	TI	SN75189	2473-28
		SN75189A	2473-42
7519	AD	AD7519J	2420-1
752	NEC-Electron	uPC752	2480-10
7520	**AD**	**AD7520J**	★3164
			2448-29
			¶ 256-18
		AD7520K	★3164
			2447-38
			¶ 256-18
		AD7520L	★3164
			2445-47
			¶ 256-18
		AD7520S	★3164
			2448-30
			¶ 256-18
		AD7520T	★3164
			2447-39
			¶ 256-18
		AD7520U	★3164
			2446-1
			¶ 256-18
	Intersil	AD7520J	2448-32
		AD7520K	2447-41
		AD7520L	2446-3
		AD7520S	2448-33
		AD7520T	2447-42
		AD7520U	2446-4
	MicroPwr	**MP7520G**	★ 401
			★2749
			2449-27
		MP7520H	★ 401
			★2749
			2449-20
		MP7520J	★ 401
			★2749
			2448-35
		MP7520K	★ 401
			★2749
			2447-44
		MP7520L	★ 401
			★2749
			2446-6
		MP7520M	★ 401
7520	**MicroPwr**	**MP7520M**	★2749
			2448-36
		MP7520N	★ 401
			★2749
			2447-45
		MP7520P	★ 401
			★2749
			2446-7
		MP7520S	★ 401
			★2749
			2448-37
		MP7520T	★ 401
			★2749
			2447-46
		MP7520U	★ 401
			★2749
			2446-8
	National	AD7520J	2449-13
		AD7520K	2448-20
		AD7520L	2447-10
		AD7520S	2449-14
		AD7520T	2448-21
		AD7520U	2447-11
	NEC-Micro	uPD7520	1088-86
			1053-19
	SiliconG	SG7520	2485-8
75207	National	DS75207	2474-11
			2485-53
	TI	SN75207	2474-13
			2485-55
			¶ 261-5
		SN75207B	2474-16
			¶ 261-5
75208	National	DS75208	2474-12
			2485-54
	TI	SN75208	2474-14
			2485-56
		SN75208B	2474-17
7521	**AD**	**AD7521J**	★3164
			2458-26
			¶ 256-18
		AD7521K	★3164
			2458-12
			¶ 256-18
		AD7521L	★3164
			2457-23
			¶ 256-18
		AD7521S	★3164
			2458-27
			¶ 256-18
		AD7521T	★3164
			2458-13
			¶ 256-18
		AD7521U	★3164
			2457-24
			¶ 256-18
	Intersil	AD7521J	2458-29
		AD7521K	2458-15
		AD7521L	2457-25
		AD7521S	2458-30
		AD7521T	2458-16
		AD7521U	2457-26
	MicroPwr	**MP7521G**	★ 401
			★2749
			2458-41
		MP7521H	★ 401
			★2749
			2458-40
		MP7521J	★ 401
			★2749
			2458-32
		MP7521K	★ 401
			★2749
			2458-18
		MP7521L	★ 401
			★2749
			2457-28
		MP7521M	★ 401
			★2749
			2458-33
		MP7521N	★ 401
			★2749
			2458-19
		MP7521P	★ 401
			★2749
			2457-29
7521	**MicroPwr**	**MP7521S**	★ 401
			★2749
			2458-34
		MP7521T	★ 401
			★2749
			2458-20
		MP7521U	★ 401
			★2749
			2457-30
	National	AD7521J	2458-36
		AD7521K	2458-22
		AD7521L	2458-10
		AD7521S	2458-37
		AD7521T	2458-23
		AD7521U	2458-11
	SiliconG	SG7521	2485-9
7522	**AD**	**AD7522J**	★3164
			2448-45
			¶ 256-18
		AD7522K	★3164
			2448-3
			¶ 256-18
		AD7522L	★3164
			2446-16
			¶ 256-18
		AD7522S	★3164
			2448-46
			¶ 256-18
		AD7522T	★3164
			2448-4
			¶ 256-18
		AD7522U	★3164
			2446-17
			¶ 256-18
	MicroPwr	**MP7522J**	★ 401
			★2749
			2448-47
		MP7522K	★ 401
			★2749
			2448-5
		MP7522L	★ 401
			★2749
			2446-18
		MP7522S	★ 401
			★2749
			2448-48
		MP7522T	★ 401
			★2749
			2448-6
		MP7522U	★ 401
			★2749
			2446-19
	SiliconG	SG7522	2485-44
7523	**AD**	**AD7523J**	★3164
			2441-39
		AD7523K	★3164
			2440-36
		AD7523L	★3164
			2440-3
		AD7523S	★3164
			2441-40
	Intersil	AD7523J	2440-12
		AD7523K	2440-37
		AD7523L	2440-4
		AD7523S	2440-13
		AD7523T	2440-38
		AD7523U	2440-5
	MicroPwr	**MP7523J**	★ 401
			★2749
			2441-41
		MP7523K	★ 401
			★2749
			2440-39
		MP7523L	★ 401
			★2749
			2440-6
	SiliconG	SG7523	2485-45
75234	TI	SN75234	2485-18
75236	SiliconG	SG75236	2485-12
75239	Fairchild	75239	2485-19
7524	**AD**	**AD7524A**	★3164
			2442-1
			¶ 256-18
		AD7524B	★3164
			2440-40
			¶ 256-18
7524	**AD**	**AD7524C**	★3164
			2440-7
			¶ 256-18
		AD7524J	★3164
			2442-2
			¶ 256-18
		AD7524K	★3164
			2440-41
			¶ 256-18
		AD7524L	★3164
			2440-8
			¶ 256-18
		AD7524S	★3164
			2442-3
			¶ 256-18
		AD7524T	★3164
			2440-42
			¶ 256-18
		AD7524U	★3164
			2440-9
			¶ 256-18
	MicroPwr	**MP7524J**	★ 401
			★2749
			2442-4
		MP7524K	★ 401
			★2749
			2440-43
		MP7524L	★ 401
			★2749
			2440-10
		MP7524S	★ 401
			★2749
			2442-5
		MP7524T	★ 401
			★2749
			2440-44
		MP7524U	★ 401
			★2749
			2440-11
	SiliconG	SG7524	2485-34
7525	**AD**	**AD7525K**	★3166
			2962-81
			2965-83
			¶ 256-18
		AD7525L	★3166
			2965-84
			¶ 256-18
		AD7525T	★3166
			2962-82
			2965-85
			¶ 256-18
		AD7525U	★3166
			2965-86
			¶ 256-18
	MicroPwr	MP7525B	2962-83
		MP7525K	2962-84
		MP7525T	2962-85
	SiliconG	SG7525	2485-35
75251	**TI**	**SN75251C**	★3437
			2887-45
7527	**AD**	**AD7527B**	★3164
			2447-31
		AD7527C	★3164
			2445-34
		AD7527GC	★3164
			2445-35
		AD7527GL	★3164
			2445-36
		AD7527GU	★3164
			2445-37
		AD7527K	★3164
			2447-32
		AD7527L	★3164
			2445-38
		AD7527T	★3164
			2447-33
		AD7527U	★3164
			2445-39
75270	TI	SN75270	505-157
			¶ 261-5
			2481-58
			¶ 261-5
7528	**AD**	**AD7528J**	★3164
			2443-45
		AD7528K	★3164
			2442-13

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
7528	AD	AD7528L	★3164
			2442-14
		AD7528S	★3164
			2443-46
		AD7528T	★3164
			2442-15
		AD7528U	★3164
			2442-16
	SiliconG	SG7528	2485-39
7529	SiliconG	SG7529	2485-40
7530	AD	AD7530J	★3164
			2448-31
			¶ 256-18
		AD7530K	★3164
			2447-40
			¶ 256-18
		AD7530L	★3164
			2446-2
			¶ 256-18
	Intersil	AD7530J	2448-34
		AD7530K	2447-43
		AD7530L	2446-5
	MicroPwr	MP7530	★ 401
			★2749
			2446-9
		MP7530J	★ 401
			★2749
			2448-38
		MP7530K	★ 401
			★2749
			2447-47
7531	AD	AD7531J	★3164
			2458-28
			¶ 256-18
		AD7531K	★3164
			2458-14
			¶ 256-18
	Intersil	AD7531J	2458-31
		AD7531K	2458-17
		AD7531L	2457-27
	MicroPwr	MP7531J	★ 401
			★2749
			2458-35
		MP7531K	★ 401
			★2749
			2458-21
		MP7531L	★ 401
			★2749
			2457-31
75322	TI	SN75322	2481-78
75325	Motorola	MC75325	2480-162
	National	DS75325	2480-164
	SiliconG	SG75325	2481-1
	TI	SN75325	2481-3
75326	SiliconG	SG75326	2481-6
	TI	SN75326	2481-10
75327	SiliconG	SG75327	2481-7
	TI	SN75327	2481-11
75328	TI	SN75328	2481-12
7533	AD	AD7533A	★3164
			2449-1
			¶ 256-18
		AD7533B	★3164
			2448-8
			¶ 256-18
		AD7533C	★3164
			2446-21
			¶ 256-18
		AD7533J	★3164
			2449-2
			¶ 256-18
		AD7533K	★3164
			2448-9
			¶ 256-18
		AD7533L	★3164
			2446-22
			¶ 256-18
		AD7533S	★3164
			2449-3
			¶ 256-18
		AD7533T	★3164
			2448-10
			¶ 256-18
		AD7533U	★3164
			2446-23
			¶ 256-18

Base Number	Source	Device	Page-Line
7533	Intersil	AD7533J	2449-4
		AD7533K	2448-11
		AD7533L	2446-24
		AD7533S	2449-5
		AD7533T	2448-12
		AD7533U	2446-25
	MicroPwr	MP7533K	★ 401
			★2749
			2448-13
		MP7533L	★ 401
			★2749
			2446-26
		MP7533S	★ 401
			★2749
			2449-6
		MP7533T	★ 401
			★2749
			2449-7
			2449-8
		MP7533U	★ 401
			★2749
			2446-27
7534	SiliconG	SG7534	2485-22
7535	SiliconG	SG7535	2485-23
75350	TI	SN75350	2482-135
75358	Motorola	MC75358	469-64
			2481-83
75361	National	DS75361	2482-132
	TI	SN75361A	2482-136
75362	National	DS75362	2482-133
75363	TI	SN75363	2481-79
75365	Motorola	MC75365	2483-41
	National	DS75365	2483-42
	TI	SN75365	2483-47
			¶ 287-9
75367	TI	SN75367	505-149
			2483-81
75368	Motorola	MC75368	469-65
			2481-84
75369	TI	SN75369	2481-107
75370	TI	SN75370	2481-85
			¶ 261-5
75375	TI	SN75375	2483-48
7538	SiliconG	SG7538	2485-27
7539	SiliconG	SG7539	2485-28
754	NEC-Electron	uPC754	2887-39
75401	TI	SN75401	2481-151
75402	TI	SN75402	2482-39
75403	TI	SN75403	2482-110
75404	TI	SN75404	2482-75
75407	TI	SN75407	★2855
			2482-40
			2482-76
75408	TI	SN75408	★2855
			2482-111
7541	AD	AD7541A	★3164
			★3166
			2456-21
			¶ 256-18
		AD7541B	★3164
			★3166
			2453-26
			¶ 256-18
		AD7541J	★3164
			★3166
			2453-27
			¶ 256-18
		AD7541S	★3164
			★3166
			2456-42
			¶ 256-18
		AD7541T	★3164
			★3166
			2453-28
			¶ 256-18
	Harris	HI7541J	★2731
			★3288
			2453-47
		HI7541K	★2731
			★3288
			2450-39
		HI7541S	★2731

Base Number	Source	Device	Page-Line
7541	Harris	HI7541S	★3288
			2453-48
		HI7541T	★2731
			★3288
			2450-40
	HybridSys	HS7541-4	2453-46
		HS7541B-1	2456-34
		HS7541B-2	2453-41
		HS7541C-1	2456-35
		HS7541C-2	2453-42
	Intersil	AD7541A	2456-23
		AD7541B	2453-29
		AD7541J	2456-24
		AD7541K	2453-30
		AD7541L	2456-43
		AD7541S	2456-44
		AD7541T	2453-31
	MicroPwr	MP7541	★ 401
			★2749
			2453-32
	TeledyneS	7541S	2456-28
		7541T	2453-36
		TSC7541A	2456-30
		TSC7541B	2453-37
		TSC7541J	2456-31
		TSC7541K	2453-38
75411	TI	SN75411	2481-152
75412	TI	SN75412	2482-41
75413	TI	SN75413	2482-112
75414	TI	SN75414	2482-77
75416	TI	SN75416	2482-12
75417	TI	SN75417	2482-52
75418	TI	SN75418	2482-123
75419	TI	SN75419	2482-87
7542	AD	AD7542A	★3166
			2456-45
		AD7542B	★3166
			2454-18
		AD7542J	★3166
			2457-1
		AD7542K	★3166
			2454-19
		AD7542S	★3166
			2457-2
		AD7542T	★3166
			2454-20
	National	DM7542	485-158
75426	TI	SN75426	2464-80
75427	TI	SN75427	2464-81
7543	AD	AD7543A	★3166
			2457-3
		AD7543B	★3166
			2454-21
		AD7543J	★3166
			2457-4
		AD7543K	★3166
			2454-22
75430	TI	SN75430	2481-81
75431	TI	SN75431	2481-82
75432	TI	SN75432	2482-42
75433	TI	SN75433	2482-113
75434	TI	SN75434	2482-78
75436	TI	SN75436	★2856
			2483-19
75437	TI	75437A	★2856
		SN75437A	★2856
			2483-20
75438	TI	SN75438	★2856
			2483-21
7544	AD	AD7544A	★3166
			2456-18
			¶ 255-11
		AD7544B	★3166
			2451-28
			¶ 255-11
		AD7544BG	★3166
			2451-29
			¶ 255-11
		AD7544GK	★3166
			2451-30
			¶ 255-11
		AD7544GT	★3166
			2451-31
			¶ 255-11
		AD7544J	★3166

Base Number	Source	Device	Page-Line
7544	AD	AD7544J	2456-19
			¶ 255-11
		AD7544K	★3166
			2451-32
			¶ 255-11
		AD7544S	★3166
			2456-20
			¶ 255-11
		AD7544T	★3166
			2451-33
			¶ 255-11
	National	DM7544	506-5
75441	TI	SN75441	2481-90
			2482-119
75446	TI	SN75446	2482-11
75447	TI	SN75447	2482-43
75448	TI	SN75448	2482-114
75449	TI	SN75449	2482-79
7545	AD	AD7545A	★3166
			2457-13
		AD7545B	★3166
			2456-14
		AD7545C	★3166
			2451-4
		AD7545GC	★3166
			2451-5
		AD7545GL	★3166
			2451-6
		AD7545GU	★3166
			2451-7
		AD7545J	★3166
			2457-14
		AD7545K	★3166
			2456-15
		AD7545L	★3166
			2451-8
		AD7545S	★3166
			2457-15
		AD7545T	★3166
			2456-16
		AD7545U	★3166
			2451-9
75450	Fairchild	75450B	2481-115
	Hitachi	HD75450A	2481-120
	Motorola	MC75450	2481-122
	National	DS75450	2481-129
	SiliconG	SG75450	2481-139
		SG75450B	2481-140
	TI	SN75450B	2482-1
			¶ 261-5
75451	Fairchild	75451A	2481-116
		75451B	2481-117
	Hitachi	HD75451A	2481-121
	Motorola	MC75451	2481-123
		SN75451B	2481-125
	National	DS75451	2481-130
	SiliconG	SG75451	2481-141
	TI	SN75451B	2482-2
			¶ 261-5
75452	Fairchild	75452A	2482-20
		75452B	2482-21
	Hitachi	HD75452	2482-24
	Motorola	MC75452	2482-25
		SN75452B	2482-27
	National	DS75452	2482-30
			¶ 259-4
	SiliconG	SG75452	2482-34
	TI	SN75452B	2482-44
75453	Fairchild	75453A/B	2482-94
	Hitachi	HD75453	2482-95
	Motorola	MC75453	2482-96
		SN75453B	2482-98
	National	DS75453	2482-101
	SiliconG	SG75453	2482-105
	TI	SN75453B	2482-115
75454	Hitachi	HD75454	2482-60
	Motorola	MC75454	2482-61
		SN75454B	2482-63
	National	DS75454	2482-66
	SiliconG	SG75454	2482-70
	TI	SN75454B	2482-80
75458	Toshiba	TA75458	2939-5
7546	AD	AD7546A	★3166
			2461-18
		AD7546B	★3166
			2461-6

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
7546	AD	AD7546J	★3166
			2461-19
		AD7546K	★3166
			2461-7
	National	DM7546	502-142
			3489-129
75460	SiliconG	SG75460	2481-142
		SG75460B	2481-143
	TI	SN75460	2482-3
75461	Fairchild	75461	2481-118
	Motorola	MC75461	2481-124
	National	DS75461	2481-131
	SiliconG	SG75461	2481-144
	TI	SN75461	2482-4
75462	Fairchild	75462	2482-22
	Motorola	MC75462	2482-26
	National	DS75462	2482-31
	SiliconG	SG75462	2482-35
	TI	SN75462	2482-45
75463	Motorola	MC75463	2482-97
	National	DS75463	2482-102
	SiliconG	SG75463	2482-106
	TI	SN75463	2482-116
75464	Motorola	MC75464	2482-62
	National	DS75464	2482-67
	SiliconG	SG75464	2482-71
	TI	SN75464	2482-81
75465	TI	SN75465	2890-4
75466	TI	SN75466	2480-83
			2482-5
			2890-63
75467	TI	SN75467	2480-99
			2890-64
75468	TI	SN75468	2480-66
			2890-5
75469	TI	SN75469	2480-42
			2890-6
75470	TI	SN75470	2482-6
75471	Fairchild	75471	2481-119
	TI	SN75471	2482-7
75472	Fairchild	75472	2482-23
	TI	SN75472	2482-46
75473	TI	SN75473	2482-117
75474	Fairchild	75474B	2482-59
	TI	SN75474	2482-82
75476	TI	SN75476	2482-8
75477	TI	SN75477	2482-51
75478	TI	SN75478	2482-118
			2482-122
75479	TI	SN75479	2482-83
			2482-86
75480	TI	SN75480	2465-69
75481	TI	SN75481	2465-32
75490	TI	SN75490	2481-59
75491	Fairchild	75491	2464-138
	Motorola	MC75491	2464-139
	National	DS75491	2464-141
			¶ 259-15
	TI	SN75491	2464-143
		SN75491A	2465-1
75492	Fairchild	75492	2465-35
		75492A	2465-36
	Motorola	MC75492	2465-37
	National	DS75492	2465-38
			¶ 259-15
	TI	SN75492	2465-44
		SN75492A	2465-45
75493	National	DS75493	2464-142
	TI	SN75493	2465-2
75494	National	DS75494	2465-39
	TI	SN75494	2465-46
75497	TI	SN75497	2465-57
75498	TI	SN75498	2465-122
755	SGS	M755	2904-141
7550	AD	AD7550B	★3174
			2436-26
	MicroPwr	MP7550B	★ 401
			★2749
			2436-25
75500	TI	SN75500	2466-8
75501	TI	SN75501	2466-9
75502	TI	SN75502	2466-10
75503	TI	SN75503	2466-11
7551	National	DM7551	486-22
			¶ 236-15
75512	TI	SN75512A	2465-135
75513	TI	75513A	★2861
		SN75513A	★2861
			2465-136
75518	TI	SN75518	★2862
			2466-12
7552	AD	AD7552	★3174
			2436-4
	National	DM7552	482-71
7553	National	DM7553	496-140
7554	National	DM7554	482-60
7555	AD	AD7555	★3174
			2962-32
	Intersil	ICM7555	2951-57
		ICM7555M	2951-58
	National	DM7555	480-123
	Sanyo	LC7555	2964-78
7556	Intersil	ICM7556	2951-63
		ICM7556M	2951-64
	National	DM7556	478-97
	Sanyo	LC7556	2964-79
75581	TI	SN75581	★2863
			2465-59
75584	TI	75584A	★2864
	TI	SN75584	2465-63
	TI	SN75584A	★2864
75590	TI	SN75590	2481-60
756	SGS	M756	2904-142
7560	National	DM7560	481-133
75603	TI	SN75603	★2857
			2964-121
75604	TI	SN75604	★2857
			2964-122
7563	National	DM7563	479-179
757	Fairchild	uA757	2900-100
7570	AD	AD7570J	2428-8
		AD7570L	2431-5
	MicroPwr	MP7570J	★ 401
			★2749
			2428-9
		MP7570L	★ 401
			★2749
			2431-6
		MP7570P	★ 401
			★2749
			2428-10
		MP7570S	★ 401
			★2749
			2431-7
	National	DM7570	502-20
			3490-116
7571	AD	AD7571J	★3171
			★3174
			2431-27
		AD7571K	★3171
			★3174
			2431-25
		AD7571S	★3171
			★3174
			2431-28
		AD7571T	★3171
			★3174
			2431-26
7574	AD	AD7574A	★3174
			2429-1
		AD7574B	★3174
			2427-45
		AD7574J	★3174
			2429-2
		AD7574K	★3174
			2427-46
		AD7574S	★3174
			2429-3
		AD7574T	★3174
			2427-47
	MicroPwr	MP7574A	★ 401
			★2749
			2429-4
		MP7574B	★ 401
			★2749
			2427-48
		MP7574J	★ 401
			★2749
			2429-5
		MP7574K	★ 401
			★2749
			2427-49
7574	MicroPwr	MP7574S	★ 401
			★2749
			2429-6
		MP7574T	★ 401
			★2749
			2427-50
75747	Toshiba	TA75747	2939-6
7575	National	DM7575	507-7
			3458-31
7576	National	DM7576	507-8
			3458-32
758	Motorola	uA758A	2901-109
	RCA	CA758	2901-127
	Signetics	uA758	2901-142
7581	AD	AD7581A	★3174
			2963-30
			★3174
			1094-115
			1095-133
			1097-57
		AD7581B	★3174
			2963-31
			★3174
			1094-116
			1095-134
			1097-58
		AD7581C	★3174
			2963-32
			★3174
			1094-117
			1095-135
			1097-59
		AD7581J	★3174
			2963-33
			★3174
			1094-118
			1095-136
			1097-60
		AD7581K	★3174
			2429-7
			★3174
			2963-34
			★3174
			1094-119
			1095-137
			1097-61
		AD7581L	★3174
			2963-35
			★3174
			1094-120
			1095-138
			1097-62
	MicroPwr	MP7581	★ 401
			★2749
			2963-36
7583	AD	AD7583K	2429-38
7589	National	DM7589	497-39
			3471-99
759	Fairchild	uA759	2909-75
			2913-2
			2925-33
		uA759C	2909-76
			2913-3
			2930-39
7590	AD	AD7590DIB	★3176
			2416-118
		AD7590DIK	★3176
			2416-119
	National	DM7590	3490-44
75902	Toshiba	TA75902	2943-54
7591	AD	AD7591DIB	★3176
			2416-120
		AD7591DIK	★3176
			2416-121
7592	AD	AD7592DIB	★3176
			2415-83
		AD7592DIK	★3176
			2415-84
7599	National	DM7599	497-47
			3471-97
75ALS245			
	Motorola	SN75ALS245	★ 732
75ALS574			
	Motorola	SN75ALS574	★ 732
75ALS695			
	Motorola	SN75ALS695	★ 732
75HC138			
	SPI	SP75HC138	454-92
75S110	Motorola	MC75S110	2472-20
75S20	Fairchild	75S20	2485-5
75S225	TI	SN75S225	3456-11
75S234	Fairchild	75S234	2485-16
75S24	Fairchild	75S24	2485-30
75S28	National	DM75S28	3484-40
75S29	National	DM75S29	3484-39
75S50	National	DM75S50	482-82
76	Burr-Brown	ADC76	2436-38
		ATF76	2962-8
	PMI	DAC-76	2444-33
			2459-9
			¶ 253-4
			¶ 254-16
			¶ 256-19
		DAC-76B	2444-25
			2450-6
			¶ 253-4
			¶ 254-16
			¶ 256-19
		DAC-76C	2444-34
			2450-13
			¶ 253-4
			¶ 254-16
			¶ 256-19
		DAC-76D	2444-39
			¶ 253-4
			¶ 254-16
			¶ 256-19
		DAC-76E	2444-26
			2450-7
			¶ 253-4
			¶ 254-16
			¶ 256-19
	Rockwell	MM76EL	1088-88
			¶ 246-17
760	Fairchild	uA760C	2892-29
		uA760M	2892-30
	SGS	M760	2948-1
		M760A	2948-2
7600	Intersil	ICL7600C	2914-3
		ICL7600M	2914-4
	LSILogic	LSI-7600	4140-156
76000	TI	SN76000	2896-132
76002	TI	SN76002	2896-133
76005	TI	SN76005	2897-86
7601	Intersil	ICL7601C	2914-5
		ICL7601M	2914-6
76011	TI	SN76011	2896-134
7602	Harris	HM7602-2	★3693
			3459-33
		HM7602-5	★3693
			3459-22
		HMI7602	★3740
76021	TI	SN76021	2896-135
76024	TI	SN76024	2896-136
7603	Harris	HM7603-2	★3693
			3459-40
		HM7603-5	★3693
			3459-26
		HMI7603	★3740
	Telaris	7603-02	2950-2
7604	Toshiba	TA7604A	2901-155
7605	Intersil	ICL7605C	2887-52
		ICL7605M	2887-53
7606	Intersil	ICL7606C	2887-54
		ICL7606M	2887-55
	Toshiba	TA7606	2968-141
7607	Toshiba	TA7607A	2904-34
7608	Harris	HM7608-2	3463-49
		HM7608-5	3463-5
761	SGS	M761	2948-32
		M761A	2948-33
	Siemens	TAA761	2909-102
			2931-19
7610	Harris	HM7610-2	★3696
			3459-118
		HM7610-5	★3696
			3459-100
		HM7610A-2	★3696
			3459-101
		HM7610A-5	★3696
			3459-73
		HMI7610	★3740

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
76104	TI	SN76104	2901-146
76105	TI	SN76105	2901-147
7611	**Harris**	**HM7611-2**	★3696
			3460-5
		HM7611-5	★3696
			3459-108
		HM7611A-2	★3696
			3459-109
		HM7611A-5	★3696
			3459-75
		HMI7611	★3740
	Intersil	ICL7611AC	2922-23
		ICL7611AM	2922-24
		ICL7611BC	2926-44
		ICL7611BM	2926-45
		ICL7611C	2912-16
			2912-36
			2934-11
		ICL7611M	2912-10
			2912-47
	Toshiba	TA7611A	2904-35
76110	TI	SN76110	2901-148
76111	TI	SN76111	2901-149
76113	TI	SN76113	2901-150
76115	TI	SN76115	2901-151
76116	TI	SN76116	2901-152
7612	Intersil	ICL7612AC	2922-25
		ICL7612AM	2922-26
		ICL7612BC	2926-46
		ICL7612BM	2926-47
		ICL7612C	2912-15
			2912-25
			2913-7
			2934-12
		ICL7612M	2912-17
			2912-48
			2913-8
	Toshiba	TA7612A	2463-50
7613	Intersil	ICL7613AC	2922-27
		ICL7613BC	2926-48
		ICL7613BM	2926-49
		ICL7613C	2912-18
			2912-49
		ICL7613DC	2934-13
		ICL7613M	2912-11
			2912-50
	National	DM7613	485-51
	Toshiba	TA7613	2900-143
76130	TI	SN76130	2898-13
76131	TI	SN76131	2898-14
7614	Intersil	ICL7614AC	2922-28
		ICL7614AM	2922-29
		ICL7614BC	2926-50
		ICL7614BM	2926-51
		ICL7614C	2912-19
		ICL7614DC	2934-14
	MicroPwr	**MP7614**	★ 401
			★2749
			2460-38
	Toshiba	TA7614	2900-144
76149	TI	SN76149	2898-15
7615	Intersil	ICL7615	2922-30
		ICL7615AC	2922-31
		ICL7615BC	2926-52
		ICL7615BM	2926-53
		ICL7615C	2912-20
		ICL7615DC	2934-15
	Toshiba	TA7615	2900-77
7616	**Harris**	**HM7616-2**	★3720
			3464-118
		HM7616-5	★3720
			3464-109
		HM7616A	★3720
			3464-76
	MicroPwr	**MP7616K**	★ 401
			★2749
			2462-14
		MP7616L	★ 401
			★2749
			2462-13
	Toshiba	TA7616	2900-86
76160	Harris	HM76160-2	3464-117
		HM76160-5	3464-107
76161	**Harris**	**HM76161-2**	★3717
			3464-119
76161	**Harris**	**HM76161-5**	★3717
			3464-110
		HM76161A-5	★3717
			3464-75
		HMI76161	★3740
	Motorola	MCM76161	3464-100
		MCM76161A	3464-80
76165	**Harris**	**76165**	★3723
	Harris	HM76165-2	3466-10
		HM76165-5	3466-6
	Harris	**HMI76165**	★3740
7617	Toshiba	TA7617	2902-118
7619	Toshiba	TA7619A	2904-58
762	Siemens	TAA762	2909-103
			2926-21
7620	**Harris**	**HM7620-2**	★3699
			3460-100
		HM7620-5	★3699
			3460-86
		HM7620A-2	★3699
			3460-72
		HM7620A-5	★3699
			3460-47
		HMI7620	★3740
	MicroPwr	MP7620J	2445-5
		MP7620K	2445-17
		MP7620L	2446-20
		MP7620M	2448-7
7621	**Harris**	**HM7621-2**	★3699
			3460-102
		HM7621-5	★3699
			3460-88
		HM7621A-2	★3699
			3460-78
		HM7621A-5	★3699
			3460-49
		HMI7621	★3740
	Intersil	ICL7621AC	2936-35
		ICL7621AM	2936-36
		ICL7621BC	2938-2
		ICL7621BM	2938-3
		ICL7621C	2912-21
		ICL7621DC	2940-41
	MicroPwr	**MP7621A**	★ 401
			★2749
			2456-25
		MP7621B	★ 401
			★2749
			2453-33
		MP7621C	★ 401
			★2749
			2450-33
		MP7621H	★ 401
			★2749
			2457-20
		MP7621J	★ 401
			★2749
			2456-26
		MP7621K	★ 401
			★2749
			2453-34
		MP7621L	★ 401
			★2749
			2450-34
		MP7621R	★ 401
			★2749
			2457-21
		MP7621S	★ 401
			★2749
			2456-27
		MP7621T	★ 401
			★2749
			2453-35
		MP7621U	★ 401
			★2749
			2450-35
		MP7621Z	★ 401
			★2749
			2457-22
	Motorola	MCM7621	3460-89
		MCM7621A	3460-58
	Toshiba	TA7621	2904-36
7622	Intersil	ICL7622AC	2936-33
		ICL7622AM	2936-34
		ICL7622BC	2938-4
		ICL7622BM	2938-5
7622	Intersil	ICL7622C	2912-22
		ICL7622DC	2940-42
	MicroPwr	**MP7622A**	★ 401
			★2749
			2456-39
		MP7622H	★ 401
			★2749
			2457-35
		MP7622J	★ 401
			★2749
			2456-40
		MP7622R	★ 401
			★2749
			2457-36
		MP7622S	★ 401
			★2749
			2456-41
		MP7622Z	★ 401
			★2749
			2457-37
	Toshiba	TA7622A	2904-37
7623	**MicroPwr**	**MP7623**	★ 401
			★2749
			2453-21
7624	Toshiba	TA7624	2901-156
76242	TI	SN76242	2904-15
76243	TI	SN76243	2904-16
76246	TI	SN76246	2904-17
7625	Toshiba	TA7625	2902-132
76267	TI	SN76267	2904-18
7628	Toshiba	TA7628	2902-99
		TA7628H	2902-100
76298	TI	SN76298	2904-19
7631	Intersil	ICL7631BC	2941-1
		ICL7631BM	2941-2
		ICL7631C	2912-23
		ICL7631CC	2941-7
		ICL7631CM	2941-8
		ICL7631EC	2941-12
		ICL7631M	2912-12
7632	Intersil	ICL7632BC	2941-3
		ICL7632BM	2941-4
		ICL7632C	2912-65
		ICL7632CC	2941-9
		ICL7632CM	2941-10
		ICL7632EC	2941-13
		ICL7632M	2912-13
			2912-66
	Toshiba	TA7632	2905-56
76321	**Harris**	**HM76321-2**	★3726
			3466-27
		HM76321-5	★3726
			3466-23
		HMI76321	★3740
7633	Toshiba	TA7633	2905-57
76333	TI	SN76333	2963-63
76334	TI	SN76334	2963-64
7637	Toshiba	TA7637	2906-21
7639	Toshiba	TA7639	2902-135
764	SGS	M764	2949-111
		M764A	2949-112
7640	**Harris**	**HM7640-2**	★3702
			3461-81
		HM7640-5	★3702
			3461-58
		HM7640A-2	★3702
			3461-59
		HM7640A-5	★3702
			3461-17
		HMI7640	★3740
	National	DS7640	2473-39
	Telaris	7640-01	2949-91
7641	**Harris**	**HM7641-2**	★3702
			3461-85
		HM7641-5	★3702
			3461-66
		HM7641A-2	★3702
			3461-67
		HM7641A-5	★3702
			3461-18
		HMI7641	★3740
	Intersil	ICL7641BC	2942-14
		ICL7641BM	2942-15
		ICL7641CC	2944-3
		ICL7641CM	2944-4
		ICL7641EC	2944-34
7641	Motorola	MCM7641	3461-70
		MCM7641A	3460-60
	National	DS7641	2476-51
7642	**Harris**	**HM7642-2**	★3705
		HM7642-5	★3705
			3462-16
			3462-16
		HM7642A-2	★3705
		HM7642A-5	★3705
			3462-3
			3462-3
		HM7642P-2	★3705
		HM7642P-5	★3705
			3462-4
			3462-4
		HMI7642	★3740
	Intersil	ICL7642BC	2942-16
		ICL7642BM	2942-17
		ICL7642C	2912-24
		ICL7642CC	2944-5
		ICL7642CM	2944-6
		ICL7642EC	2944-35
		ICL7642M	2912-14
7643	**Harris**	**HM7643-2**	★3705
		HM7643-5	★3705
		HM7643A-2	★3705
		HM7643A-5	★3705
			3462-5
			3462-5
		HM7643P-2	★3705
		HM7643P-5	★3705
			3462-6
			3462-6
		HMI7643	★3740
	Motorola	MCM7643A	3462-8
			3462-8
7644	Harris	HM7644-5	3462-15
			3462-15
7647	Harris	HM7647R-2	3461-78
		HM7647R-5	3461-43
76477	TI	SN76477	2906-42
			1101-89
7648	Harris	HM7648-2	3461-73
		HM7648-5	3461-30
76487	TI	SN76487	2898-36
76488	TI	SN76488	2898-37
			1101-90
76489	TI	SN76489	2898-31
		SN76489A	2898-32
7649	**Harris**	**HM7649-2**	★3708
			3461-76
		HM7649-5	★3708
			3461-34
		HM7649A-2	★3708
			3461-26
		HM7649A-5	★3708
			3461-11
	Motorola	MCM7649	3461-62
76493	TI	SN76493	2898-33
76494	TI	SN76494	2898-34
76495	TI	SN76495	2898-35
765	NEC-Micro	uPD765	1093-111
			1094-139
			1095-148
			1101-30
			1101-32
			1101-127
			¶ 240-13
			¶ 245-8
7650	Intersil	ICL7650C	2914-2
	Toshiba	TA7650	2904-38
7652	Toshiba	TA7652	2904-127
76524	TI	SN76524	2904-156
76525	TI	SN76525	2904-117
7654	Toshiba	TA7654	2463-52
76544	TI	SN76544	2904-157
76545	TI	SN76545	2904-158
7655	Toshiba	TA7655	2463-53
76565	TI	SN76565	2903-30
76566	TI	SN76566	2962-144
7659	Toshiba	TA7659	2904-39
7660	Datel	VI-7660C	2968-53
		VI-7660M	2968-54
	Intersil	ICL7660	2968-55
			¶ 255-16
	Toshiba	TA7660	2904-40

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
76600	TI	SN76600	2906-7
76605	TI	SN76605	2902-54
76606	TI	SN76606	2902-55
7661	Toshiba	TA7661	2904-41
7663	Intersil	ICL7663	2959-4
	Toshiba	TA7663	2902-134
76635	TI	SN76635	2900-75
7664	Intersil	ICL7664	2960-21
	National	DS7664	2465-139
76641	**Harris**	**HM76641-2**	★3729
			3466-80
		HM76641-5	★3729
			3466-79
		HMI76641	★3740
76642	TI	SN76642	2901-72
76643	TI	SN76643	2901-73
			2905-42
76644	TI	SN76644	2906-8
76645	TI	SN76645	2904-20
7665	Intersil	ICL7665	2968-142
76650	TI	SN76650	2906-9
76651	TI	SN76651	2905-43
7666	Toshiba	TA7666	2465-19
76660	TI	SN76660	2905-44
76665	TI	SN76665	2905-45
76666	TI	SN76666	2905-46
76669	TI	SN76669	2901-74
7667	Toshiba	TA7667	2465-20
76675	TI	SN76675	2901-75
76676	TI	SN76676	2901-22
76678	TI	SN76678	2901-23
76688	TI	SN76688	2905-47
76689	TI	SN76689	2901-76
767	NEC-Electron	uPC767	2949-161
76701	TI	SN76701	2903-83
76702	TI	SN76702	2903-84
76710	TI	SN76710	2903-85
76711	TI	SN76711	2903-86
76720	TI	SN76720	2904-140
76721	TI	SN76721	2903-87
76727	TI	SN76727	2903-88
76730	TI	SN76730	2902-56
7675	Toshiba	TA7675	2904-42
7676	Toshiba	TA7676	2904-43
7678	Toshiba	TA7678	2904-44
7680	Harris	HM7680-2	3463-41
		HM7680-5	3462-113
		HM7680A-5	3462-80
		HM7680P-2	3463-42
		HM7680P-5	3462-114
		HM7680R-2	3463-43
		HM7680R-5	3462-115
		HM7680RP-2	3463-44
		HM7680RP-5	3462-116
	Motorola	MCM7680C	3463-1
		MCM7680M	3463-37
7681	**Harris**	**HM7681-2**	★3711
			3463-50
		HM7681-5	★3711
			3463-6
		HM7681A-2	★3711
			3463-7
		HM7681A-5	★3711
			3462-83
		HM7681P-2	★3711
			3463-51
		HM7681P-5	★3711
			3463-8
		HM7681R-2	★3711
			3463-52
		HM7681R-5	★3711
			3463-9
		HM7681RP-2	★3711
			3463-53
		HM7681RP-5	★3711
			3463-10
		HMI7681	★3740
	Motorola	MCM7681A	3462-86
		MCM7681C	3463-14
		MCM7681M	3463-39
76810	TI	SN76810	2907-8
76811	TI	SN76811	511-125
76812	TI	SN76812	2951-7
76831	TI	SN76831	2902-57
76832	TI	SN76832A	2902-58
7684	Harris	HM7684-2	3464-30
7684	Harris	HM7684-5	3464-10
		HM7684P-2	3464-31
		HM7684P-5	3464-11
	Motorola	MCM7684C	3464-13
		MCM7684M	3464-28
7685	**Harris**	**HM7685-2**	★3714
			3464-32
		HM7685-5	★3714
			3464-14
		HM7685A-5	★3714
			3463-111
		HM7685P-2	★3714
			3464-33
		HM7685P-5	★3714
			3464-15
		HMI7685	★3740
	Motorola	MCM7685A	3464-67
		MCM7685C	3464-18
		MCM7685M	3464-29
	Toshiba	TA7685	2898-18
7686	Motorola	MCM7686	3464-19
7687	Motorola	MCM7687	3464-20
7688	Motorola	MCM7688	3463-92
76881	TI	SN76881	2901-170
76882	TI	SN76882	2901-171
76889	TI	SN76889	2904-21
7689	Motorola	MCM7689	3463-93
76891	TI	SN76891	2901-172
76940	TI	SN76940	2949-45
7699	Rockwell	A7699	1088-96
76LS03	Harris	HM76LS03-5	3460-41
76LS52	National	DM76LS52	496-148
76LS641			
	Signetics	**76LS641**	★2772
76S128	National	DM76S128	3453-1
			3453-31
76S64	National	DM76S64	3453-2
			3453-32
770	Fujitsu	C770	4140-93
	Signetics	TCA770	2901-66
			2901-100
7700	CalDevices	HC7700	4140-40
	LSILogic	LC-7700	4140-141
7705	Motorola	MC7705C	2952-37
771	Fairchild	uAF771	2909-43
			2933-1
		uAF771A	2922-40
		uAF771AM	2922-41
		uAF771B	2927-27
		uAF771BM	2927-28
		uAF771L	2934-21
7710	NEC-Electron	uPD7710	2947-105
7711	NEC-Electron	uPD7711	2947-49
77153	**Harris**	**HPL77153**	★3747
			★3750
77161	**Harris**	**HPL77161**	★3747
77171	**Harris**	**HPL77171**	★3747
772	Fairchild	uAF772	2940-29
		uAF772A	2936-41
		uAF772AM	2936-42
		uAF772B	2938-9
		uAF772BM	2938-10
		uAF772L	2940-43
77209	**Harris**	**HPL77209/16L8**	
			★3747
			★3750
77210	**Harris**	**HPL77210/16R4**	
			★3747
77211	**Harris**	**HPL77211/16R6**	
			★3747
77215	**Harris**	**HPL77215/16H8**	
			★3747
			★3750
77216	**Harris**	**HPL77216/16P8**	
			★3747
			★3750
77317	**Harris**	**HPL77317/16LD8**	
			★3747
77318	**Harris**	**HPL77318/16HD8**	
			★3747
773181	**National**	**DM773181**	★3851
774	Fairchild	uAF774	2944-13
		uAF774B	2942-20
		uAF774BM	2942-21
		uAF774L	2944-20
7751	Sanyo	LA7751	2904-153
7755	Sanyo	LA7755	2904-154
776	Fairchild	uA776	2911-172
		uA776C	2911-157
			2912-29
			2939-24
		uA776M	2912-30
			2938-13
777	Intersil	uA777C	2928-28
	TI	uA777C	2928-27
		uA777M	2923-18
7770	SGS	TDA7770	2902-121
77800	**Harris**	**HPL77800**	★3747
77801	**Harris**	**HPL77801**	★3747
77903	**Harris**	**HPL77903**	★3747
77S180	**National**	**D77S180**	★3851
	National	DM77S180	3463-47
77S181	National	DM77S181	3463-56
77S184	National	DM77S184	3464-22
77S185	National	DM77S185	3464-23
77S188	National	DM77S188	3459-5
77S190	National	DM77S190	3464-108
77S191	National	DM77S191	3464-112
77S280	**National**	**DM77S280**	★3851
			3463-23
77S281	**National**	**DM77S281**	★3851
			3463-24
77S288	National	DM77S288	3459-6
77S291	National	DM77S291	3464-113
77S401	**National**	**DM77S401**	★3853
			3456-45
77S402	**National**	**DM77S402**	★3853
			3456-55
77SR181			
	National	**DM77SR181**	★3852
			3462-68
78	Fairchild	u78HG	2959-38
		uA78G	2959-37
		uA78H	2959-11
		uA78HG	2959-13
		uA78MG	2959-36
	National	**LM78LXX**	★3299
		LM78XX	★3299
	PMI	DAC-78E	2449-28
		DAC-78F	2449-29
		DAC-78G	2449-30
	Rockwell	MM78	1088-89
			¶ 246-17
		MM78EL	1055-13
			¶ 246-17
		MM78L	1088-91
			¶ 246-17
			1055-14
			¶ 246-17
		MM78LA	1088-92
			¶ 246-17
			1055-15
			¶ 246-17
		MM78LS	1088-93
			¶ 246-17
			1055-16
			¶ 246-17
780	NEC-Micro	uPD780	1097-36
			1071-12
		uPD780-1	1097-37
	Siemens	TCA780	2968-132
	TI	**TL780-05C**	★3433
			2952-100
		TL780-12C	★3433
			2954-83
		TL780-15C	★3433
			2955-40
7800	LSILogic	LSI-7800	4140-157
	National	DS7800	505-146
	NEC-Micro	uPD7800	1098-130
	Sanyo	LA7800	2905-103
78005	Toshiba	TA78005	2952-71
7801	NEC-Micro	uPD7801	1098-129
			1071-13
	Pro-Log	7801	1765-11
	Sanyo	LA7801	2905-64
78012	Toshiba	TA78012	2954-51
78015	Toshiba	TA78015	2955-13
7802	Pro-Log	7802	1759-31
	Sanyo	LA7802	2905-65
7803	National	DS7803	2484-5
	Pro-Log	7803A	1755-31
7804	Pro-Log	7804	1755-32
7805	Fairchild	uA7805C	2952-73
		uA7805M	2952-74
	Motorola	MC7805	2952-79
		MC7805A	2952-80
		MC7805AC	2952-81
		MC7805C	2952-82
	National	LM7805	2952-88
	NEC-Electron	uPC7805	2952-60
	SGS	L7805	2952-61
		L7805C	2952-62
	SiliconG	SG7805ACK	2952-93
		SG7805ACP	2952-66
		SG7805ACR	2952-94
		SG7805ACT	2952-46
		SG7805AK	2952-95
		SG7805AP	2952-67
		SG7805AT	2952-47
		SG7805CK	2952-96
		SG7805CP	2952-68
		SG7805CR	2952-97
		SG7805K	2952-98
		SG7805P	2952-69
7806	Fairchild	uA7806C	2953-19
	Motorola	MC7806	2953-23
		MC7806A	2953-24
		MC7806AC	2953-25
		MC7806C	2953-26
	Sanyo	LA7806	2905-66
	SiliconG	SG7806ACK	2953-31
		SG7806ACP	2953-15
		SG7806ACR	2953-32
		SG7806ACT	2953-9
		SG7806AK	2953-33
		SG7806AP	2953-16
		SG7806AT	2953-10
		SG7806CK	2953-34
		SG7806CP	2953-17
		SG7806CR	2953-35
		SG7806CT	2953-11
		SG7806K	2953-36
		SG7806P	2953-18
		SG7806T	2953-12
	TI	uA7806C	2953-38
7807	National	DS7807	2484-6
7808	Fairchild	uA7808C	2953-83
		uA7808M	2953-84
	Motorola	**MC7808**	★3294
			2953-89
		MC7808A	★3294
			2953-90
		MC7808AC	★3294
			2953-91
		MC7808C	★3294
			2953-92
	NEC-Electron	uPC7808	2953-112
	SiliconG	SG7808ACK	2953-97
		SG7808ACP	2953-113
		SG7808ACR	2953-98
		SG7808ACT	2953-77
		SG7808AK	2953-99
		SG7808AP	2953-114
		SG7808AT	2953-78
		SG7808CK	2953-100
		SG7808CP	2953-115
		SG7808CR	2953-101
		SG7808CT	2953-79
		SG7808K	2953-102
		SG7808P	2953-116
		SG7808T	2953-80
	TI	uA7808C	2953-104
7809	SGS	L7809	2953-127
781	NEC-Micro	uPD781	1100-98
7810	Epson	SVM7810	2899-89
	National	DS7810	484-85
	Nitron	NC7810	3455-40
	Sanyo	LA7810	2905-67
	TI	uA7810C	2954-7
7811	National	DS7811	484-86
7812	Fairchild	uA7812C	2954-52
		uA7812M	2954-53
	Motorola	**MC7812**	★3294
			2954-58
		MC7812A	★3294
			2954-59

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
7812	**Motorola**	**MC7812AC**	★3294
			2954-60
		MC7812C	★3294
			2954-61
	National	DS7812	484-152
		LM7812	2954-66
	NEC-Electron	uPC7812	2954-42
	SGS	L7812	2954-69
			2954-88
		L7812C	2954-70
			2954-89
	SiliconG	SG7812ACK	2954-76
		SG7812ACP	2954-77
		SG7812ACR	2954-47
		SG7812ACT	2954-35
		SG7812AK	2954-78
		SG7812AR	2954-48
		SG7812AT	2954-36
		SG7812CK	2954-79
		SG7812CP	2954-80
		SG7812CR	2954-49
		SG7812CT	2954-37
		SG7812K	2954-81
		SG7812R	2954-50
		SG7812T	2954-38
	TI	uA7812C	2954-84
7815	Fairchild	uA7815C	2955-14
		uA7815M	2955-15
	Motorola	**MC7815**	★3294
			2955-20
		MC7815A	★3294
			2955-21
		MC7815AC	★3294
			2955-22
		MC7815C	★3294
			2955-23
	National	LM7815	2955-28
	SGS	L7815	2955-7
		L7815C	2955-8
	SiliconG	SG7815ACK	2955-33
		SG7815ACP	2955-34
		SG7815ACR	2955-9
		SG7815ACT	2954-132
		SG7815AK	2955-35
		SG7815AR	2955-10
		SG7815AT	2954-133
		SG7815CK	2955-36
		SG7815CP	2955-37
		SG7815CR	2955-11
		SG7815CT	2954-134
		SG7815K	2955-38
		SG7815R	2955-12
		SG7815T	2955-1
	TI	uA7815C	2955-41
7817	SiliconG	SG7817AP	2955-80
7818	Fairchild	uA7818C	2955-84
		uA7818M	2955-85
	Motorola	**MC7818**	★3294
			2955-90
		MC7818A	★3294
			2955-91
		MC7818AC	★3294
			2955-92
		MC7818C	★3294
			2955-93
	NEC-Electron	uPC7818	2955-75
	SGS	L7818	2955-78
		L7818C	2955-79
	SiliconG	SG7818ACK	2955-98
		SG7818ACP	2955-81
			2955-99
		SG7818ACT	2955-71
		SG7818AK	2955-100
		SG7818AP	2955-82
		SG7818AT	2955-72
		SG7818CK	2955-101
		SG7818CP	2955-102
		SG7818CT	2955-73
		SG7818K	2955-103
		SG7818P	2955-83
		SG7818T	2955-74
	TI	uA7818C	2955-105
7819	National	DS7819	484-66
782	NEC-Micro	uPD782	1100-99
7820	National	DS7820	2475-7
			¶ 257-13
7820	National	DS7820	¶ 258-6
			¶ 259-4
		DS7820A	2475-1
			¶ 257-13
			¶ 258-6
			¶ 259-4
	SiliconG	SG7820ACT	2955-122
		SG7820AT	2955-123
		SG7820CT	2955-124
		SG7820K	2955-134
		SG7820R	2955-135
		SG7820T	2955-125
7822	National	DS7822	2473-6
	TI	uA7822C	2956-7
7824	Fairchild	uA7824C	2956-38
		uA7824M	2956-39
	Motorola	MC7824	2956-43
		MC7824A	2956-44
		MC7824AC	2956-45
		MC7824C	2956-46
	NEC-Electron	uPC7824	2956-28
	SGS	L7824	2956-32
		L7824C	2956-33
	SiliconG	SG7824ACK	2956-54
		SG7824ACP	2956-34
		SG7824ACR	2956-55
		SG7824ACT	2956-22
		SG7824AK	2956-56
		SG7824AP	2956-35
		SG7824AT	2956-23
		SG7824CK	2956-57
		SG7824CP	2956-36
		SG7824CR	2956-58
		SG7824CT	2956-24
		SG7824K	2956-59
		SG7824P	2956-37
		SG7824T	2956-25
	TI	uA7824C	2956-61
783	**TI**	**TL783C**	★3431
			2960-18
7830	National	DS7830	2471-53
			¶ 257-13
			¶ 258-6
			¶ 259-4
7831	National	DS7831	2469-39
			2471-62
			¶ 236-15
			¶ 237-7
			¶ 257-13
7832	National	DS7832	2469-30
			2472-1
			¶ 257-13
7833	National	DS7833	2477-45
			¶ 257-13
7834	National	DS7834	2477-40
			¶ 257-13
7835	National	DS7835	2477-38
			¶ 257-13
7836	National	DS7836	2473-37
			¶ 257-13
7837	National	DS7837	2473-56
			¶ 257-13
7838	AMD	AM7838	2477-36
	National	DS7838	2477-37
			¶ 257-13
7839	National	DS7839	2477-43
			¶ 257-13
7853	National	DM7853	500-135
78540	Motorola	uA78540	2961-2
7875	National	DM7875	475-160
	SGS	L7875	2953-57
		L7875C	2953-58
7880	National	DS7880	2465-64
	Pro-Log	7880	1757-13
7885	Fairchild	uA7885	2953-120
	Pro-Log	7885	1765-17
	TI	uA7885C	2953-121
7889	National	DS7889	2465-113
	Pro-Log	7889	1763-1
7899	Rockwell	MM7899	1088-90
78C120	National	DS78C120	2474-48
78C20	National	DS78C20	2475-8
78C29	National	MM78C29	464-143
			2472-28
78C30	National	MM78C30	464-108
			2471-37
78C75	SGS	L78C75C	2953-59
78H05	Fairchild	uA78H05	2952-128
		uA78H05A	2952-129
78H08	Fairchild	uA78H08C	2953-111
78H12	Fairchild	uA78H12	2954-99
78L00	**Motorola**	**MC78L00**	★3294
78L005	Toshiba	TA78L005	2952-15
		TA78L005A	2952-16
78L006	Toshiba	TA78L006	2953-1
		TA78L006A	2953-2
78L007	Toshiba	TA78L007	2953-51
		TA78L007A	2953-52
78L008	Toshiba	TA78L008	2953-66
		TA78L008A	2953-67
78L009	Toshiba	TA78L009	2953-125
		TA78L009A	2953-126
78L010	Toshiba	TA78L010	2953-133
		TA78L010A	2953-134
78L012	Toshiba	TA78L012	2954-22
		TA78L012A	2954-23
78L015	Toshiba	TA78L015	2954-120
		TA78L015A	2954-121
78L018	Toshiba	TA78L018	2955-64
		TA78L018A	2955-65
78L02	Motorola	MC78L02C	2952-2
	TI	uA78L02AC	2952-3
		uA78L02C	2952-4
78L020	Toshiba	TA78L020	2955-117
		TA78L020A	2955-118
78L024	Toshiba	TA78L024	2956-12
		TA78L024A	2956-13
78L05	Fairchild	uA78L05C	2952-6
	Motorola	MC78L05AC	2952-7
		MC78L05C	2952-8
	National	LM78L05A	2952-10
		LM78L05C	2952-11
	NEC-Electron	uPC78L05	2952-12
	TI	uA78L05AC	2952-13
		uA78L05C	2952-14
78L06	TI	uA78L06AC	2953-49
		uA78L06C	2953-50
78L075	Toshiba	TA78L075	2953-55
		TA78L075A	2953-56
78L08	Motorola	MC78L08AC	2953-61
		MC78L08C	2953-62
	NEC-Electron	uPC78L08	2953-63
	TI	uA78L08AC	2953-64
		uA78L08C	2953-65
78L09	Fairchild	uA78L09C	2953-122
	TI	uA78L09AC	2953-123
		uA78L09C	2953-124
78L10	TI	uA78L10AC	2953-131
		uA78L10C	2953-132
78L12	Fairchild	uA78L12C	2954-12
	Motorola	MC78L12AC	2954-13
		MC78L12C	2954-14
	National	DS78L12	505-151
		LM78L12A	2954-17
		LM78L12C	2954-18
	NEC-Electron	uPC78L12	2954-19
	TI	uA78L12AC	2954-20
		uA78L12C	2954-21
78L132	Toshiba	TA78L132	2954-103
		TA78L132A	2954-104
78L15	Fairchild	uA78L15C	2954-110
	Motorola	MC78L15AC	2954-111
		MC78L15C	2954-112
	National	LM78L15A	2954-115
		LM78L15C	2954-116
	NEC-Electron	uPC78L15	2954-117
	TI	uA78L15AC	2954-118
		uA78L15C	2954-119
78L18	Motorola	MC78L18AC	2955-62
		MC78L18C	2955-63
78L20	National	DS78L20	2474-55
78L24	Motorola	MC78L24AC	2956-10
		MC78L24C	2956-11
78L62	Fairchild	uA78L62C	2953-48
78L82	Fairchild	uA78L82C	2953-118
78LS120			
	National	DS78LS120	2474-46
78M00	**Motorola**	**MC78M00**	★3294
78M05	Fairchild	uA78M05C	2952-34
		uA78M05M	2952-35
	Motorola	MC78M05C	2952-38
	National	LM78M05	2952-40
78M05	NEC-Electron	uPC78M05	2952-41
	TI	uA78M05C	2952-48
		uA78M05M	2952-49
78M06	Fairchild	uA78M06C	2953-3
		uA78M06M	2953-4
	Motorola	MC78M06C	2953-6
	TI	uA78M06C	2953-13
		uA78M06M	2953-14
78M08	Fairchild	uA78M08C	2953-70
		uA78M08M	2953-71
	Motorola	MC78M08C	2953-73
	NEC-Electron	uPC78M08	2953-74
	TI	uA78M08C	2953-81
		uA78M08M	2953-82
78M10	TI	uA78M10C	2954-4
78M12	Fairchild	uA78M12C	2954-25
		uA78M12M	2954-26
	Motorola	MC78M12C	2954-28
	National	LM78M12	2954-30
	NEC-Electron	uPC78M12	2954-31
	TI	uA78M12C	2954-39
		uA78M12M	2954-40
78M15	Fairchild	uA78M15C	2954-123
		uA78M15M	2954-124
	Motorola	MC78M15C	2954-126
	National	LM78M15	2954-128
	NEC-Electron	uPC78M15	2954-129
	TI	uA78M15C	2955-2
		uA78M15M	2955-3
78M18	Motorola	MC78M18C	2955-67
	NEC-Electron	uPC78M18	2955-68
78M20	Motorola	MC78M20C	2955-119
	TI	uA78M20C	2955-126
		uA78M20M	2955-127
78M22	TI	uA78M22C	2956-6
78M24	Fairchild	uA78M24C	2956-15
		uA78M24M	2956-16
	Motorola	MC78M24C	2956-18
	NEC-Electron	uPC78M24	2956-19
	TI	uA78M24C	2956-26
		uA78M24M	2956-27
78P05	Fairchild	uA78P05	2952-134
78S05	SGS	L78S05	2952-105
		L78S05C	2952-106
78S09	SGS	L78S09	2953-128
		SL78S09C	2953-129
78S10	SGS	L78S10	2954-8
		L78S10C	2954-9
78S12	SGS	L78S12C	2954-90
78S15	SGS	L78S15	2955-44
		L78S15C	2955-45
78S18	SGS	L78S18	2955-109
		L78S18C	2955-110
78S24	SGS	L78S24	2956-66
		L78S24C	2956-67
78S40	Fairchild	uA78S40	2960-103
			¶ 281-14
		uA78S40M	2960-104
			¶ 281-14
	Motorola	**μA78S40**	★3297
78S75	SGS	L78S75	2953-60
78T00	**Motorola**	**MC78T00**	★3294
78T05	Motorola	MC78T05	2952-114
		MC78T05A	2952-115
		MC78T05AC	2952-116
		MC78T05C	2952-117
78T06	Motorola	MC78T06	2953-44
		MC78T06C	2953-45
78T08	Motorola	MC78T08	2953-106
		MC78T08C	2953-107
78T12	Motorola	MC78T12	2954-92
		MC78T12A	2954-93
		MC78T12AC	2954-94
		MC78T12C	2954-95
78T15	Motorola	MC78T15	2955-50
		MC78T15A	2955-51
		MC78T15AC	2955-52
		MC78T15C	2955-53
78T18	Motorola	MC78T18	2955-106
		MC78T18C	2955-107
78T24	Motorola	MC78T24	2956-63
		MC78T24C	2956-64
79	Fairchild	u79HGA	2960-22
		uA79G	2960-30
		uA79MG	2960-29
	National	**LM79LXX**	★3301

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
79	**National**	**LM79MXX**	**★3301**
		LM79XX	**★3301**
	Rockwell	MM79LS	1088-94
			1055-17
7900	Sanyo	LA7900	2905-77
	Telaris	7900	2948-123
7901	Polycore	PE7901	2465-4
7902	Motorola	MC7902C	2956-83
	Polycore	PE7902	2465-5
7904	Telaris	7904	2949-4
7905	Fairchild	uA7905C	2956-111
		uA7905M	2956-112
	Motorola	MC7905	2957-9
	Motorola	**MC7905C**	**★3294**
			2956-115
	National	LM7905	2956-119
	NEC-Electron	uPC7905	2956-107
	SiliconG	SG7905	2956-125
			2957-15
			2957-16
			2957-17
			2957-18
		SG7905A	2956-126
		SG7905C	2956-127
	TI	uA7905C	2956-128
79052	Motorola	MC79052C	2956-129
7906	**Motorola**	**MC7906C**	**★3294**
			2957-25
	TI	uA7906C	2957-26
7908	Fairchild	uA7908C	2957-37
		uA7908M	2957-32
	Motorola	**MC7908C**	**★3294**
			2957-39
	NEC-Electron	uPC7908	2957-40
	SiliconG	SG7908	2957-46
		SG7908A	2957-47
		SG7908AC	2957-48
		SG7908C	2957-49
	Telaris	7908	2949-6
	TI	uA7908C	2957-50
791	Fairchild	uA791C	2931-14
7910	**AMD**	**AM7910**	**★3121**
	Epson	7910	2899-80
7911	Matrix	7911-SP9	1761-28
7911CP3			
	Matrix	7911CP3	1761-14
7912	Fairchild	uA7912C	2957-81
		uA7912M	2957-82
	Motorola	**MC7912AC**	**★3294**
			2957-85
		MC7912C	**★3294**
			2957-86
	National	LM7912	2957-87
	NEC-Electron	uPC7912	2957-77
	SiliconG	SG7912	2957-93
		SG7912A	2957-94
		SG7912AC	2957-95
		SG7912C	2957-96
	TI	uA7912C	2957-97
7915	Fairchild	uA7915C	2957-126
		uA7915M	2957-127
	Motorola	**MC7915AC**	**★3294**
			2957-130
		MC7915C	**★3294**
			2957-131
	National	LM7915	2957-132
	NEC-Electron	uPC7915	2957-122
	SiliconG	SG7915	2958-4
		SG7915A	2958-5
		SG7915AC	2958-6
		SG7915C	2958-7
	TI	uA7915	2958-8
		uA7915C	2958-9
7916	Telaris	7916	2949-5
7918	**Motorola**	**MC7918C**	**★3294**
			2958-20
	NEC-Electron	uPC7918	2958-18
	SiliconG	SG7918	2958-27
		SG7918A	2958-28
		SG7918AC	2958-29
		SG7918C	2958-30
	TI	uA7918C	2958-31
792	NEC-Electron	uPD792	2964-57
	Plessey	SL792	2947-2
7920	Epson	7920	2899-81
	SiliconG	SG7920	2958-39
7920	SiliconG	SG7920A	2958-40
		SG7920AC	2958-41
		SG7920C	2958-42
7924	**Motorola**	**MC7924C**	**★3294**
			2958-54
	NEC-Electron	uPC7924	2958-52
	TI	uA7924C	2958-55
793	Plessey	SL793	2947-3
7930	Epson	7930	2899-82
794	NEC-Electron	uPD794	2964-58
7940	Epson	SVM7940	2899-83
7950	Epson	SVM7950	2899-84
7952	TI	uA7952C	2957-19
7960	Epson	SVM7960	2899-85
	Sanyo	LC7960	453-45
7961	Sanyo	LC7961	453-71
7970	Epson	SVM7970	2899-86
798	Fairchild	uA798	2913-52
		uA798C	2939-32
7990	**AMD**	**AM7990**	**★3127**
	Epson	SVM7990	2899-87
7991	**AMD**	**AM7991**	**★3127**
79E02	Fairchild	uA79E02	2956-85
		uA79E02C	2956-86
79L00	**Motorola**	**MC79L00**	**★3294**
79L03	Motorola	MC79L03AC	2956-87
		MC79L03C	2956-88
79L05	Motorola	MC79L05AC	2956-89
		MC79L05C	2956-90
	National	LM79L05	2956-92
		LM79L05A	2956-93
	TI	MC79L05AC	2956-94
79L12	Motorola	MC79L12AC	2957-57
		MC79L12C	2957-58
	National	LM79L12	2957-60
		LM79L12A	2957-61
	TI	MC79L12AC	2957-62
79L15	Motorola	MC79L15A	2957-118
		MC79L15AC	2957-100
		MC79L15C	2957-101
	National	LM79L15	2957-103
		LM79L15A	2957-104
	TI	MC79L15AC	2957-105
79L18	Motorola	MC79L18AC	2958-21
		MC79L18C	2958-15
79L24	Motorola	MC79L24AC	2958-48
		MC79L24C	2958-49
79M05	Fairchild	uA79M05C	2956-96
		uA79M05M	2956-97
	National	LM79M05	2956-101
	TI	uA79M05C	2956-105
		uA79M05M	2956-106
79M06	TI	uA79M06C	2957-22
		uA79M06M	2957-23
79M08	Fairchild	u79M08C	2957-31
	TI	uA79M08C	2957-35
		uA79M08M	2957-36
79M10	TI	uA79M10C	2957-53
		uA79M10M	2957-54
79M12	Fairchild	uA79M12C	2957-68
		uA79M12M	2957-69
	National	LM79M12	2957-71
	TI	uA79M12C	2957-72
		uA79M12M	2957-73
79M15	Fairchild	uA79M15C	2957-112
		uA79M15M	2957-113
	National	LM79M15	2957-115
	TI	uA79M15C	2957-116
		uA79M15M	2957-117
79M20	TI	uA79M20C	2958-34
		uA79M20M	2958-35
79M24	TI	uA79M24C	2958-50
		uA79M24M	2958-51
8	AMD	AMSYS8/8	1615-1
		AMSYS8/8000	1615-2
	AMD	**AMSYS8/8112**	**★1702**
			1615-3
		AMSYS8/8116	**★1702**
			1615-4
	Advent	P-8	4001-1
	Burr-Brown	MPC8D	2424-84
		MPC8S	2424-25
	Cromemco	**8PI/O**	**★1929**
	Datel	**ADC-EK8B**	**★2619**
			2428-46
8	**Datel**	**ADC-ET8BC**	**★2619**
			2428-50
		ADC-ET8BM	**★2619**
			2428-49
		ADC-MC8BC	**★2619**
			2429-43
	Datel	ADC-MC8BM	2429-44
	Datel	**DAC-HF8BMC**	**★2621**
		DAC-HF8BMM	**★2620**
			2441-20
		DAC-IC8BC	**★2621**
			2442-29
	Datel	DAC-IC8BM	2442-30
	Datel	**DAC-UP8BC**	**★2621**
			2443-4
	Datel	DAC-UP8BM	2443-5
	Datel	**HDAS-8MC**	**★2623**
			2432-12
			★2623
			2963-14
		HDAS-8MM	**★2620**
			2432-13
			★2620
			2963-15
		HDAS-8MR	**★2623**
	Datel	SHM-8MC	2967-75
	Fairchild	**F8**	**★1253**
			★1268
			1096-106
			¶ 238-6
			★1253
			★1268
			1061-23
			¶ 238-6
	Motorola	MG8PPS	4006-3
	Rockwell	PPS-8	1073-12
		PPS-8/2	1073-13
	Signetics	**ACE/CCL/8AXXX**	
			★4522
		E/CCL/8AXXX	**★4522**
	Stag	**PMG8**	**★4105**
	Synertek	Z8	1075-3
		Z8S	1075-18
	Synertek	**Z8SMCU**	**★1547**
			1097-24
	Western	SMP-E8	1765-26
	Zilog	**SCAN8**	**★1602**
		Z-SCAN8	**★1602**
		Z8-SCB	**★1582**
			★1603
			1755-13
80	**AD**	**ADADC80-12**	**★3174**
			2433-50
		ADADC80-15	**★3174**
			2431-1
		ADADC80Z-10	**★3174**
			2431-2
		ADADC80Z-12	**★3174**
			2433-51
		ADDAC80/CBI	**★3164**
			2452-24
			¶ 252-6
		ADDAC80/CCD	**★3164**
			2459-12
			¶ 252-6
	ApplSys	ACS/80	1763-32
	Bedford	MCS80-0013	1763-8
	Burr-Brown	ADC80-12	2434-3
		ADC80A-12	2434-4
		DAC80/CBI	2452-18
		DAC80/CCD	2459-22
		SHC80	2967-69
	DistComp	DCS/80	1620-2
	EMM	SECS80/10A	1763-23
		SECS80/30	1765-4
		SECS80/544	1765-5
		SECS80/86	1769-9
	Harris	**HIDAC80I**	**★2717**
	HybridSys	**HSDAC80CBI-I**	**★2747**
			2454-1
		HSDAC80CBI-V	**★2747**
			2454-9
	Intel	iSBC80/04	1763-33
		iSBC80/05	1763-34
		iSBC80/10B	1763-11
		iSBC80/20-4	1763-24
80	Intel	iSBC80/24	1763-28
		iSBC80/30	1763-25
	Kontron	**EPP-80**	**★4103**
			4006-2
	Kontron	MPP80	4005-4
	Matrox	ZBC-80	1755-29
	MicroEng	MCE80	2930-18
	National	BLC-80/05	1765-1
		BLC-80/07	1763-12
		BLC-80/10	1763-13
		BLC-80/11	1763-14
		BLC-80/116	1763-5
		BLC-80/11A	1763-15
		BLC-80/12	1763-16
		BLC-80/12A	1763-17
		BLC-80/14	1763-18
		BLC-80/14A	1763-19
		BLC-80/204	1763-27
		BLC-80/24	1765-19
		BLC-80/28	1765-20
		BLC-80/316	1757-1
	National	**BLMX-80C**	**★1949**
	National	CLB-80/11B	1763-20
		DAC80-CBI-V	2452-13
		DAC80Z-CBI-V	2452-14
	NEC-Micro	TK-80A	1763-26
	Pro-Log	System80	4008-3
	RELMS	RSBC-Z80SP	1757-17
		Z80SAM	1755-17
	SGS	Z80-CPU	1097-38
		Z80-CTC	1097-51
		Z80-DART	1097-95
		Z80-DMA	1097-65
		Z80-PIO	1097-71
		Z80-SIO	1097-81
		Z80/A	1073-22
		Z80A-CPU	1097-39
		Z80A-CTC	1097-52
		Z80A-DART	1097-96
		Z80A-DMA	1097-66
		Z80A-PIO	1097-72
		Z80A-SIO	1097-82
	Sunrise	**ZAP-80**	**★4107**
	Sunrise	ZAP80	4009-3
	Zendex	ZX-80/15	1765-18
	Zilog	**Z80**	**★1581**
			1097-41
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
			★1581
			1075-34
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80-CTC	**★1581**
			1097-53
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80-DART	**★1581**
			1097-97
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80-DMA	**★1581**

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
80	Zilog	Z80-DMA	1097-67
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80-MCB/16	★1581
			1755-18
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80-MCB/4	★1581
			1755-19
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80-SIO	★1581
			1097-83
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80-SIO/2	★1581
			1097-84
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80-SIO/9	★1581
			1097-85
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80A	★1581
			1097-42
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80A-CTC	★1581
			1097-54
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17

Base Number	Source	Device	Page-Line
80	Zilog	Z80A-CTC	¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80A-DART	★1581
			1097-98
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80A-DMA	★1581
			1097-68
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80A-PIO	★1581
			1097-74
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80A-SIO/1	★1581
			1097-86
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80A-SIO/2	★1581
			1097-87
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80A-SIO/9	★1581
			1097-88
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80B	★1581
			1097-43
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80B-CTC	★1581
			1097-55
			¶ 242-7

Base Number	Source	Device	Page-Line
80	Zilog	Z80B-CTC	¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80B-PIO	★1581
			1097-75
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80B-SIO/9	★1581
			1097-89
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80CPU	★1583
		Z80H	★1581
			1075-37
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80L	★1581
			1097-44
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
			★1581
			1075-38
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
		Z80MCB	★1581
			1755-20
			¶ 242-7
			¶ 242-10
			¶ 243-2
			¶ 243-16
			¶ 243-17
			¶ 244-2
			¶ 244-3
			¶ 244-4
800	Burr-Brown	DAC800-CBI-I	2452-5
		DAC800-CBI-V	2452-6
		MPC800	2424-83
	DiversTech	CBC800/204	1755-8
		CBC800/208	1755-9
		CBC800/216	1755-10
	Hitachi	TBA800	2897-13
	Miller	MCPU-800	1757-6
	National	NSC800	★1367
			1097-6
			¶ 240-16
			¶ 241-1
			★1367
			1071-7
			¶ 240-16
		NSC800-1	★1367
			1071-8

Base Number	Source	Device	Page-Line
800	National	NSC800-1	¶ 240-16
			¶ 241-1
		NSC800-2	★1367
			1071-9
			¶ 240-16
			¶ 241-1
		NSC800-4	★1367
			1071-10
			¶ 240-16
			¶ 241-1
	RCA	MSI800	★1959
	SGS	TBA800	2897-56
	Synapse	CPU-800	1755-11
	TeledyneS	TSC800AC	★2853
			2436-31
		TSC800AM	★2853
			2436-32
		TSC800BC	★2853
			2436-33
		TSC800BM	★2853
			2436-34
	Telefunken	TBA800	2897-80
	Unitrode	PIC800	★3446
			2961-96
8000	Holt	HI8000	1102-71
	Nitron	NC8000	1102-72
	RCA	MSI8000	★1959
	Rockwell	CRC8000	2948-30
	Signetics	8000	★1975
	Zilog	EMS8000	★1600
		PDS8000	★1601
			1633-4
		S8000	★1600
		SCAN8000	★1600
		STEM8000	★1599
		SYSTEM8000	★1599
		Z-SCAN8000	★1600
		Z8000	★1581
			★1601
			1099-70
			¶ 240-14
			¶ 243-8
			¶ 243-15
		Z8000MPU	★1581
			★1601
			1767-29
			¶ 240-14
			¶ 243-8
			¶ 243-15
80001	MicroEng	MT80001	★4440
			4141-27
			★4440
			464-84
8001	AMD	AMZ8001	1099-68
			¶ 240-15
			1077-16
			¶ 240-15
	Intersil	ICL8001C	2892-26
		ICL8001M	2891-58
	MonSys	MSC8001	1757-7
	Omnibyte	OB8001A	1761-15
	Rockwell	CRC8001	2948-31
	SEEQ	8001	★1492
			1100-108
	SGS	Z8001	1099-69
	Zilog	Z8001	★1587
			1099-71
			★1587
			1081-32
		Z8001A	★1587
			1099-72
			★1587
			1081-33
		Z8001B	★1587
			1099-73
8002	AMD	AMZ8002	1099-63
			¶ 240-15
			1077-17
			¶ 240-15
	SGS	Z8002	1099-64
	SSS	SND8002	1100-80
			¶ 233-1
	SMC	CRT8002	3453-58
			¶ 238-4
			¶ 239-7
			1100-81

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
8002	SMC	CRT8002	¶ 238-4
			¶ 239-7
	Tektronix	8002A	1631-4
	Zilog	**Z8002**	★**1587**
			1099-65
			★**1587**
			1083-1
		Z8002A	★**1587**
			1099-66
			★**1587**
			1083-2
		Z8002B	★**1587**
			1099-67
8003	**Zilog**	**Z8003**	★**1588**
			1099-74
			★**1588**
			1083-3
		Z8003A	★**1588**
			1099-75
		Z8003B	★**1588**
			1099-76
8004	MonSys	MSC8004/A	1757-8
	RCA	**MSI8004**	★**1959**
	SMC	COM8004	2467-1
	Zilog	**Z8004**	★**1588**
			1099-77
			★**1588**
			1083-4
		Z8004A	★**1588**
			1099-78
		Z8004B	★**1588**
			1099-79
8007	Intersil	ICL8007	2921-39
			¶ 253-16
			¶ 267-7
			¶ 277-1
		ICL8007AC	2911-30
			2935-7
			¶ 253-16
			¶ 267-7
			¶ 277-1
		ICL8007AM	2911-31
			2935-8
			¶ 253-16
			¶ 267-7
			¶ 277-1
		ICL8007C	2935-24
			¶ 253-16
			¶ 267-7
			¶ 277-1
		ICL8007M	2934-41
			¶ 253-16
			¶ 267-7
			¶ 277-1
	MonSys	MSC8007/A	1757-9
8008	Intel	8008	1065-12
	Intersil	ICL8008C	2930-25
		ICL8008M	2927-38
	RCA	**MSI8008**	★**1959**
8009	MonSys	MSC8009/A	1757-10
801	Burr-Brown	MPC801	2423-60
	Digelec	UPP-801	4002-3
	Harris	HIDAC801	2452-28
	Siemens	SM801	2948-101
	Unitrode	**PIC801**	★**3446**
			2961-97
8010	DistComp	DCS8010A	1765-31
	Fairchild	FCB8010	2898-119
	SGS	Z8010-MMU	1099-107
	Zilog	**Z8010-Z-MMU**	★**1589**
			1099-108
		Z8010A-Z-MMU	★**1589**
			1099-109
		Z8010B-Z-MMU	★**1589**
			1099-110
8012	**RCA**	**MSI8012**	★**1959**
8013	Intersil	ICL8013C	2964-158
			¶ 253-16
		ICL8013M	2964-159
			¶ 253-16
8015	Sanyo	LB8015	511-120
	Zilog	**Z8015-PAMU**	★**1589**
			1099-111
8016	AMD	AMZ8016	1099-90
	RCA	**MSI8016**	★**1959**

Base Number	Source	Device	Page-Line
8016	**Zilog**	**Z8016-Z-DTC**	★**1590**
			1099-91
8017	Intersil	ICL8017C	2931-24
		ICL8017M	2928-44
	SMC	COM8017	2487-66
8018	Intersil	ICL8018AC	2968-1
		ICL8018AM	2968-2
	SMC	COM8018	2487-67
8019	Intersil	ICL8019AC	2968-3
		ICL8019AM	2968-4
802	AdaptSci	802	1614-1
	National	**CIM-802**	★**1946**
			1755-7
	Siemens	SM802	2948-100
8020	Intel	8020H	1093-87
	Intersil	ICL8020AC	2968-5
		ICL8020AM	2968-6
	RCA	**MSI8020**	★**1959**
8021	AMD	AM8021	1093-86
	Intel	8021	1093-88
			¶ 239-6
		8021H	1093-89
			¶ 239-6
			1065-13
			¶ 239-6
	Intersil	ICL8021C	2912-2
			2912-51
		ICL8021M	2912-3
			2912-52
	NEC-Micro	uPD8021	1093-90
			1071-14
	Signetics	8021	1073-26
		SCN8021	1093-91
	SMC	CRT8021	1100-78
		CRT8021-003	1100-79
8022	Intel	8022	1093-92
			¶ 239-6
		8022H	1093-93
			¶ 239-6
	Intersil	ICL8022C	2912-60
			2939-26
		ICL8022M	2912-61
			2937-29
	NEC-Micro	uPD8022	1093-94
			1071-15
8023	**Harris**	**HA-8023-2**	★**3282**
			★**3287**
			2940-57
		HA-8023-5	★**3282**
			★**3287**
			2941-6
	Intersil	ICL8023C	2912-67
		ICL8023M	2912-68
	Panasonic	MN8023	2906-53
8024	**RCA**	**MSI8024**	★**1959**
8025	Panasonic	MN8025	510-59
	RCA	**MSI8025**	★**1959**
8026	Panasonic	MN8026	2964-50
8027	Panasonic	MN8027	2964-59
80286	Intel	80286	1097-144
80287	**Intel**	**80287**	★**1350**
803	**Digelec**	**UP-803**	★**4101**
			4002-4
	Dionics	DI803A	2465-77
	Panasonic	DN803	2890-150
8030	AMD	AMZ8030	1099-114
	Rockwell	CRC8030	2949-81
			¶ 269-11
			¶ 270-11
	SGS	Z8030-SCC	1099-115
	Zilog	**Z8030-Z-SCC**	★**1590**
			1099-116
		Z8030A-Z-SCC	★**1590**
			1099-117
8031	AMD	AM8031	1094-18
			1059-7
	Fujitsu	**MBL8031**	★**1307**
			1061-29
	Intel	8031	1065-14
			¶ 246-6
		8031AH	1094-19
			¶ 246-6
		M8031	1094-21
	Siemens	8031	1094-23
	Zilog	**Z8031-Z-ASCC**	★**1591**
			1100-63

Base Number	Source	Device	Page-Line
8032	Intel	8032	1065-15
8034	SGS	Z8034-UPC	1099-119
8035	**AMD**	**AM8035**	★**1232**
			1093-19
			★**1232**
			1059-8
	Fujitsu	MBL8035	1093-21
			1061-30
	Intel	8035H	1093-24
			¶ 239-6
			1065-16
			¶ 239-6
		8035HL	1065-17
			¶ 239-6
	National	INS8035	1093-30
			1069-27
		INS8035L	1093-31
			1069-28
	NEC-Micro	uPD8035L	1093-37
			1071-16
	OKI	MSM8035	1071-26
	Signetics	8035	1073-27
	Signetics	**SCN8035A**	★**1523**
			1093-41
	Toshiba	TMP8035	1093-43
			1075-25
8036	**AMD**	**8036**	★**1231**
	AMD	AMZ8036	1099-83
	SGS	Z8036-CIO	1099-84
	Zilog	**Z8036-Z-CIO**	★**1591**
			1099-85
		Z8036A-Z-CIO	★**1591**
			1099-86
8038	**AMD**	**8038**	★**1231**
	AMD	AMZ8038	1099-97
	Exar	**XR8038**	★**3198**
			2946-25
		XR8038A	★**3198**
			2946-26
		XR8038M	★**3198**
			2946-27
	Intersil	ICL8038C	2946-28
			¶ 277-4
		ICL8038M	2946-29
			¶ 277-4
	SGS	Z8038-FIO	1099-98
	Zilog	**Z8038-Z-FIO**	★**1592**
			1099-99
			¶ 242-9
8039	**AMD**	**AM8039**	★**1232**
			1093-20
			★**1232**
			1059-9
	Fujitsu	MBL8039	1093-22
			1061-31
	Intel	8039HL	1093-25
			¶ 239-6
			1065-18
			¶ 239-6
	National	INS8039	1093-32
			1069-29
		INS8039L	1093-33
			1069-30
	NEC-Micro	uPD8039L	1093-38
			1071-17
	OKI	MSM8039	1071-27
	Signetics	8039	1073-28
		SCN8039A	1093-42
	Toshiba	TMP8039	1093-44
			1075-26
		TMP8039-6	1093-45
804	Dionics	DI804A	2465-78
	RCA	**MSI804**	★**1959**
8040	Intel	8040AH	1093-26
		8040H	1065-19
	National	INS8040	1093-34
			1069-31
		INS8040L	1093-35
			1069-32
	Rockwell	R8040	2949-123
	Signetics	8040	1073-29
	Signetics	**N8040**	★**1523**
		SCN8040	★**1523**
8041	AMD	8041A	1096-59
	AMD	**AM8041A**	★**1235**

Base Number	Source	Device	Page-Line
8041	AMD	AM8041A	1094-1
			1095-99
	Fujitsu	MBL8041A	1094-2
			1095-100
			1096-60
	Intel	8041A	1096-61
			¶ 239-6
			¶ 243-7
		8041AH	1094-3
			1095-101
			1101-100
			¶ 239-6
			¶ 243-7
		8041AH-2	1094-4
			1095-102
			¶ 239-6
			¶ 243-7
	NEC-Micro	uPD8041	1094-11
			1095-105
			1096-63
		uPD8041A	1094-12
8042	Intel	8042	1094-5
			1101-102
8043	Intersil	ICL8043C	2940-56
			¶ 253-16
		ICL8043M	2940-55
			¶ 253-16
8044	Intel	8044	1101-82
8046	SMC	COM8046	510-18
			¶ 238-4
			2486-18
			¶ 238-4
		COM8046T	510-19
			¶ 238-4
			2486-19
			¶ 238-4
8048	AMD	8048	1093-47
	AMD	**AM8048**	★**1232**
			1093-48
			★**1232**
			1059-10
	Fujitsu	MBL8048	1093-50
			1061-32
	Intel	8048H	1093-53
			¶ 239-6
			¶ 243-7
			1065-20
			¶ 239-6
			¶ 243-7
		8048H-1	1093-54
			¶ 239-6
			¶ 243-7
		M8048	1093-59
	Intersil	ICL8048C	2887-133
			¶ 253-16
			¶ 268-16
	National	INS8048	1093-65
			¶ 241-6
			1069-33
			¶ 241-6
		INS8048L	1093-66
			¶ 241-6
			1069-34
			¶ 241-6
	NEC-Micro	uPD8048	1093-72
			1071-18
	OKI	MSM8048	1093-74
			1071-28
	Signetics	8048	1073-30
	Signetics	**SCN8048A**	★**1523**
			1093-78
	Toshiba	TMP8048	1093-80
			1075-27
8049	**AMD**	**AM8049**	★**1232**
			1093-49
			★**1232**
			1059-11
	Fujitsu	MBL8049	1093-51
			1061-33
	Intel	8049	1093-55
			¶ 239-6
			¶ 239-17
		8049H	1065-21
			¶ 239-6
			¶ 239-17
		M8049	1093-60

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
8049	Intersil	ICL8049C	2887-129
			¶ 253-16
			¶ 268-16
	National	INS8049	1093-67
			1069-35
		INS8049L	1093-68
			1069-36
	NEC-Micro	uPD8049	1093-73
			1071-19
	OKI	MSM8049	1093-75
			1071-29
	Signetics	8049	1073-31
	Signetics	**SCN8049A**	**★1523**
			1093-79
	Toshiba	TMP8049	1093-81
			1075-28
805	Dionics	DI805A	2465-79
	Kontron	MPP-805	4006-1
8050	Intel	8050AH	1093-56
			1065-22
	National	INS8050	1093-69
			1069-37
		INS8050L	1093-70
			1069-38
	Rockwell	R8050	2949-18
	Signetics	8050	1073-32
8051	AMD	AM8051	1094-24
			1059-12
	Fujitsu	**MBL8051**	**★1307**
			1063-1
	Intel	8051	1065-23
			¶ 246-6
		8051AH	1094-25
			¶ 246-6
		M8051	1094-28
	Intersil	8051	1094-29
	Siemens	8051	1094-31
8052	AMD	AMZ8052	1099-87
	Intel	8052	1094-26
			1065-24
	Intersil	ICL8052	2438-25
			¶ 256-16
			¶ 248-1
		ICL8052A	2436-21
			2436-29
			2437-6
			¶ 253-16
			¶ 256-16
			¶ 276-11
			¶ 277-1
			¶ 248-1
8053	Intersil	ICL8053	2438-26
		ICL8053A	2438-43
8059	**Signetics**	**N8059**	**★1523**
		SCN8059	**★1523**
8060	AMD	AMZ8060	1099-94
	National	INS8060	1096-130
			¶ 238-10
			¶ 239-11
			1069-39
			¶ 238-10
			¶ 239-11
	Rockwell	R8060	2949-17
	SGS	Z8060-FIFO	1099-95
	Zilog	**Z8060-Z-FIFO**	**★1592**
			1099-96
8063	Intersil	ICL8063C	2896-63
		ICL8063M	2896-64
8065	AMD	AMZ8065	1099-80
			1102-34
	Zilog	Z8065-Z-BEP	1099-81
8068	AMD	AMZ8068	1099-88
	Intersil	ICL8068	2438-27
			¶ 256-16
		ICL8068A	2438-44
			¶ 256-16
	Zilog	**Z8068-Z-DCP**	**★1593**
			1099-89
8069	Intersil	ICL8069	2966-25
		ICL8069M	2966-26
807	**Datel**	**MVD-807**	**★2622**
			2424-57
		MVD-807M	**★2622**
			2424-58
		MXD-807	**★2622**
			2424-85
807	**Datel**	**MXD-807M**	**★2622**
			2424-86
8070	National	INS8070	1093-85
			1069-40
8071	Sanyo	LM8071	2900-50
8072	National	INS8072	1093-83
			1069-41
8073	AMD	AMZ8073	1099-118
	Intersil	ICL8073	2968-21
	National	INS8073	1093-84
			1069-42
8074	Intersil	ICL8074	2968-22
808	**Datel**	**MV-808**	**★2622**
			2423-88
		MV-808M	**★2622**
			2423-89
		MX-808	**★2622**
			2424-27
		MX-808M	**★2622**
			2424-28
	PMI	DAC-808	2441-9
		DAC-808A	1102-1
		DAC-808B	1102-2
		DAC-808E	1102-3
		DAC-808F	1102-4
		DAC-808G	1102-5
	RCA	**MSI808**	**★1959**
8080	AMD	8080A-1	1094-33
		8080A-2	1094-34
		8080A-4	1094-35
	AMD	**AM8080A**	**★1233**
			1094-36
			★1233
			1059-13
	Intel	8080A	1094-39
			¶ 238-11
			¶ 238-18
			¶ 242-4
			¶ 243-11
			1065-25
			¶ 238-11
			¶ 238-18
			¶ 242-4
			¶ 243-11
		8080A-1	1094-40
			¶ 238-11
			¶ 243-11
		8080A-2	1094-41
			¶ 238-11
			¶ 243-11
		M8080A	1094-42
	National	INS8080A	1094-45
			¶ 253-8
			¶ 286-11
			¶ 287-12
			¶ 238-3
			¶ 246-13
			1069-43
			¶ 253-8
			¶ 286-11
			¶ 287-12
			¶ 238-3
			¶ 246-13
		INS8080A-1	1094-46
		INS8080A-2	1094-47
	NEC-Micro	uPD8080A	1094-48
		uPD8080A-1	1094-49
		uPD8080A-2	1094-50
		uPD8080AF	1071-20
8085	**AMD**	**AM8085A**	**★1234**
			1095-110
			★1234
			1059-14
	AMD	AM8085A-2	1095-111
	Intel	8085A	1095-113
			¶ 238-18
			¶ 240-8
			¶ 242-4
			¶ 246-7
			1065-26
			¶ 238-18
			¶ 240-8
			¶ 242-4
			¶ 246-7
		8085A-2	1095-114
			¶ 246-7
8085	Intel	8085AH	1095-115
			¶ 246-7
			1065-27
			¶ 246-7
		8085AH-2	1095-116
			¶ 246-7
		M8085A	1095-117
		M8085AH	1095-118
	NEC-Micro	uPD8085A	1095-120
		uPD8085A-2	1095-121
			1071-21
	OKI	**MSM8085A**	**★3873**
			1095-122
			★3873
			1071-30
	Toshiba	TMP8085A	1095-123
			1075-29
		TMP8085A-2	1075-30
8086	**AMD**	**8086**	**★1229**
			★1231
	AMD	AM8086	1097-138
			1077-15
		AM8086-1	1097-139
		AM8086-2	1097-140
	Fujitsu	**MBL8086**	**★1305**
			1097-141
			★1305
			1077-30
		MBL8086-1	**★1305**
			1097-142
			★1305
			1077-31
		MBL8086-2	**★1305**
			1097-143
			★1305
			1079-1
	Intel	8086	1097-145
			¶ 240-8
		8086-2	1098-1
			¶ 240-8
		M8086	1098-2
	Mostek	MK8086	1079-21
	NEC-Micro	uPD8086	1098-5
		uPD8086-2	1081-5
	Siemens	SAB8086	1081-8
		SAB8086C	1098-6
		SAB8086C-4C	1098-7
8087	**AMD**	**8087**	**★1231**
	Fujitsu	**MBL8087**	**★1305**
8088	**AMD**	**8088**	**★1231**
	AMD	AM8088	1098-58
			1059-15
	Fujitsu	**MBL8088**	**★1305**
			1098-59
			★1305
			1063-2
	Intel	8088	1098-60
		8088-2	1098-61
	NEC-Micro	uPD8088	1071-22
8089	**AMD**	**8089**	**★1231**
	AMD	AM8089	1077-9
	Fujitsu	**MBL8089**	**★1305**
			1098-9
	Intel	**8089**	**★1349**
			1098-10
			★1349
			1065-28
809	AdaptSci	809	1614-2
	National	ADC809	2429-20
	NEC-Electron	uPD809	2899-124
	TI	ADC809	2429-21
8090	National	DM8090	495-88
	Zilog	**Z8090-Z-UPC**	**★1593**
			1099-103
8091	National	DM8091	491-92
8092	National	DM8092	490-143
8093	National	DM8093	476-136
			¶ 237-7
8094	National	DM8094	476-110
			¶ 237-7
8095	National	DM8095	163
			485-18
8096	National	DM8096	111
			485-15
8097	National	DM8097	164
			485-18
8098	National	DM8098	112
			485-15
8099	National	DM8099	491-81
80A48	Intel	P80A48L	1093-61
80C31	Intel	80C31	1094-20
			1065-29
	Intersil	80C31	1094-22
80C35	Intel	80C35	1093-27
	NEC-Micro	uPD80C35	1071-23
	OKI	**MSM80C35**	**★3873**
			1093-39
			★3873
			1071-31
80C39	**Fujitsu**	**MBL80C39**	**★1307**
			1093-23
			★1307
			1063-3
	Intel	80C39	1093-28
			1065-30
	OKI	**MSM80C39**	**★3873**
			1093-40
			★3873
			1071-32
	Toshiba	TMP80C39	1075-31
		TMP80C39P-6	1093-46
80C48	Intel	80C48	1093-57
	National	NS80C48	1093-71
			1071-1
	NEC-Micro	uPD80C48	1093-9
			1071-24
	OKI	**MSM80C48**	**★3873**
			1093-76
			★3873
			1071-33
80C49	**Fujitsu**	**MBL80C49**	**★1307**
			1093-52
			★1307
			1063-4
	Intel	80C49	1093-58
			1065-31
	OKI	**MSM80C49**	**★3873**
			1093-77
			★3873
			1071-34
	Toshiba	TMP80C49	1075-32
		TMP80C49P-6	1093-82
80C51	Intel	80C51	1094-27
			1065-32
	Intersil	80C51	1094-30
80C85	**OKI**	**MSM80C85A**	**★3873**
			1071-35
80C86	**Harris**	**80C86**	**★ 669**
			★1333
			1079-3
80C95	National	MM80C95	450-107
80C96	National	MM80C96	450-173
80C97	National	MM80C97	450-108
80C98	National	MM80C98	450-174
80CX35	**National**	**NS80CX35**	**★1448**
			1093-36
			★1448
			1071-2
80CX48	**National**	**NS80CX48**	**★1448**
			1093-8
			★1448
			1071-3
81	PMI	RPT-81	2948-153
		SMP81E	2967-134
		SMP81F	2967-135
810	Hitachi	TBA810	2897-14
	National	MSC810	1097-9
	National	**NSC810**	**★1371**
	NEC-Electron	uPD810	2899-97
	RCA	CA810	2897-39
		CA810A	2897-40
		CA810AM	2897-41
		CA810M	2897-42
	SGS	TBA810	2897-57
			¶ 268-1
	Telefunken	TBA810	2897-81
	TI	TL810C	2891-59
		TL810M	2891-21
	Unitrode	**PIC810**	**★3446**
			2961-98
8100	National	MM8100	2947-113
8103	AMD	AMZ8103	1099-122

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
8104	AMD	AMZ8104	1099-123
	GTEMicro	M8104-2M	3479-94
	Rockwell	R8104-3	3479-108
8107	AMD	AMZ8107	1099-124
8108	AMD	AMZ8108	1099-125
	ETIMicro	8108	1763-29
	Zilog	**Z8108**	**★1584**
			1097-101
			★1584
			1075-39
811	NEC-Electron	uPD811	2899-44
	TI	TL811C	2893-42
		TL811M	2893-24
	Unitrode	**PIC811**	**★3446**
			2961-99
8114	Rockwell	R8114-3	3479-109
8116	Fujitsu	MB8116E	3469-4
		MB8116H	3468-92
	SMC	COM8116	510-7
			2486-50
		COM8116T	510-8
			2486-51
8117	Fujitsu	MB8117-10	3468-64
		MB8117-12	3468-72
8118	Fujitsu	MB8118-10	3468-65
		MB8118-12	3468-73
812	**RCA**	**MSI812**	**★1959**
8120	AMD	AMZ8120	1099-128
8121	AMD	AMZ8121	1099-131
	National	DM8121	500-2
8123	National	DM8123	499-67
8126	Sprague	ULN-8126	2961-50
		ULS-8126	2961-53
	SMC	COM8126	510-20
			2486-20
		COM8126T	510-21
			2486-21
8127	AMD	AMZ8127	1099-82
8128	Fujitsu	MB8128-10	3480-13
		MB8128-15	3480-51
8130	National	DM8130	474-136
8131	National	DM8131	474-77
8132	Fujitsu	MB8132E	3469-49
		MB8132H	3469-48
8133	AMD	AMZ8133	1099-126
8136	AMD	AMZ8136	1099-130
	National	DM8136	474-79
	SMC	COM8136	510-9
			2486-52
		COM8136T	510-10
			2486-53
8140	AMD	AMZ8140	1099-120
81416	**Fujitsu**	**MB81416-10**	**★3672**
			3469-39
		MB81416-12	**★3672**
			3469-40
		MB81416-15	**★3672**
			3469-41
8144	AMD	AMZ8144	1099-121
8146	SMC	COM8146	510-22
			2486-22
		COM8146T	510-23
			2486-23
8148	AMD	AMZ8148	1099-129
	Intel	8148	3483-42
815	**Datel**	**ADC-815MC**	**★2619**
			2426-32
		ADC-815MM	**★2618**
			2426-33
	NEC-Electron	uPD815	2899-45
8154	National	INS8154	1095-72
			1097-2
8155	**AMD**	**AM8155**	**★1235**
			1093-147
			1096-36
		AM8155-2	**★1235**
			1093-148
			1096-37
	Intel	8155	1093-151
			1096-40
		8155-2	1093-152
			1096-41
		8155H	1093-153
		8155H-2	1093-154
		M8155	1096-44
		M8155H	1093-159
8155	NEC-Micro	uPD8155	1093-160
			1096-47
	OKI	MSM8155	1096-49
	Toshiba	TMP8155	1093-162
8156	**AMD**	**AM8156**	**★1235**
			1093-149
			1096-38
		AM8156-2	**★1235**
			1093-150
			1096-39
	Intel	8156	1093-155
			1096-42
		8156-2	1093-156
			1096-43
		8156H	1093-157
		8156H-2	1093-158
	NEC-Micro	uPD8156	1093-161
			1096-48
	Toshiba	TMP8156	1093-163
816	**Datel**	**ADC-816MC**	**★2619**
			2430-11
		ADC-816MM	**★2618**
			2430-12
	NEC-Electron	uPD816	2899-46
	RCA	**MSI816**	**★1959**
8160	AMD	AMZ8160	1099-93
	National	DM8160	474-71
	Sprague	ULN-8160	2961-51
		ULS-8160	2961-54
8161	AMD	AMZ8161	1099-104
	Sprague	ULN-8161	2961-52
8162	AMD	AMZ8162	1099-105
8163	AMD	AMZ8163	1099-106
8164	AMD	AMZ8164B	1099-92
8165	AMD	AMZ8165	1099-112
8166	AMD	AMZ8166	1099-113
8167	**Fujitsu**	**MB8167A-45**	**★3675**
			3483-69
		MB8167A-55	**★3675**
			3483-74
		MB8167A-70	**★3675**
			3483-81
8168	**Fujitsu**	**MB8168-55**	**★3675**
			3481-81
		MB8168-70	**★3675**
			3483-21
817	**Datel**	**ADC-817MC**	**★2619**
			2431-33
		ADC-817MM	**★2618**
			2431-34
8173	AMD	AMZ8173	1099-127
818	Datel	MX-818	2424-21
	Datel	**MX-818C**	**★2622**
	Datel	MX-818M	2424-22
8185	Intel	8185	1096-50
		8185-2	1096-51
819	NEC-Electron	uPD819	2899-125
81C55	**OKI**	**MSM81C55**	**★3873**
81LS95	AMD	DM81LS95	477-40
	National	DM81LS95	477-44
81LS96	AMD	DM81LS96	478-29
	National	DM81LS96	478-33
81LS97	AMD	DM81LS97	477-41
	National	DM81LS97	477-45
81LS98	AMD	DM81LS98	478-30
	National	DM81LS98	478-34
82	Burr-Brown	ADC82A	2427-18
		DAC82K	2442-25
		DAC82S	2442-26
	HybridSys	HSADC82	2427-17
	MicroEng	MCE82	2940-48
	National	**LH0082**	**★3345**
820	Fairchild	TBA820	2896-77
	ITT	DF820	2947-162
	RCA	**MSI820**	**★1959**
	SGS	TBA820	2896-119
			¶ 268-2
		TBA820M	2896-120
			¶ 268-2
	TI	TL820C	2893-26
		TL820M	2893-2
8200	National	DM8200	474-33
	Raytheon	RC8200	502-9
		RM8200	502-10
8201	Raytheon	RC8201	502-11
		RM8201	502-12
8202	Intel	8202A	1094-131
			1095-140
			1098-26
			¶ 240-8
	National	INS8202	1094-96
	Raytheon	RC8202	503-10
		RM8202	503-11
	Signetics	N8202	503-12
		S8202	503-13
8203	Intel	8203	1094-132
			1095-141
			1098-27
	National	INS8203	1094-97
	Raytheon	RC8203	503-14
		RM8203	503-15
8204	Cherry	CS8204	2949-106
	Mitel	ML8204	2949-108
8205	Cherry	CS8205	2949-107
	Intel	8205	1093-107
			1094-125
			1095-139
	Mitel	ML8205	2949-109
8206	Intel	8206	1094-135
			1102-39
	Western	**WD8206**	**★3995**
			2467-12
8207	Intel	8207	1100-61
	Western	**WD8207**	**★3996**
			2480-150
8208	National	INS8208	1094-90
821	ITT	DF821	2947-163
8210	National	DM8210	500-8
			¶ 235-12
8211	Intersil	ICL8211C	2968-56
			¶ 253-16
			¶ 280-8
		ICL8211M	2968-57
			¶ 253-16
			¶ 280-8
	National	DM8211	500-9
8212	AMD	8212C	1094-154
			¶ 247-16
		8212M	1094-155
			¶ 247-16
	Intel	8212	1094-157
			¶ 238-11
		M8212	1094-158
	Intersil	ICL8212C	2968-58
			¶ 253-16
			¶ 280-8
		ICL8212M	2968-59
			¶ 253-16
			¶ 280-8
	National	DP8212	1094-160
			1097-4
			¶ 246-13
		DP8212M	1094-161
			¶ 246-13
		INS8212	1094-162
			1097-5
	NEC-Micro	uPB8212	1094-164
	TeledyneS	TSC8212A	2464-134
8214	Intel	8214	1093-122
		M8214	1102-66
	National	DM8214	497-138
			¶ 237-7
	NEC-Micro	uPB8214	1093-123
			1102-69
8216	AMD	8216	1094-69
		M8216	1094-73
	Fujitsu	MB8216E	3468-80
	Intel	8216	1093-98
			1094-75
			1095-125
		M8216	1094-77
	National	DP8216	1094-83
			¶ 246-13
		DP8216M	1094-84
			¶ 246-13
		INS8216	1094-91
	NEC-Micro	uPB8216	1093-100
			1094-93
			1095-127
8218	Intel	8218	1094-95
8219	Intel	8219	1095-129
	National	DM8219	500-90
822	ITT	DF822	2947-164
8220	National	DM8220	509-27
8223	National	DM8223	483-147
8224	AMD	8224C	1094-99
		8224M	1094-100
	Intel	8224	1094-101
			¶ 238-11
		M8224	1094-102
	National	DP8224	1094-103
			¶ 246-13
		INS8224	1094-104
	NEC-Micro	uPB8224	1094-105
8226	AMD	8226	1094-70
		M8226	1094-74
	Intel	8226	1093-99
			1094-76
			1095-126
		M8226	1094-78
	National	DP8226	1094-85
			¶ 246-13
		DP8226M	1094-86
			¶ 246-13
		INS8226	1094-92
	NEC-Micro	uPB8226	1093-101
			1094-94
			1095-128
8228	AMD	8228C	1095-84
		8228M	1095-85
	Intel	8228	1095-88
			¶ 238-11
		M8228	1095-90
	National	DP8228	1095-92
			¶ 246-13
		DP8228M	1095-93
			¶ 246-13
		INS8228	1095-96
	NEC-Micro	uPB8228	1095-15
	TI	**TIM8228**	**★3980**
			1095-18
823	ITT	DF823	2947-165
8230	National	DM8230	482-92
			¶ 237-7
	Raytheon	RC8230	499-127
		RM8230	499-129
	Signetics	N8230	499-131
8231	**AMD**	**8231A**	**★1231**
	Intel	8231A	1090-77
			1094-62
		M8231A	1094-63
	Raytheon	RC8231	499-140
		RM8231	499-141
8232	**AMD**	**8232**	**★1231**
	Intel	8232	1094-136
			1102-41
	Raytheon	RC8232	499-128
		RM8232	499-130
8233	Raytheon	RC8233	499-15
		RM8233	499-16
	Signetics	N8233	499-19
		S8233	499-21
8234	Raytheon	RC8234	498-74
		RM8234	498-75
	Signetics	N8234	498-76
		S8234	498-77
8235	Signetics	N8235	498-67
8237	**AMD**	**8237A**	**★1231**
	Intel	8237	1101-74
		8237A	1096-5
		8237A-4	1096-6
		8237A-5	1096-7
8238	AMD	8238C	1095-86
		8238M	1095-87
	Intel	8238	1095-89
	National	DP8238	1095-94
			¶ 246-13
		DP8238M	1095-95
			¶ 246-13
		INS8238	1095-97
	TI	**TIM8238**	**★3980**
			1095-19
824	NEC-Electron	uPD824	2899-180
	RCA	**MSI824**	**★1959**
8241	Motorola	MC8241	495-14
	Raytheon	RC8241	495-18
		RM8241	495-19
	Signetics	S8241	494-169

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
8242	Motorola	MC8242	495-65
	Raytheon	RC8242	495-66
		RM8242	495-67
	Signetics	N8242	495-69
			495-79
		S8242	495-80
8243	Fujitsu	MBL8243	1093-115
		MBL8243E	1094-146
		MBL8243N	1094-147
	Intel	8243	1093-116
			1094-150
			1095-153
		M8243	1093-117
	National	INS8243	1093-118
	NEC-Micro	uPD8243	1093-119
			1095-155
	Raytheon	RC8243	508-103
		RM8243	508-104
	Toshiba	TMP8243P	1094-151
8244	National	INS8244	1095-9
8245	National	INS8245	1095-10
8246	National	INS8246	1095-11
8247	National	INS8247	1094-129
8248	National	INS8248	1094-130
825	**Datel**	**ADC-825MC**	★**2619**
			2426-44
		ADC-825MM	★**2618**
			2426-45
	RCA	**MSI825**	★**1959**
8250	Motorola	MC8250	482-113
	National	DP8250	1094-64
		INS8250	2487-73
			¶ 238-3
			1094-65
			1096-135
			¶ 238-3
	Raytheon	RC8250	482-115
		RM8250	482-116
	Signetics	N8250	482-117
		S8250	482-119
	Western	**8250**	★**2873**
		WD8250	★**2873**
			2486-16
82501	Intel	82501	1101-50
8251	**AMD**	**8251A**	★**1231**
		AM8251	★**1236**
			1095-21
			1096-1
		AM8251A	★**1236**
			1093-124
	Intel	8251	2487-8
			¶ 238-11
			1093-7
			¶ 238-11
		8251A	1093-125
			1095-23
			1096-2
			¶ 238-11
		M8251A	1095-24
	Mitel	MT8251	2949-110
	National	INS8251	1095-26
			1096-136
			¶ 246-13
	NEC-Micro	uPD8251	2487-9
			1093-126
			1095-27
			1096-4
		uPD8251A	1095-28
	Raytheon	RC8251	483-14
		RM8251	483-16
	SMC	COM8251A	1095-34
			¶ 238-4
8252	Raytheon	RC8252	483-15
		RM8252	483-17
	Signetics	N8252	483-20
8253	**AMD**	**8253**	★**1231**
		AM8253	★**1236**
			1093-134
			1095-53
		AM8253-5	★**1236**
			1096-25
	Intel	8253	1093-135
			1095-54
			1101-76
		8253-5	1096-26
		M8253	1096-23
8253	National	INS8253	1095-55
		INS8253-5	1095-56
			1096-27
	NEC-Micro	uPD8253	1093-136
			1095-57
			1096-28
		uPD8253-5	1093-137
			1095-58
			1096-29
8254	Intel	8254	1095-36
			1101-77
	National	INS8254	1095-64
			1096-134
8255	**AMD**	**8255A**	★**1231**
		AM8255A	★**1237**
			1093-138
			1095-59
	AMD	AM8255A-5	1093-139
			1095-60
			1096-31
	Intel	8255A	1093-140
			1095-62
			1101-79
		8255A-5	1096-32
		M8255A	1095-63
	National	INS8255	1095-65
			1097-1
			¶ 246-13
	NEC-Micro	uPD8255	1093-142
			1095-66
		uPD8255A-5	1093-143
			1095-67
			1096-33
	OKI	MSM8255A	1095-68
8256	Intel	8256	1095-14
8257	**AMD**	**AM8257**	★**1238**
			1095-37
			1096-9
	Intel	8257	1095-41
			1096-11
			1101-75
			¶ 238-11
			¶ 238-18
			2486-16
		8257-5	1095-42
			1096-12
			¶ 238-11
			¶ 238-18
		M8257	1095-43
			1096-13
	NEC-Micro	uPD8257	1095-44
			1096-14
		uPD8257-5	1095-45
			1096-15
82586	**Intel**	**82586**	★**1350**
			1101-51
8259	**AMD**	**8259A**	★**1231**
	Fujitsu	**MBL8259A**	★**1305**
			1098-31
	Intel	8259	1093-127
		8259-5	1093-128
		8259A	1093-129
			1095-47
			1096-16
			1098-32
		8259A-2	1093-130
			1095-48
			1096-17
		8259A-8	1093-131
			1095-49
			1096-18
		M8259A	1096-19
		M8259H	1093-141
	National	INS8259	1095-50
	NEC-Micro	uPD8259	1093-132
			1095-51
			1096-21
		uPD8259-5	1093-133
			1095-52
			1096-22
		uPD8259A	1098-33
826	**Datel**	**ADC-826MC**	★**2619**
			2430-21
		ADC-826MM	★**2618**
			2430-22
	NEC-Electron	uPD826	2899-126
8260	Motorola	MC8260	474-169
8260	Raytheon	RC8260	474-170
		RM8260	474-171
8261	Motorola	MC8261	474-138
	Raytheon	RC8261	474-139
		RM8261	474-140
8262	Raytheon	RC8262	508-162
		RM8262	508-163
	Signetics	N8262	508-166
		S8262	509-1
8263	Raytheon	RC8263	499-115
		RM8263	499-116
8264	**Fujitsu**	**MB8264-15**	★**3673**
			3469-84
		MB8264-20	★**3673**
			3470-11
		MB8264A-10	★**3673**
			3469-67
		MB8264A-12	★**3673**
			3469-75
	Raytheon	RC8264	499-117
		RM8264	499-118
8265	**Fujitsu**	**MB8265-15**	★**3673**
			3469-85
		MB8265-20	★**3673**
			3470-12
		MB8265A-10	★**3673**
			3469-68
		MB8265A-12	★**3673**
			3469-76
8266	**Fujitsu**	**MB8266A-10**	★**3673**
			3469-69
		MB8266A-12	★**3673**
			3469-77
	Motorola	MC8266	498-69
	Raytheon	RC8266	498-70
		RM8266	498-71
	Signetics	N8266	498-72
		S8266	498-73
8267	Motorola	MC8267	499-63
	Raytheon	RC8267	499-64
		RM8267	499-65
827	**Datel**	**ADC-827MC**	★**2621**
			2431-38
		ADC-827MM	★**2618**
			2431-39
8270	Motorola	MC8270	501-105
			3488-57
	Raytheon	RC8270	501-106
			3488-59
		RM8270	501-107
			3488-61
	Signetics	S8270	487-67
			3488-53
82707	Motorola	MCM82707C	3463-2
		MCM82707M	3463-38
82708	Motorola	MCM82708C	3463-15
		MCM82708M	3463-40
8271	Intel	8271	1093-109
			1094-138
			1095-147
			1101-37
		8271-6	1093-110
	Motorola	MC8271	501-113
			3488-58
	Raytheon	RC8271	501-114
			3488-60
		RM8271	501-115
			3488-62
	Signetics	N8271	501-116
			3488-52
		S8271	501-117
			3488-54
8272	Intel	8272A	1101-126
82720	**Intel**	**82720**	★**1350**
			1101-45
8273	Intel	8273	1093-167
			1095-78
			1096-57
	Raytheon	RC8273	503-21
			3491-36
		RM8273	503-22
			3491-37
	Signetics	N8273	503-23
			3491-38
		S8273	503-24
8274	Intel	8274	1095-82
			1101-129
	Raytheon	RC8274	503-18
			3491-33
		RM8274	503-19
			3491-34
	Signetics	N8274	503-20
		S8274	3491-35
8275	**AMD**	**8275**	★**1231**
	Intel	8275	1093-104
			1094-109
			1095-131
			1101-72
			¶ 238-11
	Western	**8275**	★**2879**
		WD8275	★**2879**
			1101-73
8276	Intel	8276	1094-110
			1101-85
	Western	**8276**	★**2878**
		WD8276	★**2878**
			1100-73
8277	Raytheon	RC8277	503-5
			3491-28
		RM8277	503-6
			3491-29
	Signetics	N8277	503-7
			3491-30
8279	**AMD**	**8279**	★**1231**
		AM8279	★**1239**
			1095-1
		AM8279-5	★**1239**
			1095-2
		AM8279-8	★**1239**
			1095-3
	Intel	8279	1095-4
			1101-48
			¶ 238-11
		8279-5	1095-5
			¶ 238-11
	NEC-Micro	uPD8279-5	1095-8
828	NEC-Electron	uPD828	2899-127
8280	National	DM8280	480-96
	Raytheon	RC8280	480-98
		RM8280	480-100
	Signetics	N8280	480-102
		S8280	480-103
8281	Motorola	MC8281	478-52
	National	DM8281	478-59
	Raytheon	RC8281	478-61
		RM8281	478-63
	Signetics	N8281	478-65
		S8281	478-66
8282	**Fujitsu**	**MBL8282**	★**1305**
			1098-50
	Intel	8282	1098-52
		M8282	1098-53
	NEC-Micro	uPD8282	1098-55
8283	**Fujitsu**	**MBL8283**	★**1305**
			1098-45
	Intel	8283	1098-46
		M8283	1098-47
	NEC-Micro	uPD8283	1098-49
8284	**AMD**	**8284A**	★**1231**
	Fujitsu	**MBL8284A**	★**1305**
			1098-20
	Intel	8284A	1098-21
		8284A-1	1098-22
		M8284	1098-23
	NEC-Micro	uPD8284	1098-25
	Raytheon	RC8284	480-30
		RM8284	480-31
	Signetics	S8284	480-32
8285	Raytheon	RC8285	481-88
		RM8285	481-89
8286	**AMD**	**8286**	★**1231**
	Fujitsu	**MBL8286**	★**1305**
			1098-39
	Intel	8286	1098-41
		M8286	1094-14
			1095-107
			1096-65
			1098-42
	NEC-Micro	uPD8286	1098-44
8287	**AMD**	**8287**	★**1231**

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
8287	**Fujitsu**	**MBL8287**	**★1305**
			1098-34
	Intel	8287	1098-35
		M8287	1094-15
			1095-108
			1096-66
			1098-36
	NEC-Micro	uPD8287	1098-38
8288	**AMD**	**8288**	**★1231**
	Fujitsu	**MBL8288**	**★1305**
			1098-15
	Intel	8288	1098-16
		M8288	1098-17
	National	DM8288	482-25
	NEC-Micro	uPD8288	1098-19
8289	**AMD**	**8289**	**★1231**
	Fujitsu	**MBL8289**	**★1305**
			1098-11
	Intel	8289	1098-12
		M8289	1098-13
82891	National	INS82891	1101-41
82893	National	INS82893	1101-42
829	NEC-Electron	uPD829	2899-181
	Panasonic	AN829	2962-79
		AN829S	2962-80
8290	National	DM8290	480-97
	Raytheon	RC8290	480-99
		RM8290	480-101
8291	Intel	8291	1093-114
		8291A	1094-143
			1095-152
			1098-28
	National	DM8291	478-60
	Raytheon	RC8291	478-62
		RM8291	478-64
8292	Intel	8292	1094-142
			1095-151
8293	Intel	8293	1094-144
8294	Intel	8294	1094-122
			1102-36
	National	INS8294	1094-57
8295	Intel	8295	1100-97
			¶ 240-9
82C06	National	INS82C06	1094-152
82C08	National	MM82C08	505-116
82C12	**OKI**	**MSM82C12**	**★3873**
82C19	National	MM82C19	462-7
82C43	Intersil	IM82C43I	1094-148
		IM82C43M	1094-149
82C53	**OKI**	**MSM82C53**	**★3873**
82C54	**Harris**	**82C54**	**★ 669**
			★1333
			★1335
82C55	**Harris**	**82C55A**	**★ 669**
			★1333
			★1336
	OKI	**MSM82C55**	**★3873**
82C59	**Harris**	**82C59A**	**★ 669**
			★1333
			★1337
82C82	**Harris**	**82C82**	**★1333**
			★1338
	Harris	HD82C82	1098-51
82C84	**Harris**	**82C84A**	**★ 669**
			★1333
			★1339
82C86	Harris	HD82C86	1098-40
82C88	**Harris**	**82C88**	**★ 669**
			★1333
			★1340
82HM137			
	Intersil	82HM137C	3484-28
		82HM137M	3484-29
82HM141			
	Intersil	82HM141C	3484-9
		82HM141M	3484-10
82HM181			
	Intersil	82HM181C	3484-34
		82HM181M	3484-38
82HM185			
	Intersil	82HM185M	3484-106
82HM191			
	Intersil	82HM191C	3484-111
		82HM191M	3484-114

Base Number	Source	Device	Page-Line
82HS137			
	Signetics	N82HS137	3462-2
			3462-2
82HS180			
	Signetics	N82HS180	3462-100
		S82HS180	3463-32
82HS181			
	Intel	82HS181	3462-85
	Signetics	S82HS181	3463-35
82HS185			
	Signetics	S82HS185	3464-25
82HS191			
	Intel	82HS191	3464-77
82HS195			
	Signetics	N82HS195	3465-97
		S82HS195	3466-5
82HS321			
	Intel	82HS321	3466-16
82L16	**Signetics**	**82L16**	**★3938**
82LS05	National	INS82LS05	1094-127
82LS16	Signetics	S82LS16	3473-10
82LS17	**Signetics**	**82LS17**	**★3938**
	Signetics	S82LS17	3473-8
82LS181			
	Signetics	N82LS181	3463-64
		S82LS181	3463-68
82PC08	National	MM82PC08	505-117
			1097-7
82PC12	National	MM82PC12	1094-163
82PS181			
	Signetics	82PS181	3463-59
82S09	Signetics	N82S09A	3472-29
		S82S09	3472-36
			3472-36
82S100	Motorola	MC82S100C	3458-21
		MC82S100M	3458-25
	Signetics	**82S100**	**★3911**
	Signetics	N82S100	507-12
			3458-22
		S82S100	507-14
			3458-26
82S101	Motorola	MC82S101C	3458-17
		MC82S101M	3458-23
	Signetics	**82S101**	**★3911**
	Signetics	N82S101	507-13
			3458-18
		S82S101	507-15
			3458-24
82S102	**Signetics**	**82S102**	**★3913**
	Signetics	N82S102	3457-71
		S82S102	3457-73
82S103	**Signetics**	**82S103**	**★3913**
	Signetics	N82S103	3457-72
		S82S103	3457-74
82S104	**Signetics**	**82S104**	**★3915**
	Signetics	N82S104	3457-109
		N82S104A	3457-103
			3457-110
		S82S104	3457-104
			3457-111
		S82S104A	3457-105
			3457-112
82S105	Signetics	N82S105	3457-113
		N82S105A	3457-106
			3457-114
		S82S105	3457-107
			3457-115
		S82S105A	3457-108
82S106	Signetics	N82S106	3458-1
82S107	Signetics	N82S107	3458-2
82S115	Signetics	N82S115	3461-44
		S82S115	3461-89
82S123	Signetics	N82S123	3459-42
		S82S123	3459-53
82S126	Signetics	N82S126	3459-87
		S82S126	3459-115
82S129	Signetics	N82S129	3459-89
		S82S129	3459-117
82S130	Signetics	N82S130	3460-54
		S82S130	3460-87
82S131	Signetics	N82S131	3460-59
		S82S131	3460-92
82S137	**Signetics**	**82S137**	**★3926**
	Signetics	N82S137B	3461-107
			3461-107

Base Number	Source	Device	Page-Line
82S141	Signetics	N82S141	3461-45
		S82S141	3461-90
82S147	**Signetics**	**82S147**	**★3928**
	Signetics	N82S147A	3461-14
82S150	**Signetics**	**82S150**	**★3917**
			3457-69
	Signetics	S82S150	3457-75
82S151	**Signetics**	**82S151**	**★3917**
			3457-70
	Signetics	N82S151	3457-78
		S82S151	3457-76
82S152	**Signetics**	**82S152**	**★3919**
			3457-67
	Signetics	N82S152	3457-81
		N82S152A	3457-79
		S82S152	3457-85
		S82S152A	3457-83
82S153	**Signetics**	**82S153**	**★3919**
			3457-68
	Signetics	N82S153	3457-82
		N82S153A	3457-80
		S82S153	3457-86
		S82S153A	3457-84
82S154	**Signetics**	**82S154**	**★3921**
	Signetics	N82S154	3457-97
		S82S154	3457-91
82S155	**Signetics**	**82S155**	**★3921**
	Signetics	N82S155	3457-100
		S82S155	3457-94
82S156	**Signetics**	**82S156**	**★3921**
	Signetics	N82S156	3457-98
		S82S156	3457-92
82S157	**Signetics**	**82S157**	**★3921**
	Signetics	N82S157	3457-101
		S82S157	3457-95
82S158	**Signetics**	**82S158**	**★3921**
	Signetics	N82S158	3457-99
		S82S158	3457-93
82S159	**Signetics**	**82S159**	**★3921**
	Signetics	N82S159	3457-102
		S82S159	3457-96
82S16	Signetics	S82S16	3473-19
82S17	Signetics	S82S17	3473-18
82S180	Signetics	N82S180	3463-4
		S82S180	3463-48
82S181	Intel	82S181	3463-12
	Signetics	**82S181**	**★3930**
	Signetics	N82S181	3463-19
		N82S181A	3462-93
		N82S181B	3462-77
		S82S181	3463-60
		S82S181A	3463-36
82S183	Signetics	N82S183	3462-111
		S82S183	3463-61
82S185	**Signetics**	**82S185**	**★3932**
	Signetics	N82S185	3464-38
		N82S185A	3463-114
		N82S185B	3463-108
		S82S185	3464-39
		S82S185A	3464-26
82S19	Signetics	N82S19	3472-31
		S82S19	3472-34
			3472-34
82S191	Intel	82S191	3464-99
	Signetics	**82S191**	**★3934**
	Signetics	N82S191	3464-115
		N82S191A	3464-6
		S82S191	3464-120
		S82S191A	3464-27
82S195	**Signetics**	**82S195**	**★3936**
82S21	Signetics	N82S21	497-57
			3471-122
82S210	Signetics	N82S210	3475-15
		S82S210	3475-17
82S212	**Signetics**	**82S212**	**★3924**
	Signetics	N82S212A	3475-13
		S82S212	3475-16
82S23	Signetics	N82S23	3459-35
		S82S23	3459-51
82S25	Signetics	N82S25	3471-45
		S82S25	3471-78
82S2708			
	Signetics	S82S2708	3463-62
82S30	Signetics	S82S30	499-135
82S31	Signetics	S82S31	499-136
82S32	Signetics	S82S32	499-137

Base Number	Source	Device	Page-Line
82S321	Intel	82S321	3466-18
	Signetics	N82S321	3466-32
82S41	Signetics	N82S41	495-5
82S42	Signetics	N82S42	495-83
82S50	Signetics	N82S50	482-120
82S52	Signetics	N82S52	483-39
82S62	**AMD**	**82S62C**	**★1227**
			509-13
		82S62M	**★1227**
			509-14
	Signetics	N82S62	509-23
82S71	Signetics	N82S71	501-120
82S82	Signetics	N82S82	476-93
82S83	Signetics	N82S83	474-15
83	MicroEng	MCE83	2940-49
830	Datel	ADC-830	2428-26
	Datel	**ADC-830C**	**★2621**
		ADC830	**★2615**
	Motorola	**MC830**	**★ 729**
	National	**NSC830**	**★1374**
			1097-10
	Panasonic	DN830	511-60
	SGS	TCA830S	2896-121
			¶ 268-3
	Telefunken	TCA830	2896-127
8300	Motorola	MC8300	501-41
			3488-50
	National	DM8300	501-45
			3489-12
8301	Motorola	MC8301	483-8
	National	DM8301	483-12
8303	AMD	AM8303	2478-30
	National	DP8303	2478-39
8304	AMD	8304	504-184
		AM8304	2478-14
	Motorola	MC8304	474-148
	National	DP8304	2478-15
			1094-87
		DP8304B	2478-40
8307	AMD	AM8307	2478-31
	Motorola	MC8307	2463-115
	National	DP8307	2478-41
8308	AMD	8308	3484-78
		AM8308	2478-32
	Motorola	MC8308	495-99
	National	DP8308	2478-42
	NEC-EA	uPD8308A	3484-77
		uPD8308A-5	3484-72
		uPD8308AL	3484-81
8309	Motorola	MC8309	497-107
	National	DM8309	497-109
831	National	NSC831	1097-8
	Panasonic	DN831	511-61
8310	Motorola	MC8310	480-132
	National	DM8310	480-136
		DP8310	2483-161
8311	Motorola	MC8311	484-28
	National	DM8311	484-32
		DP8311	2483-162
8312	Motorola	MC8312	499-123
	National	DM8312	499-125
8314	Motorola	MC8314	495-158
8316	AMD	AM8316EB	3485-33
		AM8316EC	3485-15
	Motorola	MC8316	478-109
	National	DM8316	478-113
	NEC-EA	uPD8316E	3485-44
		uPD8316E-5	3485-25
	TI	SBP8316C	3485-12
		SBP8316M	3485-13
8318	Motorola	MC8318	508-129
	National	DM8318	508-133
832	National	LM832	2896-45
	NEC-Electron	uPD832	2898-155
8322	Motorola	MC8322	499-9
	National	DM8322	499-13
8324	Motorola	MC8324	474-47
83256	NEC-EA	uPD83256	3487-52
8328	Motorola	MC8328	503-3
			3491-26
833	**Datel**	**ADC-833B**	**★2621**
		ADC833	**★2615**
	NEC-Electron	uPD833	2898-156
8332	NEC-EA	EA8332A	3486-3
		EA8332B	3486-4

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
8332	NEC-EA	uPD8332A-1	3485-107
		uPD8332B-1	3485-108
8334	National	DM8334	496-27
834	Panasonic	DN834	511-62
8340	**National**	**DP8340**	★2762
			2487-30
8341	**National**	**DP8341**	★2762
			2487-15
8342	**National**	**DP8342**	★2762
			2487-31
8343	**National**	**DP8343**	★2762
			2487-14
835	Panasonic	DN835	511-63
			2963-123
8350	**National**	**DP8350**	★2763
			1094-111
			1100-74
			¶ 238-3
			¶ 239-3
			¶ 240-1
8352	National	DP8352	1094-112
8353	National	DP8353	1094-113
8355	Intel	8355	1093-164
			1096-52
		8355-2	1093-165
			1096-53
	NEC-Micro	uPD8355	1093-166
			1096-54
			1096-56
	Toshiba	TMP8355	1096-55
8356	National	DP8356	1095-71
8360	Sanyo	LM8360	2898-166
8361	Sanyo	LM8361	2898-167
8363	Sanyo	LM8363	2899-19
8364	NEC-EA	uPD8364-20	3486-32
		uPD8364-35	3486-105
		uPD8364-45	3487-4
		uPD8364E	3486-40
	Sanyo	LM8364	2899-20
837	Panasonic	DN837	511-64
8372	Sanyo	LM8372	2900-27
838	Panasonic	DN838	511-65
839	Panasonic	DN839	511-66
83C55	**OKI**	**MSM83C55**	★3873
84	**AD**	**ADADC84-10**	★3175
			2430-36
		ADADC84-12	★3175
			2432-22
	Burr-Brown	ADC84-10	2430-37
		ADC84-12	2432-23
	Datel	**ADC-84-10**	★2619
			2430-29
	Datel	ADC-84-12	2432-14
	Datel	**ADC84**	★2616
	MicroNet	MNADC84-10	2430-33
		MNADC84-12	2432-1
	MicroEng	MCE84	2943-13
8400	**National**	**DP8400**	★2764
			2467-25
	Zilog	**Z8400H**	★1583
			1097-45
		Z8400L	★1583
			1097-46
8402	National	DP8402	506-170
8404	Fujitsu	MB8404E	3482-84
8408	**MMI**	**DP8408**	★ 727
			2480-151
	National	DP8408	2481-28
8409	**MMI**	**DP8409**	★ 724
	National	**DP8409**	★2765
			2481-29
8410	**Zilog**	**Z8410**	★1585
			1097-69
8414	Fujitsu	MB8414E	3478-65
8416	**Fujitsu**	**MB8416**	★3676
			3480-71
	Hitachi	HM8416A-3	3468-66
		HM8416A-4	3468-74
	MicroPwr	MP8416-20	3480-79
		MP8416-25	3480-111
8417	**Fujitsu**	**MB8417**	★3676
			3480-72
	MicroPwr	MP8417-20	3480-80
		MP8417-25	3480-112
8418	**Fujitsu**	**MB8418**	★3676
			3480-73
8418	MicroPwr	MP8418-20	3480-81
		MP8418-25	3480-113
8420	**Zilog**	**Z8420**	★1585
			1097-76
84240	**National**	**DP84240**	★2767
			2484-1
84244	**National**	**DP84244**	★2767
			2484-2
8430	**Zilog**	**Z8430**	★1585
			1097-56
844	NEC-Electron	uPD844	2899-128
8440	**Zilog**	**Z8440**	★1586
			1097-90
8441	Zilog	Z8441	1097-91
8442	Zilog	Z8442	1097-92
8449	Zilog	Z8449	1097-93
8460	**National**	**DP8460**	★2766
			2481-13
8464	**Fujitsu**	**MB8464-10**	★3672
			3468-57
		MB8464-10L	★3672
			3468-58
		MB8464-15	★3672
			3468-59
		MB8464-15L	★3672
			3468-60
8470	GI	AY3-8470	2902-6
	Zilog	**Z8470**	★1586
			1097-99
			¶ 243-17
8471	Sanyo	LM8471	2900-28
8475	GI	AY3-8475	2902-7
8495	Ferranti	AN8495A	501-79
84S22	Hitachi	HD84S22	490-77
85	**AD**	**ADADC85-10**	★3175
			2430-38
		ADADC85-12	★3175
			2432-25
		ADDAC85/CBI	★3164
			2452-25
			¶ 252-7
		ADDAC85/CCD	★3164
			2459-13
			¶ 252-7
		ADDAC85C/CBI	★3164
			2452-26
			¶ 252-7
		ADDAC85C/CCD	★3164
			2459-14
			¶ 252-7
		ADSHC-85	★3181
			2967-59
	AD	ADSHC-85E	2967-60
	Burr-Brown	ADC85-10	2430-39
		ADC85-12	2432-26
		DAC85/CBI	2452-19
		DAC85/CCD	2459-23
		DAC85C/CBI	2452-20
		DAC85C/CCD	2459-24
		SHC85	2967-70
		SHC85ET	2967-71
	Comark	MC85	1763-31
	Datel	ADC-85-12	2432-15
	Datel	**ADC-85C-10**	★2619
			2430-30
	Datel	ADC-85C-12	2432-16
	Datel	**ADC85**	★2616
		DAC-85C-CBI-I	★2621
			2451-45
	Datel	DAC-85C-CBI-V	2454-32
		DAC-85C-CCD-I	2459-10
		DAC-85C-CCD-V	2459-15
	Datel	**DAC85**	★2616
	HybridSys	**HSADC85B**	★2744
			2432-18
		HSADC85C	★2744
			2432-19
	DDC	DAC85LD-CBI-I	2451-27
		DAC85LD-CBI-V	2454-35
		DDCADC85-10	2430-32
		DDCADC85-12	2432-20
	MicroNet	DAC85/CBI	2452-23
85	MicroNet	DAC85/CCD	2459-25
		DAC85C/CCD	2459-26
		MNADC85-10	2430-34
		MNADC85-12	2432-2
	National	DAC85-CBI-V	2452-15
		DAC85L-CBI-V	2452-16
	Siemens	SKC-85	1765-8
	TeledyneP	TDADC85	2431-51
	Western	SKC-85	1765-10
	Zendex	ZX-85	1765-21
850	Panasonic	DN850	501-15
8500	GI	AY3-8500	2906-26
			¶ 274-3
		AY3-8500-1	2906-27
			¶ 274-3
	Intersil	ICH8500	2911-7
			2935-15
			¶ 253-16
		ICH8500A	2911-2
			2935-14
			¶ 253-16
	Motorola	MC8500	2467-2
	SiliconSys	SSI8500	2467-3
	Zilog	**Z8500**	★1581
85008	National	NMC85008B-9	3476-19
8501	Motorola	MC8501	2467-24
8502	Motorola	MC8502	2467-26
	SiliconSys	SSI8502	2467-27
	SMC	COM8502	2487-68
8503	Motorola	MC8503	2467-31
8504	Motorola	MC8504	508-74
			2467-33
8505	Motorola	MC8505	506-167
			2481-18
8506	Motorola	MC8506	507-5
			2467-28
8507	Motorola	MC8507	1092-101
			1102-68
851	Burr-Brown	DAC851-CBI-I	2452-7
	Panasonic	DN851	479-85
8510	Intersil	ICH8510I	2888-9
			2909-69
			2910-86
			¶ 267-1
			¶ 267-15
		ICH8510M	2888-10
			2909-70
			2910-87
			¶ 267-1
			¶ 267-15
8511	National	DM8511	485-52
8512	National	DM8512	487-112
8515	Intersil	ICH8515I	2888-7
		ICH8515M	2888-8
8516	DDC	ADC-8516-12	2431-32
		ADH-8516-11	2435-28
8518	DDC	SH-8518	2967-91
852	Panasonic	DN852	482-114
8520	Intersil	ICH8520I	2888-11
			2909-59
			2910-88
			¶ 267-1
		ICH8520M	2888-12
			2909-60
			2910-89
			¶ 267-1
	Motorola	MC8520	2467-10
	SiliconSys	SSI8520	2467-11
8523	Sanyo	LM8523	2902-133
8528	DDC	DAC-8528-11	2456-17
		DAC-8528-12	2451-20
8530	**AMD**	**8530**	★1231
	DDC	TH-8530	2968-47
	Intersil	ICH8530I	2888-13
			2909-57
			2910-90
			¶ 267-1
		ICH8530M	2888-14
			2909-58
			2910-91
			¶ 267-1
	Zilog	**Z8530SCC**	★1594
			1101-62
8531	**Zilog**	**Z8531**	★1594
8536	**Zilog**	**Z8536CI0**	★1594
8536	Zilog	Z8536CI0	1100-72
			¶ 243-16
854	Burr-Brown	SDM854	2963-40
	Motorola	MC854	2486-6
8540	Tektronix	8540	1632-1
8542	National	DM8542	485-159
8544	National	DM8544	506-6
8546	National	DM8546	502-143
			3489-130
8550	Tektronix	8550	1632-2
8551	National	DM8551	486-23
			¶ 237-6
			¶ 237-7
8552	National	DM8552	482-72
			¶ 237-7
8553	DDC	BUS-8553	2487-26
	National	DM8553	496-141
8554	DDC	BUS-8554	2487-27
	National	DM8554	482-61
8555	DDC	BUS-8555/56	2487-28
	National	DM8555	480-124
8556	National	DM8556	478-98
			¶ 237-5
8557	DDC	BUS-8557	2487-24
8559	DDC	BUS-8559	2487-29
856	Burr-Brown	DSM856	2963-39
	Datel	**ADC-856C**	★2621
			2430-13
	Datel	ADC-856M	2430-14
8560	National	DM8560	481-134
8563	National	DM8563	479-180
8565	**Zilog**	**Z8565**	★1592
857	Burr-Brown	SDM857	2963-41
8570	National	DM8570	502-21
			3490-117
8571	Signetics	PCD8571	3472-48
			3472-48
8575	National	DM8575	507-9
			¶ 235-14
			3458-33
			¶ 235-14
8576	National	DM8576	507-10
			¶ 235-14
			3458-34
			¶ 235-14
		DM8576AAA	3454-3
			¶ 235-14
8581	AD	AD8581B	1097-63
		AD8581L	2428-17
	Zilog	**Z8581-CGC**	★1595
			1100-70
8585	DDC	ADH-8585-10	2436-1
		ADH-8585-12	2432-24
8586	DDC	ADH-8586-10	2435-50
		ADH-8586-12	2431-48
8589	National	DM8589	497-40
			3471-76
8590	National	DM8590	3490-45
	Zilog	**Z8590**	★1595
			1101-97
		Z8590UPC	★1595
			1101-98
8599	National	DM8599	497-48
			3471-53
85S68	National	DM85S68	497-54
			¶ 245-14
			3471-29
			¶ 245-14
86	**AMD**	**IAPX86/10**	★1229
			1077-20
		IAPX86/20	★1229
			1077-21
	DistComp	DCS/86	1620-3
		DCS86/16	1769-12
		DCS86/8	1765-25
	EMM	SECS86/05	1769-6
	Intel	SDK-86	1769-7
	Intel	**IAPX86/10**	★1347
			1098-3
			★1347
			1079-15
		IAPX86/20	★1348
			1097-135
			★1348
			1079-16
		IAPX86/30	★1349

Arranged alphanumerically from left to right.

© IC MASTER 1983

Base Number	Source	Device	Page-Line
86	Intel	iAPX86/30	1097-136
			★1349
			1079-17
		iAPX86/50	★1349
			1079-18
	Intel	iSBC-86/05	1769-11
		iSBC-86/12A	1769-10
		iSBC-86/14	1769-16
		iSBC-86/30	1769-17
	Matrox	MBC-86/12	1769-13
	National	BLC-86/05	1769-18
		BLC-86/1213	1769-8
	PMI	DAC-86C	2444-35
			2450-10
			2459-8
			¶ 253-10
			¶ 258-4
		DAC-86E	2444-27
			2450-8
			2459-5
			¶ 253-10
			¶ 258-4
	Zendex	ZX86	1769-14
8600	Plessey	SP8600A	510-83
		SP8600B	510-84
8601	Motorola	MC8601	500-109
	National	DM8601	500-111
	Synertek	**Z8601**	★1540
			1097-11
			★1540
			1075-4
		Z8601A	★1540
			1097-12
			★1540
			1075-5
	Zilog	**Z8601**	★1596
			1097-25
		Z8601-MCU	★1596
			1077-1
8602	Motorola	MC8602	500-180
	National	DM8602	501-1
	Plessey	SP8602A	510-68
		SP8602B	510-69
	Synertek	**Z8602**	★1541
			1097-13
			★1541
			1075-6
		Z8602A	★1541
			1097-14
			★1541
			1075-7
	Zilog	Z8602	1097-26
8603	GI	AY3-8603	2906-28
		AY3-8603-1	2906-29
	Synertek	**Z8603**	★1542
			1097-15
			★1542
			1075-8
		Z8603A	★1542
			1097-16
			★1542
			1075-9
	Zilog	**Z8603**	★1596
			1097-27
		Z8603-MCU	★1596
			1077-2
8605	GI	AY3-8605	2906-30
		AY3-8605-1	2906-31
	Plessey	SP8605B	510-70
		SP8605M	510-71
8606	GI	AY3-8606	2906-32
		AY3-8606-1	2906-33
	Plessey	SP8606B	511-34
		SP8606M	511-35
8607	GI	AY3-8607-1	2906-34
	Plessey	SP8607A	510-72
		SP8607B	510-73
861	NEC-Electron	uPD861	2945-121
	Siemens	TAA861	2909-112
			2933-47
8610	GI	AY3-8610	2906-35
	Plessey	SP8610	471-5
8611	Plessey	SP8611B	471-6
		SP8611M	471-7
	Synertek	**Z8611**	★1543
			1097-17
8611	**Synertek**	**Z8611**	★1543
			1075-10
		Z8611A	★1543
			1097-18
			★1543
			1075-11
	Zilog	**Z8611**	★1597
			1097-28
		Z8611-MCU	★1597
			1077-3
8612	**Synertek**	**Z8612**	★1544
			1097-19
			★1544
			1075-12
		Z8612A	★1544
			1097-20
			★1544
			1075-13
	Zilog	**Z8612**	★1597
			1097-29
		Z8612-MCU	★1597
			1077-4
8613	National	DM8613	485-53
	Plessey	SP8613	510-78
	Synertek	**Z8613**	★1545
			1097-21
			★1545
			1075-14
		Z8613A	★1545
			1075-15
	Zilog	**Z8613**	★1597
			1097-30
		Z8613-MCU	★1597
			1077-5
8614	**National**	**DS8614**	★2771
			510-127
8615	**National**	**DS8615**	★2771
			510-132
8616	**National**	**DS8616**	★2771
			511-1
	Plessey	SP8616	510-79
8617	**National**	**DS8617**	★2771
			511-14
	Plessey	SP8617B	471-8
862	Burr-Brown	DAC862S	2453-1
	Siemens	TAA862	2909-113
			2926-22
8621	National	DS8621	511-11
			2945-79
			2946-88
8622	National	DS8622	511-19
			2945-82
8626	National	DS8626	510-133
			2945-72
8627	National	DS8627	510-128
	Plessey	SP8627	511-36
			2945-74
8628	National	DS8628	510-121
	Plessey	SP8628	511-16
			2945-75
8629	National	DS8629	511-15
			2945-73
	Plessey	SP8629	511-17
			2945-76
8630	Plessey	SP8630A	510-103
		SP8630B	510-104
864	Panasonic	MEL864A	2964-28
8640	Epson	8640	2899-26
	National	DS8640	2473-40
	TeledyneS	TSC8640B	2456-32
		TSC8640C	2456-33
8641	Intel	8641A	1094-6
			1095-103
	Motorola	DS8641	2476-46
	National	DS8641	2476-52
	TeledyneS	TSC8641B	2453-39
		TSC8641C	2453-40
8643	Plessey	SP8643	2946-79
		SP8643B	510-110
8646	National	DS8646	2465-33
8647	National	DS8647	2465-127
	Plessey	SP8647	2946-80
		SP8647A	510-111
		SP8647B	510-112
8648	National	DS8648	2465-128
865	Siemens	TAA865	2909-114
			2933-48
8650	Epson	8650	2899-27
8651	Epson	8651	2899-28
8654	National	DS8654	2481-44
8655	Plessey	SP8655A	510-130
		SP8655B	510-131
8656	National	DS8656	2481-45
	Plessey	SP8656	510-129
8657	Plessey	SP8657A	510-124
		SP8657B	510-125
8658	Plessey	SP8658	510-126
8659	Plessey	SP8659A	510-119
		SP8659B	510-120
8664	National	DS8664	2465-140
			1087-13
8665	National	DS8665	2465-137
	Plessey	SP8665B	510-101
8666	National	DS8666	2465-138
8668	Plessey	SP8668B	510-102
8669	National	DS8669	2464-23
8671	**Zilog**	**Z8671**	★1597
			1097-31
		Z8671-MCU	★1597
			1077-6
8675	Zilog	Z8675	1097-32
		Z8675-MCU	1077-7
8678	National	DM8678	3453-3
			3453-33
			¶ 284-9
			¶ 284-11
			¶ 284-12
8680	Plessey	SP8680	471-14
		SP8680A	510-113
		SP8680B	510-114
8681	**Synertek**	**Z8681**	★1546
			1097-22
			★1546
			1075-16
	Zilog	**Z8681**	★1597
			1097-33
		Z8681-MCU	★1597
			1077-8
8685	Plessey	SP8685	2946-81
		SP8685A	510-115
		SP8685B	510-116
8690	Plessey	SP8690	2946-82
			¶ 272-5
		SP8690A	510-117
			¶ 272-5
		SP8690B	510-118
			¶ 272-5
8692	National	DS8692	2481-46
8693	National	DS8693	2481-47
8694	National	DS8694	2481-48
86C01	**Synertek**	**Z86C01**	★1548
			1097-23
			★1548
			1075-17
86LS52	National	DM86LS52	496-149
86LS62	National	DM86LS62	496-150
86S128	National	DM86S128	3453-4
			3453-34
86S64	National	DM86S64	3453-5
			3453-35
87	**AD**	**ADDAC87/CBI**	★3165
			2452-22
	Burr-Brown	ADC87/MIL	2432-4
		ADC87U	2432-5
		DAC87/CBI	2452-21
	Datel	**ADC-87-10**	★2618
			2430-35
	Datel	ADC-87-12	2432-17
	Datel	**ADC87**	★2616
		DAC-87-CBI-I	★2620
		DAC-87-CBI-V	★2620
	Datel	DAC-87-CCD-I	2459-11
		DAC-87-CCD-V	2459-16
		DAC-87C-CBI-I	2451-46
		DAC-87C-CBI-V	2454-33
	Datel	**DAC87**	★2616
	HybridSys	HSDAC87BI/V	2454-2
		HSDAC87CI/V	2454-3
	DDC	DAC87-CBI-I	2451-26
			2454-34
87	DDC	DDCADC87-10	2430-31
		DDCADC87-12	2432-21
	MicroNet	MNADC87	2432-3
		MNDAC87	2454-36
	National	DAC87-CBI-V	2452-17
	PMI	DAC-87C	2444-36
			2450-14
			¶ 253-10
			¶ 258-4
		DAC-87E	2444-28
			2450-9
			¶ 253-10
			¶ 258-4
	TeledyneP	TDADC87	2431-52
8700	DDC	HMSDC-8700	2967-10
	TeledyneS	TSC8700	2428-47
8701	TeledyneS	TSC8701	2431-12
8702	AMD	8702A	3460-19
	National	MM8702A-4	3460-22
	TeledyneS	TSC8702	2435-23
8703	TeledyneS	TSC8703	2428-48
8704	TeledyneS	TSC8704	2431-13
8705	TeledyneS	TSC8705	2435-24
8708	National	INS8708	3463-85
871	Siemens	TCA871	2889-25
8720	Plessey	SP8720	510-76
			2946-54
8725	Plessey	SP8725	2946-55
873181	**National**	**DM873181**	★3851
8735	Plessey	SP8735B	510-94
8740	Plessey	SP8740	2946-62
		SP8740A	510-90
		SP8740B	510-91
8741	Intel	8741A	1094-7
			1095-104
			1096-62
			1101-99
			¶ 239-6
			¶ 243-7
		M8741A	1094-9
	NEC-Micro	uPD8741A	1095-106
			1096-64
	Plessey	SP8741	2946-68
		SP8741A	510-92
		SP8741B	510-93
	Signetics	uPD8741A	1094-13
8742	Intel	8742	1094-8
			1101-101
8743	Plessey	SP8743	2946-72
		SP8743B	510-97
		SP8743M	510-98
8745	Plessey	SP8745	2946-63
8746	Plessey	SP8746	2946-69
8748	AMD	AM8748	1093-10
	Intel	8748-8	1093-11
			¶ 239-6
			¶ 243-7
		8748H	1093-12
			¶ 239-6
			¶ 243-7
			1065-33
			¶ 239-6
			¶ 243-7
		M8748	1093-15
	NEC-Micro	uPD8748	1093-18
			1071-25
8749	Intel	8749H	1093-13
		8749H-8	1093-14
8750	TeledyneS	TSC8750	2438-35
8751	Intel	8751	1094-16
			¶ 246-6
			1065-34
			¶ 246-6
		M8751	1094-17
	TeledyneS	TSC8751	2438-30
8755	Intel	8755A	1093-144
			1095-142
			1096-34
		M8755A	1095-143
	NEC-Micro	uPD8755A	1093-145
			1095-144
			1096-35
	OKI	MSM8755	1095-145
	Plessey	SP8755A	511-3
		SP8755B	511-4
	Toshiba	TMP8755A	1093-146

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
8757	Plessey	SP8757	511-5
8770	Plessey	SP8770B	511-22
8772	Plessey	SP8772B	511-23
877C48	National	NS877C48	1071-4
8790	Plessey	SP8790	2945-6
			¶ 272-5
		SP8790A	511-38
			¶ 272-5
			2945-2
			¶ 272-5
		SP8790B	511-39
			¶ 272-5
			2945-3
			¶ 272-5
8791	Plessey	SP8791A	510-99
		SP8791B	510-100
8792	Plessey	SP8792	2946-91
		SP8792A	2946-92
8793	Plessey	SP8793	2946-85
		SP8793A	2946-86
8794	Plessey	SP8794A	511-40
			2945-4
		SP8794B	511-41
			2945-5
87P50	National	NS87P50	1071-5
87PC48	**National**	**NS87PC48**	★1451
			1093-17
			★1451
			1071-6
87S180	**National**	**D87S180**	★3851
	National	DM87S180	3463-3
87S181	National	DM87S181	3463-16
87S184	National	DM87S184	3463-122
87S185	National	DM87S185	3464-3
87S188	National	DM87S188	3459-3
87S190	National	DM87S190	3464-98
87S191	National	DM87S191	3464-101
87S280	**National**	**DM87S280**	★3851
			3462-91
87S281	**National**	**DM87S281**	★3851
			3462-92
87S288	National	DM87S288	3459-4
87S291	National	DM87S291	3464-97
87S401	**National**	**DM87S401**	★3853
			3456-46
87S402	**National**	**DM87S402**	★3853
			3456-56
87SR181			
	National	**DM87SR181**	★3852
			3462-69
88	AMD	iAPX88/10	1059-18
		iAPX88/20	1059-19
	Intel	**iAPX88/10**	★1347
			1098-62
			★1347
			1067-2
		iAPX88/20	★1348
			1098-56
			★1348
			1067-3
		iAPX88/30	★1349
			1098-57
			★1349
			1067-4
		iAPX88/50	★1349
	Intel	iAPX 88/10	1094-43
		iAPX 88/20	1094-44
		iSBC88/25	1765-23
		iSBC88/40	1765-24
	PMI	DAC-88C	2444-37
			2450-11
		DAC-88E	2444-29
			2450-4
		DMX-88E	2424-39
		DMX-88F	2424-41
		MUX-88E	2424-33
			¶ 261-8
		MUX-88F	2424-38
			¶ 261-8
	Rockwell	A88XX	1088-121
	Siliconix	VN88AF	2481-40
	Zendex	ZX-88	1765-27
880	Interdesign	MSB880	4140-128
8800	CalDevices	CDI8800	4140-22
	National	DS8800	505-147
8800	Omnibyte	OB8800	1761-16
	RCA	**MSI8800**	★1959
8801	MonSys	MSC8801	1626-1
8802	MonSys	MSC8802	1626-2
	Omnibyte	OB8802	1761-17
8803	National	DS8803	2484-7
8804	Mitel	MT8804A	2947-135
		MT8804B	2947-136
	RCA	**MSI8804**	★1959
8805	National	MH8805	2482-134
8807	National	DS8807	2484-8
8808	**RCA**	**MSI8808**	★1959
8810	National	DS8810	484-87
8811	National	DS8811	484-88
	Plessey	NJ8811	2945-90
8812	National	DS8812	484-153
	Plessey	NJ8812	2945-91
	RCA	**MSI8812**	★1959
8816	**RCA**	**MSI8816**	★1959
8819	National	DS8819	484-67
8820	National	DS8820	2475-9
			¶ 257-13
			¶ 258-6
			¶ 259-4
		DS8820A	2475-2
			¶ 257-13
			¶ 258-6
			¶ 259-4
	Plessey	MV8820	2949-77
	RCA	**MSI8820**	★1959
	TI	DS8820	2475-3
88201	**Fujitsu**	**MB88201**	★1306
			1087-17
			★1306
			1049-24
88202	**Fujitsu**	**MB88202**	★1306
			1087-18
			★1306
			1049-25
88205	Aptek	ITT88205-5NC	2949-94
88210	Mitel	MH88210	2949-96
8822	National	DS8822	2473-7
8824	**RCA**	**MSI8824**	★1959
8825	**RCA**	**MSI8825**	★1959
883	SSS	SCM883/5101-4	3475-9
8830	National	DS8830	2471-54
			¶ 257-13
			¶ 258-6
			¶ 259-4
	TI	DS8830	2471-57
88305	Mitel	MH-88305	2949-95
	Mostek	MH88305	2949-3
8831	National	DS8831	2469-40
			2471-63
			¶ 236-15
			¶ 237-7
			¶ 257-13
	TI	DS8831	2469-41
			2471-64
88315	Mitel	MH88315	2949-2
8832	National	DS8832	2469-31
			2472-9
			¶ 257-13
	TI	DS8832	2469-32
			2472-2
8833	National	DS8833	2477-46
			¶ 257-13
			1094-88
			¶ 257-13
8834	National	DS8834	2477-41
			¶ 257-13
8835	National	DS8835	2477-39
			¶ 257-13
			1094-89
			¶ 257-13
8836	National	DS8836	2473-38
			¶ 257-13
8837	National	DS8837	2473-58
			¶ 257-13
8838	AMD	AM8838	2476-1
	National	DS8838	2476-3
			¶ 257-13
8839	National	DS8839	2477-44
			¶ 257-13
88401	**Fujitsu**	**MB88401**	★1306
88401	Fujitsu	MB88401	1087-37
			★1306
			1049-26
8841	**Fujitsu**	**MB8841**	★1306
			1087-28
			★1306
			1049-27
88411	**Fujitsu**	**MB88411**	★1306
			1087-38
			★1306
			1049-28
88413	**Fujitsu**	**MB88413**	★1306
			1087-39
			★1306
			1049-29
8842	**Fujitsu**	**MB8842**	★1306
			1087-29
			★1306
			1049-30
88421	**Fujitsu**	**MB88421**	★1306
			1087-40
			★1306
			1049-31
88423	**Fujitsu**	**MB88423**	★1306
			1087-41
			★1306
			1049-32
8843	**Fujitsu**	**MB8843**	★1306
			1087-30
			★1306
			1049-33
8844	**Fujitsu**	**MB8844**	★1306
			1087-31
			★1306
			1049-34
8845	Fujitsu	MB8845	1087-32
8846	Fujitsu	MB8846	1087-33
8847	Fujitsu	MB8847	1087-34
8848	Fujitsu	MB8848	1087-35
8849	Fujitsu	MB8849	1087-36
88500	Mitel	MH88500	2949-32
	Mostek	MH88500	2949-33
88501	**Fujitsu**	**MB88501**	★1306
			1087-42
			★1306
			1049-35
88503	**Fujitsu**	**MB88503**	★1306
			1087-43
			★1306
			1049-36
8851	**Fujitsu**	**MB8851**	★1306
			1087-19
			★1306
			1049-37
		MB8851A	★1306
			1087-20
			★1306
			1049-38
		MB8851L	★1306
			1087-21
			★1306
			1049-39
8853	**Fujitsu**	**MB8853**	★1306
			1087-22
			★1306
			1049-40
	National	DM8853	500-136
88535	**Fujitsu**	**MB88535**	★1306
			1087-44
			★1306
			1051-1
88536	**Fujitsu**	**MB88536**	★1306
			1087-45
			★1306
			1051-2
8854	**Fujitsu**	**MB8854**	★1306
			1051-3
		MB8854A	★1306
			1087-23
			★1306
			1051-5
		MB8854L	★1306
			1087-24
			★1306
			1051-6
88541	**Fujitsu**	**MB88541**	★1306
88541	Fujitsu	MB88541	1087-46
			★1306
			1051-4
8855	Fujitsu	MB8855	1087-25
8856	National	DS8856	2463-127
			¶ 259-15
8857	Fujitsu	MB8857	1087-26
	National	DS8857	2464-55
			¶ 259-15
8858	Fujitsu	MB8858	1087-27
	National	DS8858	2464-58
			¶ 259-15
8859	National	DS8859	2464-82
8860	GTEMicro	G8860	2949-83
		G8860X	2949-84
	Mitel	MT8860	2949-74
	Plessey	MV8860	2949-78
8861	National	DS8861	2465-18
			¶ 259-15
8862	Mitel	MT8862	2949-75
	Plessey	MV8862	2949-79
8863	Mitel	MT8863	2949-76
	National	DS8863	2465-83
			¶ 259-15
	Plessey	MV8863	2949-80
8864	National	DS8864	2465-123
			¶ 259-15
8865	GTEMicro	G8865	2947-29
		G8865X	2947-38
	Mitel	MT8865	2947-30
	Plessey	MV8865	2947-39
8866	Fujitsu	MB8866	1097-111
			1101-26
8867	National	DS8867	2465-117
8868	Fujitsu	MB8868A	2487-59
8869	National	DS8869	2464-83
8870	Mitel	MT8870	2949-97
	National	DS8870	2465-40
8871	National	DS8871	2465-84
8872	National	DS8872	2465-118
8873	National	DS8873	2465-124
8874	National	DS8874	2465-125
8875	National	DM8875	475-161
8876	**Fujitsu**	**MB8876**	★1308
			1101-124
		MB8876A	★1308
			1091-21
			1101-27
8877	**Fujitsu**	**MB8877**	★1308
			1092-56
			1093-108
			1094-137
			1095-146
			1099-100
			1101-125
		MB8877A	★1308
			1091-22
			1101-28
	National	DS8877	2465-41
888	**National**	**NSC888**	★1377
	PMI	DAC888A	2441-5
		DAC888B	2442-17
		DAC888E	2441-6
		DAC888F	2442-18
8880	National	DS8880	2465-65
			¶ 259-14
	Signetics	DS8880	2465-68
8881	National	DS8881	2465-142
	Signetics	8881	2465-143
8884	National	DS8884A	2465-66
			¶ 259-14
8885	National	DS8885	2465-60
			¶ 259-14
	Signetics	8885	2465-61
8887	National	DS8887	2465-80
			¶ 259-14
8889	National	DS8889	2465-114
			¶ 259-14
8891	National	DS8891	2465-26
	Signetics	8891	2465-27
8897	National	DS8897	2465-81
8898	National	DM8898	507-38
8899	National	DM8899	507-35
88C120	National	DS88C120	2474-49
88C20	National	DS88C20	2475-10

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
88C29	National	MM88C29	464-144
			2472-29
88C30	National	MM88C30	464-109
			2471-38
88L12	National	DS88L12	505-152
88LS120			
	National	DS88LS120	2474-47
89	PMI	DAC-89C	2444-38
			2450-12
		DAC-89E	2444-30
			2450-5
	Rockwell	MM89LS	1088-95
			1055-18
	Siemens	S89	510-67
890	Signetics	TBA890	2904-155
8900	GI	AY3-8900	2906-36
		AY3-8900-1	2906-37
	Omnibyte	OB8900	1761-18
8901	Plessey	SP8901	511-29
			2945-92
			2946-96
8902	Omnibyte	OB8902	1765-30
8906	National	DS8906	2945-112
	Plessey	SP8906	511-20
			2945-93
			2946-97
8907	National	DS8907	2945-113
8908	National	DS8908	2945-114
8910	**GI**	**AY3-8910**	★1325
			2898-29
			2906-40
			★1325
			1101-87
8912	**GI**	**AY3-8912**	★1325
			2898-30
			2906-41
			★1325
			1101-88
	GTEMicro	G8912	2948-80
	Mitel	MT8912	2948-73
			2948-82
	Mostek	MK8912	2948-84
8913	**GI**	**AY3-8913**	★1325
8915	DDC	HSDC-8915	2967-20
	GI	AY3-8915	2906-25
8920	DDC	HSDC-8920	2967-25
	National	DS8920	2465-119
8921	DDC	HSDC-8921	2967-26
	Plessey	SP8921	2898-130
8922	DDC	HSDC-8922	2967-27
	Plessey	SP8922	2898-134
8923	Plessey	SP8923	2898-129
			2898-131
8937	DDC	BUS-8937	2486-61
8942	Sanyo	LM8942	511-87
8960	Mitel	MT8960	2947-79
8961	Mitel	MT8961	2947-60
8962	Mitel	MT8962	2947-80
8963	Mitel	MT8963	2947-61
	National	DS8963	2465-85
8972	Sanyo	LM8972	2900-29
8973	National	DS8973	2465-120
8975	National	DS8975	2465-121
8980	Mitel	MT8980	2948-58
	National	DS8980	2465-67
			¶ 259-14
8A1200	Signetics	8A1200	4141-110
			¶ 232-13
8A1260	Signetics	8A1260	4141-111
			¶ 232-13
8A1542	Signetics	8A1542	4141-112
			¶ 232-13
8LC82	**Harris**	**8LC82**	★ 669
8PI/O	**Cremenco**	**8PI/O**	★1929
8S150	Signetics	N8S150	3457-77
8S2105	**Signetics**	**8S2105**	★3915
8T04	Signetics	S8T04	2463-142
8T05	Signetics	N8T05	2463-128
		S8T05	2463-129
8T06	Signetics	N8T06	2463-95
8T09	Raytheon	RC8T09	484-61
			2469-33
		RM8T09	484-62
			2469-34
	Signetics	N8T09	484-63
			2469-35
8T09	Signetics	S8T09	484-64
			2469-36
8T10	Raytheon	RC8T10	486-24
		RM8T10	486-25
	Signetics	N8T10	486-28
		S8T10	486-29
8T125	Signetics	N8T125	504-135
			2479-30
		S8T125	504-136
			2479-31
8T126	Signetics	N8T126	2477-17
		S8T126	508-18
			2477-20
8T127	Signetics	N8T127	508-16
			2477-18
		S8T127	508-19
			2477-21
8T128	Signetics	N8T128	508-28
			2477-31
		S8T128	508-31
			2477-34
8T129	Signetics	N8T129	508-29
			2477-32
		S8T129	508-32
			2477-35
8T13	Motorola	MC8T13	2469-7
	Signetics	N8T13	2469-10
		S8T13	2469-11
	TI	N8T13	2469-12
8T14	Motorola	MC8T14	2473-13
	Signetics	N8T14	2473-16
8T15	Signetics	N8T15	2469-19
8T16	Signetics	N8T16	2473-5
8T20	Raytheon	RC8T20	500-91
		RM8T20	500-92
	Signetics	N8T20	500-93
8T22	Signetics	N8T22	500-114
8T23	Motorola	MC8T23	2469-1
	Signetics	N8T23	2469-3
	TI	N8T23	2469-4
		S8T23	2469-5
8T24	Motorola	MC8T24	2473-8
	Signetics	N8T24	2473-10
8T245	Signetics	N8T245	505-17
		S8T245	505-18
8T25	SiliconG	N8T25	2485-52
8T26	AMD	N8T26	508-8
			2477-8
			1090-26
		N8T26A	508-9
		S8T26	508-10
			2477-9
		S8T26A	508-11
	Fairchild	uA8T26A	2477-10
		uA8T26AM	2477-11
	Motorola	MC8T26A	508-13
			2477-14
			1090-27
	National	DS8T26A	508-14
			2477-15
			1090-29
		DS8T26AM	508-15
			2477-16
	Signetics	N8T26A	508-17
			2477-19
	TI	N8T26	508-20
		N8T26A	508-21
8T28	AMD	N8T28	508-23
		N8T28A	2477-23
		S8T28A	2477-24
	Fairchild	uA8T28	2477-25
		uA8T28M	2477-26
	Motorola	MC8T28	508-25
			2477-28
			1090-28
	National	DS8T28	508-26
			2477-29
			1090-30
		DS8T28M	508-27
			2477-30
	Signetics	N8T28	508-30
			2477-33
8T31	**Signetics**	**N8T31**	★1502
			★1504
			508-81
			★1502
8T31	**Signetics**	**N8T31**	★1504
			1096-81
8T32	**Signetics**	**N8T32**	★1502
			★1504
			508-83
			★1502
			★1504
			1096-85
		S8T32	★1502
			★1504
			508-90
			★1502
			★1504
			1096-91
8T33	**Signetics**	**N8T33**	★1502
			★1504
			508-84
			★1502
			★1504
			1096-86
		S8T33	★1502
			★1504
			508-91
			★1502
			★1504
			1096-92
8T34	Signetics	N8T34	2477-42
8T3404	Signetics	8T3404	496-22
8T35	**Signetics**	**N8T35**	★1502
			★1504
			508-85
			★1502
			★1504
			1096-74
		S8T35	★1502
			★1504
			508-92
			★1502
			★1504
			1096-78
8T36	**Signetics**	**N8T36**	★1502
			★1504
			508-86
			★1502
			★1504
			1096-75
		S8T36	★1502
			★1504
			508-93
			★1502
			★1504
			1096-79
8T37	Signetics	N8T37	2473-59
8T38	Signetics	N8T38	2476-4
8T39	**Signetics**	**N8T39**	★1502
			★1504
			★1511
			508-87
			★1502
			★1504
			★1511
			1096-72
		S8T39	★1502
			★1504
			★1511
			508-94
8T58	**Signetics**	**N8T58**	★1502
			★1504
			★1511
			1096-101
8T80	Signetics	N8T80	484-93
		S8T80	484-94
8T90	Signetics	S8T90	477-65
8T93	Signetics	N8T93	478-24
8T95	Motorola	MC8T95	477-24
			1090-31
	Signetics	N8T95	477-26
			1090-35
		S8T95	477-28
			1090-39
8T96	Motorola	MC8T96	477-148
			1090-32
	Signetics	N8T96	477-150
			1090-36
8T97	Motorola	MC8T97	477-25
			1090-33
8T97	Signetics	N8T97	477-27
			1090-37
		S8T97	477-29
			1090-40
8T98	Motorola	MC8T98	477-149
			1090-34
	Signetics	N8T98	477-151
			1090-38
		S8T98	477-152
			1090-41
8TS805	**Signetics**	**8TS805**	★ 793
			496-88
8TS806	**Signetics**	**8TS806**	★ 793
			486-113
8TS807	**Signetics**	**8TS807**	★ 799
			496-89
8TS808	**Signetics**	**8TS808**	★ 799
			486-114
8V41	**Signetics**	**N8V41**	★1516
8X01	Signetics	8X01A	2467-8
	Signetics	**N8X01A**	★1514
			506-15
8X02	Signetics	N8X02	1085-112
			1102-35
	Signetics	**N8X02A**	★1513
			506-163
8X08	Signetics	8X08	2945-142
8X300	Signetics	8X300	1073-33
			¶ 247-1
	Signetics	**N8X300**	★1501
			★1511
			1096-67
		S8X300-1	★1501
			★1511
			1096-69
		S8X300-2	★1501
			★1511
			1096-70
8X300KT100			
	Signetics	8X300KT100SK	1763-3
8X305	Signetics	8X305	1073-34
			¶ 248-9
	Signetics	**N8X305**	★1501
			1096-68
		S8X305	★1501
			1096-71
8X31	**Signetics**	**N8X31**	★1502
			★1504
			508-82
			★1502
			★1504
			1096-82
8X310	**Signetics**	**N8X310**	★1501
			★1505
			1096-98
		S8X310	★1501
			★1505
8X32	**Signetics**	**N8X32**	★1502
			★1504
			508-88
			★1502
			★1504
			1096-87
8X320	**Signetics**	**N8X320**	★1501
			★1506
			506-142
			★1501
			★1506
			1096-97
8X330	**Signetics**	**N8X330**	★1501
			★1507
			1096-73
8X338	**Signetics**	**N8X338**	★1501
			★1508
8X350	**Signetics**	**N8X350**	★1501
			★1509
			3475-11
			★1501
			★1509
			1096-100
	Signetics	S8X350	3475-12
8X36	**Signetics**	**N8X36**	★1502
			★1504
			508-89
			★1502

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
8X36	**Signetics**	**N8X36**	★**1504**
			1096-76
8X360	**Signetics**	**N8X360**	★**1501**
			★**1510**
			1096-99
8X371	**Signetics**	**N8X371**	★**1501**
			1096-83
		S8X371	★**1501**
			1096-84
8X372	**Signetics**	**N8X372**	★**1501**
			1096-88
		S8X372	★**1501**
			1096-93
8X374	**Signetics**	**N8X374**	★**1501**
			★**1510**
			1096-95
	Signetics	S8X374	1096-96
8X376	**Signetics**	**N8X376**	★**1501**
			1096-77
		S8X376	★**1501**
			1096-80
8X382	**Signetics**	**N8X382**	★**1501**
			1096-89
		S8X382	★**1501**
			1096-94
8X41	Signetics	N8X41	505-159
			1102-24
8X42	**Signetics**	**N8X42**	★**1502**
			★**1504**
			★**1511**
			1096-90
8X60	**Signetics**	**N8X60**	★**1517**
			506-107
9	**Datel**	**SHM9**	★**2614**
	Percom	SBC/9	1761-7
		SBC/9EX	1761-2
90	Burr-Brown	DAC90B	2441-24
		DAC90S	2441-25
	CompAuto	4/90	1619-4
	Heurikon	MLZ-90	1755-15
	Quay	90F/MPS	1757-14
		90MPS	1757-15
900	AnalogSys	MI900	2964-111
	Cherry	IC900	2939-38
	Dionics	DI900	2956-81
	SGS	TCA900	2906-75
			2964-132
			¶ 276-7
	Unitrode	**PIC900**	★**3446**
			2964-118
	Western	WD/900	1767-25
9000	Fairchild	9000M	487-96
	TI	**TMAM9000**	★**1560**
			★**1748**
			1632-4
	Western	WD9000	1096-103
9001	Fairchild	9001C	487-97
		9001M	487-98
9002	National	DM9002C	492-6
9003	National	DM9003C	490-176
9004	National	DM9004C	490-91
	SMC	COM9004	2486-77
9005	National	DM9005C	492-152
9006	National	DM9006C	493-29
	SMC	CRT9006-135	1100-75
		CRT9006-83	1100-76
9007	SMC	CRT9007	1101-112
9008	National	DM9008C	493-54
	Western	CP9008	1096-102
			1081-28
9009	National	DM9009C	490-4
9010	**TI**	**TMAM9010**	★**1560**
			★**1749**
			1633-1
9012	National	DM9012C	491-137
9014	**OEI**	**9014**	★**3347**
			2962-1
9016	AMD	9016C	3469-35
		9016D	3469-21
		9016E	3469-2
	AMD	**AM8/9016**	★**1705**
	National	DM9016C	477-162
9021	SMC	CRT9021B	1100-77
	TI	**TMAM9021**	★**1560**
			★**1749**
			1633-2
9024	Fairchild	9024C	487-113
		9024M	487-114
9026	SMC	COM9026	1101-53
9041	**TI**	**TMAM9041**	★**1560**
			★**1749**
			1633-3
905	Dionics	DI905	2956-82
9050	**OEI**	**9050**	★**3347**
			2892-56
9080	**AMD**	**AM9080A**	★**1233**
			1059-16
	AMD	AM9080AC	1094-37
		AM9080AM	1094-38
9085	AMD	AM9085A	1095-112
			1059-17
909	Harris	HA-909	2928-52
			¶ 266-5
			¶ 266-6
90F/MPS			
	Quay	90F/MPS	1757-14
90L50	AMD	90L50C	3468-49
		90L50D	3468-43
		90L50E	3468-31
90L60	AMD	90L60C	3468-50
		90L60D	3468-44
		90L60E	3468-32
91	Heurikon	MLZ-91A	1755-26
910	Pro-Log	M910A	4008-1
	SGS	TCA910	2906-76
			2964-133
			¶ 276-7
91009	Fairchild	91009C	505-150
9101	AMD	AM9101A	3474-99
		AM9101AM	3474-100
		AM9101B	3474-68
		AM9101BM	3474-69
		AM9101C	3474-39
		AM9101CM	3474-40
		AM9101D	3474-17
9102	AMD	AM9102	3477-13
		AM9102A	3477-6
		AM9102AM	3477-7
		AM9102B	3476-92
		AM9102BM	3476-93
		AM9102C	3476-74
		AM9102CM	3476-75
		AM9102D	3476-54
		AM9102M	3477-14
	Plessey	MN9102	511-89
			¶ 233-4
9105	Plessey	MN9105	510-47
			¶ 233-4
9106	Plessey	MN9106	510-52
			¶ 233-4
	Toshiba	TC9106B	2945-136
9107	Plessey	MN9107	510-53
			¶ 233-4
9108	Plessey	MN9108	510-54
			¶ 233-4
9109	Toshiba	TC9109B	2945-137
911	Harris	HA-911	2931-17
			¶ 266-5
			¶ 266-6
9111	AMD	AM9111A	3474-101
		AM9111AM	3474-102
		AM9111B	3474-70
		AM9111BM	3474-71
		AM9111C	3474-41
		AM9111CM	3474-42
		AM9111D	3474-18
	Toshiba	TC9111B	2945-138
9112	AMD	AM9112A	3474-92
		AM9112AM	3474-93
		AM9112B	3474-72
		AM9112BM	3474-73
		AM9112C	3474-43
		AM9112CM	3474-44
		AM9112D	3474-19
9114	AMD	AM9114B	3479-19
		AM9114BM	3479-20
		AM9114C	3478-81
		AM9114CM	3478-82
		AM9114E	3478-13
912	**OKI**	**MSL912R**	★**3873**
			2465-99
91200	Nitron	NC91200	4141-63
9121	Toshiba	TC9121	2902-116
9122	AMD	AM9122-25	3473-60
		AM9122-35	3473-63
	Toshiba	TC9122	453-58
9124	AMD	AM9124B	3479-21
			¶ 287-10
		AM9124BM	3479-22
			¶ 287-10
		AM9124C	3478-83
			¶ 287-10
		AM9124CM	3478-84
			¶ 287-10
		AM9124E	3478-14
			¶ 287-10
9128	**AMD**	**AM9128**	★**3601**
9130	AMD	AM9130AC	3479-53
		AM9130AM	3479-54
		AM9130BC	3479-7
		AM9130BM	3479-8
		AM9130CC	3478-109
		AM9130CM	3479-1
		AM9130DC	3478-62
		AM9130EC	3478-48
	Toshiba	TC9130	464-78
9131	Plessey	SP9131	4141-84
	Toshiba	TC9131	2900-57
9132	Toshiba	TC9132	2902-59
9133	Toshiba	TC9133	2902-60
9134	Toshiba	TC9134	2902-61
9135	Toshiba	TC9135	464-79
9136	Toshiba	TC9136	2904-59
9137	Toshiba	TC9137	2904-60
9138	Toshiba	TC9138	2902-110
9139	Toshiba	TC9139	2902-111
9140	AMD	9140AC	3482-107
		9140AM	3482-108
		9140BC	3482-91
		9140BM	3482-92
		9140CC	3482-79
		9140CM	3482-80
		9140DC	3482-52
		AM9140EC	3482-36
9143	Toshiba	TC9143	2902-119
9144	Toshiba	TC9144	2902-120
9147	AMD	9147-55	3481-56
		AM9147-55	3481-59
		AM9147-70	3481-89
		AM9147-70M	3481-90
		AM9147-85M	3481-111
9148	AMD	AM9148-55	3477-48
		AM9148-70	3477-69
9149	AMD	AM9149-55	3477-49
		AM9149-70	3477-70
915	**OKI**	**MSL915R**	★**3873**
			2465-100
	Signetics	TBA915	2896-14
91500	Nitron	NC91500	4141-64
9151	GI	AY5-9151	2948-4
9153	GI	AY5-9153	2948-5
9154	GI	AY5-9154	2948-6
916	OKI	MSL916R	2465-101
917	**OKI**	**MSL917R**	★**3873**
			2465-102
91L01	AMD	AM91L01A	3474-103
		AM91L01AM	3474-104
		AM91L01B	3474-74
		AM91L01BM	3474-75
		AM91L01C	3474-45
		AM91L01CM	3474-46
91L02	AMD	AM91L02	3477-15
		AM91L02A	3477-8
		AM91L02AM	3477-9
		AM91L02B	3476-94
		AM91L02BM	3476-95
		AM91L02C	3476-76
		AM91L02CM	3476-77
		AM91L02M	3477-16
91L11	AMD	AM91L11A	3474-106
		AM91L11B	3474-76
		AM91L11BM	3474-77
		AM91L11CM	3474-48
91L111	AMD	AM91L111AM	3474-105
		AM91L111C	3474-47
91L12	AMD	AM91L12A	3474-94
		AM91L12AM	3474-95
		AM91L12B	3474-78
91L12	AMD	AM91L12BM	3474-79
		AM91L12C	3474-49
		AM91L12CM	3474-50
91L14	AMD	AM91L14B	3479-23
		AM91L14BM	3479-24
		AM91L14C	3478-85
		AM91L14CM	3478-86
		AM91L14E	3478-15
91L22	AMD	AM91L22-35	3473-64
		AM91L22-45	3473-74
		AM91L22-60	3473-81
91L24	AMD	AM91L24B	3479-25
		AM91L24BM	3479-26
		AM91L24C	3478-87
		AM91L24CM	3478-88
		AM91L24E	3478-16
91L30	AMD	AM91L30AC	3479-55
		AM91L30AM	3479-56
		AM91L30BC	3479-9
		AM91L30BM	3479-10
		AM91L30CC	3479-2
		AM91L30CM	3479-3
		AM91L30DC	3478-63
91L40	AMD	91L40AC	3482-109
		91L40AM	3482-110
		91L40BC	3482-93
		91L40BM	3482-94
		91L40CC	3482-81
		91L40CM	3482-82
		91L40DC	3482-53
91L47	AMD	AM91L47	3481-91
92	Heurikon	MLZ-92A	1755-27
920	National	TBA920	2904-92
	Plessey	ML920	2902-26
		TBA920	2904-99
	RCA	CA920A	2904-107
	Signetics	TBA920S	2904-109
9201	**Exar**	**XR9201**	★**3193**
			2442-40
9208	AMD	9208BC	3484-75
		9208BM	3484-76
		9208CC	3484-64
		9208D	3484-57
9212	SMC	CRT9212	1100-100
92128	AMD	AM92128B	3487-35
		AM92128C	3487-27
		AM92128D	3487-22
9214	AMD	9214C	3484-17
		9214M	3484-18
9216	SMC	FDC9216	1101-34
	Western	**WD9216-00**	★**1570**
			1101-38
		WD9216-01	★**1570**
			1101-39
9217	AMD	9217AC	3485-56
		9217AM	3485-57
		9217BC	3485-29
		9217BM	3485-30
9218	AMD	9218BC	3485-31
		9218BM	3485-32
		9218C	3485-14
		AM9218-10	3480-10
		AM9218-15	3480-48
		AM9218-20	3480-87
		AM9218-70	3480-1
922	Plessey	ML922	2902-27
9229	SMC	FDC9229	1101-40
9232	AMD	9232BC	3485-117
		9232BM	3485-118
		9232C	3485-81
9233	AMD	9233BC	3485-119
		9233BM	3485-120
		9233C	3485-82
92560	**Harris**	**HM92560**	★ **669**
			★**3782**
926	Plessey	ML926	2902-28
9264	AMD	AM9264B	3486-112
		AM9264C	3486-75
		AM9264D	3486-45
9265	AMD	AM9265B	3486-121
		AM9265C	3486-91
		AM9265D	3486-64
927	Teltone	M927	2949-99
928	Plessey	ML928	2902-29
929	Plessey	ML929	2902-30
93	Heurikon	MLZ-93	1755-28

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
930	**Motorola**	**MC930**	★ 729
		MVME930	★1936
9300	Epson	SVM9300	2902-87
	Fairchild	9300C	501-36
			3488-114
		9300M	501-37
			3488-115
	Motorola	MC9300	501-42
			3488-51
	National	DM9300	501-46
			3489-13
	Signetics	N9300	501-49
9301	Fairchild	9301C	482-155
		9301M	482-156
	Motorola	MC9301	483-9
	National	DM9301	483-13
	Signetics	N9301	482-118
9302	Fairchild	9302C	483-1
		9302M	483-2
9304	Fairchild	9304C	474-146
		9304M	474-147
	Motorola	MC9304	474-149
9305	Fairchild	9305C	479-27
		9305M	479-28
9306	**National**	**MMC9306**	★3867
			3455-1
9307	Fairchild	9307C	2463-109
		9307M	2463-110
	Motorola	MC9307	2463-116
9308	Fairchild	9308C	495-97
		9308M	495-98
	Raytheon	RC9308	495-100
9309	Fairchild	9309C	497-105
		9309M	497-106
	Motorola	MC9309	497-108
	National	DM9309	497-110
	Signetics	N9309	497-111
		S9309	497-112
931	**Motorola**	**MVME931**	★1936
9310	Fairchild	9310C	480-127
		9310M	480-128
	Motorola	MC9310	480-133
	National	DM9310	480-137
	Signetics	N9310	480-140
9311	Fairchild	9311C	484-21
		9311M	484-22
	MicroPwr	**MP9311**	★2749
	Motorola	MC9311	484-29
	National	DM9311	484-33
9312	Fairchild	9312C	499-121
		9312M	499-122
	Motorola	MC9312	499-124
	National	DM9312	499-126
	Signetics	N9312	499-132
9313	Fairchild	9313C	499-138
		9313M	499-139
9314	Fairchild	9314C	495-156
		9314M	495-157
	Motorola	MC9314	495-159
	Signetics	S9314	495-160
9316	Fairchild	9316C	478-101
		9316M	478-102
	GI	RO3-9316A	3485-62
		RO3-9316B	3485-39
		RO3-9316C	3485-19
	Motorola	MC9316	478-110
	National	DM9316	478-114
	Signetics	N9316	478-117
9317	Fairchild	9317BC	2463-152
		9317BM	2463-153
		9317CC	2464-7
		9317CM	2464-8
93174	Fairchild	93174C	486-44
9318	Fairchild	9318C	508-126
		9318M	508-127
	Motorola	MC9318	508-130
	National	DM9318	508-134
9319	Fairchild	9319C	481-72
		9319M	481-73
932	**Motorola**	**MVME932**	★1941
9320	Fairchild	9320C	508-1
		9320M	481-74
9321	Fairchild	9321C	483-48
		9321M	483-49
9322	Fairchild	9322C	499-3
		9322M	499-4
9322	Motorola	MC9322	499-10
	National	DM9322	499-14
	Signetics	N9322	499-20
9324	Fairchild	9324C	474-39
		9324M	474-40
	Motorola	MC9324	474-48
	Signetics	N9324	474-61
932510	Fairchild	932510C	3464-56
		932510M	3464-85
932511	Fairchild	932511C	3464-60
9328	Fairchild	9328C	503-1
			3491-31
		9328M	503-2
			3491-32
	Motorola	MC9328	503-4
			3491-27
933	**Motorola**	**MVME933**	★1941
9331	HybridSys	DAC9331-14	2460-25
	HybridSys	**DAC9331-16-4**	★2745
			2461-31
		DAC9331-16-5	★2745
			2461-16
		DAC9331-16-6	★2745
			2461-3
	MicroPwr	MP9331-4	2461-32
		MP9331-5	2461-17
		MP9331-6	2461-4
9332	GI	RO3-9332A	3486-24
		RO3-9332B	3485-126
		RO3-9332D	3485-70
9333	GI	RO3-9333B	3485-127
		RO3-9333C	3485-101
9334	Fairchild	9334C	496-23
			¶ 237-4
		9334M	496-24
			¶ 237-4
	National	DM9334	496-28
	Signetics	N9334	496-29
		S9334	496-30
9338	Fairchild	9338C	496-157
			¶ 236-14
		9338M	496-158
			¶ 236-14
	HybridSys	**HS9338-0**	★2748
			2458-3
		HS9338-1	★2748
			2457-7
		HS9338-2	★2748
			2455-13
9340	Fairchild	9340C	476-42
		9340M	476-43
93407	Fairchild	93407C	496-159
		93407M	496-160
9341	Fairchild	9341C	475-2
		9341M	475-3
93410	Fairchild	93410C	3473-6
		93410M	3473-15
93411	Fairchild	93411M	3473-11
93412	AMD	AM93412	3473-67
		AM93412AC	3473-65
		AM93412AM	3473-75
		AM93412M	3473-82
	Motorola	MCM93412C	3473-68
		MCM93412M	3473-84
93415	AMD	AM93415AC	3475-56
		AM93415AM	3475-69
		AM93415C	3475-79
		AM93415M	3475-99
	Fairchild	**93415AC**	★3615
			3475-58
		93415C	★3615
			3475-80
		93415M	★3615
			3475-93
	Motorola	**MCM93415C**	★3839
			3475-82
		MCM93415M	★3839
			3475-95
93417	Fairchild	93417C	3459-78
		93417M	3459-99
93419	**Fairchild**	**93419A**	★3615
			★3631
			3472-30
		93419C	★3615
			★3631
			3472-32
93419	**Fairchild**	**93419M**	★3615
			★3631
			3472-35
			3472-35
	Fujitsu	MBM93419	3472-33
9342	Fairchild	9342C	475-68
		9342M	475-69
93421	AMD	AM93421C	3473-4
	Fairchild	93421M	3473-9
93422	AMD	AM93422	3473-71
		AM93422AC	3473-66
		AM93422AM	3473-77
		AM93422M	3473-85
	Fairchild	**93422AM**	★3615
			★3634
			3473-61
		93422C	★3615
			★3634
			3473-72
		93422M	★3615
			★3634
			3473-87
	Motorola	**MCM93422C**	★3839
			3473-73
		MCM93422M	★3839
			3473-90
93425	AMD	AM93425AC	3475-57
		AM93425AM	3475-70
		AM93425C	3475-83
		AM93425M	3475-100
	Fairchild	**93425AC**	★3615
			★3640
			3475-59
		93425C	★3615
			★3640
			3475-84
		93425M	★3615
			★3640
			3475-96
	Motorola	**MCM93425C**	★3839
			3475-86
		MCM93425M	★3839
			3475-98
93427	Fairchild	93427C	3459-82
		93427M	3459-107
93436	Fairchild	93436C	3460-53
		93436M	3460-71
93438	Fairchild	93438C	3461-2
		93438M	3461-21
9344	Fairchild	9344M	475-108
93446	Fairchild	93446C	3460-57
		93446M	3460-77
93448	Fairchild	93448C	3461-3
		93448M	3461-25
93450	Fairchild	93450C	3462-71
		93450M	3462-97
93451	Fairchild	93451C	3462-74
		93451M	3462-105
93452	Fairchild	93452C	3461-112
			3461-112
		93452M	3462-10
			3462-10
93453	Fairchild	93453C	3461-113
			3461-113
		93453M	3462-12
			3462-12
93458	**Fairchild**	**93458C**	★3661
			3458-16
		93458M	★3661
			3458-19
93459	**Fairchild**	**93459C**	★3661
			3458-20
		93459M	★3661
			3458-27
93460	Fairchild	93460M	3462-98
93471	**Fairchild**	**93471A**	★3615
		93471C	★3615
			★3643
			3481-52
		93471M	★3615
			★3643
			3481-82
93475	**Fairchild**	**93475**	★3615
			★3646
			3477-46
93479	**Fairchild**	**93479DC**	★3615
93479	**Fairchild**	**93479DC**	★3649
			3475-14
9348	Fairchild	9348C	509-45
		9348M	509-46
9349	HybridSys	DAC9349-12	2455-33
		DAC9349-3D	2460-5
93510	Fairchild	93510C	3464-86
		93510M	3464-57
93511	Fairchild	93511C	3464-88
		93511M	3464-95
93546	Fairchild	93546M	474-72
9356	HybridSys	DAC9356	2455-40
936	Reticon	RL936	2964-44
9360	Nitron	NC9360	4141-65
9362	**OKI**	**MSL9362**	★3873
			2902-22
9363	**OKI**	**MSL9363**	★3873
			2902-23
9364	GI	RO3-9364B	3487-1
		RO3-9364C	3486-78
9365	GI	RO3-9365B	3487-2
		RO3-9365C	3486-68
9368	Fairchild	9368C	2463-74
937	Teltone	M937	2949-100
9370	Fairchild	9370C	2463-70
9374	Fairchild	9374C	2464-57
9377	**HybridSys**	**DAC9377-16-4**	★2745
			2458-7
		DAC9377-16-5	★2745
			2457-9
		DAC9377-16-6	★2745
			2461-8
		DAC9377-40	★2745
			★2745
			2460-15
	MicroPwr	**MP9377-16**	★ 401
			★2749
			2461-9
9386	Fairchild	9386C	495-62
		9386M	495-63
	Signetics	9386	495-68
93F425	Fairchild	93F425	3475-47
93L00	Fairchild	93L00C	3488-48
		93L00M	3488-49
93L28	Fairchild	93L28C	3491-24
		93L28M	3491-25
93L412	AMD	AM93L412	3473-83
		AM93L412AC	3473-76
		AM93L412AM	3473-79
		AM93L412M	3473-91
93L415	AMD	AM93L415C	3475-92
		AM93L415M	3476-5
	Fairchild	93L415	3475-94
93L420	Fairchild	93L420M	3473-5
93L421	Fairchild	93L421C	3473-22
		93L421M	3473-25
93L422	AMD	AM93L422	3473-86
		AM93L422AC	3473-78
		AM93L422AM	3473-80
		AM93L422M	3473-92
	Fairchild	**93L422AC**	★3615
			★3637
			3473-62
		93L422AM	★3615
			★3637
			3473-93
		93L422C	★3615
			★3637
			3473-88
		93L422M	★3615
			★3637
			3473-94
	Motorola	**MCM93L422**	★3839
93L425	AMD	AM93L425M	3476-8
	Fairchild	**93L425C**	★3615
			3475-97
		93L425M	★3615
			3476-9
93L450	Fairchild	93L450C	3462-99
		93L450M	3463-20
93L451	Fairchild	93L451C	3462-106
		93L451M	3463-22
93S00	Fairchild	93S00C	501-69
			3489-39
		93S00M	501-70
			3489-40

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
93S10	**AMD**	**93S10C**	★1227
			480-172
		93S10M	★1227
			480-173
	Fairchild	93S10C	480-176
		93S10M	480-177
93S12	Fairchild	93S12C	499-186
		93S12M	499-187
93S137	Fairchild	93S137C	484-16
		93S137M	484-17
93S16	AMD	93S16C	478-150
		93S16M	478-151
	AMD	**SN93S16**	★1227
	Fairchild	93S16C	478-154
		93S16M	478-155
93S41	Fairchild	93S41C	475-56
		93S41M	475-57
93S42	Fairchild	93S42C	475-83
		93S42M	475-84
93S43	Fairchild	93S43C	475-144
			¶ 228-3
		93S43M	475-145
			¶ 228-3
93S46	Fairchild	93S46C	474-73
93S47	Fairchild	93S47C	474-74
		93S47M	474-75
93S48	**AMD**	**93S48C**	★1227
			509-47
		93S48M	★1227
			509-48
93S62	Fairchild	93S62C	509-16
		93S62M	509-17
93Z450	**Fairchild**	**93Z450**	★3652
			3462-72
		93Z450A	★3652
			3462-63
93Z451	**Fairchild**	**93Z451**	★3652
			3462-75
		93Z451A	★3652
			3462-66
93Z510	**Fairchild**	**93Z510C**	★3655
			3464-58
		93Z510M	★3655
			3464-87
93Z511	**Fairchild**	**93Z511C**	★3655
			3464-61
		93Z511M	★3655
			3464-89
93Z564	**Fairchild**	**93Z564**	★3658
			3466-75
93Z565	**Fairchild**	**93Z565**	★3658
			3466-76
94	Quay	94F/MPS	1757-16
		99/94F	1628-3
940	ITT	TBA940	2904-83
	NEC-Electron	uPD940	2898-62
	Plessey	TBA940	2904-100
	SGS	TCA940	2896-175
			¶ 268-4
		TCA940E	2897-58
			¶ 268-4
9400	GI	AY3-9400	2949-126
	TeledyneS	9400	2963-107
			¶ 252-3
			¶ 252-15
9401	AMD	9401C	3488-28
		9401M	3488-29
	Fairchild	9401C	506-11
			2467-4
			1085-11
		9401M	506-12
			2467-5
			1085-12
	Signetics	**N9401**	★1514
			506-16
			★1514
			2467-9
			★1514
			1085-15
	TeledyneS	9401	2963-108
9402	Fairchild	9402C	1085-7
		9402M	1085-8
	TeledyneS	9402	2963-109
9403	Fairchild	9403AC	1085-4
		9403AM	1085-5
9403	**Signetics**	**N9403**	★1515
			1085-6
	TeledyneS	**TSC9403**	★2854
			2480-14
			★2854
			3488-1
	Toshiba	TSC9403	2463-23
9404	Fairchild	9404C	1085-20
	TeledyneS	**TSC9404**	★2854
			2480-15
			★2854
			3488-2
			3491-40
	Toshiba	TSC9404	2463-24
9405	Fairchild	9405AC	474-172
			1085-2
		9405AM	474-173
			1085-3
9406	Fairchild	9406C	3456-60
			1085-25
		9406M	3456-61
			1085-26
	OEI	**9406**	★3346
9407	Fairchild	9407C	1085-16
		9407M	1085-17
9408	Fairchild	9408AC	1085-21
		9408AM	1085-22
		9408C	1085-23
		9408M	1085-24
941	NEC-Electron	uPD941	2898-63
9410	Fairchild	9410C	497-55
			3470-95
			1085-27
		9410M	497-56
			1085-28
	GI	AY3-9410	2949-127
9411	Fairchild	9411C	506-13
			2467-6
			1085-13
		9411M	506-14
			2467-7
			1085-14
9412	**OEI**	**9412**	★3346
9414	Fairchild	9414STC	506-17
			1085-18
		9414STM	506-18
			1085-19
9423	Fairchild	9423C	3456-39
			1085-9
		9423M	3456-40
			1085-10
9428	Fairchild	9428	2467-17
			1085-121
943	NEC-Electron	uPD943	2898-64
9440	Fairchild	F9440	1077-28
		F9440C	1099-132
		F9440M	1099-133
9441	Fairchild	9441C	1100-3
9442	Fairchild	9442C	1100-2
9443	**Fairchild**	**F9443**	★1286
			1100-1
9444	**Fairchild**	**F9444**	★1285
			★1287
			1100-4
9445	**Fairchild**	**F9445**	★1285
			★1288
			1099-134
			★1285
			★1288
			1077-29
9446	**Fairchild**	**F9446**	★1285
			★1292
			1100-5
9447	**Fairchild**	**F9447**	★1285
			★1293
			1100-6
9448	**Fairchild**	**F9448**	★1285
			★1294
			1099-135
9449	**Fairchild**	**F9449**	★1285
			★1295
			1099-136
9454	Fairchild	F9454	1099-137
946	NEC-Electron	uPD946	2898-65
947	NEC-Electron	uPD947	2898-66
	Teltone	M947	2949-101
9470	**Fairchild**	**F9470**	★1285
			★1296
			1099-138
9480	Fairchild	9480	4140-77
9491	**OEI**	**9491A**	★3346
	TeledyneS	9491AM	2966-11
		9491B	2966-12
		9491BM	2966-13
9495	TeledyneS	9495A	2966-99
		9495C	2966-100
		TSC9495	2966-101
9496	TeledyneS	TSC9496	2966-171
94F/MPS			
	Quay	94F/MPS	1757-16
95	**AMD**	**AM95/3310**	★1905
		AM95/4006	★1902
			1755-2
		AM95/4010	★1902
			1755-1
		AM95/5132	★1905
		AM95/6110	★1904
		AM95/6120	★1904
	CompAuto	4/95	1619-4
950	**CMA**	**CMA950**	★4311
			4140-57
	ITT	TBA950	2904-84
	National	TBA950-2	2904-93
	NEC-Electron	uPD950	2898-67
	Plessey	TBA950	2904-101
9500	ITT	TDA9500	2904-86
95000	Fairchild	F95000	470-3
			3489-49
95002	Fairchild	F95002	469-136
95003	Fairchild	F95003	469-138
95004	Fairchild	F95004	469-134
95010	Fairchild	F95010	469-127
95016	Fairchild	F95016	469-126
9502	GI	RO3-9502	3485-65
			1089-2
95029	Fairchild	F95029	469-129
9503	GI	RO3-9503	1089-3
	ITT	TDA9503	2904-87
9505	GI	RO3-9505	3486-28
951	NEC-Electron	uPD951	2898-68
9510	**OKI**	**MSL9510R**	★3873
			2465-103
95101	Fairchild	F95101	469-140
95102	Fairchild	F95102	469-135
95103	Fairchild	F95103	469-131
95105	Fairchild	F95105	469-139
95106	Fairchild	F95106	469-133
95107	Fairchild	F95107	470-1
95109	Fairchild	F95109	469-137
9511	AMD	9511	1102-19
	AMD	**9511A**	★1231
			510-1
			★1231
			1102-20
	AMD	9511A-5	510-2
			1102-21
	AMD	**AM9511A**	★1240
			1094-58
			¶ 247-17
	AMD	AM9511A-1	1094-59
			¶ 247-17
		AM9511A-5	1094-60
			¶ 247-17
		AM9511ADM	1094-61
			¶ 247-17
	OKI	**MSL9511R**	★3873
			2465-104
95110	Fairchild	F95110	469-130
95111	Fairchild	F95111	469-132
95115	Fairchild	F95115	470-7
95116	Fairchild	F95116	470-6
9512	**AMD**	**9512**	★1231
			1102-22
		AM9512	★1241
95124	Fairchild	F95124	470-5
9513	AMD	9513	1102-80
	AMD	**9513A**	★1231
		AM9513	★1242
9513	AMD	AM9513	1095-98
			¶ 244-13
	ITT	TDA9513	2904-88
95130	Fairchild	F95130	470-2
9516	**AMD**	**9516**	★1231
	HybridSys	HS9516-4	2436-35
		HS9516-5	2436-41
		HS9516-6	2436-49
9517	**AMD**	**9517A**	★1231
			1102-37
		AM9517A	★1243
			1095-38
			¶ 247-18
	AMD	AM9517A-5	1095-39
			¶ 247-18
9518	**AMD**	**9518**	★1231
		AM9518	★1244
			1094-121
9519	**AMD**	**9519A**	★1231
			1101-70
		AM9519A	★1245
			1095-46
			¶ 247-19
952	**Datel**	**DAS-952R**	★2623
			2963-44
	NEC-Electron	uPD952	2898-69
	Plessey	SL952	2905-79
9520	**AMD**	**9520**	★1231
		AM9520	★1246
			1102-33
9521	**AMD**	**9521**	★1231
95231	Fairchild	F95231	469-128
9540	Nitron	NC9540	4141-66
955	Siemens	TCA955	2906-79
			2964-134
9551	**AMD**	**AM9551**	★1236
			1095-22
9555	AMD	AM9555ADM	1095-61
9557	**AMD**	**AM9557**	★1238
			1095-40
			1096-10
95H00	Fairchild	95H00C	3489-47
		F95H00C	470-4
95H90	Fairchild	95H90C	510-106
			2946-75
		95H90M	510-107
			2946-76
95H91	Fairchild	95H91C	510-86
			2946-58
		95H91M	510-87
			2946-59
96	**AMD**	**AM96/4018**	★1705
		AM96/4116A	★1901
			1767-7
	National	LX96XXD	2965-135
960	Signetics	TAA960	2887-12
	Universal	HCM960	4141-127
9600	**CreMicro**	**9600A**	★1911
	CreMicro	CMS-9600A	1761-3
	Fairchild	9600C	500-133
		9600M	500-134
9601	**CreMicro**	**9601A**	★1912
	Fairchild	9601C	500-107
		9601M	500-108
	Motorola	MC9601	500-110
	National	DM9601	500-112
	Signetics	9601	500-113
9602	**CreMicro**	**9602B**	★1912
	Fairchild	9602C	500-176
		9602M	500-177
	Motorola	MC9602	500-181
	National	DM9602	501-2
	Signetics	N9602	501-3
		S9602	501-4
9603	**CreMicro**	**9603A**	★1912
9604	**CreMicro**	**9604**	★1912
9609	**CreMicro**	**9609**	★1911
	CreMicro	CMS-9609	1761-20
9610	**CreMicro**	**9610**	★1912
96101	Fairchild	96101	484-95
		96101C	2469-37
		96101M	2469-38
96103	**CreMicro**	**96103**	★1912
	Fairchild	96103M	2476-5
96106	Fairchild	96106	2473-41
9611	**CreMicro**	**9611A**	★1911

Arranged alphanumerically from left to right.

Base Number	Source	Device	Page-Line
9612	**CreMicro**	**9612**	★**1912**
	Fairchild	9612C	2471-39
96130	**CreMicro**	**96130**	★**1912**
9614	**CreMicro**	**9614**	★**1912**
	Fairchild	9614C	2471-40
		9614M	2471-41
	TI	9614C	2471-44
9615	Fairchild	9615C	2474-56
		9615M	2474-57
	TI	9615C	2474-60
9616	**CreMicro**	**9616**	★**1911**
	Fairchild	9616	2469-25
		9616E	2469-26
		9616M	2469-27
9617	**CreMicro**	**9617**	★**1912**
	Fairchild	9617C	2473-12
9618	**CreMicro**	**9618**	★**1912**
9619	**CreMicro**	**9619**	★**1911**
	CreMicro	CMS-9619	1761-25
9620	**CreMicro**	**9620A**	★**1912**
9622	**CreMicro**	**9622**	★**1912**
9624	Fairchild	9624C	505-142
		9624M	505-143
9625	Fairchild	9625C	505-126
		9625M	505-127
9634	**CreMicro**	**9634**	★**1911**
	Fairchild	9634C	2472-7
		9634M	2472-8
9635	**CreMicro**	**9635**	★**1911**
9636	**CreMicro**	**9636**	★**1911**
	Fairchild	9636AC	2469-16
		9636AM	2469-17
	Motorola	**μA9636A**	★**2753**
	TI	uA9636A	2469-18
96364	SMC	CRT96364	1101-93
	Thomson-CSF	SFF96364	1101-94
96366	Thomson-CSF	SFF96366	1101-95
9637	**CreMicro**	**9637A**	★**1911**
	Fairchild	9637AC	2474-50
		9637AM	2474-51
	TI	uA9637AC	2474-54
9638	**CreMicro**	**9638**	★**1911**
	TI	uA9638C	2472-11
9639	TI	uA9639C	2469-15
9640	**CreMicro**	**9640A**	★**1912**
	Fairchild	9640C	508-41
			2478-3
		9640M	508-42
			2477-61
9641	Fairchild	9641M	508-43
9643	Fairchild	9643	2481-76
9645	Fairchild	9645	2483-83
965	Siemens	TCA965	2968-121
9650	**CreMicro**	**9650A**	★**1912**
	Fairchild	9650	2963-8
	OKI	**MSL9650**	★**3873**
			3453-24
9651	OKI	MSL9651	3453-25
9653	OKI	MSL9653	3453-26
9657	**CreMicro**	**9657**	★**1911**
966	**OKI**	**MSL966RS**	★**3873**
96600	**TI**	**SBP96600**	★ **438**
9661	**CreMicro**	**9661**	★**1912**
9662	**OKI**	**MSL9662**	★**3873**
			3453-65
		MSL9662RS	★**3873**
			3453-27
9663	**OKI**	**MSL9663**	★**3873**
			3453-66
		MSL9663RS	★**3873**
			3453-28
9664	**OKI**	**MSL9664**	★**3873**
			3453-64
		MSL9664RS	★**3873**
			3453-29
9665	Fairchild	9665	2480-70
			2890-23
	OKI	**MSL9665**	★**3873**
9666	Fairchild	9666	2480-87
			2890-24
		9666M	2480-88
			2890-25
9667	Fairchild	9667	2480-46
			2890-26
		9667M	2480-47
			2890-27
9668	Fairchild	9668	2480-31
			2890-28
		9668M	2480-32
			2890-29
967	Teltone	M967	2949-102
9670	**CreMicro**	**9670**	★**1911**
96702	**CreMicro**	**96702**	★**1912**
9671	**CreMicro**	**9671**	★**1912**
9685	**AD**	**AD9685**	★**3157**
			2892-9
	Plessey	SP9685	2893-38
			¶ 271-1
9687	**AD**	**AD9587**	★**3157**
			2892-10
	Plessey	SP9687	2893-39
			¶ 271-1
9697	**OEI**	**9697**	★**3346**
96L02	Fairchild	96L02C	500-178
		96L02M	500-179
96LS02	Fairchild	96LS02C	501-5
		96LS02M	501-6
96LS32	Fairchild	96LS32	2481-20
		96LS32C	2481-21
96LS42	Fairchild	96LS42C	2481-23
		96LS42M	2481-24
96LS488			
	Fairchild	96LS488DC	506-108
			¶ 237-2
			1102-44
			¶ 237-2
		96LS488DM	506-109
			¶ 237-2
			1102-45
			¶ 237-2
96S02	Fairchild	96S02C	501-9
		96S02M	501-10
97	**AMD**	**AM97/0064**	★**1903**
		AM97/0128	★**1903**
		AM97/0256	★**1903**
		AM97/0512	★**1903**
970	National	TBA970	2905-141
	Signetics	TAA970	2887-139
9702	AMD	9702A-1	3460-40
9706	Fairchild	uA9706C	2439-35
9708	AMD	AM9708	3463-60
	Fairchild	uA9708	2963-13
			1102-9
		uA9708C	2429-41
		uA9708M	2429-42
	TI	SBP9708C	476-5
			1098-89
		SBP9708M	476-6
			1098-90
9709	National	AM9709C	2422-26
971	Siemens	TCA971	2889-26
9710	National	AM9710C	2422-33
9711	National	AM9711C	2422-52
9712	National	AM9712C	2422-59
9716	AMD	AM9716	3465-14
	National	**NMC9716**	★**3868**
			3465-56
		NMC9716-25	★**3868**
			3465-6
		NMC9716-35	★**3868**
			3465-24
		NMC9716-45	★**3868**
			3465-57
		NMC9716E-25	★**3868**
			3465-7
		NMC9716E-35	★**3868**
			3465-25
		NMC9716E-45	★**3868**
			3465-58
		NMC9716H-25	★**3868**
			3465-8
		NMC9716H-35	★**3868**
			3465-26
		NMC9716M-45	★**3868**
			3465-59
9720	Nitron	NC9720	4141-67
9725	**OEI**	**9725**	★**3346**
9740	**OEI**	**9740**	★**3346**
97600	**TI**	**SBP97600**	★ **438**
9768	**AD**	**AD9768**	★**3162**
9768	**AD**	**AD9768**	★**3169**
			2439-39
	Plessey	SP9768	2441-17
97C09	National	AM97C09	2422-27
97C10	National	AM97C10C	2422-34
97C11	National	AM97C11C	2422-53
97C12	National	AM97C12C	2422-60
980	Pro-Log	M980	4008-2
	Signetics	TCA980	2887-140
9804	**OEI**	**9804**	★**3346**
9808	**OEI**	**9808**	★**3346**
9818	OEI	9818	2935-5
	TI	SBP9818C	3484-121
		SBP9818M	3484-122
9826	**OEI**	**9826**	★**3346**
990	National	TBA990	2903-111
	Plessey	TBA990	2903-132
	Telefunken	TBA990	2904-9
	TI	FS990/10	1632-3
	TI	**TM990/1481**	★**1564**
			1769-5
			¶ 250-1
			¶ 250-17
			¶ 251-3
			¶ 251-4
			¶ 251-5
			¶ 251-6
9900	AMI	S9900	1098-70
			¶ 238-13
			¶ 239-16
			¶ 246-12
			1077-23
			¶ 238-13
			¶ 239-16
			¶ 246-12
	GI	AY3-9900	2947-87
	TI	SBP9900A	1081-14
		SBP9900AC	1098-74
		SBP9900AE	1098-75
		SBP9900AM	1098-76
		TM9900/100MA	
			1767-20
		TM9900/101MA	
			1767-21
		TM9900/102	1767-22
	TI	**TMS9900**	★**1552**
			1098-77
			¶ 239-8
			¶ 239-9
			¶ 240-4
			¶ 246-11
			¶ 247-10
			¶ 247-15
			★**1552**
			1081-16
			¶ 239-8
			¶ 239-9
			¶ 240-4
			¶ 246-11
			¶ 247-10
			¶ 247-15
			★**1552**
			1081-17
			¶ 239-8
			¶ 239-9
			¶ 240-4
			¶ 246-11
			¶ 247-10
			¶ 247-15
		TMS9900-40	★**1552**
			1098-78
			¶ 239-8
			¶ 239-9
			¶ 240-4
			¶ 246-11
			¶ 247-10
			¶ 247-15
99000	**TI**	**TMS99000**	★**1552**
9901	AMI	S9901-4	1098-119
	TI	**TMS9901**	★**1554**
			1098-120
9902	AMI	S9902	1098-85
	TI	**TMS9902A**	★**1554**
			1098-86
9903	**TI**	**TMS9903**	★**1554**
			1098-123
9904	TI	TIM9904	1098-92
9905	**TI**	**TIM9905**	★**3980**
			★**1554**
			1098-99
9906	**OEI**	**9906**	★**3346**
			2910-22
			2913-159
			2933-8
	TI	**TIM9906**	★**1554**
			★**3980**
			1098-84
9907	**TI**	**TIM9907**	★**1554**
			★**3980**
			1098-114
9908	**OEI**	**9908**	★**3346**
			2910-28
			2913-162
	TI	**TIM9908**	★**3980**
			1098-116
9909	**OEI**	**9909**	★**3346**
			2910-6
			2913-163
	TI	**TMS9909**	★**1554**
			1098-101
991	Siemens	TAA991	2900-110
		TCA991	2889-27
9910	**OEI**	**9910**	★**3346**
			2887-24
			2908-34
	TI	TMS9910SA	1081-19
99105	**TI**	**TMS99105**	★**1555**
			1081-18
		TMS99105A	★**1553**
			★**1555**
			1098-68
9911	**OEI**	**9911**	★**3346**
			2887-25
			2908-22
	TI	TMS9911	1098-100
99110	**TI**	**TMS99110**	★**1555**
			1081-20
		TMS99110A	★**1553**
			★**1555**
			1098-69
			★**1553**
			★**1555**
			1081-21
9912	**OEI**	**9912**	★**3346**
			2909-111
			2910-10
			2913-143
			2913-158
			2935-6
9913	OEI	9913	2888-22
9914	**OEI**	**9914**	★**3346**
			2909-88
			2910-9
			2913-166
			2935-10
	TI	**TMS9914A**	★**1554**
			1098-105
9915	**OEI**	**9915**	★**3347**
			2892-57
9916	**OEI**	**9916**	★**3346**
			2910-19
			2913-164
			2935-9
	TI	TMS9916	1098-87
9917	OEI	9917	2910-29
			2913-126
9918	**OEI**	**9918**	★**3346**
			2909-89
			2913-165
	TI	**TMS9918A**	★**1554**
			1098-93
9922	TI	TMS9922	1098-88
9923	OEI	9923	2888-23
	TI	TMS9923	1100-65
9927	**TI**	**TMS9927**	★**1554**
			1098-94
			1100-88
			¶ 239-8
			¶ 240-12
9928	**TI**	**TMS9928A**	★**1554**
			1098-126

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Base Number	Source	Device	Page-Line
9929	TI	**TMS9929A**	★1554
			1098-127
9932	OEI	**9932**	★3346
			2910-11
			2913-128
	TI	**TMS9932**	★1554
9934	OEI	**9934**	★3347
			2962-2
9937	TI	**TMS9937**	★1554
			1098-95
9940	TI	**TMS9940E**	★1552
			1098-65
			¶ 240-11
			★1552
			1081-22
			¶ 240-11
		TMS9940M	★1552
			1098-67
			¶ 240-11
			★1552
			1081-23
			¶ 240-11
99531	TI	**TMS99531**	★1554
			1098-121
99532	TI	TMS99532	1098-102
99541	TI	**TMS99541**	★1554
			1098-96
9960	Nitron	NC9960	4141-68
	TI	SBP9960C	1098-117
		SBP9960M	1098-118
9961	TI	SBP9961C	1098-106
		SBP9961M	1098-107
99610	TI	**TMS99610**	★1555
9963	OEI	**9963**	★3346
			2887-19
			2908-4
9964	TI	SBP9964C	1098-124
		SBP9964M	1098-125
9965	TI	SBP9965C	1098-111
		SBP9965M	1098-112
99650	TI	**TMS99650**	★1554
			1098-110
998	TI	TMS998S	1081-26
9980	AMI	S9980	1059-30
		S9980A	1098-71
	SMC	SMC9980	1098-73
			1081-10
	TI	**TMS9980A**	★1552
			1098-79
			★1552
			1081-24
9981	AMI	S9981	1098-72
	TI	**TMS9981**	★1553
			1098-80
			★1553
			1081-25
9985	TI	TMS9985	1098-81
9989	TI	**SBP9989**	★1553
			1081-15
		TMS9989	★ 443
999	TI	TMS999S	1081-27
9995	TI	TM9995	1098-63
	TI	**TMS9995**	★1552
99C91	AMI	**S99C91**	★1252
			1098-64
			★1252
			1077-24
99C922	AMI	S99C922	1098-103
99C923	AMI	S99C923	1098-104
9LS194	Fairchild	9LS194C	3488-116
		9LS194M	3488-117
9LS195	Fairchild	9LS195C	3488-118
		9LS195M	3488-119
9LS295	Fairchild	9LS295C	3488-120
		9LS295M	3488-121
9LS298	Fairchild	9LS298C	499-89
		9LS298M	499-90
9LS395	Fairchild	9LS395C	3488-122
		9LS395M	3488-123
9LS95	Fairchild	9LS95C	3488-124
		9LS95M	3488-125

Arranged alphanumerically from left to right.

© IC MASTER 1983

ABBREVIATIONS OF COMPANY NAMES

Action Ins	Action Instruments
AD	Analog Devices
ADT	Advanced Digital Technology
Adapt Sci	Adaptive Science Corp.
Advent	Advent Products, Inc.
Alphatron	Alphatron
AMA	American Automation
AMD	Advanced Micro Devices
AMI	American Microsystems, Inc.
Amperex	Amperex Electronic Corp.
Analogic	Analogic
Analog Sys	Analog Systems
APC	Applied Micro Circuits
Apex	Apex Microtechnology
APM	Applied Microsystems Corp.
Appl Sys	Applied Systems Corp.
APT	Applied Microtechnology
Aptek	Aptek Microsystems
Array Tech	Array Technology
AWI	Analog West
Bedford	Bedford Computer Systems Inc.
Burr-Brown	Burr-Brown Research
CAE	Computer Aided Engineering
Cal Devices	California Devices
Cent Data	Central Data Corp.
Cermetek	Cermetek
CGRS	CGRS Microtech Inc.
Cherry	Cherry Semiconductor
CIC	Custom Integrated Circuits
Citel	Citel, Inc.
Comlinear	Comlinear Corporation
CMA	Custom MOS Arrays
Comark	Comark Corp.
Comdial	Comdial Semiconductor
Comp Auto	Computer Automation
Compas	Compas Microsystems
Cont Logic	Control Logic Inc.
Control Sys	Control Systems Microsystems Div.
CreMicro	Creative Micro Systems
Cromemco	Cromemco, Inc.
CSG	Commodore Semiconductor Group
Cubit	Cubit Inc.
Curtis	Curtis Electro Devices, Inc.
Cybernetic	Cybernetic Micro Systems
Cybersys	Cybersystems
Cybertek	Cybertek Inc.
Data General	Data General
Data I/O	Data I/O
Data Trans	Data Translation
Datel	Datel-Intersil
Datricon	Datricon Corporation
DDC	Data Devices Corporation
DEC	Digital Equipment Corporation
Delco	Delco Electrónics
DGM	Digital Microsystems
Digelec	Digelec Corp.
Digitek	Digitek, Inc.
Dionics	Dionics Inc.
Dist Comp	Distributed Computer Systems
Divers Tech	Diversified Technology
E-HI	E-H International, Inc.
Elind	Elind Elettronica Industriale
EL Instr	E & L Instruments
EMM	EMM
Emulogic	Emulogic Inc.
Epson	Epson America, Inc.
ETI Micro	ETI Micro
Exar	Exar Integrated Systems
Fairchild	Fairchild
Ferranti	Ferranti Electric
Fujitsu A	Fujitsu America
Fujitsu	Fujitsu Microelectronics, Inc.
GI	General Instrument
GMS	General Microsystems
GTE Micro	GTE Microcircuits
Harris	Harris Semiconductor
Heurikon	Heurikon Corp.
Hilevel	Hilevel Technology, Inc.
Hitachi	Hitachi America, Ltd.
Holt	Holt Inc.
HP	Hewlett-Packard
Hughes	Hughes Aircraft, Solid State Products
Hybrid Sys	Hybrid Systems
Hycom	Hycom Incorporated
IDT	Integrated Device Technology
IMI	International Microcircuits, Inc.
IMP	International Microelectronic Products
IMS	Industrial Micro-systems Inc.
Inconix	Inconix Corporation
Ind Tech	Inductive Technology
Inmos	Inmos
IntCirEng	Integrated Circuit Engineering
IntCirSys	Integrated Circuit Systems
IntCompSys	Integrated Computer Systems
IntCyber	International Cybernetics
Int Micro	International Microsystems
Int Tech	Integrated Technology Corp.
Intech/FMI	Intech/Function Modules Inc.
Intel	Intel
Interdesign	Interdesign
Intersil	Intersil
Intronics	Intronics
IPI	Integrated Photomatrix Inc.
ITT	ITT Semiconductors
Kinetic Sys	Kinetic Systems
Kontron	Kontron Electronics
Lambda	Lambda Semiconductor
Laserdyne	Laserdyne
LSI Comp	LSI Computer Systems
LSI Logic	LSI Logic Corporation
Master Logic	Master Logic Corporation
Matrix	Matrix Corp.
Matrox	Matrox Electronic Systems
MCC	Microcomputer Control
Micrel	Micrel
Micro Eng	Micro Circuit Engineering
Micro Innov	Micro Innovators
Micropac	Micropac Industries
Micro Net	Micro Networks
Micro Pwr	Micro Power Systems
Micro Sci	Micro Sciences Corp.
Micro Tech	Microcircuits Technology
Micro-Link	Micro-Link Corporation
Micron	Micron Technology
MilerTron	MilerTronics
Miller	Miller Technology
Mitel	Mitel Semiconductor
Mitsubishi	Mitsubishi Electronics
MMI	Monolithic Memories, Inc.
Monosil	Monosil
MonSys	Monolithic Systems Corp.
Mostek	Mostek
Motorola	Motorola Semiconductor
MRC	MRC Systems
Murray	Murray Consulting
National	National Semiconductor
NCR	NCR Corp., Microelectronics Division
NEC-EA	NEC/Electronic Arrays Division
NEC Electron	NEC/Electron Division
NEC Micro	NEC/Microcomputer Division
Nitron	Nitron
Nortek	Nortek
OAE	Oliver Advanced Engineering
Octagon	Octagon Systems Corp.
OEI	Optical Electronics Inc.
Ohio Sci	Ohio Scientific
OKI	OKI Semiconductor
Omnibyte	Omnibyte Corp.
Oscar	I. S. Oscar Assoc.
Panasonic	Panasonic
PC/M	Pacific/Cyber Metrix
Percom	Percom Data Co.
Phoenix	Phoenix Digital Corp.
Pico Design	Pico Design
Polycore	Polycore Electronics
Plessey	Plessy Semiconductors
PMI	Precision Monolithics, Inc.
PragDes	Pragmatic Design Inc.
PREMA	PREMA GmbH
Pro-Log	Pro-Log Corp.
Quay	Quay Corp.
Raytheon	Raytheon Semiconductor
RCA	RCA Solid State Division
RCI Data	RCI Data
RELMS	Relational Memory Systems
Reticon	Reticon
RIFA	RFIA
Rockwell	Rockwell, Microelectronic Devices
RTC	Riehl Time Corporation
Sanken	Sanken Electric
Sanyo	Sanyo
SEEQ	SEEQ Technology, Inc.
Semi Proc	Semi Processes
Siemens	Siemens
Signetics	Signetics
SGS	SGS-ATES Semiconductor
Sharp	Sharp
Silicon G	Silicon General
Siliconix	Siliconix
Silicon Sys	Silicon Systems Inc.
Siltronics	Siltronics
SMC	Standard Microsystems Corp.
Solarise	Solarise Enterprises
Solitron	Solitron Devices
Sprague	Sprague Electric Company
SSM	Solid State Micro Technology for Music
SSS	Solid State Scientific
Stag	Stag Microsystems
Struc. Des.	Structured Design Inc.
Stynetic	Stynetic Systems
Sunrise	Sunrise Electronics
Sunshine	Sunshine Semiconductor
Supertex	Supertex Inc.
Symtek	Symtek Corp.
Synapse	Synapse Corp.
Synertek	Synertek
Sys Innov	Systems Innovations
Tau Zero	Tau Zero Inc.
Tektronix	Tektronix
Telaris	(See Laserdyne)
Teledyne C	Teledyne Crystalonics
Teledyne P	Teledyne Philbrick
Teledyne S	Teledyne Semiconductor
Telefunken	Telefunken
Telephonics	Telephonics LSI
Telmos	Telmos
Teltone	Teltone Corporation
TI	Texas Instruments
Thomson-CSF	Thompson-CSF Components Corp.
TMX	TMX
Topanga	Topanga Data Systems
Toshiba	Toshiba America
Trans-Data	Trans-Data
TRW	TRW-LSI Products
Unitrode	Unitrode
Universal	Universal Semiconductor, Inc.
Vantage	Vantage Data Products
VTI	VLSI Technology, Inc.
Votrax	Votrax
Weitek	Weitek Corporation
Western	Western Digital
Wintek	Wintek Corp.
Xicor	Xicor, Inc.
Xycom	Xycom
Zendex	Zendex Corp.
Zilog	Zilog
Zymos	Zymos Corporation

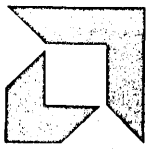
© IC MASTER 1983

PART NUMBER GUIDE

Each IC manufacturer has his own special method of identifying products, usually through a system of logos, device number prefixes and suffixes. This Part Number Guide is arranged alphabetically by manufacturer and describes each company's part number system. JAN nomenclature is also covered.

Manufacturer	Part Number: Prefix	Part Number: Suffix	Example

ADVANCED MICRO DEVICES



Note: Alternate source devices follow original manufacturer's part number and marking system.

Prefix

Functional Group
- **25** MSI
- **26** Computer Interface
- **27** Bipolar Memory
- **28** MOS
- **29** Bipolar Microprocessor
- **90** MOS
- **91** MOS
- **92** MOS
- **94** MOS
- **95** MOS
- **79** Telecommunications

Type
- **L** Low Power
- **S** Schottky
- **LS** Low Power Schottky
- **(Blank)** Standard

Suffix

Package
- **D** Hermetic DIP
- **P** Molded
- **F** Flat
- **X** Dice
- **L** Leadless chip-carrier

Temperature Range
- **C** Commercial
- **M** Military

Example

Prefix	Device	Suffix
AM25	S 05	D M

Functional Group — Type — Device Number — Package — Temperature Range

AMERICAN MICROSYSTEMS

A Subsidiary of Gould Inc.

(Current)

(Discontinued)

(Note: see pages B.18 — B.28 of AMI's 1982 MOS PRODUCTS CATALOG)

Prefix

Family
- **S** Standard

Suffix

Package Type
- **P** Plastic
- **D** Cerdip
- **C** Ceramic
- **L** Leadless Chip Carrier

Pins/Package
- **8**-Plastic
- **14**-Plastic, Ceramic
- **16**-Plastic, Cerdip, Ceramic
- **18**-Plastic, Cerdip, Ceramic
- **22**-Plastic, Cerdip, Ceramic
- **24**-Plastic, Cerdip, Ceramic
- **28**-Plastic, Cerdip, Ceramic
- **40**-Plastic, Cerdip, Ceramic
- **64**-Plastic, Ceramic

- **20**-Lead Chip Carrier
- **24**-Lead Chip Carrier
- **24**-Lead Slam Chip Carrier
- **28**-Lead Chip Carrier
- **28**-Lead Slam Chip Carrier
- **40**-Lead Chip Carrier
- **44**-Lead Chip Carrier
- **44**-Lead Slam Chip Carrier
- **68**-Lead Chip Carrier
- **84**-Lead Chip Carrier

Example

Prefix	Device	Suffix
S	68A00	P
	5101L-1	C
	2559A	P

Version — Package Type

ANALOG DEVICES

ICs are marked with an **AD** prefix.

Prefix

AD Analog Devices

Suffix

Temperature Range
- **A,B,C** Industrial Range
- **J,K,L** Commercial Range
- **S,T,U** Military Range

Package
- **D** Ceramic DIP
- **F** Ceramic Flatpack
- **H** TO-5 Type Can
- **N** Plastic DIP

Example

Prefix	Device	Suffix
AD	7516	JN

Temperature Range — Package

BURR-BROWN

(Current)

Suffix

Temperature
- **H, J, K, L** 0°C to +70°C
- **R, S, T** −55°C to +125°C
- **A, B, C** −25°C to +85°C

Package
- **M** Metal
- **P** Plastic
- **Q** MIL-883 Screening

Example

Prefix	Device	Suffix
	3532	AMQ

Temperature Range — Package — MIL-883 Screening

© IC MASTER 1983

Manufacturer	Part Number: Prefix	Part Number: Suffix	Example

CHERRY SEMICONDUCTOR

CHERRY SEMICONDUCTOR

(Older ICs may be marked with MCC prefix instead of CS prefix.)

Prefix
- CS Cherry Semiconductor
- D Diode Flip Chip
- N NPN Flip Chip
- P PNP Flip Chip

Package
- 0 Loose Component
- D Dual-In-Line
- P "Pill," Small Round Package
- T TO-Can
- 4 4 Leads
- 8 8 Leads

Circuit Style
- B National Dual Source
- S Signetics Dual Source

Prefix	Device	Suffix
CS	122	0D8
CS	555	B
D	823	

Package/Circuit

CYBERNETIC MICRO SYSTEMS

(CMS may be used instead of logo)

Description
- CY232 Parallel/Serial Interface Device
- CY250 Multi Chip Controller
- CY300 LCD/Console Controller
- CY360 Waveform Synthesizer
- CY480 Printer Controller
- CY500 Stepper Motor Controller
- CY512 Stepper Motor Controller
- CY600 Data Acquisition Controller
- CY750 Programmable Controller

DATEL-INTERSIL

Family
- ADC A/D Converters
- AM Amplifiers
- DAC D/A Converters
- DAS Data Acquisition System
- FLT Filters
- MV, MX Multiplexer
- SHM Sample-Hold
- VF Voltage to Freq. Converters
- VR Voltage Reference
- VI Voltage Inverter
- TT Temperature Transducer

Package — Monolithic
- 1 14 Pin DIP
- 2 TO-99

Seal — Hybrid
- G Epoxy
- M Hermetic

Temperature
- C 0°C to 70°C
- M −55°C to 125°C
- R −25°C to +85°C

Prefix	Device	Suffix
AM	490	2 A

Package

Selection

Prefix	Device	Suffix
DAC	HZ12B	G C

Seal

Temperature

NEC ELECTRONICS U.S.A. — ELECTRONIC ARRAYS DIVISION

Note: Alternate source devices follow original manufacturer's part number and marking system.

Family
- 15 N Channel ROM

Package
- D Hermetic DIP
- P Molded DIP
- X Dice

Temperature Range
- C 0° to 70°C
- I −55°C to 85°C
- L −55°C to 100°C
- M −55°C to 125°C
- X Other

Prefix	Device	Suffix
EA	32XX	DM

Family

Package

Temperature Range

EXAR INTEGRATED SYSTEMS

XR Exar

Grade
- C Commercial
- M Military (Ceramic package and −55°C to 125°C)
- ( ) The absence of C or M Indicates a Commercial Part with Tighter Specs

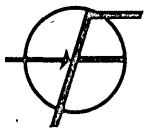
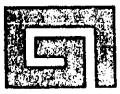
Package
- D Dice
- P Plastic
- N Ceramic

Prefix	Device	Suffix
XR	567	CP

Grade

Package

© IC MASTER 1983

Manufacturer	Part Number Prefix	Part Number Suffix	Example
FAIRCHILD (Current) (Current)  (Current) (Discontinued) Note: Alternate source devices follow original manufacturer's part number and marking systems.	**F** Fairchild **SH** Hybrid **μA** Linear	**Package** **D** Ceramic DIP **E** Plastic Can **F** Flat Pack **H** Metal Can **J** Metal Power Package (TO-66) **K** Metal Power Package (TO-3) **P** Plastic DIP **R** Ceramic Mini DIP **S** Ceramic DIP (F6800 Family) **T** Mini DIP **U** Power Package (Molded, TO-220) **W** Plastic TO-92 **Temperature — Check Device Data for Specific Values** **C** 0°C to 70°C/75°C (CMOS −40°C to 85°C) **L** MOS −55°C to 85°C Hybrid −20°C to 85°C **M** −55°C to 125°C	**Prefix** **Device** **Suffix** μA 741 AHM Electrical Class (if used) Package Temperature
FUJITSU (Current) (Discontinued)	**MB** Micro Block **MBM** Micro Block Modified and Industry Standard Numbers	**Performance Variation** **Y** **E** **H** **L** Low Power **Package** **C** Ceramic **M** Molded (Plastic) **Z** Cerdip	**Prefix** **Device** **Suffix** MB 8116 E M Speed or Performance Variation Package (Ordering purposes only) M — Indicates Plastic Package
GENERAL INSTRUMENT 	**Designation** **CU** Array **AY** Array **DL** Shift Register Dynamic ≥ 50 Bits **DS** Shift Register Dynamic < 50 Bits **LC** Linear Circuit **LG** Logic Cells **MEN** N and P Channel FETs **MU** Multiplexer **RA** RAM **RO** ROM **SL** Shift Register Static ≥ 50 Bits **SS** Shift Register Static < 50 Bits **ER** Elec. Alterable Non-Volatile Memory **LA** Logic Array **Temperature and Processing** **0** MTOS −55°C to 85°C **1** MTOS 0°C to 70°C **4** N Channel **5** MTNS 0°C to 70°C **6** −55°C to 125°C **7** MTNS **8** Silicon Gate −55°C to 125°C **9** Silicon Gate 0°C to 70°C	**Package Identification (Not Marked on Package)** **01** Dice **12** 8 Lead DIP **14** TO-5 4 Lead **15** TO-78 8 Lead **16** TO-5 8 Lead **17** TO-5 8 Lead High Profile **21** TO-5 10 Lead **22** TO-5 10 Lead Isolated **23** TO-100 10 Lead **29** 24 Lead Plastic DIP **30** 14 Lead Plastic DIP **31** 16 Lead Plastic DIP **32** 24 Lead Plastic DIP **33** 40 Lead Plastic DIP **35** 36 Lead Plastic Flat Pack **51** TO-8 12 Lead Low Profile **55** 16 Lead DIP **60** 10 Lead Flat Pack **61** 14 Lead Flat Pack **62** 16 Lead Flat Pack **63** 20 Lead Flat Pack **64** 24 Lead Flat Pack **65** 40 Lead Flat Pack **66** 36 Lead	**Prefix** **Device** **Suffix** RO-6 WXYZ (XX) Desig-nation Temp. and Processing Description Package Identification

© IC MASTER 1983

GENERAL INSTRUMENT (continued)

Part Number

Prefix

Description — Multiplexers
- **WX** Indicates Typical R_{ds}(on) In Hundred Ohms Steps:
  - 01 ≤ 100 ohms
  - 02 ≤ 200 ohms
  - 03 ≤ 300 ohms, etc.
- **YZ** Total Number of Channels

Custom
- Custom Number Assigned

ROM/RAM
- **WXYZ** Total Number of Bits

Shift Registers
- **W** Indicates the Number of Redundant Configurations:
  - 1 Single 3 Triple
  - 2 Dual 4 Quad, etc.
- **XYZ** Total No. of Bits per Configuration

Arrays/Linear/Logic
- **WXYZ** Arbitrary Number Assigned

Suffix

Package Identification (Not Marked on Package)
- **68** 44 Lead Flat Pack
- **69** 14 Lead DIP
- **71** 16 Lead DIP
- **72** 24 Lead DIP .6 MIL Centers
- **73** 24 Lead DIP .5 MIL Centers
- **74** 40 Lead DIP .6 MIL Centers
- **75** 40 Lead DIP 1.05 MIL Centers
- **76** 28 Lead DIP
- **77** 18 Lead DIP
- **79** 24 Lead DIP .6 MIL Centers
- **80** 14 Lead Ceramic RIP
- **81** 16 Lead Ceramic DIP

Example

GTE MICROCIRCUITS

GTE

Microcircuits

Prefix

Description
- **C** Special
- **G** Standard

Package
- **P** Plastic
- **C** Ceramic
- **D** Cerdip
- **E** Leaderless Chip Carrier
- **X** Dice

Suffix

Temperature Range
- **None** 0°C to +70°C
- **I** −40°C to +85°C
- **M** −55°C to +125°C (Commercial)
- **B** −55°C to +125°C (MIL-STD-883, Level B)

Example

Prefix	Device	Suffix
G	8860	A P I 2

- G — Description
- A — Version
- P — Package
- I — Temperature Range
- 2 — Speed/Power Variation

Prefix

Description
- **C** Special
- **G** Standard

Package
- **P** Plastic
- **C** Ceramic
- **D** Cerdip
- **E** Leaderless Chip Carrier
- **X** Dice

Suffix

Temperature Range
- **74** −40°C to +85°C
- **54** −55°C to +125°C

Processing
- **B** MIL-STD-883, Level B

Example

Prefix	Device	Suffix
G	74 SC 134	P B

- G — Description
- 74 — Temperature Range
- SC — ISO-CMOS/Process Designation
- P — Package
- B — Processing

HARRIS

Prefix

Family
- **A** Analog
- **C** Communications
- **D** Digital
- **I** Interface
- **M** Memory
- **S** Custom Circuits
- **V** Analog, High Voltage

Package
- **1** Ceramic DIP
- **2** TO-5 Type
- **3** Epoxy DIP
- **4** Leadless Carriers
- **5** Substrate Based Arrays
- **7** Mini DIP
- **9** Flat Pack
- **0** Chip Form

Exceptions
- **1** HPROMX-0512
- **2** 8ZC82

Suffix

Temperature Range
- **1** 0°C to +200°C*
- **2** −55°C to 125°C
- **2A** −55°C to +125°C (Temperature Range Only — Does not Imply 883B Processing)
- **3** −200°C to +300°C*
- **4** −25°C to 85°C
- **5** 0°C to 75°C
- **6** 25°C Probe 100% (Dice Only)
- **7** Dash 7, High Reliability Commercial Product, 0°C to +75°C
- **8** Dash 8 Program, MIL-STD-883, Class B — Example: HA-2700-8
- **9** −40°C to 85°C

* Special high temperature testing available on some production devices. Consult factory for availability.

Example

Prefix	Device	Suffix
H M 1	7620	5

- H M — Family
- 1 — Package
- 5 — Temperature Range

© IC MASTER 1983

Part Number

Manufacturer	Prefix	Suffix	Example

HITACHI

Hitachi

Prefix: Type
- **HA** Analog
- **HD** Digital
- **HM** Memory (RAM)
- **HN** Memory (ROM)

Suffix: Package
- **P** Plastic

Example

Prefix	Device	Suffix
HM	472114	A P

Description — Model No. — Modification — Package

HUGHES AIRCRAFT

HUGHES

HUGHES AIRCRAFT COMPANY
Solid State Products

Prefix: Family
- **HCMP** Commercial Microprocessor
- **HCTR** Counter
- **HSSR** Static Shift Register
- **HLCD** Liquid Crystal Driver
- **HLSS** Heart Rate Monitor
- **HMMP** Military Microprocessor
- **HNVM** Non-Volatile Memory

Suffix: Package
- **D** Ceramic DIP
- **H** Dice
- **L** Leadless Chip Carrier
- **P** Plastic DIP
- **Y** Cerdip

Example

Prefix	Device	Suffix
HNVM	3008	D

Family — Package

HYBRID SYSTEMS

Hybrid Systems CORPORATION

(Discontinued)

Prefix: Family
- **ADC9** Commercial Analog to Digital Converter
- **DAC3** Digital to Analog Converter
- **DAC9** Commercial Digital to Analog Converter
- **HS3** Second Source Digital to Analog Converter
- **HS5** Second Source Analog to Digital Converter
- **R6** Precision Voltage Reference

Suffix: Processing
- **C** Commercial Industrial Use
- **B** Per MIL-STD883B, Class B

Resolution
- **8** 8-Bits Binary
- **10** 10 Bits Binary
- **11** 11-Bits Binary
- **12** 12-Bits Binary
- **14** 14-Bits Binary
- **16** 16-Bits Binary
- **18** 18-Bits Binary
- **2D** 2-Decade BCD
- **3D** 3-Decade BCD
- **4D** 4-Decade BCD

Example

Prefix	Device	Suffix
DAC3	31	C-14

Processing — Resolution

ILC DATA DEVICE

DDC
ILC DATA DEVICE CORPORATION

Prefix: Family
- **ADC** Analog to Digital
- **ADH** Analog to Digital (Hybrid)
- **BUS** Data Bus Device
- **DAC** Digital to Analog
- **DDAC** Deglitched, Digital to Analog
- **DSC** Digital to Synchro
- **HDSC** Hybrid Digital to Synchro or Resolver
- **HDP** Hybrid Data Processor
- **HMSDC** Hybrid Multiplexed Synchro to Digital
- **HSCT** Hybrid Solid State Control Transformer
- **HSDC** Hybrid Synchro to Digital
- **MSDC** Multiplexed Synchro to Digital
- **SBA** Synchro Booster Amplifier
- **SDC** Synchro to Digital
- **SH** Sample and Hold
- **TD** Torque Driver
- **TH** Track and Hold

Suffix: Converter Resolution
- **-6** 6-Bits
- **-8** 8-Bits
- **-10** 10-Bits
- **-11** 11-Bits
- **-12** 12-Bits
- **-14** 14-Bits
- **-16** 14-Bits

Temperature Ranges
- **-1** Extended Temperature Range
- **-3** 0°C to +70°C

Voltage Range (Synchro Converters Only)
- **-H** 90V at 400 Hz
- **-M** 26V at 400 Hz
- **-L** 11.8V at 400 Hz
- **-6** 90V at 60 Hz

Example

Prefix	Device	Suffix
DAC	SL	1 883B

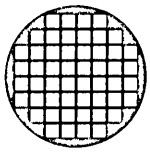
Family — Temperature — MIL-STD-883 Level B Processing

© IC MASTER 1983

Part Number

Manufacturer	Prefix	Suffix	Example

INMOS



inmos

Type
- 1 Static RAM
- 2 Dynamic RAM

Size (2^n) K
- 4 = 16K
- 5 = 32K
- 6 = 64K
- etc....

Organization (2^n) Bits
- 0 = x1
- 1 = x2
- 2 = x4
- etc....

Version
- 0 Standard
- I High Speed
- etc....

Package
- S Ceramic DIP
- W Ceramic Chip Carrier
- P Plastic DIP

Speed
- 45 — 45ns Access Time
- 55 — 55ns Access Time
- 12 — 120ns Access Time
- etc....

Screening
- (Blank) Commercial
- M MIL-883B
- E Extended Temperature

Example

Prefix	Device	Suffix
IMS	1420	S 45 M

IMS — Company; 1420 — Type / Size / Organization / Version; S — Package; 45 — Speed; M — Screening

INTEL

Description
- M Indicates Military Operating Temperature Range
- I Indicates Industrial Grade
- J Indicates a JAN qualified device, but is for internal identification purposes only. All JAN devices must be ordered by M38510 part number (Example: M38510/42001 BQB), and will be marked in accordance with MIL-M-38510 specifications.

Package Type
- B Hermetic Package, Type B
- C Hermetic Package, Type C
- D Hermetic Package, Type D
- I Crystal Package
- M Metal Can Package
- P Plastic Package
- X Unpackaged Device

Examples:

D2147H1	High Speed 4096x1-Bit Static RAM (35ns, 180/30mA)
C8080A2	8080A Microprocessor with 1.5 s cycle time, hermetic package Type C, commercial temperature range
MD8080A/B	8080A Microprocessor, hermetic package Type D, military temperature range. MIL-STD-883 Level B processing*

* On military devices, B suffix indicates MIL-STD-883 Level B processing.

Example

Prefix	Device	Suffix
M D	2114A	L — 3

M — Description; D — Package; L — 3 — Power/Speed/Processing

INTERNATIONAL MICROCIRCUITS

Circuit Technology
- 4 Metal Gate CMOS, Single Metal
- 7 Silicon Gate CMOS, Single Metal
- 9 Silicon Gate CMOS, Double Metal

Revision Level — Serialized
- A First Design

Customer and Job Code — Serialized
- 00 Unassigned

Package Type
- P Plastic
- Q Cerdip
- R Chip Carrier
- S Special
- T No Package (Die)
- U Side Brazed
- X Prototype Part

Temperature Range
- V Special
- W 0°C to +70°C
- X Prototype Part
- Y −25°C to +85°C
- Z −55°C to +125°C

Assurance, Testing
- K Full Functional Test at 25°C
- L Special Test/Screen
- M MIL-STD-883B, 5004
- X Prototype

Example

Prefix	Device	Suffix
G 7	1440	B 26 Q Y L

G 7 — IMI Prefix / Circuit Technology; 1440 — Available Logic Cells (3 or 4 Digits); B — Revision Level; 26 — Customer and Job Code; Q — Package Type; Y — Temperature Range; L — Assurance, Testing

© IC MASTER 1983

Manufacturer	Part Number: Prefix	Part Number: Suffix	Example

INTERSIL

(Current)

(Discontinued)

(Discontinued)

Prefix

- **D** Drivers
- **DG** Drivers (Analog Switches)
- **G** Multi-Channel FET
- **ICL** Linear and Data Acq. Circuits
- **ICM** Watch and Clock Circuit
- **IH** Hybrid/Analog Gate
- **IM** Digital or Memory Circuit

On all Intersil IC Part Numbers. **The Last Three Letters** are Temperature, Package, and Number of Pins, respectively.

Package

- **A** TO-237
- **B** Plastic flat-pack
- **C** TO-220
- **D** Ceramic dual-in-line
- **E** Small TO-8
- **F** Ceramic flat-pack
- **H** TO-66
- **I** 16 pin (.6 x .7 pin spacing) hermetic hybrid dip
- **J** Cerdip dual-in-line
- **K** TO-3
- **L** Leadless, ceramic
- **P** Plastic dual-in-line
- **S** TO-52
- **T** TO-5 type (also TO-78, TO-99, TO-100)
- **U** TO-72 type (also TO-18, TO-71)
- **V** TO-39
- **Z** TO-92
- **/W** Wafer
- **/D** Dice

Number of Pins

A	8	**P**	20
B	10	**Q**	2
C	12	**R**	3
D	14	**S**	4
E	16	**T**	6
F	22	**U**	7
G	24	**V**	8 (0.230″ pin circle,
H	42		isolated case)
I	28	**W**	10 (0.230″ pin circle,
J	32		isolated case)
K	35	**Y**	8 (0.200″ pin circle,
L	40		case to pin 4)
M	48	**Z**	10 (0.230″ pin circle,
N	18		case to pin 5)

Linear and Data Acquisition

Prefix	Device	Suffix
ICL	8038	C C P D

- ICL — Intersil Linear Circuit
- 8038 — Device Chip Type
- C — Electrical Option
- C — Temperature Range
  - M — −55°C to +125°C
  - I — −20°C to + 85°C
  - C — 0°C to + 70°C
- P — Package
- D — Number of Pins

Hybrids

Prefix	Device	Suffix
DG	126	A L

- DG — Device Family
  - DG — Drivers
  - D — Drivers
  - G — Multi-channel FET
- 126 — Device Chip Type
- A — Temperature Range
  - A — −55°C to +125°C
  - B — −20°C to + 85°C
  - C — 0°C to + 70°C
- L — Package
  - A — Metal Can
  - K — Cerdip
  - L — Flat Pack
  - P — Ceramic

Prefix	Device	Suffix
IH	5043	B M F D

- IH — Intersil Hybrid/Analog Gate
- 5043 — Device Chip Type
- B — Electrical Option
- M — Temperature Range
  - M — −55°C to +125°C
  - C — 0°C to + 70°C
- F — Package
- D — Number of Pins

Watch and Clock

Prefix	Device	Suffix
ICM	7045	A I P I

- ICM — Intersil Watch and Clock Circuit
- 7045 — Device Chip Type
- A — Electrical Option
- I — Temperature Range
  - M — −55°C to +125°C
  - I — −20°C to +70°C
  - C — 0°C to + 70°C
- P — Package
- I — Number of Pins

© IC MASTER 1983

Manufacturer	Part Number: Prefix	Part Number: Suffix	Example

JAN NOMENCLATURE

Prefix
- **J** / **JAN** Qualified Device
- **M38510** Military Designation

Device
The "Slash" numbering signifies the specification and specifies the device type. See Military Parts Directory.
Note: The J or JAN prefix is very important. If it is not there it is not a JAN device.

Device Class
- **A** Missiles and Manned Spacecraft
- **B** General Military
- **C** Less Critical Military Applications

Case Outline
- **A** ¼″ x ¼″ Flat Pack, 14-Pin
- **B** ⅛″ x ¼″ Flat Pack, 14-pin
- **C** ¼″ x ¾″ Dual-In-Line, 14-Pin
- **D** ¼″ x ⅜″ Flat Pack, 14-Pin
- **E** ¼″ x ¾″ Dual-In-Line, 16-Pin
- **F** ¼″ x ⅜″ Flat Pack, 16-Pin
- **G** 8-Lead Can
- **H** ¼″ x ¼″ Flat Pack, 10-Lead
- **I** 10-Lead Can
- **J** ½″ x 1¼″ Dual-In-Line, 24-Pin
- **K** ⅜″ x ½″ Flat Pack, 24-Pin
- **L** ⅜″ x ½″ Flat Pack, 24-Pin
- **Z** ¼″ x ⅜″ Flat Pack, 24-Pin

Lead Finish
- **A** Kovar or Alloy 42, with Hot Solder Dip
- **B** Kovar or Alloy 42, with Bright Acid Tin Plate
- **C** Kovar or Alloy 42, with Gold Plate

Prefix	Device	Suffix
JM38510	/XXXXX	B C B

Device Class — Case Outline — Lead Finish

LAMBDA

Prefix
- **L** Overvoltage Regulator
- **LAS** Regulator
- **LPD** Dual Power Driver
- **PMD** Discrete Transistor
- **PMR** Dual Rectifier

Prefix	Device	Suffix
LAS	14	12

Voltage

MASTER LOGIC

(Most ICs are marked with ML prefix as well as purchaser's marks)

Family
- **ML** CMOS Gate Array
- **MLA** CMOS Custom
- **F** Other

Gate Capacity
- **50** 50 Gates
- **75** 75 Gates
- **100** 100 Gates
- **150** 150 Gates
- **200** 200 Gates
- **350** 350 Gates

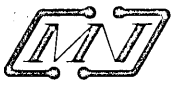
Package
- **P** Plastic
- **CD** CerDIP
- **SB** Side Brazed

Pins
By Count

Prefix	Device	Suffix
ML	150	P-24

Family — Gate Capacity — Package — Pins

MICRO NETWORKS



Prefix
- **MN** Micro Networks

Temperature Range
- **(No Suffix)** 0°C to 70°C
- **E** −25°C to 85°C
- **H** −55°C to 125°C
- **B** Processing to MIL-STD-883

Prefix	Device	Suffix
MN	3000	H B

Temperature Range — Processing

MICRO POWER SYSTEMS

Prefix
- **MP** Micro Power

Temperature Range
- **J, K, L** Commercial/Industrial
- **S, T, U** Military

Package
- **D** Ceramic DIP
- **N** Plastic DIP
- **H** TO-100 Type Can

Prefix	Device	Suffix
MP	7520	T D XXXX

Level of Performance — Package — Special Processing

© IC MASTER 1983

Manufacturer	Part Number Prefix	Part Number Suffix	Example

MITEL SEMICONDUCTOR

Family
- **MD** Digital
- **MDXXSC** Super CMOS Digital Product Family
- **MH** Hybrid
- **ML** Linear
- **MT** Telecommunications

Package Type
- **C** Ceramic Dip
- **E** Plastic Dip
- **H** Dice
- **Y** Leadless Ceramic Chip Carrier

Example

Prefix	Device	Suffix
MT	8804	A E

Electrical Specification
Package Type

MITSUBISHI

M Mitsubishi Integrated Circuit

Temperature Range
- **5** Industrial/Commercial
- **9** High Reliability

Series (Original Products)
- **0** CMOS
- **1** Linear Circuit
- **3** TTL
- **10-19** Linear Circuit
- **32-33** TTL
- **41-47** TTL
- **84** CMOS
- **85, 86** PMOS
- **87** NMOS
- **88** PMOS
- **89** CMOS
- **9** DTL
- **S0-S2** Schottky TTL

Series (Alternate Source)
- **K** Mostek MK Series
- **L** Intel Series
- **T** TI TMS Series
- **G** General Instrument
- **C** Motorola MC Series
- **W** Western Digital Series

Package Style
- **K** Glass-Sealed Ceramic
- **P** Molded Plastic
- **S** Metal-Sealed Ceramic

Package Outline
- **1** DIL Without Fin
- **2** Flat Without Fin
- **4** DIL Without Fin (Improved)
- **4B** Shrink DIL Without Fin
- **10** DIL Without Fin and With Quartz Lid

Example

Prefix	Device	Suffix
M5	89 81	S-45

Temperature Range
Original Product Series
Circuit Function
Package
Electrical Characteristic (1 or 2 digits)

Second Source

M5	K	4164	P-15

Series Designation
Circuit Function of Original Source type name

MONOLITHIC MEMORIES

PAL/HAL — Family
- **PAL** Programmable Array Logic
- **HAL** Hard Array Logic

Output Type
- **H** Active High
- **L** Active Low
- **C** Complementry
- **R** Registered
- **X** Exclusive or Registered
- **A** Arithmetic Registered

Temperature Range
- **C** Commercial
- **M** Military

Package Type
- **J** Ceramic Dual-In-Line
- **N** Plastic Dual-In-Line

Screening Level
- **883B** MIL-STD-883, Method 5004 and 5005, Level B
- **883C** MIL-STD-883, Method 5004 and Level C

Example

Prefix	Device	Suffix
PAL	14 L 4 M J	883B

Family
Number of Array Inputs
Output Type
Number of Outputs
Temperature Range
Package Type
HI-REL Screening Level

Octal Interface

Temperature Range
- **74** Commercial
- **54** Military

Family
- **S** Schottky
- **LS** Low Power Schottky

Package Type
- **J** Ceramic Dual-In-Line (600 Mil Wide)
- **JS** Ceramic Dual-In-Line (300 Mil Wide)
- **N** Plastic Dual-In-Line (600 Mil Wide)
- **NS** Plastic Dual-In-Line (300 Mil Wide)
- **D** Side Brazed Ceramic Dual-In-Line
- **F** Flat Pack
- **L** Leadless
- **T** Inverted "D" Package

Screening Level
See Above

Example

Prefix	Device	Suffix
SN	54 LS 373 J	883B

Standard Prefix
Temperature Range
Family
Package Type
HI-REL Screening Level

© IC MASTER 1983

Manufacturer	Part Number: Prefix	Part Number: Suffix	Example

MONOLITHIC MEMORIES (continued)

PROMs-ROMs Character Generator-Logic

Temperature Range
- **6** Commercial
- **5** Military

Product
- **0** Character Generator O.C.
- **1** Character Generator T.S.
- **2** Read Only Memory (ROM)
- **3** Programmable Read Only Memory (PROM)
- **7** LSI Logic Product

Family
- **-1** Schottky Process (ROMS/PROMS)
- **-2** Improved Performance Over -1

Package Type
See Octal Interface

Screening Level
See Above

Prefix	Device	Suffix
5	3 41-1 J	883B

5 — Temperature Range
3 41-1 — Product
J — Family
J — Package Type
883B — HI-REL Screening Level

High Performance PROMs

Temperature Range
- **6** Commercial
- **5** Military

Product
- **3** Programmable Read Only Memory (PROM)

Family
- **S** Schottky
- **LS** Low Power Schottky
- **RA** Registered

Memory Size
- **1** 1024 Bit
- **2** 2048 Bit
- **4** 4096 Bit
- **8** 8192 Bit
- **16** 16384 Bit

No. of Outputs
- **4** 4 Bit
- **8** 8 Bit

Output/Pin Out Designator
- **0** Open Collector
- **1** Three State

Performance
- **None** Standard
- **A** Enhanced

Package Type
See Octal Interface

Screening Level
See Above

Prefix	Device	Suffix
5	3 S 24 0 A J	883B

5 — Temperature Range
3 — Product
S — Family
24 — Memory Size
0 — Number of Outputs
A — Output/Pin Out Designation
J — Performance
J — Package
883B — HI-REL Screening Level

MOSTEK

MOSTEK

MK Mostek

Package
- **E** Ceramic Leadless Chip Carrier
- **J** CER-DIP
- **K** Tin Side-Brazed Ceramic DIP
- **N** Epoxy DIP (Plastic)
- **P** Gold Side-Brazed Ceramic DIP
- **T** Ceramic DIP with Transparent Lid

Prefix	Device	Suffix
MK	4116	P

P — Package

MOTOROLA

(ICs may not have the circle on the marking)

Some second source ICs follow the original marking system.

Description
- **MC** Packaged Integrated Circuits
- **MCC** Unencapsulated Integrated Circuit Chips
- **MCCF** Flip-Chip Linear Integrated Circuits
- **MCM** Integrated Circuit Memories
- **LM** Pin-for-Pin Equivalent to Linear Integrated Circuits Made by National Semiconductor
- **MMS** Memory Systems

Package
- **F** Flat Ceramic Package
- **G** Metal Can Package (TO-5 Types)
- **K** Metal Power Package (TO-3 Types)
- **L** Ceramic Dual-In-Line Case
- **P** Plastic Package
- **PQ** ICs Packaged In Staggered-Lead Plastic DIP Packages
- **R** Metal Power Packages (TO-66 Types)
- **T** Plastic Package (TO-220 Type)
- **U** Ceramic Package

SOIC package (small outline IC package), Dual-In-Line plastic in 8, 14 and 16 leads
SOT package (small outline, transistor package), such as SOT 23, etc.
Leadless Ceramic Chip Carriers
Leaded Plastic Chip Carriers (to be introduced in 1st Qtr. of '82)
Now (new): A ceramic package with a lead count, up to 68 leads or more for direct socketing with boards

Prefix	Device	Suffix
MC	14510	L

MC — Description
L — Package

© IC MASTER 1983

Manufacturer	Part Number: Prefix	Part Number: Suffix	Example

NATIONAL SEMICONDUCTOR

(Current)

Family

- **ADC** Analog — Digital Converter
- **AEE** Microcomputer Product
- **AF** Active Filter
- **AH** Analog Switch (Hybrid)
- **ALS** Advance Low Power Schottky
- **AM** Analog Switch (Monolithic)
- **BLC** Board Level Computer
- **BLX** Board Level Expansion
- **CD** CMOS (4000 Series Only)
- **COP** Family of Microcontrollers
- **DAC** Digital — Analog Converter
- **DH** Digital (Hybrid)
- **DM** Digital (Monolithic)
- **DP** Interface (Microprocessor)
- **DS** Interface
- **FOR** Fiber Optics Receiver
- **FOT** Fiber Optics Transmitter
- **HC** High Speed CMOS
- **IDM** Microprocessor (2901)
- **IMP** Microprocessor (IMP)
- **INS** Microprocessor (4004/8080A)
- **IPC** Microprocessor (PACE)
- **ISP** Microprocessor (SC/MP)
- **JM** MIL-M38510
- **LF** Linear (BI-FET)
- **LF** Linear (BI-FET II)
- **LH** Linear (Hybrid)
- **LM** Linear (Monolithic)
- **LP** Linear Low Power
- **LX** Transducers (Press. & Temp.)
- **MA** Clock Module
- **MH** MOS (Hybrid)
- **MM** MOS (Monolithic)
- **NH** Hybrid (Obsolete)
- **NSA** LED — Numeric Arrays
- **NSB** LED Numerics (Quad/Quint)
- **NSC LED** — Dice (or Chip)
- **NSC** Microprocessor 1600, 800)
- **NSL** LED — Lamp
- **NSL** Opto
- **NSM** LED — Integrated Display Modules
- **NSN** LED — Numerics (Dual)
- **NSW** LED — Watch Die Set PNP, NPN, 2N
- **RA** Resistor Array
- **RMC** Rack Mount Computer
- **SD** Special Digital
- **SF** Special FET
- **SFW** Software
- **SH** Special Hybrid
- **SK** Special Kit
- **SL** Special Linear
- **SM** Special MOS
- **SN** Digital (2nd Source)
- **SPM** Development Systems
- **SPX** Development Systems
- **SZ** Special Transducer
- **TBA** Linear (2nd Source)
- **TDA** Linear
- **TP** Telecom Products
- **TRC** Tone Receiver Card

Package Type

- **D** Glass/Metal DIP
- **F** Glass/Metal Flat Pack (¼" x ¼")
- **F-00, F-01, F-06, F-07** Glass/Metal Flat Pack With Standard Leadform
- **G** 12 Lead TO-8 M/C
- **H** Multi-Lead M/C
- **H-05** 4 Lead M/C (TO-5)
- **H-46** 4 Lead M/C (TO-46)
- **J** Lo-Temp Ceramic DIP (Sometimes referred to as the "Frit-Seal" Package).
- **J-8** 8 Lead Ceramic DIP ("Mini-DIP")
- **J-14** 14 Lead Ceramic DIP (-14 used only when product is also available in -8 pkg.).
- **K** TO-3 M/C in Steel, except LM309K which is shipped in Aluminum
- **KC** TO-3 M/C (Alminum)
- **K Steel** TO-3 M/C (Steel)
- **N** Molded DIP (EPOXY B)
- **N-01** Molded DIP (Epoxy B) with Staggered Leads
- **N-8** 8 Lead Molded DIP (Epoxy B) ("Mini-DIP")
- **N-14** 14 Lead Molded DIP (Epoxy B) (-14 used only when product is also available in -8 pkg.).
- **P** 3 Lead TO-202 PWR Pkg.
- **S** 14 Lead "SGS" Type PWR DIP (Epoxy B)
- **T** 3 Lead TO-220 PWR Pkg. (Epoxy B)
- **W** Lo-Temp Ceramic Flat Pak
- **W-00, W-01, W-06, W-07** Ceramic Flat Pack with Standard Leadform
- **Z** 3 Lead TO-92 Molded Pkg. (Epoxy B)

Prefix	Device	Suffix
LF	356	N /A+

- LF — Device Family
- 356 — Device Number (Generic Type) and Suffix Letter (Optional)
  - A: Improved Electrical Specification
  - C: Commercial Temperature Range (2nd Source Products)
- N — Package Type
- /A+ — Reliability Program (Optional)

Temperature Ranges

Linear Devices

With proprietary linear circuits, a 1-2-3 numbering system is employed. The 1 denotes a Military temperature range device (−55°C to 125°C), the 2 denotes an Industrial device (−25°C to 85°C), and the 3 denotes a Commercial device (0°C to 70°C). i.e. LM101/LM201/LM301. Exception to this are the LM1800 Series; some hybrid circuits which employ a "C" Suffix; and second-source products which follow the original manufacturer's numbering system.

Digital Devices

CDXXXX-CMOS —
C Suffix −40°C to 85°C,
M Suffix −55°C to 125°C.

DM54XX — All numbers beginning with 5 denote −55°C to 125°C temperature operation.

DM74XX — If the "74" is indicated, the operating temperature is 0°C to 70°C.

DM7XXX — All other numbers beginning with 7 (besides the "74" shown above) are NSC proprietary products and a 7 here indicates −55°C to 125°C.

DM8XXX — All numbers beginning with 8 denote 0°C to 70°C temperature operation.

© IC MASTER 1983

NATIONAL SEMICONDUCTOR (continued)

Converter Products

Resolution
- **08** 8 Bits
- **10** 10 Bits
- **12** 12 Bits
- **25** 2½ Digit
- **35** 3½ Digit
- **37** 3¾ Digit
- **45** 4½ Digit

Form
- **C** Complete
- **B** Building Block
- **D** Digital Panel Meter Chip
- **M** Module
- **S** Card Systems

Technology
- **P** PMOS
- **C** CMOS
- **H** Hybrid
- **B** Bipolar
- **N** NMOS
- **L** Linear
- **I** I^2L

Prefix	Device	Suffix
AD C	08 00	P C N

Converter Products: Form — Resolution — More Than One in Family — Technology — Temperature Range — Package

NEC ELECTRONICS U.S.A.— MICROCOMPUTER DIVISION

NEC Electronics U.S.A. Inc. Microcomputer Division

Family
- **μP** Micro Product
- **B** Digital Bipolar
- **D** Digital MOS

Package
- **D** Hermetic
- **C** Plastic

Prefix	Device	Suffix
μP D	416	D

Family — Package

NITRON

Nitron

Description
- **NC** Standard
- **NS** System
- **SC** Custom

Family
- **2xxx** Communications
- **4xxx** Memory Systems
- **64xx** Frequency Synthesizers
- **65xx, 68xx** Static ROMs
- **7xxx** MNOS Memories

Temperature Range
- **C** Commercial, 0°C to 70°C
- **E** Extended, −20°C to 85°C
- **T** Telecom/Auto, −40°C to 85°C
- **M** Military, −55°C to 125°C

Package
- **D** Cer-DIP (Glass/Glass) Hermetic
- **F** Flat Pack
- **L** Ceramic (Glass/Metal) Hermetic
- **P** Plastic
- **T** TO-5 Type Metal Can
- **W** Wafers, Probed and Inked
- **X** Die in Waffle Carriers

Prefix	Device	Suffix
NC	6405	PC-0246

Standard — Family — Package — Temperature Range — Custom Code (for Custom Devices)

OPTICAL ELECTRONICS

oei

Description
- **2000** Log/Anti-Log
- **3000** V/F - F/V Phase Detector
- **5000** Non-Linear Functions
- **6000** 3-D System Card
- **9000** Op Amps, Comparators, Current Booster, etc.

PANASONIC (MATSUSHITA)

MATSUSHITA

Description
- **AN** Analog
- **DN** Digital Bipolar
- **M,J** Development Type
- **MN** MOS

Prefix	Device
DN	830

PLESSEY

(All ICs are marked **PLESSEY**)

Description
- **MJ** N-Channel MOS
- **ML** MOS Linear (w/Gate Protection)
- **MN** MNOS Digital
- **MP** MOS Digital
- **MT** MOS Linear (without Gate Protection)
- **MV** CMOS
- **NJ** N-Channel MOS
- **NOM** MNOS Memory Elements and Arrays
- **TAA, TBA, TCA, TDA** Alternate Sourced Consumer Devices
- **SL** Bipolar Linear
- **SP** Bipolar Digital

Package
- **CM** Multilead TO-5
- **DC** Dilmon
- **DG** Ceramic Dual-In-Line
- **DP** Plastic Dual-In-Line
- **EP** Power Stud
- **FM** Ten Lead Flatpack
- **GC** Leadless Carrier
- **GM** Fourteen Lead Flatpack
- **KM** TO-3
- **QG** Ceramic Quad-In-Line
- **QP** Plastic Quad-In-Line
- **RP** Power Findip
- **SP** Plastic Single-In-Line

Prefix	Device	Suffix
SP	8735B	DG

Description — Package

© IC MASTER 1983

Manufacturer	Part Number: Prefix	Part Number: Suffix	Example
PRECISION MONOLITHICS	Description **ADC** Analog-to-Digital Converter **BUF** Buffer Amplifier **CMP** Comparator **DAC** Digital-to-Analog Converter **DMX** De-Multiplexer **FLT** Filter **GAP** General Analog Processor **MAT** Matched Transistors **MLT** Multiplier **MUX** Multiplexer **OP** Operational Amplifier **PKD** Peak Detector **PM** PMI Second Soure Product **REF** Reference **RPT** Repeater **SAR** Successive Approximation Register **SLC** Subscriber Line Interface **SMP** Sample/Hold Amplifier **SW** Switch	Package **H** 6 lead TO-78 **J** 8 lead TO-99 **K** 10 lead TO-100 **L** 10 lead Hermetic Flatpack **M** 14 lead Hermetic Flatpack **N** 24 lead Hermetic Flatpack **P** Epoxy B DIP **Q** 16 lead Hermetic DIP **R** 20 lead Hermetic DIP **RC** 20 lead Hermetic Chip Carrier (LLC) **T** 28 lead Hermetic DIP **TC** 28 lead Hermetic Chip Carrier (LCC) **V** 24 lead Hermetic DIP **W** 40 lead Hermetic DIP **X** 18 lead Hermetic DIP **Y** 14 lead Hermetic DIP **Z** 8 lead Hermetic DIP	Prefix **DAC** Device **01** Suffix **C Y** Electrical Grade Package
PRO ELECTRON	**First Two Letters** **Digital** **FA - FZ** **GA - GZ** Identify the Family **etc.** **Solitary Circuits** **S** Solitary Digital Circuit **T** Analog Circuit **U** Mixed Analog/Digital (The second letter has no special significance, except H means Hybrid.) **Third Letter** **Temperature Range** **A** Temp. Range not specified below **B** 0°C to +70°C **C** −55°C to +125°C **D** −25°C to +70°C **E** −25°C to +85°C **F** −40°C to +85°C **G** −55°C to +85°C If a circuit is designed for a wider temperature range, the letter indicating a narrower temperature range or the letter "A" can be used. **Device or Serial Number** Either a 4-digit number assigned by PRO ELECTRON or the serial number (even a combination of figures and letters) of an existing type designation which can be extended to a minimum of a 4-digit number by adding zeros in front of it.	**Suffix or Version Letter (Recommended)** **Single Letter** **C** Cylindrical **Q** Quad-In-Line **P** Plastic DIL **F** Flat Pack **D** Ceramic DIL **U** (Uncased) Chip Other letters have no fixed meaning except Z means customized wiring. **Two Letters** **First Letter: General Shape** **C** Cylindrical **D** Dual-In-Line (DIL) **E** Power DIL (with External Heat Sink) **F** Flat (Leads on 2 Sides) **G** Flat (Leads on 4 Sides) **K** Diamond (TO-3 Family) **M** Multiple-In-Line (Except Dual-, Triple-, Quad-In-Line) **Q** Quad-In-Line (QUIL) **R** Power QUIL (with External Heat Sink) **S** Single-In-Line (as TO-127 or TO-220) **T** Triple-In-Line **Second Letter: Material** **C** Metal-Ceramic **G** Glass-Ceramic (cerDIP) **M** Metal **P** Plastic	Prefix / Device / Suffix **GFB** 7400 -DP **GMB** 74LS00A -DC **SAC** 2000 **TDA** 1000 P
RAYTHEON SEMICONDUCTOR	**Temperature** **LH1, LM1** −55°C to 125°C **LH2, LM2** −25°C to 85°C **LH3, LM3** 0°C to 70°C **RC** 0°C to 70°C **RM** −55°C to 125°C **RV** −40°C to 85°C **54** −55°C to 125°C **74** 0°C to 70°C	**Package** **Most Devices** **BM** 16-Pin Epoxy-B DIP **CH** Gold-Backed Chip, Visually Inspected to MIL-STD-883A, Method 2012, and Packaged in Waffle Pack. **CJ** 14-Pin Ceramic Flatpak **CL** 16-Pin Ceramic Flatpak	Prefix / Device / Suffix **54** 153 DD **RC** 4130 DB **LM** 118 H **HA1** 4741 5 **XR** 2207 CN

© IC MASTER 1983

Manufacturer	Part Number		Example
	Prefix	Suffix	

RAYTHEON SEMICONDUCTOR (continued)

HA Series
- **HA1** 14-Pin Ceramic DIP
- **HA3** 14-Pin Plastic DIP

Microcomputer Components
- **AM**
- **R**
- **93**

- **CK** 14-Pin Ceramic Flatpak
- **CQ** 10-Pin Ceramic Flatpak
- **D** 14-Pin Metal DIP
- **DB** 14-Pin Epoxy-B DIP
- **DC** 14-Pin Ceramic DIP
- **DD** 16-Pin Ceramic DIP
- **DE** 8-Pin Ceramic DIP
- **DM** 16-Pin Ceramic DIP
- **DZ** 40-Pin Ceramic DIP
- **F** Flatpak
- **FD** 64-Lead Ceramic Flatpak, Side Brazed
- **FV** 28-Pin Ceramic Flatpak
- **FZ** 42-Pin Ceramic Flatpak
- **H** 3, 8 or 10-Pin Metal Can
- **J** 14 or 16-Pin Ceramic DIP
- **K** TO-3 Power Pack
- **M** 8 or 14-Pin Plastic Micro-Pak
- **LS** 20-Lead Chip Carrier (Square)
- **LV** 28-Lead Chip Carrier (Rectangular)
- **LW** 28-Lead Chip Carrier (Square)
- **MB** 16-Pin Epoxy-B DIP
- **ML** 16-Pin Ceramic DIP, Side Brazed
- **MS** 20-Pin Ceramic DIP, Side Brazed
- **MZ** 40-Pin Ceramic DIP, Side Brazed
- **N** 24-Pin Glass/Metal Flatpak
- **N** Epoxy-B DIP (LM Series)
- **NB** 8-Pin Epoxy-B DIP
- **PS** 20-Pin Epoxy-B DIP
- **PU** 24-Pin Epoxy-B DIP
- **PV** 28-Pin Epoxy-B DIP
- **PZ** 40-Pin Epoxy-B DIP
- **Q** 10-Pin Flatpak (¼″ x ¼″)
- **R** 24-Pin Ceramic DIP
- **T** 3, 8, 10 or 12-Pin Metal Can
- **TK** 9-Pin TO-66 Power Pack
- **W** 14-Pin Ceramic Flatpak

Beam Lead Chip
- **BL**

HA Series
- **2** −55°C to +125°C
- **5** 0°C to +70°C
- **8** −55°C to +125°C

XR Series
- **M** Ceramic −55°C to +125°C
- **N** Ceramic −40°C to +85°C
- **P** Epoxy −40°C to +85°C
- **CN** Ceramic 0°C to +75°C
- **CP** Epoxy 0°C to +75°C

Microcomputer Components Package
- **D** Hermetic DIP
- **F** Flatpak
- **P** Plastic DIP
- **X** Chip

Temperature
- **C** 0°C to +75°C
- **M** −55°C to +125°C

Process to MIL-M-883B
- **B**

Prefix	Device	Suffix
AM	2901	D M B

Package — D
Temperature Range — M
Processing — B

Raytheon ICs are identified by an **RAY** prefix to the date code.

© IC MASTER 1983

Manufacturer	Part Number: Prefix	Part Number: Suffix	Example

RCA

RCA Solid State

Description
- **CA** Linear ICs
- **CD** Digital ICs
- **CDP** Microprocessor ICs
- **MWS** MOS ICs

Version
- **A** Modified Version, Unilaterally Interchangeable with Prototype
- **B** Modified Version, Unilaterally Interchangeable with A Version, and with Prototype
- **C** Modified Version

Package
- **D** Ceramic DIP
- **E** Plastic DIP
- **F** Ceramic DIP, Frit Seal
- **G** Hermetic Chip in Plastic Package
- **H** Chip
- **K** Ceramic Flat Package
- **L** Beam-Lead Device
- **Q** Quad-In-Line Plastic Package
- **S** TO-5 Package with DIL-CAN
- **T** TO-5 Package

Prefix	Device	Suffix
CD	4070	BD

Version — 4070
Package — BD

RETICON

RETICON®

Previous Products
- **RA** Area Array
- **RL** Linear Array
- **SAD** Serial Analog Delay
- **SAM** Serial Analog Memory
- **TAD** Tapped Analog Delay

New Analog Products
- **R5** Reticon Analog

Family
- **0** Complex Special Functions
- **1** Simple Delays
- **2** Tapped Delay
- **3** Analog Memory
- **4** Correlator
- **5** Multiplexer, Parallel to Serial Converter
- **6** Filters

Code (for Corresponding Products)
- No. of Columns and Lines
- No. of Elements
- No. of Storage Elements
- No. of Storage Elements
- No. of Storage Elements
- No. of Taps

Prefix	Device	Suffix
RA	50x50	A
RL	1024	C
TAD	32	A

Code — 32
Revision — A

Prefix	Device	Suffix
R5 X	YY	A -1

Family — X
Revision (If Required) — A
Member of Device Type (If Required) — -1

ROCKWELL (COLLINS)

Rockwell

- **CRC** Telecommunications
- **R** Rockwell

Frequency Range
- **No Suffix** 1 MHz
- **A** 2 MHz
- **B** 3 MHz

Package
- **C** Ceramic
- **P** Plastic

Temperature
- **No Suffix** 0°C to 70°C
- **E** −40°C to 85°C (Industrial)
- **MT** −55°C to 125°C (Military)
- **M** MIL-STD-883, Class B

Prefix	Device	Suffix
R	6502	ACE

Product Type — R
Frequency Range — A
Package — C
Temperature — E

SANYO

Designation
- **LA** Bipolar Linear
- **LB** Bipolar - Digital
- **LC** CMOS
- **LE** MNMOS
- **LM** PMOS, NMOS
- **STK** Thick Film

Prefix	Device
LA	1230

© IC MASTER 1983

SEEQ

Part Number

Prefix

Family
- **5** For Nonvolatile Memory
- **6** For Microcomputer Products
- **8** For Communications

Temperature Range
- **Q** For Commercial Temperature 0°C to +70°C
- **E** For Extended Temperature −40°C to +85°C
- **M** For Military Temperature −55°C to +125°C

Suffix

MIL-STD-883
- Level B Processing

Read access time of memory device (ns)

Organization of memory device (2^1 x 2^3 or 2K x 8)

(This scheme does not apply to partials — a 5212 is a 1K x 8 (or half) partial of the 5213)

Type of Memory
- **1** For EPROM
- **2** For E²ROM

Package Type
- **D** For Cerdip

Example

Prefix	Device	Suffix
D Q	5 2 1 3 —	350 B

- Package Type
- Temperature Range
- Family
- Type of Memory
- Organization of Memory Device
- Read Access Time of Memory Device (ns)
- MIL-STD-883 Level B Processing

SGS-ATES SEMICONDUCTOR

(Marking)

(Current Logo)

Prefixes assigned by the European Association "PRO ELECTRON" (See PRO ELECTRON)
- **H** High Level Logic
- **HB, HC** CMOS
- **L, LS** Linear Professional
- **M** MOS
- **TAA** Linear Consumer
- **TBA** Linear Consumer
- **TCA** Linear Consumer
- **TDA** Linear Consumer

Prefix	Device
TDA	1200

SIEMENS

Prefixes assigned by the European Association "PRO ELECTRON". (See PRO ELECTRON)

Prefix	Device
SDA	5010
TDA	2030
UAA	170

SIGNETICS

Temperature
- **N** 0°C to +70°C
- **S** −55°C to +125°C
- **NE** 0°C to +70°C
- **SA** −40°C to +85°C
- **SE** −55°C to +125°C
- **SU** −25°C to +85°C

- **55** −55°C to +125°C
- **75** 0°C to +70°C
- **DS** Second Source to National Part Number
- **MC** Second Source to Motorola Part Number
- **ULN** Second Source to Sprague Part Number
- **μA** Second Source to Fairchild Part Number

Device Family
- **CA, DS** Linear Industry Standard
- **DAC** D/A Converter
- **HEF** LOCMOS Family
- **JB** Mil Rel — Jan — Old Desig.
- **JM** Mil Rel — Jan — New Desig.
- **LF, LH** Linear Lndustry Standard
- **LM, MC** Linear Industry Standard
- **MB, MJ** CMOS
- **OM** Linear Industry Standard
- **PCD, PCE** CMOS
- **SAA, SAB** Digital Industry Standard
- **SAF** Digital Industry Standard
- **SD** Linear DMOS
- **SG, TAA** Linear Industry Standard
- **TBA, TCA** Linear Industry Standard
- **TDA, TDB** Linear Industry Standard
- **TEA** Linear Industry Standard
- **UA, ULN** Linear Industry Standard
- **SCN** Microprocessor N Channel
- **SCB** Microprocessor Bipolar
- **SCC** Microprocessor CMOS

Package
- **CK** Philips Die
- **D** 8, 14, 15-Lead DIL Plastic Microminiature (SO)
- **EC** 4-Lead TO-46 can
- **EE** 4-Lead TO-72 can
- **F** 14, 16, 18, 20, 22, 24, 28-Lead DIL CERDIP
- **FE** 8-Lead DIL CERDIP
- **G** 20, 28, 44-Lead Square Leadless
- **H** 4, 8, 10-Lead TO-5 can
- **I** 8, 10, 14, 16, 18, 24, 28, 40, 50-Lead DIL CERAMIC
- **K** 2-Lead TO-3 can
- **N** 8, 14, 16, 18, 20, 22, 24, 28, 40-Lead DIL PLASTIC
- **N14** 14-Lead DIL Plastic for those products available in both 8 and 14-Lead packages, the 14-Lead package will be identified with N14
- **Q** 10, 14, 16, 24-Lead CERAMIC Flat
- **R** 16, 18, 24, 28, 40-Lead CERAMIC-Beryllia-Flat
- **SK** Microprocessor Kits
- **TA** 8-Lead TO-5 can
- **U** 9-, 13-Lead Single-in-Line
- **Y** 24-Pin Ceramic Square Flat-pack with Radial Leads
- **W** 10, 14, 16, 24-Lead CERPAC

Example

Prefix	Device	Suffix
	74123	N
N	8X02	N

- Temperature
- Package

© IC MASTER 1983

Manufacturer	Part Number: Prefix	Part Number: Suffix	Example

SILICON GENERAL

SG Silicon General

Characteristics
- **A** Improved Electrical Specifications
- **C** Reduced Temperature Range

Package
- **F** Flat Pack
- **J** 14, 16-Pin DIP (CerDIP)
- **K** TO-3 Power Pack
- **M** 8-Pin Plastic DIP
- **N** 14, 16-Pin Plastic DIP
- **P** TO-220 Plastic
- **R** TO-66 (3-Pin and 8-Pin)
- **T** TO-5 Metal Can (TO-39/99/100/101)
- **Y** 8-Pin DIP (CerDIP)
- **W** 16-Pin Batwing (CerDIP)
- **S** Multiwatt 15
- **L** Leadless Chip Carrier

Prefix	Device	Suffix
SG	1524	J
SG	108A	T

Characteristics

Package

SILICONIX

Description
(1, 2 or 3 letters)
- **D** Drivers for FET Switches
- **DF** Digital Function
- **DG** Analog Switches
- **DGM** Analog Switches
- **G** Multi-Channel FETs
- **L** Linear
- **LD** Linear Digital Combinations
- **SI** Siliconix Second Source Parts
- **SJM** QPL Listed Part
- **VN** MOSPOWER FET
- **VQ** MOSPOWER FET

Operating Temperating Range — IC's
(1 Letter)
- **A** −55°C to +125°C
- **B** −20°C to + 85°C
- **C** 0°C to + 70°C
- **D** −40°C to + 85°C (Applies to Telecommunication Products Only)

B, C, D temperature range parts receive industrial/commercial processing

Packages — IC's
(1 Letter)
- **A** Metal Can — Hermetic
- **J** Dual-In-Line Package — Plastic
- **K** Dual-In-Line Package — CERDIP
- **L** Flat Package — Hermetic
- **N** Dual-In-Line Package — Plastic Mini-DIP
- **P** Dual-In-Line Package — Side Braze — Hermetic
- **R** Dual-In-Line Package — Side Braze — Hermetic

Process Option
- **/883** MIL-STD-883. Class B
- **(-4)** 160 Hour Burn-In for Industrial and Commercial Parts

Packages — MOSPOWER
- **A** TO-3
- **B** TO-39
- **D** TO-220
- **E** TO-52
- **F** TO-202
- **J** Plastic DIP
- **L** TO-92
- **M** TO-237
- **P** Sidebraze DIP

IC's

Prefix	Device		Suffix
L	144		A P /883
DG	508	X	B K (-4)
DG	211		C J

Device Family

Device Number

Optional Designator for Improved Part

Operating Temperature Range

Package

Process Option

MOSPOWER

Prefix	Device			Suffix	
V	N	6	7	A	B

Verticle MOSPOWER

Substrate

Voltage [x10]

Selection

Geometry

Package

SOLID STATE SCIENTIFIC

Product Category
- **SCL** Standard Logic Products
- **SCM** Memory Products
- **SND** Data Communication Products
- **JCL** JAN M38510 Products
- **BCL** MIL-STD-883 Class B

Package
- **C** Cerdip
- **CT** TO-5 Metal Can
- **D** Ceramic
- **E** Plastic
- **F** Flat Pack
- **H** Chip

Prefix	Device	Suffix
SCL	4000	E+

Product Category

Package

© IC MASTER 1983

SOLITRON

(Current) (Discontinued)

Part Number — Prefix

- **CM** CMOS
- **UC4xxx** Linear
- **UC6xxx** PMOS Memory (discontinued)
- **UC7xxx** PMOS Memory (discontinued)

Part Number — Suffix

Process (CMOS)
- **(None)** Limited Operating Voltage Range
- **A** 3-15 Volt Operating Voltage
- **B** 3-18 Volt Operating Voltage

Package Style, Temperature Range (CMOS)
- **D** Ceramic DIP, −55°C to 125°C
- **E** Epoxy DIP, −40°C to 85°C
- **F** Cer DIP (Frit Seal) −55°C to 125°C
- **H** Uncased Die
- **K** Flatpack, −55°C to 125°C

Package Style, Temperature Range (Linear)
- **(None)** TO-99, −65°C to 125°C
- **C** TO-99, 0°C to 70°C
- **CE** 8 lead MINI DIP, 0°C to 70°C
- **ID** Uncased Die

Example

Prefix	Device	Suffix
CM	4000	AD

Package/Temperature

SPRAGUE ELECTRIC

SPRAGUE

Family
- **UC** CMOS/Complex Array
- **UD** Display Drivers
- **UG** Hall Effect Circuits
- **UL** Linear Circuits
- **UT** Thyristor Arrays

Temperature
- **N** Limited Temperature Range −20°C to +85°C Typical
- **Q** Industrial Temperature Range −40°C to +85°C
- **S** Military Temperature Range −55°C to +125°C
- **X** Preproduction Device

Package
- **A** Plastic DIP
- **B** Plastic DIP with Heat Sink Tabs
- **C** Chip
- **H** Hermetic DIP
- **M** 8-Pin Plastic DIP
- **P** Batwing DIP (Replaced by B)
- **Q** Batwing Quad In-Line
- **R** Ceramic DIP
- **S** 4-Pin SIP
- **T** 3-Pin SIP
- **U** Thin 3-Pin SIP
- **W** 12-Pin SIP
- **Y** TO-92 Transistor
- **Z** 5-Lead TO-220

Prefix	Device	Suffix
UL N	2111	A

Family; Temperature; Package

Family
- **UH** Peripheral Power/Display Drivers

Package
- **C** Hermetic Flatpack
- **D** Hermetic DIP
- **K** Chip
- **P** Plastic DIP

Prefix	Device	Suffix
UH	400	P

Family; Package

STANDARD MICROSYSTEMS

Family
- **COM** Data Communications
- **CRT** CRT Display
- **CG** Character Generator
- **SR** Shift Register
- **KR** Keyboard Encoder
- **ROM** Read-Only-Memory
- **FDC** Floppy Disk
- **CCC** Cassette/Cartridge

Functional Options
- **T** TTL Clock Input
- **H** High Speed
- **ST** ROM
- **STD** Program Options
- **PRO** See Catalog
- **HR** MIL-STD-883 Level B
- **BI** Burned-In
- **A** Speed 20 MHz
- **B** Speed 15 MHz CRT Devices Only
- **C** Speed 10 MHz

Program Options
- **X or XXX** Specifies Mask Program

Package
- **No Letter** Ceramic
- **P** Plastic

Prefix	Device	Suffix
COM	5016	T X P

Family; Function; Program Option; Package

SYNERTEK

Temperature Range
- **None** 0°C to 70°C
- **M** −55°C to 125°C
- **X** Special

Package
- **C** Ceramic
- **P** Molded
- **D** Cerdip
- **X** Dice
- **F** Flat Pac
- **T** TO Can

Prefix	Device	Suffix
SY M C	2114	L3

Temperature Range; Package; Device Code; Performance or Processing Designator

© IC MASTER 1983

Manufacturer	Part Number Prefix	Part Number Suffix	Example

TELEDYNE PHILBRICK

TELEDYNE PHILBRICK

Description

1000 Series Operational Amplifier, Module
1300 Series Operational Amplifier, IC
1400 Series Operational Amplifier, FET IC
1700 Series Operational Amplifier Chopper Stabilized
2200 Series Power Supply, AC Input, PC Mount
2300 Series Power Supply, DC Input, PC Mount
2400 Series Power Supply, AC Input, Chassis Mount
4000 Series Digital to Analog Converters
4100 Series Analog to Digital Converters
4200 Series Modular Instrumentation Amplifiers
4300 Series Non-Linear Function Modules
4700 Series Voltage to Frequency and Frequency to Voltage Converters
4800 Series Sample-Hold Amplifiers
4900 Series Deglitchers

TELEDYNE SEMICONDUCTOR

Temperature
A 0°C to 70°C
B −55°C to 125°C
C 0°C to 70°C
M −55°C to 125°C

Package
J Plastic DIP
L CerDIP
N Ceramic DIP
Y Dice

Device	Suffix
8700	CJ

Temperature
Package

TELEFUNKEN

Note:
ICs are marked **TFK**

Prefixes Assigned by the European Association "PRO ELECTRON" (See Pro Electron)
Proprietary Devices
U Integrated Circuits

B Bipolar
M MOS

Prefix	Device	Suffix
U	113	B

TEXAS INSTRUMENTS

AC Advanced Bipolar Circuits
RSN Radiation Hardened Circuit
SBP Bipolar Microprocessor
SMJ MOS High Reliability
SN Standard Circuit
SNJ MIL STD-883 Method 5004 Level B
TAC CMOS Logic Array
TAL Low-Power Schottky TTL Logic Array
TAT STL Logic Array
TL Linear Circuit
TMS MOS Memory/Microprocesor
TM Microcomputer Module
TBP Bipolar Memory
SNC MACH VI, Level 3, Bipolar Circuits
TC CCD Imager
TCM Telecommunications IC
TIED Infrared Detector
TIL Optoelectronic Circuit
VM Voice Memory Circuit
JANB JAN-Qualified Circuits, Level B
JBP JEDEC Standard MIL-STD-883B (SNJ)

Package
J, JG Ceramic DIP
JD Side braze ceramic DIP
KA, KC, KD, KF Plastic power tab
LP Plastic 3-lead
N, NE Plastic DIP
P Plastic DIP
RA Ceramic Flat Pack
T Metal Flat Pack
W Ceramic Flat Pack
NT Plastic DIP, 24 pin 300 mil
U Ceramic Flat Pack
NF Plastic DIP, 28 pin 400 mil
FH Single Layer Sq. Chip Carrier
FK Multi Layer Sq. Chip Carrier
FE Multi Layer Rect. Chip Carrier
WC Ceramic Flat Pack
FG Multilayer chip carrier

Prefix	Device	Suffix
SN 74	S188	J

Description
Temperature Range
Package

Prefix	Device	Suffix
TMS	4027	-15 JL

Speed
Package
Temperature Range

Temperature (Most Devices) Digital & Interface Prefixes

Series −55°C to 125°C	Series 0°C to 70°C	Description
54	74	Standard TTL Circuits
54H	74H	High-speed TTL
54L		Low-power TTL
54LS	74LS	Low-power Schottky TTL
54S	74S	Schottky TTL
55	75	Standard Interface Circuits
54AL	74AS	Advanced Schottky TTL
54ALS	74ALS	Advanced Low-power Schottky TTL
	76	Advanced Circuits

Bipolar Suffixes
C 0°C to 70°C
I −25°C to 85°C
E −40°C to 85°C
M −55°C to 125°C

MOS Suffixes
L 0°C to 70°C
C −25°C to 85°C
R −55°C to 85°C
M −55°C to 125°C
A −40°C to 85°C
H 0°C to 55°C
S Special Range

Speed (MOS Only)
— 15 150 ns Max. Access
— 20 200 ns Max. Access
— 25 250 ns Max. Access
— 35 350 ns Max. Access

© IC MASTER 1983

Manufacturer	Part Number: Prefix	Part Number: Suffix	Example

TOSHIBA

Prefix
- **TA** Bipolar Linear
- **TC** CMOS
- **TD** Bipolar Digital
- **TM** MOS

Suffix
- **P** Plastic
- **M** Metal
- **A** Improved Type
- **C** Ceramic

Prefix	Device	Suffix
TA	7173	AP

TRW LSI PRODUCTS

TRW LSI PRODUCTS

Prefix
- **MPY** Multiplier
- **TDC** Other Functions/Bipolar
- **TMC** CMOS Products

Package
- **C** Jedec Type C Chip Carrier
- **J** Ceramic DIP
- **L** Leaded Chip Carrier

Temperature
- **C** Commercial (0°C to +70°C Guaranteed)
- **F** Extended Temperature Range (−55°C to +125°C Guaranteed)
- **A** MIL-STD-883B (−55°C to +125°C Guaranteed)

Prefix	Device	Suffix
TDC	1010	J1 C

TDC — Descriptive Prefix
1010 — Device
J1 — Package (64 Pin DIP)
C — Temperature

UNIVERSAL SEMICONDUCTOR

Family
- **UM** Memories

Temperature
- **No Letter** 0°C to +70°C
- **X** Special

Package
- **C** Ceramic DIP
- **P** Plastic Molded DIP
- **D** Cerdip

Prefix	Device	Suffix
UM	2147	XD-2

UM — Memory
XD — Temperature Range
-2 — Package
Performance/Speed Range

WESTERN DIGITAL

Package
- **A** 40 Lead DIP, Ceramic
- **B** 40 Lead DIP, Plastic
- **C** 24 Lead DIP, Ceramic
- **D** 24 Lead DIP, Plastic
- **E** 28 Lead DIP, Ceramic
- **F** 28 Lead DIP, Plastic
- **G** 22 Lead DIP, Ceramic
- **H** 22 Lead DIP, Ceramic
- **U** 20 Lead, Ceramic
- **V** 20 Lead, Plastic

Prefix	Device	Suffix
TR1602	A	01

TR1602 — Prefix
A — Package
01 — Special Parameter

ZILOG

Zilog
an affiliate of
EXXON Corporation
(Current)

Zilog
(Discontinued)

Family
- **Z80**
- **Z**

Speed
- **A** 4.0 MHz
- **blank** 2.5 MHz

Device
- **CPU** Central Processor Unit
- **PIO** Parallel Input/Output Unit
- **CTC** Counter Timer
- **SIO** Serial Input/Output
- **DMA** Direct Memory Access

Package
- **C** Ceramic
- **P** Plastic

Screening
- **S** Standard
- **M** Military

Prefix	Device	Suffix
Z80 A	CPU	CM

Z80 — Family
A — Speed
CPU — Device
C — Package
M — Screening

© IC MASTER 1983

GUIDE TO IC LOGOS

The following logos and symbols are provided to help you identify the manufacturers of IC products. Sometimes different marks are used on a company's products, depending upon individual package sizes.

LOGO	MANUFACTURER
	ADVANCED MICRO DEVICES
AMI. A Subsidiary of Gould Inc.	AMERICAN MICROSYSTEMS
ANALOG DEVICES	ANALOG DEVICES
ANALOGIC	ANALOGIC
BURR-BROWN® BB	BURR-BROWN
CHERRY SEMICONDUCTOR	CHERRY SEMICONDUCTOR (Micro Components)
	COMLINEAR CORPORATION
commodore semiconductor group	COMMODORE SEMICONDUCTOR GROUP
	CONSUMER MICROCIRCUITS
	CYBERNETIC MICRO SYSTEMS
DDC	ILC DATA DEVICE CORPORATION
	DATA GENERAL
	DATEL-INTERSIL
	ELECTRONIC ARRAYS
	EXAR INTEGRATED SYSTEMS
FAIRCHILD F	FAIRCHILD
FERRANTI	FERRANTI
FUJITSU FUJITSU LIMITED	FUJITSU
GENERAL INSTRUMENT GI	GENERAL INSTRUMENT
GTE	GTE MICROCIRCUITS
	HARRIS

LOGO	MANUFACTURER
	HITACHI
HUGHES HUGHES AIRCRAFT COMPANY Solid State Products	HUGHES AIRCRAFT
Hybrid Systems	HYBRID SYSTEMS
IMP	INTERNATIONAL MICROELECTRONIC PRODUCTS
	INTEGRATED PHOTOMATRIX
inmos	INMOS
intel	INTEL
interdesign	INTERDESIGN
INTERSIL	INTERSIL
	ITT semiconductors
LSI COMPUTER SYSTEMS	LSI COMPUTER SYSTEMS
	LAMBDA
ML	MASTER LOGIC
MCE™	MCE
MTI microcircuits technology, inc.	MICROCIRCUITS TECHNOLOGY, INC.
	MICRO NETWORKS
	MICROPAC INDUSTRIES

© IC MASTER 1983

LOGO	MANUFACTURER
	MICRO POWER SYSTEMS
	MITEL SEMICONDUCTOR
	MITSUBISHI
MMI *	MONOLITHIC MEMORIES
UNITED TECHNOLOGIES MOSTEK	MOSTEK
	MOTOROLA
NS *	NATIONAL SEMICONDUCTOR
NCR	NCR
NEC NEC Electronics U.S.A. Inc. Microcomputer Division	NEC
Nitron	NITRON
OKI JAPAN OKI *	OKI JAPAN
oei	OPTICAL ELECTRONICS
MATSUSHITA	PANASONIC (Matsushita)
PLESSEY	PLESSEY
PMI	PRECISION MONOLITHICS
RCA Solid State	RCA

LOGO	MANUFACTURER
RAY	RAYTHEON SEMICONDUCTOR
EG&G RETICON	EG&G RETICON
Rockwell	ROCKWELL (COLLINS)
SGS-ATES	SGS-ATES SEMICONDUCTOR
	SANYO
seeQ Technology, Incorporated	SEEQ TECHNOLOGY, INC.
signetics S *	SIGNETICS
Silicon General	SILICON GENERAL
Si	SILICON SYSTEMS
	SILICONIX
	SOLID STATE SCIENTIFIC
S S *	SOLITRON
② SPRAGUE	SPRAGUE ELECTRIC
	STANDARD MICROSYSTEMS

LOGO	MANUFACTURER
	SUPERTEX
	SYNERTEK
TELEDYNE CRYSTALONICS	TELEDYNE CRYSTALONICS
TELEDYNE PHILBRICK	TELEDYNE PHILBRICK
	TELEDYNE SEMICONDUCTOR
TFK	TELEFUNKEN
TELTONE®	TELTONE
	TEXAS INSTRUMENTS
	THOMSON-CSF COMPONENTS
TMX	TMX
Toshiba	TOSHIBA
TRW LSI Products	TRW
UNIVERSAL SEMICONDUCTOR INC	UNIVERSAL SEMICONDUCTOR
	WESTERN DIGITAL
Zilog an affiliate of EXXON Corporation	ZILOG

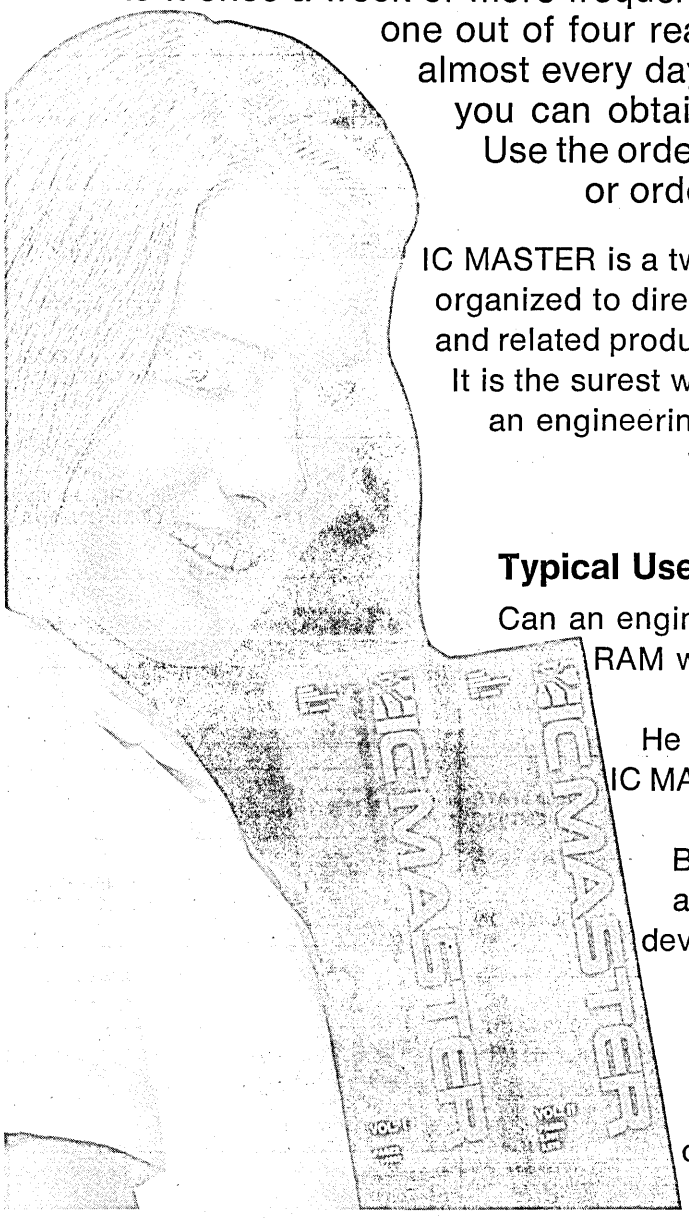
*DISCONTINUED LOGOS PROVIDED TO IDENTIFY OLDER DEVICES.

© IC MASTER 1983

Last Page This Section. Next Page 227.

IC MASTER BELONGS ON YOUR BOOKSHELF; ORDER YOUR COPY NOW

A recent survey revealed that one out of two IC MASTER users refer to it once a week or more frequently. The survey also discovered that one out of four readers use IC MASTER every day or almost every day. If you use IC MASTER frequently, you can obtain your own copy by ordering now. Use the order cards contained in this publication, or order by telephone as described below.



IC MASTER is a two-volume set of technical data carefully organized to direct the engineer to the integrated circuits and related products that are closest to his specific needs. It is the surest way to find the optimum device to answer an engineering design requirement. By ordering now, you won't have to borrow or search for IC MASTER the next time you need it.

Typical Use of IC MASTER

Can an engineer find out who makes a 64K dynamic RAM with an access time of 120 nanoseconds or faster in less than 30 seconds? He can if he turns to the Memory section of IC MASTER and looks for the 64K organization (words and bits per word) that he needs. Because each device is listed in order of access time, he can easily determine the devices that satisfy his speed requirements.

In the United States only:

You can order IC MASTER simply by charging it to your VISA or Master Card credit card. To place your order, call now: (516) 222-2500. Ask for Extension 314.

APPLICATION NOTE DIRECTORY

The Application Note Directory is a comprehensive guide to the many IC and Microcomputer Board application notes available. It lists the devices covered, describes each note, and tells who publishes each one.

HOW TO USE THE APPLICATION NOTE DIRECTORY

The application notes in this directory can be located by function or device number.

1. To find out what is published by function, locate the closest topics in the index at right, turn to the pages indicated, and scan through the listings.

2. To find all the application notes covering a given device, look up the device in the Part Number Index at the front of this book. The ¶ sign leads to application notes.

The application note descriptions are organized under the headings: Digital, Microprocessor, Microcomputer Boards, Interface, Linear and Memory. Beneath those headings are functional and applications categories arranged alphabetically. Within each category the notes are arranged in alphabetical sequence by title. The mixing of functions and applications is necessary, since application notes do not lend themselves to classification entirely by function or entirely by application. When an application note fits under several categories, it is listed in one and cross referenced by the others. This may mean that you have to spend five minutes checking a number of categories to be sure you've found everything you want, but finding suitable information can save you considerable design time. If an application note covers specific devices or it shows in some detail how certain devices are used, these device numbers are listed in parentheses just below the title.

The application note descriptions are as short as possible. They are designed to save you time in reading while giving an overall sense of the contents. The length of each note is indicated in parentheses on the last line; if the note is bound into a book, the last line will show that it is part of a handbook, databook, catalog, etc.

Once you have determined which application notes you need, check to see if the manufacturer has placed the complete application note in the back of this section (immediately following the short descriptions). If not, contact the manufacturer's sales office or write to the manufacturer. Be sure to give both the title and the application note number. Addresses and phone numbers are listed in the Manufacturers and Distributors Directory.

APPLICATION NOTE SUBJECTS

Category	Page
DIGITAL	
Arithmetic	228
CMOS	228
Consumer	231
Counters	231
General	233
HNIL/HTL	233
High-Speed Logic	234
High-Speed TTL	235
I²L	235
LSI, General	235
Multiplexers	235
PLAs	235
Pulse Handling	236
Signal Processors	236
TTL, General	236
Trigger Circuits	237
MICROPROCESSOR	
Applications	238
General	240
I/O	241
Programming	242
Systems	244
MICROCOMPUTER BOARDS	
Applications	250
INTERFACE	
Converters	252
Data Transmission	257
Drivers	259
Encoders	260
MOS/Bipolar	261
Multiplexers	261
Switches	261
LINEAR	
Active Filters	264
Amplifiers, Current	264
Amplifiers, Instrumentation	264
Amplifiers, Operational	264
Amplifiers, Power	267
Amplifiers, RF	268
Amplifiers, Special Purpose	268
Amplifiers, Video	269
Arrays	269
Communications	270
Comparators	270
Consumer, AM/FM	271
Consumer, Audio	272
Consumer, Medical	273
Consumer, TV	273
Followers	274
General	274
Industrial Control	276
Instrumentation	276
Modulators	277
Multipliers	278
Phase-locked Loops	278
Photosensitive Devices	279
Power Control	279
Power Supplies	280
Preamplifiers	280
Regulators	281
Thermal Considerations	282
Timers	282
Transducers	282
Voltage References	283
MEMORY	
Analog	284
Character Generators	284
EAROMs	284
General	285
Microprogramming	285
PROMs	285
RAMs	286
ROMs	288
Shift Registers	289

© IC MASTER 1983

DIGITAL

Arithmetic

1 **"A Four-Cycle Butterfly Arithmetic Architecture"**
Explains the background of the FFT and the computational element called the butterfly. A block diagram of the FFT processor is presented and the DAU (data arithmetic unit) architecture is described in detail. The text's description of the four FFT instructions are supplemented by computational diagram, block diagrams, a data flow chart and a timing diagram.
TRW/LSI A-10

2 **"AM25S10 Four-Bit Shifter"**
(AM25S10)
Provides functional description and discusses logic equivalents. Applications: up-shift, down and around end shifts, scaling and fixed multiplication.
Advanced Micro Devices (10pp)

3 **"Applications of the TTL/MSI 93S43 4-Bit by 2-Bit Two's Complement Multiplier"**
(93S43)
How to implement a combinatorial multiplication array of any size for two's complement numbers. How to multiply in other number representations. Speed/hardware tradeoffs, normalization of floating point numbers after multiplying, rounding or truncation of double length products.
Fairchild AN-329 (15pp)

4 **"Arithmetic Arrays Using Standard COS/MOS Building Blocks"**
(CD4001, CD4008, CD4011, CD4013, CD4019)
Describes design of a 32-bit full adder/arithmetic logic system. Discusses four-bit full adder, quad AND-OR select gate, dual D-type flip-flop, input NAND gates, input NOR gates, and arithmetic register.
RCA ICAN-6600 (6pp)

5 **"COS/MOS Rate Multipliers—Versatile Circuits for Synthesizing Digital Functions"**
(CD4089, CD4527)
Describes operation of a rate multiplier, and the effects of cascading. Covers addition, subtraction, multiplication, division, square and higher order roots, frequency ratios and integration. Also discusses symmetric operations.
RCA ICAN-6739 (12pp)

"Fast Multipliers Using TTL Read Only Memories"
See listing under (Memory) ROMs. (Texas Instruments)

6 **"Floating Point Multiplier"**
Explains how to implement a 24-bit floating point multiplier using one MPY-12HJ multiplier and other devices.
TRW/LSI A-6

7 **"High-Speed TTL Adders"**
(DM5483, DM7483)
Describes 16-bit parallel adders, using the DM7283/DM8383, and connections for ripple-carry addition. Also describes BCD adder techniques implemented with these devices. Shows how the devices can be used to improve the performance of MOS storage systems.
National AN-35 (6pp)

Arithmetic (cont)

8 **"LSI Multipliers Application Notes"**
Describes larger and smaller word multiplication, higher speed multiplication and division using multiplication.
TRW/LSI A-1

"MECL 10,000 Arithmetic Elements MC10179, MC10180, MC10181"
See listing under (Digital) High Speed Logic (Motorola).

9 **"Multiplier-Accumulator Application Notes"**
Covers the use of multiplier-accumulators including an explanation of the clock, input and output controls. Other discussions include: larger word accumulations, multiplication plus a constant, operation with microprocessors, digital filters and complex multiplication.
TRW/LSI A-7

10 **"NBCD Sign and Magnitude Adder/Subtracter"**
(MC14560, MC14561)
Describes CMOS parallel adder-subtracters for both signed and unsigned natural binary coded decimal (NBCD) numbers.
Motorola AN-738 (7pp)

11 **"The AM2506—A Latching ALU"**
(AM2506)
Combines four-bit arithmetic logic unit and four-bit latch. Describes application in high-speed multiple word adder, multiple master-slave registers, 16-word arithmetic register, multiplication at 16 MHz rate.
Advanced Micro Devices (4pp)

12 **"Wire-A-Gate with the AM25LS2521 Comparator"**
(AM25LS2521)
Describes device logic and uses of the device for decoding I/O addresses in a microprocessor system. Also covers a combination lock application.
Advanced Micro Devices (8pp)

CMOS

13 **"54C/74C Family Characteristics"**
(MM54C Series, MM74C Series)
Discusses output, noise and temperature characteristics, power consumption, and propagation delay for the 54C/74C logic family.
National CMOS Databook AN-90 (6pp)

"A 3½ Digit DVM Using an Integrated Circuit Dual Ramp System"
See listing under (Linear) Instrumentation (Motorola)

14 **"A COS/MOS PCM Telemetry and Remote Data Acquisition Design"**
(CD4000 Series)
Describes data transmission formats and the following data acquisition sections: analog and digital multiplexers, A/D converters, transmission formatters and system programmers.
RCA ICAN-6289 (12pp)

© IC MASTER

DIGITAL

CMOS (cont)

"A New CMOS Analog Gate Technology"
See listing under (Interface) Switches. (Intersil)

1 **"A Simplified Approach to Testing CMOS Inverters and Gates"**
Bench tests using a power supply and a V-O-M are described. They include continuity, input leakage, quiescent device current, output voltage, noise immunity, output drive current and threshold voltage.
Solid State Scientific AN-107 (4pp)

2 **"A Typical Data-Gathering & Processing System Using CD4000A-Series COS/MOS Parts"**
(CD4000 Series)
Describes data-gathering and processing system using CMOS circuits. Includes discussion of input signal conditioning and transmission, the digital processor unit, receiver, memory, arithmetic unit, display unit, output buffer, output transmitter, receiver, and control unit.
RCA ICAN-6210 (11pp)

"Application of CD4016A Quad Bilateral Switch"
See "Transmission and Multiplexing of Analog or Digital Signals Using the CD4016A Quad Bilateral Switch" Under (Interface) Data Transmission. (RCA)

3 **"Application of the RCA-CD4093B COS/MOS Schmitt Trigger"**
(CD4093B)
Describes characteristics of the CD4093 quad 2-input Schmitt trigger. Covers applications in waveshaping (sinewave to squarewave, edge delay, edge detection), power-on reset, astable multivibrators and use as a Schmitt trigger for noise immunity.
RCA ICAN-6346 (6pp)

4 **"Applications of CD40107BE COS/MOS Dual Buffer"**
(CD40107BE)
Describes the characteristics of the CD40107BE and the variety of applications including a lamp driver, an LED driver, and a relay driver.
RCA ICAN-6564

5 **"Applications of CMOS Integrated Circuits in Communications Equipment"**
(SCL4000 Series)
Uses of SCL4000 Series circuits as frequency synthesizers, digital frequency displays, frequency scanners, and squelch circuits.
Solid State Scientific AN-108 (4pp)

6 **"Astable and Monostable Oscillators using RCA COS/MOS Digital Integrated Circuits"**
(CD4000 Series)
Describes several techniques used to compensate for the normal threshold variation of MOS devices in the design of stable multivibrator circuits for operation at frequencies up to 1 MHz. Also covers applications for multivibrator circuits including VCOs, voltage controlled pulse-width circuits, and phase-locked VCOs.
RCA ICAN-6267

CMOS (cont)

7 **"Battery-Powered Digital-Display Clock/Timer and Metering Applications Utilizing the RCA CD4026A and CD4033A Decade Counters 7-Segment Output Types"**
(CD4009, CD4010, CD4026, CD4033)
Describes the CD4026A/33A ICs and their use with 7-segment display units. Discusses interface packages and methods to help the designer optimize his system. Includes a discussion of battery-operated systems for digital clocks and watches.
RCA ICAN-6733 (16pp)

8 **"CMOS Analog Multiplexers and Switches; Applications, Considerations"**
Covers selection criteria, parameter definitions, handling and design precautions, typical applications, and other topics concerning CMOS analog multiplexers and switches.
Harris Semiconductor AN-520 (9pp)

9 **"CMOS Databook"**
Primarily contains data sheets, but also includes the following application notes individually described elsewhere: AN-77, 88, 90, 118, 138, 140, 177, 200; DB-5, and MB-18.
National Semiconductor $6

10 **"CMOS Expandable Gates"**
(SCL4402A, SCL4412A)
Compares the transfer characteristics of ordinary CMOS gates to those gates using double buffered output. Includes performance characteristics and discusses expansion of SCL4412A and SCL4402A to 12-input NOR, 16-input OR, and other combinations.
Solid State Scientific AN-102 (3pp)

11 **"CMOS Linear Applications"**
(MM74C00, MM74C02, MM74C04)
Describes use of CMOS devices biased to operate at the midpoint of the transfer characteristics.
National CMOS Databook AN-88 (3pp)

12 **"CMOS Monostable Multivibrators"**
(MC14538B)
Covers theory of operation with emphasis on pulse widths, retriggerable and non-retriggerable operation. Describes use in a tachometer.
Motorola AN-772 (7pp)

13 **"CMOS Oscillators"**
Describes square wave oscillators that can be built with CMOS logic elements.
National CMOS Databook AN-118 (4pp)

14 **"CMOS Wave Shaping and Level Detection"**
Describes methods to obtain modified transfer characteristics of double buffered NAND gates, by connecting inputs together, connecting extra inputs to Vcc, etc. Shows how to obtain variable amounts of hysteresis, and describes systems of level detection using trigger circuits.
Solid State Scientific AN-109 (5pp)

15 **"CMOS, the Ideal Logic Family"**
Talks about the characteristics of CMOS logic. Describes system considerations, interfacing to other logic types, and timing considerations.
National CMOS Databook AN-77 (7pp)

DIGITAL

CMOS (cont)

"CMOS/MOS Interfacing Simplified"
See listing under (Interface) MOS/Bipolar (RCA)

"CMOS/MOS Rate Multipliers—Versatile Circuits for Synthesizing Digital Functions"
See listing under (Digital) Arithmetic (RCA)

1 **"COS/MOS Electrostatic-Discharge Protection Networks"**
(CD4000 Series)
Discussion and illustrations of the various electrostatic-discharge protection networks provided on RCA CMOS parts.
RCA ICAN-6572 (2pp)

2 **"COS/MOS Integrated Circuits Manual"**
(CD4000 Series)
Discusses fabrication, logic system design, and applications of RCA COS/MOS circuits.
RCA CMS-272 $5.00 (168pp)

"Design of Fixed and Programmable Counters Using the RCA 4018A COS/MOS Presettable Divide-by-"N" Counter"
See listing under (Digital) Counters. (RCA)

3 **"Designing with MM74C908, MM74C918 Dual High Voltage CMOS Drivers"**
(MM74C908, MM74C918)
Presents curves for power dissipation design limits. Shows simple driver circuits plus flasher, oscillator, siren and latch applications.
National CMOS Databook AN-177 (12pp)

4 **"Fundamentals of Testing COS/MOS Integrated Circuits"**
Describes the techniques employed in testing CMOS devices to assure their adherence to data sheet specs.
RCA ICAN-6532 (14pp)

5 **"Getting the Most Out of CMOS Devices for Analog Switching Jobs"**
Describes latch-proof junction isolation, floating-body junction isolation, and dielectric isolation as solutions to CMOS problems when applied to analog design.
Harris Semiconductor AN-521 (7pp)

6 **"Guide to Better Handling and Operations of CMOS Integrated Circuits"**
Recommends specific handling and operating practices to minimize the probability of damage in manufacturing and field environments.
RCA ICAN-6525 (5pp)

7 **"Improved CMOS Gate Design"**
(SCL4000 Series)
Description of the output buffering of the SCL4000 Series.
Solid State Scientific AN-105 (3pp)

8 **"Interfacing Analog and Digital Displays with CMOS Integrated Circuits"**
(CD4000 Series)
Details some of the CMOS ICs most suitable for interfacing the electronic circuit and the display. For digital displays, basic display operation is also covered as an aid in selecting the appropriate interfacing device.
RCA ICAN-6595 (12pp)

CMOS (cont)

9 **"Interfacing COS/MOS with Other Logic Families"**
(CD4000A Series)
Describes conditions governing interface of CMOS 4000A series with other logic families.
RCA ICAN-6602 (12pp)

10 **"Interfacing with CMOS"**
Describes the electrical characteristics of CMOS inputs and outputs. Discusses interfacing CMOS with CMOS, PMOS, NMOS, DTL/TTL, HTL, and ECL.
Solid State Scientific AN-104 (5pp)

11 **"Intrinsically Safe Data Acquisition"**
Presents methods by which CMOS circuitry can be used in the construction of intrinsically safe low-level multiplexers, A/Ds, and instrumentation amplifers.
Burr-Brown AN-84 (4pp)

12 **"Introduction to CMOS Integrated Circuits with Three-State Outputs"**
Describes a wide variety of CMOS ICs incorporating transmission gates with standard logic. Gives design rules. Covers applications in analog switching and multiplexing, digital multiplexing, and data bussing.
Motorola AN-715 (19pp)

"MM54C/74C Voltage Translation/Buffering"
See listing under Interface (National)

"NBCD Sign and Magnitude Adder/Subtracter"
See listing under Arithmetic (Motorola)

13 **"Noise Immunity Comparison of CMOS Versus Popular Bipolar Logic Families"**
Compares the noise immunities of TTL, DTL, HTL, and CMOS logic families. Discusses common noise sources, precautions against noise, noise specification, and standard noise tests.
Motorola AN-708A (8pp)

14 **"Noise Immunity of COS/MOS B-Series Integrated Circuits"**
(CD4000UB Series, CD4000B Series)
Evaluates noise immunity of B-Series CMOS devices with respect to noise-energy immunity, and dc/ac noise-immunity. Includes definitions of test terms, discussion of logic-system noise and rejection, and schematics.
RCA ICAN-6587 (9pp)

15 **"Noise Immunity of COS/MOS Integrated-Circuit Logic Gates"**
(CD4000A, CD4001A)
Evaluates noise immunity of the CD4000A/01A gates with respect to external noise, crosstalk, transmission-line reflections, power-line noise, and ground-line noise. Includes schematics and logic diagrams.
RCA ICAN-6176 (8pp)

16 **"Parallel Clocking of Sequential CMOS Devices"**
(CD4000A Series, CD4000B Series)
Shows how to avoid logic-state errors in cascaded CMOS devices by optimizing clock transition time.
RCA ICAN-6948 (2pp)

©IC MASTER

DIGITAL

CMOS (cont)

1 **"Radiation Resistance of the COS/MOS CD4000A and CD4000B Series"**
(CD4000 Series)
Studies permanent and transient radiation as they affect CMOS devices.
RCA ICAN-6563 (3pp)

2 **"Scanning Logic for RF Scanner-Receivers Using CMOS Integrated Circuits"**
Describes rf scanner-receiver control functions using standard CMOS devices. Covers crystal switching and priority channel monitoring with mention of phase-locked loop designs.
Motorola AN-753 (7pp)

3 **"Understanding Buffered and Unbuffered CMOS Characteristics"**
Presents the relative merits of buffered and unbuffered CMOS devices. Provides background, definitions, and an applications chart.
RCA ICAN-6558 (8pp)

4 **"Understanding CMOS"**
Programmed text covers basic theory, construction, and characteristics of COS/MOS digital integrated circuits. Describes RCACOS/MOS circuits, packaging, specifications, and design factors. Programmed instruction format enables a reader to learn at his own pace.
RCA CPI-279 (80pp) $2.00

5 **"Using the CD4047A in COS/MOS Timing Applications"**
(CD4047)
Compares this monostable-astable multivibrator with simpler types of oscillator circuits and discusses applications, including a noise discriminator, low-pass and band-pass filters, a frequency discriminator, and a pulse generator.
RCA ICAN-6230 (13pp)

6 **"Using the CD4520B to Design Dividers with Symmetrical Outputs"**
(CD4520B)
Describes how to use this CMOS counter to divide an input frequency by N where N is any integer from 2 to 256 and obtain outputs with approximately 50% duty cycles.
RCA ICAN-6362 (10pp)

7 **"Using the SCL 4528 Dual Monostable Multivibrator"**
(SCL4528)
Describes operating modes and timing, equations for pulse width calculations.
Solid State Scientific AN-111 (6pp)

Consumer

8 **"Calculator Learns to Keep Time"**
Describes stopwatch and keyboard controlled interval timing functions using the MM5736 calculator chip.
National MOS/LSI Databook AN-119 (8pp)

9 **"Handheld Calculator Battery Systems"**
Describes the tradeoffs in battery performance for 6.5-9.5v calculators driven by 2, 3 and 4 cell as well as 9v. batteries.
National MOS/LSI Databook AN-149 (4pp)

Consumer (cont)

"High Voltage Shift Registers Move Displays"
See listing under (Memory) Shift Registers (National)

10 **"Keyless Lock Circuit"**
(LS7220)
Describes device operation and implementation in a digital lock.
LSI Computer Systems (6pp)

11 **"Timekeeping Advances Through COS/MOS Technology"**
Discusses basic oscillator design considerations, practical oscillator circuits, and some typical timing-circuit applications, including wrist watches, wall clocks, and auto clocks.
RCA ICAN-6086 (12pp)

12 **"Universal Count/Display Circuit"**
(ZN1040AE)
Examines range of applications for a 4-decade up/down counter with BCD and seven-segment outputs. Covers external circuit connections and component values for zero suppression, blanking, decimal-point input, lamp test, and common anode or common cathode LED displays.
Ferranti (23pp)

13 **"Using Standard National Calculators in Industrial and Microprocessor Applications"**
Discusses keybounce and noise rejection, ready signal operation, and zero suppression as they pertain to using calculator circuits in applications.
National MOS/LSI Databook AN-176 (4pp)

Counters

14 **"A 200 MHz Autoranging MECL-McMOS Frequency Counter"**
(MC10000 Series)
Presents basic frequency counter design along with the schematics and diagrams needed to build a 200 MHz autoranging frequency counter.
Motorola AN-742 (11pp)

15 **"A Basic Selection Guide to Digital Counters"**
(CD4017, CD4024, CD4518)
Discusses the advantages of the binary ripple counter and compares it with the Johnson decade counter and the BCD counter. Also covers selection of the most suitable counter for specific applications.
RCA ICAN-6552 (6pp)

"An MSI 500 MHz Frequency Counter Using MECL and MTTL"
See listing under (Digital) High Speed Logic. (Motorola)

16 **"Applications Using the MK50395 Six Decade Counter Display Totalizer"**
(MK50395, MK50396, MK50397)
Discusses use of the counter in batch control position measurement, greater-than less-than detection, automatic stop, frequency counter, darkroom timer, digital tuning, and N-Pulser applications.
Mostek (16pp)

DIGITAL

Counters (cont)

1 **"Battery-Powered 5 MHz Frequency Counter"**
Describes a battery operated 5 MHz counter built with CMOS for low power operation. Discusses methods to minimize power consumption.
Motorola AN-717 (9pp)

2 **"Calculator Chip Makes A Counter"**
(MM5736, MM5739)
Discusses use of the MM5736 calculator chip as a counter operating up to 120 Hz.
National MOS/LSI Databook AN-112 (6pp)

3 **"Design of Fixed and Programmable Counters Using the RCA 4018A COS/MOS Presettable Divide-by-"N" Counter"**
(CD4018)
Describes the use of this device in single-decade and multi-decade fixed and programmable divide-by-"N" counters. System considerations, such as switch simplifications, components minimization, and speed are also discussed.
RCA ICAN-6498 (6pp)

4 **"Five Digit Accumulator/Elapsed Time Indicator"**
(MC14534)
Describes in detail the circuit for a CMOS 5 digit elapsed time indicator and a 99,999 count accumulator with a 1-999 prescaler.
Motorola AN-743 (5pp)

5 **"Keyboard Programmable Divide-by-"N" Counter with Symmetrical Output"**
(MM54C922, MM74C922)
Describes a circuit to divide by 1 through 16 by pushing a single key for each division ratio.
National DB-5 (2pp)

6 **"Single IC Forms 2-to-9-Bit Ring Counter"**
(AM2503)
Describes use of device to make a ring counter.
Advanced Micro Devices (2pp)

7 **"The Logical Design of Shift Counters"**
Presents two techniques to aid in designing shift-register counters. Gives results for "sequence tree" and "count multiplication" techniques for cycle lengths of 30 or less. Shows solutions for both "D" flip-flops and J-K flip-flops as the input elements of the shift register.
Motorola AN-576 (8pp)

8 **"Using the MK5009P MOS Counter Time-Base Circuit"**
(MK5009)
Describes the use of the MK5009 along with complete circuits for a digital frequency meter, pulse generator and digitally-programmable one-shot. Discusses operation of the units oscillator circuit.
Mostek AN-104 (4pp)

Counters (cont)

9 **"Using the SN74160 Family of Synchronous Counters"**
(SN74160, SN74161, SN74162, SN74163)
Describes carry circuit operation, cascading and programming.
Texas Instruments Application Report CA-174 (7pp)

General

"Criteria for Choosing Resins and Evaluation Tests for Discrete and Integrated Power Devices in Plastic Packages"
See listing under (Linear) General (SGS-ATES)

10 **"Custom Bipolar Integrated Circuits for Automotive Applications"**
Provides overview of bipolar ICs for customized systems in automotive and other applications. Reviews a typical custom development cycle and examines tradeoffs with other approaches.
Sprague TP79-2 (8pp)

11 **"Digital Telephone-System Components - CODECs—and the μ and A Laws"**
Defines terminology associated with converting telephone systems from analog to digital operation; discusses design and operation of codecs as governed by μ and A laws.
RCA ICAN-6941 (7pp)

12 **"Don't Be Confused by Switching Time Specifications"**
Uses a TTL J-K flip-flop to explain switching time specifications.
Advanced Micro Devices (4pp)

13 **"Economics of ISL Gate Arrays"**
(8A1200, 8A1260, 8A1542)
Describes manufacturing cost savings achievable by replacing standard 74-series logic with ISL gate arrays.
Signetics

14 **"HMOS Reliability"**
Describes HMOS technology and device operation. Presents failure mechanisms, reliability testing, and test results.
Intel RR-18 (9pp)

15 **"How Cost Effective Are Custom IC's?"**
(MONOCHIP)
Looks at the relative economies of discrete circuit designs versus semicustom IC's at various volume levels. Economic costs often not analyzed such as rework, supervisory overhead, inventory maintenance, quality assurance, and purchasing and stocking costs are included.
Interdesign APN-5 (6pp)

16 **"Logic Design for CMOS and NMOS Monochips"**
(MONOCHIP)
Describes techniques for transforming breadboard logic into MONOCHIP compatible logic using equivalent gates. Uses the 4008 binary adder and 4516 up/down counter as examples.
Interdesign APN-14 (15pp)

DIGITAL

General (cont)

1 **"Low Cost Versatile CRT Terminal Using the SND5027 and SND8002"**
(SND5027, SND8002)
Discusses the design of a CRT terminal using two MOS/LSI devices that minimize parts count in the display circuitry.
SSS AN-303 (10pp)

2 **"MOS 100-Bit Word Generator"**
Describes how to build a 100-bit word generator using MOS ICs.
National MB-1 (2pp)

3 **"MOS Clock Savers"**
Design and use of MOS Clock-Drive Networks. Offers tips for saving power and lowering component costs.
National MB-5 (2pp)

4 **"Nonvolatile Logic Applications"**
(MN9102, MN9105, MN9106, MN9107, MN9108)
Provides theory and application of several MNOS ICs that combine logic and nonvolatile memory functions. Example applications include an elapsed-time indicator, last-program memory and decade counter.
Plessey (40pp)

5 **"Solid-State Devices Manual"**

6 **"Special Functions Databook"**
Primarily contains data sheets, but also includes the following application notes described elsewhere: AN-10, 13, 28, 33, 38, 48, 49, 63, 75, 76, 156, 159, 180, 215, 219, 221; MB-9, LB-2, 14, 17.
National Semiconductor $6

7 **"The SND5027 Video Timer-Controller"**
(SND5027)
Describes a user-programmable LSI device containing the logic for generating timing signals required in presentation and formatting video data on CRT monitors.
SSS AN-301 (19pp)

8 **"Touchcontrol Circuits for Capacitance Switching"**
Describes seven MOS ICs that interface with a capacitive keypad panel to form a nonmechanical switching system. Includes discussion on keyboard scanning, noise immunity, switch size, capacitance values, multiplexing, panel construction and output considerations.
American Microsystems Inc. (15pp)

9 **"Worst Case Design For Integrated Circuits"**
Discusses defining worse case conditions of an IC design parameter variations, breadboarding for verification of worse case conditions and parasitic effects.
Interdesign APN-2 (5pp)

HNIL/HTL

"Combining HNIL and CMOS—An Optimum Design Technique"
See listing under (Interface) MOS/Bipolar (Teledyne Semiconductor)

HNIL/HTL (cont)

10 **"Combining HNIL and CMOS—an Optimum Design Technique"**
Outlines advantages of combining HNIL and CMOS devices in system design, includes HNIL/CMOS interface techniques.
Teledyne Semiconductor APB 1 (3pp) Data and Design Manual $5.00

11 **"Design Techniques with HiNIL 367 Quad Schmitt Trigger"**
General discussion of Schmitt Trigger and the differences of the 367, which ignores open inputs and offers 3.5v noise immunity. Applications include line receivers, pulse stretchers, ac detectors, free-running and voltage-controlled oscillators.
Teledyne Semiconductor HiNIL AN-2 (4pp)

12 **"Designing Programmable Controllers with HiNIL"**
(380, 312, 371, 311, 372, 302)
Discusses using HNIL circuits, such as BCD-to-decade decoders, decode counters, buffers, gates and flip-flops, to design programmable controllers ranging in complexity from simple single-output systems to cascaded systems with multiple output.
Teledyne Semiconductor AN-3 (4pp) Data and Design Manual $5.00

13 **"HiNIL 375 Universal Shift Register"**
Operation and applications of this synchronous 4-bit device as a 4 and 8-bit shift-left, shift-right register, 7 and 8-bit parallel-to-serial and serial-to-parallel converters and various counters.
Teledyne Semiconductor HiNIL AN-4 (10pp)

14 **"HiNIL Interface Summary"**
Circuit diagrams show how to interface HNIL devices with TTL/DTL/RTL, TTL, CMOS, PMOS, and NMOS circuits.
Teledyne Semiconductor APB 5 (1pp) Data and Design Manual $5.00

15 **"High Noise Immunity Logic—Powerful, Versatile and Growing"**
Discusses advantages of using HNIL devices in systems operating in electrically noise environments.
Teledyne Semiconductor AN-5 (5pp) Data and Design Manual $5.00

16 **"Keeping the Bugs Out of Microprocessor Systems with High Noise Immunity Logic"**
Discusses the advantages of substituting HNIL interface devices for conventional I/O logic in microprocessor systems.
Teledyne Semiconductor APB 4 (1pp) Data and Design Manual $5.00

17 **"Noise Immunity with Motorola High Threshold Logic"**
(MC660 Series)
Compares noise immunity characteristics between High Threshold Logic (HTL) and standard saturated logic devices. Discusses noise injection and noise reduction techniques.
Motorola AN-298 (5pp)

18 **"Protecting Logic Inputs"**
Discusses the use of resistors, capacitors and diodes for protecting logic-circuit inputs from large voltage spikes.
Teledyne Semiconductor APB 2 (2pp) Data and Design Manual $5.00

DIGITAL

HNIL/HTL (cont)

1 **"The 355 Timer Solves Noise Problem"**
Compares the 355 and 555 timer chips in applications using higher power supply voltages.
Teledyne Semiconductor APB 3 (2pp) Data and Design Manual $5.00

2 **"The HiNIL 347-A Dual Retriggerable One Shot with High Noise Immunity"**
Description and application details for this device are provided along with diagrams showing its use in pulse generators, coincidence detectors, frequency dividers, voltage to frequency and frequency to voltage converters, a pulse absence detector and an ac line presence detector.
Teledyne Semiconductor Digital AN-6 (6pp)

3 **"Using Bipolar Logic To Improve Performance in CMOS and Microprocessor Systems"**
(367, 350)
Discusses applications reflecting advantages of speed, power and noise immunity resulting from combining HNIL, Schottky and CMOS in microprocessor systems.
Teledyne Semiconductor AN-7 (4pp) Data and Design Manual $5.00

4 **"Using High Note Immunity Logic"**
Reviews operating characteristics of NiNIL devices and discusses loading rules and techniques for interfacing to MOS circuits and microprocessors.
Teledyne Semiconductor AN-1 (7pp) Data and Design Manual $5.00

5 **"Using Motorola High Threshold Logic"**
(MC660 Series)
Describes MC660 series ICs and provides many of the characteristics of these units. Application examples include logic translation, line driving, and trigger circuits.
Motorola AN-467 (11pp)

High Speed Logic

6 **"A High Speed FIFO Memory Using the MECL MC1143 Register File"**
(MCM10143)
Describes the required features of a high speed FIFO design. Different approaches are compared and a design is shown using the MC10143 Multiport Register File.
Motorola AN-730 (6pp)

7 **"AC Noise Immunity of MECL 10,000 Integrated Circuits"**
(MECL)
Discusses ac noise immunity. Describes test circuits for measuring this immunity and the results to be expected for MECL 10,000 circuits.
Motorola AN-592 (6pp)

8 **"An MSI 500 MHz Frequency Counter Using MECL and MTTL"**
(MECL)
Describes design of 8-digit LED readout counter using MECL III, 10,000 and TTL. Discusses two prescalers using MECL, two input amplifier designs, and a time-base controller for the counter's multiphase clock.
Motorola AN-581 (9pp)

High Speed Logic (cont)

"Bussing with MECL 10,000 Integrated Circuits"
See listing under (Interface) Data Transmission (Motorola)

9 **"F10,000 Series ECL"**
(ECL Series)
Operation and circuit parameters are described for the Fairchild ECL Series.
Fairchild AN-330 (6pp)

10 **"IC Crystal Controlled Oscillators"**
(MC1023, MC1662, MC10101, MC10116)
Describes use of MC1023 OR/NOR gate as an amplifier and oscillator. Discusses square wave oscillator circuits with crystal control capable of output frequencies up to 150 MHz. Examples use MC10116/10101, and MC1662.
Motorola AN-417B (4pp)

11 **"Interconnection Techniques for Motorola's MECL 10,000 Series Emitter Coupled Logic"**
(MECL)
Describes some of the characteristics of high digital signal lines and gives wiring rules for MECL 10,000 circuits. Discusses p-c board interconnects, board-to-board interconnects, and includes wire-wrapping techniques.
Motorola AN-556 (22pp)

12 **"Interfacing with MECL 10,000 Integrated Circuits"**
(MC1650, MC1692, MC10115, MC10116, MC10124, MC10125, MC10128, MC10129, MC10216)
Discusses circuits to interface ECL with TTL, TTL and IBM busses, MOS, low level signals, and LEDs.
Motorola AN-720 (9pp)

13 **"M10800 MECL LSI Circuits are Designed for High-Performance Microprogrammed Processors"**
Describes individual family members and how they tie together in a system. Includes block diagrams of devices and an instruction set table for the processor.
Motorola AN-792 (12pp)

14 **"MECL 10,000 Arithmetic Elements MC10179, MC10180, MC10181"**
(MC10179, MC10180, MC10181)
Describes 10180 dual adder/subtractor, 1018 4-bit arithmetic logic unit/function generator, and 10179 lookahead carry block. Discusses their operation in parallel adders, in both ripple and look ahead systems.
Motorola AN-709 (11pp)

15 **"MECL Positive and Negative Logic"**
(MECL)
Describes equivalences between positive and negative ECL logic and provides guides for converting between them.
Motorola AN-567 (2pp)

16 **"Measure Frequency and Propagation Delay with High Speed MECL Circuits"**
(MECL)
Describes ECL frequency counter useful to 160 MHz and a propagation delay measuring circuit capable of 100-picosecond resolution.
Motorola AN-586 (2pp)

© IC MASTER

DIGITAL

High Speed Logic (cont)

1 **"Simulate MECL System Interconnections with a Computer Program"**
Develops a basic computer program that allows the user to simulate the performance of signal lines and to analyze termination techniques. Applies to ECL and other highspeed digital systems.
Motorola AN-700 (10pp)

2 **"Testing MECL 10,000 Integrated Logic Circuits"**
(MECL)
Describes AC and DC tests in a 50 ohm transmission-line environment for measuring logic levels or noise margins, circuit current, input currents, propagation delays, edge speeds, and flip-flop toggle rates.
Motorola AN-579 (6pp)

3 **"The MC1600 Series MECL III Gates"**
(MC1660, MC1661, MC1662, MC1663, MC1664, MC1665)
Gives typical operating characteristics and explains the operation of various gates in the MECL III family. Describes recommended layout, breadboarding, and testing procedures.
Motorola AN-504 (14pp)

4 **"Understanding MECL 10,000 DC and AC Data Sheet Specifications"**
(MECL)
Discusses basic MECL 10,000 gate structure, transfer curve and dc levels. Covers specifications data sheet, including power supply drain current, high and low output voltages, propagation delay, rise and fall times, and toggle frequency.
Motorola AN-701 (7pp)

5 **"Using Shift Registers as Pulse Delay Networks"**
(MC10135)
Discusses a high-speed delay shift register using the MC10135 flip flop.
Motorola AN-565 (3pp)

6 **"Video Terminal Strips Down to 26 MOS/LSI Chips"**
Discusses the use of single or multiple chip sets to implement the functions of a smart video terminal—programmable I/O and counters, keyboard scanner and encoder, baud rate generator, memory and video timer and controller.
Standard Microsystems AR3-3 (4pp)

High Speed TTL

7 **"The MC3000/MC3100 Series Transistor-Transistor Logic Flip-Flops"**
(MC3050, MC3051, MC3052, MC3060, MC3061, MC3062, MC3150, MC3151, MC3152, MC3160, MC3162)
Describes basic operation of the various flip-flops available in the MC3000/3100 (54H/79H) series and gives typical operating characteristics of each.
Motorola AN-493 (14pp)

IL

8 **"Custom IC Design Using IL Technology"**
(XR-IIL-CHIP)
Compares IL to other technologies. Describes design procedure for linear and digital circuits using master chips.
Exar (5pp)

IL (cont)

9 **"Digital Display Systems"**
Discusses decoding, format, multiplexing, zero suppression for LED, LCD, incandescent, fluorescent and gas discharge displays.
Fairchild AN-212/2 (24pp)

10 **"Monolithic IL Test Circuit Using XR-C409"**
(XR-C409)
A monolithic test circuit has been developed for evaluation of speed and performance capabilities of Exar's (IL technology. This test circuit, designated the XR-C409, is intended to familiarize the IL user and the system designer with some of the performance features of IL such as its frequency capability and power-speed tradeoffs.
Exar AN-17 (4pp)

LSI, General

11 **"Semi-Custom LSI Design with IL Gate Arrays Using XR300 and XR500"**
A design approach to developing complex LSI systems using the devices is described.
Exar AN-16 (6pp)

Multiplexers

12 **"TTL MSI Multiplexers and Demultiplexers"**
(DM7210, DM7842, DM8210, DM8842)
Describes features of DM7210 multiplexer and DM7842 demultiplexer and discusses their use in a synchronous digital data transmission system, a keyboard entry decoder, and as minterm generators.
National AN-37 (8pp)

PLAs

13 **"Field Programmable Logic Arrays—An Application Manual"**
Covers basic FPLA operation and describes various applications, including a data cartridge tape drive controller, an opcode decoder for the PDP-11, and a combination sync and video generator.
Signetics (116pp)

14 **"How to Design with Programmable Logic Arrays"**
(DM8575, DM8576)
Discusses operation of PLAs and use as code converters, decode elements in digital processors and sequential controllers.
National AN-89 (8pp)

IL (cont)

1 **"Programmable PROM Memory Expansion"**
(82S102, 82S103)
Describes the use of FPGA in memory intensive systems, which may accept 4K, 8K, 16K, 32K, or 65K PROMs, simply by editing the FPGA program.
Signetics AB-005 (4pp)

2 **"Single Chip Multiprocessor Arbiter"**
Shows how the Field Programmable Logic Sequencer (FPLS) can use state logic to implement a multiprocessor arbiter conveniently and cost effectively.
Signetics AN-007 (4pp)

Pulse Handling

3 **"Nanosecond Pulse Handling Techniques in I/C Interconnections"**
Discusses problems of pulse transmission and measurement for TEM mode on coax, stripline, and above-ground wire systems.
Motorola AN-270 (6pp)

Signal Processors

4 **"2920 Analog Signal Processor Design Handbook"**
(2920)
Through background review and design examples, explains how analog signal processing can be performed with digital signal processing techniques.
Intel (128pp) $7.50

5 **"An LSI Digital Signal Processor for Airborne Applications"**
Discusses the background of digital signal processing with emphasis on radar processors. Described is a digital signal processing board, employing a multiplier-accumulator IC, that includes the basic processor, address generators, controller and system interface.
TRW/LSI A-12

6 **"Bipolar VLSI for High Performance Digital Signal Processing"**
Explains the triple diffusion process used by TRW LSI Products to produce multipliers and multiplier-accumulators. Also included are multiplier configurations for recursive and non-recursive filters and FFTs.
TRW/LSI A-3

7 **"Digital Signal Processing for Radar Systems"**
Shows how VLSI multipliers and multiplier-accumulators can be used in a radar signal processor to achieve: data rate reduction, by means of predictive mechanization; pulse compression, utilizing an FIR matched filter; maximum computational capabilities, via pipelining; high speed convolution, using 2-point DFTs and a complete FFT processor.
TRW/LSI A-2

Signal Processors (cont)

8 **"General Purpose Formant Speech Synthesizer Module Using the Intel 2920 Signal Processor"**
(2920)
Describes phoneme-based speech synthesizer design using the 2920 signal processor.
Intel AP-111 (24pp)

9 **"Hardware Development for a General Purpose Digital Filter Computing Machine"**
Describes the architecture and design of the arithmetic logic unit (ALU) for a digital filter computing machine. The computer control unit (CCU) required to drive the ALU is also explained; the CCU receives user-programmed instructions, interprets them and directs the ALU to perform the appropriate computations.
TRW/LSI A-9

10 **"High-Speed Servo Control with the 2920 Signal Processor"**
(2920)
Describes techniques and principles associated with digital (vs. analog) control system design; includes detailed application examples.
Intel AP-124 (40pp)

11 **"Introduction to the Z-Transform and its Derivation"**
A tutorial discussion of LaPlace and Z-transforms and their use in sampled data systems. Application of the Z-transform to filter synthesis is also treated.
TRW/LSI A-4

12 **"Second Order Recursive Digital Filter Design with the TRW Multiplier-Accumulators"**
Develops the fundamental concepts for second order recursive digital filters and describes some efficient hardware implementations using the TDC1010J multiplier-accumulator.
TRW/LSI A-8

13 **"Using the 2920 Signal Processor in Modem Applications"**
Discusses modem design using digital signal processing techniques and detailed design examples for various modems.
Intel AP-117 (40pp)

TTL, General

14 **"9338 8-Bit Multiple Port Register"**
(9338)
Describes the features of this device, the TTL/MSI equivalent and parallel serial expansion capabilities. Covers use as three address arithmetic unit with eight registers, and use in a first-in first-out memory.
Fairchild AN-294 (6pp)

15 **"Characteristics and Applications of Tri-State IC's"**
(DM7093, DM7490, DM7214, DM7230, DM7551, DM7598, DS7831, DS8831)
Describes application of the general configuration of the Tri-State logic family and discusses application of the following: quad bus-buffer gates, dual 4:1 multiplexer, demultiplexer and bus-interchange switch, quad-D flip-flop, expandable 256-bit ROM, and quad driver.
National AN-45 (12pp)

DIGITAL

TTL, General (cont)

1 **"Medium Scale Integration in the Numerical Control Field"**
(MC4016, MC4018, MC4024, MC4044, MC4324, MC4344)
Discusses operation of MC4016 decade programmable cascadeable counter, MC4324/4024 dual voltage controlled multivibrator, and MC4344/4044 frequency phase detector. Describes applications of these devices in audio frequency comparator, frequency synthesizer, and motor speed control circuits.
Motorola AN-541 (10pp)

2 **"Microprocessor—GPIB Interfacing with the 96LS488"**
(96LS488)
Shows how to interface instruments and system components that talk, listen or talk and listen in accordance with the IEEE-488 standard for programmable instrumentation. Sample applications demonstrate use with various microprocessors.
Fairchild Application Note 351 (24pp)

3 **"TTL Integrated Circuits—Applications of MSI Devices"**
Covers counters, modulo-N dividers, decoders, switches, adders, comparators, parity generators, shift registers and bus-ORable flip-flop. Describes many applications, including up/down counters, a stepping waveform generator, shift registers, frequency synthesizers, digital data demultiplexer, analog commutator, minterm generator, ripple carry parallel adder and tape position locator.
National AN-36 (23pp)

4 **"TTL/MSI 9334 8-Bit Addressable Latch"**
(9334)
Describes operation and application, including 16 and 32-bit addressable latches, 16-word by 4-bit memory, demultiplexer and decoder, 8-bit A/D converter and a 16-bit serial-to-parallel converter.
Fairchild Application Note 220 (8pp)

5 **"Tri-State Logic Applied in a Computer System Can Reduce System Cost and Provide Added Performance"**
(DM8556)
Analyzes Tri-State characteristics using the DM8556 counter/register as an example. Shows how performance of PDP-8 can be improved using TSL.
National AN-73 (7pp)

6 **"Tri-State Logic in High Speed Memories of Microprogrammed Computers"**
(DM8551)
Discusses tri-state logic in general and its use in scratchpad memories. Covers storage of microinstructions and program constants in high-speed ROMs.
National AN-47 (5pp)

7 **"Tri-State Logic in Modular Systems"**
(DS7831, DM8093, DM8094, DM8214, DM8230, DM8551, DM8552, DM8598, DS8831, DM8840, DM8842, DM8846)
Discusses output drive characteristics logical control, safety factors in Tri-State Logic circuits. Describes applications, including complex switching functions, driving and transmitting, multiplexing, data storage, decoding, and data manipulation.
National AN-43 (16pp)

Trigger Circuits

"1.3 Volt IC Flasher, Oscillator, Trigger, or Alarm"
See listing under (Linear) Timers (National)

8 **"Advantages of the AM26123 Compared with the AM54/74123"**
(AM26123, SN54123, SN74123)
Discusses changes in the pulse width circuits and the addition of an output latch.
Advanced Micro Devices Application Brief (4pp)

9 **"CMOS Schmitt Triggers"**
(MC14093B, MC14583B, MC14584B)
Operating characteristics, theory of operation, and Schmitt trigger applications are covered for digital logic systems.
Motorola AN-768 (8pp)

10 **"CMOS Schmitt Trigger—a Uniquely Versatile Design Component"**
(MM54C14, MM74C14)
Analyzes CMOS Schmitt triggers and outlines applications including a light activated switch, an RC oscillator, and a pulse stretcher. Also outlines the benefits of hysteresis.
National MOS/LSI Databook AN-140 (6pp)

11 **"Designing with SN54/74LS123 Dual Retriggerable Monostable Multivibrators"**
(SN54LS123, SN74LS123)
Includes descriptions of device used in frequency discrimination, missing pulse detection, pulse width detection, frequency doubling.
Texas Instruments Application Report CA-196 (12pp)

12 **"Schmitt Triggers and Multivibrators"**
(MONOCHIP)
Discusses implementation of Schmitt triggers and multivibrators on an NMOS gate array. Presents design considerations and electrical characteristics for both at 5 and 12 V.
Interdesign APN-13 (7pp)

13 **"Using the CMOS Dual Monostable Multivibrator"**
(MM54C221, MM74C221)
Discusses device theory, accuracy, and diagrams typical applications including oscillator circuits, a frequency magnitude comparator, and a linear VCO.
National CMOS Databook AN-138 (6pp)

MICROPROCESSOR

Applications

1 "68047 Video Display Generator"
(S68047)
Describes a low cost IC that provides a link between an MPU and a standard black and white or color television set. Includes software implementation.
American Microsystems AN796801 (12pp)

2 "A Dual Processor System for Use in the EXORciser"
Introduces dual processing and presents the design of a dual processor system for use in the EXORciser. In the system discussed, the μP's have control of a common bus on opposite phases of the clock.
Motorola AN-777 (13pp)

3 "A Low Component Count Video Data Terminal Using the DP8350 CRT Controller and the INS8080 CPU"
(DP8350, INS8080A, INS8250)
Describes a video data terminal system. Provides block diagrams and short descriptions of individual circuit elements as well as system schematic.
National Interface Databook AN-199 (10pp)

4 "A Low Cost-MOS/LSI Based Smart CRT Terminal"
(CRT5037, KR3600, ROM4732, CRT8002, COM8046, COM8251, 8085)
Presents design of a "smart" word editing CRT terminal with 29 IC's and programmable format.
Standard Microsystems AN3-1 (20pp)

5 "A Low-Cost Terminal Using the MC6801"
(MC6801, MC6847, MC1372)
Provides instructions by using an unmodified television set as a monitor terminal by applying a microcomputer, a video display generator and an RF modulator. Includes wiring diagram, program flow chart and program listing.
Motorola AN-798 (21pp)

6 "A Matrix Printer Controller Using the F8 and F3870 Circuits"
(F8, F3870)
Describes the construction of a matrix printer controller using the devices. Includes software listings and diagrams.
Fairchild AN-340 (15pp)

7 "An Interactive Graphic System Using the MC6809"
(MC6809, MC6847, MC1372)
Details procedures for implementing cost-effective graphic displays on the video screen of a small business computer.
Motorola Semiconductor AN-825 (28pp)

8 "An Introduction to Digital Spectrum Analysis including a High Speed FFT Processor Design"
Describes the design of a high-speed FFT processor, particularly the architecture and address generation. Also included is an explanation of the use of bit-slice microprocessors as FFT sequencers.
TRW/LSI A-11

9 "Analog-to-Digital Conversion Using the S2000 Family"
(S2000)
Presents four a/d conversion schemes of varying complexity incorporating the device. Block diagrams are supplied.
American Microsystems AN-79-2K-10 (4pp)

Applications (cont)

10 "Automatic Multipoint Pressure Measurement"
(INS8060)
Details design procedures for making a multipoint pressure measurement and control system using a microcomputer with 12-bit A/D resolution; includes software program listing.
National Semiconductor AN-235 (16pp)

11 "CRT Terminal Design Using the 8275 and 8279"
(8275, 8279, 8224, 8080, 8257, 8228, 8212, 8251, 2708, 2714, 2716)
Provides component descriptions and system design details needed to apply the 8275 programmable CRT controller and 8279 programmable keyboard/display interface in CRT systems. Flowcharts, sample code, and schematics included.
Intel AP-32 (57pp)

12 "Communication Interfaces for the IMP-16"
(IMP-16)
Describes the use of this microprocessor in leased line and switched line applications with the communications conforming to EIA standard RS232-C.
National AN-152 (13pp)

13 "Controlled Dot Matrix Printer S9900"
(S9900)
Describes use of the device to control a 7040 series dot matrix printer. Supplies block diagram, flowchart, and software listing.
American Microsystems AN-79-99-03 (7pp)

14 "Correcting Errors Digitally in Data Acquisition and Control"
(SDM856/857, MP20, MP21)
Describes how to combine a microprocessor with analog techniques to optimize the compensation of gain and offset errors in digital data-acquisition and control applications.
Burr-Brown Research AN-101 (6pp)

15 "Data Acquisition Networks with NMOS and CMOS"
(MC14433, MC6800)
Discusses an 8-channel acquisition network using the MC14433 A/D converter and the MC6800 microprocessor.
Motorola AN-770 (11pp) MP000500

16 "Data Handling with the IMP-8"
(IMP-8, IMP-16)
Covers basic concepts for transferring data from a memory to peripherals.
National AN-117 (4pp)

17 "Details of INS1771 FDC"
(INS1771)
Introduces the device and its command set. Provides timing diagrams and system block diagrams.
National AN-220 (10pp)

18 "Direct Memory Access with the 8257 DMA Controller"
(8257, 8080A, 8085A)
Examines determining the need for DMA, operation of the device and its application in an MCS-85 system controlling a Burroughs self-scan display panel. Includes diagrams, flowcharts, and software.
Intel AP-48 (4pp)

©IC MASTER

MICROPROCESSOR

Applications (cont)

1 **"FD179X Application Notes"**
(FD179X)
Describes devices and their operation. Includes schematics and timing diagrams.
Western Digital (16pp)

2 **"Function/Application of the LD122/LD121A ±4½ Digit A/D Converter Set in Measurement Systems"**
An updated version of AN77-3 extending system resolution beyond 10 μV. Describes interfacing guidelines and precautions.
Siliconix AN80-8 (9pp)

3 **"Graphics Using the DP8350 Series of CRT Controllers"**
(DP8350)
General discussion on using the device in CRT graphics applications. Topics covered include using line buffers and memory mapped graphics.
National AN-212 (4pp)

4 **"Interfacing M6800 Peripheral Devices to the MC68000 Asynchronously"**
(M6800, MC68000)
Describes a technique for interfacing peripheral devices to an MC68000 microprocessor using a 4-chip TTL circuit.
Motorola Semiconductor AN-808 (9pp)

5 **"Interfacing and Controlling Digital Temperature Data Using the MC6800"**
(MC6800, MC6821)
Provides block diagrams, instruction set, and discussion of a temperature control system using the device.
Motorola AN-782 (4pp)

6 **"Keyboard Display Scanning with Intel's MCS-48 Microcomputers"**
(8035, 8039, 8048, 8049, 8021, 8022, 8748, 8041, 8741)
Presents a software package for interfacing the devices to keyboards and displays. Includes circuit diagrams as well as program details.
Intel AP-40 (24pp)

7 **"Low Cost Versatile CRT Terminal Using the CRT5027 and CRT8002"**
(CRT5027, CRT8002)
Describes devices and their uses in a CRT terminal with a screen format of 16 rows of 64 characters. Provides schematics, block diagram, and the changes required for an 80 character/row, 24 row format.
Standard Microsystems AN2-1 (11pp)

8 **"Memory-Mapped I/O"**
(TMS9900, TMS9927)
Discusses a technique for transferring 8 or 16 bits in parallel to an I/O port. The method is useful for applications requiring the transfer of complete bytes or words such as for parallel communication links.
Texas Instruments (6pp)

Applications (cont)

9 **"Microprocessor I/O Techniques"**
(TMS9900)
Discusses the selection of the proper I/O mode for different applications to simplify hardware interface and associated software.
Texas Instruments (6pp)

10 **"Microprocessor Mates with MOS/LSI Keyboard Encoder"**
(IMP-16)
Shows how to interface a keyboard to the IMP-16 microprocessor for text editing.
National MOS/LSI Databook AN-128 (6pp)

11 **"Motor RPM Control: An INS8060 Multiprocessor Example"**
(INS8060)
Examines multiprocessor theory and system implementation. Includes circuit diagrams and software listings.
National AN-201 (10pp)

12 **"Musical Application for the S2000 Microcomputer"**
(S2000)
Describes capabilities on the device when programmed to generate any of 60 musical frequencies and play on command any one of the twelve pre-programmed tunes.
American Microsystems AN-79-2K-02 (14pp)

13 **"Programmable Appliance/Outlet Controller using the S2000/2150"**
(S2000/2150)
Discusses hardware and software considerations for designing a programmable timer based on the S2000/2150 microprocessor interfacing with an LED display and keypad.
American Microsystems AN-79-2K-14 (3pp)

14 **"S2000 Software Seconds Timing and Display"**
(S2000)
Gives introductory software program demonstrating use of instructions and programming techniques for controlling LED time display.
American Microsystems AN-79-2K-07 (3pp)

15 **"S2000 Software—Touch Control Keyboard Scan and Display Output"**
(S2000)
Describes the display and keyboard scan subroutines for a typical display output program.
American Microsystems AN792K06 (6pp)

16 **"S9900 Simplifies Design of Bidirectional I/O Module"**
(S9900)
Demonstrates a bidirectional I/O module built by incorporating standard addressing and multiplexing logic with the device.
American Microsystems AN-79-99-01 (2pp)

17 **"Serial I/O and Math Utilities for the 8049 Microcomputer"**
(8049)
Provides several program modules which illustrate the increased capabilities of the device over initial members of the family. Modules cover full duplex serial I/O, binary multiply and divide, and binary to BCD and BCD to binary conversions.
Serial I/O and Math Utilities for the 8049 Microcomputer

MICROPROCESSOR

Applications (cont)

1 **"Simplify CRT Terminal Design with the DP8350"**
(DP8350)
Describes a low-cost CRT data terminal design based on the DP8350 CRT controller and SC/MP microprocessor. Features screen scroll, RS-232C interface, and adjustable band rate. Includes schematics, flowcharts, and PC board layout.
National Interface Databook AN-198 (10pp)

2 **"Soft Scrolling with the CRT5037 VTAC"**
(CRT5037)
Describes method of performing "soft scroll" with the CRT5037.
Standard Microsystems AN1-3 (4pp)

3 **"Special Considerations in Using the MC6801 Interrupt Capabilities"**
(MC6801)
Reviews MC6801 interrupt operation and discusses important interrupt design constraints.
Motorola Semiconductor AN-807 (11pp)

4 **"TMS9900 CRT Controller"**
(TMS9900)
Analyzes a CRT controller system that employs a TMS9900 microprocessor. Contains diagrams of the system and a software monitor routine.
Texas Instruments Application Report MOSA6 (32pp)

5 **"The CRT5027/37/57: Video Timer-Controller"**
(CRT5027, CRT5037, CRT5057)
Characterizes the device and explains how to program it. Provides examples for systems with 80 characters by 24 rows and 40 characters by 12 rows. Schematics and system block diagrams are included.
Standard Microsystems AN-1-1 (18pp)

6 **"The IMP-16 in Communication Applications"**
(IMP-16)
Discusses communication processor functions, requirements for communications microprocessors and system considerations. Gives programming examples including status monitoring, data transmission, message routing, interrupt handling and error control.
National AN-134 (6pp)

7 **"The IMP-8C as a Data Concentrator"**
(IMP-8C)
Describes the use of this microprocessor in data concentrator applications. Covers use with a full duplex modem, and the terminal controller interface.
National AN-113 (6pp)

8 **"Using the 8202 Dynamic RAM Controller"**
(8202, 8085A, 8086)
Describes the device in detail and illustrates its use. Covers functionality, interfacing, decoupling, and speed selection of memory array. Provides 8085A application examples and an interconnect of the 8086 max mode system with 128K bytes of dynamic RAM.
Intel AP-45 (25pp)

9 **"Using the 8295 Printer Controller"**
(8295)
Describes device which interfaces microprocessors to the LRC 7040 series of dot matrix impact printers. Provides software and schematics for various interface schemes.
Intel AP-54 (31pp)

Applications (cont)

10 **"Using the CRT5027 VTAC for Double Height Characters"**
(CRT5027)
Outlines procedures for obtaining double height characters using the device and a 32 x 8 PROM. Circuit diagram and program for both the device and PROM included.
Standard Microsystems AN1-2 (2pp)

11 **"Vacuum Fluorescent Display Driven by TMS9940"**
(TMS9940)
Describes how the TMS9940 single-chip microcomputer makes an efficient, low-cost controller for multi-character fluorescent displays.
Texas Instruments Applications Report MP717 (28pp)

12 **"Video Terminal Interface Design Using TMS9927 Controller/Timer"**
(TMS9927)
Describes a terminal interface design for connecting a TM990 microcomputer module with a keyboard and an RS Video Monitor to form a complete stand alone terminal.
Texas Instruments Application Report MP024 (48pp)

13 **"μPD765 Single/Double Density Floppy Disk Controller"**
(uPD765)
Presents a complete floppy disk controller design incorporating the device. Allows DMA or non-DMA operation. Includes block diagram and timing diagrams.
NEC Microcomputers AN-8 (32pp)

General

14 **"Z8000 vs 6800 Register Architecture"**
(Z8000)
Examines the difference between the Z8000 and 6800 register architectures on the basis of general-purpose vs special-purpose registers, pairing vs telescoping of subregisters and register-set extensibility.
Zilog (5pp)

"A Non-Volatile Microprocessor Memory Using 4K N-Channel MOS RAMS"
See listing under (Memory) RAMS (Motorola)

15 **"AmZ8001/AmZ8002 Processor Interface"**
(AmZ8001, AmZ8002)
Three-chapter booklet covering interfacing fundamentals, memory interfacing techniques and I/O interfacing techniques for the AmZ8000 system.
Advanced Micro Devices AM-PUB089 (81pp)

16 **"Comparison Study NSC800 vs 8085, Z80"**
(NSC800)
Compares the NSC800, 8085 and Z80 MPUs on the basis of critical selection factors, including speed, bus structure, architecture, instruction sets and I/O requirements.
National Semiconductor uB 3 (3pp)

17 **"S6802 Microprocessor Crystal Specification"**
(S6802)
Explains method for specifying the oscillator crystal for the S6802 microprocessor.
American Microsystems AN796803 (1pp)

©IC MASTER

MICROPROCESSOR

General (cont)

1 **"Software Comparison NSC800 vs 8085, Z80"**
(NSC800)
Compares the instruction sets of the NSC800, 8085 and Z80.
National Semiconductor uB4 (3pp)

I/O

2 **"Application Prototype Board (APB) for MC6801/MC6803/MC68701 MCUs"**
(MC6801, MC6803, MC68701)
Describes the design and fabrication of an application prototype board for evaluating single-chip microcomputers in the MC6801 family. Includes a parts list and artwork needed to generate the p-c board.
Motorola AN799 (12pp)

3 **"Asynchronous Communications for the MC68000 Using the MC6850"**
(MC68000, MC6850)
Discusses operation of an asynchronous communications interface adapter and interconnection requirements for use with the MC68000 microprocessor.
Motorola Semiconductor AN-817 (4pp)

4 **"Color Graphics for the MC68000 Using the MC6847"**
(MC68000, MC6848)
Illustrates how to use a video display generator to provide a video signal to a color or B/W television receiver in a microprocessor-based system.
Motorola Semiconductor AN-815 (3pp)

5 **"Designing Low Power 12-Bit Microprocessor Systems"**
(IM6100)
Examines selection considerations for CMOS microprocessors. Discussion includes power consumption, word length, architecture, I/O structure and throughput.
Intersil Application Bulletin M009 (4pp)

6 **"Expanding 48-Series Program Space in 4K Byte Increments"**
(INS8048)
Reviews the external memory interface for the 48-Series microcomputers and shows how to use external ICs for paging control of add-on memory.
National AN254

7 **"Hardware Considerations for Direct Memory Access Using the MC6809 Microprocessor Unit and MC6844 DMA Controller"**
(MC6809, MC6844)
Discusses hardware considerations regarding DMA in systems using the MC6809 microprocessor, with emphasis on DMA dead-state protection.
Motorola Semiconductor AN-820 (5pp)

8 **"Increasing Throughput for IMP-16 Serial Input/Output"**
(MM5303)
Describes use of device to improve communication between microprocessor and peripheral with little increase in component count.
National AN-160 (7pp)

I/O (cont)

9 **"Interlaced Video Displays Utilize Low Cost CRT Controllers"**
Discusses the design of interlaced raster scan CRT displays that refresh at half the usual rate and thus require less expensive components.
Standard Microsystems AR1-5 (6pp)

10 **"Microprocessors—An Introduction"**
Shows system components, defines terms and describes operation of an elementary computer system.
National AN-114 (4pp)

11 **"Prioritized Individually Vectored Interrupts for Multiple Peripheral Systems with the MC68000"**
(MC68000)
Reviews MC68000 interrupt structure and discusses circuits comprised of standard TTL parts for generating interrupt vector numbers.
Motorola Semiconductor AN-819 (6pp)

12 **"Synchronous I/O for the MC68000 Using the MC6852"**
(MC68000, MC6852)
Describes operation and interface requirements of a synchronous serial data adapter for use with the MC68000 microprocessor.
Motorola Semiconductor AN-818 (5pp)

13 **"The Video Display Generator as a Color Television Interface"**
(MC6847, MC1372)
Describes two ICs that convert a television display into an active, intelligent terminal when used with an MPU, some memory devices and about a dozen passive discrete components.
Motorola Semiconductor AN-822 (18pp)

14 **"Use of the CDP1852 8-Bit I/O Port with RCA Microprocessor Evaluation Kit CDP18S020"**
(CDP1852)
Describes several applications of the CDP1852 I/O Port and specifically explains its use in the CDP18S020 Evaluation Kit.
RCA ICAN-6538 (4pp)

15 **"Use of the CDP1854 UART with RCA Microprocessor Evaluation Kit CDP18S020 or EK/Assembler-Editor Design Kit CDP18S024"**
(CDP1854)
Describes several methods of interfacing the CDP1854 with the CDP1802 microprocessor and specifically explains the use of the CDP1854 in the CDP18S020 and CDP18S024 Kits.
(CDP1854)
RCA ICAN-6632 (6pp)

16 **"Using the CRT5037 VTAC for a 512 x 512 Dot Matrix"**
(CRT5037)
Describes the design of dot-graphic terminals using CRT controllers. Includes a detailed example of a 512 x 512 dot graphic terminal.
Standard Microsystems AN1-4 (8pp)

MICROPROCESSOR

I/O (cont)

1 **"Using the MP8418 Microcomputer Analog I/O System"**
(MP8418)
Discusses theory and application of a board-level data acquisition system that interfaces with the Intel Multibus. Includes troubleshooting software for system checking.
Burr-Brown AN-95 (12pp)

Programming

2 **"12-Bit Addressing with the Z8600 Series Family"**
(Z8600)
Shows how to use 12-bit addressing to manipulate data in the internal program memory, external program memory and the external data memory of a Z8600-based system.
Zilog (2pp)

3 **"6500 Programming Manual"**
(MCS6500 Series)
Describes the software aspects of the 6500 microprocessor family and related support devices.
MOS Technology $6.95

4 **"8080/8085 Assembly Language Programming Manual"**
(8080A, 8085A)
Primarily a reference manual, this manual describes the 8080/8085 instruction set, assembly language concepts, assembler directives, macros, programming techniques and interrupts.
Intel $10.00 (210pp)

5 **"A Methodology for Programming COSMAC 1802 Applications Using Higher-Level Languages"**
(COSMAC 1802)
Discusses a method for optimizing time-critical portions of programs written in higher-level languages for COSMAC 1802 applications by recoding those portions in assembly language.
RCA ICAN-6918 (4pp)

6 **"A Microprogram Development System"**
(IMP-16)
Describes the application of microprogramming to LSI processors and the advantages of a microprogram development system for hardware and software.
National AN-123 (6pp)

7 **"A Z89-Based System Using the DMA with the SIO"**
(Z80)
Describes the use of Z80A SIO and DMA hardware/software in a Z80-based system to transfer data to the SIO via the DMA.
Zilog (11pp)

8 **"An Introduction to RIO Text Processing"**
Presents for the beginning microcomputer user an introductory overview of the fundamentals of Relocatable Modules and Input/Output Management.
Zilog AN1 (24pp)

Programming (cont)

9 **"Architectural Concepts for Microprocessor Peripheral Families"**
(Z8038)
Discusses overcoming the constraints of limited microprocessor signal lines by using an intelligent FIFO I/O device.
Zilog (3pp)

10 **"Binary Synchronous Communication Using the Z80 SIO"**
(Z80)
Discusses design considerations for using the Z80 SIO for implementing communication protocol for information exchange between data-processing devices.
Zilog (4pp)

11 **"CDP1802 Microprocessor-Based Setback Thermostat"**
(CDP1802)
Covers the design of a programmable, setback thermostat circuit for controlling heating and air-conditioning systems.
RCA ICAN-6901 (7pp)

12 **"COSMAC Software Development Program on GE Mark III Time Sharing System"**
(CDP 1802)
Describes the COSMAC Software Development Packages (CSDP) available for the GE Mark III time sharing system. Briefly covers the assembler and the simulator debugger which make up the package.
RCA ICAN-6656 (4pp)

13 **"Chaining the Execution of Disk Resident Basic-M Program Overlays"**
(XDOS)
Describes a way to implement a "chain" instruction using the XDOS, COMND system call.
Motorola Semiconductor AN-812 (6pp)

14 **"HM-6100 Microprocessor Basic 4K Software"**
(HM6100)
Describes the Digital Equipment Corp. PDP-8 software.
Harris Semiconductor AN-HM003 (4pp)

15 **"HM-6100 ROM Based Subroutine Calls"**
(HM6100)
Describes two methods for returning to the proper program location after executing a subroutine.
Harris Semiconductor AN-HM008 (4pp)

16 **"How To Use Fortran with Other Intel Languages"**
Shows how to link together program modules comprised of Fortran, PL/M and assembly language; example application is included.
Intel AP-44 (22pp)

17 **"IMP-16 Programming Techniques"**
(IMP-16)
Discusses several aspects of the instruction set to enable programmer to code more efficiently. Includes discussion of subroutines, subroute parameter passing, recursive subroutines, as well as sample programs.
National AN-111 (6pp)

18 **"ISIS-II System Calls"**
Discusses how ISIS routines facilitate program generation by providing interface functions such as program I/O, diskette directory maintenance and program loading and execution routines.
Intel AP-80 (20pp)

© IC MASTER

MICROPROCESSOR

Programming (cont)

1 **"Inter-Intellec Communications"**
(Intellec Series II)
Illustrates how to establish a communications link between two Intellec Series II development systems to allow file transfer and increased program development flexibility.
Intel AP-81 (30pp)

2 **"Interfacing 8500 Peripherals to the Z80"**
(Z80)
Describes hardware interface requirements and interrupt structure of 8500 series peripherals in a Z80 system.
Zilog (5pp)

3 **"Interfacing PLM Code to CDOS System Functions"**
Describes an array of PLM procedures and supportive macro definitions for interfacing PLM programs to CDOS system functions; includes example program.
RCA ICAN-6928 (6pp)

4 **"Letting the MC68702 Program Itself"**
(MC68701)
Describes how the MC68701 MCU controls data flow to an on-chip EPROM and gates programming power during programming with the help of only a few external devices.
Motorola Semiconductor AN-832 (8pp)

5 **"M6800 Microprocessor Programming Manual"**
(MC6800)
Provides information needed to program the unit, discusses the instruction set, source language, assembler, simulator, Build-Virtual-Machine and HELP programs. Gives programs examples.
Motorola $10.00 (303pp)

6 **"MC6802/MC6846 with MIKBUG 2.0: A Powerful Software Development Team"**
(MC6802, MC6846)

7 **"MCS-48 and UPI-41 Assembly Language Manual"**
(8041, 8048, 8741, 8748, MCS-48, UPI-41)
Describes the assembly language for programming the MCS-48 and UPI-41 single device microcomputers. Covers procedures and controls for operating the assemblers to translate the source file into object code.
Intel $10.00 (192pp)

8 **"Memory-Mapped vs Explicit I/O"**
(Z8000)
Compares two approaches to the addressing of microprocessor I/O transactions: the memory-mapped I/O of the 68000 and the explicit I/O scheme of the Z8000.
Zilog (2pp)

9 **"Microprocessor Interface Software"**
(NC7033)
Describes how to interface the NC7033 MN05 non-volatile memory directly with an 8085 or 8080 microprocessor.
Nitron AN101 (28pp)

10 **"Microprogramming Handbook"**
(2911, 2909, 29811, 2922, 29803)
Discusses microprogramming a bipolar processor. Includes sections on microprogram memory, sequencing, branching, jumping, and subroutines.
Advanced Micro Devices, $5.00 (44pp)

Programming (cont)

11 **"PL/M-80 Programming Manual"**
(8080, PL/M-80)
Provides in readable format a complete description of the PL/M language as implemented by the PL/M-80 compiler.
Intel $10.00 (134pp)

12 **"Partitioning a Basic-M Source Program"**
(XDOS)
Describes how to partition a source program into several separately compiled modules that can reside in ROMs in the final environment outlines user-program design constraints and illustrates the assembly routine for calling one module from another.
Motorola Semiconductor AN-813 (6pp)

13 **"S2000 Software Routines: Keyboard Entry, LED Display, Software Timing and Sound Generation"**
(S2000)
Describes software program that demonstrates capability of the S2000 single-chip MCU.
American Microsystems Inc. (8pp)

14 **"SC/MP NIBL ROM Hardware Implementation"**
Shows the design of the RAM and ROM memories needed to implement National's Industrial Basic Language on the SC/MP LCDS.
National AN-204 (2pp)

15 **"Segmented vs Linear Addressing"**
(Z8000)
Compares two approaches used for addressing microprocessor memory: the segmented addressing method of the Z8000 and the linear addressing method of the 68000.
Zilog (9pp)

16 **"Serial Clock Generation Using the Z8536 CIO"**
(Z80, Z8536)
Describes the use of a counter/timer I/O device for generating bit-rate clocks for asynchronous communications in a Z80-based system.
Zilog (4pp)

17 **"Serial Communication with the Z80 DART"**
(Z80, Z8470)
Covers hardware and software considerations for using the Z80 DART, an IC that provides two independently programmable, asynchronous communication channels for a Z80-based system.
Zilog (9pp)

18 **"Signetics Micro Assembler Reference Manual"**
(N3002, 8X02)
Describes this FORTRAN program developed as a design tool for writing microprograms. This microprogram defines its own assembly language, writes the microprogram, then assembles it to generate tapes to load memory. Program is suitable for most microprogrammed applications.
Signetics $4.00 (74pp)

19 **"Software Control of Microprocessor-Based Realtime Clock"**
(CDP1802)
Shows how to use software to implement a 12-hr clock, 4-yr calendar and a 12-hr elapsed time indicator with a microprocessor-based timing system.
RCA ICAN-6677 (9pp)

MICROPROCESSOR

Programming (cont)

1 **"Starplex's "Submit Utility" Speeds Program Development"**
(Starplex)
Illustrates how the Submit utility program increases programming speed and accuracy.
National Semiconductor SB SPX-AP-8 (7pp)

2 **"The Z80 Family Program Interrupt Structure"**
(Z80)
Describes the Z80 interrupt structure, which includes one non-maskable and three software maskable interrupt modes. Provides flow charts, timing diagrams, and circuit diagrams.
Zilog (31pp)

3 **"Using the Z80 SIO with SDLC"**
(Z80)
Covers the use of the Z80 SIO with synchronous data-link control communication protocol.
Zilog (12pp)

4 **"Z80 Family Interrupt Structure"**
(Z80)
Describes the Z80 CPU interrupt process and evaluates the design of the daisy-chain interrupt scheme.
Zilog (12pp)

5 **"μPD379 Application Note"**
(uPD379)
Bisync and SDLC protocols using the μPD379.
NEC Microcomputers $1 (20pp)

Systems

6 **"6500 Hardware Manual"**
(MCS6500 Series)
Describes the hardware aspects of the 6500 microprocessor family and related support devices.
Commodore Semiconductor Group

7 **"A Guide to the Selection of Support Components for the Series 3000 Microprocessor"**
(N3001, N3002)
Categorizes the various components used to implement major sections of a typical microprocessor system.
Signetics AM-1 (4pp)

8 **"A Microprogrammed 16-Bit Computer"**
(AM2901, AM2902, AM2914, AM2913, AM29705)
Presents computer design starting with the specification of a computer from a functional standpoint. Describes architectural units including the ALU, the Program Control Unit, and memory.
Advanced Micro Devices $5.00 (47pp)

9 **"A Minimal S6802/S6846 Systems Design"**
(S6802, S6846)
Presents a minimal prototyping system design using the devices.
American Microsystems AN-79-68-02 (3pp)

Systems (cont)

"A PROM Programmer for the SC/MP LCDS"
See listing under (Memory) PROMs (National)

10 **"A Simple High Speed Bipolar Microprocessor Illustrates System Design and Microprogram Techniques"**
(MC10801, MC10803)
Describes a complete bipolar LSI systems design using 10 ICs to perform 2's complement add, subtract, multiply and divide.
Motorola AN-774 (12pp)

11 **"A User's Guide to the Series 3000 Microprocessor Chip Set"**
(N3001, N3002)
Describes devices, instruction sets. Design examples included.
Signetics AM-2 (14pp)

12 **"AM2914 Priority Interrupt Encoder"**
(AM2913, AM2914, AM2900, 9080A)
Provides data sheet information on devices. Outlines construction of a microprogrammable, bipolar, LSI interrupt structure for the 2900 and 9080A processors using the 2914.
Advanced Micro Devices (33pp)

13 **"AM9513 System Timing Controller"**
(AM9513)
Provides detailed functional description of device. Examines command set, device interfacing, and control elements. Includes block and timing diagrams.
Advanced Micro Devices (16pp)

14 **"An Emulation of the AM9080A: An example of a Microprogrammed Machine"**
(AM2901A, AM2909, 9080A)
Describes the emulation of an 8-bit μP built around four 4-bit slices and three microprogrammed sequences. Provides instruction set and clock cycle tables, block diagrams, a parts list, schematics, a printout of the microprogram definition, and a print out of the assembler statements and object code in an interleaved format.
Advanced Micro Devices $4 (47pp)

15 **"An M6800 Clock System That Handles DMA and Memory Refresh Cycle Stealing"**
(MC6800, MC6875)
Presents a method for stealing cycles from the MPU for DMA transfers, refreshing memory through cycle stealing, and also providing refresh to an MC6800 dynamic MPU after each cycle stolen. Block diagrams included.
Motorola AN-787 (6pp)

16 **"Analog Input/Output for Microprocessors Made Easy"**
(MP10, MP11, MP20, MP21)
Outlines features of devices and describes various ways each can be handwired to suit user configurations. Includes block diagrams of hookups with SC/MP, Z80, F8, 6800, 8080, 8085 and 9002 MPUs as well as discussion of memory mapped vs. accumulator I/O.
Burr Brown AN-87 (6pp)

© IC MASTER

MICROPROCESSOR

Systems (cont)

1 **"Application Memo to Control Store Sequencer 8X02"**
(8X02)
Presents a functional description and gives microprogramming system suggestions.
Signetics Bipolar Application Memo 3 (7pp)

2 **"Application Technique for the 2651 PCI"**
(2651)
Shows application techniques for the 2651 programmable communications interface.
Signetics M26 (2pp)

3 **"Basic Microprocessors and the 6800"**
(MC6800)
Introduces microprocessor basics and the M6800 microcomputer system including details of the hardware addressing modes, system configuration, and instruction set. Supplies programming examples complete with flow charts, source program, and assembled output.
Motorola $12.90 (272pp)

4 **"Bit-Slice Microprocessor Design Takes a Giant Step Forward with "Scottky-Coupled-Logic" Circuits"**
(IDM2900)
Covers a four-bit slice Schottky-coupled-logic design that combines the flexibility of the industry standard 2900 microprocessor architecture with advanced LSI processing.
National Semiconductor AN-203 (12pp)

5 **"CDP1802-Based Designs Using the 8283 Programmable Counter/Timer"**
(CDP1802)
Describes methods by which the 8283 programmable counter/timer can be incorporated in RCA COSMAC-based microprocessor systems (CDP1802)
RCA ICAN-6693 (4pp)

6 **"Cassette Tape I/O for COSMAC Microprocessor Systems"**
(CDP18S020, CDP18S024, CDP18S025, CDP18S005, CDP18S007, CDP18S691)
Describes circuit and software for adding cassette-tape I/O to the COSMAC evaluation kit and development system, or the Microboard prototyping kit.
RCA ICAN-6934 (4pp)

7 **"Clock-Hold Schemes for the IMP Microprocessor Family"**
(IMP-8C, IMP-16C)
Presents scheme to extend the clock-hold function for additional periods of the main system clock, using the DM8570 shift register.
National AN-105 (4pp)

8 **"Considerations for Interfacing the μPD765 to the CDC9404B and 9406-2, -3 Flexible Disc Drives"**
(uPD765)
Describes design procedures for connecting CDC flexible disk drives to the μPD765 with emphasis on phase lock loop.
NEC Microcomputers AN10 (14pp)

"Data Acquisition System Interface to Computers"
See listing under (Interface) Converters (National)

Systems (cont)

9 **"Design of Clock Generators for Use with RCA COSMAC Microprocessor"**
(CDP1802)
Describes a crystal controlled clock generator using on-chip circuits and crystal and RC generators using external circuits.
RCA ICAN-6565

"Device Operation and System Implementation of the Asynchronous Communications Interface Adapter MC6850"
See listing under (Interface) Data Transmission (Motorola)

10 **"Fine Tuning the ALU Carry Path"**
(DM74S182)
Provides a look at higher speed look-ahead carry techniques. Covers four basic methods (ripple carry, single level, multilevel, shifted) and examines factors affecting choice of technique.
National AN-230 (7pp)

11 **"Floppy Disk Controller"**
(8X330)
Describes hardware and software of a floppy-disk controller design that demonstrates the capabilities of the 8X330 floppy disk formatter/controller.
Signetics

12 **"General Purpose Interface Adapter"**
(S68488)
Defines limitations and characteristics of a general-purpose interface adapter and discusses software considerations for interfacing with the IEEE488-1978 standard instrument bus.
American Microsystems Inc. (3pp)

13 **"Generating Non-Standard Baud Rates with R6551"**
(R6551)
Describes how the R6551 can be used to generate baud rates other than 15 selectable ones specified for the device.
Rockwell Document No. 6500 No. 3 (2pp)

14 **"IDM2901A File Expansion Using the DM85S68"**
(DM85S68, IDM2901A)
Discusses file expansion for the μP using a register array.
National Memory Applications Handbook (1pp)

15 **"IMP-16L DMA—What It Is and How to Use It"**
(IMP-16)
Discusses general theory of the DMA Bus, gives examples of priority expansion and data transfer.
National AN-135 (6pp)

16 **"Increasing the Number of Control Flags and Jump Conditions in the IMP-16C"**
(IMP-16C)
Describes simple and economical method of increasing the number of testable jump conditions and the number of control flags on the IMP-16C microprocessor.
National AN-101 (4pp)

17 **"Interface Techniques for the 2651 PCI"**
(2651)
Covers interfacing the 2652 programmable communications interface with the SC/MP, Z80, 8085, and 6800 microprocessors.
Signetics M22 (8pp)

MICROPROCESSOR

Systems (cont)

1 **"Interfacing 16 Pin Dynamic RAMs to the Z80A Microprocessor"**
(Z80)
Presents the major design considerations, and a design example, for interfacing 16-pin dynamic RAMs, both 4k and 16k to the Z80 and Z80A. Supplies circuit and timing diagrams.
Zilog (27pp)

2 **"Interfacing R6500 Microprocessors to a Floppy Disk Controller"**
(R6500, FDC1781, FDC1791)
Describes the interface between an R6500 μP and a floppy disk controller. Outlines timing considerations and provides a block diagram.
Rockwell Document No. R6500 No. 9 (2pp)

3 **"Low Cost Crystal Oscillator for Clock Input"**
(R6500)
Describes a low cost oscillator circuit which produces the baud input frequency required by the clock generator circuits in the R650X series microcomputers. The circuit uses one of two readily available low cost crystals. Circuit diagram.
Rockwell Document No. 1 (1pp)

4 **"M6800 Systems Utilizing the MC6875 Clock Generator/Drive"**
(MC6875)
Gives extensive design examples using the MC6875 in systems including slow or dynamic memories, and DMA (multiprocessor) applications.
Motorola AN-775 (20pp)

5 **"MC6801/03 Port Expansion"**
(SN74LS374, MC6821, SN74LS163, SN74LS154, SN74LS175, SN74LS377, SN74LS165)
Shows various methods for expanding I/O capability of the MC6801/03 microcomputers using various peripheral chips.
Motorola AN-797 (8pp)

6 **"MCS-51 Microcomputer User's Manual"**
(8051, 8751, 8031)
Describes system architecture, instruction set and software; includes applications examples and data sheets.
Intel (448pp) $7.50

7 **"MCS-85 User's Manual"**
(8085, MCS-85)
Describes this 8085 based system and peripheral components. Extensive coverage through data sheets.
Intel $5.00 (273pp)

8 **"MN1400 Series 4-Bit One-Chip Microcomputers User's Manual"**
(MN1400, MN1402, MN1498, MN1499)
Introduces the MN1400 family. Encompasses system architecture, timing, and the instruction set including examples of various commands and routines.
Panasonic (65pp)

9 **"Microcomputer Applications Handbook"**
Provides application hardware and software information for the entire microcontroller line, which includes both the MCS-48 and the MCS-51 families.
Intel $7.50

Systems (cont)

10 **"Microprocessor Systems Handbook"**
Explains μP hardware, the interaction of hardware and software, and the interfacing of μP's with A/D and D/A converters. Topics covered include memory addressing, I/O operations, and applications of various microprocessors.
Analog Devices $9.50 (218pp)

11 **"Minimum System Design TMS 9900 16-Bit Microprocessor"**
(TMS9900)
Explains system design, system performance, and minimum system configuration.
Texas Instruments Application Report CA-184A (7pp)

12 **"Minimum System Design with the S9900 16-bit Microprocessor"**
(S9900)
Describes device and basic system configuration. Includes timing and block diagrams.
American Microsystems AN-79-99-02 (6pp)

13 **"N8080 System Design Manual"**
(INS8080A, DP8212, DP8216, DP8224, DP8226, DP8228, DP8238, INS8251, INS8255)
Describes the INS8080A μP including architecture, timing, data and instruction representation, and I/O operation and control. Also covers use of various support chips.
National $5.00 (72pp)

14 **"Number Cruncher (MM57109) Interface to Microprocessor"**
(MM57109)
Describes the MM57109 number cruncher unit which can perform most arithmetic functions found in complex hand-held calculators and interfaces either to a microprocessor or a random logic system. Provides schematics of interface logic and a flow chart for initialization of the device.
National AN-186 (10pp)

15 **"Optimizing Hardware/Software Trade-Offs in RCA CDP1802 Microprocessor Applications"**
(CDP1802)
Presents examples of processor interfaces that minimize external hardware and through programming techniques, minimize speed requirements on the CPU.
RCA ICAN-6704 (10pp)

16 **"PIC1650 8 Bit A to D Example Program"**
(PIC1650)
Provides diagram, flowchart, and example program for an A/D converter system using the device.
General Instrument Bulletin 1001 (3pp)

17 **"PPS-4/1 Prototyping with 2708 PROMs"**
(2708, PPS-4/1, MM76, MM77, MM78)
Outlines circuit design and programming considerations needed to build a system prototyping unit using members of the PPS-4/1 family and 2708 PROM.
Rockwell Document No. 29410 No. 22 (2pp)

18 **"Power-On Reset/Run Circuits for the RCA CDP1802 COSMAC Microprocessor"**
Provides diagrams and discussion of several circuits which enable a power-on reset/run capability for the device.
RCA ICAN-6581 (2pp)

Systems (cont)

1 **"Product Capabilities Manual"**
(8X300)
Describes the capabilities of the 8X300 microcontroller family in high-speed applications, including computer peripherals, industrial controllers and telecommunications.
Signetics

2 **"R6500/R6532 Timer Interrupt Precautions"**
(R6500, R6532)
Discusses solutions to a timer interrupt problem that could occur when using the R6502 and R6532.
Rockwell Document No. R6500 No. 2 (2pp)

3 **"R650X Clock Stretching for Use with Slower Peripherals"**
(R6500)
Discusses a clock stretching scheme that allows slower peripheral devices to operate with the R650X microprocessors. Includes schematic and timing diagrams.
Rockwell Document No. R6500 No. 7 (2pp)

4 **"R6531 Address Lines for Contiguous ROM"**
(R6502, R6531)
Describes an 8-bit μC system using seven R6531's (ROM-RAM-I/O-Counter) and a single R6502. The ROMs are designed to be a contiguous block extending from highest address down. Supplies diagrams and table for address line selection.
Rockwell Document No. R6500 No. 6 (2pp)

5 **"Register-Based Output Functions for RCA COSMAC Microprocessors"**
(CDP1802, CDP1852)
Describes circuits using the CDP1852 I/O port for outputting information from any of the 16 general purpose scratch pad registers of the CDP 1802 microprocessor.
RCA ICAN-6562

6 **"S2000 Family Extended Memory Implementation"**
(S2000)
Shows four method for connecting external memory to members of the S2000 single-chip microcomputer family.
American Microsystems AN-79-2K-01 (3pp)

7 **"SYSTEM 65 to AIM 65 Interface"**
(R6500)
Outlines method of interfacing SYSTEM 65 to AIM 65 using the TTY serial port each has. Diagram and detailed procedure included.
Rockwell Document No. 6500 No. 4 (1pp)

8 **"Single Chip Multiprocessor Arbiter"**
Describes use of Signetics' Field Programmable Logic Sequencer to provide a convenient and cost effective means for implementing a synchronous arbiter, to control system communication with peripherals, by a single chip.
Signetics AN-007 (8pp)

9 **"Software Conversion of Analog Outputs to Analog Inputs"**
(MP10, MP11)
Discusses using the devices as an analog input system with diagrams illustrating hookups to the 6800 and 8080. Includes software program for each processor as well.
Burr Brown AN-88 (4pp)

Systems (cont)

10 **"Software Design for Microprocessors"**
(SBP0400, TMS1000, TMS5501, TMS8080, TMS9900)
Presents basic microprocessor fundamentals. Includes such topics as basic terms, basic machine architecture, instruction sets, and programming. Sample design problems are examined.
Texas Instruments $12.50 (385pp)

11 **"Special Communications Protocol for Multiple PPS-4/1 Systems"**
(PPS-4/1)
Details a communications protocol that can be implemented between two PPS-4/1 microprocessors using only five interface lines.
Rockwell Document No. 29410 No. 21 (2pp)

12 **"Static Memory Systems Utilizing the HM-6100"**
(HM6100)
Describes CMOS, nonvolatile CMOS and NMOS memory systems.
Harris Semiconductor AN-HM004 (7pp)

13 **"TIM Manual"**
(MCS6530)
Describes the program contained in the ROM portion of the 6530-004.
Commodore Semiconductor Group

14 **"TMS 5501 I/O in TMS 8080A μP Systems"**
(TMS5501, TMS8080A)
Describes operation and use of this input/output controller.
Texas Instruments Application Report CA-185A (18pp)

15 **"TMS9900 Family System Design Manual"**
(TMS9900)
Covers the general operation of TI's TMS9900 16-bit family of microprocessors and peripheral support devices.
Texas Instruments Application Report MP702 (120pp)

16 **"The 8080A/9080A MOS Microprocessor Handbook"**
(8080A, 9080A, 8212, 8255, 9555, 8251, 9551)
Provides descriptions of the 9080A CPU and the associated clock generator and system controllers. Supplies data sheet information on various I/O interfaces, support circuits, and memories. An application section covers clock generation, memory system design, timing, interrupts, and multiplication.
Advanced Micro Devices, $7.95 (280pp)

17 **"The AM9511 Arithmetic Processing Unit"**
(AM9511)
Discusses device features and command set. Outlines algorithm and error that can be expected from its use.
Advanced Micro Devices (21pp)

18 **"The AM9517 Multimode Direct Memory Access Controller"**
(AM9517)
Provides device overview and discussion of interfacing device to the system. Include block diagram of sample system and software listings.
Advanced Micro Device (20pp)

19 **"The AM9519 Universal Interrupt Controller"**
(AM9519)
Discusses basic interrupt procedure and device features. Examines hardware interface, operation procedures, command descriptions and system interface as they relate to use of the device.
Advanced Micro Devices (17pp)

MICROPROCESSOR

Systems (cont)

1 **"The ICL7104: A Binary Output A/D Converter for μ Processors"**
(ICL7104, ICL8052)
Describes designing with this 2 device A/D converter in detail. Discusses interfacing with and without handshakes, performance enhancement, and external auto-zero. Includes schematics, block diagrams, and graphs.
Intersil Application Bulletin A030 (14pp)

2 **"The M10800 MECL LSI Processor Family—Three Descriptive Articles"**
(MC10800, MC6800)
Presents three articles about the device: "Get the Best Microprocessor Performance"; "The MSP: GTE Sylvania's Microsignal Processor"; "M10800 Microprogrammed Demonstrator". The first examines features of the processor; the second discusses a customer application; and the third describes a demonstrator treated as a peripheral to the M6800 system.
Motorola AN-776 (21pp)

3 **"Understanding and Using the CDP1855 Multiply/Divide Unit"**
(CDP1855)
Shows how the use of hardware can eliminate complex and slow software routines for performing arithmetic and signal-processing algorithms in 8-bit microprocessor systems.
RCA ICAN-6970 (11pp)

4 **"Use of CMOS RAM CDP1824 with RCA Microprocessor Evaluation Kit CDP18S020"**
(CDP1824)
Describes the CDP1824 and its application in the CDP18S020 Evaluation Kit, and presents examples of how the CDP1824 can be combined with the CDP1831 ROM to form efficient ROM-RAM systems.
RCA ICAN-6537 (4pp)

5 **"Use of CMOS ROMs CDP1831 and CDP1832 With the RCA Microprocessor Evaluation Kit CDP18S020"**
(CDP1831, CDP1832)
Describes the operation and design of CDP1831- and CDP1832-based read-only memory systems in the CDP18S020 Evaluation Kit.
RCA ICAN-6536 (4pp)

6 **"Use of CMOS-SOS RAM CDP1822 with RCA Microprocessor Evaluation Kit CDP18S020"**
(CDP1822)
Describes the CDP1822, its operation, and its application in the CDP18S020 Evaluation Kit.
RCA ICAN-6539 (4pp)

7 **"Use of the CDP1856 and CDP1857 Buffer/Separator in CDP1802 Microprocessor Systems"**
(CDP1802, CDP1856, CDP1857)
Describes use of the CDP1856 and CDP1857 four-bit buffers or separators in the CDP18S020 Evaluation Kit and CDP18C024 E-K/Assembled-Editor Design Kit. Includes functional diagrams.
RCA ICAN-6657 (4pp)

Systems (cont)

8 **"User Manual for the CDP1802 COSMAC Microprocessor"**
(CDP1802)
Describes the device architecture and its instruction set with examples of each command. Reviews basic programming techniques and supplies timing diagrams.
RCA MPM-201B $5.00 (115pp)

9 **"User's Manual for 8X305 Controller"**
(8X305)
Provides hardware/software details pertaining to the 8X305 microprocessor and its family of supportive parts with emphasis on timing, programming and system interface.
Signetics

10 **"Using Low-Cost 1 MHz Peripherals in a 2 MHz System with the MC68B09 and the MC68B09E"**
(MC68B09, MC68B09E)
Discusses how to minimize system cost by manipulating 2 MHz MPU access time to accommodate slower peripherals and memories.
Motorola Semiconductor AN-836 (7pp)

11 **"Using NSC-800 & 8085 ISE as Automatic Test Equipment"**
(Starplex)
Discusses techniques for using a microprocessor development system and in-circuit emulators for functional tests on production systems.
National Semiconductor SA SPX-AP-7 (16pp)

12 **"Using the 2651 with BISYNC"**
(2651)
Details how the 2651 PCI supports IBM's Binary Synchronous Communications protocol.
Signetics M24 (4pp)

13 **"Using the COSMAC Microboard Battery-Backup RAM, CDP18S622"**
(CDP18S622)
Describes circuits, operation and application of an 8-kbyte, CMOS RAM board with on-board rechargeable batteries.
RCA ICAN-6955 (5pp)

14 **"Z80 Interfacing Techniques for Dynamic RAM"**
(Z80, MK4027, MK4116)
Provides specific examples of interfacing 16-pin dynamic memories to the Z80 microprocessor. Includes timing diagrams and refresh information.
Mostek

15 **"μCOM-43 Single Chip Microcomputer Users' Manual"**
(uCOM-43)
Describes device architecture and specifications. Includes timing diagrams.
NEC Microcomputers (48pp)

16 **"μCOM-44 Single Chip Microcomputer Users' Manual"**
(uCOM-44)
Describes device architecture and specifications. Includes timing diagrams.
NEC Microcomputers (40pp)

17 **"μCOM-45 Single Chip Microcomputer Users' Manual"**
(uCOM-45)
Describes device architecture and specifications. Includes timing diagrams.
NEC Microcomputers (36pp)

©IC MASTER

MICROPROCESSOR

Systems (cont)

1 **"μPD371 Magnetic Tape Cassette/Cartridge Controller Users Manual"**
(uPD371)
Gives description, timing and circuit diagrams. Assembly language listing for use with NEC's 8080A.
NEC Microcomputers $10.00 (58pp)

2 **"μPD372 Mini-Floppy Disk Controller Users Manual"**
(uPD372)
Supplements the Floppy Disk Manual for Mini-Floppy applications.
NEC Microcomputers $10.00 (44pp)

MICROCOMPUTER BOARDS

Applications

1 **"A Microcomputer Industrial Control Interface Using I/O Modules"**
(TM990)
Describes Industrial Control Systems with TM990 Microcomputer Modules and 5MT ac/dc Input/Output Modules.
Texas Instruments Application Report MP 716 (20pp)

2 **"Designing Floppy Disk Systems (and a Sample CP/M Implementation)"**
(BLC-8221, BLC-8222)
Reviews theory of floppy-disk operation and describes how to use a floppy-disk drive with intelligent controller boards.
National Semiconductor SA4-8221/22 (54pp)

3 **"Designing With Memory-Mapped Video Cards"**
Describes the principles involved in designing both hardware and software around the Color-Master Programmable Color Graphics Card, including screen dimensioning, Cursor and Highlighting Control, and custom character sets.
MicroDaSys $25.00 (100pp)

4 **"I/O Application Manual"**
(8P2SM, 4P4S)
Discusses the hardware capabilities of the 8P2SM and 4P4S I/O cards with emphasis on interface to user software. Software test routines are included.
MicroDaSys $25.00 (100pp)

5 **"Introduction to Microprocessors"**
(TM990/u89)
This microprocessor textbook, based on the TM990/u89 University Board, provides an introduction to microcomputers and assembly language programming. Includes many program examples illustrating instructions, programming techniques, and I/O interfacing.
Texas Instruments (MPB30 Rev.*) $19.95 (570pp)

6 **"KIM-1 Microcomputer Model User Manual"**
(KIM-1)
Describes start-up and operating procedures for the KIM-1 Microcomputer Module. Discusses system hardware, system expansion and gives an example of a typical application program.
Commodore (138pp)

7 **"Keyboard Scan Routine for Use with the RCA COSMAC Microterminal CDP18S021"**
(CPD18S021)
Contains the code for a keyboard reading routine which makes the Microterminal useful as a general purpose input as well as output device.
RCA ICAN-6611 (4pp)

8 **"Large System Design With Low Board Count"**
Designing a CP/M based Z-80 system with only two S100 cards is covered in this application manual. The system uses the Super-Z CPU board, which combines Parallel and Serial I/O with 64K of RAM and 2K of PROM on a Z-80 processor card. This board and a Disk Controller form a complete CP/M system.
MicroDaSys $25.00 (100pp)

Applications (cont)

9 **"MD-690A Application Manual"**
(MD-690a, MD-690b)
Details features and capabilities of the MD690a and MD690b S100 based CPU boards. Includes software and hardware applications information for these 6802/6809 processor cards. Monitor listing included to facilitate custom software development.
MicroDaSys $25.00 (100pp)

10 **"MLZ-80 Multi-Processor Feature"**
(MLZ-80)
Describes how to use bus control lines to obtain multiprocessor capability for the MLZ-80 board.
Heurikon Corporation (4pp)

11 **"MLZ-80 System Manual"**
(MLZ-80)
Describes system configuration, I/O device addresses, bus logic, bus timing and I/O connections.
Heurikon Corporation (24pp)

12 **"MLZ-80 and MLZ-81 Configuration Procedures"**
(MLZ-80, MLZ-81)
Outlines the steps required to configure the MLZ-80/81 cards for a particular application.
Heurikon (10pp)

13 **"MLZ-DAQ System Manual"**
(MLZ-DAQ)
Complete description and operating procedures for the MLZ-DAQ. Includes charts and instruction set map.
Heurikon Corporation (22pp)

14 **"Micro-12 User Manual"**
(HB61000-1)
A complete documentation package for the Micro-12 microprocessor system, this manual describes control panel operations, system organization, sample programs, and hardware/software applications.
Harris Semiconductor (204pp)

15 **"Microproducts Hardware Systems Reference"**
(MBC/1, MP100, 8562, 8563)
Describes the Microproducts MP/100 and MP/200 systems. Part I, a hardware systems reference, is designed for engineers and systems programmers. Part II, a troubleshooting guide, is intended for field service engineers.
Data General $25.00 (388pp)

16 **"Millie User Guide"**
(Super Z)
Complete guide to the hardware, software and use of the Millie, a CP/M system based upon the Super-Z single board computer and the Color Master video graphics board.
MicroDaSys $50.00 (200pp)

17 **"Reentrant Programming"**
(TM990)
Describes the use of reentrant software to eliminate the need for providing separate copies of common subroutines for concurrently executing tasks.
Texas Instruments (6pp)

© IC MASTER

MICROCOMPUTER BOARDS

Applications (cont)

1 **"SBC-100 Operations Manual"**
(SBC-100)
Provides product description and details its operation.
SD Systems (38pp)

2 **"Scout Naked Mini 4/04"**
Describes the Scout Computer System incorporating the Naked Mini 4/04 processor. Discusses the basic machine, I/O and peripheral devices, and system software.
Computer Automation (272pp)

3 **"Software Development Using TM990/302 SDB and TIMBER"**
(TM990)
Covers the development of TM990 Series software with a TM990/302 Software Development Module, and TIMBER, a ROM-based executive program.
Texas Instruments Applications Report MP712 (92pp)

4 **"TM990 Analog Modules Applications Report"**
(TM990)
Describes the general operation of the TM990 Serial Analog modules and the software necessary for control.
Texas Instruments Applications Report MP714 (54pp)

5 **"TM990 Microcomputer Handbook"**
(TM990)
Describes the technical features of the TM990 product line. In addition to CPU, Memory and I/O Interface Modules, the book discusses software products, development systems, the TM99 System Bus, and customer support services.
Texas Instruments (207pp)

6 **"TM990/101M EIA Communications Link"**
(TM990)
Describes the development of a software communications link between the TM990 board, a host computer, and an EIA RS232 interface for software development.
Texas Instruments Applications Report MP705 (52pp)

7 **"Technical Notes on Modification, Expansion, and Various Applications of the SYM-1"**
(SYM-1)
Explains how to expand the number of general purpose I/O lines in the SYM-1.
Synertek Systems TNP-1 $3.00 (60pp)

INTERFACE

Converters

1 "3 IC 8-Bit Binary Digital to Process Current Converter with 4-20 mA Output"
(REF-01, DAC-08, OP-14)
Delineates the construction of a process current converter operating from −5v and 23v supplies. Complete theory of operation followed by calibration procedures and a detailed parts list are included.
Precision Monolithics AN-21 (2pp)

2 "A Cookbook Approach to High Speed Data Acquisition and Microprocessor Interfacing"
Shows how to design a complete data acquisition board with multiplexers, programmable gain amplifiers, track and hold, A/D converter, D/A converter, address decoding, read and write timing and interfacing to a microprocessor bus.
Intersil A020 (20pp)

3 "A Digital Multimeter That Measures Frequency Using the 9400 F/V Converter"
(9400)
Shows how to add frequency measurement capability to a low-cost standard DMM by adding an external circuit consisting of a F/V converter, resistors and capacitors.
Teledyne Semiconductor AN-14 (2pp)

4 "A Low Cost, Easy-to-Build Successive Approximation Analog-to-Digital Converter"
(DAC-100, CMP-01)
General discussion of feedback A/D converters. Operation of A/D converter capable of 8-bit conversions in 6 μs. The system is expandable to 10-bit resolution. It uses DAC-100, CMP-01, and a successive approximation register.
Precision Monolithics AN-11 (8pp)

5 "A Low Cost, High-Performance Tracking A/D Converter"
(DAC-100, CMP-01)
Basic operation of 8-bit tracking converter that uses DAC-100 series 10-bit D/A converter, CMP-01 series comparator, and 4-bit MSI up/down counters.
Precision Monolithics AN-6 (8pp)

6 "AD DAC80 Reliability Predictions"
(ADDAC80)
Describes model for calculating predicted failure rate of hybrid circuits per MIL-HDBK-217B and corresponding performance data for device.
Analog Devices (1pp)

7 "AD DAC85 Reliability Predictions"
(ADDAC85)
Presents model for calculating predicted failure rate of hybrid circuits per MIL-HDBK-217B and corresponding device data.
Analog Devices (1pp)

8 "Am6012 12-Bit High-Speed DAC"
(Am6012)
Describes characteristics of a 12-bit DAC and discusses various modes of operations and microprocessor interface considerations.
Advanced Micro Devices LIC-165 (12pp)

Converters (cont)

9 "An Introduction to the Sampling Theorem"
Analyzes the sampling theorem and pitfalls encountered in its application to signal processing systems. Hardware implementation includes discussion of antialiasing filters, S/H circuits and D/A converters.
National Semiconductor AN236 (12pp)

10 "Analog-Digital Conversion Notes"
Covers many aspects of A/D and D/A converters including use, testing and specifying. Extensive applications information includes data systems, acquisition, distribution, communication.
Analog Devices $5.95 (254pp)

11 "Analog-to-Digital Conversion Techniques"
Discusses open-loop and feedback techniques: frequency, pulse width, cascade, ramp, counter, successive approximation, multiple comparison subranging, nonlinear conversion, double and triple ramp conversion.
Motorola AN-471 (21pp)

"Analog-to-Digital Conversion Techniques with the M6800 Microprocessor System"
See listing under (Microprocessor) Systems (Motorola)

12 "Analog-to-Digital Cyclic Converter"
(MC1456)
Discusses circuits and operation of medium speed-medium accuracy converter that uses successive approximation technique in which unknown analog input voltage is successively compared to reference voltage to determine each bit of digital output. A comparison of gray and binary code operation and an error analysis are provided.
Motorola AN-557 (10pp)

13 "Application Circuits of μPC603D, 610D"
(μPC603, μPC610)
Discusses functions and operating principles of each device as well as applications including a digitally programmable power source and a waveform generator.
NEC Electron IEP-543 (24pp)

14 "Application Information for μPC614D"
(μPC614)
Provides application hints and parameters for a pulse width modulation converter in a digital multimeter application.
NEC Electron (6pp)

15 "Applications for the 9400 Voltage to Frequency/ Frequency to Voltage Converter"
(9400)
Contains 25 block diagrams of applications in which the device is used.
Teledyne Semiconductor AN-10 (8pp)

"Applications of a Monolithic Sample-and-Hold/Gated Operational Amplifier"
See (Linear) Amplifiers, Operational (Harris)

© IC MASTER

INTERFACE

Converters (cont)

1 **"Applications of the 8700 Series A/D Converters"**
(8700)
Supplies diagrams showing interface to autoranging circuits, to gas discharge displays, and to two independent displays, operated from one A/D.
Teledyne Semiconductor AN-9 (16pp)

2 **"Applications of the AD537 IC Voltage-to-Frequency Converter"**
(AD537)
Describes device theory and operation. Presents various applications including strain-gauge input, position transducers, and a photodiode input. Block diagrams are provided.
Analog Devies (20pp)

"Applications of the MC1405/MC14435 in Digital Meters"
See listing under (Linear) Instrumentation (Motorola)

3 **"Applications of the ZN425E 8-Bit A-D/D-A Converter"**
(ZN425)
Covers converter definitions, calibration, bipolar operation. Applications: ramp generation, peak detect, channel selection, weighing system, bargraph drive, multiply/divide, and function generation.
Ferranti (31pp)

4 **"Audio Applications for the DAC-76 Companding Converter"**
(DAC-76)
Discusses the multiplying and control characteristics of the DAC-76 in audio applications. High performance digitally-controlled attenuators are featured.
Precision Monolithics AN-28 (8pp)

5 **"Autoranging Digital Multimeter Using the MC14433 CMOS A/D Converter"**
(MC14433)
Describes using the MC14433 A/D converter to build an autorange digital multimeter. The multimeter includes ac and dc voltage ranges from 200mV to 200V, ac and dc current from 2mA to 2A full scale, and resistance ranges from 2 kilohms to 2 megohms full scale.
Motorola AN-769 (5pp)

6 **"Binary D/A Converters Can Provide BCD-Coded Conversion"**
(MC1408, MC1508)
Describes the MC1508 D/A converter used as a 2 or 2½ digit BCD converter. Describes application in a 2½ digit digital voltmeter.
Motorola AN-713 (4pp)

7 **"Build a Low Cost Data Acquisition System with Standard DIPs"**
(MN7130)
Shows how a complete 12-bit, 16-channel data acquisition system can be built by adding a few standard ICs to the MN7130 multiplexed sample/hold amplifier.
Micro Networks AN201 (6pp)

8 **"CMOS A/D Converter Chips Easily Interface to 8080A Microprocessor Systems"**
(ADC3511, ADC3711, INS8080A)
Outlines techniques for interfacing AID converter devices to 8080A μP systems. Includes description of A/D conversion, BCD output capability, flowcharts, schematics, and block diagrams.
National CMOS Databook AN-200 (9pp)

Converters (cont)

9 **"Circuit Applications for a 12-bit ECL DAC"**
(DAC63, MC10176, MC10176, MC10136, MC10101, MCM10149)
Compares operation of TL and ECL D/A converters with respect to data skew, ground currents, line driving and receiving capability; includes discussions on amplitude and phase synthesis and the use of an ECL DAC in a 12-bit, 250ns A/D converter.
Burr-Brown Research AN-105 (6pp)

10 **"Companding Digital-to-Analog Converter"**
(DAC-86, DAC-87)
Discusses how a companding digital-to-analog converter (DAC) is the key component in PCM CODEC Systems.
Precision Monolithics AN-39 (13pp)

11 **"Counter Type A to D Converter"**
(HI1080)
Circuit details of an A to D converter employing a unidirectional digital counter and the HI-1080 eight-bit D to A converter to generate a ramp voltage.
Harris Semiconductor AN-512 (3pp)

12 **"D/A Converter Differential Linearity Error-It Really Shows Up"**
Discusses differential linearity, the difference in analog output for a change between two successive digital input codes. Gives graphs of two examples with the same linearity specification.
Burr-Brown AN-58 (2pp)

13 **"D/A Converter Generates Hyperbolic Functions"**
(DAC-20)
Explains operating theory and design considerations of two IC hyperbolic function generator. Includes circuit diagrams.
Precision Monolithics AN-23 (3pp)

14 **"DAC-08 Applications Collection"**
(DAC-08)
Discusses the dual output, and high compliance. Covers use as a CRT display driver, bridge transducer control system, A/D converter, waveform generator, digital addition/subtraction with analog output, digital attenuator and microprocessor controlled A/D converter.
Precision Monolithics AN-17 (12pp)

15 **"DAC-08 Control of A 555 Timer IC"**
(DAC-08)
Describes a digitally or microprocessed controlled one-shot and an astable multivibrator using two of the low cost building blocks, the DAC-08 and the 555 timer. Digital control ranges of 255 to 1 and 510 to 1 are shown for one-shot and astable applications allowing periods of 18 μsec to 1.4 seconds and frequencies of 1 Hz to 60 kHz.
Precision Monolithics AN-36 (3pp)

16 **"Data Acquisition Handbook"**
(ICL7109, ICL7104, IH8510, ICL7103A, ICL8052A, HDAS-8, HDAS-16, ICH8500, ICL8007, ICL8043, ICL8048, ICL8049, ICL8013, ICL8211, ICL8212, IH5009, IH5025, IH5040, IH5009)
Comprehensive introduction to the principles of data acquisition and conversion, including a compilation of many technical articles published in industry trade journals. Contains detailed application information on D/A and A/D converters, data acquisition systems, samples/hold circuits, op amps, and V/F converters.
Intersil $5.00 (396pp)

INTERFACE

Converters (cont)

"Data Acquisition Networks with NMOS and CMOS"
See listing under (Microprocessors) Applications (Motorola)

1 **"Data Acquisition and Conversion Handbook"**
Discusses data acquisition/conversion principles. With Applications and glossary.
Datel-Intersil $4.95 (250pp)

2 **"Data Conversion Handbook"**
Defines the qualities, specifications, and techniques that combine to give D/A and A/D converters their special character. Also covers sample/hold amplifiers, multiplexers, and coding.
Hybrid Systems Free (175pp)

3 **"Data Conversion Interfacing with the 8080 Microprocessor"**
(8080)
Discusses Analog-to-Digital Conversion (ADC) and Digital-to-Analog Conversion (DAC) and their importance in input/output (I/O) control functions when interfacing with the 8080 Microprocessor. Describes low cost and system simplicity in the versatility of a DAC as it progresses from a μP output device to an ADC input function and finally to its use in a complete Data Acquisition System.
Precision Monolithics, Inc. AN-30 (12pp)

4 **"Data Conversion with Companding DAC Devices"**
Introduces companding principles and use of companding DACs in industrial and PCM transmission systems. Provides companding DAC circuit description and discussion of how μP based data acquisition systems, motion control, audio systems, and telecommunication systems.
Advanced Micro Devices (36pp)

5 **"Designing High Speed Data Acquisition Systems"**
Discusses the basics of data acquisition systems; focusing on A/D converters, sample-and-hold circuits, and multiplexer modules.
Teledyne Philbrick AN-21 (12pp)

6 **"Differential and Multiplying Digital-to-Analog Converter Applications"**
(DAC-08)
Describes use in 2-quadrant, 4-quadrant, 4-quadrant and AC-coupled multiplication. Also covers differential and ratiometric conversion, a nulling bridge circuit, a power monitor, and algebraic computation circuits with analog output.
Precision Monolithics An-19 (8pp)

7 **"Digital Voltmeters and the MM5330"**
(MM5330)
Describes basic counting techniques for building digital voltmeters and shows how the MM5330 can be used in a dual slope system.
National MOS/LSI Databook AN-155 (8pp)

8 **"Digital to Analog Converter High Speed DAC Family"**
(HI562, HI5608, HI5610)
Provides functional and operational diagrams plus descriptions of the devices.
Harris Semiconductor AN-523 (4pp)

Converters (cont)

9 **"Digital to Analog Converter Terminology"**
Explains need to D/A and terms used in specifying it.
Harris Semiconductor AN-522 (3pp)

10 **"Digital to Analog Converter: High Speed ADC Applications"**
Discusses tracking and successive-approximation a/d converter design. Presents a data acquisition system including block diagrams.
Harris Semiconductor AN-524 (3pp)

11 **"Digital-to-Analog Conversion Using the RCA CD4007A COS/MOS IC"**
(CD4007A)
Discusses resistance networks for DAC's and a voltage-follower amp for single-supply operation. Describes a 9-bit COS-MOS DAC.
RCA ICAN-6080 (6pp)

12 **"Digital-to-Analog Converter Applications"**
(HI1080, HI1085)
Operating modes and applications of HI-1080 converter, which features resistor ladder network and switching devices on same chip. Discusses cascaded D to A converter as well as up-down counter and successive approximation A to D converters.
Harris Semiconductor AN-511 (7pp)

13 **"Direct Bus Interfacing using the ZN427/ZN428"**
(ZN427, ZN428)
Describes how A/D and D/A converter chips are interfaced to most popular 8-bit microprocessors. Provides timing diagrams and electrical characteristics.
Ferranti Application Report 14 (9pp)

14 **"Do's and Don'ts of Applying A/D Converters"**
Examines topics concerning proper system design when using A/D converters. Subjects treated include ground loop errors, components, references, capacitive coupling, and thermal effects.
Intersil A018 (2pp)

15 **"Don't Forget D/A Converter Tempco"**
Discusses offset, gain and linearity drift with temperature.
Burr-Brown AN-59 (3pp)

16 **"Exponential Digitally Controlled Oscillator Using DAC-76"**
(DAC-76)
Depicts a 4-IC microprocessor-controlled oscillator with a 8159 to 1 frequency range covering 2.5 Hz to 20 kHz. The circuit uses an exponential current output D/A converter as a programmable current source.
Precision Monolithics AN-20 (3pp)

17 **"FX-209 AP Notes"**
(FX-209)
Describes use of the FX-209 delta modulation analog to digital converter as an AGC amplifier, audio delay line and as an audio scrambler.
Consumer Microcircuits of America (6pp)

© IC MASTER

INTERFACE

Converters (cont)

1 **"Function and Application of 3½ Digit A/D Converter Set"**
(LD110, LD111)
Describes the operation of the LD110 digital processor and the LD111 analog processor. Various DVM circuits are shown including circuits for ratio, current, ac voltage and frequency measurements. A detailed error analysis is provided.
Siliconix AN74-1 (12pp)

2 **"Function/Application of the LD122/LD121A ±4½ Digit A/D Converter Set in Measurement Systems"**
(LD122, LS121A)
Discusses differential measurement techniques, input buffer selection considerations, system layout, grounding methods and troubleshooting in thermocouple, resistance bridge and strain-gage measurement systems using an A/D converter set.
Siliconix AN80-8 (8pp)

3 **"High Speed Digital-to-Analog and Analog-to-Digital Techniques"**
Gives overview that includes voltage and current output D/A, parallel (flash), tracking, successive approximation, and parallel ripple A/Ds as well as nonsynchronous and synchronous VTF A/D. Glossary of terms.
Motorola AN-702 (14pp)

4 **"How to Specify and Test Voltage-to-Frequency and Frequency-to-Voltage Converters"**
Defines device parameters, specifications, and test techniques.
Teledyne Philbrick AN-22 (4pp)

5 **"IC F/V Converters Readily Handle Other Functions, Such as F/V, A/D"**
(RC4151, RM4151)
Describes use of the 4151 as an F/V converter, a V/F converter, and an FSK demodulator.
Raytheon Semiconductor Application Note (6pp)

6 **"Interfacing Precision Monolithics Digital-to-Analog Converters with CMOS Logic"**
(DAC-100, DAC-01)
Analyzes input circuits of these DACs and CMOS interfaces. Describes a complete 10-bit DAC and an 8-bit A/D.
Precision Monolithics AN-14 (4pp)

7 **"Interfacing the AD558 Dacport to Microprocessors"**
(AD558)
Examines considerations for interfacing an 8-bit DAC with the 8080A, 8085A, 8048/8758, 6800/650X and 1802 microprocessors. Example applications include ramp generation and software-controlled analog-to-digital conversion.
Analog Devices (6pp)

"Intrinsically Safe Data Acquisition"
See listing under (Digital) CMOS (Burr-Brown)

8 **"Introduction to Quantized Feedback"**
(LD111A, LD120, LD122, LD130, LD110, LD121A, LD114)
Describes propietary approach to A/D conversion using an analog processor and digital controller and with auto-polarity, auto-zero and ratiometric operation.
Siliconix AN81-2 (10pp)

Converters (cont)

9 **"Low Cost Four Channel DAC gives BCD or Binary Coding"**
(DAC-08, DAC-20)
Describes the construction of a four-channel digital-to-analog converter using four multiplying DACs, a precision quad op amp, a system IC voltage reference, and a DIP-packaged thin-film resistor network.
Precision Monolithics AN-26 (4pp)

10 **"Low Cost, High Speed Analog-to-Digital Conversion with the DAC-08"**
(DAC-08)
Discusses the successive approximation technique to A/D and describes three designs with conversion times of 1, 2, and 4 μsec.
Precision Monolithics AN-16 (7pp)

11 **"Methods for Generating Complex Waveforms and Vectors Using Multiplying D/A Converters"**
(AD7544)
Describes analog waveform synthesis using CMOS multiplying D/A converters, including staircase, triangle and sawtooth waveforms.
Analog Devices (6pp)

12 **"Microprocessor Interface Techniques as Applied to the Siliconix A/D Converter Family"**
(L121A, LD130)
Discusses cost and speed advantages of using A/D converters instead of a peripheral interface device for synchronous or asynchronous interface to a microprocessor.
Siliconix AN81-1 (4pp)

13 **"Microprocessor Interfacing Using the ZN427/ZN428 Data Converters"**
(ZN427, ZN428)
Demonstrates the design of an analog I/O system using A/D and D/A converters with 6800 and 8085A microprocessors. Includes circuit, timing and logic flow diagrams plus example programs.
Ferranti Application Notes 10, 11 and 12 (28pp)

14 **"Microprocessor Interfacing Using the ZN432 10-Bit ADC"**
(ZN432)
Describes a 10-bit A/D converter IC and techniques for interfacing with 8-bit microprocessors using a minimum of external discrete components and standard TTL logic elements.
Ferranti Electric AR-16 (9pp)

15 **"Power D/A Converters Using the IH8510"**
(IH8510, AH8520, IH8521, 7105, 7120)
Discusses the addition of a power amplifier to a D/A converter. Briefly describes use for motor control and programmable power supplies.
Intersil A021 (4pp)

16 **"Principles and Applications of the ICL7660 CMOS Voltage Converter"**
(ICL7660)
Describes operation and application of a monolithic voltage converter that provides a complementary voltage output of −1.5V to −10V with a +1.5V to +10V input.
Intersil A051 (8pp)

INTERFACE

Converters (cont)

1 **"Principles of Date Acquisition and Conversion"**
Discusses basic principles of analog to digital systems including sampling rate, aperture error, accuracy, resolution, throughput, and codes.
Burr-Brown AN-79 (5pp)

2 **"Remote Control Dual Range A/D Converter Using the 7106"**
(7106)
Discusses design of a remote-control, dual-range voltage-measuring circuit using a A/D converter-display driver chip.
Teledyne Semiconductor AN-13 (1pp)

3 **"Repetitive Mode Operation for Models 4109/4111 Integrating A/D Converters"**
(4109, 4111)
Runs through external trigger generator and sure start circuit schemes which are used when the devices must run without ceasing to convert.
Teledyne Philbrick AN-28 (2pp)

4 **"Selecting A/D Converters"**
Compares and contrasts successive approximation and integrating A/D conversion techniques with respect to speed, accuracy, and cost.
Intersil A016 (6pp)

5 **"Serial to Parallel Conversion"**
(MN502, MN5200, MN5210)
Covers timing consideratins in the conversion of A/D converter output from serial to parallel form.
Micro Networks AN-106 (2pp)

6 **"Software Controlled A/D Conversion Using DAC-08 and the 8080A Microprocessor"**
(DAC-08)
Describes software controlled, 8-bit A/D conversion using the DAC-08 and the 8080A. Subjects include I/O interface considerations, I/O control using memory mapping, and a successive approximation A/D conversion algorithm.
Precision Monolithics AN-22 (4pp)

7 **"Solve Your Measurement Problems"**
Discusses V/F and F/V converters and their use in data acquisition problems.
Teledyne Philbrick AN-20 (6pp)

8 **"Specifying and Testing Analog-to-Digital Converters"**
Defines the basic parameters, specifications, and test methods.
Teledyne Philbrick AN-24 (7pp)

9 **"Specifying and Testing Digital-to-Analog Converters"**
Defines basic parameters, specifications and test methods.
Teledyne Philbrick AN-25 (7pp)

10 **"Specifying and Testing Sample-Hold Amplifiers"**
Defines various sample-hold amplifier parameters and outlines methods of testing for them.
Teledyne Philbrick AN-30 (5pp)

11 **"Squeeze High Performance Out of Low-Cost Hybrid Data Converters"**
Lists ways in which converter performance can be improved by the addition of a few external components.
Burr-Brown AN-86 (4pp)

Converters (cont)

12 **"Static and Dynamic Testing of Digital-to-Analog Converters"**
Describes test procedures and equipment for measuring offset, full-scale, gain and linearity errors in DACs. Test equipment discussed ranges from DVMs to automatic testers.
Burr-Brown AN-99 (6pp)

13 **"Strobing the DAC-08 Under Logic Control"**
(DAC-08)
Gives connections for strobing the output of this DAC.
Precision Monolithics AB-1 (1pp)

14 **"Successive Approximation A/D Conversion"**
(MC1408, MC14559)
Describes advances in successive approximation techniques with emphasis on SARs (Successive Approximation Registers.) Shows both a normal and a high speed A/D using these methods.
Motorola AN-716 (8pp)

15 **"The 4151 Voltage to Frequency Converter"**
(RC4151, RM4151, RV4151)
Describes various uses of this v/f and f/v converter.
Raytheon Semiconductor Application Note (8pp)

16 **"The ICL7104—A Binary Output A/D Converter for μ Processors"**
(ICL7104, ICL8052, ICL8068)
Describes the operation of the ICL7104, and either the ICL8052 or ICL8068, as a dual-slope integrating converter.
Intersil A030 (14pp)

17 **"The Integrating A/D Converter"**
Discusses the dual slope technique with considerable attention to error analysis.
Intersil A017 (4pp)

18 **"The Multiplying DAC Application Guide"**
(AD7520, AD7521, AD7522, AS7523, AD7524, AD7525, AD7530, AD7531, AD7533, AD7541)
Discusses applications which take advantage of the MDAC's ability to accept AC or DC references, which can be of either polarity. Applications include digitally-controlled gain and attenuation circuits.
Analog Devices (40pp)

19 **"The OOP-17, OP-16, OP-15 as Output Amplifiers for High Speed D/A Converters"**
(DAC-08, DAC-20, DAC-76, OP-15, OP-16, OP-17)
Illustrates design of high speed, voltage output D/A converters using these devices. Circuit diagrams for high speed, low drift, and low power applications are provided.
Precision Monolithics AN-24 (3pp)

20 **"Tips for Using Single-Chip 3½ Digit A/D Converters"**
(ICL7106, ICL7116, ICL7107, ICL7117, ICL7126)
Provides answers to commonly asked questions regarding A/D converter application in display systems. Includes troubleshooting guide, normal waveforms and equations for component values.
Intersil A052 (8pp)

© IC MASTER

INTERFACE

Converters (cont)

1 **"Understanding the Auto-Zero and Common-Mode Performance of the ICL7103/7107/7109 Family"**
(ICL7106, ICL7107, ICL7109)
Shows how to avoid application problems with differential-input A/D converters having differential reference and separate analog and digital ground references.
Intersil Application Bulletin A032 (8pp)

2 **"V/F's and F/V's: Simple Solutions to Everyday Conversion Problems"**
Examines applications of V/F's and F/V's. Also demonstrates how accuracy can be improved with the addition of more components.
Teledyne Philbrick AN-32 (7pp)

3 **"Voltage Transients (Glitches)"**
(MN3008)
Discusses D/A converter analog voltage spikes appearing in the output following a change of input code.
Micro Networks AN-101 (2pp)

4 **"What Designers Should Know About Data-Converter Drift"**
Examines components of drift as they apply to A/D and D/A converters. Includes discussion of the effect of reference drift and computation of worst case error.
Burr-Brown AN-89 (4pp)

5 **"When Should a Sample Hold Amplifier be Used?"**
Covers the use of sample-hold amplifiers with A/D converters. Discusses use with dynamically changing signals and the droop rate of the sample-hold circuit.
Micro Networks AN-103 (2pp)

Data Transmission

6 **"2661 Operating Mode Switching Procedures"**
(2661)
Covers methods for switching the 2661 Enhanced Programmable Communications Interface from echoplex or remote loop-back mode to normal operation and vice versa.
Signetics AN-402 (1pp)

7 **"A 20-Mbaud Full Duplex Fiber Optic Data Link Using Fiber Optic Active Components"**
(SN74LS40B, MF0D4-02F, MC1733, MC75107)
Describes the design, construction, testing and performance of a TTL-compatible, optical data link. Includes schematic, parts list and printed circuit artwork.
Motorola AN-794 (28pp)

"A COS/MOS PCM Telemetry and Remote Data Acquisition Design"
See listing under (Digital) CMOS (RCA)

"A Typical Data-Gathering and Processing System Using CD4000A-Series COS/MOS Parts"
See listing under (Digital) CMOS (RCA)

Data Transmission (cont)

8 **"An Introduction to the Video Interface System (VIS) Devices - CDP1869 and CDP1870"**
(CDP1869, CDP1870, CDP18S020)
Describes circuit and software for mating a video-interface chip set to the CDP18S020 evaluation kit for assessing chip-set capability in the video portion of a CRT terminal.
RCA ICAN-6953 (11pp)

9 **"Asynchronous Receiver/Transmitter"**
(TR1602, TR1865)
General description of asynchronous transmission and operation of TR1602, which is capable of full or half duplex operation. Describes application in distributed computer networks.
Western Digital Application Report 1 (12pp)

10 **"Binary Synchronous Communications"**
(2661, 2653)
Covers procedures and hardware for implementing character-oriented and bit-oriented protocols in a data communications network.
Signetics TB-4001 (3pp)

11 **"Bussing with MECL 10,000 Integrated Circuits"**
(MC10111, MC10123)
Describes use of MECL 10,000 circuits in high speed data transmission systems with emphasis on transmission line construction and termination.
Motorola AN-726 (6pp)

12 **"Convolution: Digital Signal Processing"**
Discusses the Impulse function and its effect on linear systems in terms of the fundamental convolution theorem. Analytical and illustrative examples.
National Semiconductor AN237 (8pp)

13 **"Data Bus and Differential Line Drivers and Receivers"**
(DS7820, DS7830, DS7831, DS7832, DS7833, DS7834, DS7835, DS7836, DS7837, DS7838, DS7839, DS8820, DS8830, DS8831, DS8832, DS8833, DS8834, DS8835, DS8836, DS8837, DS8838, DS8839, DS1488, DS1489)
Includes schematics and describes the operation of these line drivers, receivers and transceivers.
National AN-83 (12pp)

14 **"Data Comm Async and Sync Transmission"**
(2661, 2652, 2681)
Reviews fundamental considerations and describes controller chips for implementing synchronous and asynchronous data transmission.
Signetics TB-4004 (3pp)

15 **"Data Comm Error Control"**
(2652, 2653, 2661)
Describes chip set for implementing error control at system protocol levels in data communication systems.
Signetics TB-4003 (3pp)

16 **"Data Comm Protocols"**
(2652, 2653, 2661)
Discusses procedures, conventions and hardware governing data transfer between data-processing machines.
Signetics TB-4000 (2pp)

ADVERTISERS INDEX

Advanced Micro Devices
Digital 601-617
Microprocessor 1201-1246
Microprocessor Development Systems 1701-1705
Microcomputer Boards 1901-1910
Interface 2601-2608
Linear 3101-3137
Memory 3601-3607
American Automation
Microprocessor Development Systems 1706
American Microsystems, Inc.
Digital 618
Microprocessor 1247-1252
Interface 2609-2611
Linear 3138-3150
Memory 3608-3614
Custom/Semicustom 4301-4308
Analog Devices
Linear 3151-3186
Arrow Electronics
357, 1720, 2300
Burr-Brown
1984
California Devices
Custom/Semicustom 4309
Computer Aided Engineering
Custom/Semicustom 4310
Creative Micro Systems
Microcomputer Boards 1911-1912
Cromemco
Microcomputer Boards 1913-1932
Custom MOS Arrays, Inc.
Custom/Semicustom 4311
Datel-Intersil
Microcomputer Boards 1933
Interface 2613-2623
Digelec
PROM Programmers 4101
Diplomat Electronics Corp.
Manufacturers and Distributors Directory
Emulogic
Microprocessor Development Systems 1708-1709
Exar Integrated Systems, Inc.
Linear 3187-3209
Custom/Semicustom 4312-4315
Fairchild
Digital 619-668
Microprocessor 1253-1304
Microprocessor Development Systems 1711-1718
Memory 3615-3666
Custom/Semicustom 4316-4317
Fujitsu America
Memory 3668-3671
Fujitsu Microelectronics
Microprocessor 1305-1308
Memory 3672-3681
Custom/Semicustom 4318-4320
General Instrument
Microprocessor 1309-1332
Memory 3683-3692
Harris Semiconductor
Digital 669-695
Microprocessor 1333-1344
Interface 2624-2742
Linear 3210-3291
Memory 3693-3788
Custom/Semicustom 4321-4430
Hilevel Technology
Microprocessor Development Systems 1719

© IC MASTER 1983

Hitachi America
Microprocessor 1345
Memory 3789
Holt, Inc.
Custom/Semicustom 4431
Hybrid Systems Corp.
Interface 2743-2748
Inmos Corp.
Memory 3790-3792
Integrated Device Technology
Memory 3793-3807
Intel
Microprocessor 1347-1350
Microprocessor Development Systems 1721-1728
Memory 3808-3825
Interdesign, Inc.
Custom/Semicustom 4433
International Microelectronic Products
Custom/Semicustom 4435
Kontron Electronics
PROM Programmers 4103
LSI Computer Systems, Inc.
Digital 696
Custom/Semicustom 4436
Micro Circuit Engineering
Custom/Semicustom 4437-4440
Micro Power Systems
Military 401
Interface 2749
Linear 3292
Mitel Semiconductor
Digital 697-714
Monolithic Memories, Inc.
Digital 715-728
Memory 3826-3838
Custom/Semicustom 4442-4478
Motorola Semiconductor
Digital 729-733
Microprocessor 1351-1360
Microprocessor Development Systems 1729-1738
Microcomputer Boards 1935-1945
Interface 2750-2761
Linear 3293-3298
Memory 3839-3849
Custom/Semicustom 4479-4480
National Semiconductor
Military 402-405
Digital 729-733
Microprocessor 1361-1456
Microcomputer Boards 1946-1955
Interface 2762-2771
Linear 3299-3345
Memory 3850-3871
Custom/Semicustom 4481-4499
OKI Semiconductor
Memory 3872-3873
Oliver Advanced Engineering
PROM Programmer 4104
Optical Electronics
Linear 3346-3347
Plessey Semiconductors
Custom/Semicustom 4501-4516
RCA
Military 406-409
Digital 739-760
Microprocessor 1457-1491
Microcomputer Boards 1956-1961
Linear 3348-3371
Memory 3874-3881
Custom/Semicustom 4517-4521
Schweber Electronics
349, 2064, Volume II opp. page 2401,
Seeq Technology, Inc.
Microprocessor 1492-1500
Memory 3882-3896
Semi Processes Inc.
Digital 761-771
Signetics
Military 410-423
Digital 773-810
Microprocessor 1501-1525
Microprocessor Development Systems 1739-1746
Microcomputer Boards 1962-1979
Interface 2772-2778
Linear 3372-3421
Memory 3897-3939
Custom/Semicustom 4522-4526
Silicon Systems
Custom/Semicustom 4528-4529
Siliconix
Interface 2779-2842
Sprague Electric
Interface 2843
Stag Microsystems
PROM Programmers 4105
Structured Design
PROM Programmers 4106
Sunrise Electronics
PROM Programmers 4107
Synertek
Military 424-432
Microprocessor 1526-1550
Microprocessor Development Systems 1747
Microcomputer Boards 1980-1983
Memory 3940-3957
Custom/Semicustom 4531-4537
TRW LSI Products
Digital 812-819
Linear 3438-3442
Teledyne Semiconductor
Interface 2845-2854
Texas Instruments
Military 433-443
Digital 821-1034
Microprocessor 1552-1564
Microprocessor Development Systems 1748-1749
Interface 2855-2868
Linear 3422-3437
Memory 3958-3980
Custom/Semicustom 4539-4560
Unitrode Corporation
Linear 3444-3446
VTI
Memory 3981-3993
Custom/Semicustom 4561-4562
Weitek
Digital 1036-1041
Western Digital
Microprocessor 1566-1579
Interface 2869-2880
Memory 3994-3997
Custom/Semicustom 4563-4564
Xicor
Memory 3998-3999
Zilog
Microprocessor 1581-1604

© IC MASTER 1983

INTERFACE

Data Transmission (cont)

1 **"Device Operation and System Implementation of the Asynchronous Communications Interface Adapter"**
(MC6850)
Provides information on ACIA transmitter and receiver operation, initialization, status register bits, use in a microcomputer based communications system, software requirements, and transmission subroutines.
Motorola AN-754 (11pp)

2 **"Digital Data Comm Message Protocol"**
(2652, 2661, 2653)
Covers operating modes, format, control set, error detection and recovery, and implementation of message protocols.
Signetics TB-4005 (3pp)

3 **"Eight Channel Codec Demonstrator"**
Explains how a codec demonstrator system is used to provide a working digital transmission system incorporating eight analog input channels digitally interfacing to eight output channels.
Precision Monolithics AN-37 (8pp)

4 **"Four-Channel Shared Codec"**
(DAC-86, DAC-87)
Describes a four-channel CODEC assembled from LSI components as a cost-effective digital transmission system requiring a relatively small number of devices. The system makes use of a single COMDAC® companded DAC-86 or DAC-87 digital-to-analog converter for both encoding and decoding.
Precision Monolithics AN-38 (6pp)

5 **"High Speed Digital Communications"**
(HD245, HD246, HD545, HD546)
Describes the use of the HD-245 family in a current mode digital communication system (up to 2 Mbs over 1,000-ft-long line.)
Harris Semiconductor AN-205 (4pp)

6 **"Integrated Circuits for Digital Data Transmission"**
(DS7820, DS7830, DS8820, DS8830)
Describes the operation and use of the DS7830 line driver and DS7830 line receiver for transmission systems using twisted-pair lines. Includes a mathematical design analysis of this line receiver.
National Special Functions Databook AN-22 (16pp)

"Intrinsically Safe Data Acquisition"
See listing under (Digital) CMOS. (Burr-Brown)

7 **"Line Drivers and Receivers"**
(AM2614, AM2615)
Discusses single ended, differential, unbalanced differential digital communications systems and line matching methods. Describes the above circuits and their use in systems.
Advanced Micro Devices (12pp)

8 **"Low Speed Modem Fundamentals"**
(MC6860)
Describes interface circuitry and performance of the MC6860 low speed modem. Evaluation of the system performance in the presence of Gaussian noise is given, as well as a brief description of data couplers.
Motorola AN-731 (15pp)

Data Transmission (cont)

9 **"Low Speed Modem System Design Using the MC6860"**
(MC6860)
Describes the MC6860 modem. Provides filter design tables and equations to develop a complete 100 series compatible system.
Motorola AN-747 (13pp)

10 **"Mixed Data Link Extends Length, Reduces Cost"**
(3712R, 3713T)
Describes how to use a fiber-optic transmitter and receiver to form a fiber-optic data link for extending link length or reducing link cost. Provides a performance chart for comparing various cable types.
Burr-Brown AN-97 (4pp)

11 **"Monolithic Bipolar Circuits for Video Speed Data Conversion"**
(TDC1007J, TDC1016J)
Describes the "flash" A/D converter, TDC1007J, and the TDC1016J, D/A converter. Also included are appoaches for extending the performance of the TDC1007J.
TRW/LSI A-5

12 **"Operation of the MC14469"**
(MC14469)
Discusses the operation of an addressable asynchronous receiver transmitter and its application in control of remote devices, transfer of data on a shared wire, and as an interface from remote sensors to a central processor.
Motorola AN-806 (8pp)

13 **"Operational Aspects of Nitron's Data Terminal Transmitter and Receiver"**
(NC2257, NC2259, NC2260)
Discusses basic operation of the NC2257/2259/2260 IC's, and application in various types of communications systems.
Nitron Communications Note 1 (24pp)

14 **"Receiver/Transmitter Noise Immunity"**
(HD245, HD246, HD545, HD546)
Discusses HD-245 transmitter/receiver system noise: External magnetic and capacitive effects, crosstalk, and ground line noise. Includes a comparison with voltage mode and differential voltage switching type systems.
Harris Semiconductor AN-207 (4pp)

15 **"Remote Multiplexing"**
Discusses acquisition of data at sensors distant from the location where the data is required and the control of actuators at a distance from the control system. Topics include interconnection, data transmission integrity, temperature, and electrical and mechanical protection.
Burr-Brown AN-80 (6pp)

16 **"Revised Data—Interface Standards"**
(MC3486, MC3487, MC3488)
Compares RS232, RS422, and RS423 standards and discusses cable length.
Motorola AN-781 (4pp)

17 **"Stable FSK Modems Featuring the XR-2207, XR-2206, and XR-2211"**
(XR2206, XR2207, XR2211)
Describes designing a modulator-demodulator for use in frequency-shift keying. Circuit designs and the adjustment procedure for frequency tuning is included.
Exar AN-01 (5pp)

© IC MASTER

INTERFACE

Data Transmission (cont)

1 **"Successive Approximation Register Design for Multi-Channel Codec's"**
Explains a low cost, high speed Successive Approximation Register (SAR) design for use with 24-channel or 32-channel encoders.
Precision Monolithics AN-31 (4pp)

2 **"Synchronous Data Link Control (SDLC)"**
(2652)
Reviews protocols used in data communications networks; discusses message format, error detection and the operation of a controller chip.
Signetics TB-4002 (4pp)

3 **"The UAR/T in Data Communications"**
(AY5-1013)
Describes this full duplex receiver/transmitter and discusses its application in computer, terminal and slow speed device interfacing. Also covers use in polling.
General Instrument (4pp)

4 **"Transmission Line Characteristics"**
(DM7400, DS7820, DS7830, DS75452, DS8820, DS8830)
Describes the characteristics of digital signals in transmission lines and the characteristics of the line that effect transmission quality. Also compares the performance of unbalanced and balanced circuits in digital systems.
National Interface Databook AN-108 (6pp)

5 **"Transmission Line Drivers and Receivers for RS-422 and RS-423"**
(9636A, 9637A, 9638)
Reviews requirements of EIA standards RS-422 and RS-423 for interfacing data terminals and data-communications equipment with transmission live drivers and receivers. Describes theory and application of Schottky driver and receiver circuits. Circuit diagrams, performance curves and tables, and system design assistance are provided.
Fairchild Application Note 354 (16pp)

6 **"Transmission and Multiplexing of Analog or Digital Signals Utilizing the CD4016A Quad Bilateral Switch"**
(CD4016A)
Describes features and operation of this switch. Discusses applications, including switching, gating digital or analog signals, multiplexing and demultiplexing, D/A conversion, sample and hold, and squelch-control.
RCA ICAN-6601 (12pp)

7 **"Tri-State FSK Modem Design Using XR2206/XR2211"**
(XR2206, XR2211)
Design of FSK modems with carrier detection and control capability are discussed.
Exar AN-05 (6pp)

8 **"Use of the AM26LS29, 30, 31, and 32 Quad Driver/Receiver Family in EIA RS-422 and 423 Applications"**
(AM26LS29, AM26LS30, AM26LS31, AM26LS32)
Reviews use of the devices in implementing RS-422 and 423 with emphasis given to the EIA RS-422 balanced interface.
Advanced Micro Devices (12pp)

Data Transmission (cont)

9 **"Using the 2653 Polynomial Generator and Checker"**
(2653)
Describes techniques and hardware for monitoring parallel data transfer between a CPU or memory and a serial receiver/transmitter or other bus oriented device.
Signetics AN-400 (16pp)

10 **"Using the 2670/71/72/73 CRT Terminal Chip Set"**
(2670/71/72/73)
Reviews major elements of a CRT terminal and covers the application of a display character and graphics generator, a programmable keyboard and communication controller, a programmable video timing controller and a video and attributes controller.
Signetics AN-401 (16pp)

Drivers

11 **"7106/7107 Digital Meter Applications"**
(7106, 7107)
Presents diagrams, circuit board design, test information and sources of supply for building LED or LCD digital meters around display driver ICs.
Teledyne Semiconductor AN-11 (6pp)

12 **"A Single IC Digital Thermocouple Thermometer Using the 7106"**
(7106)
Describes design and application details of a thermometer circuit built around a display driver and for use with type J and K thermocouples.
Teledyne Semiconductor AN-12 (2pp)

13 **"CMOS Line Drivers"**
States reasons for using CMOS line drivers.
National AN-158 (4pp)

14 **"Driving 7-Segment Gas Discharge Display Tubes with National Semiconductor Circuits"**
(DS8880, DS8884A, DS8885, DS8887, DS8889, DS8980, DS8981)
Explains each of the device's characteristics and operation. Application circuit diagrams also supplied.
National Interface Databook AN-84 (4pp)

15 **"Driving 7-Segment LED Displays with National Semiconductor Circuits"**
(DM5446A, DM5447A, DM5448A, DM7446A, DM7447A, DS75491, DS75492, DS7856, DS7858, DS8856, DS8857, DS8858, DS8861, DS8863, DS8864, DS8865, DS8866)
Discusses configurations and construction of 7-segment LEDs and drive modes. Describes BCD to 7-segment decoder drivers, BCD to 7-segment LED drivers, MOS to LED segment drivers, four and five segment drivers, as well as digit drivers. Describes calculator and digital clock applications.
National AN-99 (12pp)

16 **"Driving Burroughs' Bar Graph Display"**
Shows the use of comparators and flip-flops to drive these displays.
National DB-4 (2pp)

INTERFACE

Drivers (cont)

1 **"Expanding the Frontiers of IC Interface for Electronic Displays"**
Presents interface IC basics concerning incandescent, gas discharge, LED, plasma, fluorescent, and hot wire displays.
Sprague Electric AN29304.9 (10pp)

2 **"Interface Considerations for Numeric Display Systems"**
(MC14511, MC14543)
Gives basic information on LDC, LED, gas discharge, fluorescent and incandescent displays. Discusses interfacing 7 segment displays to logic with emphasis on multiplexed systems.
Motorola AN-741 (25pp)

3 **"Line Driver and Receiver Considerations"**
(MC1488, MC1489, MC3486, MC3487, MC3488, MC10194, MC75107, MC75110)
Discusses line driver and receiver related topics including system description, definition of terms, important parameter measurements and application example.
Motorola AN-708A (18pp)

4 **"MOS Clock Drivers"**
(MH0007, MH0009, MH0012, MH0013)
Lists the characteristics of various MOS clock drivers and how they differ in their input stages.
National Special Functions Databook MB-9 (2pp)

"PIN Diode Drivers"
See listing under (Interface) Switches. (National)

5 **"Self-Scanned Cascade Readout of the LS7060 and LS7061"**
(LS7060, LS7061)
Describes two 32-bit binary counter-latch-output driers and their use in system-oriented pulse counting applications.
LSI Computer Systems (3pp)

6 **"Series ULN-2000A Darlington Transistor Arrays-Description and Application"**
(ULN-2001A, ULN-2002A, ULN-2003A, ULN-2004A)
Describes circuit capabilities and its use as an interface.
Sprague AN29304.9 (7pp)

7 **"Simple Voltmeter Monitors TTL Supplies"**
(LM3914)
Explains how to use a bar/dot display driver chip, a few resistors and some LEDs to make a simple expanded-scale voltmeter that runs on 5V and provides TTL undervoltage and overvoltage warning signals.
National Semiconductor Linear Brief 48 (2pp)

"Using the MM5704 Keyboard Interface in Keyboard Systems"
See listing under (Digital) Encoders (National)

Encoders

8 **"60 Key Keyboard Encoder Applications Note"**
Describes implementation of keyboard scanning, key debouncing, key encoding, and key data availability indication functions.
Signetics AN-002 (8pp)

Encoders (cont)

9 **"A Single Channel Codec Integrated Circuit"**
(ZNPCM1)
Includes tables of recommended operating conditions, electrical characteristics and pinouts for 24-pin DIP codec. Single-channel, 30-channel, and switching application examples includes circuit and timing diagrams.
Ferranti (15pp)

10 **"AY5-3600 Keyboard Encoder Operation"**
(AY5-3600)
Characterizes the device and supplies a chart of the code assignments it uses.
General Instrument Bulletin 1402 (3pp)

11 **"Asynchronous Communications Interface Adapter"**
(SY6551)
Discusses transmitter and receiver operation, status register operations, programmed reset functions, generation of non-standard baud rates and diagnostic loop-back operating modes of the SY6551.

12 **"Control Circuits for LED Scales with Linear and Logarithmic Behavior"**
(U237B, U247B, U257B, U267B)
Discusses circuit design for driving up to 10 LEDs in a linear or logarithmic bar display. Includes suggestions for using various colors for emphasizing selected parts of the display.
AEG-Telefunken Halbleiter Informationsdienst 8.78 (3pp)

13 **"Designing with the HD-0165 Keyboard Encoder"**
(HD0165)
The organization and truth table for this encoder are presented. The use of two circuits for encoding up to 256 keys, battery operation, examples of a teletypewriter keyboard and universal keyboard encoders are described.
Harris Semiconductor AN-204 (8pp)

14 **"ED Family of Remote Control Encoder/Decoders"**
(ED-5, ED-9, ED-11, ED-15)
Describes how to incorporate the ED-15, ED-11, ED-9, and ED-5 into user's system. Contains information covering various transmission media, as well as using ED with microprocessor interface.
Supertex 1 (9pp)

15 **"Exclusive-OR Code Converters"**
(DM7086)
Covers use of exclusive-OR gates to do Gray/Binary and Binary/Hamming code conversion.
National DB-2 (2pp)

16 **"Interface Circuitry and Performance Optimization TMX2141 Encoder, TMX2151 Decoder"**
(2141, 2151)
Provides design notes including pulse width and timing considerations for these pulse width signaling devices.
TMX Bulletin 751 (7pp)

17 **"Keyboard Encoder and PROM/EPROM Application"**
(AY5-3600)
Describes use of the device in 64 key 4 mode and 90 key 4 mode applications. The device's binary outputs are organized to provide direct interface with a PROM/EPROM thus enabling the specific pattern format to be verified prior to a "custom" encoder commitment.
General Instrument Bulletin 1401 (4pp)

©IC MASTER

INTERFACE

Encoders (cont)

1 **"Using the MM5704 Keyboard Interface in Keyboard Systems"**
(MM5704)
Discusses features, operation, and programming of this device. Discusses use with the MM5702 timing and control chip of the Microprogrammable Arithmetic Processing System, and in a standard ASCII encode system.
National AN-52 (11pp)

MOS/Bipolar

"Applications of the RCA CD4093B COS/MOS Schmitt Trigger"
See listing under (Digital) CMOS (RCA)

2 **"COS/MOS Interfacing Simplified"**
(CD4000 Series)
Covers interfacing 4000A and B series with TTL, DTL, ECL, NMOS, PMOS, industrial and power control circuits, op amps and displays.
RCA ICAN-6315 (7pp)

3 **"Combining HNIL and CMOS—An Optimum Design Technique"**
(300 Series)
Discusses noise immunity, HNIL/74C interface, Schmitt trigger input and high current output.
Teledyne Semiconductor Digital Catalog (3pp)

"Interfacing COS/MOS with Other Logic Families"
See listing under (Digital) CMOS (RCA)

"Interfacing with CMOS"
See listing under (Digital) CMOS (Solid State Scientific)

4 **"MM54C/MM74C Voltage Translation/Buffering"**
(MM54C901, MM54C902, MM54C903, MM54C904, MM74C901, MM74C902, MM74C903, MM74C904)
Interfacing PMOS to CMOS, CMOS to CMOS with different voltage levels, and CMOS to two standard TTL loads, are illustrated using 74C901 series devices.
National MB-18 (2pp)

5 **"TTL to MOS and MOS to TTL Interface Circuits"**
(SN7400, SN5107, SN75207, SN75270, SN75370, SN75450, SN75451, TMS1103, TMS4062)
Describes MOS/TTL interface circuits using bipolar transistors, JFETs, MOSFETs, and ICs.
Texas Instruments Applications Report CA-170 (11pp)

6 **"TTL/MOS/DTL Interfaces"**
Techniques for coupling the above devices and characteristics of the interfaces.
National MB-7 (2pp)

MOS/Bipolar (cont)

7 **"Using Bipolar Logic to Improve Performance in CMOS and Microprocessor Systems"**
Suggests the use of HiNIL for improving noise performance, input protection, and output drive, and of LP Schottky for improved speed/power.
Teledyne Semiconductor Digital AN-7 (4pp)

Multiplexers

8 **"Single Supply Operation of PMI Multiplexers"**
(MUX-08, MUX-16, MUX-24, MUX-28, MUX-88)
Explains single supply operation as it applies to BIFET and CMOS multiplexers. Common applications are in microprocessor-based, single supply data acquisition systems.
Precision Monolithics AN-32 (2pp)

9 **"Understanding Crosstalk in Analog Multiplexers"**
Explains the three crosstalk components, Satic (CT), Dynamic (DCT), and Adjacent Channel (ACCT) qualitatively and quantitively. The discussion tells what component(s) should be considered in various applications. The qualitative discussion uses both theoretical and empirical information to arrive at conclusions about what performance should be expected.
Precision Monolithics AN-35 (8pp)

Switches

10 **"A New CMOS Analog Gate Technology"**
General discussion of "latch up." Describes "floating body" process, which eliminates this problem.
Intersil AN-A006 (2pp)

11 **"A New J-FET Structure—the VARAFET"**
(IT401, IT401A)
Lists advantages of an integrated J-FET switching circuit. Covers cell structure, electrical characteristics and device operation.
Intersil Application Bulletin AO22 (4pp)

12 **"Analog Switches and Their Applications"**
Introduces basic semiconductor theory and discusses in detail FET analog switches. Various circuit combinations including driver cicuits, multiplexing, sample-and-hold circuits, N-path filters, and converters are also analyzed.
Siliconix $7.95 (324pp)

13 **"Analog Switches in Sample and Hold Circuits"**
Covers the effects of FET analog switch current handling capability on settling time and the effects of offset characteristics on sample and hold system accuracy. Describes inverting and non-inverting sample and hold circuits.
Siliconix AN74-2 (4pp)

14 **"Analog-Signal Commutation"**
(MM450, MM451, MM454, MM550, MM551, MM552)
Describes dc characteristics involved in MOS IC switching of analog signals when the signal input range varies between ± 10 v.
National Special Functions Handbook AN-33 (6pp)

INTERFACE

Switches (cont)

1 **"Application of the MC3416 Crosspoint Switch"**
(MC3416)
Describes operation and use of this 4 X 4 balanced cross point switch in telephone applications including PABX. Appendices cover dielectric isolation, SCR action and testing.
Motorola AN-760 (15pp)

2 **"Applications of MOS Analog Switches"**
(LH0014, LH0019)
Discusses basic commutation circuits and describes the use of the LH0014 and LH0019 in linear amplifier applications, including reset functions and chopper circuits. Covers use of MOS switches as suppressed carrier double-sideband modulators and double-side-band demodulators. Also describes a circuit for a phase-locked loop AM-FM detector without tuned circuits.
National Special Functions Databook AN-38 (8pp)

3 **"CMOS Analog Switches—A Powerful Design Tool"**
Describes CMOS switch construction, characteristics and operating precautions. Applications include: a four channel switch to multiplex a scope input, a low pass filter with digitally controlled frequency response, an amplifier with programmable inputs and gain, a sample and hold circuit, a latching switch, high frequency switching and multiplexer systems.
Siliconix AN75-1 (16pp)

4 **"Designing with Monolithic FET Switches"**
Describes MOSFET and JFET switch operation, including driver consideratins.
Siliconix TA73-2 (4pp)

5 **"Driver Circuits for the JFET Analog Switch"**
Discussion and comparison of resistor-coupled diode charge transfer, space transistor charge transfer, and switched resistor driver circuits for JFET switches.
Siliconix AN73-5 (12pp)

6 **"Electronic Switches in NMOS - Silicon Gate Technology"**
(U353M, U354M)
Lists performance parameters for NMOS siligon-gate transistor arrays of up to 5 devices for use as a relay replacement. Includes discussions on electrical principles and large signal operation.
AEG-Telefunken Halbleiter Informationsdienst 11.78 (6pp)

7 **"FETs as Analog Switches"**
General discussion of FET operation: detailed discussion of factors affecting switch performance, including specific load problems and applicable driver circuits.
Siliconix AN72-2 (12pp)

8 **"Features and Applications of RCA IC Zero-Voltage Switches"**
(CA3058, CA3059, CA3079)
Discusses zero-voltage switch operation in general. Operation primarily with thyristors in ac power control and switching applications, including electric heating, oven/broiler control, machine control, light control and industrial systems.
RCA ICAN-6182 (6pp)

Switches (cont)

9 **"High Speed Analog Switches"**
(AM1000, AM1001, AM1002)
Discusses time domain multiplexing, current mode multiplexing, the switching characteristics of the AM1000 JFET switches, and drive circuits.
National AN-53 (6pp)

10 **"High Speed MOS Commutators"**
(MM451, MM453, MM454)
Discusses the lowered threshold voltages in commutators, on and off resistances, switching speed, noise and high-frequency noise control.
National Special Functions Databook AN-28 (8pp)

11 **"IC Multiplexer Increases Analog Switching Speeds"**
(DG506, DG181)
Describes single and two level IC multiplexing systems, including the advantages and disadvantages of each.
Siliconix AN73-2 (5pp)

12 **"PIN Diode Drivers"**
(DH0035, DH003C)
Describes PIN diode switching requirements and application of DH0035 as a driver. Includes discussion of anode ground and cathode ground designs and of repetition rate considerations.
National Special Functions Databook AN-49 (6pp)

"Some Applications of Programmable Power Switch/Amplifier"
See listing under (Linear) Power Control (RCA)

13 **"Specifying and Testing Multiplexers"**
Describes how Teledyne Philbrick defines and measures analog multiplexer parameters with emphasis on CMOS types.
Teledyne Philbrick Applications Bulletin AN-31 (4pp)

14 **"Switching High-Frequency Signals with FET Integrated Circuits"**
(DG133, DG171, DG181, DG200)
Discussion of DG133/171/181/200 as rf switches. Gives equivalent circuits. "Off" isolation and "On" performance data. Applications: control of video monitor and switching between two video cameras.
Siliconix AN73-3 (16pp)

15 **"The IH5009 Series of Low Cost Analog Switches"**
(IH5009 Series)
Describes circuit parameters, logic compatibility, and virtual ground switching applications including 4-channel multiplexer, gain ranging circuit, gain programmable amplifier and 16-channel multiplexer.
Intersil Application Bulletin A0004 (8pp)

16 **"Understanding and Applying the Analog Switch"**
(IH5001, IH5009, IH5025, IH5040)
Compares parameters of analog switches. Applications of several switch families are discussed, including 3-channel differential multiplexer, gain programmable amplifier, gain ranging circuit, sample and hold circuit.
Intersil Application Bulletin A003 (16pp)

© IC MASTER

INTERFACE

Switches (cont)

1 "Zero Voltage Switch"
(U106)
Discusses the feaures of the U106 Triac control circuit. Provides diagrams, schematics, and temperature control, timer, and static switch applications.
AEG-Telefunken (12pp)

LINEAR

Active Filters

1 **"Active Filter Design with IC OP Amps"**
(XR3403, XR4136, XR4202, XR4558)
Provides table of transfer functions and equations for low, high and bandpass filters as well as filter responses for Bessel, Butterworth and Chebychev types. Working schematic of an active filter in a modem application included.
Exar AN-03 (8pp)

"Function Circuits, Design and Applications"
See listing under (Linear) General (Burr-Brown)

Amplifiers, Current

2 **"Application of the LH0002 Current Amplifier"**
(LH0002)
Circuit operation. Describes uses in a differential input-output op amp, booster amplifier, level shifter, pulse transformer driver, and transmission line driver.
National Special Functions Databook AN-13 (4pp)

Amplifiers, Instrumentation

3 **"A User's Guide to IC Instrumentation Amplifiers"**
(AD522)
Explains where and when an instrumentation amplifier may best be employed. Provides basic theory, specifications and examples of use.
Analog Devices (12pp)

4 **"Application of the RCA CA3000 Integrated-Circuit DC Amplifier"**
(CA3000)
Describes circuit and application as modulated oscillator, crystal oscillator, low-frequency mixer, cascaded RC-coupled feedback amp, narrow-band tuned amp, and Schmitt trigger.
RCA ICAN-5030 (11pp)

5 **"Applications of Wide-Band Buffer Amplifiers"**
Describes high and low frequency operation of several wide-band, high-current, unity-gain buffer amplifiers. Discusses application techniques and illustrates their use in driver, sample and hold amplifier, and active filter circuits.
National Semiconductor AN227 (16pp)

6 **"Instrumentation Amplifiers—Versatile Differential Input Gain Blocks"**
(3660)
Describes the feaures and general operation of instrumentation amplifiers. Depicts their use in bridge circuits, in reducing ground loop interference, and in driven guard input circuits.
Burr-Brown AN-75 (6pp)

Amplifiers, Instrumentation (cont)

7 **"Isolation and Instrumentation Amplifiers Designers Guide"**
Primer on the operation, application, and selection of isolation and instrumentation amplifiers.
Analog Devices (20pp)

8 **"OP-10 Instrumentation Amplifier CMRR Versus Frequency Improvement"**
(OP-10)
Discusses optimization of CMRR versus frequency response of a three op amp instrumentation amplifier.
Precision Monolithics AB-2 (1pp)

9 **"Optical Coupling Extends Isolation-Amplifier Utility"**
(3450, 3650)
Explains isolation amplifier fundamentals, optical coupling, and use of the amp in medical electronics and industrial motor control.
Burr-Brown AN-85 (8pp)

10 **"Testing of Analog-to-Digital Converters"**
Discusses methods, circuits and instruments for testing accuracy of A/D converters with conversion times under 100μs; includes a circuit for testing high-speed converters with less than 10μs conversion times.
Burr-Brown Research An-100 (6pp)

11 **"The Instrumentation Amp vs the Op Amp; Which, Where, and How to Use Them"**
Compares an op amp connected as a differential amp with an instrumentation amp built from several general purpose op amps. Discusses how to put each one together, and when and where to use them.
Teledyne Philbrick AN-29 (6pp)

Amplifiers, Operational

12 **"A High Impedance Hysteresis Circuit"**
(HA-2520, HA-2620)
Describes HA-2520/HA-2620 used as a hysteresis amplifier and covers output voltage limiting.
Harris Semiconductor AN-505 (2pp)

13 **"A Simple Comparator Using the HA-2620"**
(HA-2620)
Describes op amp comparator circuit capable of driving approximately ten logic gates.
Harris Semiconductor AN-509 (1pp)

14 **"A Simple Square-Triangle Waveform Generator"**
(HA-2510, HA-2600, HA-2620)
Circuit for waveform generator using three op amps.
Harris Semiconductor AN-510 (2pp)

15 **"An IC Amplifier User's Guide to Decoupling, Grounding, and Making Things go Right for a Change"**
Contains considerable information on good grounding practices and op amp decoupling.
Analog Devices (8pp)

©IC MASTER

LINEAR

Amplifiers, Operational (cont)

1 **"An IC Operational-Transconductance-Amplifier (OTA) with Power Capability"**
(CA3094)
Describes what an OTA is and the characteristics of the device. Outlines its use in such consumer applications as a power amplifier and a companion RIAA preamplifier.
RCA ICAN-6077 (12pp)

2 **"Analysis and Design of the Op/Amp Current Source"**
Develops expressions for the transfer function and output impedance of voltage controlled op amp current source using both ideal and non-ideal models. Discusses effects of parameter and temperature variations on performance.
Motorola AN-587 (7pp)

3 **"Application of the RCA CA3008 and CA3010 Integrated-Circuit Operational Amplifiers"**
(CA3008, CA3010)
Describes operating characteristics of two op amps and their application in video amplifiers, frequency-shaping amplifiers, comparators, integrators, differentiators, scaling adders. Also covers the addition of a power output stage and/or input emitter followers.
RCA ICAN-5015 (15pp)

4 **"Application of the RCA CA3015 and CA3016 Integrated-Circuit Operational Amplifiers"**
(CA3015, CA3016)
Describes operating characteristics at ±12 v. Applications covered are: 50-dB amplifier; twin-T bandpass amplifiers, 20-dB, 10 MHz bandpass amplifier; and voltage follower.
RCA ICAN-5213 (6pp)

5 **"Applications of Operational Amplifiers"**
Presents op amp applications including designs for signed controls, processors, waveform generators, and special purpose circuits. Provides information on error sources, circuit values, and design equations.
Burr-Brown $29.50 (220pp)

6 **"Applications of a Monolithic Sample-and-Hold/Gated Operational Amplifier"**
(HA-2420, HA-2425)
Describes HA-2420/2425 circuit. Applications include various track-and-hold/sample-and-hold configurations, an A/D converter, a demultiplexer, an integrated-hold-reset amplifier, a gated operational amplifier, and a peak detector with reset.
Harris Semiconductor AN-517 (8pp)

7 **"Applications of the CA3080 and CA3080A High-Performance Operational Transconductance Amplifiers"**
(CA3090, CA3080A)
This device has an additional control terminal for flexibility. Circuit operation is discussed. Applications covered: communications and industrial systems, modulators, multiplexers, sample and hold circuits, gain control circuits, and micropower comparators. Appendix discusses current mirrors.
RCA ICAN-6668 (16pp)

Amplifiers, Operational (cont)

8 **"Applications of the Gated Linear Amplifier ZN424"**
(ZN424)
Details the operation of the ZN424 and describes a variety of specific applications including filters, comparators, and peak hold circuits.
Ferranti (46pp)

9 **"Applications of the RCA CA3048 Integrated Circuit Amplifier Array"**
(CA3048)
Discusses operating parameters for this 4-amplifier array and covers applications, including Hartley and Colpitts oscillators, an astable multivibrator, four-channel linear mix, and a gain-controlled amplifier.
RCA ICAN-4072 (8pp)

10 **"Applying Dual and Quad FET Op Amps"**
(LF347, LF353)
Shows how dual and quad FET op amps can be used as a temperature controller, high-temperature thermometer, sine wave oscillator, voltage reference, A/D converter and current amplifier.
National Semiconductor AN-262 (7pp)

11 **"Applying a New Precision Op Amp"**
(LM11)
Details characteristics of the LM11 which combines low offset voltage with low bias current. Applications include meters, differential instrumentation amplifiers and coupling with existing fast op amps.
National Semiconductor AN242 (16pp)

12 **"Circuit Design with the Photon-Coupled Interrupter Modules CNY36 and CNY37"**
(TAA861)
Describes how a photocoupler module is combined with an operational amplifier to actuate a relay upon interruption of an infrared light beam.
AEG-Telefunken Halbleiter Informationsdienst 5/76 (4pp)

13 **"Combine Two Op Amps to Avoid the Speed Accuracy Compromise"**
(3521)
Discusses interconnecting low drift and wideband op amps to form a composite op amp.
Burr-Brown AN-64 (2pp)

"D.C. Servo Motor Systems Using the ICH8510"
See listing under (Linear) Amplifiers, Power (Intersil)

14 **"Design of a Unique Precision Controlled Current Source"**
(3500)
Diagrams a current source using an op amp and a complementary FET pair to form a current source with differential input and bipolar current output.
Burr-Brown AN-74 (2pp)

15 **"Designing Junction FET Input Op Amps"**
(U401, 421 Series)
Discusses the advantages, behavior and design of JFET input operational amplifiers.
Siliconix AN74-3 (17pp)

LINEAR

Amplifiers, Operational (cont)

1 **"Designing with Operational Amplifiers: Application Alternatives"**
Amplifier improvement techniques, signal analyzers, signal conditioners, absolute value circuits, signal generators, computing circuits, data transmission circuits, as well as test and measurement circuits are discussed. Circuit designs and explanations of circuit operation are provided.
Burr-Brown $24.50 (220pp)

2 **"Digital Nulling of OP-05 and SSS725"**
(DAC-08, OP-05, SSS725)
Shows digitally controlled offset nulling achieved by imbalancing the first stage collector currents of the op amp with a D/A.
Precision Monolithics AB-3 (1pp)

3 **"Diode-Connected FET Protects Op Amps"**
(BB3528CM)
Shows how to use an FET to protect an op amp from overload in a circuit that measures dielectric properties.
Burr-Brown AN-106 (1pp)

4 **"Fast Settling Operational Amplifier"**
(HA-5190, HA-5195)
Covers operation at elevated temperatures, frequency compensation techniques and performance enhancement methods for op amps used in pulse, RF and video amplifiers, waveform generators, data requisition and instrumentation.
Harris Application Note 525 (4pp)

5 **"HA-909 Operational Amplifier"**
(HA-909, HA-911)
Discusses applications as a unity gain breadboard op amp, servo preamplifier, high-Q bandpass filter, Wien bridge oscillator, and phase-delay filters.
Harris Semiconductor AN-501 (2pp)

6 **"HA-909 Operational Amplifiers Performance Tailoring"**
(HA-909, HA-911)
Discusses how to optimize HA-909's offset, power dissipation, bandwidth, large signal bandwidth, slew rate, transient response, and stability with reactive loads.
Harris Semiconductor AN-502 (3pp)

7 **"How To Select Output Amplifiers for CMOS MDACs"**
(AD542, AD544)
Discusses unique problems of amplifying CMOS, multiplying-DAC outputs. Provides performance comparison of two op amp families to aid in selection.
Analog Devices (4pp)

8 **"IC Power Op Amps (Revised)"**
(μA759, μA791)
Discusses evolution of power op amps with specific reference to the μA759 and μA791. Included are applications to voltage regulators, audio amplifiers and servo motor drivers.
Fairchild AN347 (8pp)

"IC Preamp Challenges Choppers On Drift"
See listing under (Linear) Pre-amplifiers (National)

9 **"L144 Programmable Micro-Power Triple Op Amp"**
(L144)
Describes device function, elements of programming, effects of slew rate limiting. Applications discussed include instrumentation amplifier, tone detectors, triple-amplifier active filters, and a micropower double-ended limit detector.
Siliconix AN73-6 (6pp)

Amplifiers, Operational (cont)

10 **"Logarithmic Amplifiers and Operators Parameter Definition and Measurement"**
Defines and explains logarithmic amplifier parameters.
Teledyne Philbrick AN-27 (3pp)

11 **"Low Power Operational LH0001 Amplifier"**
(LH0001)
Operation of circuit offering 0.2 mv typical offset voltage at 25 C and quiescent supply currents in 100 μA range.
National Linear Applications Handbook AN-10 (4pp)

12 **"Measurement of Burst (Popcorn) Noise in Linear Integrated Circuits"**
Discusses "pass-fail" criteria and describes a test set-up for measuring burst noise. The set-up includes a high gain amplifier-filter, a bipolar comparator, and a counter-latch-timer control circuit.
RCA ICAN 6732 (8pp)

13 **"Micro Power Applications Collection"**
(OP-20)
Discusses the OP-20 Micro-Power Operational Amplifier as a combination of precision performance, ultra-low supply current and single power supply operation.
Precision Monolithics AN-34 (4pp)

14 **"Minimization of Noise in Operational Amplifier Applications"**
(OP-07)
Describes internal and external sources of noise. Helps to locate noise sources by frequency. Gives examples of noise calculation using the OP-07 as an example.
Precision Monolithics AN-15 (11pp)

15 **"New Design Techniques for FET Op Amps"**
(LH0022, LH0022C, LH0042C, LH0052, LH0052C)
Gives parameters for LH0022, LH0042 and LH0052 operational amplifiers. Discusses rationale for FETs in these devices, describes the circuits. Describes application as voltage followers, integrators, sample/hold amplifiers, comparators, instrumentation and charge amplifiers.
National Special Functions Databook AN-63 (12pp)

16 **"Operational Amplifier Noise Prediction"**
Provides a noise model, a procedure for computing output noise, and spot noise curves for many Harris amplifiers.
Harris Semiconductor AN-519 (10pp)

17 **"Operational Amplifier Parameter Definition and Measurement Guide"**
Defines parameters and means of measuring them.
Teledyne Philbrick AN-23 (8pp)

18 **"Operational Amplifier Stability: Input Capacitance Considerations"**
(HA-2600, HA-2605)
Discusses overcoming stray capacitance in op amps, such as the HA-2600.
Harris Semiconductor AN-515 (2pp)

19 **"Operational Amplifiers—Design and Application"**
Covers basic theory, amplifier design techniques and applications.
Burr-Brown $27.50 (470pp)

© IC MASTER

LINEAR

Amplifiers, Operational (cont)

1 **"Power Op-Amp Heat Sink Kit"**
(ICH8510, ICH8520, ICH8530)
Discusses mounting the devices on heat sinks.
Intersil Application Bulletin A029 (2pp)

2 **"Precision Op Amp on a Semicustom Chip"**
(MONOCHIP)
Discusses building an op amp on a semicustom chip with performance comparable to standard precision units. Covers all phases of design and thermal considerations as well.
Interdesign APN-9 (10pp)

3 **"Precisional Operational Amplifier"**
(μA714)
Describes operation of the μA714 and compares key parameters with other precision op amps. Discusses applications including use as a replacement for chopper-stabilized amplifiers.
Fairchild AN348 (10pp)

4 **"Protect Op Amps from Overloads"**
Discusses protection from power-supply faults, keeping input voltages at safe levels, and limiting output currents.
Burr-Brown AN-60 (3pp)

5 **"Simple Precision Millivolt Reference Uses No Zeners"**
(OP-05)
Describes −3.5 mv to 3.5 mv reference built with instrumentation op amp and a potentiometer.
Precision Monolithics AN-10 (1pp)

"Specifying Selected Op Amps and Comparators"
See listing under (Linear) Comparators (National)

6 **"Test Procedures for Operational Amplifiers"**
Circuit for measuring offset voltage, bias current, offset current, open loop voltage gain, common mode and power supply rejection ratios, output voltage/current, power dissipation, and making continuity checks.
Harris Semiconductor AN-508 (2pp)

7 **"The 8007—A High Performance FET-Input Operational Amplifier"**
(ICL8007)
Circuit description, applications as log and antilog amplifiers, photocell amplifier, peak detector, sample and hold circuits, high impedance buffer, and Wien Bridge oscillator.
Intersil Application Bulletin A005 (6pp)

8 **"The HA-2400 PRAM Four Channel Operational Amplifier"**
(HA-2400, HA-2405)
This is a programmable input stage, operational amplifier. This note describes its applications including an analog multiplexer with buffered input and output, an inverting or non inverting amplifier with a programmable gain, a sine wave oscillator with programmable frequency, and a track and hold/sample and hold circuit.
Harris Semiconductor AN-514 (8pp)

Amplifiers, Operational (cont)

9 **"The HA-2530/2535 Wideband High Slew Inverting Amplifier"**
(HA-2530, HA-2535)
Briefly discusses internal circuit. Shows how closed-loop frequency response can be predicted. Describes application as a fast settling coaxial driver, a 10 MHz coaxial line driver, a wide range signal separator, a high frequency triangular wave generator, and a current-to-voltage converter.
Harris Semiconductor AN-516 (11pp)

10 **"The HA-2900 Monolithic Chopper Stabilized Amplifier"**
(HA-2900)
Discusses offset voltage and current drift and chopper stabilization, then describes the circuit. Applications include a high impedance differential instrumentation amplifier, use as an integrator, and several wide bandwidth configurations.
Harris Semiconductor AN-518 (8pp)

"The Instrumentation Amp vs the Op Amp; Which, Where, and How to Use Them"
See listing under (Linear) Amplifiers, Instrumentation (Teledyne Philbrick)

11 **"The Monolithic Op Amp: A Tutorial Study"**
Detailed paper on the design of IC operational amplifiers.
National Linear Applications Handbook (18pp)

12 **"The OP-07 Ultra-Low Offset Voltage Op Amp—A Bipolar Op Amp that Challenges Choppers, Eliminates Nulling"**
(OP-07)
Describes circuit design, compares performance to other devices. Covers application in a voltage reference, a high accuracy buffer, a D/A test system, a composite summing amplifier, an absolute value circuit, an analog computer building block, and as a thermocouple amplifier.
Precision Monolithics AN-13 (12pp)

13 **"Using Op Amps in Low Noise Applications"**
Discusses shot noise and noise from source resistances.
Burr-Brown AN-68 (2pp)

14 **"Working with High Impedance Op Amps"**
Describes a low offset voltage op amp that also has low input current error, especially at high temperatures. Discusses techniques for eliminating problems with high impedance circuits.
National Semiconductor AN241 (6pp)

Amplifiers, Power

15 **"D.C. Servo Motor Systems Using the ICH8510"**
(ICH8510)
Explains servo systems in general and use of the device for velocity control, position control, and torque control in particular.
Intersil Application Bulletin A026 (4pp)

"LM380 Power Audio Amplifier"
See listing under (Linear) Consumer, Audio (National)

"Power D/A Converters Using the IH8510"
See listing under (Interface) Converters (Intersil)

LINEAR

Amplifiers, Power (cont)

1 **"TBA810S/AS Thermally Protected Power Amplifier"**
(TBA810)
Description of the device followed by discussion of its performance. Also shows examples of use in tone control, TV, radio and tape playback channel applications.
SGS-ATES Technical Note 120 (16pp)

2 **"TBA820 Two-Watt Monolithic Audio Amplifier"**
(TBA820)
Lists main electrical characteristics of device and presents typical applications.
SGS-ATES Technical Note 114 (11pp)

3 **"TCA830S-Thermally Protected Audio Power Amplifier"**
(TCA830S)
Briefly describes how the device functions followed by an examination of performance under different supply and load conditions. Portable AM/FM receiver, intercom, and magnetic tape player circuits are shown.
SGS-ATES Technical Note 126 (15pp)

4 **"TCA940 Fully Protected Audio Amplifier"**
(TCA940)
Presents temperature and output short circuit protection features of the device along with a description of its performance. Illustrates use of the device in a stereo amplifier and an equalized amplifier for magnetic pickups.
SGS-ATES Technical Note 119 (15pp)

5 **"TDA2020/TDA2010 HI-FI Monolithic Amplifiers"**
(TDA2020, TDA2010)
Describes these power amplifiers and how to apply them.
SGS-ATES Technical Note 130 (12pp)

6 **"The MC1554 One-Watt Monolithic Integrated Circuit Power Amplifier"**
(MC1554)
Describes the circuit, including dc characteristics, frequency response, and distortion. Shows how to calculate package power dissipation using the curves on the data sheet. Describes application, as one watt non-inverting, inverting, pulse power, and three-watt differential output amplifiers.
Motorola AN-401 (7pp)

Amplifiers, RF

7 **"A High Gain Integrated Circuit RF-IF Amplifier with Wide Range AGC"**
(MC1590G)
Describes operation and Y parameters of the MC1590G. Applications include mixer plus IF, video, single and two-stage RF amplifiers.
Motorola AN-513 (10pp)

8 **"A Two-Stage 1kW Solid-State Linear Amplifier"**
Discusses the design of 50W and 300W linear amplifiers for the 1.6 to 30 MHz frequency band.
Motorola AN-758 (16pp)

Amplifiers, RF (cont)

9 **"Application of the RCA CA3002 Integrated-Circuit IF Amplifier"**
(CA3002)
Describes circuit, operating modes, characteristics, and application as an envelope detector, product detector, and a Schmitt trigger.
RCA ICAN-5036 (9pp)

10 **"Application of the RCA CA3004, CA3005, and CA3006 Integrated-Circuit RF Amplifiers"**
(CA3004, CA3005, CA3006)
Discusses operating modes, Y parameters, noise performance, video amp capabilities, gain control, cross modulation and modulation distortion. Covers application as single-ended RF amplifier, tuned IF amplifier, mixer, suppressed-carrier modulator and product detector.
RCA ICAN-5022 (26pp)

11 **"Application of the RCA CA3021, CA3022, and CA3023 Integrated-Circuit Wideband Amplifiers"**
(CA3021, CA3022, CA3023)
Describes circuit and operating characteristics. Covers video, 10 MHz IF, 455 kHz IF, 28 MHz two-stage limiter, and 500 kHz limiting amplifier applications.
RCA ICAN-5338 (12pp)

12 **"Application of the RCA CA3028A and CA3028B Integrated-Circuit RF Amplifiers in the HF and VHF Ranges"**
(CA3028A, CA3028B)
Descries circuits and operating modes. Covers use as an RF amp, autodyne converter, IF amp, and limiter.
RCA ICAN-5337 (10pp)

13 **"Linear Amplifiers for Mobile Operation"**
Discusses the design of a portable amplifier suitable for amateur radio applications.
Motorola AN-762 (8pp)

14 **"Logarithmic IF Strips Using Monolithic Integrated Circuits"**
(SL521)
Describes operation of this log amplifier in successive detection type IF strips with center frequencies from 10 to 100 MHz. Covers broadband and narrow band circuits and describes in detail a 60 MHz wide-range logarithmic amplifier.
Plessey Semiconductor Technical Communication (3pp)

15 **"Logging IF Strip"**
(SL1521)
Describes a logging IF strip using Plessey IC's.
Plessey Semiconductor (2pp)

Amplifiers, Special Purpose

16 **"Using the 8048/8049 Monolithic Log-Antilog Amplifier"**
(ICL8048, ICL8049)
Describes in detail the operation of the 8048 log amp, and its counterpart, the 8049 antilog amp.
Intersil A007

LINEAR

Amplifiers, Video

1 **"Application of the RCA CA3001 Integrated-Circuit Video Amplifier"**
(CA3001)
Describes circuit and operating characteristis. Covers cascaded stages and use as a Schmitt trigger.
RCA ICAN-5038 (9pp)

"Television Video IF Amplifier Using Integrated Circuits"
See listing under (Linear) Consumer, TV (Motorola)

2 **"Video Applications"**
(HA-5190, HA-5195)
Discusses power supply requirements and temperature considerations, and provides design and prototyping tips for using an op amp as a video amplifier.
Harris AN526 (5pp)

Arrays

3 **"Application of the RCA CA3018 Integrated Circuit Transistor Array"**
(CA3018)
Array of two isolated silicon epitaxial transistors plus two transistors with emitter-base common connections, suited for closely matched device requirements or interconnections with non-integrable components. Applications covered include IF-RF, video, AGC, audio and dc amplifiers.
RCA ICAN-5296 (5pp)

4 **"Application of the RCA CA3019 Integrated-Circuit Diode Array"**
(CA3019)
Describes circuit configuration, operating characteristics and applications, including balanced modulator, high-speed gates, balanced mixer, and a ring modulator.
RCA ICAN-5299 (6pp)

5 **"Designing with an IC Transistor Array Containing Matched Super-Beta Transistors"**
(CA3095)
Describes CA3095 IC array. Applications: low frequency amplifier, low noise video amplifier, long-delay monostable multivibrator, low-input-bias current comparator, analog timer for long delays, high input impedance dc-voltmeter circuit, and tape-head preamplifier.
RCA ICAN-6222 (9pp)

6 **"Super-Matched Differential Pair"**
(MONOCHIP)
Illustrates matching capabilities of interconnected NPN devices on the Monochip family. The circuit described consists of 2 transistors implemented by interconnecting 18 small geometry devices in parallel.
Interdesign APN-20 (5pp)

Arrays (cont)

7 **"Using the SL362C Low Noise Transistor Pair"**
(SL362)
Provides general data on noise performance plus application in DC to 200 MHz amplifier.
Plessey Semiconductor Technical Communication (4pp)

Communications

8 **"A 10-Number Repertory Pulse Dialer"**
(AY5-9100, AY5-9200, AY5-9500)
Diagram and short description of a telephone pulse dialer with capability for storage and reference of 10 numbers of up to 22 digits each.
General Instrument Bulletin 0702 (2pp)

9 **"A CB Audio Compression System"**
(MONOCHIP)
Describes using the device to provide an on-chip regulator, audio pre-amp, AGC amplifier, DC volume control, and a headphone driver amplifier for use in a CB transceiver.
Interdesign APN-10 (7pp)

10 **"Applications of Hybrid Active Filters to Telecommunication Systems"**
(AF133, AF134)
Transmit and receive filters in 8 kHz sample rate PCM systems such as D3 channel bank and band splitting filters for DTMF receivers are described, and their application to these systems is discussed.
National AN-221 (4pp)

11 **"CRC8030 Telephone DTMF Receiver"**
(CRC8030)
Discusses dual-tone multi-frequency signaling. Includes specifications, test data, and interface capabilities.
Rockwell (28pp)

12 **"Data Conversion, Switching, and Transmission using the Intel 2910A/11A Codec and 2912 PCM Filter"**
(2910A/2911A, 2912)
Provides general telecommunications concepts and terminology. Includes technical reviews of codecs and PCM filters and gives application guidelines.
Intel AP-64 (40pp)

13 **"Delta Modulation for Voice Transmission"**
Provides introduction to delta modulation basics and describes various applications, including telecommunications and audio delay lines, in which it can be used.
Harris Semiconductor AN-607 (6pp)

14 **"Digital Telephony and the Integrated Circuit CODEC"**
(TP3000, TP3001)
Discusses in detail PCM CODECs. Covers theory, μ-law and A-law characteristics, and device specifications. Also provides test controller examples, transmission applications, and switching applications.
National AN-215 (16pp)

15 **"Dual Tone Decoding"**
(XR567, XR2567)
Discusses and presents diagrams for a fast, narrow band tone decoder, a touch-tone decoder, and a low cost frequency indicator.
Exar AN-08 (2pp)

LINEAR

Communications (cont)

1 **"EX-C277 Low-Voltage PCM Repeater IC"**
(XR-C277)
Explains PCM repeater fundamentals, device operation, and presents schematic for a repeater application.
Exar An-04 (6pp)

2 **"Gain Measurements in a CODEC System"**
(TP3000)
Explains aspects of telecommunication measurement techniques and units as they apply to the single channel CODEC.
National AN-219 (4pp)

3 **"HC-55516/32 CVSD Concept and Operations"**
(HC55516, HC55532)
Outlines Continuously Variable Slope Delta Modulation and compares it to pulse code modulation.
Harris Semiconductor (5pp)

4 **"High Performance PCM Repeater Using XR-C262"**
(XR-C262)
The design principle and the electrical characteristics of the XR-C262 high performance PCM repeater IC are described. Circuit connection and application examples are given in its use in 1.5 Megabit or 2 Megabit PCM systems.
Exar AN-10 (8pp)

"Modems"
See listings under (Interface) Data Transmission

5 **"Monolithic Dual-Tone Multi-Frequency Receiver"**
(SSI201)
Describes device and its operation, gives performance data and three application circuits: a 16-channel remote control, a 2-of-8 decoder, and a DTMF to rotary dial pulse converter.
Silicon Systems (8pp)

6 **"One-Button 32 Number Repertory Dialer/Calculator"**
(AY5-9200)
The circuit described features one-button redial of one of the 32 storable telephone numbers of up to 22 digits each. The 8-digit calculator features five functions, including percent.
General Instrument Bulletin 0706 (6pp)

7 **"Pushbutton Dialer with Memory"**
(AY5-9100, A5-9200, AY5-9500)
Provides instructions, diagram, and PC board layout for an add-on device that connects to any telephone and permits dialing via a separate keyboard. The module has a redial mode and a 20-digit 10 number expandable memory.
General Instrument Bulletin 0701 (7pp)

8 **"S2559 Digital Tone Generator"**
(S2559)
Describes a tone generator designed specifically to implement a dual tone telephone dialing system.
American Microsystems ANT01 (12pp)

9 **"SL560 Low Noise Amplifier Owner's Manual"**
(SL560)
Describes operation of a high-power 50-ohm amplifier, includes design examples of a 2-channel, variable-gain preamplifier.
Plessey Semiconductor (9pp)

Communications (cont)

10 **"SL600 Series—Integrated Circuits for Radio Communications"**
(SL600 Series)
Describes circuits and applications for the following: RF/IF amplifiers; limiting RF amplifier/detector; AGC generators; AF amplifier, VOGAD side tone amplifier, AM detector, AGC amplifier and SSB demodulator; multimode detector; microphone/headphone amplifier; double balanced modulators; and a square log device. Describes synchrodyne, superhet, SSB and multimode receivers; SSB and AM transmitters; SSB transceiver, a multi/mode transceiver and a Morse keyer.
Plessey Semiconductor Applications Manual (92pp)

11 **"The CRC8030 Dual Tone Multi-Frequency Receiver"**
(CRC8030)
Discusses various approaches to DTMF receiver design and DTMF signaling. Includes a chart of receiver specifications and a description of the device.
Rockwell (11pp)

12 **"The Impact of LSI on the Design of PCM Codecs"**
Discusses the changes existing telephone systems will go through as LSI circuits are increasingly used for PCM and computer controlled switching.
General Instrument Bulletin 0707 (4pp)

13 **"XR-C240 Monolithic PCM Repeater"**
(XR-C240)
Provides device description, description of circuit operation, and schematics for a typical repeater system.
Exar AN-02 (6pp)

Comparators

14 **"A High Speed Dual Differential Comparator—the MC1514"**
(MC1414, MC1514)
Describes circuit operation and applications, including level and limit detectors, multivibrators, line receivers, sense amplifiers, zero crossing pulse generator and a peak voltage detector.
Motorola AN-547 (13pp)

"A Simple Comparator Using the HA2620"
See listing under (Linear) Amplifiers, Operational (Harris)

15 **"AM685/AM686/AM687 Designing with High Speed Comparators"**
(685, 686, 687)
Gives a mathematical analysis of circuit operation. Discusses use as a pulse detector, precision monostable and applications requiring hysteresis.
Advanced Micro Devices (10pp)

16 **"Application of Programmable Micropower Comparators"**
(L161)
Describes the device and how to program it. Also describes the effects of programming on AC characteristics, limit, zero crossing, and level detectors; DC to DC converter applications.
Siliconix AN76-7

© IC MASTER

LINEAR

Comparators (cont)

1 **"High-Speed Comparator Applications"**
(SP9750, SP9685, SP9687)
Describes a family of high-speed comparators and circuits for A/D converters. Reviews all parallel, parallel/series and successive approximation conversion techniques.
Plessey (50pp)

"Radiation Testing of Linear Microcircuits"
Includes the 702. See listing under (Linear) General. (Fairchild).

2 **"The 725 Op Amp as a Low Level Comparator"**
(PM725)
Provides the circuit and design curves for a submillivolt level comparator based on the 725 op amp.
Precision Monolithics AN-25 (4pp)

3 **"Varying Comparator Hysteresis without Shifting Initial Trip Point"**
Describes adding a positive feedback circuit to introduce precise variable hysteresis into the usual comparator switching action.
Burr-Brown AN-62 (1pp)

Consumer, AM/FM

4 **"AM-FM Radio Designs Using the ULN-2242A, ULN-2241A and ULN-2240A Integrated Circuits"**
(ULN-2242A, ULN-2241A, ULN-2240A)
Describes ICs containing all the active circuits needed for the AM tuner, FM IF amplifier and detector of a radio receiver. Details options for implementing these functions.
Sprague AN27121.63 (14pp)

5 **"AM/SSB Transceivers and Noise Blanking Using SL1600 Series Circuits"**
(SL1623, SL1626, SL1640, SL1641)
Describes the sub-systems used in AM-SSB transceivers.
Plessey Semiconductor (10pp)

6 **"An AM Receiver Using the Plessey SL1600 Series"**
(SL1600 Series)
Describes the design of a simple AM receiver.
Plessey Semiconductor (7pp)

7 **"An SSB Transceiver for Citizens' Band Using Plessey SL1600 Integrated Circuits"**
(SL1600 Series)
Describes the design of an SSB transceiver.
Plessey Semiconductor (4pp)

8 **"Application of the CA3039E FM-IF Subsystem"**
(CA3089)
Discusses stability considerations and following circuits: quadrature-detector, audio and AFC, mute, tuning meter and rf-AGC, if amplifier/detector system and stereo decoder. Also covers operation at frequencies other than 10.7 MHz.
RCA ICAN-6257 (8pp)

Consumer, AM/FM (cont)

9 **"Binary Synthesizers Users Guide"**
Full details on components of a two-device binary synthesizer. Includes programming information.
Plessey Semiconductor (13pp)

10 **"Designing FM Tuners with TDA1062 and TDA1093 Integrated Circuits"**
(TDA1062, TDA1093)
Includes functional diagrams, schematics, and typical performance charts along with discussion of FM tuner design.
AEG-Telefunken (46pp)

11 **"Frequency Selective AM Detection Using Monolithic Phase-Locked Loops"**
(XR2228, XR215, XR2212)
Design of frequency selective coherent AM and AM/FM demodulator systems using these devices is described.
Exar AN-13 (4pp)

12 **"IF Amplifier/Detectors for FM Receivers"**
(SL6600, SL6640, SL6650, SL6690)
Describes monolithic ICs containing an IF strip, an FM demodulator and a squelch system for use in FM receivers for mobile, portable, base-station and paging systems. Provides circuit diagrams of typical applications and includes printed circuit layouts and component location.
Plessey (32pp)

13 **"Integrated Circuits for FM Broadcast Receivers"**
(CA3005, CA3011, CA3012, CA3013, CA3014)
Discusses circuits for FM tuner, IF amplifier, limiter, and detector applications.
RCA ICAN-5269 (7pp)

14 **"Integrated-Circuit Stereo Decoder Using the CA3090AQ Stereo Multiplex Demodulator"**
(CA3090AQ)
Gives circuit description. Describes the LC oscillator, reactance, stereo defeat, dc coupled flip-flop preamplifier and phase splitter circuits.
RCA ICAN-6259 (10pp)

15 **"Manual and Automatic FM Tuning System Using Economega I"**
(Economega, AY3-8203, ER1400, MEM4956)
Describes a system that allows manual tuning of a Goodman 1-20 tuner with non-volatile electronic storage of tuning data for 16 stations. Diagrams, schematic.
General Instrument Bulletin 0414 (4pp)

16 **"Radio Receiver Frequency Counter/Clock"**
Supplies diagram and operating instructions for using each device to display time or frequency on a 3½ digit display.
General Instrument Bulletin 0411 (3pp)

17 **"SL1600 Series Transceiver Applications"**
(SL1600 Series)
Discusses simple SSB and multimode transceiver design.
Plessey Semiconductor (32pp)

LINEAR

Consumer, AM/FM (cont)

"Scanning Logic for RF Scanner-Receivers Using CMOS Integrated Circuits"
See listing under (Digital) CMOS (Motorola)

1 **"TDA1083—Integrated Circuit for AM/FM Receivers"**
(TDA1083)
Shows external connections for using integrated receiver circuit in low and medium power AM/FM radios, VHF and microwave receivers, and in TV sound channels.
AEG-Telefunken Halbleiter Informationsdienst 2.78 (11pp)

2 **"TDA1200 FM-IF System for High Performance Radio Receivers"**
(TDA1200)
Gives a detailed description of the device. Describes relative performance of device when used in an FM tuner, an AM/FM car radio, and a portable AM/FM radio.
SGS-ATES Technical Note 117 (12pp)

3 **"The Design of Programmable Dividers for UHF and VHF Synthesizers"**
(SP8000 Series)
Details considerations for designing a programmable frequency synthesizer using high-speed frequency dividers and standard TTL devices. Example problems demonstrate device selection procedures.
Plessey AN2 (24pp)

4 **"ULN-2204A AM/FM Receiver System"**
(ULN-2204)
Presents operation of device and discusses typical applications.
Sprague AN-27121.51 (12pp)

5 **"VHF Synthesizer"**
(SP1648, SL1521, SP8690, SP8790, SP8760)
Describes a phase-lock loop synthesizer used in marine UHF radio telephone, weather broadcasts, air-traffic control and the amateur 2-meter band. Provides electrical diagrams and circuit board layout.
Plessey (3pp)

Consumer, Audio

"An AGC Building Block"
See (Linear) Consumer, TV (Interdesign)

6 **"An Electronic Music Synthesizer Using the XR2207 and the XR2240"**
(XR2207, XR2240)
The design of a simple, low-cost music synthesizer system is described.
Exar AN-15 (2pp)

7 **"An Electronic Piano Using the AY-1-1320"**
(AY1-0212, AY1-1320, AY1-5050)
Presents circuit diagrams and description of an electronic piano using a divider, a top octave generator and the device.
General Instrument Bulletin 0501 (5pp)

Consumer, Audio (cont)

8 **"Application of Audio Amplifier - Transistor Array ICs"**
(LM389)
Discusses the use of audio amplifier ICs with on-chip transistor arrays in a variety of audio circuits including a dc-dc converter, bistable touch switch, frequency standard, oscillator and logarithmic amplifier.
National Semiconductor AN-264 (5pp)

9 **"Application of the RCA CA3007 Integrated-Circuit Audio Amplifier"**
(CA3007)
Describes circuit. Covers application as dual-supply audio driver in a direct-coupled audio amp, and as single-supply audio driver in a capacitor-coupled audio amp.
RCA ICAN-5037 (4pp)

10 **"Applications for Audio and Electronic Music"**
(SSM2030, SSM2040, SSM2050)
Analysis of the 2030 voltage controlled oscillator, the 2040 voltage controlled filter and the 2050 transient generator in electronic music systems. Discusses error sources and techniques for improving accuracy and temperature stability. Circuit diagrams are included.
Solid State Micro Technology for Music (8pp)

11 **"Audio Amplifiers"**
Discusses basic design considerations, performance capabilities, and circuit configurations for audio amplifiers intended for a wide range of power-output levels. Covers preamplifiers, intermediate stages, overload protection circuits, as well as audio output circuits. Features circuit diagrams and per-data for a wide variety of practical circuits, including discrete-component types, integrated-circuit types, or a combination of discrete components and integrated circuits.
RCA APA-551 (104pp) $5.00

12 **"Build a Simple Comb-Filter or Flanger with a Bucket Brigade Delay Line"**
(SAD1024A)
Describes a flanger (electronic sound modifier) and what is needed to build one.
Reticon AN-113 (4pp)

13 **"Cassette Tape Players using TDA7270"**
(TDA7270)
Describes circuit operation and gives application guidelines for an IC that provides control functions for a cassette/radio unit.
SGS-ATES DN347 (8pp)

14 **"M252 and M253 Rhythm Generators for Electronic Organs"**
(M252, M253)
Defines and describes rhythm generators. Presents these two devices, and describes their use in electronic organs.
SGS-ATES Technical Note 131 (21pp)

15 **"MOS Music"**
(S10377, S10430, S50240)
Illustrates a basic electronic organ system and describes its implementation using the devices.
American Microsystems AN79C05 (6pp)

16 **"S8890 Rhythm Generator"**
(S8890)
Demonstrates capabilities of the S8890, and explains programming of custom ROM patterns.
American Microsystems AN79RR01 (11pp)

LINEAR

Consumer, Audio (cont)

"TCA600/900 and TCA610/910 Integrated Motor Speed Regulators"
See listing under (Linear) Industrial Control (SGS-ATES)

1 **"TDA105M—Cassette Recorder Preamplifier with ALC"**
(TDA1054M)
Discusses features of the device and preamplifier noise. Applications in Hi-Fi, stereo, and dynamic range compressors are described.
SGS-ATES Technical Note 124 (24pp)

2 **"Use of Analog Delay Lines for Audio Speed Change without Pitch Changes"**
(SAD1024A)
Describes technique for increasing or slowing the speed of a recording.
Reticon AN-112 (4pp)

3 **"Useful Noise—S2688"**
(S2688)
Explains noise types and workings of a noise generator. Examines use of device in Pink and White noise generators and as a noise source in synthesizer circuits.
American Microsystems AN79C01 (3pp)

4 **"Writing Music for the AY3-1350 Tunes Synthesizer"**
(AY3-1350)
Provides coding scheme for writing music to be incorporated in a PROM and played back by a music synthesizer chip.
General Instrument Bulletin 0502 (4pp)

Consumer, Medical

5 **"A Personalized Heart-Rate Monitor with Digital Readout"**
(MC1776, MC14013, MC14040, MC14572)
Describes digital heart-rate monitor using the MC1776 op amp and CMOS digital ICs.
Motorola AN-714 (4pp)

Consumer, TV

6 **"A Flexible Integrated-Circuit Color Demodulator for Color Television"**
(CA3067)
Describes circuit operation of the CA3067, including its output amplifiers, demodulator, demodulator preamp, and tint control amplifier. Describes use of this circuit in a red-green-blue system.
RCA ICAN-6724 (8pp)

7 **"A High Stability Syn-AGC and Horizontal-Vertical Countdown System for 525-Line Color Television Receiver Applications Using the RCA CA3154G and CA3157G Integrated Circuits"**
(CA3154, CA3157)
Provides detailed description of each circuit and how they are used in 525-line color TV applications. Contains schematics and waveforms for selected terminals.
RCA ICAN-6802 (20pp)

Consumer, TV (cont)

8 **"A Medium Cost PLL Varactor Tuning System Utilizing Off-the Shelf Logic"**
Describes a frequency domain tuning scheme for varactor TV tuners.
Motorola AN-729 (14pp)

9 **"A Single IC for the Complete PIX-IF-System in TV Receivers"**
(CA3068)
Gives a detailed description of the circuit functions of the CA3068 and its use in color and b/w TV receivers.
RCA ICAN-6303 (17pp)

10 **"A Synthetic Spectrum Tuning System for TV"**
Describes a tuning system which generates a complete spectrum of TV channel markers to achieve precise tuning on any channel.
Motorola AN-739 (12pp)

11 **"An AGC Building Block"**
(MONOCHIP)
Describes four AGC circuits using a semi-custom chip. Includes graphs of characteristics and schematics.
Interdesign APN-17 (6pp)

12 **"Application of the CA3126Q Chroma-Processing IC Using Sample-and-Hold Circuit Techniques"**
(CA3126Q)
Detailed circuit description of the device, which requires only one adjustment; a trimmer capacitor to tune the crystal filter. Discusses performance data, the phase detector, sample and hold circuits, the VCO loop, first chroma amplifier and ACC servo loop, and the second chroma amplifier.
RCA ICAN-6247 (8pp)

13 **"Application of the CA3143 and CA3144 TV Luminance Processors"**
(CA3143, CA3144)
Describes application information for both the CA3143 and CA3144 luminance processors.
RCA ICAN-6718 (4pp)

14 **"Application of the RCA CA3044 and CA3044V1 Integrated Circuits in Automatic-Fine-Tuning Systems"**
(CA3044)
Describes circuits, operating characteristics and dynamic performance of this wideband amplifier for AFC applications.
RCA ICAN-5831 (5pp)

15 **"Applications of the CA3134G Sound IF and Output Subsystem in Television Receivers"**
(CA3134)
Describes device and its application in TV sound systems.
RCA ICAN-6728

16 **"Description and Application of the RCA CA3120E and CA3142E Integrated-Circuit TV-Signal Processors"**
(CA3120E, CA3142E)
Gives circuit description and application instructions for two ICs that process video signals in monochrome or color TV receivers and supply noninverted and video outputs, dual-polarity composite synchronization signals and AGC signals.
RCA ICAN-6302 (9pp)

LINEAR

Consumer, TV (cont)

1 **"Economega I Digital Tuning for UK Televisions"**
(Economega)
Describes two eight program UHG band versions of the Economega System specificaly for U.K. market. Conventional AFC is retained for simplicity. Includes a manually controlled search feature.
General Instrument Bulletin 0420 (4pp)

2 **"Feedback-Type Volume-Control Circuit for RCA CA3041 and CA3042 Integrated Circuits"**
(CA3041, CA3042)
Describes several types of volume controls for television receivers using these ICs, with detailed discussion of feedback control.
RCA ICAN-5841 (4pp)

3 **"PAL Color Encoding Systems for the AY3-8500 TV Game Circuit"**
(AY3-8500)
Briefly describes the PAL system, then presents two alternate circuits for color encoding the AY3-8500 TV game according to PAL.
General Instrument Bulletin 0404 (8pp)

4 **"Programmable TV Timer/Time-Channel Display"**
(MM53107, MM53100, MM5840)
Describes an on-screen TV real time and channel display based on the devices. Includes schematics and PC board layout.
National Semiconductor AN-196 (10pp)

5 **"Remote Control of Color TV Sets via Infrared Transmission"**
(TDA4180, SAB2010, SAB2020, H843, SAS660, SAS770)
Describes design and operation of an infrared transmitter and receiver for remote control of a TV set. Controlled functions include power, brightness, color, sound volume and channel selection.
AEG-Telefunken Halbleiter Informationsdienst 2/66 (3pp)

6 **"Television Horizontal APC/AFC Loops: The Last 10 Percent"**
Discusses some of the common problems that may be encountered in the design of horizontal APC/AFC loops and methods to avoid or overcome them.
Motorola AN-727 (15pp)

7 **"Television Video IF Amplifier Using Integrated Circuits"**
(MC1330, MC1350, MC1352, MC1353)
Discusses requirements of the video IF section of a TV receiver. Describes MC1350/2/3 amplifier and MC1330 detector circuits. Includes design for a practical TV IF amplifier and detector.
Motorola AN-545A (11pp)

8 **"The MC1323—A Fully Programmable Demodulator"**
(MC1323)
Describes operation of this NTSC demodulator and use with various picture tube phosphors, especially color temperature D6500.
Motorola AN-763 (16pp)

Consumer, TV (cont)

9 **"Video Amplifier Design: Know Your Picture Tube Requirements"**
(MC1323)
Describes video systems designed to alleviate design compromises associated with driving a unitized gun picture tube.
Motorola AN-761 (26pp)

10 **"Video Game FM Sound Generator"**
Describes a system that enables a TV sound system to be used for game sounds as well.
General Instrument Bulletin 0405 (2pp)

Followers

"Monolithic Operation Amplifiers—The Universal Linear Component"
See (Linear) Amplifiers, Operational (National)

General

11 **"A Cookbook Approach to High Speed Data Acquisition and Microprocessor Interfacing"**
Shows how to design a complex data-acquisition system as a series of building blocks using a mixture of LSI, MSI, SSI and discrete devices.
Intersil Application Bulletin A020 (20pp)

12 **"A Guide to Hybrid Circuit Design"**
Discusses techniques that aid the hybrid designer in the design and development of thin and thick film hybrid MICRO CIRCUITS. Emphasis is placed on assembly techniques and procedures with general design rules that help to avoid common design problems.
Precision Monolithics AN-33 (4pp)

13 **"Alarm Circuit"**
(MONOCHIP)
Discusses an alarm sensing circuit capable of driving a loud speaker or LED or triggering a logic level. The design and performance is described in detail, including all component values, layout and characteristics over the military temperature range.
Interdesign APN-1 (7pp)

14 **"Analog Data Manual"**
Covers linear IC processing and design, data sheets and characteristics of operational amplifiers, video amplifiers, power controllers, timers, comparators, memory interfaces, transistor arrays, display drivers, D/A-A/D converters, PLL, microprocessor interface, and radio, audio and TV circuits. 1981.
Signetics $7.00 (448pp)

15 **"Applications Data Book"**
Contains Application Notes 1-17 individually described elsewhere.
Exar (80pp)

LINEAR

General (cont)

1 **"Bipolar Semi-Custom ICs in Non Entertainment Consumer Applications"**
(Monochips)
Discusses a semicustom approach to designing linear bipolar ICs in consumer, medical, telecommunications, military, industrial and automotive products.
Interdesign APN-24 (12pp)

2 **"Building Blocks for the Linear I.C. Designer"**
Presents approximate models for various basic circuit elements. Emphasizes key parameters of circuit and neglects complications.
Analog Devices (29pp)

"CMOS Linear Applications"
See listing under (Digital) CMOS (National)

3 **"Coil Driven Alarm Design Considerations"**
(ICM7220A)
Provides a simple circuit for boosting watch-circuit output to increase the volume of an audible alarm. Sample design problem is included.
Intersil Application Bulletin A031 (2pp)

4 **"Computer Analysis of Linear Semicustom IC's"**
(MONOCHIP)
Describes a computer aided design program jointly developed by Interdesign and UCC. Illustrates the use of this program by analyzing a high performance integrated phase-locked loop.
Interdesign APN-12 (6pp)

"Constant Current LED"
See listing under (Linear) Regulators (National)

5 **"Criteria for Choosing Resins and Evaluation Tests for Discrete and Integrated Power Devices in Plastic Packages"**
Describes the criteria and experimental procedures used in the choosing of moulding resin for plastic packaged devices.
SGS-ATES Technical Note 132 (15pp)

"Custom IC Design Using IL Technology"
See (Digital) IL (Exar)

6 **"Function Circuits, Design and Applications"**
Covers design theory and applications for such analog functions as multipliers, dividers, logarithmic amplifiers, exponentiators, RMS converters, and active filters. Includes notes on specifying and testing these functions.
Burr-Brown $24.50 (300pp)

7 **"General Solid State Gas/Smoke Detector Systems"**
Describes semiconductor and ionization chamber systems with some discussion of the use of these with CMOS ICs.
Motorola AN-735 (9pp)

8 **"IC Crystal Oscillators"**
(MONOCHIP)
Covers crystal oscillator basics and interfacing them with device.
Interdesign APN-4 (3pp)

General (cont)

9 **"Integrated High Speed Operational Amplifier"**
(MONOCHIP)
Explains how modern high speed, high stability circuits can be constructed using semicustom IC technology. A representative op amp with a bandwidth of 40 MHz and an open loop gain of 10,000 is presented.
Interdesign APN-7 (7pp)

10 **"Interface Databook"**
Primarily data sheets, but includes the following application notes individually described elsewhere: AN-22, 84, 108, 198, 199.
National $6

"Intrinsically Safe Data Acquisition"
See listing under (Digital) CMOS (Burr-Brown)

11 **"Linear Applications Handbook"**
Published 1980, includes National application notes (AN) 2-4, 13, 20, 21, 23, 24, 29-32, 41, 42, 46, 48, 56, 64, 69-72, 74, 75, 79, 81, 82, 87, 88, 97, 103, 104, 110, 115, 116, 125, 127, 129, 132, 146, 147, 151, 153, 154, 156, 159, 161, 173, 178, 179, 181, 182, 184, 192, 193, 210, 211, 222, 225, 233, 234, 238, 240, 241, 242 and Linear Briefs (LB) 1-29, 32-39, 40-50 individually described elsewhere.
National $16 (623pp)

12 **"Nonlinear Circuits Handbook"**
Covers principles, circuits, performance, specifications, testing and applications for multipliers, dividers, squares, log circuits, multi-function and rms-to-dc converters.
Analog Devices $5.95 (535pp)

13 **"Optoelectronics Handbook"**
Covers discrete LED lamps, LED numeric displays, multidigit numeric displays, bar graphs, and interface devices. Both product descriptions and applications included.
National $6 (160pp)

14 **"Polarity Programmable Peak Detector"**
Details a circuit that gives positive or negative peak detection and reset levels over a ± 10 V range.
Precision Monolithics AN-27 (2pp)

15 **"Rectifier Circuits for Linear IC's"**
(MONOCHIP)
Discusses techniques for designing rectifiers using the components available on semicustom IC's. Design precautions are examined in detail and illustrative diode, peak detector, and averaging rectifier circuits are presented.
Interdesign APN-6 (7pp)

16 **"Simplified Design of Astable RC Oscillators Using the CD4060B or Two CMOS Inverters"**
(CD4060B)
Stresses practical aspects of design and provides easy-to-use algebraic equations that permit values of R and C for a given oscillator frequency to be quickly determined.
RCA ICAN-6883 (2pp)

LINEAR

General (cont)

1 **"Solid-State Devices Manual"**
Provides tutorial information on discrete devices and ICs, with emphasis on consumer, hobbyist and experimenter applications.
RCA SC-16 $5.00 (750pp)

2 **"Summary of Electrical Characteristics of Some Well Known Digital Interface Standards"**
Summarizes the important electrical characteristics of the most commonly accepted interface standards (IEEE488, RS357, RS366, etc.) and offers recommendations on how to use the companies' products to meet those standards.
National AN-216 (15pp)

Industrial Control

3 **"A ROM-Digital Approach to PWM-Type Speed Control of AC Motors"**
Describes a pulse width modulation scheme to control motor speed. Shows a CMOS-ROM system to provide variable frequency drive for 1, 2, or 3 phase motors.
Motorola AN-733 (12pp)

4 **"A Variable Frequency Control for 3ϕ Induction Motors"**
Describes a variable frequency, variable voltage drive system for 3-phase inducton motor controls.
Motorola AN-766 (10pp)

5 **"Electronic Controller with an Equilibrium Sustaining Mode"**
(3500 Series)
Discusses a controller formed with two operational amplifiers in a pulse width modulation circuit with feedback. The feedback operates from a heater through the medium being heated to sense amplifiers.
Burr-Brown AN-63 (2pp)

6 **"Pulsed IR Light Barrier"**
(TDA4180P, U113B)
Describes electro-optical proximity-sensing system using a pulsed infrared light barrier. Provides circuit diagrams for receiver and transmitter, and includes curves for selecting external circuit RC values.
AEG-Telefunken Halbleiter Informationsdienst 1/77 (5pp)

7 **"TC900 and TC910 Integrated Motor Speed Regulators"**
(TCA900, TCA910)
Introduces speed regulator basic and describes device performance. Portable and car mounted applications are depicted.
SGS-ATES Technical Note 113 (10pp)

8 **"Temperature Measurement Method Based on Matched Transistor Pair Requires No Reference"**
(MAT-01, OP-10)
Discusses properties of matched transistor pairs, then describes temperature measuring systems built with a matched pair, constant current sources, and a differential amplifier (OP-10).
Precision Monolithics AN-12 (8pp)

Industrial Control (cont)

9 **"Variable Speed Control System for Induction Motors"**
(MC673, MC688)
Describes control scheme implemented with discrete components and IC logic coupled by an LED and a photo transistor. Gives example of a circuit used to drive a Class F, 60 Hz, permanent-split, capacitor induction motor with a 13 oz. in. load rating.
Motorola AN-575A (5pp)

10 **"μA7392 Motor Speed Controller"**
(uA7392)
Describes device operating principles and performance. Includes schematics, design considerations, and applications in a tape recorder, an optical tach, and for bidirectional motor control.
Fairchild AN-343 (20pp)

Instrumentation

11 **"4½ Digit Panel Meter Demonstrator/Instrumentation Boards"**
(ICL8052A, ICL7103A)
Describes two versions of the complete circuit for a 4½ digit DPM with ±2.000 V full scale and LED readout.
Intersil A019 (8pp)

12 **"A Complete Function Generator System Using the XR2206"**
(XR2206)
A self contained function generator system is described, using the device. Complete circuit connection diagram, parts list and assembly instructions are given for a DC to 100 kHz self-contained function generator system with AM/FM capability and triangle, sine and square wave output.
Exar AN-14 (4pp)

13 **"A Digital Multimeter Using the ADD3501"**
(ADD3501)
Describes a 3½ digit multimeter capable of measuring ac and dc voltages, currents and resistance with the device. Includes circuit diagram.
National AN-202 (4pp)

14 **"A Universal Sinewave Converter Using the XR2208 and XR2211"**
(XR2208, XR2211)
A circuit technique is described which can convert any periodic waveform into a low-distortion sinewave. The circuit operation is completely independent of input waveform amplitude and frequency as long as the input signal is periodic and can operate over a frequency range of 1 Hz to 100 kHz.
Exar AN-11 (4pp)

15 **"Building a Battery Operated Auto Ranging DVM with the ICL7106"**
(ICL7106)
Describes a technique for autoranging a battery-operated DVM suitable for panel-meter applications. Includes circuit ideas for measuring conductance, resistance and current, and for 9V and 5V supply operations.
Intersil Application Bulletin A046 (4pp)

LINEAR

Instrumentation (cont)

1 **"Building an Auto-Ranging DMM with the ICL7103A/8052A A/D Converter Pair"**
(ICL7103A, ICL8052A, ICL8007)
Describes the design and operation of two 10 μV resolution, 4½ digit auto-ranging DMMs using the 7103A/8052A pair.
Intersil A028 (6pp)

2 **"Design for a Battery Operated Frequency Counter"**
(ICM7208, ICM7207A)
Shows how to build a low-cost, battery-operated instrument for measuring both frequency and period, based around a crystal-controlled time-base circuit, a frequency-divider circuit and a counter-display chip. Includes circuit design and board layout.
Intersil Application Bulletin A015 (6pp)

3 **"Dual Polarity 3½ Digit DVM Realized with Simple CMOS Interface"**
(ADC3711, LF11300)
Describes an auto-zero, auto-polarity 3½-digit DVM using the LF11300 and the MM74C928 (ADC3711).
National AN-165 (2pp)

4 **"Everything You Always Wanted to Know About the 8038"**
(ICL8038)
Presents answers to the most frequently asked questions about the 8038 function generator and its applications.
Intersil A013 (4pp)

5 **"How to Build a Battery-Operated Auto-Ranging DVM with the ICL7106"**
(ICL7106)
Describes the design of an autoranging 3½ digit DVM using the ICL7106.
Intersil A046 (6pp)

6 **"Implementation of a Scanning Spectrum Analyzer Using the 2920 Signal Processor"**
(2920)
Reviews sampling theory and describes operation of a signal-processing chip used in spectrum analysis for speech processing, industrial control, medical electronics, signal detection and analog signal processing. Includes assembly code listings for processing functions.
Intel AP-29 (23pp)

7 **"Instrumentation Amplifiers—They're Great Problem Solvers When Correctly Applied"**
(MN2200)
Covers basic operation and application considerations for instrumentation amplifiers.
Micro Networks AN202 (4pp)

8 **"LD120/LD121 4½ Digit DVM"**
(LD120, LD121)
Details construction of a DVM using these devices.
Siliconix DA77-2 (4pp)

9 **"LM2907, LM2917 Tachometer/Speed Switch Building Block Applications"**
(LM2907, LM2917)
Covers basic circuit and use. Applications illustrated include: speed switch, analog display drive, automotive tachometer, motor speed controls, skid sensor, A/D converter, frequency doubler.
National Linear Applications Handbook AN-162 (16pp)

Instrumentation (cont)

10 **"Low Cost Digital Panel Meter Designs"**
(ICL7106, ICL7107)
Supplies complete assembly instructions for Intersil's LCD and LED evaulation kits as well as descriptions of individual components.
Intersil A023 (6pp)

11 **"RMS Converters and Their Applications"**
(LH0091)
Covers RMS converter basics and specifications. Sketches applications including spectrum analysis, harmonic distortion, noise, vibration analysis, and DVM uses.
National Special Functions Databook AN-180 (4pp)

12 **"Solid State Altimeter for Transponder Applications"**
(LX3702)
Describes a solid state altimeter using a pressure transducer. The unit provides an altitude transmission code for use with transponders, plus digital readout.
National AN-109 (8pp)

"The Integrating A/D Converter"
See (Interface) Converters (Intersil)

13 **"Thermometer for Albacore Fishing"**
(MONOCHIP)
Discusses characteristics of a thermometer used for albacore fishing built on a semi-custom chip. Includes schematic and block diagram.
Interdesign APN-21 (3pp)

14 **"Waveform Generator"**
(MONOCHIP)
Describes using two of the devices in a wave form generator application that produces sine, triangle, and square wave outputs. Provides schematics and a discussion of performance.
Interdesign APN-8 (10pp)

Modulators

15 **"Deadband Control with the SG1524 Regulating Pulse Width Modulator Circuit"**
(SG1524, SG2524, SG3524)
Discusses techniques to control the amount of deadband in push-pull inverter applications.
Silicon General Linear Brief 6 (1pp)

16 **"Designing with the SG1525/1527 Series of Pulsewidth Modulators"**
(SG1525, SG1527)
Discusses application of pulsewidth modulator ICs in a variety of output configurations, including bipolar power transistor, power FET, low-power transformer and single ended.
Silicon General ANSG1525/1527 (7pp)

17 **"Simplifying Converter Design with a New Integrated Regulating Pulse Width Modulator"**
(SG1524, SG2524, SG3524)
Describes various functions within the device and describes such applications as a low current polarity converter, a DC to DC converter, and a +5 to ±15V flyback converter.
Silicon General (7pp)

LINEAR

Multiplier

1 **"Log/Lin Multiplier"**
(MONOCHIP)
Describes an IC multiplier which achieves low noise and distortion. Covers all phases of development from initial concept and breadboarding to integration in an audio sweep function generator.
Interdesign APN-3 (11pp)

Multipliers

2 **"Analog Multiplier"**
(RC4200)
Includes functional description, electrical characteristics and circuit designs for multiplier and divider, square root, squaring and rms-to-dc converter circuits.
Raytheon (23pp)

3 **"Analog Shaping"**
(4301)
Describes the use of the 4301 multifunction circuit which has the transfer function XY/Z. Includes rms to dc conversion, exponentiation, trigonometric functions, vector computation, and use as a log amp.
Burr-Brown AN-70 (5pp)

"Function Circuits, Design and Applications"
See listing under (Linear) General (Burr-Brown)

4 **"Linear-Antilog Voltage Controlled Amplifiers"**
(SSM2000, SSM2020)
Discusses control circuits, voltage controlled amplifiers, and a four quadrant multiplier among other applications.
Solid State Micro Technology for Music (9pp)

5 **"Multiplier Application Guide"**
(AD530, AD531, AD532, AD533, AD534, AD536)
Explains multiplier basics, upkeep, and use in a variety of applications including instrumentation functions, signal generators and filters, and to augment the performance of other circuits.
Analog Devices (40pp)

6 **"Wideband Amplifier/Multiplier"**
(SG1402)
Operation and applications of the SG1402. Describes use as a single-ended variable gain amplifier, a modulator, and a demodulator.
Silicon General Linear IC Product Guide (4pp)

Phase Locked Loops

"A Medium Cost PLL Varactor Tuning System Utilizing Off-the-Shelf Logic"
See listing under (Linear) Consumer, TV (Motorola)

Phase Locked Loops (cont)

7 **"A New Generation of Integrated Avionic Synthesizers"**
Discusses several different types of servo phase locked loop systems and describes a synthesizer for avionic equipment.
Motorola AN-553 (9pp)

"A Phase-Locked Loop Tuning System for Television"
See listing under (Linear) Consumer, TV (Motorola)

8 **"A Wide Tracking Range Precision PLL System Using the XR2212 and XR4151"**
(XR2212, XR4151)
A two-chip PLL system is described which offers extremely wide tracking range without harmonic locking.
Exar AN-12 (3pp)

9 **"Applications of the COS/MOS CD4059A Programmable Divide-by-N Counter: Digital Frequency Synthesis for FM Tuners and CB Transceivers"**
(CD4059)
Discusses frequency synthesis using the counter for an FM digital tuner and a CB transceiver.
RCA ICAN-6374 (12pp)

10 **"Crystal Switching Methods for MC12060/MC12061 Oscillators"**
(MC12060, MC12061)
Discusses methods of using diodes as rf switches to select crystals for these oscillators. The techniques are useful for electronic selection of one of a group crystals with minimum disturbance to the series resonant frequency of the selected crystal.
Motorola AN-756 (5pp)

11 **"Low-Power Digital Frequency Synthesizers Utilizing COS/MOS ICs"**
(CD4000 Series)
Reviews digital phase-locked loops. Describes their implementation with CMOS for use in FM receiver synthesizers, both heterodyne and prescaling types.
RCA ICAN-6716 (15pp)

12 **"Phase-Locked Loop Design Fundamentals"**
(MC4016, MC4024, MC4044, MC4316, MC4324, MC4344)
Outlines fundamental-design concepts for phase locked loops implemented with ICs. Gives equations using Laplace Transforms needed to evaluate the basic loop performance and briefly describes a design using MC4000 series devices.
Motorola AN-535 (11pp)

13 **"Precision PLL System Using the XR2207 and the SR2208"**
(XR2207, XR2208)
Defines phase locked loop parameters and describes this two-chip PLL system. Includes circuit interconnections for both single supply and split-supply operation. Also gives PLL design equations.
Exar AN-06 (6pp)

©IC MASTER

LINEAR

Phase Locked Loops (cont)

1 **"SL650 Phase-Locked Loop Applications"**
(SL650, SL651)
Describes the circuit and application of this device that can operate to 0.5 MHz. Applications: Modulators-AM, FM, FSK, PAN, SCAM, tone burst, phase shift, delta, PWM, Waveform Generators-sine, triangle, mark/space ratio, staircase: Demodulators; Modem Systems, and a Digital Voltmeter.
Plessey Semiconductor SL650 Applications (32pp)

2 **"Sinusoidal Output from XR-215 Monolithic PLL Circuit"**
(XR215)
Discusses obtaining a sinusoidal output signal which is synchronozed to a desired reference or clock output using the device. Provides schematics of device and application.
Exar AN-09 (2pp)

3 **"The RCA COS/MOS Phase-Locked-Loop: A Versatile Building Block for Micro-Power Digital and Analog Applications"**
(CD4046A)
Discusses PLL basics, characteristics of device, and circuit elements. Describes application in FM demodulation, a frequency synthesizer, split-phase synchronization and decoding, and PLL lock detection.
RCA ICAN-6101 (4pp)

4 **"The Solid State Scientific Phase-Locked Loop"**
(SCL4046B, SCL4446B)
Reviews fundamentals and design considerations of phase-locked loops and briefly describes application in FM demodulation, frequency shift keying, PLL lock detection, AM detection, frequency synchronization, signal conditioning and frequency synthesis.
SSS AN-112 (15pp)

Photosensitive Devices

5 **"Applications of Reticon Photodiode Arrays in Electron and X-Ray Detectors"**
(RL Series)
Describes the use of self-scanning photodiode arays for detecting soft X-rays (1 to 10A) and electrons in the 10 to 100 KEV range.
Reticon AN-101 (4pp)

6 **"Light Sense"**
Covers optoelectronic sensors and systems including light activated switches and selfscanned photodiode arrays.
Integrated Photomatrix $12.95 (147pp)

Power Control

7 **"Applications of the VN10KM MOS Power FET"**
(VN10KM)
Reviews MOS power technology and characteristics, including load considerations, techniques for interfacing to logic circuits, drive techniques, and example applications.
Siliconix AN79-7 (8pp)

Power Control (cont)

8 **"Controlling Secondary Breakdown in Bipolar Transistors"**
(LT10)
Describes a resistive ballasting technique that allows bipolar single and Darlington power transistors to operate at higher voltages and power densities by controlling secondary breakdown.
National Semiconductor TP-16 (4pp)

"Features and Applications of RCA IC Zero-Voltage Switches"
See listing under (Interface) Switches. (RCA)

9 **"ICs for Phase and Burst Control of SCR of Triac"**
(L120, L121)
Examines 12 ICs which are suitable for SCR and Triac firing. Description includes diagrams, equations, and applications in ON-OFF control and proportional control.
SGS-ATES Technical Note 116 (12pp)

10 **"Motor Speed Applications Using the TDA1085A"**
(TDA1085A)
Discusses control of line-powered resistive and inductive loads using phase control in closed-loop system with tacho-frequency or analog voltage feedback.
Plessey Semiconductor (20pp)

11 **"Phase Control U111B"**
(U111B)
Provides detailed circuit description of bipolar IC forming the heart of a phase controller for varying power to household appliances. Includes example application for controlling universal motor speed.
AEG-Telefunken Halbleiter Informationsdienst 10.78 (16pp.)

12 **"Phase Control of AC Power with the SL440"**
(SL440)
Describes the operation of the SL440 power control circuit, and supply requirements. Applications include use with inductive loads, three phase systems, lighing, heating, motor and power supply control.
Plessey Semiconductor (38pp)

13 **"Some Applications of a Programmable Power Switch/Amplifier"**
(CA3094)
Brief circuit description of CA3094. Device delivers three watts average power, 10 watts peak power to external load. Applications include Class A power amplifiers and driver amplifiers for complementary transistors, wideband power multivibrators, oscillators, comparators, voltage regulators, analog timers, and motor-speed controllers.
RCA ICAN-6048 (12pp)

14 **"The Power MOSFET, a Breakthrough in Power Device Technology"**
(IVN5200, IVN5201)
Describes geometries of various power FET devices and discusses their operating limitations, linear characteristics, safe operating areas and radiation effects.
Intersil A033 (14pp)

15 **"Triac Phase Control Circuits"**
(MONOCHIP)
Illustrates a phase control circuit fabricated on a semi-custom chip. Device provides power supply, 60 Hz zero crossing detector and pulse generator, time delay ramp generator, and triac tigger pulse generator.
Interdesign APN-15 (7pp)

LINEAR

Power Control (cont)

1 **"Two-Point Driver to Temperature Controlling of Inductive Loads with U106BS"**
(U106BS)
Describes use of an integrated zero-crossing switch to control an air-conditioner compressor motor for maintaining a preset temperature.
AEG-Telefunken Halbleiter Informationsdienst 4.77 (4pp)

2 **"Using the Power MOSFET as a Switch"**
(IVN6000, IVN5200, IVN5001)
Details the fine points of power MOSFETs with discussions on switching and conduction characteristics, power loss and junction temperature calculation, 50A, dV/dt limitations and multiple device operation.
Intersil A036 (32pp)

3 **"Using the VN64GA High Current, High Power MOS Power FET"**
(VN64GA)
Covers geometry and operating characteristics of MOS power FETs; including examples of linear and switching applications.
Siliconix AN79-5 (6pp)

4 **"Zero-Voltage Switch U217B is Two-Step Temperature Controller with Superimposed Proportional Behavior"**
(U217B)
Offers circuit description and diagrams for applying a zero-voltage switch in a proportional temperature controller.
AEG-Telefunken Halbleiter Informationsdienst 12.78 (2pp.)

Power Supplies

5 **"Output Supervisory Circuits: A New Family of Power Supply Control Devices"**
(SG1543)
Describes ICs that monitor and control the outputs of sophisticated power supplies. Functions provided include overvoltage and undervoltage sensing, current sensing and SCR crowbar firing.
Silicon General AN1542, 1543, 1544, 3523 (8pp)

6 **"Power Supply Building blocks"**
(MONOCHIP)
Describes circuit blocks used in power supply circuits. They include: bandgap voltage regulator, bandgap reference, zener reference and amplifier, start-up circuit, differential amplifier stage, and Darlington pass transistor. Includes schematics.
Interdesign APN-18 (5pp)

7 **"Power Supply Circuits Head for Simplicity by Integration"**
Describes several integrated circuits designed specifically for simplifying switching power supply control and improving circuit reliability.
Silicon General (10pp)

8 **"Power Supply Design Using the ICL8211 and ICL8212"**
(ICL8211, ICL8212)
Describes use of these devices as positive and negative voltage regulators, constant current sources, high voltage and overvoltage protection circuits, supply window detectors and power failure-shutdown systems.
Intersil A027 (8pp)

Power Supplies (cont)

9 **"Power Switch Drivers: New IC Interface Building Blocks for Switched-Mode Converters"**
(SG1627, SG1629)
Details the characteristics and performance of the SG1627/9 designed to interface between the control circuitry for switch mode converters and their high power output stages.
Silicon General (8pp)

10 **"Protect Your Switchers with Digital Current Limiting"**
(SG1549)
Describes operation and application of a current sense latch IC in switching power supplies to provide pulse-by-pulse current limiting.
Silicon General ANSG1549 (4pp)

11 **"Switchmode Converter Topologies — Make Them Work for You"**
Provides a broad view of the variety of switch-mode converter topology options available. Discusses synthesis procedures for modifying known circuits and generating new circuits including duality, bilateral inversion and combinations of regulators and dc transformers.
Intersil A035 (32pp)

12 **"The Design of Switchmode Converters Above 100 kHz"**
Comprehensive discussion of circuit topology, components, and layouts in designing high frequency converters. Discusses cost tradeoffs and size/volume reduction tradeoffs.
Intersil A034 (20pp)

13 **"The Integration of Switching Power Supply Circuitry"**
(SG1525/1527, SG1526)
Reviews past approaches for controlling switching power supplies, and describes new ICs with integrated control/driver functions.
Silicon General (9pp)

14 **"The Output Supervisory Circuit: A New Analog LSI Circuit For Power Supply Control"**
(SG1543, SG2543, SG3543)
Describes the SG1543, an IC that monitors and controls the output of a power supply system. Includes diagrams, schematics and typical applications.
Silicon General (7pp)

Preamplifiers

"Audio Handbook"
See listing under (Linear) Consumer, Audio (National)

15 **"Audio Preamplifiers"**
(MONOCHIP)
Provides schematics and parameters for using the device in three separate preamplifier configurations.
Interdesign APN-11 (6pp)

LINEAR

Regulators

1 **"A New Approach to Switching Regulators"**
Describes a 24 volt 3 ampere switching mode supply which operates at 20 kHz from as 120 volt AC line with 70% efficiency. Briefly discusses load-line shaping to reduce power losses and to reduce noise.
Motorola AN-719 (11pp)

2 **"A Switching Regulator Using the SH1605"**
(SH1605)
Discusses switching regulator theory, device parameters, and a design example.
Fairchild AN-341 (3pp)

3 **"Applications of the CA3085 Series Monolithic IC Voltage Regulators"**
(CA3085)
Circuit description of positive regulators with output currents up to 100 milliamperes from −55°C to +125°C. Applications include high-current and constant-current regulators; switching, dual-tracking and high-voltage regulators. Use as a general purpose amplifier, and various methods of current limiting are mentioned.
RCA ICAN-6157 (11pp)

4 **"CA1524G Series Offers Efficiency in Power-Supply Designs"**
(CA1524G)
Describes the features, capabilities, and operation of the CA1524G series of pulse-width-modulated switching regulators and explains the advantages offered by this series in switching power-supply designs. Also lists power devices recommended for use with CA1524G-series IC's in various switching power-supply configurations.
RCA MSR-310 (12pp) .65¢

5 **"Control Circuit Unit and Application Manual"**
(uPC1042)
Describes control circuit unit used for board testing of the switching regulator control circuit (μPC1042). Provides application schematics, components table, and wiring diagrams.
NEC Electron (5pp)

6 **"Designing Around the L200 Variable Voltage/Current Regulator IC"**
(L200)
Discusses circuit designs for variable voltage and current regulators, motor-speed control, remote voltage control and battery chargers.
SGS-ATES DN318 (7pp)

7 **"L200 1A/15V Switch Mode Regulator"**
(L200)
Provides circuit-design equations and discusses application constraints for using a programmable voltage and current regulator as a switching power-supply regulator.
SGS-ATES DN319 (8pp)

Regulators (cont)

8 **"MOE 6047 Building Block"**
(MONOCHIP)
Discusses circuit with a bandgap regulator and matched current sources for use in D/A converters or as precision current sources. Provides schematics and test data.
Interdesign APN-19 (5pp)

9 **"Protect your Switchers with Digital Current Limiting: A New Current Sense Latch IC Provides Pulse-by-Pulse Control"**
(SG1524)
Discusses operation of a current sensing latch that operates at power supply switching frequencies for fast turn-off on current overload.
Silicon General SG1524 (4pp)

10 **"Resolving the Problems of Switching Mode Power Supplies with the ZN1066"**
(ZN1066)
Describes switching mode power supplies and problems involved in using, including current limit and switching transistor protection, low voltage cutoff, and impulse starting.
Ferranti (20pp)

11 **"The 4195 Regulator"**
(RC4195, RM4195)
Describes application as a ±15 v, 100 ma regulator; a ±2.5 a regulator; a ±15 to ±150 v unit, or a complementary ±3 to ±27 v device.
Raytheon Semiconductor (9pp)

12 **"Using a Dual-Polarity, Tracking Voltage Regulator"**
(SG1501, SG2501, SG3501)
Describes the circuit and use of the SG1501 series of dual regulators.
Silicon General Applications Bulletin 1 (6pp)

13 **"Voltage Regulator Handbook"**
(LM109, LM117, LM120, LM123, LM125, LM129, LM136, LM137, LM150, LM199, LM320, LM340, LM341, LM7800, LM78L00)
Covers product selection; heat flow and thermal resistance; commercial and custom heat sinks; applications of positive, negative and dual regulators; power supply design and includes data sheets for the product families listed above.
National Voltage Regulator Handbook, $7.00 (139pp)

14 **"μA78S40 Switching Voltage Regulator Applications (Revised)"**
(uA78S40)
Introduces device parameters and operations. Includes design equations and block diagrams.
Fairchild AN-344 (13pp)

LINEAR

Thermal Considerations

1 **"A Simple Thermal Analysis Program for Integrated Circuits"**
(MONOCHIP)
Presents a thermal analysis program for determining the temperature at any point on an IC.
Interdesign APN-16 (7pp)

"Low Cost LED Thermometer"
See listing under (Linear) Transducers. (National)

"Micropower Thermometer"
See listing under (Linear) Transducers. (National)

2 **"Mounting Procedure for, and Thermal Aspects of, Thermopad Plastic Power Devices"**
Covers various methods of mounting and heat-sinking Motorola case number 77, 90, and 199 plastic power devices. Also discusses thermal resistance considerations, lead forming, and circuit board cleaning.
Motorola AN-290B (9pp)

3 **"Mounting Techniques for Metal Packaged Power Semiconductors"**
Discusses preparation of mounting surfaces, using thermal compounds, and fastening techniques. Gives typical interface thermal resistance for a number of packages.
Motorola AN-599 (5pp)

4 **"Transient Thermal Resistance—General Data and Its Use"**
Discusses transient thermal resistance and its use and describes methods using various degrees of approximations to determine the junction temperature rise of a device. Also covers the concept of a duty cycle family of curves to simplify calculation of junction temperature rise under a repetitive pulse train.
Motorola AN-569 (15pp)

Timers

5 **"A 4-Digit, 7-Function Stop Watch/Timer"**
(MM5865)
Gives detailed instructions for the circuit and construction of a 4-digit, 7-function timer with a display resolution of 0.01, 0.1, and 1 second, using the MM5865.
National MOS/LSI Databook AN-169 (14pp)

6 **"MM5865 Universal Timer Applications"**
(MM5865)
Provides block diagram and system description, discusses general timing and programming capabilities, suggests timing and counting applications.
National MOS/LSI Databook AN-168 (10pp)

7 **"Precision Timer"**
(ZN1034E)
Explains the device and its use in various applications including a wiper control, a metronome, and a battery charger.
Ferranti Electric (19pp)

Timers (cont)

8 **"Single-Chip Frequency Synthesizer Employing the XR2240"**
(XR2240)
Describes use of this timer/counter as a single-chip frequency synthesizer: fo = f, (m/n + 1) Where fo <200 kHz. Describes generating 100 Hz synchronized to 60 Hz line.
Exar AN-07 (3pp)

9 **"The LX1602A Pressure Transducer and Altimeter Applications"**
(LX1602A)
Describes how to use this transducer along with additional electronics to build an altimeter that operates over a range of −1,000 feet to +50,000 feet.
National AN-91 (3pp)

10 **"Using National Clock Integrated Circuits in Timer Applications"**
(MM5309, MM5311, MM5312, MM5315)
Describes demultiplexing techniques to generate time intervals and low frequency square waves. Gives as an example a failsafe lighting timer.
National MOS/LSI Databook AN-143 (4pp)

Transducers

11 **"Accuracies of the AD590"**
(AD590)
Tables of maximum errors for device by grade involving limited temperature spans.
Analog Devices (4pp)

12 **"Application Circuits of Temperature Sensor and Temperature Controller IC's"**
(uPC616, uPC3911)
Provides device characteristics and four basic applications with diagrams.
NEC Electron (6pp)

13 **"Crystal Oven Controller and Precision Voltage Reference"**
(LM199, LM299, LM399, LM199A, LM299A, LM399A)
Shows the use of the LM199 both as an oven temperature controller and a voltage reference at the same time.
National Linear Applications Handbook LB-31 (2pp)

14 **"Installation Ideas for Pressure Transducers"**
(LX1600, LX1700, LX1400, LX1701)
Provides suggestions for mounting National transducers for various applications. Includes diagrams and typical mounting configurations.
National AN-92 (4pp)

15 **"LX Series Pressure Transducers: Design and Applications Information"**
(LX1600A, LX1601A, LX1602A)
Describes hybrid transducer circuit and applications, including pressure to frequency converter, latching altitude detector, digital readout barometer and altimeter.
National AN-94 (8pp)

© IC MASTER

LINEAR

Transducers (cont)

1 **"Pressure Transducer Handbook"**
Supplies product descriptions and talks about related topics including installation, fluid flow, auto-referencing and signal conditioning. Covers applications in the acoustic, medical, and automotive areas.
National Semiconductor $3 (130pp)

2 **"Pressure Transducer Load Cell"**
(LX1700G)
Describes use of LX1700G pressure transducer to measure weight.
National AN-95 (4pp)

3 **"Pressure Transducers as Accelerometers"**
(LX1700G)
Discusses uses of accelerometers and describes scheme of converting LX series pressure transducers to cover ranges from fractions to thousands of g's.
National AN-96 (4pp)

4 **"REF-02 Temperature Controller"**
(CMP-02, REF-02)
Describes temperature control using the REF-02 and the CMP-02 comparator.
Precision Monolithics AB-4 (1pp)

5 **"The Multi-Level Switch Kit, Part No. SK1007"**
Details the use of any LX series pressure transducer to produce a high level analog output as well as three independent switch points.
National TB-1 (2pp)

6 **"Thermometer Application of the REF-02"**
(REF-02)
Discusses thermometer essentials bandgap voltage reference theory, and basic circuit design using device.
Precision Monolithics AN-18 (4pp)

7 **"Transducer Fluid Filled Option"**
Describes the "Fluid-Filled" methods of protecting transducers from hostile environments. Rates the resistance of silicone rubber to some common fluids.
National TB-8 (2pp)

8 **"Transducer Interfacing Handbook"**
Basic guide to analog signal conditioning required to excite and amplify the output of commonly used input transducers. Describes over 100 applications to the most popular kinds of transducers for sensing temperature, pressure, force, flow and level.
Analog Devices $14.50 (254pp)

9 **"Transducer Sensor Diaphragm 15 Million Cycle Life Test"**
Findings in the continuing test of National's transducer sensing elements—a silicon membrane approx. 1 mil thick.
National TB-3 (1pp)

Transducers (cont)

10 **"Transducers in Fluid Flow Applications"**
(LX1602A)
Discusses application of LX1602A in pressure vessel, open flow and closed flow applications.
National AN-93 (8pp)

11 **"Use of the SK1007 Pressure Transducer Kit in Vault Alarm Systems"**
Describes application of this multi-level switch kit with a pressure transducer in vault alarm systems.
National TB-7 (2pp)

Voltage References

12 **"A Micropower Voltage Reference"**
Describes a voltage reference made by operating a JFET slightly below pinch-off along with an op amp to convert current to voltage.
National Linear Applications Handbook LB-34 (2pp)

"Crystal Oven Controller and Precision Voltage Reference"
See listing under (Linear) Transducers (National)

MEMORY

Analog

1 **"A Programmable Binary-Analog Correlator"**
(BAC-32)
Describes device and its capability to perform various mathematical operations like convolution and correlation. Applications such as filtering, correlation, decoding, and chirp detection are shown.
Reticon AN-106 (14pp)

2 **"A Tapped Analog Delay for Sampled Data Signal Processing"**
Introduces tapped analog delays and gives various applications previously accomplished by digital techniques.
Reticon AN-105 (11pp)

3 **"A Time Base Compressor for Low-Frequency Chirp-Z Transforms"**
(R5601)
Examines time base compression (TBC) of data recorded for analysis. Illustrates implementation of a TBC system using the device and low-cost digital memories. Block and timing diagrams are supplied.
Reticon AN-115 (18pp)

4 **"Acoustic Applications of Serial Analog Delay Devices"**
(SAD1024)
Covers use in reverberation, vibrato, chorus, wow and flutter control plus considerations in using this device.
Reticon AN-104A (8pp)

5 **"Analog Analog Correlator/Convolver"**
Presents an LSI discrete-time processing device capable of performing the convolution or correlation of two analog signals at clock rates up to 5 MHz.
Reticon AN-116 (4pp)

6 **"Charge Transfer Devices for Sampled-Data Processing"**
Discusses the application of charge transfer devices to analog and digital signal processing. Compares CTD devices. Describes Tapped Analog Delay, the Binary Analog Correlator, the Analog Correlator and the Transversal Filter.
Reticon AN-114 (11pp)

7 **"MOS Delay Lines"**
(DM8000, DM8510, DM8830)
Covers use of MOS shift registers to build delay lines.
National MB-4 (2pp)

8 **"Serial Operation of Clocked Analog Delay Lines to Obtain Long Delay"**
(SAD1024A)
Describes advantages, coupling, and performance of device.
Reticon AN-109 (8pp)

Character Generators

9 **"128 Characters with the DM8678"**
(DM8678)
Describes the control logic necessary to generate 128 characters and attributes.
National Memory Applications Handbook (9pp)

10 **"7 x 9 Display Character Generator"**
Uses three MOS ROMs and some TTL logic to create a font of 64 7 x 9 dot-type characters. A circuit diagram and suggested character forms are provided.
National MB-13 (2pp)

11 **"DM8678 Bipolar Character Generator"**
(DM8678)
Explains the operation of the device and the various features which include circuit address latches, the line counter, the 7-bit shift register, and the output buffer.
National AN-167 (4pp)

12 **"DM8678 Character Generator Emulator"**
(DM8678)
Describes a field programmable emulator to be used when developing new character fonts or graphic symbol sets for the DM8678.
National Memory Applications Handbook (2pp)

13 **"Digital Display Systems"**
Using TTL compatible MOS ROMs to generate displays. Gives circuit diagrams and a sample readout.
National MB-8 (2pp)

"The Systems Approach to Character Generators"
See listing under (Memory) ROMs. (National)

EAROMs

14 **"Data Retention Testing of ER3400"**
(ER3400)
Describes nondestructive analog-test procedure for determining EAROM data-retention capability.
General Instrument Bulletin 1210 (1pp)

15 **"EAROMs Replace Mechanical Switches"**
(ER1400)
Reports how CRT terminal makers use EAROMs to replace DIP switches to lower costs, reduce parts count, improve reliability and obtain field programmability of hardware options.
General Instrument Bulletin 1209 (3pp)

16 **"Electronic Digital Lock"**
(ER2050)
Schematic and description of an 8-digit electronic lock that has 4 different "open" codes and a programming mode that allows any of the codes to be changed.
General Instrument Bulletin 1206 (3pp)

© IC MASTER

MEMORY

EAROMs (cont)

1 **"Microprocessor Interface to the NCR 3400 Word Alterable ROM"**
(3400)
Block diagrams and discussion show how to interface an MNOS memory chip to the 8085, 8088 and 8086 microprocessors.
NCR (3pp)

2 **"Microprocessor Interfaces to the ER1400 EAROM"**
(ER1400)
Shows how to interface a serial I/O EAROM with four popular microprocessors using a variety of techniques.
General Instrument Bulletin 1207B (5pp)

3 **"NC7033 Interfacing with Microprocessors"**
(NC7033)
Gives theory of operation for MNOS memory transistors and discusses typical applications. Emphasizes direct interfacing techniques for the 8085 and 8080 microprocessors. Tables provide main program routines, subroutines and key sequences.
Nitron AN-101

4 **"NCR High-Density Nonvolatile Memory Family"**
(2168, 2161, 1734)
Discusses timing considerations and provides circuit diagrams and instructions for operating WAROMs, EAROMs and NVROMs with a microprocessor.
NCR (10pp)

5 **"The Role of Non-Volatile Memories in Consumer Electronics"**
Briefly describes MNOS technology, updating EAROMs, and use of EAROMs to store data, to keep track of system status, and store programs for microcontrollers.
General Instrument Bulletin 1202 (3pp)

General

6 **"10155 Content Addressable Memory (CAM)"**
Because of the associative architecture of the CAM, it is ideally suited for data "search" operations. The CAM has been found useful in applications such as file operations, list searching, traffic control, artificial intelligence, language translation, matrix manipulations, and cache memory control.
Signetics AN-004 (8pp)

7 **"Applying Modern Clock Drivers to MOS Memories"**
(DS0025, DS0026)
Covers use of 0025/26 drivers in MOS memory systems. Information includes selection of packages and heat sinks, power dissipation, rise and fall time, power supply decoupling, system clock line ringing and crosstalk, input coupling techniques, and sample calculations.
National Special Functions Databook AN-76 (12pp)

8 **"Error Detection and Correction Using SN54/74LS630 or SN54/74LS631"**
(SN54LS630, SN54LS631, SN74LS630, SN74LS631)
Discusses the need for improved error detection systems and the use of the SN54/74LS630/1 for reducing downtime in large memory boards.
Texas Instruments CA-201 (18pp)

General (cont)

9 **"Memory Applications Handbook"**
Contains assorted applications material on memory products manufactured by National Semiconductor. Individual application notes described and listed elsewhere.
National $11.00 (206pp)

10 **"Semiconductors for Plated-Wire Memories"**
(MC4006, MC4007, MC4038, MC4040, MC4043, MC1514, MC1546)
Discusses operation and electrical characteristics of plated wire memories. Covers applications of drivers, sense amplifiers, and decoders as interface circuits. Also discusses memory organization and memory-related semiconductor applications.
Motorola AN-533 (15pp)

11 **"Using Slower Memories with the VIS Display System"**
(CDP1869, CDP1870)
The scheme described nearly doubles memory access time of the system and permits use of memories approximately half as fast as those normally required with the VIS system.
RCA ICAN-6889 (4pp)

Microprogramming

"How to Design with the 8X02 Control Store Sequencer"
See listing under (Microprocessor) Systems (Signetics)

"Signetics Micro Assembler Reference Manual"
See listing under (Microprocessor) Programming (Signetics)

"Tri-State Logic in High Speed Memories of Microprogrammed Computers"
See listing under (Digital) TTL, General (National)

PROMs

12 **"32K EPROM Decision TMS2532 or Intel 2732"**
(TMS2532, 2732)
Compares two devices as to operation, microprocessor compatibility, plus timing and electrical parameters.
Texas Instruments Application Report MM9010 (12pp)

13 **"A Guide to Implementing Logic Functions Using PROMs"**
Illustrates techniques for using PROMs to efficiently emulate logic functions. Block diagrams provided.
National Memory Applications Handbook (4pp)

14 **"A PROM Programmer for the SC/MP LCDs"**
(MM4204, MM5204)
Provides a method for the user of the SC/MP LCDs to program MM4204 PROMs. Using wire-wrap techniques the user can construct a programmer that plugs into the SC/MP LCDs backplane and programs a 512 x 8 PROM in 10 seconds.
National Memory Applications Handbook AN-189 (23pp)

MEMORY

PROMs (cont)

1 **"Bipolar Generic PROMs"**
(Am27LS18, Am27LS19, Am27S18, Am27S19, Am27S50, Am27S21, Am27S12, Am27S13, Am27S15, Am27S25, Am27S26, Am27S27, Am27S28, Am27S29, Am27S30, Am27S31, Am27S32, Am27S33, Am27S810, Am27S181, Am27S184, Am27S185)
Includes a bipolar PROM cross-reference guide and a technical report that reviews manufacturing processes, circuit design techniques, testing, fuse element and reliability of generic bipolar PROMs.
Advanced Micro Devices AM-BUB094 (100p)

"Intel Memory Design Handbook"
See listing under (Memory) RAMs (Intel)

2 **"Interfacing the HM6641 with the NSC800"**
(HM6641)
The HM6641 is a CMOS PROM utilizing the polysilicon fuse technology. This paper discusses interfacing the 6641 with the 8 bit microprocessor, the NSC800.
Harris Semiconductor AN-103

3 **"PROM Power Switching Alternatives"**
Describes circuits for external power switching of Tri-State bipolar PROMs to reduce average power requirements. Circuits directly interface active data bus.
National Semiconductor AN229 (6pp)

4 **"PROM Power-Down Circuits"**
(DM74S287)
Describes several ways to power-down bipolar, three-state PROMs.
National AN-171 (4pp)

5 **"Programming 2732 PROMs with the CDP18S480 PROM Programmer"**
(CDP18S480)
Describes procedure for programming 2732 PROMs with the CDP18S480 PROM programmer.
RCA ICAN-6847 (4pp)

6 **"Understanding and Using the CDP18U42 EPROM"**
(CDP18U42)
Cover design and programming characteristics of a 256 x 8-bit nonvolatile, UV EPROM; includes discussions on programmer circuit options and device applications.
RCA ICAN-6925 (8pp)

RAMS

7 **"The Nonvolatile RAM for Microprocessor Applications"**
(M193, M120)
Compares cell structure and operation of EPROMs, EAROMs, and NVRAMs. Emphasizes NVRAM applications.
SGS-ATES DN317 (15pp)

RAMs (cont)

8 **"1K CMOS RAMs"**
(MM54C920, MM54C921, MM74C920, MM74C921, MM54C929, MM74C929, MM54C930, MM74C930)
Presents considerations for designing with CMOS RAMs. Considers synch vs asynch memory, memory structure and timing, and characteristics of devices.
National Memory Applications Handbook (13pp)

9 **"64k Dynamic RAM Memory Board with Transparent Refresh"**
(MCM4116, MC3242, MC3480)
Describes circuits for implementing hardware-refreshed 64k dynamic memory board for use with 6800 or 6809-based systems.
Motorola Semiconductor AN-835 (7pp)

10 **"A CMOS Keyboard Data Entry System for Bus Oriented Memory Systems"**
(MC14419)
Describes a keypad to binary data entry system for placing data in RAM memories. It allows data to be entered through keystrokes encoding 4-bits at a time.
Motorola Application Note AN-759 (4pp)

"A High Speed FIFO Memory Using the MECL MC10143 Register File"
See listing under (Digital) High Speed Logic (Motorola)

11 **"A Memory Design for an 8080A-Based Microprocessor System"**
(INS8080A, MM5290)
Describes a memory design for a system with up to 64 bytes of R/W memory in 16 kbyte increments. Provision is made for further address decoding (up to 1 megabyte). Includes schematics, timing diagrams.
National Memory Applications Handbook (8pp)

12 **"A Method of Implementing Stacks with Existing Minicomputer Memory"**
Gives detailed description of a controller for a stack of programmable size up to 256 words for a 16-bit minicomputer with less than 16K of memory. Tells how stack size can be increased to 4096 words by adding ten ICs.
National AN-60 (4pp)

13 **"A Non-Volatile Microprocessor Memory Using 4K N-Channel MOS RAMs"**
(MCM6605, MC6800)
Describes the design of a 8192-byte non-volatile memory using the MCM6605 4K x 1 RAM and CMOS control logic to reduce the power requirement in the standby mode.
Motorola AN-732A (17pp)

14 **"Application of First-In First-Out Memories"**
(AM2812, AM2813, AM2814, 3341)
Describes the function of a first-in, first-out memory, methods of constructing FIFO buffers and the operation of the above P-channel MOS devices. Discusses storage and control, expansion methods, interfacing, and applications in an N-bit shift register and as a key encoder on key matrix.
Advanced Micro Devices Application Note (9pp)

© IC MASTER

MEMORY

RAMs (cont)

1 **"Applications for HM6505"**
(HM6505)
A technical brief of the uses and operation of this CMOS RAM. Microprocessor and battery backup applications are discussed.
Harris Semiconductor AN-102

2 **"Applications of the Intel 2104A 4K RAM"**
(2104A)
Discusses operation of the device including power distribution and decoupling.
Intel Application Note AP-23 (13pp)

3 **"Battery Back Up Considerations Using NEC CMOS RAMs"**
Discusses basic battery types available and their application to battery back up with NEC SMOS memory.
NEC Microcomputers AN11 (5pp)

4 **"Charge Pump Driver for 7001 RAMs"**
(SN54508)
Defines a method for driving the charge storage pump input of a 7001 RAM. Provides a description of the basic storage pump RAM cell and the charge pump circuit diagram. Gives performance curves.
Texas Instruments Application Report CA-178 (6pp)

5 **"Designing Minimum/Nonvolatile Memory Systems with CMOS Static RAMs"**
(CDP1800)
Details system considerations and circuit requirements for CDP-1800 series RAM operation and data retention in CDP1802-based systems. Discusses interfacing complexity vs memory size, power distribution, power-up/power-down control and battery selection.
RCA ICAN-6943 (25pp)

6 **"Designing with 16K and 64K Dynamic RAMs"**
(NMC4164, NMC5295)
Discusses design procedures using multiplexed-address, dynamic RAMs. Describes basic functions and RAM controller operation. Provides extensive electrical and timing diagrams.
National AN228 (16pp)

7 **"Designing with AMI's High Speed S2114H 1024x4 bit Static RAM"**
(S2114H)
Describes device and its use. Supplies block diagram, operating modes and timing diagrams.
American Microsystems (3pp)

8 **"Dynamic RAM Board Design Made Easy"**
Discusses RAM chip characteristics, power supply and control signal distribution on PC boards, and control logic implementation. With schematics, PC layout.
National Memory Applications Handbook (9pp)

9 **"High Speed TTL Interfacing for 7001 Static RAMs"**
(SN75261, SN75365)
Illustrates interface techniques for driving the 7001 RAM chip-select input, and sensing the memory output.
Texas Instruments Application Report CA-179 (8pp)

RAMs (cont)

10 **"Improved Performance with the AM9124"**
(AM9124)
Discusses device advantages over the 2114, including power and dc parameters, and memory system design incorporating the device.
Advanced Micro Devices (6pp)

11 **"Intel Memory Design Handbook"**
(1103, 2107A, 2107B, 2416, 3207A, 3222, 3245, 5101, 5235, 5244)
Combines various RAM, ROM, PROM and CCD application notes plus information on support circuits.
Intel $5.00 (265pp)

12 **"Interfacing Static R/W Memories to the 8080A"**
(INS8080A)
Considers addressing techniques and memory interfacing for the 8080A family.
National Memory Applications Handbook (4pp)

13 **"Interfacing the 6800 Microprocessor to National MM74C910 Memory"**
(MC6800, MM74C910)
Outlines an area navigation system for aircraft using the devices.
National Memory Applications Handbook (2pp)

14 **"MOS Scratch Pad/Content Addressable Memory System"**
Describes a 64-bit Scratch Pad/Content Addressable Memory using MOS devices. Includes circuit diagrams and discusses circuit operations.
National MB-11 (2pp)

15 **"Memory Systems Characteristics and Applications for the CD4061A"**
(CD4061A)
Describes basic device operation, application in memory systems, and testing including construction of an all CMOS memory tester.
RCA ICAN-6445

16 **"Power Reduction Techniques for CMOS RAMs"**
(SCM5101)
Discusses RAM structure, chip deselection, input voltage levels, dynamic power dissipation and low voltage data retention as they relate to reducing power consumption.
Solid State Scientific AN-200 (11pp)

17 **"Software Refresh Memory Board for an MC6809 System"**
(MCM4116, MCM4027, MCM6664)
Describes hardware and software for implementing a software-refreshed dynamic memory board for use with 6809-based systems.
Motorola Semiconductor AN-833 (5pp)

18 **"Software Refreshed Memory Card for the MC68000"**
(MC68000, MCM4116, MCM6664)
Describes hardware and software for implementing a software-refreshed, dynamic memory card using 16k or 64k RAMs for use in an 8-MHz MC68000 system.
Motorola Semiconductor AN-816 (6pp)

19 **"Static RAM Applications"**
(INS8900, MM5257)
Discusses memory support for a μP and power down for RAMs.
National Memory Applications Handbook (2pp)

MEMORY

RAMs (cont)

1 **"The 5-Volt, 64K Dynamic RAM is Here, So is The 32K, So is The 16K!!!"**
(MCM4516/17, MCM6664/65, MCM6634)
Provides diagrams and instructions for optimizing memory-board layout using three types of RAMs in an expandable system. Emphasizes planning of addressing at the card edge, and physical and logical row selection on the card.
Motorola AN-805 (5pp)

2 **"The AM9338 Multiple Port Memory"**
(9338)
Describes applications for this 8-word by 1-bit three-address memory, including the working store for high-speed, three address computers; first in, first out (asynchronous buffer) memory; and direct address/indirect address memory.
Advanced Micro Devices Application Note 4 (pp)

3 **"The Design of an N-Channel 16K x 16-Bit Memory System for the PDP-11"**
(MCM6605, MC3450, MC3452, MC3459, MC3460)
Briefly describes operation of the MCM6605 NMOS RAM, the details, the design of a PDP-11 add-on mainframe memory using this device. The interface ICs and system performance are also discussed.
Motorola AN-740 (15pp)

4 **"Understanding the FIFO"**
(3351)
Covers 3351 FIFO operation, cascading, plus use in data rate buffering; parallel operation, and burst operation.
Fairchild APP 332 (8pp)

5 **"Use of CMOS RAM CDP1824 with RCA Microprocessor Evaluation Kit 18S020"**
(CDP1824)
Describes the CDP1824 and its application in the CDP18S020 Evaluation Kit, and presents examples of how the CDP1824 can be combined with the CDP1831 ROM to form efficient ROM-RAM systems.
RCA ICAN-6537 (4pp)

6 **"Use of CMOS-SOS RAM CDP1822 with RCA Microprocessor Evaluation Kit CDP18S020"**
(CDP1822)
Describes the CDP1822, its operation, and its application in the CDP18S020 Evaluation Kit.
RCA ICAN-6539 (4pp)

7 **"Using Synchronous Static CMOS RAMs"**
A detailed study of the design techniques required for high performance, low power, CMOS RAM arrays. An example array design is presented, and interfacing to common microprocessors is discussed.
Harris Semiconductor AN-101

8 **"Using Tri State® Logic for Rubber Band Memories"**
Describes the construction and use of scratch/pad memories to store data at a rapid rate and then release it as required. They serve as buffers between systems operating at different clock rates.
National AN-68 (4pp)

RAMs (cont)

9 **"Which Way for 16K?"**
Considers various aspects of 16K RAMs including 64 and 128 cycle refresh and the advantages versus disadvantages of latching.
Intel Application Note AP-22 (7pp)

ROMs

10 **"Custom ROM Programming"**
Gives forms for submitting truth tables for various National read only memories.
National AN-100 (8pp)

11 **"Designing With Signetics MOS ROM Family"**
Lists the advantages of designing with a generic printout family of EPROM/ROMs. Describes data and specifications of major lines of MOS ROM.
Signetics (50pp)

12 **"Fast Multipliers Using TTL Read Only Memories"**
(SN74182, SN74H183, SN74283, SN74284, SN74285)
Reviews fundamental algorithm of binary multiplication. Shows use of ROMs for multiplication, two's complement multiplication, and truncated multiplications.
Texas Instruments Application Report CA-172 (11pp)

"Intel Memory Design Handbook"
See listing under (Memory) RAMs (Intel)

"MOS Goes Bipolar"
See listing under (Memory) Shift Registers (National)

13 **"Monolithic Diode Matrices"**
Describes programming and use of diode matrices. Applications: teletypewriter coding matrix, decimal decode for displays, nines complement-BCD, shift register matrices, and ROMs.
Harris Semiconductor AN-206 (16pp)

14 **"NCR 3400 Data Retention Measurement"**
(3400)
Describes theory of operation and procedure for measuring change in threshold voltage in MNOS ROM memory cells with respect to time and read access stress.
NCR (2pp)

15 **"ROM Application Note"**
(EA8308A, EA8316E)
General discussion of ROMs and characteristics of each device.
Electronic Arrays (11pp)

16 **"Saving ROMs in High-Resolution Dot-Matrix Displays and Printers"**
(DM8596, MM8597)
Describes two-stage, column-generation approach called "intermediate coding" that saves more than 25% of ROM capacity when several ROMs are needed to store a font.
National AN-85 (8pp)

© IC MASTER

MEMORY

ROMs (cont)

"The Application of ROMs"
(MM5203)
Describes applications of read only memories in table look up, code conversion and generation, character generation, random logic generation, and microprogramming.
National AN-61 (12pp)

2 **"Trig Function Generators"**
Instead of simply cascading ROM to increase resolution and accuracy of the look-up tables, this note describes interpolation techniques to increase trig function accuracy with less memory.
National MB-10 (12pp)

3 **"Use of CMOS ROMs CDP1831 and CDP1832 with the RCA Microprocessor Evaluation Kit CDP18S020"**
(CDP1831, CDP1832)
Describes the operation and design of CDP1831- and CDP1832-based read-only memory systems in the CDP18S020.
RCA ICAN-6536 (4pp)

4 **"Use of CMOS ROMs CDP1833 and CDP1834 with the RCA Microprocessor Evaluation Kit CDP18S020 and the EK/Assembler-Editor Design Kit CDP18S024"**
(CDP1833, CDP1834)
Describes the application of the CDP1833 and CDP1834 in the CDP18S020 Evaluation Kit and the CDP18S024 EK/Assembler-Editor Kit.
RCA ICAN-6635 (4pp)

Shift Registers

"9338 8-Bit Multiple Port Register"
See listing under (Digital) TTL-General (Fairchild)

5 **"A Random Pattern Generator for Testing Digital Delay Elements"**
Describes the use of a linear feedback shift register for digital testing.
Advanced Micro Devices (3pp)

6 **"Applications of Dynamic Shift Registers"**
(1402A, 1403A, 1404A, 1405A, AM2802, AM2803, AM2804, AM2805, AM2806, AM2807, AM2808)
Discusses dynamic shift register storage in general, clock timing, circuits for clock drivers, interfacing with TTL, and recirculating registers.
Advanced Micro Devices (7pp)

"COS/MOS MSI Counter and Register Design and Applications"
See listing under (Digital) CMOS (RCA)

"HiNIL 375 Universal Shift Register"
See listing under (Digital) HNIL/HTL (Teledyne Semiconductor)

Shift Registers (cont)

7 **"High-Speed Shift Registers Use TTL RAMs and Counters to do all the Shifting"**
Describes how to build a high speed shift register using a RAM accessed by counters.
Advanced Micro Devices (2pp)

8 **"Schottky TTL MSI Registers"**
(AM25S07, AM25S08, AM25S09, SN54S174, SN54S175, SN54S194, SN54S195, SN74S174, SN74S175, SN74S194, SN74S195)
Describes these 4 and 6-bit registers, their operation and applications. Contains logic diagrams and function tables. Applications covered include: longer words, use with dynamic shift registers, selective bus storage, use as a LIFO memory, pseudo random feedback, unique counting codes, permutation of inputs, and use in arithmetic.
Advanced Micro Devices (16pp)

"The Logic Design of Shift Counters"
See listing under (Digital) Counters. (Motorola)

"Using Shift Registers as Pulse Delay Networks"
See listing under (Digital) High Speed Logic (Motorola) Microprocessors.

Authorized IC Master International Distributors

ARGENTINA, COLOMBIA, ECUADOR, VENEZUELA, MEXICO, PERU
Intectra
2629 Terminal Blvd.
Mt. View, CA 94043
Tel. (415) 967-8818

AUSTRALIA
A J Distributors Pty Ltd.
P.O. Box 71
Prospect, S. Australia 5082
Tel. 269-1244
Telex (790) 82635

AUSTRIA
LBG GmbH
Tichtelgasse 10/2/12
A-1120 Vienna, Austria
Tel. (0222) 83 41 01
Telex (847) 134106

BELGIUM
J. P. Le Maire
Rampe Gaulouise Ia
1020 Bruxelles, Belgium
Tel. 02 478 4847
Telex (846) 24610

BRAZIL
Filcres Importacao
Rua Auroraigs
CEP 01209
Caixa Postal 18767
Sao Paulo, Brazil
Tel. (011) 223 7388
Telex 113298

CYPRUS
MOR Electronics Ltd.
P.O. Box 4155
Ramat Gan 52141, Israel

DENMARK
Advanced Electronik
55, Mariendalsvej
DK2000, Copenhagen F, Denmark
Tel. 01 194433
Telex (855) 22431

ENGLAND
Paterson/Steadman & Partner
4 Gold Street
Saffron Walden, Essex CB10 IEP
England
Tel. 27067
Telex 81653

J. B. Tratsart Ltd.
Dogmersfield Nr. Baskingstoke
Hampshire RG27 8SU, England
Tel. 02514 3334
Telex (851) 8814136

FRANCE
Conseilet Promotion
1 Rue Damiens
92100 Boulogne, France
Tel. 621-30-77
Telex 250030F

OFFILIB
48 Rue Gay-Lussac
75240 Paris, Cedex 05, France
Tel. 329-2132
Telex: None

HOLLAND
Manudax-Nederland B. V.
54732G Heeswijk (N.B.)
Meerstraat 7, Holland PB25
Tel. 04139 2901
Telex (844) 50175

HONG KONG
Conmos Products, Ltd.
Haynein Bldg., 11th Floor
1 Tai Yip Street
Keun Tong, Kowloon
Tel. 3-684572
Telex 85448

INDIA, MALAYSIA, SINGAPORE, THAILAND
Radio & Craft Publications
4794/23 Bharat Ram Road
Daryanganj, New Delhi 2, India
Tel. 277147
Telex: None

ISRAEL
STG International Ltd.
10 Huberman Street
P.O. Box 1276
61012 Tel-Aviv, Israel
Tel. 248231
Telex 342229

ITALY
Gruppo Editoriale Jackson
Technoclub
Direzione Redacione e
Amministrazione
Via Rosellini 12
20124 Milano, Italy
Tel. 688-0951

JAPAN
Asahi Glass Company, Ltd.
Electronic Components Group
1-2 Marunouchi 2-chome
Chiyoda-ku, Tokyo 100, Japan
Tel. (03) 218-5813
Telex TK4616

JAPAN (Continued)
Overseas Data Service Co., Ltd.
Shugetsu Building, No. 12-7
Kita-Aoyama 3-chome
Minato-ku, Tokyo 107, Japan
Tel. (03) 400-7090
Telex (781) J26487

Tokyo International
Communications, Inc.
Miyajima Blvd.
28 Yoyogi 1-chome, Shibuya-ku
Tokyo 151, Japan
Tel. 379-2561
Telex: 33106

NORWAY, FINLAND, SWEDEN
Ingenioerforlaget A/S
Kronprinsens Gate 17
Boxs 2476 Solli
Oslo 2, Norway
Tel. (02) 11-51-70
Telex 72400Y

SOUTH AFRICA
Suntronika PTY Ltd.
P.O. Box 46268 Orange Grove
Johannesburg 2119, South Africa
Tel. 725-1210

SPAIN
Sagitron
Castello 25, 2, °
Madrid 1, Spain
Tel. 402 6085
Telex (831) 43819

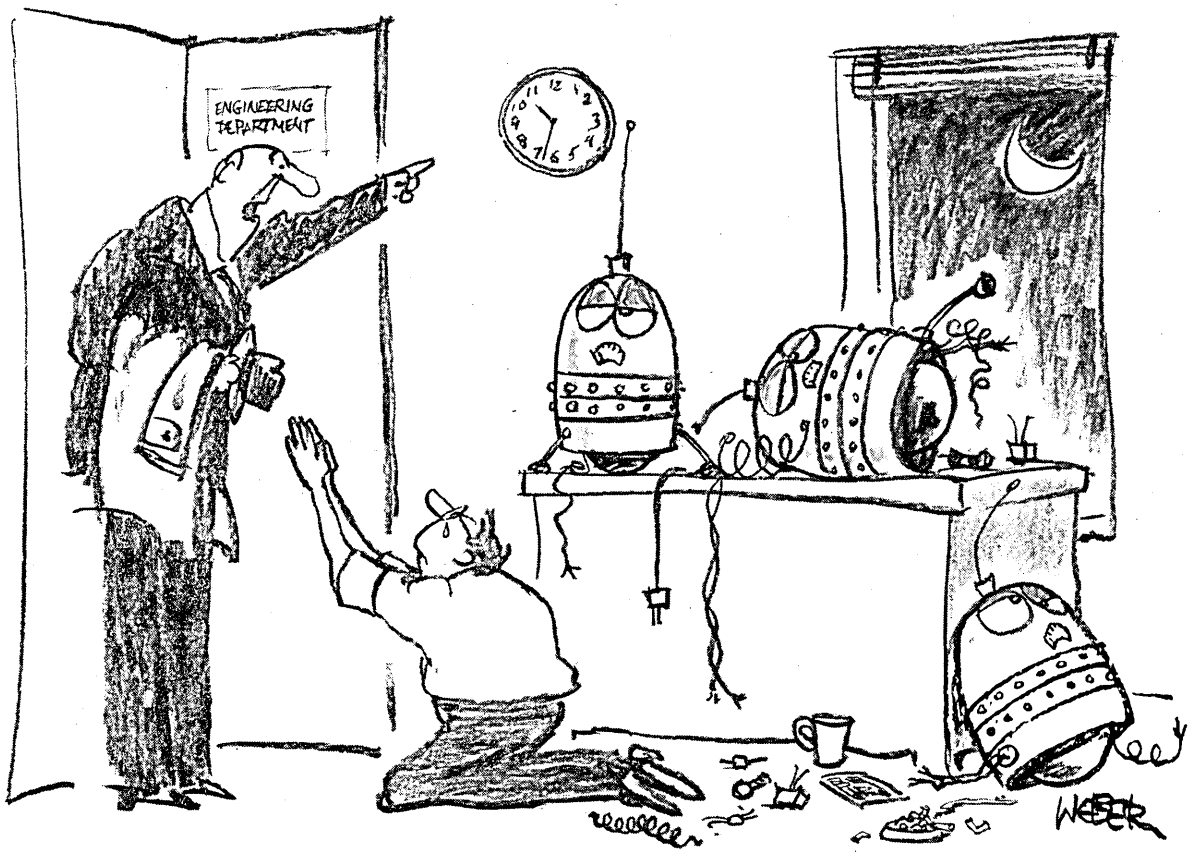
SWITZERLAND
W. Stolz AG
Taefernstrasse 15
CH-5404 Baden-Daettwil
Switzerland
Tel. 056 840151
Telex (845) 54070Z

TAIWAN
Alfred M. L. Pien
IBS Publications Ltd.
P.O. Box 55-879
Taipei, Taiwan

TURKEY
EEMPA Elektronik
Tersane Cad. Kuthan 38/408
TR/Kara Koy, Istanbul
Turkey
Tel. (11) 49-6249
Telex 24429

WEST GERMANY
Astronic GmbH
Winzererstrasse 47d
8000 Munich 40
West Germany
Tel. (089) 309031
Telex (841) 5216187

GET HIGH TECHNOLOGY WITHOUT HIGH ANXIETY.



"DON'T GIVE ME EXCUSES ABOUT 'UNDELIVERED PARTS', MCGINNIS! I WANT THESE ROBOTS COMPLETED AND READY FOR SHIPPING BY NINE O'CLOCK TOMORROW MORNING!"

CALL SCHWEBER FOR IMMEDIATE DELIVERY ON:

AMD
Allen-Bradley
American Microsystems
Amphenol
Anadex
Beehive International
Bourns
Computer Memories, Inc.
Corning
Crydom
Data General
Fairchild
General Electric
General Instrument/Opto.
Harris
Hazeltine
Hewlett Packard
IBM
IR
Intersil
Intersil Systems
Kemet
Mepco/Electra
3M
Mostek
Motorola
National
Olivetti
Qume
RCA
Seeq
Signetics
Sprague
Timeplex
Westinghouse
Zilog

Schweber is the high technology leader in distribution. Our technology centers are located nationwide. Staffed with specialists, they feature the latest in computer products. For your FREE copy of the 32-page "Microcomputer Acronyms and Buzz-Words" write to Schweber Electronics, Att: Technology Center, Jericho Turnpike, CB 1032; Westbury, New York 11590. Or call:

Westbury, NY: 516/334-7474 ■ Rochester, NY: 716/424-2222 ■ Fairfield, NJ: 201/227-7880 ■ Danbury, CT: 203/792-3500
Bedford, MA: 617/275-5100 ■ Manchester, NH: 603/625-2250 ■ Horsham, PA: 215/441-0600 ■ Pittsburgh, PA: 412/782-1600
Gaithersburg, MD: 301/840-5900 ■ Raleigh, NC: 919/876-0000 ■ Atlanta, GA: 404/449-9170 ■ Huntsville, AL: 205/882-2200
Orlando, FL: 305/331-7555 ■ Hollywood, FL: 305/927-0511 ■ Dayton, OH: 513/439-1800 ■ Beachwood, OH: 216/464-2970
Livonia, MI: 313/525-8100 ■ Elk Grove, IL: 312/364-3750 ■ Brookfield, WI: 414/784-9020 ■ Eden Prairie, MN: 612/941-5280
Cedar Rapids, IA: 319/373-1417 ■ Kansas City, KA: 913/492-2922 ■ St. Louis, MO: 314/739-0526 ■ Tulsa, OK: 918/622-8000
Dallas, TX: 214/661-5010 ■ Austin, TX: 512/458-8253 ■ Houston, TX: 713/784-3600 ■ Sacramento, CA: 916/929-9732
Santa Clara, CA: 408/748-4700 ■ Canoga Park, CA: 213/999-4702 ■ Irvine, CA: 714/556-3880, 213/537-4321

SCHWEBER ELECTRONICS

©1982 SCHWEBER ELECTRONICS CORPORATION

MILITARY PARTS DIRECTORY

This section is divided into three parts: a table of those manufacturers willing to perform MIL-STD-883 screening, a two way military to commercial cross reference index, and the Qualified Parts List broken down into functions. It not only shows what devices are on the list and which manufacturers supply them, but also it decodes the military numbers into familiar terms.

Detailed Product Information provided by:

Mirco Power Systems	401
National Semiconductor	402
RCA	408
Signetics	410
Synertek	424
Texas Instruments	433

The manufacturers listed above have provided detailed information on their latest and most significant products.

HOW TO USE THE MILITARY PARTS DIRECTORY

The next page contains a table showing the manufacturers who have advised that they want to screen devices to MIL-STD-883 and/or perform other environmental screening. The table also indicates which companies are currently qualified to supply one or more devices on the QPL list. Such achievement is apt to indicate that these companies are well equipped to perform 883 testing. The following four pages provide convenient cross references between M38510 numbers and their commercial equivalents; plus indication of which devices are listed in the latest QPL.

The heart of this section is the functional QPL parts list. It is based on the latest Defense Electronics Supply Center Qualified Products List (QPL-38510-XX) at the time of publication. The revision and date of this list are indicated at the bottom of each page. The devices are identified by major functions; within each function the devices are arranged in alphanumeric order, which automatically groups CMOS together, 5400 Series together, etc.

A complete military part number includes a three letter suffix signifying the device class and packaging. The definitions of these letters are given in the Part Number Guide under "JAN Nomenclature." The package styles and lead finishes that each manufacturer is qualified to supply can be determined by consulting the official QPL or by contacting the individual manufacturers. Once you have found the names of the companies you need to contact, you can reach them by using the information in the Manufacturers and Distributors Directory.

© IC MASTER 1983

VERZEICHNIS MILITÄRISCHER ICs

Dieser Abschnitt besteht aus drei Teilen: einem Verzeichnis de Hersteller, welche eine Prüfung nach Mil-Standard 883 vornehmen, eine sowohl militärische als auch kommerzielle Äquivalenzliste und die QPL-Listung nach Funktionen. Hier wird nicht nur genannt, welche Bauelemente verfügbar sind und wer sie liefert, sondern es werden außerdem militärische Typennummern in allgemeinverständliche umgeschlüsselt.

GEBRAUCHSANLEITUNG FÜR DAS VERZEICHNIS MILITÄRISCHER ICs

Die nächste Seite enthält eine Liste jener Hersteller, dia eine Prüfung nach MIL-Standard 883 vornehmen und/oder andere Tests für verschärfte Umweltbedingungen durchführen. Die Liste zeigt außerdem, welche Firmen gegenwärtig für die Lieferung von einem oder mehreren Bauteilen nach QPL qualifiziert sind. Eine solche Qualifikation ist ein Hinweis darauf, daß diese Firmen für eine Prüfung nach 883 gut ausgerüstet sind. Die folgenden vier Seiten enthalten praktische Äquivalenzlisten von M38510-Nummern zu deren kommerziellen Bezeichnungen mit einem Hinweis darauf, welche Bauteile in der neuesten QPL-Listung aufgeführt sind.

Das Kernstück dieses Abschnitts ist die QPL-Liste nach Funktionen. Sie basiert auf der neuesten Defense Electronics Supply Center Qualified Products List (QPL-385 10-XX) zum Zeitpunkt der Drucklegung. Die Ausgabe und das Datum dieser Liste werden am Ende jeder Seite angegeben. Die Bauteile sind nach den wichtigsten Funktionen geordnet. Innerhalb jeder Funktion werden sie in alphanumerischer Reihenfolge aufgeführt, so daß automatisch CMOS zusammen sind, 5400 Serien zusammen sind usw.

Eine Vollstandige Militärische Typennummer umfast ein Suffix von drei Bruchstaben, welche die Klassifizierung und Gehäuseform des Bauelements bedeuten. Diese Buchstaben werden im Numerischen Typenverzeichnis unter "JAN Nomenclature" erläutert. Die Gehäuseformen und Ausführung der Anschlüsse, die jeder Hersteller liefern darf, können über die offizielle QPL-Listung oder über die einzelnen Hersteller in Erfahrung gebracht werden. Haben Sie einmal die Namen der Firmen gefunden, die Sie brauchen, können Sie weitere Informationen über das Hersteller- und Distributoren-verzeichnis erhalten.

© IC MASTER 1983

CATALOGUE DES PIECES MILITAIRES

Cette section est divisée en trois catégories : un tableau des fabricants se conformant à la méthode MIL-STD-883, un index de référence entre le domaine militaire et le domaine industriel, et une liste par fonction des pièces qualifiées (QPL). Non seulement les appareils figurant sur la liste et les noms de leurs fabricants sont indiqués, mais les numéros des pièces militaires sont décodés en des termes plus compréhensibles pour les industriels.

COMMENT SE SERVIR DU CATALOGUE DES PIECES MILITAIRES

La page suivante offre un tableau donnant les noms des fabricants désireux de sélectionner des appareils suivant la méthode MIL-STD-883, ou d'exécuter d'autres tests d'environnement. Ce tableau énumère également les sociétés actuellement qualifiées pour produire un ou plusieurs appareils figurant sur la Liste de Pièces Militaires (QPL). Il est sous-entendu que ces sociétés possèdent l'equipement nécessaire pour accomplir les tests éxigés par la méthode 883. Les quatre pages suivantes fournissent un index pratique de référence entre les numéros de la méthode M38510 et leurs équivalents industriels, ainsi que la liste des appareils figurant sur la QPL la plus récente.

Le coeur de cette section est la Liste des Pièces Qualifiées. Elle est basée sur l'edition las plus recente de la QPL publiée par le "Defense Electronics Supply Center" lors de la publication de ce catalogue (QPL-38510-XX). Le numéro et la date de révision de cette liste sont indiqués au bas de chaque page. Les appareils sont identifiés par fonctions principales. Dans chaque fonction les appareils sont indiqués par ordre alphanumérique, ce qui regroupe automatiquement les CMOS ensemble, les séries 5400 ensemble, etc. . .

Un numéro complet de pièce militaire comprend un suffixe de trois lettres qui détermine lat catégorie de l'appareil et le type de boitier utilisé. La définition de ces lettres est fournie dans le Guide des Numéros de Pièces (Part Number Guide) sous la nomenclature JAN. Les types de boitier et de finition que chaque fabricant est qualifié de produire, peuvent être déterminés en consultant la QPL officielle ou en contactant les fabricants respectifs. Une fois que vous connaissez les noms des sociétés que vous desirez contacter, vous pourrez en obtenir les adresses et numéros de téléphone en consultant l'Annuaire des Fabricants et Distributeurs (Manufacturers and Distributors Directory).

© IC MASTER 1983

DIRECTORIO DE PARTES PARA USO MILITAR

Esta sección está dividada en tres partes: Una tabla de aquellos fabricantes que seleccionan componentes de acuerdo a la ESPECIFICATIÓN MILITAR-883*, un índice de referencia entre componentes militares y comerciales, y una Lista de partes subdividida en funciones. No solo muestra que componentes forman parte de la lista y que fabricantes la proveen, sino también traduce los números militares a términos familiares.

MODO DE EMPLEO DEL DIRECTORIO DE PARTES PARA USO MILITAR

La siguiente página contiene una tabla de fabricantes que desean seleccionar partes de acuerdo a la ESPECIFICACION MILITAR-883 y/o ejecutar otro tipo de segregación ambiental. La tabla también indica que compañías están calificadas para proveer una o más componentes en la lista QPL. Esta proeza es un indicio que dichas compañías están equipadas para ejecutar la prueba 883. Las siguientes cuatro páginas proveen referencias convenientes entre los números M3851 y sus equivalentes comerciales, además indica que componentes aparecen en la lista más reciente de QPL.

La importancia de esta sección está en la lista funcional de componentes QPL. Está basada en la lista de productos del Centro de Abastecimiento de Defensa Electronica más reciente (QPL-38510-XX) antes de su publicación. La revisión y fecha de esta lista aparecen al pie de cada página. Las componentes están identificadas de acuerdo a funciones; que a su vez están organizadas en ordén alfabético-numérico, que automáticamente agrupa las familias CMOS, 5400, etc.

La numeración completa de una componente militar incluye un sufijo de tres letras alfabéticas que determinan la clase y estilo constructivo de la componente. Las definiciones de estas letras se encuentran en la Guía de Numero de Pieza bajo "nomenclatura JAN." El estilo constructivo y acabado de las terminales que cada fabricante suple puede ser determinado consultando el QPL oficial o comunicándose con los fabricantes mismos. Después de haber averiguado los nombres de las compañías a las que deberá dirigirse, puede ponerse en contacto con ellos por medio del Directorio de Fabricantes y Distribuidores.

© IC MASTER 1983

ミリタリー用部品録

このセクションは次の３部門に分れています。(1)ＭＩＬ-ＳＴＤ-８８３のスクリーニングをするメーカー表，(2)一般型名からミリタリー番号を，ミリタリー番号から一般型名を探し出すクロスリファレンス表，(3)機能別に分類された認定部品表，これは部品名丈でなくそのメーカー名とミリタリー番号のなじみの深い用語への対応も網羅しています。

使用方法

次ページにはＭＩＬ-ＳＴＤ-８８３並に他のスクリーニングをするメーカー名が記載されています。その表にはどのメーカーが現在ＱＰＬ（認定部品表）上のどんな製品の供給に認定されているかも示していますから，記載されているメーカーが８８３による試験設備を備えているかどうか判断することも出来ます。その後の４ページはミリタリーから一般型名，一般型名からミリタリーのクロスリファレンスで最新のＱＰＬに記載されている型名も分ります。

このセクションの最も大切な所は機能別ＱＰＬ部品リストです。これは本マスター発行時点で最新の国防省電子部品供給センター（ＤＥＳＣＥ）認定品リスト（ＱＰＬ-３８５１０-××）に基くものです。本リストの改定又は日付は各ページの下欄に示されています。デバイスは主要機能毎に記載されています。その機能毎にデバイスはアルファベット順にのっていますのでＣＭＯＳはＣＭＯＳ内に，５４００シリーズは５４００シリーズ内にまとめられています。

ミリタリー部品番号はデバイスのクラス分けパッケージ分けを示す３文字のサフィックスを入れています。この３文字の規定はパーツナンバーガイドのＪＡＮノーメンクラチュアに記載されています。各メーカーが認定されているパッケージ形状とリード仕上げは公式のＱＰＬを見るか個々のメーカーに連絡して下さい。連絡先の住所，電話番号等は〝メーカー，代理店ダイレクトリー〟にのせてあります。

© IC MASTER 1983

MANUFACTURER	MIL-M-38510 QPL				MIL-STD-883 SCREENING			OTHER SCREENING	
	Linear	TTL	Other Bipolar	CMOS	Class B	Class C	Class S	Military	Industrial
Advanced Micro Devices	X	X	X		X	X	X	X	X
American Microsystems, Inc.					X	X	limited	X	X
Analog Devices					X			X	X
Burr-Brown Research					X	X		X	X
Cherry Semiconductor					X	X	X	X	X
Datel-Intersil					X	X	X	X	X
EMM/Semi					X	X		X	X
Exar Integrated Systems					X	X	X	X	X
Fairchild Semiconductor	X	X	DTL		X	X	X	X	X
General Instrument					X	X	X		X
Harris Semiconductor	X		PROM		X	X	X	X	X
Hughes Aircraft					X	X	X	X	X
Hybrid Systems					X	X	X	X	X
ILC - Data Device					X	X	X	X	X
Integrated Device Technology				X	X	X	X	X	X
Intel			μP		X	X		X	X
Interdesign					X	X		X	X
International Microcircuits					X	X	X	X	X
Intersil	X				X	X	X	X	X
LSI Computer Systems					X	X	X	X	X
Micro Networks					X	X		X	X
Micropac					X	X		X	X
Micro Power Systems					X	X	X	X	X
Monolithic Memories		X	PROM		X	X	X	X	X
Mostek					X	X		X	X
Motorola Semiconductor	X	X	ECL, μP	X	X		X	X	X
National Semiconductor	X	X		X	X	X	X	X	X
NEC-Electronic Arrays									X
NEC Microcomputers					X	X			X
Nitron					X	X	X	X	X
Nortec					X	X		X	X
Optical Electronics								X	X
Plessey Semiconductor					X	X	X		
Precision Monolithics	X		DAC		X	X	X	X	X
Raytheon Semiconductor	X	X	X		X	X	X	X	X
RCA Solid State	X			X	X	X	X	X	X
Rockwell					X	X		X	X
SGS-ATES								X	X
Signetics	X	X	PROM		X	X	X	X	X
Silicon General					X	X	X	X	X
Siliconix			Analog Switches		X	X	X	X	X
Solid State Scientific				X	X	X		X	X
Solitron					X	X	X	X	X
Sprague Electric					X	X	X	X	X
Standard Microsystems Corp.					X	X	X	X	X
Synertek					X	X		X	X
Teledyne Crystalonics					X	X	X	X	X
Teledyne Philbrick					X	X	X	X	X
Teledyne Semiconductor					X	X		X	X
Texas Instruments	X	X	RAM		X	X	X	X	X
TRW LSI					X	X	X	X	X
Zilog					X	X		X	X

EXPLANATION:

The "MIL-M-38510" section indicates the IC manufacturers currently providing Q.P.L. ICs. More detailed information on the specific devices is given in the Qualified Products lists which follow.

The "MIL-STD-883 Screening" section lists those manufacturers who are both set up and actively want to screen devices to the levels indicated. "Other Screening" shows those who report that they want business calling for special military and industrial environment screening procedures.

© IC MASTER 1983

CROSS REFERENCE — COMMERCIAL TO MILITARY

Device	M38510/	QPL
AM91L30AF	23706	
AM91L30ADM	23708	
AM91L30AFM	23708	
AM91L30CDM	23707	
AM91L30CF	23705	
AM91L30CFM	23707	
AM91L40ADM	23716	
AM91L40AFC	23714	
AM91L40AFM	23716	
AM91L40CDM	23715	
AM91L40CFC	23713	
AM91L40CFM	23715	
AM9130ADM	23704	
AM9130AFC	23702	
AM9130CDM	23703	
AM9130AFM	23704	
AM9130CFC	23701	
AM9130CFM	23703	
AM9140ADM	23712	
AM9140AFC	23710	
AM9140AFM	23712	
AM9140CDM	23711	
AM9140CFC	23709	
AM9140CFM	23711	
DAC-08	11301	X
DAC-08A	11302	X
DG181	11101	X
DG182	11102	X
DG184	11103	X
DG185	11104	X
DG187	11105	X
DG188	11106	X
DG190	11107	X
DG191	11108	X
DG300	11601	X
DG301	11602	
DG302	11603	X
DG303	11604	X
DG304	11605	X
DG305	11606	X
DG306	11607	X
DG307	11608	X
HA-2500	12204	X
HA-2510	12205	X
HA-2520	12206	X
HA-2600	12202	X
HA-2620	12203	X
HA-4741	11003	X
HPROM0512	20101	X
IM5603A	20201	
IM5623	20202	
LF147	11906	
LF151	11904	
LF153	11905	
LH2101A	10105	X
HM7602-2	20701	X
HM7603-2	20702	X
HM7610-2	20301	X
HM7611-2	20302	X
HM76160-2	21001	
HM76161-2	21002	X
HM7620-2	20401	X
HM7621-2	20402	X
HM7640-2	20801	X
HM7641-2	20802	X
HM7642-2	20601	X
HM7643-2	20602	X
HM7644-2	20603	
HM7680-2	20903	
HM7681-2	20904	
HM7684-2	20901	
HM7685-2	20902	
LH2110	10603	
LH2111	10305	X
LM101A	10103	X
LM102	10601	X
LM106	10303	
LM108A	10104	X
LM109	10701	X
LM110	10602	
LM111	10304	X
LM118	10107	X
LM120H-05	11501	
LM120H-12	11502	
LM120H-15	11503	
LM120H-24	11504	
LM120K-05	11505	
LM120K-12	11506	
LM120K-15	11507	
LM120K-24	11508	
LM124	11005	
LM139	11201	X
LM140K-05	10706	
LM140K-12	10707	
LM140K-15	10708	
LM140K-24	10709	
LM141H-05	10702	
LM141H-12	10703	
LM141H-15	10704	
LM141H-24	10705	
LM148	11001	X
LM149	11002	
LM193	11202	
LM723	10201	X
MCM5303	20101	
MCM5304	20102	
MCM6604A*	23602	
MCM6604A†	23604	
MCM6605*	23601	
MCM6605†	23603	
MH0026	03501	
MKB4096*	23602	
MKB4096†	23604	
MM5280*	23505	
MM5280†	23506	
PM155	11401	X
PM155A	11404	X
PM156	11402	X
PM156A	11405	X
PM157	11403	X
PM157A	11406	X
PM2108A	10106	X
Special	15504	X
TMS4050*	23502	
TMS4050†	23504	
TMS4060*	23501	
TMS4060†	23503	
061	11901	
062	11902	
064	11903	
071	11904	
072	11905	
074	11906	
10501	06001	X
10502	06002	X
10504	06201	X
10505	06003	X
10506	06004	X
10507	06005	X
10509	06006	X
10524	06301	X
10525	06302	X
10531	06101	X
10535	06104	X
10576	06103	X
10597	06202	X
10631	06102	X
1558	10108	X
1802	47001	
2117	24001	X
2117	24002	X
2147H	23801	X
2147H	23803	X
2147H	23805	X
2147H	23807	X
2148H	23806	X
25LS174	33106	X
25LS175	33107	X
2708	22001	
2901A	44001	
2905	44101	
2906	44102	
2907	44103	
2915	44104	
2916	44105	
2917	44106	
2918	44201	
3018A	10801	
3045	10802	X
4000A	05201	X
4000B	05251	
4001A	05202	X
4001B	05252	
4002A	05203	X
4002B	05253	
4006A	05701	X
4007A	05301	X
4008A	05401	X
4009A	05501	X
4010A	05502	X
40106B	17702	
40107B	17402	
40109B	17404	
4011A	05001	X
4011B	05051	
4012A	05002	X
4012B	05052	
4013A	05101	X
4013B	05151	
4014A	05702	X
4015A	05703	X
4016A	05801	X
4017A	05601	X
40174B	17505	
4018A	05602	X
4019A	05302	X
4019B	05352	X
4020A	05603	X
4021A	05704	X
4022A	05604	X
4023A	05003	X
4023B	05053	
4024A	05605	X
4025A	05204	X
4025B	05254	
40257B	17803	
4027A	05102	X
4027B	05152	
4028A	05901	
4030A	05303	X
4031A	05705	X
4034A	05706	
4041A	05505	
4043A	05103	X
4043B	05153	
4048A	05304	
4049A	05503	X
4050A	05504	X
4066A	05802	X
4067B	17801	
4069UB	17401	X
4070B	17203	X
4071B	17101	X
4072B	17102	X
4073B	17003	X
4075B	17103	X
4076B	17501	
4077B	17204	X
4081B	17001	X
4082B	17002	X
4085B	17201	X
4086B	17202	X
4093B	17701	
4095B	17502	
4096B	17503	
4097B	17802	
4098B	17504	X
4099B	17601	X
4116	24001	X
4116	24002	X
4136	11004	X
4156	11003	X
4502B	17403	X
4508B	17602	
4514B	17301	
4515B	17302	
4532B	17303	
4555B	17304	
4556B	17305	
53S1680	21001	
53S1681	21002	
5300-1	20301	
5301-1	20302	
5305-1	20401	
5306-1	20402	
5330	20701	
5331	20702	
5340-1	20801	
5341-1	20802	
5348-1	20804	
5349-1	20805	
5352-1	20601	
5353-1	20602	
5380-1	20903	
5381-1	20904	
54C929	23901	
54C930	23902	
54H00	02304	X
54H01	02306	X
54H04	02305	X
54H08	15501	X
54H10	02303	X
54H101	02205	X
54H103	02206	X
54H11	15502	X
54H20	02302	X
54H21	15503	X
54H22	02307	X
54H30	02301	X
54H40	02401	X
54H50	04001	X
54H51	04002	X
54H53	04003	X
54H54	04004	X
54H55	04005	X
54H72	02201	X
54H73	02202	X
54H74	02203	
54H76	02204	X
54LS00	30001	X
54LS02	30301	X
54LS03	30002	X
54LS04	30003	X
54LS05	30004	X
54LS08	31004	X
54LS09	31005	
54LS10	30005	X
54LS107	30108	X
54LS109	30109	X
54LS11	31001	X
54LS112	30103	X
54LS113	30104	X
54LS114	30105	X
54LS12	30006	X
54LS122	31403	X
54LS123	31401	X
54LS125	32301	X
54LS126	32302	X
54LS13	31301	X
54LS132	31303	X
54LS138	30701	X
54LS139	30702	X
54LS14	31302	X
54LS148	36001	X
54LS15	31002	X
54LS151	30901	X
54LS153	30902	X
54LS155	32601	X
54LS156	32602	X
54LS157	30903	X
54LS158	30904	X
54LS160	31503	X
54LS161	31504	X
54LS162	31511	X
54LS163	31512	X
54LS164	30605	X
54LS165	30608	X
54LS166	30609	X
54LS168	31505	
54LS169	31506	
54LS170	31902	
54LS174	30106	X
54LS175	30107	X
54LS181	30801	
54LS190	31513	X
54LS191	31509	X
54LS192	31507	X
54LS193	31508	X
54LS194	30601	X
54LS195	30602	X
54LS196	32001	
54LS197	32002	X
54LS20	30007	X
54LS21	31003	X
54LS22	30008	X
54LS221	31402	X
54LS240	32401	X
54LS241	32402	X
54LS242	32801	X
54LS243	32802	X
54LS244	32403	X
54LS245	32803	X
54LS251	30905	X
54LS253	30908	X
54LS257	30906	X
54LS258	30907	X
54LS259	31603	X
54LS26	32102	X
54LS261	31801	
54LS266	30303	X

NOTE: Items marked X in the QPL column are listed on QPL-38510-54 with at least one source. * 85°C Max. † 100°C Max.

© IC MASTER 1983

ARROW ELECTRONICS, INC.
ELECTRONICS DISTRIBUTION DIVISION

900 BROAD HOLLOW ROAD
FARMINGDALE, NEW YORK 11735

516/694/6800
510/224/6126—TWX

The Arrow Lines of Military Semiconductors

AMD
Fairchild
General Electric
General Instrument
Inmos
Intel
International Rectifier
Intersil
Microsemiconductor
MMI
Mostek
Raytheon
RCA
Signetics
Texas Instruments
TRW
Unitrode

For applications ranging from shipboard and ground communication systems to avionics and missile control, Arrow inventories quality hi-rel products within a separate military warehouse system. Strict warehousing procedures, full traceability control and trained personnel support Arrow's multi-million dollar commitment to a growing demand for military electronic components. Arrow's broad inventory base meets or exceeds standards for MIL-38510 and 19500 and our on-line real time computerized inventory system quickly processes your order so we can ship it to you on time.

NORTHWEST
Denver, Colorado (303) 758-2100
Salt Lake City, Utah (801) 539-1135
San Francisco, California (408) 745-6600
Seattle, Washington (206) 643-4800

SOUTHWEST
Albuquerque, New Mexico (505) 243-4566
Los Angeles, California (213) 701-7500
Newport Beach, California (714) 851-8961
San Diego, California (714) 565-4800

NORTH CENTRAL
Cedar Rapids, Iowa (319) 395-7230
Chicago, Illinois (312) 397-3440
Madison, Wisconsin (608) 273-4977
Milwaukee, Wisconsin (414) 764-6600
Minneapolis, Minnesota (612) 830-1800

SOUTH CENTRAL
Austin, Texas (512) 835-4180
Dallas, Texas (214) 386-7500
Houston, Texas (713) 491-4100
Tulsa, Oklahoma (918) 665-7700

MIDWEST
Cleveland, Ohio (216) 248-3990
Detroit, Michigan (313) 971-8220
Grand Rapids, Michigan (616) 243-0912
Pittsburgh, Pennsylvania (412) 856-7000

TRI-STATE
Dayton, Ohio (513) 435-5563
Indianapolis, Indiana (317) 243-9353
St. Louis, Missouri (314) 567-6888

NORTHEAST
Boston, Massachusetts (617) 933-8130
Manchester, New Hampshire (603) 668-6968

EMPIRE
Hauppauge, New York (516) 231-1000
Rochester, New York (716) 275-0300
Syracuse, New York (315) 652-1000
Wallingford, Connecticut (203) 265-7741

MID-ATLANTIC
Baltimore, Maryland (301) 247-5200
Fairfield, New Jersey (201) 575-5300
Moorestown, New Jersey (609) 235-1900
Richmond, Virginia (804) 282-0413

SOUTHEAST
Atlanta, Georgia (404) 449-8252
Fort Lauderdale, Florida (305) 776-7790
Huntsville, Alabama (205) 882-2730
Melbourne, Florida (305) 725-1480
Raleigh, North Carolina (919) 876-3132
Winston Salem, North Carolina (919) 725-8711

International, TWX (510) 224-6021

Arrow.
Gain strategic advantage

© IC MASTER 1983

CROSS REFERENCE — COMMERCIAL TO MILITARY (Continued)

Device	M38510/	QPL	Device	M38510/	QPL	Device	M38510/	QPL	Device	M38510/	QPL
54LS27	30302	X	54S139	07702	X	54368	16304	X	82S185	20902	X
54LS273	32501	X	54S140	08101	X	5437	00302	X	82S190	21001	
54LS279	31602	X	54S15	08002		5438	00303	X	82S191	21002	X
54LS28	30204	X	54S151	07901	X	5440	00301	X	82S23	20701	X
54LS280	32901	X	54S153	07902	X	5442	01001	X	82S2708	20905	X
54LS283	31202	X	54S157	07903	X	5443	01002	X	8212	42101	
54LS290	32003	X	54S158	07904	X	5444	01003	X	8224	42201	
54LS293	32004	X	54S174	07105	X	5445	01004	X	8228	42301	
54LS295	30606	X	54S175	07106	X	5446	01006	X	8250	15204	
54LS298	30909	X	54S181	07801	X	5447	01007	X	8251	15205	
54LS30	30009	X	54S182	07802		5448	01008	X	8252	15206	
54LS32	30501	X	54S194	07601		5449	01009	X	9LS51	30401	
54LS348	36002	X	54S195	07602		5450	00501	X	9LS54	30402	
54LS365	32201	X	54S20	07006	X	5451	00502	X	9093	03304	
54LS366	32202	X	54S22	07007	X	5453	00503	X	93L00	02804	
54LS367	32203	X	54S251	07905		5454	00504	X	93L01	02907	
54LS368	32204	X	54S253	07908		5470	00206	X	93L08	04502	
54LS37	30202	X	54S257	07906		5472	00201	X	93L09	04601	
54LS373	32502	X	54S258	07907		5473	00202	X	93L10	02504	
54LS374	32503	X	54S30	07008	X	5474	00205	X	93L12	04602	
54LS375	31604	X	54S40	07201	X	5475	01501	X	93L14	04501	
54LS377	32504	X	54S412	42101		5476	00204	X	93L16	02505	
54LS38	30203	X	54S51	07401	X	5477	01502	X	93L18	04301	
54LS390	32701	X	54S64	07402	X	5479	00207		93L22	04603	
54LS393	32702	X	54S65	07403		5480	00604	X	93L24	04401	
54LS395	30607	X	54S74	07101	X	5482	00601	X	93L28	02803	
54LS40	30201	X	54S85	08201	X	5483	00602	X	93L415	23103	X
54LS42	30703	X	54S86	07501	X	5485	15001	X	93L422	23112	X
54LS47	30704	X	5400	00104	X	5486	00701	X	93L422A	23115	X
54LS490	32703	X	5401	00107	X	5490	01307	X	93L420	23004	
54LS51	30401	X	5402	00401	X	5492	01301	X	93L425	23104	X
54LS54	30402	X	5403	00109	X	5493	01302	X	93Z511	21004	X
54LS670	31901	X	5404	00105	X	5495	00901	X	930	03001	X
54LS73	30101	X	5405	00108	X	5496	00902	X	9300	15901	X
54LS74	30102	X	5406	00801	X	55107	10401	X	9301	15206	X
54LS75	31601	X	5407	00803	X	55108	10402	X	9304	00603	X
54LS76	30110	X	5408	01601	X	55113	10405	X	9308	01503	
54LS83A	31201	X	5409	01602	X	55114	10403	X	9309	01404	X
54LS85	31101	X	5410	00103	X	55115	10404	X	9311	15201	X
54LS86	30502	X	54107	00203	X	555	10901	X	9312	01402	X
54LS90	31501	X	54116	01503	X	556	10902	X	9314	01504	X
54LS92	31510	X	5412	00106	X	558	10903	X	9317	15802	X
54LS93	31502	X	54121	01201	X	6508	23901		9318	15603	X
54LS95	30603	X	54122	01202	X	6518	23902		9321	15801	
54LS96	30604	X	54123	01203	X	6800	40001		9322	01405	X
54L00	02004	X	54125	15301		710	10301	X	9324	15002	X
54L01	02006	X	54126	15302	X	711	10302		9328	15902	X
54L02	02701	X	5413	15101	X	723	10201	X	932	03101	
54L03	02006	X	54132	15103	X	741	10101	X	933	03105	
54L04	02005	X	5414	15102	X	747	10102	X	9334	16001	
54L10	02003	X	54145	01005	X	76L70	02805		9338	15701	
54L121	04201		54147	15601		76L42A	02906		9341	01101	X
54L122	04202		54148	15602		771	11904		93410	23001	
54L164	02802		54150	01401	X	772	11905		93411	23003	
54L193	02503		54151	01406	X	774	11906		93415	23101	
54L20	02002	X	54153	01403	X	78M05	10702		93417	20301	
54L30	02001	X	54154	15201	X	78M12	10703	X	9342	01102	
54L42	02901		54155	15202	X	78M15	10704	X	93421	23002	
54L43	02902		54156	15203	X	78M24	10705		93425	23102	X
54L44	02903		54157	01405	X	7805	10706	X	93425	23106	X
54L46	02904		5416	00802	X	7812	10707	X	93425A	23108	X
54L47	02905		54160	01303	X	7815	10708	X	93427	20302	
54L51	04101		54161	01306	X	7824	10709	X	93436	20401	
54L54	04102		54162	01305	X	7831	10406		93438	20801	
54L55	04103		54163	01304	X	7832	10407		93446	20402	
54L71	02101	X	54164	00903	X	79M05	11501	X	93448	20802	
54L72	02102	X	54165	00904	X	79M12	11502	X	93450	20903	
54L73	02103	X	5417	00804	X	79M15	11503	X	93451	20904	
54L74	02105	X	54170	01801		79M24	11504		93452	20601	
54L78	02104	X	54174	01701	X	7905	11505	X	93453	20602	
54L86	02601	X	54175	01702	X	7912	11506	X	93460	20906	
54L90	02501	X	54180	01901	X	7915	11507	X	93461	20905	
54L93	02502	X	54181	01101	X	7924	11508		935	03002	X
54L95	02801	X	54182	01102	X	8080A	42001	X	93510	21001	
54S00	07001	X	54186	20101		8086	53001	X	93511	21002	
54S02	07301	X	54192	01308	X	82S10	23101		936	03003	X
54S03	07002	X	54193	01309	X	82S11	23102		940	03002	X
54S04	07003	X	54194	00905	X	82S115	20803	X	944	03102	
54S05	07004	X	54195	00906	X	82S123	20702	X	945	03301	
54S08	08003	X	5420	00102	X	82S126	20301	X	946	03004	X
54S09	08004	X	5423	00402	X	82S129	20302	X	948	03302	
54S10	07005	X	5425	00403	X	83S130	20401	X	950	03303	
54S11	08001	X	5426	00805	X	82S131	20402	X	951	03201	
54S112	07102	X	5427	00404	X	82S136	20601		957	03103	
54S113	07103	X	5428	16201		82S137	20602	X	958	03104	
54S114	07104		5430	00101	X	82S140	20801		9601	01204	X
54S133	07009	X	5432	16101	X	82S141	20802	X	9602	01205	X
54S134	07010		54365	16301	X	82S180	20903		9614	10403	X
54S135	07502		54366	16302	X	82S181	20904	X	9615	10404	X
54S138	07701		54367	16303	X	82S184	20901		962	03005	X
									9900A	46001	

NOTE: Items marked X in the QPL column are listed on QPL-38510-54 with at least one source. * 85°C Max. † 100°C Max.

© IC MASTER 1983

CROSS REFERENCE — MILITARY TO COMMERCIAL

M38510/	Device	QPL	M38510/	Device	QPL	M38510/	Device	QPL	M38510/	Device	QPL
00101	5430	X	02003	54L10	X	05202	4001A	X	10102	747	X
00102	5420	X	02004	54L00	X	05203	4002A	X	10103	LM101A	X
00103	5410	X	02005	54L04	X	05204	4025A	X	10104	LM108A	X
00104	5400	X	02006	54L03	X	05251	4000B		10105	LH2101A	X
00105	5404	X	02006	54L01	X	05252	4001B		10106	PM2108A	X
00106	5412	X	02101	54L71	X	05253	4002B		10107	LM118	X
00107	5401	X	02102	54L72	X	05254	4025B		10108	1558	X
00108	5405	X	02103	54L73	X	05301	4007A	X	10201	LM723	X
00109	5403	X	02104	54L78	X	05302	4019A	X	10301	710	X
00201	5472	X	02105	54L74	X	05303	4030A	X	10302	711	
00202	5473	X	02201	54H72	X	05304	4048A		10303	LM106	
00203	54107	X	02202	54H73	X	05352	4019B	X	10304	LM111	X
00204	5476	X	02203	54H74		05401	4008A	X	10305	LH2111	X
00205	5474	X	02204	54H76	X	05501	4009A	X	10401	55107	X
00206	5470	X	02205	54H101	X	05502	4010A	X	10402	55108	X
00207	5479		02206	54H103	X	05503	4049A	X	10403	55114	X
00301	5540	X	02301	54H30	X	05504	4050A	X	10403	9614	X
00302	5437	X	02302	54H20	X	05505	4041A		10404	55115	X
00303	5438	X	02303	54H10	X	05601	4017A	X	10404	9615	X
00401	5402	X	02304	54H00	X	05602	4018A	X	10405	55113	X
00402	5423	X	02305	54H04	X	05603	4020A	X	10406	7831	
00403	5425	X	02306	54H01	X	05604	4022A	X	10407	7832	
00404	5427	X	02307	54H22	X	05605	4024A	X	10601	LM102	
00501	5450	X	02401	54H40	X	05701	4006A	X	10602	LM110	
00502	5451	X	02501	54L90	X	05702	4014A	X	10603	LH2110	
00503	5453	X	02502	54L93	X	05703	4015A	X	10701	LM109	X
00504	5454	X	02503	54L193		05704	4021A	X	10702	LM141H-05	
00601	5482	X	02504	93L10		05705	4031A	X	10702	78M05	
00602	5483	X	02505	93L16		05706	4034A		10703	LM141H-12	
00603	9304	X	02601	54L86	X	05801	4016A	X	10703	78M12	X
00604	5480	X	02701	54L02	X	05802	4066A	X	10704	LM141H-15	
00701	5486	X	02801	54L95	X	05901	4028A		10704	78M15	X
00801	5406	X	02802	54L164		06001	10501	X	10705	LM141H-24	
00802	5416	X	02803	93L28		06002	10502	X	10705	78M24	
00803	5407	X	02804	93L00		06003	10505	X	10706	LM140K-05	
00804	5417	X	02805	76L70		06004	10506	X	10706	7805	X
00805	5426	X	02901	54L42		06005	10507	X	10707	LM140K-12	
00901	5495	X	02902	54L43		06006	10509	X	10707	7812	X
00902	5496	X	02903	54L44		06101	10531	X	10708	LM140K-15	
00903	54164	X	02904	54L46		06102	10631	X	10708	7815	X
00904	54165	X	02905	54L47		06103	10576	X	10709	LM140K-24	
00905	54194	X	02906	76L42A		06104	10535	X	10709	7824	X
00906	54195	X	02907	93L01		06201	10504	X	10801	3018A	
01001	5442	X	03001	930	X	06202	10597	X	10802	3045	X
01002	5443	X	03002	940	X	06301	10524	X	10901	555	X
01003	5444	X	03002	935	X	06302	10525	X	10902	556	X
01004	5445	X	03003	936	X	07001	54S00	X	10903	558	X
01005	54145	X	03004	946	X	07002	54S03	X	11001	LM148	X
01006	5446	X	03005	962	X	07003	54S04	X	11002	LM149	
01007	5447	X	03101	932		07004	54S05	X	11003	HA4741	X
01008	5448	X	03102	944		07005	54S10	X		4156	X
01009	5449	X	03103	957		07006	54S20	X	11004	4136	X
01101	54181	X	03104	958		07007	54S22	X	11005	LM124	X
01101	9341	X	03105	933		07008	54S30	X	11101	DG181A	X
01102	54182	X	03201	951		07009	54S133	X	11102	DG182A	X
01102	9342		03301	945		07010	54S134		11103	DG184A	X
01201	54121	X	03302	948		07101	54S74	X	11104	DG185A	X
01202	54122	X	03303	950		07102	54S112	X	11105	DG187A	X
01203	54123	X	03304	9093		07103	54S113	X	11106	DG188A	X
01204	9601	X	03501	MH0026		07104	54S114		11107	DG190A	X
01205	9602	X	04001	54H50	X	07105	54S174	X	11108	DG191A	X
01301	5492	X	04002	54H51	X	07106	54S175	X	11201	LM139	X
01302	5493	X	04003	54H53	X	07201	54S40	X	11202	LM193	
01303	54160	X	04004	54H54	X	07301	54S02	X	11301	DAC-08	X
01304	54163	X	04005	54H55	X	07401	54S51	X	11302	DAC-08A	X
01305	64162	X	04101	54L51		07402	54S64	X	11401	PM155	X
01306	54161	X	04102	54L54		07403	54S65		11402	PM156	X
01307	5490	X	04103	54L55		07501	54S86	X	11403	PM157	X
01308	54192	X	04201	54L121		07502	54S135		11404	PM155A	X
01309	54193	X	04202	54L122		07601	54S194		11405	PM156A	X
01401	54150	X	04301	93L18		07602	54S195		11406	PM157A	X
01402	9312	X	04401	93L24		07701	54S138		11501	LM120H-05	
01403	54153	X	04501	93L14		07702	54S139	X	11501	79M05	X
01404	9309	X	04502	93L08		07801	54S181	X	11502	LM120H-12	
01405	9322	X	04601	93L09		07802	54S182		11502	79M12	X
01405	54157	X	04602	93L12		07901	54S151	X	11503	LM120H-15	
01406	54151	X	04603	93L22		07902	54S153	X	11503	79M15	X
01501	5475	X	05001	4011A	X	07903	54S157	X	11504	LM120H-24	
01502	5477	X	05002	4012A	X	07904	54S158	X	11504	79M24	
01503	9308		05003	4023A	X	07905	54S251		11505	LM120K-05	
01503	54116	X	05051	4011B		07906	54S257		11505	7905	X
01504	9314	X	05052	4012B		07907	54S258		11506	LM120K-12	
01601	5408	X	05053	4023B		07908	54S253		11506	7912	X
01602	5409	X	05101	4013A	X	08001	54S11	X	11507	LM120K-15	
01701	54174	X	05102	4027A	X	08002	54S15		11507	7915	X
01702	54175	X	05103	4043A	X	08003	54S08	X	11508	LM120K-24	
01801	54170		05151	4013B		08004	54S09	X	11508	7924	
01901	54180	X	05152	4027B		08101	54S140	X	11601	DG300	X
02001	54L30	X	05153	4043B		08201	54S85	X	11602	DG301	
02002	54L20	X	05201	4000A	X	10101	741	X	11603	DG302	X

NOTE: Items marked X in the QPL column are listed on QPL-38510-54 with at least one source. * 85°C Max. † 100°C Max.

© IC MASTER 1983

CROSS REFERENCE — MILITARY TO COMMERCIAL (Continued)

M38510/	Device	QPL	M38510/	Device	QPL	M38510/	Device	QPL	M38510/	Device	QPL
11604	DG303	X	20102	MCM5304		23601	MCM6605*		30902	54LS153	X
11605	DG304	X	20201	IM5603A		23602	MCM6604A*		30903	54LS157	X
11606	DG305	X	20202	IM5623		23602	MKB4096*		30904	54LS158	X
11607	DG306	X	20301	HM7610-2	X	23603	MCM6605†		30905	54LS251	X
11608	DG307	X	20301	5300-1		23604	MCM6604A†		30906	54LS257	X
11901	061		20301	82S126	X	23604	MKB4096†		30907	54LS258	X
11902	062		20301	93417		23701	AM9130CFC		30908	54LS253	X
11903	064		20302	HM7611-2	X	23702	AM9130AFC		30909	54LS298	X
11904	071		20302	5301-1		23703	AM9130CFM		31001	54LS11	X
11904	771		20302	82S129	X	23703	AM9130CDM		31002	54LS15	X
11904	LF151		20302	93427		23704	AM9310AFM		31003	54LS21	X
11905	072		20401	HM7620-2	X	23704	AM9130ADM		31004	54LS08	X
11905	772		20401	5305-1		23705	AM91L30CF		31005	54LS09	
11905	LF153		20401	82S130	X	23706	AM91L30AF		31101	54LS85	X
11906	074		20401	93436		23707	AM91L30CFM		31201	54LS83A	X
11906	774		20402	HM7621-2	X	23707	AM91L30CDM		31202	54LS283	X
11906	LF147		20402	5306-1		23708	AM91L30AFM		31301	54LS13	X
12202	HA-2600		20402	82S131	X	23708	AM91L30ADM		31302	54LS14	X
12203	HA-2620		20402	93446		23709	AM9140CFC		31303	54LS132	X
12204	HA-2500		20601	HM7642-2	X	23710	AM9140AFC		31401	54LS123	X
12205	HA-2510		20601	5352-1		23711	AM9140CFM		31402	54LS221	X
12206	HA-2520		20601	82S136		23711	AM9140CDM		31403	54LS122	X
15001	5485	X	20601	93452		23712	AM9140AFM		31501	54LS90	X
15002	9324	X	20602	HM7643-2	X	23712	AM9140ADM		31502	54LS93	X
15101	5413	X	20602	5353-1		23713	AM91L40CFC		31503	54LS160	X
15102	5414	X	20602	82S137	X	23714	AM91L40AFC		31504	54LS161	X
15103	54132	X	20602	93453		23715	AM91L40CFM		31505	54LS168	
15201	54154	X	20603	HM7644-2		23715	AM91L40CDM		31506	54LS169	
15201	9311	X	20701	HM7602-2	X	23716	AM91L40AFM		31507	54LS192	X
15202	54155	X	20701	5330		23716	AM91L40ADM		31508	54LS193	X
15203	54156	X	20701	82S23	X	23801	2147H	X	31509	54LS191	X
15204	8250		20702	HM7603-2	X	23803	2147H	X	31510	54LS92	X
15205	8251		20702	5331		23805	2147H	X	31511	54LS162	X
15206	8252		20702	82S123	X	23806	2148H	X	31512	54LS163	X
15206	9301	X	20801	HM7640-2	X	23807	2147H	X	31513	54LS190	X
15301	54125		20801	5340-1		23901	6508		31601	54LS75	X
15302	54126	X	20801	82S140		23901	54C929		31602	54LS279	X
15501	54H08	X	20801	93438		23902	6518		31603	54LS259	X
15502	54H11	X	20802	HM7641-2	X	23902	54C930		31604	54LS375	X
15503	54H21	X	20802	5341-1		24001	2117 (200 ns)	X	31801	54LS261	
15504	Special	X	20802	82S141	X	24001	4116 (250 ns)	X	31901	54LS670	X
15601	54147		20802	93448		24002	2117 (250 ns)	X	31902	54LS170	
15602	54148		20803	82S115	X	24002	4116 (250 ns)	X	32001	54LS196	
15603	9318	X	20804	5348-1		30001	54LS00	X	32002	54LS197	X
15701	9338		20805	5349-1		30002	54SL03	X	32003	54LS290	X
15801	9321		20901	HM7684-2		30003	54LS04	X	32004	54LS293	X
15802	9317	X	20901	82S184		30004	54LS05	X	32102	54LS26	X
15901	9300	X	20902	HM7685-2		30005	54LS10	X	32201	54LS365	X
15902	9328	X	20902	82S185	X	30006	54LS12	X	32202	54LS366	X
16001	9334		20903	HM7680-2		30007	54LS20	X	32203	54LS367	X
16101	5432	X	20903	5380-1		30008	54LS22	X	32204	54LS368	X
16201	5428		20903	82S180		30009	54LS30	X	32301	54LS125	X
16301	54365	X	20903	93450		30101	54LS73	X	32302	54LS126	X
16302	54366	X	20904	HM7681-2		30102	54LS74	X	32401	54LS240	X
16303	54367	X	20904	5381-1		30103	54LS112	X	32402	54LS241	X
16304	54368	X	20904	82S181	X	30104	54LS113	X	32403	54LS244	X
17001	4081B	X	20904	93451		30105	54LS114	X	32501	54LS273	X
17002	4082B	X	20905	82S2708	X	30106	54LS174	X	32502	54LS373	X
17003	4073B	X	20905	93461		30107	54LS175	X	32503	54LS374	X
17101	4071B	X	20906	93460		30108	54LS107	X	32504	54LS377	X
17102	4072B	X	21001	HM76160-2		30109	54LS109	X	32601	54LS155	X
17103	4075B	X	21001	53S1680		30110	54LS76	X	32602	54LS156	X
17201	4085B	X	21001	82S190		30201	54LS40	X	32701	54LS390	X
17202	4086B	X	21001	93510		30202	54LS37	X	32702	54LS393	X
17203	4070B	X	21002	HM76161-2		30203	54LS38	X	32703	54LS490	X
17204	4077B	X	21002	53S1681		30204	54LS28	X	32801	54LS242	X
17301	4514B		21002	82S191	X	30301	54LS02	X	32802	54LS243	X
17302	4515B		21002	93511		30302	54LS27	X	32803	54LS245	X
17303	4532B		21004	93Z511	X	30303	54LS266	X	32901	54LS280	X
17304	4555B		22001	2708		30401	9LS51	X	33106	25LS174	X
17305	4556B		23001	93410		30401	54LS51	X	33107	25LS175	X
17401	4069UB	X	23002	93421		30402	54LS54	X	36001	54LS148	X
17402	40107B		23003	93411		30402	9LS51	X	36002	54LS348	X
17403	4502B	X	23004	93L420		30501	54LS32	X	40001	6800	
17404	40109B		23101	93415		30502	54LS86	X	42001	8080A	X
17501	4076B		23101	82S10		30601	54LS194	X	42101	8212	
17502	4095B		23102	93425		30602	54LS195	X	42101	54S412	
17503	4096B		23102	82S11		30603	54LS95	X	42201	8224	
17504	4098B	X	23103	93L415	X	30604	54LS96	X	42301	8228	
17505	40174B		23104	93L425	X	30605	54LS164	X	44001	2901A	
17601	4099B	X	23106	93425	X	30606	54LS295	X	44101	2905	
17602	4508B		23108	93425A	X	30607	54LS395	X	44102	2906	
17701	4093B		23112	93L422	X	30608	54LS165	X	44103	2907	
17702	40106B		23115	93L422A	X	30609	54LS166	X	44104	2915	
17801	4067B		23501	TMS4060*		30701	54LS138	X	44105	2916	
17802	4097B		23502	TMS4050*		30702	54LS139	X	44106	2917	
17803	40257B		23503	TMS4060†		30703	54LS42	X	44201	2918	
20101	HPROM0512	X	23504	TMS4050†		30704	54LS47	X	46001	9900A	
20101	MCM5303		23505	MM5280*		30801	54LS181		47001	1802	
20101	54186		23506	MM5280†		30901	54LS151	X	53001	8086	X

NOTE: Items marked X in the QPL column are listed on QPL-38510-54 with at least one source. * 85°C Max. † 100°C Max.

© IC MASTER 1983

Detailed Product Information on Military Parts Provided by:

Micro Power Systems 401
National Semiconductor 402
RCA 406
Signetics 410
Synertek 424
Texas Instruments 433

DIGITAL

ARITHMETIC FUNCTIONS

Device	M38510/	Description	Source
4008A	05401	4-Bit Full Adder	SSS
5480	00604	Gated Full Adder	Motorola
5482	00601	2-Bit Binary Full Adder	Motorola
5483	00602	4-Bit Binary Full Adder (Look-Ahead Carry)	Motorola, National, Signetics, TI
5485	15001	4-Bit Magnitude Comparator	Motorola, Signetics
54181, 9341	01101	Arithmetic Logic/ Function Generator	Motorola, National, Signetics
54182	01102	Look-Ahead Carry Generator	Motorola
54LS83A	31201	4-Bit Binary Full Adder	Fairchild, Motorola, TI
54LS85	31101	4 Bit Magnitude Comparator	Motorola, Signetics, TI
54LS283	31202	4 Bit Binary Full Adder	Fairchild, Motorola, TI
54S85	08201	4-Bit Magnitude Comparator	Signetics
54S181	07801	ALU/Function Generator	Signetics
9304	00603	Dual Full Adder	Motorola
9324	15002	4-Bit Magnitude Comparator	Motorola

BUFFERS, INVERTERS

4007A	05301	Dual Complementary Pair plus Inverter	National, RCA, SSS
4009A	05501	Hex Buffer/Converter, Inverting	SSS
4010A	05502	Hex Buffer/Converter, Non-Inverting	SSS
4049A	05503	Hex Buffer/Converter, Inverting	Motorola, National, RCA, SSS
4050A	05504	Hex Buffer/Converter, Non-Inverting	Motorola, National, RCA, SSS
4069UB	17401	Hex Inverter	RCA
4502B	17403	Hex Inverter/Buffer	RCA
5404	00105	Hex Inverter	Fairchild, Motorola National, Signetics, TI
5405	00108	Hex Inverter, O/C	Motorola, National, TI
5437	00302	Quad 2-Input NAND Buffer	Fairchild, Motorola, National, TI
5438	00303	Quad 2-Input NAND Buffer, O/C	Motoral, National, TI
5440	00301	Dual 4-Input NAND Buffer	Fairchild, Motorola National, TI
54126	15302	Quad Gated Buffer, TS	Signetics
54365	16301	Hex Buffer, TS	Signetics
54366	16302	Hex Inverter, TS	Signetics
54367	16303	Hex Buffer, Three State	Signetics
54368	16304	Hex Inverter, TS	Signetics
54H04	02305	Hex Inverter	Fairchild, Motorola, TI
54H40	02401	Dual 4-Input NAND Buffer	Motorola, TI
54LS04	30003	Hex Inverter	Fairchild, Motorola, National, Raytheon, Signetics, TI
54LS05	30004	Hex Inverter, O/C	Fairchild, Motorola, National, TI
54LS28	30204	Quad 2-Input NOR Buffer	Motorola
54LS37	30202	Quad 2-Input NAND Buffer	Motoroa, National Raytheon, Signetics, TI
54LS40	30201	Dual 4-Input NAND Buffer	Motorola, National, Raytheon, TI
54LS125	32301	Quad Gated Buffer, TS	Signetics, TI
54LS126	32302	Quad Gated Buffer, TS	TI
54LS365	32201	Hex Buffer, TS	Fairchild, Signetics, TI
54LS366	32202	Hex Inverter, TS	Fairchild, TI
54LS367	32203	Hex Buffer, TS	Fairchild, Motorola, Signetics, TI
54LS368	32204	Hex Inverter, TS	Fairchild, Motorola, Signetics, TI
54L04	02005	Hex Inverter	National
54S04	07003	Hex Inverter	Fairchild, Signetics, TI

BASED ON QPL-38510-54, 20 SEPTEMBER 1982

BUFFERS (cont)

Device	M38510/	Description	Source
54S05	07004	Hex Inverter, O/C	TI
54S40	07201	Dual 4-Input NAND Buffer	Fairchild, Signetics
935	03002	Hex Inverter	Fairchild
936	03003	Hex Inverter	Fairchild

COUNTERS

4017A	05601	Decade Counter/ Divider, Decoded Output	National, RCA, SSS
4018A	05602	Presettable Divide-by-N Counter	Motorola, National,
4020A	05603	14-Bit Binary Counter	Motorola, National, RCA
4022A	05604	Divide-by-8 Counter/ Divider, Decoded Output	National, RCA, SSS
4024A	05605	7-Bit Binary Counter	Motorola, National, RCA, SSS
5490	01307	Decade Counter, Ripple	Motorola, National
5492	01301	Divide-by-12 Counter (÷2, ÷6)	Motorola
5493	01302	4-Bit Binary Counter	Motorola, Signetics
54160	01303	Synchronous Decade Counter	Motorola, National, Signetics
54161	01306	Synchronous 4-Bit Binary Counter	Motorola, National, Signetics
54162	01305	Fully Synchronous Decade Counter	Motorola, National
54163	01304	Fully Synchronous 4-Bit Binary Counter	Motorola, National, Signetics
54192	01308	Decade Up/Down	Motorola
54193	01309	Decade Up/Down	Motorola, Signetics
54LS90	31501	Decade Counter	Motorola, Signetics, TI
54LS92	31510	Divide-by-12 Counter	Motorola, Signetics, TI
54LS93	31502	4-Bit Binary Counter	Signetics, TI
54LS160	31503	Synchronous Decade Counter	Motorola, TI
54LS161	31504	Synchronous 4-Bit Binary Counter	Motorola, Signetics, TI
54LS162	31511	Fully Synchronous Decade Counter	Motorola, TI
54LS163	31512	Fully Synchronous 4-Bit Binary Counter	Motorola, Signetics, TI
54LS190	31513	Synchronous Decade Up/Down Counter	Motorola, Signetics, TI
54LS191	31509	Synchronous Binary Up/Down Counter	Motorola, Signetics, TI
54LS192	31507	Decade Up/Down Counter	Motorola, Signetics, TI
54LS193	31508	Binary Up/Down Counter	Motorola, Signetics, TI
54LS197	32002	Binary Up Counter	Signetics
54LS290	32003	Decade Counter, Divide-by-2 and 5	Motorola, Signetics, TI
54LS390	32701	Dual Decade Counter, Ripple	TI
54LS293	32004	4-Bit Binary Counter, Ripple	Signetics, TI
54LS393	32702	Dual 4-Bit Binary Counter, Ripple	Signetics, TI
54LS490	32703	Dual Decade Counter, Ripple	Signetics, TI
54L90	02501	Decade Counter, Ripple	National
54L93	02502	4-Bit Binary Counter	National

DECODERS

5442	01001	BCD-to-Decimal Decoder	Fairchild, Motorola, National, Signetics
5443	01002	Excess 3-to-Decimal Decoder	Motorola
5444	01003	Excess 3-Gray-to-Decimal Decoder	Motorola
5445	01004	BCD-to-Decimal Decoder, O/C	Motorola
5446	01006	BCD-to-Decimal Decoder/Driver, 30V Output	National
5447	01007	BCD-to-Decimal Decoder/Driver, 15V Output	National
5448	01008	BCD-to-7 Segment Decoder/Driver with 30V Output	Motorola
5449	01009	BCD-to-7 Segment Decoder, O/C	Motorola
54145	01005	BCD-to-7 Segment Decoder	Motorola
54154, 9311	15201	4-Line to 16-Line Decoder/Demultiplexer	Motorola, Signetics

© IC MASTER 1983

MILITARY PARTS DIRECTORY

DECODERS (cont)

Device	M38510/	Description	Source
54155	15202	Dual 2-Line to 4-Line Decoder/Demultiplexer	Motorola
54156	15203	Dual 2-Line to 4-Line Decoder/Demultiplexer	Motorola
54LS138	30701	3-to-8-Line Decoder/ Demultiplexer	Fairchild, Motorola, Raytheon, Signetics, TI
54LS139	30702	Dual 2-Line to 4-Line Decoder/Demultiplexer	Fairchild, Motorola, TI
54LS148	36001	8-Input Priority Encoder	TI
54LS155	32601	Dual 2-to-4 Line Decoder/Demultiplexer	TI
54LS156	32602	Dual 2-to-4 Line Decoder/Demultiplexer	Motorola, Signetics, TI
54LS348	36002	8-Input Priority Encoder	TI
54LS42	30703	BCD to Decimal Decoder	Fairchild, Motorola, Signetics, TI
54LS47	30704	BCD to7-Segment Decoder	TI
54S139	07702	Dual 2-Line to 4-Line Decoder/Demultiplexer	Fairchild
9301	15206	BCD-to-Decimal Decoder	Motorola
9317	15802	BCD to 7-Segment Decoder/Driver	Fairchild
9318	15603	8-Input Priority Encoder	Motorola

DRIVERS

5406	00801	Hex Inverter Buffer/ Driver, O/C High Voltage Output	Motorola, National, TI
5407	00803	Hex Buffer/Driver, O/C High Voltage Output	Motorola, TI
5416	00802	Hex Inverter Buffer/ Driver, O/C High Voltage Output	Fairchild, Motorola, National, TI
5417	00804	Hex Buffer/Driver, O/C High Voltage Output	Fairchild, Motorola, TI
5426	00805	Quad 2-Input NAND Buffer/Driver, O/C, High Voltage Output	Signetics

FLIP-FLOPS

25LS174	33106	Hex D-Type Flip-Flop	Motorola, TI
25LS175	33107	Quad D-Type Flip-Flop	Motorola
4013A	05101	Dual "D" Flip-Flop with Set/Reset	Motorola, National, RCA, SSS
4027A	05102	Dual J-K Master-Slave Flip-Flop	Motorola, National, RCA, SSS
5470	00206	Positive Edge-Triggered J-K Flip-Flop	Motorola, TI
5472	00201	J-K Master Slave Flip-Flop (AND Inputs)	National, TI
5473	00202	Flip-Flop Dual J-K Master Slave	Motorola, National, Signetics, TI
5474	00205	Dual D-Type Edge-Triggered Flip-Flop	Fairchild, Motorola, National, Signetics, TI
5476	00204	Dual J-K Master Slave Flip-Flop with Preset and Clear	National, Signetics, TI
54107	00203	Dual J-K Master Slave Flip-Flop	Motorola, National, TI
54174	01701	Hex D-Type Flip-Flop	Fairchild, Motorola, Signetics
54175	01702	Quad D-Type Flip-Flop	Fairchild, Motorola, Signetics
54H72	02201	J-K Master-Slave Flip-Flop (AND Inputs)	Motorola
54H73	02202	Dual J-K Master-Slave Flip-Flop	Motorola
54H76	02204	Dual J-K Flip-Flop	TI
54H101	02205	J-K Negative Edge-Triggered Flip-Flop (AND-OR Inputs)	Motorola
54H103	02206	Dual J-K Negative Edge-Triggered Flip-Flop	Motorola
54LS73	30101	Dual J-K Master Slave Flip-Flop	Signetics, TI
54LS74	30102	Dual D-Type Positive Edge-Triggered Flip-Flop with Preset and Clear	Fairchild, Motorola, Signetics, TI
54LS76	30110	Dual J-K-Master Slave Flip-Flop with Preset and Clear	Signetics, TI
54LS107	30108	Dual Master Slave Flip-Flop	Motorola, Signetics, TI
54LS109	30109	Dual J-K Positive Edge-Triggered Flip-Flop with Preset and Clear	Fairchild, Motorola, Signetics, TI

BASED ON QPL-38510-54, 20 SEPTEMBER 1982

FLIP-FLOPS (cont)

Device	M38510/	Description	Source
54LS112	30103	Dual J-K Negaive Edge-Triggered Flip-Flop with Preset and Clear	Fairchild, Motorola, Signetics, TI
54LS113	30104	Dual J-K Negative Edge-Triggered Flip-Flop with Separate Preset and Clock	Fairchild, Motorola, Signetics, TI
54LS114	30105	Dual J-K Negative Edge-Triggered Flip-Flop with Clock, Clear, and Preset	Fairchild, Motorola, TI
54LS174	30106	Hex D-Type Flip-Flop	Fairchild, Motorola, Signetics, TI
54LS175	30107	Quad D-Type Edge-Triggered Flip-Flop with Clear	Fairchild, Motorola, Raytheon, Signetics, TI
54LS273	32501	Octal D-Type Edge-Triggered Flip-Flop with Clear	TI
54LS298	30909	Quad D-Type Flip-Flop with Multiplexed Dual Inputs	Signetics
54LS373	32502	Octal Transparent Latch	TI
54LS374	32503	Octal D-Type Edge-Triggered Flip-Flop, Three State	TI
54LS377	32504	Octal D-Type Flip-Flop with Enable	TI
54L71	02101	J-K Master-Slave Flip-Flop (AND-OR Inputs)	National
54L72	02102	J-K Master-Slave Flip-Flop (AND Inputs)	National
54L73	02103	Dual J-K Master-Slave Flip-Flop	National
54L74	02105	Dual D-Type Edge-Triggered Flip-Flop	National
54L78	02104	Dual J-K Master-Slave Flip-Flop	National
54S74	07101	Dual Flip-Flop	Fairchild, Signetics
54S112	07102	Dual J-K Negative Edge-Triggered Flip-Flop	Signetics
54S113	07103	Dual J-K Negative Edge-Triggered Flip-Flop Separate Preset and Clock	Signetics
54S174	07105	Hex D-Type Flip-Flop	AMD, Fairchild
54S175	07106	Quad D-Type Flip-Flop	AMD, Fairchild
10531	06101	Dual "D" Master Slave Flip-Flop	Motorola
10576	06103	Hex "D" Master Slave Flip-Flop	Motorola
10535	06104	Dual J-K Master-Slave Flip-Flop	Motorola
10631	06102	Dual "D" Master Slave Flip-Flop	Motorola

GATES, AND/NAND

4011A	05001	Quad 2-Input NAND Gate	Motorola, National, RCA, SSS
4012A	05002	Dual 4-Input NAND Gate	Motorola, National, RCA, SSS
4023A	05003	Triple 3-Input NAND Gate	Motorola, National, RCA, SSS
4073B	17003	Triple 3-Input AND Gate	Motorola, RCA
4081B	17001	Quad-2-Input AND Gate	Motorola, RCA, SSS
4082B	17002	Dual 4-Input AND Gate	Motorola, RCA
5400	00104	Quad 2-Input NAND Gate	Fairchild, Motorola, National, Signetics, TI
5401	00107	Quad-2-Input NAND Gate, O/C	Motorola, National, TI
5403	00109	Quad 2-Input NAND Gate, O/C	Motorola, National, TI
5408	01601	Quad 2-Input AND Gate	Fairchild, Motorola, National
5409	01602	Quad 2-Input AND Gate, O/C	Fairchild, Motorola
5410	00103	Triple 3-Input NAND Gate	Fairchild, Motorola National, Signetics, TI
5412	00106	Triple 3-Input NAND Gate, O/C	TI
5420	00102	Dual 4-Input NAND Gate	Fairchild, Motorola, National,Signetics, TI
5426	00805	Quad 2-Input NAND Gate, O/C	Signetics
5430	00101	8-Input NAND Gate	Fairchild, Motorola, National, TI
54H00	02304	Quad 2-Input NAND Gate	Fairchild, Motorola, TI
54H01	02306	Quad 2-Input NAND Gate, O/C	Motorola, TI

© IC MASTER 1983

GATES, AND/NAND (cont)

Device	M38510/	Description	Source
54H08	15501	Quad 2-Input AND Gate	Motorola
Special	15504	Quad 2-Input AND Gate	Motorola
54H10	02303	Triple 3-Input NAND Gate	Fairchild, Motorola, TI
54H11	15502	Triple 3-Input AND Gate	Motorola
54H20	02302	Dual 4-Input NAND Gate	Fairchild, Motorola, TI
54H21	15503	Dual 4-Input AND Gate	Motorola
54H22	02307	Dual 4-Input NAND Gate, O/C	Fairchild, Motorola
54H30	02301	8-Input NAND Gate	Fairchild, Motorola, TI
54LS00	30001	Quad 2-Input NAND Gate	Fairchild, Motorola, National, Signetics, TI
54LS03	30002	Quad 2-Input NAND Gate, O/C	Fairchild, Motorola, National, TI
54LS08	31004	Quad 2-Input AND Gate	Fairchild, Motorola, National, Raytheon, Signetics, TI
54LS10	30005	Triple 3-Input NAND Gate	Fairchild, Motorola, National, Signetics, TI
54LS11	31001	Triple 3-Input AND Gate	Fairchild, Motorola, National, Raytheon, TI
54LS12	30006	Triple 3-Input NAND Gate, O/C	Motorola, National, Signetics, TI
54LS15	31002	Triple 3-Input AND Gate, O/C	Motorola, National, TI
54LS20	30007	Dual 4-Input NAND Gate	Fairchild, Motorola, National, Signetics, TI
54LS21	31003	Dual 4-Input AND Gate	Fairchild, Motorola, National, Raytheon, TI
54LS22	30008	Dual 4-Input NAND Gate, O/C	Fairchild, Motorola, National, TI
54LS26	32102	Quad 2-Input NAND O/C to 15V	Motorola, TI
54LS30	30009	8-Input NAND Gate	Fairchild, Motorola, National, TI
54LS38	30203	Quad 2-Input NAND Gate, O/C	Motorola, National, TI
54L00	02004	Quad 2-Input NAND Gate	National
54L03	02006	Quad 2-Input NAND Gate, O/C	National
54L10	02003	Triple 3-Input NAND Gate	National
54L20	02002	Dual 4-Input NAND Gate	National
54L30	02001	8-Input NAND Gate	National
54S00	07001	Quad 2-Input NAND Gate	Fairchild,Signetics, TI
54S03	07002	Quad 2-Input NAND Gate, O/C	TI
54S08	08003	Quad 2-Input AND Gate	Fairchild, Signetics
54S09	08004	Quad 2-Input AND Gate, O/C	Fairchild
54S10	07005	Triple 3-Input NAND Gate	Fairchild, Signetics, TI
54S11	08001	Triple 3-Input AND Gate	Fairchild,Signetics
54S20	07006	Dual 4-Input NAND Gate	Fairchild, TI
54S22	07007	Dual 4-Input NAND Gate, O/C	TI
54S30	07008	8 Input NAND Gate	TI
54S133	07009	13-Input NAND Gate	Fairchild,Signetics
930	03001	Dual 4-Input NAND Gate, Expandable, DTL	Fairchild
935	03002	DTL Hex Inverter	Fairchild
940	03002	DTL Logic Gate	Fairchild
946	03004	Quad 2-Input NAND Gate, DTL	Fairchild
962	03005	Triple 3-Input NAND Gate, DTL	Fairchild
10504	06201	Quad 2-Input NAND Gate	Motorola
10597	06202	Hex AND Gate	Motorola

GATES, AND-OR/AND-OR-INVERT

4019A	05302	Quad AND-OR Select Gate	National, RCA, SSS
4019B	05352	Quad and/or Select Gate	SSS
4085	17201	Dual 2-Wide 2-Input AOI	RCA
4086	17202	4-Wide 2-Input AOI Gate, Expandable	RCA
5450	00501	2-2-Input AOI Gate, Expandable	Motorola, National, TI
5451	00502	2-2-Input AOI Gate, Expandable	Motorola, National, TI

BASED ON QPL-38510-54, 20 SEPTEMBER 1982

GATES, AND-OR/AND-OR-INVERT (cont)

Device	M38510/	Description	Source
5453	00503	2-2-2-2-Input AOI Gate, Expandable	Motorola, National, TI
5454	00504	2-2-2-2-Input AOI Gate	Motorola, National, TI
54H50	04001	2-2-Input AOI Gate, Expandable	Motorola
54H51	04002	Dual 2-2-Input AOI Gate	Motorola
54H53	04003	2-2-2-3-Input AOI Gate, Expandable	Motorola
54H54	04004	2-2-2-3-Input AOI Gate	Motorola
54H55	04005	4-4-Input AOI Gate, Expandable	Motorola
54LS51	30401	Dual 2-2-Input AOI Gate	Fairchild, Motorola, National, Raytheon, TI
54LS54	30402	2-2-2-3-Input AOI Gate	Fairchild, Motorola, National, Raytheon, TI
54S51	07401	2-2-Input AOI Gate	Fairchild, Signetics
54S64	07402	4-2-3-2-Input AOI Gate	Fairchild

GATES, EXCLUSIVE OR/NOR

4030A	05303	Quad Exclusive OR Gate	Motorola, National, SSS
4070B	17203	Quad Exclusive OR Gate	Motorola, RCA
4077B	17204	Quad Exclusive OR Gate	RCA
5486	00701	Quad 2-Input Exclusive OR Gate	Fairchild, Motorola, National, Signetics, TI
54L86	02601	Quad 2-Input Exclusive OR Gate	National
54LS86	30502	Quad 2-Input Exclusive OR	Motorola, National, Signetics, TI
54LS266	30303	Quad 2-Input Exclusive NOR Gate, O/C	Fairchild, Motorola, National, Signetics, TI
54S86	07501	Quad 2-Input Exclusive OR Gate	Signetics
10507	06005	Triple 2-Input Exclusive OR/NOR Gate	Motorola

GATES, OR/NOR

4000A	05201	Dual 3-Input NOR Gate plus Inverter	RCA, SSS
4001A	05202	Quad-2-Input NOR Gate	Motorola, National, RCA, SSS
4002A	05203	Dual 4-Input NOR Gate	Motorola, National, RCA, SSS
4025A	05204	Triple 3-Input NOR Gate	Motorola, National, RCA, SSS
4071B	17101	Quad 2-Input OR Gate	RCA, SSS
4072B	17102	Dual 4-Input OR Gate	RCA
4075B	17103	Triple 3-Input OR Gate	RCA
5402	00401	Quad 2-Input NOR Gate	Fairchild, Motorola, National, TI
5423	00402	Dual 4-Input NOR Gate with Strobe, Expandable	Motorola, TI
5425	00403	Dual 4-Input NOR Gate with Strobe	Motorola, TI
5427	00404	Triple 3-Input NOR Gate	Fairchild, Motorola, TI
5432	16101	Quad 2-Input OR Gate	Signetics
54LS02	30301	Quad 2-Input NOR Gate	Fairchild, Motorola, National, Signetics, TI
54LS27	30302	Triple 3-Input NOR Gate	Fairchild, Motorola, National, Raytheon, TI
54LS32	30501	Quad 2-Input OR Gate	Fairchild, Motorola, National, Raytheon, Signetics, TI
54L02	02701	Quad 2-Input NOR Gate	National
54S02	07301	Quad 2-Input NOR Gate	Fairchild, Signetics
10501	06001	Quad 2-Input OR/NOR Gate	Motorola
10502	06002	Quad 2-Input Gate (3 NOR, 1 OR/NOR)	Motorola
10505	06003	2-3-2-Input OR/NOR Gate	Motorola
10506	06004	4-3-3 Input OR/NOR Gate	Motorola
10509	06006	4-5-Input OR/NOR Gate	Motorola

LATCHES

4099B	17601	8-Bit Addressable Latch	RCA
4043A	05103	Quad NOR R/S Latch	SSS
5475	01501	Complementary Output	Motorola, Signetics
5477	01502	Quad Bistable Latch	Motorola
54116	01503	Dual 4-Bit Latch with Clear	Signetics
54LS75	31601	Quad Bistable Latch	Signetics, TI
54LS259	31603	8-Bit Addressable Latch	TI

© IC MASTER 1983

MILITARY PARTS DIRECTORY

LATCHES (cont)

Device	M38510/	Description	Source
54LS279	31602	Quad Set Reset Latch	Fairchild, Signetics, TI
54LS373	32502	8-Bit Latch, Transparent D-Type, Three State	TI
54LS375	31604	Quad Bistable Latch	Signetics, TI
9314	01504	Quad Multifunction Latch	Motorola

MULTIPLEXERS

54150	01401	16-Channel Data Selector/Multiplexer	Motorola
54151	01406	8-Input Multiplexer	Fairchild, Motorola, National, Signetics
54153	01403	Dual 4-Channel Data Selector/Multiplexer	Fairchild, Motorola, National, Signetics
54LS151	30901	8-Input Multiplexer	Fairchild, Motorola, National, TI
54LS153	30902	Dual 4-Channel Data Selector/Multiplexer	Fairchild, Motorola, National, Signetics, TI
54LS157	30903	Quad 2-Input Multiplexer, Non-Inverting	Fairchild, Motorola, National, Raytheon, TI
54LS158	30904	Quad 2-Input Multiplexer, Inverting	Fairchild, Motorola, Raytheon, TI
54LS251	30905	8-Input Multiplexer, Complemetary Input, Strobe, TS	TI
54LS253	30908	Dual 4-Input Multiplexer, TS	Fairchild, Motorola, National, TI
54LS257	30906	Quad 2-Input Multiplexer, Non-Inverting, TS	Fairchild, Motorola, Signetics, TI
54LS258	30907	Quad 2-Input Multiplexer, Inverting, TS	Fairchild, Signetics, TI
54S151	07901	8-Input Multiplexer	Fairchild, Signetics
54S153	07902	Dual 4-Channel Data Selector/Multiplexer	Fairchild, Signetics
54S157	07903	Quad 2-Input Multiplexer, Non-Inverting	Fairchild, Signetics
54S158	07904	Quad 2-Input Multiplexer, Inverting	Fairchild, Signetics
9309	01404	Dual 4-Input Multiplexer	Fairchild, Motorola, Signetics
9312	01402	8-Channel Data Selector/Multiplexer	Motorola
54157, 9322	01405	Quad 2-Input Data Selector/Multiplexer (Non-Inverting)	Fairchild, Motorola, National, Signetics

MULTIVIBRATORS

4098B	17504	Dual Monostable Multivibrator, Retriggerable	RCA
54121	01201	Monostable Multivibrator	Fairchild, Motorola, Signetics
54122	01202	Retriggerable Monostable Multivibrator with Clear	Fairchild, Motorola
54123	01203	Retriggerable Monostable Multivibrator with Clear	Fairchild, Motorola, Signetics
54LS122	31403	Dual Retriggerable Monostable Multivibrator with Clear	Motorola, TI
54LS123	31401	Dual Retriggerable Monostable Multivibrator with Clear	Motorola, TI
54LS221	31402	Dual Monostable Multivibrator, Schmitt Trigger Input	Motorola, TI
9601	01204	One Shot Multivibrator	Fairchild, Motorola
9602	01205	Dual One Shot Multivibrator	Fairchild, Motorola

MISCELLANEOUS

5413	15101	Dual 4-Input NAND Schmitt Trigger	Motorola
5414	15102	Hex Schmitt Trigger, Inverting	Motorola
54132	15103	Quad 2-Input NAND Schmitt Trigger	Motorola, Signetics
54180	01901	9-Bit Odd/Even Parity Generator/Checker	Motorola, National, Signetics
54LS13	31301	Dual 4-Input NAND Schmitt Trigger	Motorola, TI
54LS14	31302	Hex Schmitt Trigger, Inverting	Motorola, Signetics, TI
54LS240	32401	Octal Bus Driver, Schmitt Trigger, Inverting	TI

BASED ON QPL-38510-54, 20 SEPTEMBER 1982

MISCELLANEOUS (cont)

Device	M38510/	Description	Source
54LS241	32402	Octal Bus Driver, Schmitt Trigger, Non-Inverting	Motorola, TI
54LS242	32801	Quad Bus Transceiver	TI
54LS243	32802	Quad Bus Transceiver	TI
54LS244	32403	Octal Bus Driver, Schmitt Trigger, Non-Inverting, Three State	Motorola, TI
54LS245	32803	Octal Bus Transceiver, Three State	TI
54LS132	31303	Quad 2-Input NAND Schmitt Trigger	Motorola, Signetics, TI
54LS280	32901	9-Bit Odd/Even Parity Generator Checker	TI
10524	06301	Quad TTL to ECL OR/NOR Translator	Motorola
10525	06302	Quad ECL to TTL Translator	Motorola

INTERFACE

ANALOG SWITCHES

DG181	11101	2xSPST, JFET	Siliconix
DG182	11102	2xSPST, JFET	Siliconix
DG184	11103	2xDPST, JFET	Siliconix
DG185	11104	2xDPST, JFET	Siliconix
DG187	11105	SPDT, JFET	Siliconix
DG188	11106	SPDT, JFET	Siliconix
DG190	11107	2xSPDT, JFET	Intersil, Siliconix
DG191	11108	2xSPDT, JFET	Intersil, Siliconix
DG300	11601	2 x SPST, CMOS	Siliconix
DG302	11603	2 x DPST, CMOS	Siliconix
DG303	11604	2 x SPDT, CMOS	Siliconix
DG304	11605	2 x SPST, CMOS	Siliconix
DG305	11606	SPDT, CMOS	Siliconix
DG306	11607	2 x DPST, CMOS	Siliconix
DG307	11608	2 x SPDT, CMOS	Siliconix
4016A	05801	4 x SPST, CMOS	Motorola, SSS
4066A	05802	4xSPST, CMOS	Motorola

D/A CONVERTERS

DAC-08A	11302	D/A Converter, 8-Bit	PMI
DAC-08	11301	D/A Converter, 8-Bit	PMI

LINE DRIVERS AND RECEIVERS

54S140	08101	Dual 4-Input Positive NAND Line Driver	Fairchild, Signetics
55107	10401	Differential Line Receiver	Fairchild, Motorola, TI
55108	10402	Differential Line Receiver	TI
55113	10405	Dual Differential Line Driver, Three-State	TI
55114, 9614	10403	Dual Differential Line Driver	Fairchild, TI
55115, 9615	10404	Dual Differential Line Receiver	Fairchild, TI

LINEAR

AMPLIFIERS

LM101A	10103	Operational Amplifier	Fairchild, National, Raytheon, Signetics
LM108A	10104	Operational Amplifier	Fairchild, National
LM118	10107	Operational Amplifier	National
1558	10108	Dual Operational Amplifier	Fairchild
741	10101	Operational Amplifier	Fairchild, National, Raytheon
747	10102	Dual Operational Amplifier	Fairchild, National, Raytheon
LH2101A	10105	Dual Operational Amplifier	Raytheon, Signetics
HA2500	12204	Operational Amplifier	Harris
HA2510	12205	Operational Amplifier	Harris
HA2520	12206	Operational Amplifier	Harris
HA2600	12202	Operational Amplifier	Harris
HA2620	12203	Operational Amplifier	Harris

© IC MASTER 1983

AMPLIFIERS (cont)

Device	M38510/	Description	Source
4136	11004	Quad Operational Amplifier	Fairchild, Raytheon
PM2108A	10106	Dual Operational Amplifier	PMI
LM124	11005	Quad Operational Amplifier	Fairchild
LM148	11001	Quad Operational Amplifier	Raytheon
PM155	11401	Operational Amplifier	PMI
PM155A	11404	Operational Amplifier	PMI
PM156	11402	Operational Amplifier	PMI
PM156A	11405	Operational Amplifier	PMI
PM157	11403	Operational Amplifier	PMI
PM157A	11406	Operational Amplifier	PMI
4156	11003	Quad Operational Amplifier	Raytheon
HA4741	11003	Quad Operational Amplifier	Harris

COMPARATORS

111	10304	Voltage Comparator	Fairchild, Raytheon, National
139	11201	Quad Voltage Comparator	Raytheon
710	10301	Voltage Comparator	Fairchild
LH2111	10305	Dual Voltage Comparator	Raytheon

TIMERS

555	10901	Timer	Fairchild, Signetics
556	10902	Dual Timer	Signetics
558	10903	Quad Timer	Signetics

TRANSISTOR ARRAYS

3045	10802	Transistor Array	Fairchild

VOLTAGE REGULATORS

LM723	10201	Voltage Regulator	Fairchild
LM109	10701	Voltage Regulator	Fairchild
7812	10707	Voltage Regulator	Fairchild
7805	10706	Voltage Regulator	Fairchild
78M12	10703	Voltage Regulator	Fairchild
78M15	10704	Voltage Regulator	Fairchild
7815	10708	Voltage Regulator	Fairchild
7824	10709	Voltage Regulator	Fairchild
79M05	11501	Voltage Regulator	Fairchild
7905	11505	Voltage Regulator	Fairchild
7912	11506	Voltage Regulator	Fairchild
7915	11507	Voltage Regulator	Fairchild
79M12	11502	Voltage Regulator	Fairchild
79M15	11503	Voltage Regulator	Fairchild

MEMORY

PROMs

82S23	20701	32x8, OC	Signetics
82S123	20702	32x8, TS	Signetics
82S115	20803	512x8, TS PROM	Signetics
82S126	20301	256x4, OC	Signetics
82S129	20302	256x4, TS	Signetics
82S185	20902	2048x4 PROM	Signetics
82S130	20401	PROM, 512x4, OC	Signetics
82S131	20402	PROM, 512x4, TS	Signetics
82S137	20602	1024x4, TS	Signetics
82S141	20802	512x8, TS	Signetics
82S181	20904	1024x8, TS	Signetics
82S191	21002	2048x8, TS	Signetics
82S2708	20905	1024x8, TS	Signetics
HM7602-2	20701	32x8, OC	Harris
HM7603-2	20702	32x8, TS	Harris
HPROM512	20101	64x8 PROM	Harris
HM7610-2	20301	256x4, OC	Harris
HM7611-2	20302	256x4, TS	Harris
HM7620-2	20401	PROM, 512x4, OC	Harris
HM7621-2	20402	PROM, 512x4, TS	Harris

BASED ON QPL-38510-54, 20 SEPTEMBER 1982

PROMs (cont)

Device	M38510/	Description	Source
HM7642-2	20601	1024x4, OC	Harris
HM7643-2	20602	1024x4, TS	Harris
HM7640-2	20801	512x8, OC	Harris
HM7641-2	20802	512x8, TS	Harris
93Z511	21004	2048x8, TS 45 nsec	Fairchild

RAMs

4116 (200 ns)	24001	16384x1, TS	Mostek
4116 (250 ns)	24002	16384x1, TS	Mostek
2147H (85 ns)	23801	4096 x 1, TS	Intel
2147H (70 ns)	23803	4096 x 1, TS	Intel
2147H (55 ns)	23805	4096 x 1, TS	Intel
2147H (45 ns)	23807	4096 x 1, TS	Intel
2148H	23806	RAM, 1024x4, TS	Intel
93L415	23103	RAM, 1024x1-Bit, OC	Fairchild
93425	23102	RAM, 1024x1-Bit, TS	Fairchild
93L425	23104	RAM, 1024x1-Bit, TS	Fairchild
93425	23106	RAM, 1024x1-Bit, TS	Fairchild
93425A	23108	RAM, 1024x1-Bit, TS	Fairchild
93L422	23112	RAM, 256x4, T.S	Fairchild
93L422A	23115	RAM, 256x4, T.S	Fairchild

SHIFT REGISTERS

4006A	05701	18-Bit Static S.R.	Motorola, National, RCA
4014A	05702	18-Bit Static S.R. (Synchronous)	Motorola, National, RCA
4015A	05703	Dual 4-Bit Static S.R.	Motorola, National, RCA, SSS
4021A	05704	8-Bit Static S.R. Asynchronous	Motorola, National, RCA, SSS
4031A	05705	64-Bit Static S.R.	National, RCA
54L95	02801	4-Bit Parallel Access S.R.	National
5495	00901	4-Bit Parallel Access S.R.	Motorola, National
5496	00902	5-Bit S.R.	Motorola, National, Signetics
54164	00903	8-Bit Serial-In Parallel-Out S.R.	National, Signetics
54165	00904	8-Bit Parallel-Serial S.R.	Motorola
54194	00905	4-Bit Universal S.R.	Motorola, National, Signetics
54195	00906	4-Bit Parallel Access S.R.	Motorola
54LS95	30603	4-Bit Parallel Access S.R.	Fairchild, Signetics, TI
54LS96	30604	5-Bit S.R.	Signetics, TI
54LS164	30605	8-Bit Serial In, Parallel Out, S.R.	Motorola, Signetics, TI
54LS165	30608	8-Bit Parallel Load S.R., Complementary Outputs	Motorola
54LS166	30609	8-Bit Parallel-In, Serial-Out S.R.	Motorola, TI
54LS194	30601	4-Bit Universal Bidirectional S.R.	Motorola, TI
54LS195	30602	4-Bit Parallel In, Parallel Out, S.R.	Signetics, TI
54LS295	30606	4-Bit Parallel In, Parallel Out, Right/ Left S.R.	Signetics, TI
54LS395	30607	4-Bit Parallel In, Parallel Out, Cascadable S.R.	Signetics, TI
54LS670	31901	4x4 Register File, TS	Motorola
9300	15901	Universal 4-Bit S.R.	Motorola
9328	15902	Dual 8-Bit S.R.	Motorola

MICROPROCESSORS

8080A	42001	Microprocessor	Intel
8086	53001	Microprocessor	Intel

© IC MASTER 1983

Last Page This Section. Next Page 401.

ABBREVIATIONS OF COMPANY NAMES

Action Ins	Action Instruments
AD	Analog Devices
ADT	Advanced Digital Technology
Adapt Sci	Adaptive Science Corp.
Advent	Advent Products, Inc.
Alphatron	Alphatron
AMA	American Automation
AMD	Advanced Micro Devices
AMI	American Microsystems, Inc.
Amperex	Amperex Electronic Corp.
Analogic	Analogic
Analog Sys	Analog Systems
APC	Applied Micro Circuits
Apex	Apex Microtechnology
APM	Applied Microsystems Corp.
Appl Sys	Applied Systems Corp.
APT	Applied Microtechnology
Aptek	Aptek Microsystems
Array Tech	Array Technology
AWI	Analog West
Bedford	Bedford Computer Systems Inc.
Burr-Brown	Burr-Brown Research
CAE	Computer Aided Engineering
Cal Devices	California Devices
Cent Data	Central Data Corp.
Cermetek	Cermetek
CGRS	CGRS Microtech Inc.
Cherry	Cherry Semiconductor
CIC	Custom Integrated Circuits
Citel	Citel, Inc.
Comlinear	Comlinear Corporation
CMA	Custom MOS Arrays
Comark	Comark Corp.
Comdial	Comdial Semiconductor
Comp Auto	Computer Automation
Compas	Compas Microsystems
Cont Logic	Control Logic Inc.
Control Sys	Control Systems Microsystems Div.
CreMicro	Creative Micro Systems
Cromemco	Cromemco, Inc.
CSG	Commodore Semiconductor Group
Cubit	Cubit Inc.
Curtis	Curtis Electro Devices, Inc.
Cybernetic	Cybernetic Micro Systems
Cybersys	Cybersystems
Cybertek	Cybertek Inc.
Data General	Data General
Data I/O	Data I/O
Data Trans	Data Translation
Datel	Datel-Intersil
Datricon	Datricon Corporation
DDC	Data Devices Corporation
DEC	Digital Equipment Corporation
Delco	Delco Electronics
DGM	Digital Microsystems
Digelec	Digelec Corp.
Digitek	Digitek, Inc.
Dionics	Dionics Inc.
Dist Comp	Distributed Computer Systems
Divers Tech	Diversified Technology
E-HI	E-H International, Inc.
Elind	Elind Elettronica Industriale
EL Instr	E & L Instruments
EMM	EMM
Emulogic	Emulogic Inc.
Epson	Epson America, Inc.
ETI Micro	ETI Micro
Exar	Exar Integrated Systems
Fairchild	Fairchild
Ferranti	Ferranti Electric
Fujitsu A	Fujitsu America
Fujitsu	Fujitsu Microelectronics, Inc.
GI	General Instrument
GMS	General Microsystems
GTE Micro	GTE Microcircuits
Harris	Harris Semiconductor
Heurikon	Heurikon Corp.
Hilevel	Hilevel Technology, Inc.
Hitachi	Hitachi America, Ltd.
Holt	Holt Inc.
HP	Hewlett-Packard
Hughes	Hughes Aircraft, Solid State Products
Hybrid Sys	Hybrid Systems
Hycom	Hycom Incorporated
IDT	Integrated Device Technology
IMI	International Microcircuits, Inc.
IMP	International Microelectronic Products
IMS	Industrial Micro-systems Inc.
Inconix	Inconix Corporation
Ind Tech	Inductive Technology
Inmos	Inmos
IntCirEng	Integrated Circuit Engineering
IntCirSys	Integrated Circuit Systems
IntCompSys	Integrated Computer Systems
IntCyber	International Cybernetics
Int Micro	International Microsystems
Int Tech	Integrated Technology Corp.
Intech/FMI	Intech/Function Modules Inc.
Intel	Intel
Interdesign	Interdesign
Intersil	Intersil
Intronics	Intronics
IPI	Integrated Photomatrix Inc.
ITT	ITT Semiconductors
Kinetic Sys	Kinetic Systems
Kontron	Kontron Electronics
Lambda	Lambda Semiconductor
Laserdyne	Laserdyne
LSI Comp	LSI Computer Systems
LSI Logic	LSI Logic Corporation
Master Logic	Master Logic Corporation
Matrix	Matrix Corp.
Matrox	Matrox Electronic Systems
MCC	Microcomputer Control
Micrel	Micrel
Micro Eng	Micro Circuit Engineering
Micro Innov	Micro Innovators
Micropac	Micropac Industries
Micro Net	Micro Networks
Micro Pwr	Micro Power Systems
Micro Sci	Micro Sciences Corp.
Micro Tech	Microcircuits Technology
Micro-Link	Micro-Link Corporation
Micron	Micron Technology
MilerTron	MilerTronics
Miller	Miller Technology
Mitel	Mitel Semiconductor
Mitsubishi	Mitsubishi Electronics
MMI	Monolithic Memories, Inc.
Monosil	Monosil
MonSys	Monolithic Systems Corp.
Mostek	Mostek
Motorola	Motorola Semiconductor
MRC	MRC Systems
Murray	Murray Consulting
National	National Semiconductor
NCR	NCR Corp., Microelectronics Division
NEC-EA	NEC/Electronic Arrays Division
NEC Electron	NEC/Electron Division
NEC Micro	NEC/Microcomputer Division
Nitron	Nitron
Nortek	Nortek
OAE	Oliver Advanced Engineering
Octagon	Octagon Systems Corp.
OEI	Optical Electronics Inc.
Ohio Sci	Ohio Scientific
OKI	OKI Semiconductor
Omnibyte	Omnibyte Corp.
Oscar	I. S. Oscar Assoc.
Panasonic	Panasonic
PC/M	Pacific/Cyber Metrix
Percom	Percom Data Co.
Phoenix	Phoenix Digital Corp.
Pico Design	Pico Design
Polycore	Polycore Electronics
Plessey	Plessy Semiconductors
PMI	Precision Monolithics, Inc.
PragDes	Pragmatic Design Inc.
PREMA	PREMA GmbH
Pro-Log	Pro-Log Corp.
Quay	Quay Corp.
Raytheon	Raytheon Semiconductor
RCA	RCA Solid State Division
RCI Data	RCI Data
RELMS	Relational Memory Systems
Reticon	Reticon
RIFA	RFIA
Rockwell	Rockwell, Microelectronic Devices
RTC	Riehl Time Corporation
Sanken	Sanken Electric
Sanyo	Sanyo
SEEQ	SEEQ Technology, Inc.
Semi Proc	Semi Processes
Siemens	Siemens
Signetics	Signetics
SGS	SGS-ATES Semiconductor
Sharp	Sharp
Silicon G	Silicon General
Siliconix	Siliconix
Silicon Sys	Silicon Systems Inc.
Siltronics	Siltronics
SMC	Standard Microsystems Corp.
Solarise	Solarise Enterprises
Solitron	Solitron Devices
Sprague	Sprague Electric Company
SSM	Solid State Micro Technology for Music
SSS	Solid State Scientific
Stag	Stag Microsystems
Struc. Des.	Structured Design Inc.
Stynetic	Stynetic Systems
Sunrise	Sunrise Electronics
Sunshine	Sunshine Semiconductor
Supertex	Supertex Inc.
Symtek	Symtek Corp.
Synapse	Synapse Corp.
Synertek	Synertek
Sys Innov	Systems Innovations
Tau Zero	Tau Zero Inc.
Tektronix	Tektronix
Telaris	(See Laserdyne)
Teledyne C	Teledyne Crystalonics
Teledyne P	Teledyne Philbrick
Teledyne S	Teledyne Semiconductor
Telefunken	Telefunken
Telephonics	Telephonics LSI
Telmos	Telmos
Teltone	Teltone Corporation
TI	Texas Instruments
Thomson-CSF	Thompson-CSF Components Corp.
TMX	TMX
Topanga	Topanga Data Systems
Toshiba	Toshiba America
Trans-Data	Trans-Data
TRW	TRW-LSI Products
Unitrode	Unitrode
Universal	Universal Semiconductor, Inc.
Vantage	Vantage Data Products
VTI	VLSI Technology, Inc.
Votrax	Votrax
Weitek	Weitek Corporation
Western	Western Digital
Wintek	Wintek Corp.
Xicor	Xicor, Inc.
Xycom	Xycom
Zendex	Zendex Corp.
Zilog	Zilog
Zymos	Zymos Corporation

© IC MASTER 1983

Military IC's

Note: See other MPS parts in Interface and Linear Sections.

MICRO POWER SYSTEMS - HIGH RELIABILITY (HI-REL)

Micro Power Systems has established standard procedures for manufacturing, screening, qualification, and quality conformance, and is incorporating the requirements of both MIL-STD-883 and MIL-Q-9858. Devices meeting Class B screening requirements of MIL-STD-883 are available as standard catalog items. Requests for devices with other special requirements are invited.

MPS standard "/883B" parts designate devices which have been subjected to 100% screening in accordance with Method 5004 of MIL-STD-883, Class B.

Quality Conformance Testing (Groups A, B, C, D) in accordance with Method 5005 of MIL-STD-883 is available on special order.

Additionally, a complete line of monolithic dual transistors, both field effect and bipolar types, screened to the requirements of MIL-S-19500, MIL-STD-750, and MIL-STD-202 are also available as standard catalog items.

100% SCREENING PROCEDURE

SCREEN	MIL-STD-883 METHOD/COND.
1. Internal Visual	2010 Cond. B.
2. Stabilization Bake	1080 Cond. C (24 hrs. min.)
3. Temperature Cycling	1010 Cond. C
4. Constant Acceleration	2001 Cond. E; Y1 plane
5. Seal: (A) Fine	1014 Cond. A or B
(B) Gross	1014 Cond. C
6. Initial Electrical	MPS Specifications
7. Burn-In Test	1015 Cond. A or B 168 hrs. @ +125°C
8. Final Electrical 100% go-no-go	Subgroups A1, A2, A3, A7, Functional tests per Table 1
9. External Visual	2009 Sample Inspection
10. Lot Acceptance	Table 1, Group A Elect. Tests

MILITARY PROGRAMS

- Space Shuttle
- LAMPS
- Cruise Missile
- AWACS
- NEARTIP
- ALQ119, ALQ131
- IR Maverick
- QF100/A300 Airbus
- HG480/280
- Alpha Jet

The following MPS parts are available for "Hi-Rel" Military Applications:

Digital-to-Analog Converters

MP370
MP377-18
MP562
MP3140
MP5520
MPDAC100
MP7520
MP7521
MP7522
MP7523
MP7524
MP7530
MP7531
MP7533
MP7541
MP7614
MP7616
MP7621
MP7622
MP7623
MP9377-16

Analog-to-Digital Converters

MP7138
MP7550
MP7570
MP7574
MP7581

Precision Voltage References

MP5010
MP5532/REF01
MP5531/REF02

Precision Operational Amplifiers

MP5501/OP01
MP5502/OP02
MP5505/OP05
MP5507/OP07
MP5508/OP08
MP5509/OP09
MP5510/OP10
MP5511/OP11
MP5512/OP12
MP5524/OP24
MP5527/OP27
MP5534/OP34
MP5537/OP37

Analog Multiplexers*

MP7501
MP7502
MP7503
MP7506
MP7507
MP7508DI
MP7509DI

Analog Switches*

MP7510DI
MP7511DI
MP7512DI
MP200DI
MP201DI

*Note: Dielectrically isolated Multiplexers and switches are indicated by "DI" suffix.

MICRO POWER SYSTEMS
3100 Alfred Street
Santa Clara, CA 95050
(408) 727-5350

© IC MASTER 1983

NATIONAL SEMICONDUCTOR MIL-AERO

National Semiconductor offers six basic categories of Military/Aerospace Products. Our support of military standardization is demonstrated in the number of MIL-M-38510 qualified devices we offer. To provide devices of comparable quality and reliability where no MIL-M-38510 specifications exist, we offer a complete line of 883B/RETS™ devices, tested to the most compliant in-house screening program in the industry. The heart of this program is the RETS (Rel Electrical Test Specification) a fully documented and controlled electrical test specification. Our customers can tell exactly what we test. None of our competitors provide this level of visibility.

To meet the more extensive reliability needs of the space community, we offer MIL-M-38510 Class S devices and 883S/RETS™ devices, many of them radiation hardened. We have the products and the screening most major programs need. Let us show how we can meet your needs.

NATIONAL SEMICONDUCTOR RELIABILITY SCREENING FLOWS

	JM38510 Class S	883S/RETS™ Monolithic	883S/RETS Hybrid	JM38510 Class B	883B/RETS™	883B/RETS™ Hybrid
Line Certification	X			X		
Wafer Lot Acceptance	X	X	SEM only			
On Shore Assembly	X	X	from seal onward	X		
Assembly Die-Shear	X	X	X	X	X	X
100% Non-Destructive Bond Pull	X	X	X			
Destructive Bond Pull Sample	X	X	X	X	X	X
Internal Visual	2010A	2010A	2017	2010B	2010B	2017
Stabilization Bake, 1008C	X	X	X	X	X	X
Temperature Cycle, 1010C	X	X	X	X	X	X
Constant Acceleration, 2001E	X	X	relaxed for some packages	X	X	X
Fine Leak, 1014B	optional	optional	optional	X	X	X
Cross Leak, 1014C	optional	optional	optional	X	X	X
PIND, 2020	X	X	some devices			
Serialization	X	X	X			
Controlled Electrical Test Specifications	X	X	X	X	X	X
Interim Electricals, 25°C	X	X	X	optional	optional	optional
Burn-in, 125°C, 1015*	240 hrs	240 hrs	240 hrs	160 hrs	160 hrs	160 hrs
PDA ⩽ 10%*	5%	5%	X	X	X	X
Drift Measurement (Δ's)	X	X	X			
Fine Leak, 1014B	X	X	X	optional	optional	optional
Cross Leak, 1014C	X	X	X	optional	optional	optional
Final Electricals (3 temp DC, 25°C AC)	X	X	X	X	X	X
X-Ray, 2012	X	X	X			
Group A, 5005 Table I (Note: hybrids use Method 5008 for Quality)	X	X	X	X	X	X
Group B, 5005 Table II**	every lot	every lot	every lot	every lot	every lot	every lot
Group C, 5005, Table III	not required	not required	not required	every 90 days	every 90 days	every 90 days
Group D, 5005, Table IV	every 6 months per package	every 6 months per package	every 6 months per package	every 6 months per package	every 6 months per package	for quality
External Visual, 2009	X	X	X	X	X	X

* CMOS devices receive 2 static burn-ins of 24 hours each and a dynamic burn-in of 240 hours with PDA's of 5% on the statics (combined) and 5% on the dynamic.

** For lot definitions, see MIL-M-38510.

*** Some devices are tested to other conditions.

© IC MASTER 1983

NATIONAL SEMICONDUCTOR MILITARY/AEROSPACE PRODUCTS
(X = Available, F = Future, S = Submitted for Qualification)

	883B	38510B	883S	38510S	RAD HARD
ADC0800	X				
ADC0808	X				
ADC0816	X				
ADC1210	X				
ADC1211	X				
AF100-1	X				
AF100-2	X				
AF120	X				
AH0014	X		X		
AH0015	X		X		
AH0019	X		X		
AH0126	X		X		
AH0129	X		X		
AH0133	X		X		
AH0134	X		X		
AH0139	X		X		
AH0140	X		X		
AH0141	X		X		
AH0142	X		X		
AH0143	X		X		
AH0144	X		X		
AH0145	X		X		
AH0146	X		X		
AH0151	X		X		
AH0152	X		X		
AH0153	X		X		
AH0154	X		X		
AH0161	X		X		
AH0162	X		X		
AH0163	X		X		
AH0164	X		X		
AH2114	X				
AM3705	X				
CD4000	F		X		
CD4001	X	X	X	F	X
CD4002	X	X	X	F	X
CD4006	X	X	X	F	X
CD4007	X	X	X	F	X
CD4008	X	F	X	F	X
CD4009	X		X		X
CD4010	X		X		X
CD4011	X	X	X	F	X
CD4012	X	X	X	F	X
CD4013	X	X	X	F	X
CD4014	X	X	X	F	X
CD4015	X	X	X	F	X
CD4016	X	F	X	F	X
CD4017	X	X	X	F	X
CD4018	X	X	X	F	X
CD4019	X	X	X	F	X
CD4020	X	X	X	F	X
CD4021	X	X	X	F	X
CD4022	X	X	X	F	X
CD4023	X	X	X	F	X
CD4024	X	F	X	F	X
CD4025	X	X	X	F	X
CD4027	X	X	X	F	X
CD4028	X	F	X	F	X
CD4029	X		X		X
CD4030	X	X	X	F	X
CD4031	X	X	X	F	X
CD4034	X		X		
CD4035	X		X		X
CD4040	X		X		X
CD4041	X	F	X	F	X
CD4042	X		X		X
CD4043	X		X		X
CD4044	X		X		X
CD4046	X		X		
CD4047	X		X		
CD4048	X	F	X		X
CD4049	X	X	X	F	X
CD4050	X	X	X	F	X
CD4051	X		X		X
CD4052	X		X		X
CD4053	X		X		X
CD4060	X		X		
CD4066	X	F	X	F	X
CD4069	X	F	X	F	X
CD4070	X	F	X	F	X
CD4071	X	F	X	F	X
CD4072	X	F	X	F	X
CD4073	X	F	X	F	X
CD4075	X	F	X	F	X
CD4076	X	F	X	F	X
CD4081	X	F	X	F	X
CD4082	X		F		
CD4089	X		X		
CD4093	X	F	X	F	X
CD4099	X	F	X	F	
CD40106	X	F	X	F	X
CD40160	X		X		
CD40161	X		X		
CD40162	X		X		
CD40163	X		X		
CD40174	X	F	X	F	X

	883B	38510B	883S	38510S	RAD HARD
CD40175	X		X		
CD40192	X		X		X
CD40193	X		X		X
CD40195	X		X		
CD4503	X		X		
CD4507	X		F		
CD4510	X		X		
CD4511	X		X		
CD4512	X		F		
CD4514	X	F	F	F	X
CD4515	X	F	F	F	X
CD4516	X		X		
CD4518	X		X		X
CD4519	X		X		
CD4520	X		X		
CD4522	X		F		
CD4526	X		F		
CD4527	X		X		
CD4528	X		F		
CD4529	X		F		
CD4543	X		F		
CD4584	X		F		X
CD4723	X		X		
CD4724	X		X		
COP320C	F				F
COP402L	F				
COP498	F				F
COP499	F				F
DAC0800	X	F	X		
DAC0808	X		X		
DAC1020	X				
DAC1021	X				
DAC1022	X				
DAC1200	X				
DAC1201	X				
DAC1202	X				
DAC1203	X				
DAC1220	X				
DAC1221	X				
DAC1222	X				
DAC1285	X				
DAC1286	X				
DH0006	X		X		
DH0008	X		X		
DH0011	X				
DH0034	X		X		
DH0035	X				
DM2502	X		X		
DM2503	X		X		
DM2504	X		X		
DM5400	X	X	X		
DM5401	X	X	X		
DM5402	X	X	X		
DM5403	X	X	X		
DM5404	X	X	X		
DM5405	X	X	X		
DM5406	X	X	X	S	
DM5407	X		X		
DM5408	X	X	X		
DM5409	X		X		
DM5410	X	X	X		
DM5411	X		X		
DM5413	X		X		
DM5414	X		X		
DM5416	X		X		
DM5417	X		X		
DM5420	X	X	X		
DM5423	X		X		
DM5425	X		X		
DM5426	X		X		
DM5427	X		X		
DM5430	X	X	X		
DM5432	X		X		
DM5437	X	X	X		
DM5438	X	X	X		
DM5440	X	X	X		
DM5441A	X		X		
DM5442	X		X		
DM5445	X		X		
DM5446A	X		X		
DM5447A	X		X		
DM5448	X		X		
DM5450	X	X	X		
DM5451	X	X	X		
DM5453	X	X	X		
DM5454	X	X	X		
DM5460	X		X		
DM5470	X		X		
DM5472	X	X	X		
DM5473	X	X	X		
DM5474	X	X	X		
DM5475	X		X		
DM5476	X	X	X		
DM5483	X	X	X		
DM5485	X		X		
DM5486	X	X	X		

	883B	38510B	883S	38510S	RAD HARD
DM5490A	X		X		
DM5492A	X		X		
DM5493A	X		X		
DM5495	X	X	X		
DM5496	X		X		
DM54107	X	X	X		
DM54109	X		X		
DM54121	X		X		
DM54123	X		X		
DM54125	X		X		
DM54126	X		X		
DM54132	X		X		
DM54142	X		X		
DM54145	X		X		
DM54147	X		X		
DM54148	X		X		
DM54150	X		X		
DM54151A	X	X	X		
DM54153	X	X	X		
DM54154	X		X		
DM54155	X		X		
DM54156	X		X		
DM54157	X	X	X		
DM54160A	X	X	X	F	
DM54161A	X	X	X		
DM54162A	X	X	X		
DM54163A	X	X	X		
DM54164	X	X	X		
DM54165	X		X		
DM54166	X		X		
DM54173	X		X		
DM54174	X		X		
DM54175	X		X		
DM54176	X		X		
DM54177	X		X		
DM54180	X	X	X		
DM54181	X	X	X		
DM54184	X		X		
DM54185A	X		X		
DM54190	X		X		
DM54191	X		X		
DM54192	X		X		
DM54193	X		X		
DM54194	X		X		
DM54195	X		X		
DM54196	X		X		
DM54197	X		X		
DM54198	X		X		
DM54199	X		X		
DM54251	X		X		
DM54284	X		X		
DM54285	X		X		
DM54365	X		X		
DM54366	X		X		
DM54367	X		X		
DM54368	X		X		
DM54L00	X	X	X		
DM54L01	X	F	X	F	
DM54L02	X	X	X	S	
DM54L03	X	X	X		
DM54L04	X	X	X	S	
DM54L05	X		X		
DM54L08	X		X		
DM54L09	X		X		
DM54L10	X	X	X		
DM54L11	X		X		
DM54L20	X	X	X		
DM54L26	X		X		
DM54L30	X	X	X		
DM54L32	X		X		
DM54L42A	X	F	X	F	
DM54L51	X		X		
DM54L54	X		X		
DM54L55	X		X		
DM54L71	X	X	X		
DM54L72	X	X	X		
DM54L73	X	X	X		
DM54L74	X	X	X		
DM54L75	X		X		
DM54L78	X	X	X		
DM54L85	X		X		
DM54L86	X	X	X		
DM54L90	X	X	X		
DM54L91	X		X		
DM54L93	X	X	X		
DM54L95	X	X	X		
DM54L98	X		X		
DM54L123A	X		X		
DM54L154A	X		X		
DM54L157A	X		X		
DM54L164A	X	F	X	F	
DM54L165A	X		X		
DM54L192	X		X		
DM54L193	X		X		
DM54LS00	X	X	X	S	
DM54LS01	X		X		

© IC MASTER 1983

NATIONAL SEMICONDUCTOR MILITARY/AEROSPACE PRODUCTS

(X = Available, F = Future, S = Submitted for Qualification)

	883B	38510B	883S	38510S	RAD HARD
DM54LS02	X	X	X	S	
DM54LS03	X	X	X	F	
DM54LS04	X	X	X	S	
DM54LS05	X	X	X	S	
DM54LS08	X	X	X	S	
DM54LS09	X		X		
DM54LS10	X	X	X	S	
DM54LS11	X	X	X	S	
DM54LS12	X	X	X	F	
DM54LS13	X		X		
DM54LS14	X	F	X	F	
DM54LS15	X	X	X	F	
DM54LS20	X	X	X	S	
DM54LS21	X	X	X	S	
DM54LS22	X	X	X	S	
DM54LS26	X		X		
DM54LS27	X	X	X	S	
DM54LS30	X	X	X	S	
DM54LS32	X	X	X	S	
DM54LS37	X	X	X	F	
DM54LS38	X	X	X	S	
DM54LS40	X	X	X	F	
DM54LS42	X		X		
DM54LS47	X		X		
DM54LS48	X		X		
DM54LS49	X		X		
DM54LS51	X	X	X	S	
DM54LS54	X	X	X	F	
DM54LS55	X		X		
DM54LS73	X	F	X	F	
DM54LS74	X	F	X	F	
DM54LS75	X	F	X	F	
DM54LS76	X	F	X		
DM54LS77	X		X		
DM54LS78	X		X		
DM54LS83	X	F	X	F	
DM54LS85	X		X	F	
DM54LS86	X	X	X	S	
DM54LS90	F		F		
DM54LS93	F		F		
DM54LS107	X	F	X		
DM54LS109	X	F	X	F	
DM54LS112	X	F	X	F	
DM54LS113	X	F	X	F	
DM54LS114	X	F	X		
DM54LS122	X		X		
DM54LS123	X		X		
DM54LS125	X	F	X	F	
DM54LS126	X		X		
DM54LS132	X	F	X	F	
DM54LS138	X	X	X	F	
DM54LS139	X	X	X	F	
DM54LS151	X	X	X	S	
DM54LS153	X	X	X	S	
DM54LS154	X		X		
DM54LS155	X		X		
DM54LS156	X		X		
DM54LS157	X	X	X	S	
DM54LS158	X		X		
DM54LS160	X		X		
DM54LS161	X	F	X	F	
DM54LS162	X		X		
DM54LS163	X	F	X	F	
DM54LS164	X	X	X	F	
DM54LS168	X		X		
DM54LS169	X	F	X	F	
DM54LS170	X		X		
DM54LS173	X		X		
DM54LS174	X	F	X	F	
DM54LS175	X	F	X	F	
DM54LS190	X		X		
DM54LS191	X	F	X	F	
DM54LS192	X	F	X	F	
DM54LS193	X	F	X	F	
DM54LS194	X	F	X	F	
DM54LS196	X		X		
DM54LS197	X	F	X	F	
DM54LS240	X		F		
DM54LS241	X		F		
DM54LS242	X	F	F	F	
DM54LS243	X	F	F	F	
DM54LS244	X		F		
DM54LS247	X		F		
DM54LS248	X		X		
DM54LS249	X		X		
DM54LS251	X	F	X	F	
DM54LS253	X	X	X	S	
DM54LS257	X	F	X	F	
DM54LS258	X	F	X	F	
DM54LS266	X	F	X	F	
DM54LS279	X		X		
DM54LS283	X		X		
DM54LS352	X		X		
DM54LS353	X		X		
DM54LS365	X	F	X	F	
DM54LS366	X	F	X	F	
DM54LS367	X	F	X	F	
DM54LS368	X	F	X	F	
DM54LS373	X		X		
DM54LS374	X		X		
DM54LS386	X		X		
DM54LS670	X		X		
DM54S00	X	F	X	F	

	883C	38510B	883S	38510S	RAD HARD
DM54S02	X	F	X	F	
DM54S03	X	F	X		
DM54S04	X	F	X	F	
DM54S05	X	F	F		
DM54S08	X	F	X	F	
DM54S09	X	F	X		
DM54S10	X	F	X	F	
DM54S11	X	F	X		
DM54S15	X	F	F		
DM54S20	F	F	F	F	
DM54S22	F	F	F		
DM54S30	F	F	F		
DM54S32	F		F		
DM54S40	X	F	F	F	
DM54S51	F	F	F	F	
DM54S64	X	F	F		
DM54S65	X	F	F		
DM54S74	X	F	F	F	
DM54S86	X	F	F	F	
DM54S112	X	F	X		
DM54S113	X	F	X		
DM54S114	X	F	X		
DM54S133	X	F	X		
DM54S134	X	F	X		
DM54S135	X	F	X		
DM54S136	X		X		
DM54S138	X		X		
DM54S139	X		X		
DM54S140	X	F	X		
DM54S151	X	F	F	F	
DM54S153	X	F	X	F	
DM54S157	X	F	X		
DM54S158	X	F	X		
DM54S160	X		F		
DM54S161	X		F		
DM54S162	X		F		
DM54S163	X		X		
DM54S174	X	F	X		
DM54S175	X	F	X	F	
DM54S181	X		F		
DM54S182	X	F	X		
DM54S188	X		X		
DM54S189	X				
DM54S194	X	F	X		
DM54S195	X	F	F		
DM54S196	X		F		
DM54S197	X		F		
DM54S240	X		F		
DM54S241	X		F		
DM54S242	X		X		
DM54S243	X		X		
DM54S244	X		F		
DM54S251	X	F	F		
DM54S253	X		X		
DM54S257	X	F	X		
DM54S258	X	F	X		
DM54S280	X		X		
DM54S283	X		X		
DM54S287	X	F	X		
DM54S288	X		X		
DM54S289	X				
DM54S299	F		F		
DM54S373	F		F		
DM54S374	F		F		
DM54S381	F		F		
DM54S387	X	F	X		
DM54S472	X		X		
DM54S473	X		X		
DM54S474	X		X		
DM54S475	X		X		
DM54S570	X	F	X		
DM54S571	X	F	X		
DM54S572	X	F	X		
DM54S573	X	F	X		
DM54S940	F		X		
DM54S941	F		X		
DM7092	X		X		
DM7093	X		X		
DM7094	X		X		
DM7095	X		X		
DM7096	X		X		
DM7097	X		X		
DM7098	X		X		
DM70L95	X		X		
DM70L96	X		X		
DM70L97	X		X		
DM70L98	X		X		
DM70LS95	X		X		
DM70LS96	X		X		
DM70LS97	X		X		
DM70LS98	X		X		
DM7121	X		X		
DM7123	X		X		
DM7130	X		X		
DM7131	X		X		
DM7136	X		X		
DM7160	X		X		
DM71L23	X		X		
DM71LS95	X		X		
DM71LS96	X		X		
DM71LS97	X		X		
DM71LS98	X		X		
DM7200	X		X		

	883C	38510B	883S	38510S	RAD HARD
DM7214	X		X		
DM7219	X		X		
DM7220	X		X		
DM7223	X		X		
DM7280	X		X		
DM7281	X		X		
DM7288	X		X		
DM7290	X		X		
DM7291	X		X		
DM7511	X		X		
DM7520	X		X		
DM7542	X		X		
DM7544	X		X		
DM7546	X		X		
DM7551	X		X		
DM7552	X		X		
DM7553	X		X		
DM7554	X		X		
DM7555	X		X		
DM7556	X		X		
DM7560	X		X		
DM7563	X		X		
DM7570	X		X		
DM7590	X		X		
DM75L11	X		X		
DM75L12	X		X		
DM75L51	X		X		
DM75L52	X		X		
DM75L54	X		X		
DM75L60	X		X		
DM75L63	X		X		
DM7613	X		X		
DM76L13	X		X		
DM76L24	X		X		
DM76L25	X		X		
DM76L70	X		X		
DM76L75	X		X		
DM76L76	X		X		
DM76L90	X		X		
DM76L93	X		X		
DM76LS52	X		X		
DM76LS62	X		X		
DM76S75	F		X		
DM77S184	X	F	X		
DM77S185	X	F	X		
DM77S190	X	F	F		
DM77S191	X	F	F		
DM77S295	X		X		
DM77S296	X		X		
DM7853	X		X		
DM7875A	X		X		
DM7875B	X		X		
DM9024	X		X		
DM9300	X		X		
DM9301	X		X		
DM9309	X		X		
DM9310	X		X		
DM9312	X		X		
DM9316	X		X		
DM9318	X		X		
DM9322	X		X		
DM9334	X		X		
DM9601	X		X		
DM9602	X		X		
DP7303	F				
DP7304	X				
DP7307	F				
DP7308	F				
DP7310	X				
DP7311	X				
DS0025	X				
DS0026	X		X		
DS0056	X				
DS1603	X		X		
DS1611	X		X		
DS1612	X		X		
DS1613	X		X		
DS1614	X		X		
DS1631	X		X		
DS1632	X		X		
DS1633	X		X		
DS1634	X		X		
DS1647	X		X		
DS1648	X		X		
DS1671	X		X		
DS1674	X		X		
DS1678	X		X		
DS1686	X		X		
DS1687	X		X		
DS1691	X		X		
DS1692	F				
DS16149	F				
DS16179	F				
DS26LS31	X		F		
DS26LS32	X		X		
DS26LS33	X		X		
DS26S10	F				
DS26S11	F				
DS55107	X		X		
DS55108	X				
DS55113	X				
DS55114	X	F	X	F	

© IC MASTER 1983

NATIONAL SEMICONDUCTOR MILITARY/AEROSPACE PRODUCTS

(X = Available, F = Future, S = Submitted for Qualification)

	883B	38510B	883S	38510S	RAD HARD
DS55115	X	F	X	F	
DS55121	X				
DS55122	X				
DS55180	X		X		
DS55182	X		X		
DS55183	X		X		
DS55325	X				
DS55450	X				
DS55451	X		X		
DS55452	X		X		
DS55453	X		X		
DS55454	X		X		
DS55460	X				
DS55461	X		X		
DS55462	X		X		
DS55463	X		X		
DS55464	X		X		
DS55493	X				
DS55494	X				
DS7800	X		X		
DS7803	X				
DS7811	X				
DS7812	F				
DS7819	X				
DS7820A	X	F	X	F	
DS7830	X	F	X	F	
DS7831	X	F	X		
DS7832	X	F	X		
DS7833	X		X		
DS7834	X		X		
DS7835	X		X		
DS7836	X		X		
DS7837	X		X		
DS7838	X		X		
DS7839	X		X		
DS7856	X				
DS7858	X				
DS7880	X				
DS7889	X				
DS78C20	X		X		
DS78C120	X		X		
DS78L12	X		X		
DS78LS120	X		X		
DS8T26A	F				
DS8T28	F				
IDM2901A	X				
IDM2901A-1	X				
IDM2909A	F				
IDM2911A	F				
IDM29750	X				
IDM29751	X				
IDM29760	X				
IDM29761	X				
IDM29803	F				
IDM29811	F				
IDM29901	X				
IDM29903	F				
IDM29908	X				
INS8048	F				
INS8049	F				
INS80C48	F		F		
INS8080A	F				
INS82C06	X		X		
INS82LS05	X		X		
LF111	F				
LF151	X		X		
LF151A	X				
LF153	X				
LF155	X	F	X		
LF155A	X				
LF156	X	F	X		
LF156A	X				
LF157	X	F	X		
LF157A	X				
LF198	X	F	X	F	
LF11201	X				
LF11202	X				
LF11331	X				
LF11332	X				
LF11333	X				
LF11508	X				
LH0002	X		X		
LH0003	X				
LH0004	X				
LH0005	X		X		
LH0005A	X				
LH0020	X		X		
LH0021	X		X		
LH0022	X		X		
LH0023	X		X		
LH0024	X		X		
LH0032	X				
LH0033	X				
LH0036	X		X		
LH0037	X		X		
LH0038	X		X		
LH0041	X		X		
LH0042	X				
LH0043	X		X		
LH0044	X		X		
LH0044A	X				

	883B	38510B	883S	38510S	RAD HARD
LH0045	X		X		
LH0052	X		X		
LH0053	X		X		
LH0061	X		X		
LH0062	X		X		
LH0063	X		X		
LH0070-0	X		X		
LH0070-1	X		X		
LH0070-2	X		X		
LH0075	X		X		
LH0076	X		X		
LH0082	X		X		
LH0084	X		X		
LH0086	X				
LH0091	X		X		
LH0094	X		X		
LH1605	X				
LH740A	X				
LH2101A	X		X		
LH2108	X		X		
LH2108A	X				
LH2110	X		X		
LH2111	X		X		
LH24250	X		X		
LM10	X		X		
LM11	F		F		
LM101A	X	X	X	S	
LM102	X		X		
LM103	X		X		
LM104	X		X		
LM105	X		X		
LM106	X		X		
LM107	X		X		
LM108	X		X		
LM108A	X	X	X	S	
LM109	X	F	X	F	
LM110	X	F	X	F	
LM111	X	X	X	S	
LM112	X		X		
LM113	X		X		
LM117	X	F	X	F	
LM118	X	X	X	S	
LM119	X		X		
LM120	X	F	X	F	
LM121	X		X		
LM122	X		X		
LM124	X	F			
LM124A	X		X		
LM125	X		X		
LM126	X		X		
LM129A	X				
LM129B	X		X		
LM131	X		X		
LM131A	X				
LM134	X		X		
LM135	X		X		
LM136	X		X		
LM137	X	F	X	F	
LM138	X				
LM139	X				
LM139A	X	F	X	F	
LM140	X	F	X		
LM143	X		X		
LM144	X		X		
LM145	X		X		
LM146	X		X		
LM148	X				
LM149	X				
LM150	X				
LM158	X		X		
LM158A	X				
LM159	X		F		
LM160	X				
LM161	X				
LM185	F		F		
LM192	X		F		
LM193	X		X		
LM193A	X	F	X		
LM194	X				
LM195	X				
LM199	X		X		
LM199A	X				
LM555	X				
LM556	X				
LM567	X				
LM709	X				
LM709A	X				
LM710	X				
LM711	X				
LM723	X		X		
LM725	X				
LM725A	X		X		
LM733	X				
LM741	X		X		
LM741A	X		X		
LM747	X		X		
LM747A	X	X		F	
LM748	X		X		
LM1514	X				
LM1524	F				
LM1536	X				

	883B	38510B	883S	38510S	RAD HARD
LM1558	X				
LM1596	X				
LM4250	X		X		
MF10	F				
MH0007	X				
MH0009	X				
MH0012	X		X		
MH0013	X		X		
MM2114	X				
MM2147	X		F		
MM2708	X				
MM2716	X				
MM4723	X				
MM4724	X				
MM5290	X				
MM5298	F				
MM54C00	X		X		
MM54C02	X		X		
MM54C04	X	F	X	F	X
MM54C08	X		X		
MM54C10	X		X		
MM54C14	X	F	X	F	X
MM54C20	X		X		
MM54C30	X		X		
MM54C32	X		X		
MM54C42	X		X		
MM54C48	X		X		
MM54C73	X		X		
MM54C74	X		X		
MM54C76	X		X		
MM54C83	X		X		
MM54C85	X		X		
MM54C86	X		X		X
MM54C89	X		X		
MM54C90	X		X		
MM54C93	X		X		
MM54C95	X		X		
MM54C107	X		X		
MM54C150	X		X		
MM54C154	X		X		
MM54C157	X		X		
MM54C160	X	F	X	F	
MM54C161	X	F	X	F	
MM54C162	X	F	X	F	
MM54C163	X	F	X	F	
MM54C164	X		X		
MM54C165	X		X		
MM54C173	X	F	X	F	X
MM54C174	X	F	X	F	X
MM54C175	X		X		
MM54C192	X	F	X	F	X
MM54C193	X	F	X	F	X
MM54C195	X		X		
MM54C200	X		X		X
MM54C201			F		F
MM54C204			F		F
MM54C221	X		X		
MM54C240	X		F		
MM54C244	X		F		
MM54C373	X		X		
MM54C374	X		X		
MM54C901	X		X		X
MM54C902	X		X		X
MM54C903	X		X		X
MM54C904	X		X		X
MM54C905	X		X		
MM54C906	X		X		X
MM54C907	X		X		X
MM54C908	X		X		
MM54C909	X		X		
MM54C910	X		X		
MM54C914	X		X		
MM54C915	X				
MM54C920	X				
MM54C921	X				
MM54C922	X		X		
MM54C923	X				
MM54C929	X	F	X	F	F
MM54C930	X				
MM54C941	X		F		
MM54C948	X		X		
MM54C949	X		X		
MM70C95	X		X		
MM70C96	X		X		
MM70C97	X		X		
MM70C98	X		X		
MM72C19	X		X		
MM78C29	X		X		
MM78C30	X		X		
NSC800	X		F		F
NSC810	X		F		F
NSC830	X		F		F
NSC831	F		F		
NS80C48	X		F		
NS80C49	X		F		
NMC6504	F		F		F
NMC6514	F		F		F
MM82PC08	F		F		
MM82PC12	F		F		

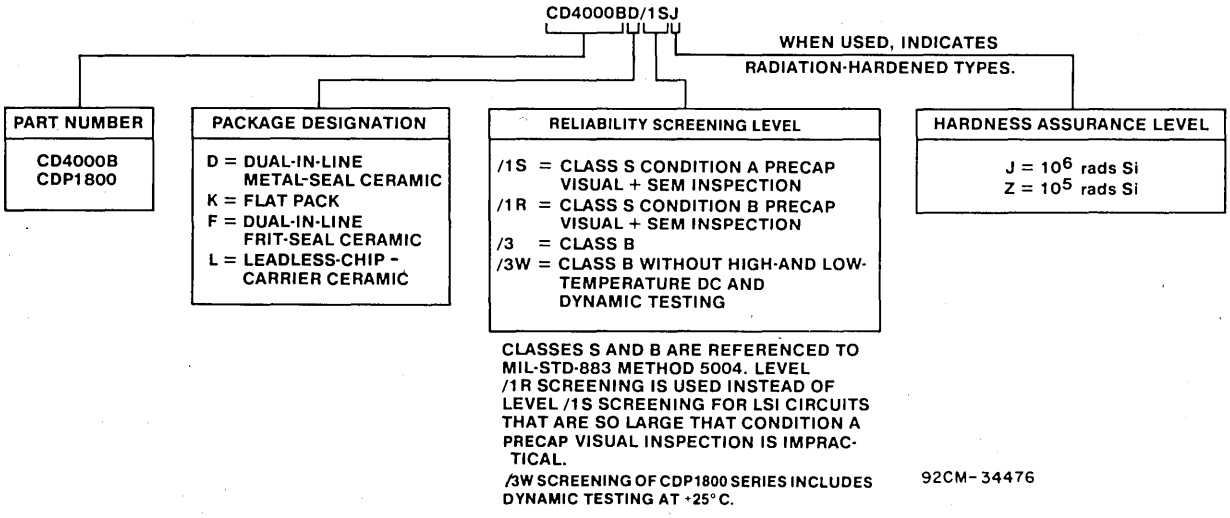
© IC MASTER 1983

RCA MIL-STD-883 Slash-Series CMOS IC's

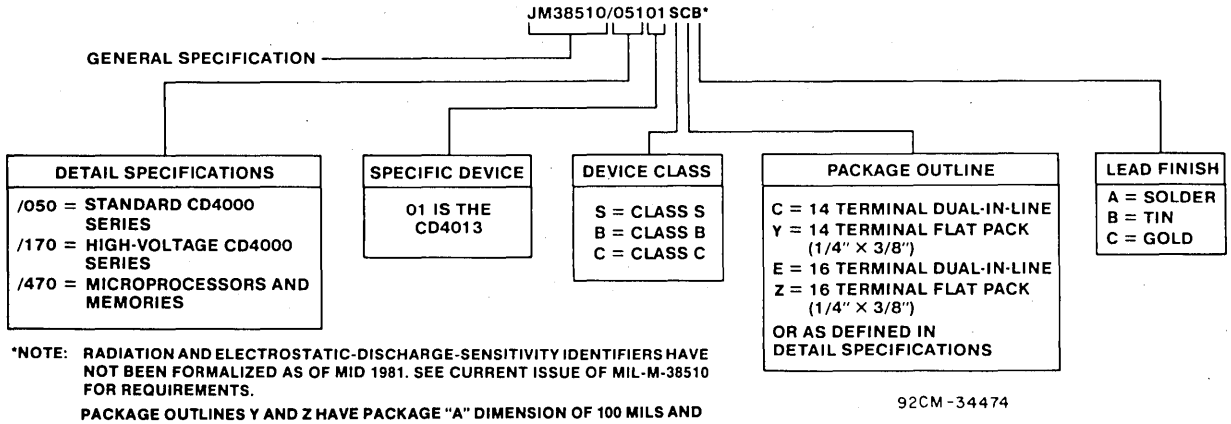
RCA high-reliability slash-series CMOS products include both CD4000-series digital logic types and CDP1800-series microprocessor and memory-system types. The CD4000-series parts are provided to three screening levels—/1S, /3, and /3W—that correspond to MIL-STD-883, Method 5004, Classes S and B requirements. The CDP1800-series parts are supplied to levels /3 and /3W. Equivalent aerospace level screening may be negotiated on a custom basis. RCA also supplies high-reliability chips. These chips are provided to two screening levels, /S (or /R for LSI types) and /M.

RCA CD4000-series level /1S packaged devices and /S chips are also available in radiation-hardened versions. These parts are processed to either 10^5 or 10^6 rads(Si) and are identified by addition of a " Z" or a "J" suffix letter, respectively, to the device type number (see nomenclature diagram below).

Guide to the reliability class, package, and radiation-hardness assurance level of RCA high-reliability (slash-series) CMOS integrated circuits processed to MIL-STD-883 Format.



Guide to the reliability class, package, lead finish, radiation-hardness assurance level, and electrostatic sensitivity of RCA high-reliability CMOS integrated circuits processed in accordance with MIL-M-38510.



*NOTE: RADIATION AND ELECTROSTATIC-DISCHARGE-SENSITIVITY IDENTIFIERS HAVE NOT BEEN FORMALIZED AS OF MID 1981. SEE CURRENT ISSUE OF MIL-M-38510 FOR REQUIREMENTS.

PACKAGE OUTLINES Y AND Z HAVE PACKAGE "A" DIMENSION OF 100 MILS AND ARE IN DETAILED SPECIFICATIONS.

© IC MASTER 1983

RCA High-Reliability CMOS IC's

High-Voltage CD4000B-Series CMOS IC's

Type No.	Description	No. of Leads
CD4000B	Dual 3-input NOR gate plus inverter	14
CD4000UB	Dual 3-input NOR gate plus inverter	14
CD4001B	Quad 2-input NOR gate	14
CD4001UB	Quad 2-input NOR gate	14
CD4002B	Dual 4-input NOR gate	14
CD4002UB	Dual 4-input NOR gate	14
CD4006B	18-stage static shift register	14
CD4007UB	Dual complementary pair plus inverter	14
CD4008B	4-bit full adder with parallel carry-out	16
CD4009UB	Hex buffer/converter (inverting)	16
CD4010B	Hex buffer/converter (non-inverting)	16
CD4011B	Quad 2-input NAND gate	14
CD4011UB	Quad 2-input NAND gate	14
CD4012B	Dual 4-input NAND gate	14
CD4012UB	Dual 4-input NAND gate	14
CD4013B	Dual "D" flip-flop with set/reset capability	14
CD4014B	8-stage static shift register	16
CD4015B	Dual 4-stage static shift register	16
CD4016B	Quad bilateral switch	14
CD4017B	Decade counter/divider	16
CD4018B	Presettable divide-by "N" counter	16
CD4019B	Quad AND/OR select gate	16
CD4020B	14-stage Binary Ripple Counter	16
CD4021B	8-stage static shift register	16
CD4022B	Divide-by-8 counter/divider	16
CD4023B	Triple 3-input NAND gate	14
CD4023UB	Triple 3-input NAND gate	14
CD4024B	7-stage binary ripple counter	14
CD4025B	Triple 3-input NOR gate	14
CD4025UB	Triple 3-input NOR gate	14
CD4026B	Decade counter/divider	16
CD4027B	Dual "J-K" flip-flop with set/reset capability	16
CD4028B	BCD-to-decimal decoder	16
CD4029B	Presettable up/down counter	16
CD4030B	Quad exclusive-OR gate	14
CD4031B	64-stage static shift register	16
CD4033B	Decade counter/divider	16
CD4034B	8-stage static shift register	24
CD4035B	4-stage parallel-in/parallel-out shift register	16
CD4040B	12-stage binary ripple counter	16
CD4041UB	Quad true/complement buffer	14
CD4042B	Quad clocked "D" latch	16
CD4043B	Quad NOR R/S latch (3-state outputs)	16
CD4044B	Quad NAND R/S latch (3-state outputs)	16
CD4045B	21-stage timer	14
CD4046B	Micropower phase-locked loop	16
CD4047B	Monostable/astable multivibrator	14
CD4048B	Multifunctional expandable 8-input gate (3-state output)	16
CD4049UB	Hex buffer/converter (inverting)	16
CD4050B	Hex buffer/converter (non-inverting)	16
CD4051B	8-channel analog multiplexer/ demultiplexer	16
CD4052B	4-channel analog multiplexer/ demultiplexer	16
CD4053B	Triple 2-channel analog multiplexer/ demultiplexer	16
CD4060B	14-stage binary ripple counter/ divider and oscillator	16
CD4063B	4-bit magnitude comparator	16

Type No.	Description	No. of Leads
CD4066B	Quad bilateral switch	14
CD4067B	16-channel analog multiplexers/ demultiplexers	24
CD4068B	8-input NAND/AND gate	14
CD4069UB	Hex inverter	14
CD4070B	Quad exclusive-OR gate	14
CD4071B	Quad 2-input OR gate	14
CD4072B	Dual 4-input OR gate	14
CD4073B	Triple 3-input AND gate	14
CD4075B	Triple 3-input OR gate	14
CD4076B	4-bit "D" flip-flop (3-state outputs)	14
CD4077B	Quad exclusive-NOR gate	14
CD4078B	8-input NOR/OR gate	14
CD4081B	Quad 2-input AND gate	14
CD4082B	Dual 4-input AND gate	14
CD4085B	Dual 2-wide, 2-input AND/OR INVERT (AO1) gate	14
CD4086B	Expandable 4-wide, 2-input AND/OR/INVERT (AO1) gate	14
CD4089B	Binary rate multiplier	16
CD4093B	Quad 2-input NAND Schmitt Trigger	14
CD4094B	8-stage shift-and-store bus register	16
CD4095B	Gated "J-K" flip-flop (non-inverting)	14
CD4096B	Gated "J-K" flip-flop (inverting and non-inverting)	14
CD4097B	8-channel analog multiplexer/ demultiplexer	24
CD4098B	Dual monostable multivibrator	16
CD4099B	8-bit addressable latch	16
CD4502B	Strobed hex inverter/buffer	16
CD4503B	Hex buffer (non-inverting)	16
CD4508B	Dual 4-bit latch	24
CD4510B	Presettable 4-bit BCD up/down counter	16
CD4511B	BCD-to-7-segment latch decoder/ driver	16
CD4512B	8-channel data selector (3-state output)	16
CD4514B	4-bit latch/4-to-16 line decoder (outputs low)	24
CD4515B	4-bit latch/4-to-16 line decoder (outputs low)	24
CD4516B	Presettable 4-bit binary up/down counter	16
CD4517B	Dual 64-bit shift register	16
CD4518B	Dual BCD up counter	16
CD4520B	Dual binary up counter	16
CD4527B	BCD rate multiplier	16
CD4532B	8-input priority encoder	16
CD4536B	Programmable timer	16
CD4538B	Dual precision monostable multivibrator	16
CD4555B	Dual 1-of-4 decoder/demultiplexer (outputs high)	16
CD4556B	Dual 1-of-4 decoder/demultiplexer (outputs low)	16
CD4585B	4-bit magnitude comparator	16
CD4724B	8-bit addressable latch	16
CD40100B	32-bit left/right shift register	16
CD40101B	9-bit parity generator/checker	14
CD40102B	Presettable 2-decade BCD down counter	16
CD40103B	Presettable 8-bit binary down counter	16
CD40104B	4-bit bidirectional universal shift register	16
CD40105B	4-bit x 16 word FiFo buffer register	16

© IC MASTER 1983

RCA High-Reliability CMOS IC's

High-Voltage CD4000B-Series CMOS IC's (Cont'd)

Type No.	Description	No. of Leads
CD40106B	Hex Schmitt Trigger	14
CD40107B	Dual 2-input NAND buffer/driver	14
CD40108B	4 x 4 multiport register	24
CD40109B	Quad low-to-high voltage interface	16
CD40110B	Decade up/down counter/ decoder/latch/driver	16
CD40147B	10-line to 4-line BCD priority encoder	16
CD40160B	Decade counter with asynchronous clear	16
CD40161B	Binary counter with asynchronous clear	16
CD40162B	Decade counter with synchronous clear	16

Type No.	Description	No. of Leads
CD40163B	Binary counter with synchronous clear	16
CD40174B	Hex "D" flip-flop	16
CD40181B	4-bit arithmetic logic unit	24
CD40182B	Look-ahead-carry block	16
CD40192B	Presettable 4-bit BCD up/down counter	16
CD40193B	Presettable 4-bit binary up/down counter	16
CD40194B	4-bit bidirectional universal shift register	16
CD40208B	4 x 4 multiport register	24
CD40257B	Quad 2-line-to-1-line data selector	16

Note:
RCA also offers high-reliability versions of a number of the A-series (3 to 12V) counterparts (CD4000A through CD4050A and CD4060A) of the high-voltage B-series types listed above and of several A-series types for which there are no corresponding B-series types (i.e., CD4036A and CD4039A RAM's, CD4057A ALU, and CD4059A programmable divide-by-N counter).

CDP1800-series CMOS Microprocessor, Memories, and I/O's

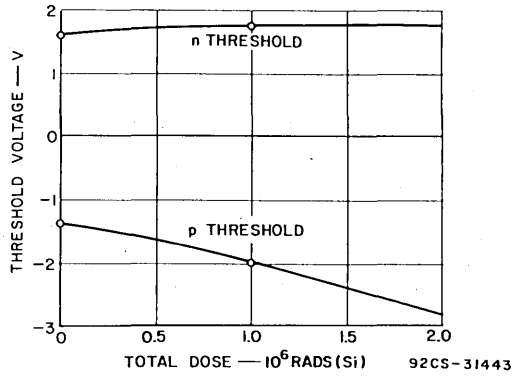
Type No.	Description	No. of Leads
CDP1802A	LSI Central-processing unit	40
CDP1821	1024 x 1 RAM	16
CDP1822	256 x 4 RAM	22
CDP1823	128 x 8 RAM	24
CDP1824	32 x 8 RAM	18
CDP1831	512 x 8 ROM (custom)	24
CDP1832	512 x 8 ROM (custom)	24
CDP1833	1024 x 8 ROM (custom)	24

Type No.	Description	No. of Leads
CDP1834	1024 x 8 ROM (custom)	24
CDP1852	Byte I/O	24
CDP1853	N-Bit Decoder	16
CDP1854A	UART	40
CDP1856	Bus Buffer (memory)	16
CDP1857	Bus Buffer (I/O)	16
CDP1858	Address Latch	16
CDP1859	Address Latch	16

Radiation-Resistant CD4000-Series CMOS IC's

RCA offers radiation-hardened CD4000-series CMOS integrated circuits capable of withstanding total ionizing radiation dosages of 10^5 rads(Si)—Z-suffix types—or 10^6 rads(Si)—J-suffix types. These radiation-hardened types are processed to either MIL-M-38510 Class S or MIL-STD-883 level /1S. In addition, these types are subjected to special process controls in which their radiation tolerance is monitored. Samples are exposed to specified total radiation dosages from a Cobalt 60 source, pre- and post-radiation measurements are made of threshold, threshold delta, leakage current, and go, no-go functional tests.

The radiation resistance to the specified levels is verified by exposure of two packaged devices per wafer for SSI, MSI-1, and MSI-2 types and a varied quantity of packaged devices per lot for LSI types, depending on their complexity.



Typical threshold-voltage variations of RCA MEGARAD CD4000-series CMOS integrated circuits as a function of total-dose gamma radiation.

Radiation-Resistant CDP1800-Series Microprocessor and Memory IC's

The CDP1800 series utilizes self-aligned silicongate technology on either bulk or sapphire substrates. In this technology the gate oxide is grown early in the wafer fabrication sequence. In order to achieve total dose hardness the subsequent processes must be done at relatively low temperatures. RCA's Solid State Technology Center has developed a hardening process for silcon gate and is refining that process for volume manufacture. At the present time, requirements for total dose hardness will be negotiated on a customer by customer basis.

The RCA radiation-hardening custom technology has made possible selected CDP1800-series microprocessor and memory integrated circuits with radiation tolerance levels that approach 10^5 rads(Si).

Transient Capability of CMOS/SOS Memories

Temporary Upset	7×10^9 rads(Si)/second
Permanent Upset	$> 1 \times 10^{11}$ rads(Si)/second
Latch-Up	Not possible
Survival	$> 1 \times 10^{11}$ rads(Si)/second

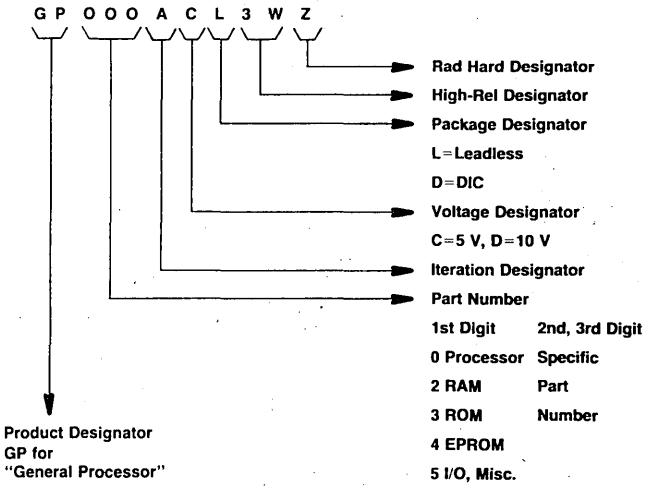
© IC MASTER 1983

RCA High-Reliability IC's

Emulating and Programmable Integrated Circuit (EPIC) 8-Bit Slice Microcomputer Family (GP Series)

Type No.	Description	No. of Leads
GP001ADL	CMOS 8-bit general-processor unit (CPU)	48
GP201ACL	CMOS 1024 x 4 RAM	18
GP301ADL	CMOS 4096-bit mask-programmable static ROM	32
GP302ADL	CMOS 4096-bit mask-programmable static ROM	32
GP501ADL	Emulating controller	48
GP504ADL	Address select unit	48
GP505ADL	Register select unit	48
GP507ADL	Interrupt control unit	48

Nomenclature Guide



RCA MIL-STD-883 Slash-Series Linear IC's

The RCA CA3000 slash-series of high-reliability linear integrated circuits includes a broad range of types for use in satellites and other aerospace, military, and critical industrial applications in which maintenance is extremely difficult. These integrated circuits are processed and screened in accordance with MIL-STD-883, Method 5004 format.

The RCA CA3000 slash-series types are supplied to three screening levels (/1, /3, and /3W) that meet the electrical, mechanical, and environmental test methods and procedures established for microelectronics in MIL-STD-883.

RCA CA3000-series IC products listed below are commercial products that can be supplied to standard RCA screening levels or to specialized customer requirements on a custom basis.

CA3000-Series Linear IC's and MOS/FET's

Type No.	Description	No. of Leads
CA101A	Operational Amplifiers	8
CA723	Voltage Regulators	10
CA741	Operational Amplifiers	8
CA747	Dual Operational Amplifiers	10
CA748	Operational Amplifiers	8
CA1558	Dual Operational Amplifiers	8
CA3000	Differential Amplifiers	10
CA3001	Differential Amplifiers	12
CA3002	Differential Amplifiers	10
CA3004	Differential Amplifiers (RF)	12
CA3006	Differential Amplifiers (RF)	12
CA3015A	Operational Amplifiers	12
CA3018A	Transistor Arrays	12
CA3019	Diode Arrays	10
CA3020A	Wide-Band Power Amplifiers	12
CA3026	Dual Differential Amplifier Arrays	12
CA3028B	Differential Amplifiers (RF)	8
CA3039	Diode Arrays	12
CA3045	Transistor Arrays	14
CA3049	Dual Differential Amplifier Arrays	12
CA3058	Zero-Voltage Switches	14
CA3078	Micropower Operational Amplifiers	8
CA3080	Variable Operational Amplifiers	8
CA3081	Transistor Arrays	16
CA3082	Transistor Arrays	16
CA3085	Voltage Regulators	8

Type No.	Description	No. of Leads
CA3085A	Voltage Regulators	8
CA3085B	Voltage Regulators	8
CA3094	Programmable Power Switch/ Amplifier	8
CA3094A	Programmable Power Switch/ Amplifier	8
CA3094B	Programmable Power Switch/ Amplifier	8
CA3100	BiMOS Operational Amplifiers	8
CA3118	Transistor Arrays	12
CA3118A	Transistor Arrays	12
CA3130	BiMOS Operational Amplifiers	8
CA3130A	BiMOS Operational Amplifiers	8
CA3140	BiMOS Operational Amplifiers	8
CA3140A	BiMOS Operational Amplifiers	8
CA3160	BiMOS Operational Amplifiers	8
CA3160A	BiMOS Operational Amplifiers	8
CA3260T	BiMOS Operational Amplifier	8
CA3260AT	BiMOS Operational Amplifier	8
CA3290	BiMOS Dual Voltage Comparators	8

MOS/FET's

HR3N187	Dual-Gate MOS Field-Effect Transistor	4
HR3N200	Dual-Gate MOS Field-Effect Transistor	4

Note: High-reliability versions of most commercially available CA3000-series linear IC's not listed above can also be supplied on a custom basis.

© IC MASTER 1983

MILITARY PRODUCT GUIDE

MILITARY PRODUCTS/ PROCESS LEVELS

The Signetics MIL 38510/883 Program is organized to provide a broad selection of processing options, structured around the most commonly requested customer flows. The program is designed to provide our customers:

- Fully compliant 883B flows on all products.
- Standard processing flows to help minimize the need for custom specs.
- Cost savings realized by using standard processing flows in lieu of custom flows.
- Better delivery lead times by minimizing spec negotiation time, plus allow customers to buy product off-the-shelf or in various stages of production rather than waiting for devices started specifically to custom specs.

The following explains the different processing options available to you. Special device marking clearly distinguishes the type of screening performed. Refer to Tables 2, 3, 4 and 5.

JAN CASE OUTLINE AND LEAD FINISH	SIGNETICS MILITARY PACKAGE TYPES							
	METAL CAN		CERAMIC					
	8-PIN	10-PIN	8-PIN	14-PIN	16-PIN	18-PIN	20-PIN	24-PIN
PB	—	—	FE	—	—	—	—	—
CB	—	—	—	F	—	—	—	—
EB	—	—	—	—	F	—	—	—
JB	—	—	—	—	—	—	—	F
DB	—	—	—	W	—	—	—	—
FB	—	—	—	—	W	—	—	—
RB	—	—	—	—	—	—	F	—
GC	H	—	—	—	—	—	—	—
IC	—	H	—	—	—	—	—	—
VB	—	—	—	—	—	F	—	—

All products listed are also available in Die form.

Table 1 MILITARY PACKAGE AVAILABILITY

	JS	JB	RB
	JAN Qualified		883B
54	X	X	X
54LS	X	X	X
54S	X	X	X
82	—	—	X
8T	—	—	X
93XX	—	X	X
96XX	—	—	X
Analog	—	X	X
Bipolar Memory	—	X	X
Microprocessor	—	—	X

Table 2 MILITARY SUMMARY

JAN QUALIFIED (JS and JB)

JAN Qualified product is designed to give you the optimum in quality and reliability. The JAN processing level is offered as the result of the government's product standardization programs, and is monitored by the Defense Electronic Supply Center (DESC), through the use of industry-wide procedures and specifications.

JAN Qualified products are manufactured, processed and tested in a government certified facility to Mil-M-38510, and appropriate device slash sheet specifications. Design documentation, lot sampling plans, electrical test data and qualification data for each specific part type has been approved by the Defense Electronic Supply Center (DESC) and products appear on the DESC Qualified Products List (QPL 38510).

Quality conformance inspection testing, per MIL-STD-883, Method 5005, is performed according to Mil-M-38510 as follows:

- Group A; each sublot.
- Group B; one sublot for each package type every week.
- Group C; one sublot for each microcircuit group every 13 weeks.
- Group D; one sublot for each package type every 26 weeks.

NOTE: This category of part conforms to Quality Level B-1 (π_Q = 3.0) of MIL-HDBK-2170.

In addition to the common specs used throughout the industry for processing and testing, JAN Qualified products also possess a requirement for a standard marking used throughout the IC industry.

By implementing this space-oriented government standardization program, Signetics complies with the trend of reducing the numerous similar Source Control Drawings (SCD's). This standardized trend results in a *single* complete and comprehensive specification, a *single* product flow, and a *single* administrative effort—for both the aerospace community and for Signetics. This effort will also result in a *single* lower price. Because the list of Signetics' qualified products will change periodically, you may wish to contact your nearest Signetics' Sales Office or refer to the *Products Qualified* under Military Specification from DESC for our current update.

JAN Class S orders will be quoted with unit price only (similar to present Class B programs). There will be no lot charges for SEM inspection, electrical testing, or Group B or D qualification. All additional charges are amortized in the unit price.

Package types currently qualified are:
1) Cerdip—ceramic dual-in-line
2) Cerpac—ceramic flat pack
3) Metal can packages

Government Source Inspection (GSI) is a required portion of the JAN 38510 Class S specification. No alterations to this specification may be instituted. Therefore, the only customer source inspection option is at pre-ship (verification only).

Additional program data options (such as wafer lot acceptance, attributes, Group B, D, and others) are available upon request for a nominal fee.

MIL-STD-883, LEVEL B

Processing to this option is ideal when no JAN slash sheets are released on devices required. Product is processed to MIL-STD-883 Method 5004, and is 100% electrically tested to Signetics data sheets.

Generic quality conformance inspection testing, per MIL-STD-883, Method 5005, is performed as follows:

- Group A; each sublot.
- Group B; one sublot for each package type every week.
- Group C; one sublot for each microcircuit group every 52 weeks (JAN data is applicable).
- Group D; one sublot for each package type every 52 weeks.

NOTE: This category of part conforms to Quality Level B (π_Q = 1.0) of MIL-HDBK-217D.

Copies of generic data, as defined above, are available to thos customers who require this data specifically on their purchase orders.

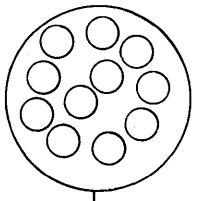
Signetics

© IC MASTER 1983

MILITARY PRODUCT GUIDE

PROCESS LEVEL AND MARKETING	PRE-CAP VISUAL	BURN IN	FUNCTIONAL TEST	DC/AC @ 25° C	DC/AC @ TEMP	QPL	OFFSHORE
JS/JB JM38510XXXXX	2010, Cond. B	Yes	100%	100%	100%	Yes	No
RB SXXXX883B	2010, Cond. B	Yes	100%	100%	100%	No	Yes

JAN Class S Product Inventory



Wafer Lot
≈ 24 Wafers

Wafer Lot Acceptance
(Includes SEM and GSI)

Wafers Required for Purchase Order

+Inventory Overbuild

Ship Purchase Order

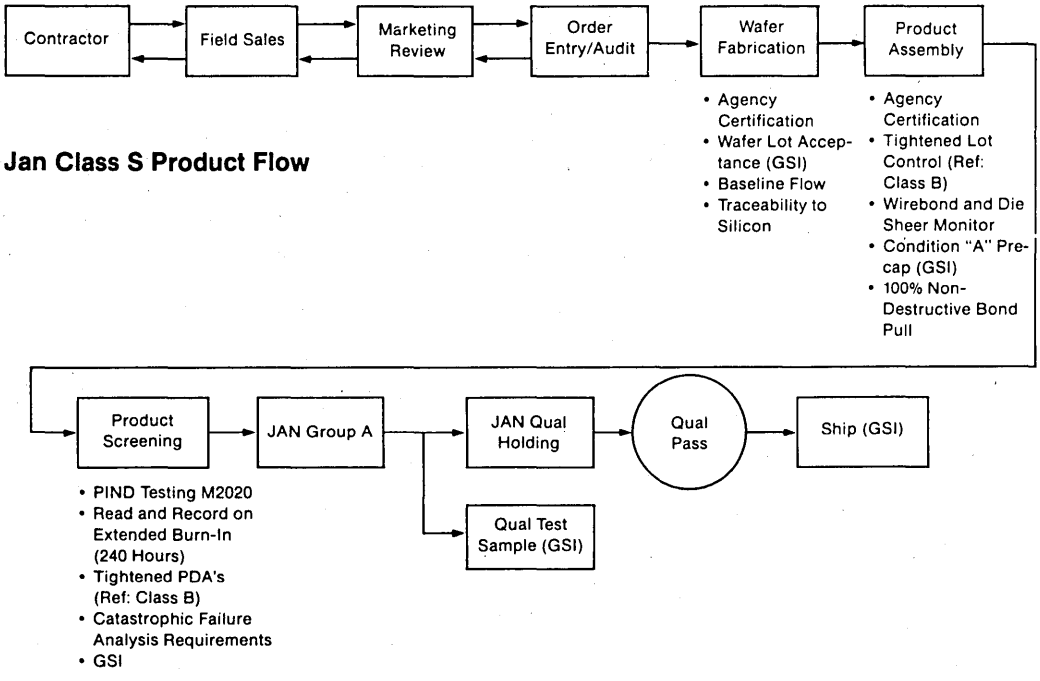
Balance to Finished Goods Inventory

Wafer Bank:
1 or 2 Wafers
(Wafer Lot Accepted)

Balance to Support JAN Class "B" Production

The Signetics' JAN Class S inventory program will reduce delivery time and shipment delinquencies. As continuing orders from customers are processed to this specification, inventories will be established for products in the form of pre-qualified wafers and finished parts. As the program matures, this will allow immediate delivery of JAN Class S parts.

Jan Class S Product Flow



Signetics

© IC MASTER 1983

MILITARY PRODUCT GUIDE

DESCRIPTION OF REQUIREMENTS AND SCREENS	MIL-M-38510 AND MIL-STD-883 REQUIREMENTS, METHODS AND TEST CONDITIONS	REQUIREMENT	PROCESSING LEVELS		
			CLASS S	JAN QUALIFIED (JB)	883B (RB)
General Mil-M-38510 1. Pre-Certification A. Product Assurance Program B. Manufacturer's Certification	The Manufacturer shall establish and implement a Products Assurance Program Plan and provide for a manufacturer survey by the qualifying activity, Para. 3.4.1.1	—	X	X	N/A
2. Certification	Received after manufacturer has completed a successful survey, Para. 3.4.1.2	—	X	X	N/A
3. Device Qualification	Device qualification shall consist of subjecting the desired device to groups A, B, C & D of method 5005, Para. 3.4.1.2	—	X	X	N/A
4. Traceability	Traceability maintained back to a production lot Para. 3.4.6	—	X	X	X
5. Country of Origin	Devices must be manufactured, assembled, and tested within the U.S. or its territories, Para. 3.2.1	—	X	X	N/A
Screening Per Method 5004 of Mil-Std-883					
6. Internal Visual (Precap)	2010, Cond. A or B	100%	XA	XB	XB
7. Stabilization Bake	1008, Cond. C Min; (24 Hrs @ 150°C)	100%	X	X	X
8. Temperature Cycling	1010, cond. C; (10 cycles, −65°C to +150°C)	1005	X	X	X
9. Constant Acceleration	2001, Cond. E; (30kg in YI Plane)	100%	X	X	X
10. Visual Inspection	There is no test method for this screen; it is intended only for the removal of "Catastrophic Failures" defined as "Missing Leads, Broken Packages or Lids Off."	100%	X	X	X
11. Seal (Hermeticity)					
A. Fine	Cond. A or B (5.0×10^{-8}CC/Sec)	100%	X	X	X
B. Gross	Cond. C Min.	100%	X	X	X
12. Interim Electricals (Pre Burn-In)	Per applicable device specification	100%	X	Optional	Optional
13. Burn-In	1015, Cond. as specified (160 hrs. Min at 125°C)	100%	240 hrs.	X	X
14. Final Electricals	Per applicable Device Specification	100%	100% Read & Record	Slash Sheet	Data Sheet
A. Static Tests @25°C	Sub Group 1		X	X	X
B. Static Tests @ +125°C	Sub Group 2		X	X	X
C. Static Tests @−55°C	Sub Group 3		X	X	X

Table 5 REQUIREMENTS AND SCREENING FLOWS FOR STANDARD PRODUCTS

© IC MASTER 1983

MILITARY PRODUCT GUIDE

DESCRIPTION OF REQUIREMENTS AND SCREENS	MIL-M-38510 AND MIL-STD-883 REQUIREMENTS, METHODS AND TEST CONDITIONS	REQUIREMENT	PROCESSING LEVELS		
			CLASS S	JAN QUALIFIED (JB)	883B (RB)
D. Dynamic Test @25°C	Sub Group 4 (for Linear Products mainly)		X	X	X
E. Functional Test @25°C	Sub Group 7		X	X	X
F. Switching Test @25°C	Sub Group 9		X	X	X
15. Percent Defective Allowable (PDA)	A PDA of 10% is a normal requirement applied against the static tests @25°C (A-1). This is controlled by the slash sheets for JB products. For RB 10% is standard.	10% 3% Funct'l	5%	X	X
16. Marking	Fungus Inhibiting Paint	100%	As Req'd	JM38510/ XXXX Slash Sheet #	SXXXX883B 883B
17. X-Ray	2012		100%	N/A	N/A
18. External Visual	2009	100%	X	X	X
Quality Conformance Inspection per Method 5005 of Mil-Std 883					
19. Group A	Electrical Tests—Final Electricals (#14 above) repeated on a sample basis. (Sub Groups 1 thru 12 as specified.)	Each sublot	X	X	X
20. Group B	Package functional and constructional related test I.E. package dimensions, resistance to solvents, internal visual & mechanical, bond strength & solderability.	Every week per pkg. type	Each sublot	X	X
21. Group C	Die related tests I.E. 1,000 hr. operating life, temperature cycling, & constant acceleration.	Every 13 weeks per μcircuit group	N/A	X	Generic
22. Group D	Package related tests I.E. physcial dimensions, lead fatigue, thermal shock, temperature cycle, moisture resistance, mechanical shock, vibration, variable frequency, constant acceleration & salt atmosphere.	Every 26 weeks per package type	X	X	Generic

Table 5 REQUIREMENTS AND SCREENING FLOWS FOR STANDARD PRODUCTS (Cont'd)

© IC MASTER 1983

MILITARY PRODUCT GUIDE

LINEAR DEVICES

DEVICE	DESCRIPTION	PACKAGE	
		DIP	CAN
	OPERATIONAL AMPLIFIERS		
LF155	JFET Op Amp		H
LF156	JFET Op Amp		H
LF198	Sample and Hold Amp	FE	H
LH2101A	Dual Op Amp	F	
LM101/A	Hi Perf Op Amp	F	H
LM124	Quad Op Amp	F	
LM158	Dual Op Amp	FE	H
SE532	Dual Op Amp	FE	H
SE5512	Dual Op Amp	FE	H
SE5532A	Dual Op Amp	FE	H
SE5534	Lo Noise Op Amp	FE	H
SE5534A	Lo Noise Op Amp	FE	H
SE5537	Sample and Hold Amp	FE	H
SE5539	High Freq Op Amp	F	
μA747	Dual Op Amp	F	H
	COMPARATORS		
SE521	Dual Differential Comparator	F	
SE522	Dual Differential Comparator	F	
SE527	Voltage Comparator	F	H
SE529	Voltage Comparator	F	H
LH2111	Dual Voltage Comparator	F	
LM111	Voltage Comparator	F	H
LM119	Dual Voltage Comparator	F	H
LM139/A	Quad Voltage Comparator	F	
LM193/A	Dual Voltage Comparator	F	H
	DIFFERENTIAL AMPLIFIERS		
SE592	Video Amplifier	F	
μA733	Video Amplifier	F	H
	PHASE LOCKED LOOPS		
SE564	Phase Locked Loop	F	H
SE567	Tone Decoder PLL	F	H
	TIMERS		
SE555	Timer	F, FE	H
SE556-1	Dual Timer	F	

DEVICE	DESCRIPTION	PACKAGE	
		DIP	CAN
	D to A CONVERTERS		
DAC-08	8-Bit Mult DAC	F	
SE5008	8-Bit Mult DAC	F	
SE5009	8-Bit Mult DAC	F	
SE5018	8-Bit μP-Comp DAC	F	
SE5019	8-Bit μP-Comp DAC	F	
SE5118	8-Bit μP-Comp DAC	F	
SE5119	8-Bit μP-Comp DAC	F	
	SMPS CONTROL CIRCUITS		
SE5560	SMPS Controller	F	

JAN M—38510			
DEVICE	SLASH SHEET	PKG	QUAL STATUS
SE555	10903BCB	F	QPL 1
SE555	10903BPB	FE	QPL 1
SE556-1	10902BCB	F	QPL 1
LH2101A	10105BEB	F	QPL 1
LM101A	10103BCB	F	QPL 1
LM101A	10103BPB	FE	QPL 1
LM124	11005BCB	F	1982

NOTE
F = Cerdip

© IC MASTER 1983

MILITARY PRODUCT GUIDE

LINEAR INDUSTRY CROSS REFERENCE

FAIRCHILD	SIGNETICS
μA111	LM111
μA139	LM139
μA733	μA733
μAF155/156	LF 55/156
μA101	LM101
μA101A	LM101A
MC1556	MC1556
μA747	μA747
MC1555	SE555
μA556	SE556-1

MOTOROLA	SIGNETICS
MLM111	LM111
MC1733	μA733
LF155/56	LF155/156
MLM101	LM101
MLM101A	LM101A
MC1747	μA747
MC3556	SE556-1
MC1508	MC1508-8

NATIONAL	SIGNETICS
LM161	SE529
LH2111	LH2111
LM111	LM111
LM119	LM119
LM139	LM139
LM193	LM193/193A
LM733	μA733
LF155/56	LF155/156
LH2101A	LH2101A
LM101A	LM101
LM101	LM101A
LM124	LM124
LM158	LM158
LM1581	SE532
LM747	μA747
LM567	SE567
LM555	SE555

PMI	SIGNETICS
DAC-08	SE5008 & DAC-08

RAYTHEON	SIGNETICS
LM111	LM111
LM139	LM139
RM733	μA733
LF155/56/57	LF155/156
LM101	LM101
LM101A	LM101A
LM124	LM124
RM1556	MC1556
RM747	μA747
RM555	SE555

T.I.	SIGNETICS
LM111	LM111
SN52733	μA733
LF155/56	LF155/156
SN52101A	LM101A
SN52555	SE555
SE556	SE556-1

BIPOLAR LSI

	BASE		PACKAGE	DESCRIPTION
I/O Interface	8X371		I	8-Bit Bidirectional I/O Port for 8X300/8X305
	8X372		I	8-Bit Bidirectional I/O Port for 8X300/8X305
	8X374		I	8-Bit I/O Port with Parity for 8X305
	8X376		I	8-Bit Bidirectional I/O Port for 8X300/8X305
	8X382		I	4-In/4-Out I/O Port for 8X300/8X305
Memory (RAM)	8X350		F	256X8 Bit Bipolar RAM for 8X300/8X305
Microprocessors	3002		I	2-Bit Central Processing Element
	8X305		I, W	8-Bit Microcontroller
Semicustom Circuits	8A 1200		I	ISL Gate Array
	8A 1260		I	ISL Gate Array
	8A 1542		I	ISL Gate Array
	8A 1664		I, G, W	ISL Gate Array
	8A 1864		I, G, W	ISL Gate Array
	8A 2176		I, G, W	ISL Gate Array
Sequencers	3001		I	Microprogram Control Unit
Special Purpose Circuits	8X310		I	Interrupt Control Coprocessor for 8X305
	8X360		I	Memory Address Director for 8X305
	8X60		F	FIFO RAM Controller
Development Hardware and Kits			8X300KT1	8X305 Evaluation and Prototyping Kit
			EZ-PRO	Development System for 8X300/8X305 available from American Automation
			Programmer (I/O Port)	Available from Data I/O or American Automation
Development Software			8X300AS1	8X300 Cross-assembler (MCCAP) FORTRAN Source Program

© IC MASTER 1983

MILITARY PRODUCT GUIDE

LOGIC—5400 SERIES

DEVICE	DESCRIPTION	JM38510 SLASH SHEET	JAN QUALIFIED		MIL-STD 883	
			DIP	FLAT-PACK	DIP	FLAT-PACK
5400	Quad 2-Input NAND Gate	/00104	1	1	F	W
5404	Hex Inverter	/00105	1	1	F	W
5420	Dual 4-Input NAND Gate	/00102	1	1	F	W
5426	Quad 2-Input NAND Gate with o/c	/00805	1	—	F	—
5432	Quad 2-Input OR Gate	/16101	1	1	F	W
5473	Dual J-K Master-Slave Flip-Flop	/00202	1	1	F	W
5474	Dual D-Type Edge Triggered Flip-Flop	/00205	1	1	F	W
5475	Quad Bistable Latch	/01501	1	1	F	W
5476	Dual J-K Master-Slave Flip-Flop	/00204	1	1	F	W
5477	Quad Bistable Latch	—	—	—	—	W
5485	4-Bit Magnitude Comparator	/15001	1	1	F	W
5493	4-Bit Binary Counter	/01302	1	1	F	W
5496	5-Bit Shift Register	/00902	1	1	F	W
54121	Monostable Multivibrator	/01201	1	1	F	W
54123	Retriggerable Monostable Multivibrator	/01203	1	1	F	W
54126	Quad 3-State Buffer	/15302	1	1	F	—
54151	8-Line to 1-Line Mux	/01406	1	1	F	W
54153	Dual 4-Line to 1-Line Mux	/01403	1	1	F	W
54161	Synchronous 4-Bit Binary Counter	/01306	1	1	F	W
54163	Synchronous 4-Bit Binary Counter	/01304	1	1	F	W
54164	8-Bit Parallel-Out Serial Shift Register	/00903	1	—	F	—
54165	Parallel-Load 8-Bit Shift Register	—	•	•	F	W
54174	Hex D-Type Flip-Flop with Clear	/01701	1	1	F	W
54175	Quad D-Type Edge-Triggered Flip-Flop	/01702	1	1	F	W
54180	8-Bit Odd/Even Parity Checker	/01901	1	1	F	W
54190	Synchronous Up/Down Counter (BCD)	—	—	—	•	•
54191	Synchronous Up/Down Counter (Binary)	—	—	—	•	•
54193	Synchronous 4-Bit Binary Up/Down Counter	/01309	1	1	F	W
54279	Quad S-R Latch	—	—	—	F	W
54365A	Hex Buffer w/Common Enable (3-State)	/16301	1	—	F	—
54366A	Hex Buffer w/Common Enable (3-State)	/16302	1	—	F	—
54367A	Hex Buffer, 4-Bit and 2-Bit (3-State)	/16303	1	—	F	—
54368A	Hex Buffer, 4-Bit and 2-Bit (3-State)	/16304	1	—	F	—
9309	Dual 4-Input Multiplexer	/01404	1	1	F	W

NOTE
1 = QPLI 2 = QPLII • = In process

© IC MASTER 1983

MILITARY PRODUCT GUIDE

LOGIC—54LS SERIES

DEVICE	DESCRIPTION	JM38510 SLASH SHEET	JAN QUALIFIED		MIL-STD 883		
			DIP	FLAT-PACK	DIP	LCC	FLAT-PACK
54LS00	Quad 2-Input NAND Gate	/30001	1	1	F	G	W
54LS02	Quad 2-Input NOR Gate	/30301	1	1	F	G	W
54LS04	Hex Inverter	/30003	1	1	F	G	W
54LS08	Quad 2-Input AND Gate	/31004	1	1	F	G	W
54LS10	Triple 3-Input NAND Gate	/30005	1	1	F	G	W
54LS14	Hex Schmitt Trigger	/31302	1	1	F	—	W
54LS20	Dual 4-Input NAND Gate	/30007	1	1	F	G	W
54LS28	Quad 2-Input NOR Buffer	—	—	—	F	—	W
54LS32	Quad 2-Input OR Gate	/30501	1	1	F	1	W
54LS37	Quad 2-Input NAND Buffer	/30202	1	1	F	—	W
54LS42	BCD-to-Decimal Decoder	/30703	1	1	F	—	W
54LS73	Dual J-K Master-Slave Flip-Flop	/30101	1	1	F	—	W
54LS74	Dual D-Type Edge-Triggered Flip-Flop	/30102	1	1	F	—	W
54LS75	Quad Bistable Latch	/31601	1	1	F	—	W
54LS83A	4-Bit Binary Full Adder	—	—	—	F	—	W
54LS85	4-Bit Magnitude Comparator Gate	/31101	1	1	F	—	W
54LS86	Quad 2-Input Exclusive-OR Gate	/30502	1	1	F	G	W
54LS90	Decade Counter	/31501	1	1	F	—	W
54LS93	4-Bit Binary Counter	/31502	1	1	F	—	W
54LS95	4-Bit Left-Right Shift Register	/30603	1	1	F	—	W
54LS96	5-Bit Shift Register	/30604	1	1	F	—	W
54LS107	Dual J-K Master-Slave Flip-Flop	/30108	1	1	F	—	W
54LS109	Dual J-K Positive Edge-Triggered Flip-Flop	/30109	1	1	F	G	W
54LS112	Dual J-K Negative Edge-Triggered Flip-Flop	/30103	1	1	F	—	W
54LS113	Dual J-K Negative Edge-Triggered Flip-Flop	/30104	1	1	F	—	W
54LS125	Quad Bus Buffer Gate w/3-State Outputs	/32301	1	1	F	—	W
54LS138	3-to-8 Line Decoder/Demux	/30701	1	1	F	G	W
54LS139	Dual 2-to-4 Line Decoder/Demux	/30702	—	—	F	G	W
54LS151	8-Line to 1-Line Mux	/30901	•	•	•	—	•
54LS153	Dual 4-Line to 1-Line Mux	/30902	1	1	F	G	W
54LS154	4-Line to 16-Line Decoder/Demux	—	—	—	1	—	—
54LS157	Quad 2-Input Data Selector (non-inv.)	—	—	—	F	—	W
54LS161A	Synchronous 4-Bit Binary Counter	/31504	1	1	F	—	W
54LS163A	Synchronous 4-Bit Binary Counter	/31512	1	1	F	—	W
54LS164	8-Bit Parallel-Out Serial Shift Register	/30605	1	1	F	—	W
54LS173	Quad D-Type Flip-Flop (3-State) (8T10)	—	—	—	F	—	W
54LS174	Hex D-Type Flip-Flop with Clear	/30106	1	1	F	—	W
54LS175	Quad D-Type Edge-Triggered Flip-Flop	/30107	1	1	F	—	W
54LS181	4-Bit Arithmetic Logic Unit	/30801	1	—	F	—	W
54LS190	Synchronous Up/Down Counter (BCD)	/31513	1	1	F	—	W
54LS191	Synchronous Up/Down Counter (Binary)	/31509	1	1	F	—	W

NOTE
1 = Level 1 Qualification 2 = Level 2 Qualification • = In process
LCC = Leadless Chip Carrier
JEDEC standard 20-Pin

© IC MASTER 1983

MILITARY PRODUCT GUIDE

LOGIC—54LS SERIES (Cont'd)

DEVICE	DESCRIPTION	JM38510 SLASH SHEET	JAN QUALIFIED		MIL-STD 883		
			DIP	FLAT-PACK	DIP	LCC	FLAT-PACK
54LS192	Synchronous Decade Up/Down Counter	/31507	1	1	F	—	W
54LS193	Synchronous 4-Bit Binary Up/Down Counter	/31508	1	1	F	—	W
54LS194A	4-Bit Bidirectional Universal Shift Register	/30601	•	•	F	G	W
54LS195A	4-Bit Parallel-Access Shift Register	/30602	1	1	F	—	W
54LS197	Presettable Binary Counter/Latch (8291)	/32002	1	1	F	—	W
54LS221	Dual Monostable Multivibrator	—	—	—	•	—	•
54LS240	Octal Inverter Buffer 3-State	/32401	•	—	F	G	—
54LS241	Octal Buffer 3-State	/32402	•	—	F	G	—
54LS242	Quad Inverting TCRS 3-State	/32801	•	•	F	—	W
54LS243	Quad TCRS 3-State	/32802	•	•	F	—	W
54LS244	Octal Buffer 3-State	/32403	•	—	F	—	—
54LS251	Data Selector/Mux with 3-State Outputs	—	—	—	•	—	•
54LS253	Dual 4-Line to 1-Line Data Selector/Mux	—	•	•	F	—	W
54LS257A	Quad 2-Line to 1-Line Data Selector/Mux	/30906	1	1	•	G	•
54LS258A	Quad 2-Line to 1-Line Data Selector/Mux	/30907	1	1	•	—	•
54LS261	2X4 Parallel Binary Multiplier	—	—	—	F	—	W
54LS266	Quad Exclusive-NOR Gate	/30303	1	1	F	—	W
54LS273	Octal D Flip-Flop	/32501	1	•	F	G	—
54LS283	4-Bit Adder	/31202	•	•	F	—	W
54LS290	Decade Counter	/32003	1	1	F	—	W
54LS293	4-Bit Binary Counter	/32004	1	1	F	—	W
54LS295B	4-Bit Right-Shift Left-Shift Register	/30606	1	1	F	—	W
54LS298	Quad 2-Input Mux with Storage	—	—	—	F	—	W
54LS363	Octal Latch for MOS Interface (3-State)	—	—	—	F	G	—
54LS364	Octal Flip-Flop for MOS Interface (3-State)	—	—	—	F	—	—
54LS365A	Hex Buffer w/Common Enable (3-State)	/32201	1	1	F	—	W
54LS367A	Hex Buffer, 4-Bit and 2-Bit (3-State)	/32203	1	1	F	—	W
54LS368A	Hex Buffer, 4-Bit and 2-Bit (3-State)	/32204	1	1	F	—	W
54LS373	Octal Transparent Latch (3-State)	/32502	1	—	F	—	—
54LS374	Octal D Flip-Flop (3-State)	/32503	1	—	F	G	—
54LS375	Quad Latch	/31604	1	1	F	—	W
54LS377	Octal D Flip-Flop Clock Enable	—	—	—	F	—	—
54LS378	Hex D Flip-Flop with Enable	—	—	—	F	—	W
54LS393	Dual Binary Ripple Counter	—	—	—	F	—	W
54LS395A	4-Bit Cascadeable Shift Register (3-State)	/30607	1	1	F	—	W
54LS490	Dual Decade Ripple Counter	/32703	1	1	F	—	W
54LS670	4X4 Register File (3-State)	/31901	•	•	F	—	W

NOTE
1 = Level 1 Qualification 2 = Level 2 Qualification • = In process
LCC = Leadless Chip Carrier
JEDEC standard 20-Pin

© IC MASTER 1983

MILITARY PRODUCT GUIDE

LOGIC—54S SERIES

DEVICE	DESCRIPTION	JM38510 SLASH SHEET	JAN QUALIFIED		MIL-STD 883		
			DIP	FLAT-PACK	DIP	LCC	FLAT-PACK
54S00	Quad 2-Input NAND Gate	/07001	1	1	F	G	W
54S02	Quad 2-Input NOR Gate	/07301	1	1	F	G	W
54S04	Hex Inverter	/07003	1	1	F	—	W
54S08	Quad 2-Input AND Gate	/08003	1	1	F	G	W
54S10	Triple 3-Input NAND Gate	/07005	1	1	F	G	W
54S11	Triple 3-Input NAND Gate	/08001	1	1	F	—	W
54S20	Dual 4-Input NAND Gate	—	—	—	F	—	W
54S40	Dual 4-Input NAND Buffer	/07201	1	1	F	—	W
54S51	Dual 2-Wide 2-Input A01 Gate	/07401	1	1	F	—	W
54S74	Dual D-Type Edge-Triggered Flip-Flop	/07101	1	1	F	G	W
54S85	4-Bit Magnitude Comparator	/08201	1	—	F	—	—
54S86	Quad 2-Input Exclusive-OR Gate	/07501	1	1	F	G	W
54S112	Dual J-K Negative Edge-Triggered Flip-Flop	/07102	1	1	F	—	W
54S113	Dual J-K Negative Edge-Triggered Flip-Flop	/07103	2	2	F	—	W
54S133	13-Input NAND Gate	/07009	1	1	F	—	W
54S135	Quad Exclusive-OR/NOR Gate	—	—	—	F	—	—
54S138	3-to-8 Line Decoder/Demux	—	—	—	—	—	—
54S139	Dual 2-to-4 Line Decoder/Demux	/07702	—	—	F	—	W
54S140	Dual 4-Input NAND Line Driver	/08101	1	1	F	—	W
54S151	8-Line to 1-Line Mux	/07901	1	1	F	—	W
54S153	Dual 4-Line to 1-Line Mux	/07902	1	1	F	G	W
54S157	Quad 2-Input Data Selector (non-inv.)	/07903	1	1	F	—	W
54S158	Quad 2-Input Data Selector (inv.)	/07904	1	1	F	—	W
54S174	Hex D-Type Flip-Flop with Clear	—	—	—	F	—	W
54S181	4-Bit Arithmetic Logic Unit	/07801	1	—	F	—	•
54S182	Look-Ahead Carry Generator	—	—	—	•	—	•
54S253	Dual 4-Line to 1-Line Data Selector/Mux	—	—	—	F	—	W
54S273	Octal D-Type Flip-Flop with Reset	—	—	—	F	—	—
54S258	Quad 2-Line to 1-Line Data Selector/Mux	—	—	—	—	—	—
54S26C	Dual 5-Input NOR Gate	—	—	—	F	—	W
54S280	9-Bit Odd/Even Parity Generator/Checker	—	—	—	—	—	—
54S374	Octal D-Type Flip-Flop (3-State)	—	—	—	F	—	—

NOTE
1 = Level 1 Qualification 2 = Level 2 Qualification • = In process
LCC = Leadless Chip Carrier
JEDEC standard 20-Pin

© IC MASTER 1983

MILITARY PRODUCT GUIDE

LOGIC—8T INTERFACE SERIES

DEVICE	DESCRIPTION	MIL-STD 883	
		DIP	FLAT PACK
8T05	7-Segment Decoder Display Driver (Active-Hi Outputs)	F	W
8T09	Quad Bus Driver with 3-State Outputs	F	W
8T13	Dual Line Driver	F	W
8T16	Dual Communications EIA/MIL Receiver with Hysteresis	—	—
8T18	Dual 2-Input NAND (High Voltage to TTL Interface)	F	W
8T26A	Quad Bus Driver/Receiver (3-State Outputs)	F	R
8T28	Quad Non-Inverting Bus Driver/Receiver (3-State Outputs)	F	W
8T30	Dual TTL/DTL to MOS Transceiver/Port Controller	F	—
8T38	Quad Bus Transceiver (Open Collector) (DM8838)	F	W
8T80	Quad 2-Input NAND Gate (High Voltage)	F	W
8T90	Hex Inverter (High Voltage)	F	W
8T97	High Speed Hex Buffers/Inverters (74367/DM8097)	F	R
8T98	High Speed Hex Buffers/Inverters (74368/DM8098)	F	R
8T126	Quad 3-State Transceivers	F	W
8T127	Quad 3-State Transceivers	F	W
8T128	Quad 3-State Transceivers	F	W
8T129	Quad 3-State Transceivers	F	W

LOGIC—82XX SERIES

DEVICE	DESCRIPTION	MIL-STD 883	
		DIP	FLAT PACK
8202	Buffer Register	F	W
8250	Binary-to-Octal Decoder	F	W
8266	2-input 4-Bit Digital Multiplexer	F	W
8273	10-Bit Serial-In Parallel-Out Shift Register	F	W
8280	BCD Decade Counter/Storage Element	F	W
8281	4-Bit Binary Counter/Storage Element	F	W

© IC MASTER 1983

MILITARY PRODUCT GUIDE

BIPOLAR MEMORY

DEVICE	ORGANIZATION	PACKAGE*		OUTPUT CIRCUIT	NUMBER OF PINS
PROMs					
82S23	32X8	F	R	OC	16
82S115	512X8	I	R	TS	24
82S123	32X8	F	W	TS	16
82S126	256X4	F	W	OC	16
82S129	256X4	F	R	TS	16
82S130	512X4	F	R	OC	16
82S131	512X4	F	R	TS	16
82S137	1024X4	F,I	R	TS	18
82S141	512X8	F,I	R	TS	24
82S147	512X8	F	R	TS	20
82S181	1024X8	F,I	R,G	TS	24
82S185	2048X4	I	R	TS	18
82S2708	1024X8	F,I	R	TS	24
82LS2708	1024X8	F	R	TS	24
82S191	2048X8	I	R,G	TS	24
FPLF					
82S100	16X48X8	I	R,G	TS	28
82S101	16X48X8	I	R	OC	28
82S102	16X9	I	R	OC	28
82S103	16X9	I	R	TS	28
82S104	16X48X8	I	R	OC	28
82S105	16X48X8	I	R	TS	28
82S106	16X48X8	I	R	OC	28
82S107	16X48X8	I	R	OC	28
82S150	18X12	I	R	OC	20
82S151	18X12	I	R	TS	20
82S152	18X32X10	I	R	OC	20
82S153	18X32X10	I	R	TS	20
82S154	16X32X12	I	R	OC	20
82S155	16X32X12	I	R	TS	20
82S156	16X32X12	I	R	OC	20
82S157	16X32X12	I	R	TS	20
82S158	16X32X12	I	R	OC	20
82S159	16X32X12	I	R	TS	20
RAMs					
54S189	16X4	F	R	TS	16
54S301	256X1	F	R	OC	16
82S09	64X9	I	R	OC	28
82S19	64X9	I	R	OC	28
82S16	256X1	F	R	TS	16
82S25	16X4	F	R	OC	16
82S210	256X9	I	R	TS	24
82S212	256X9	I	R	TS	22
8X350	256X8	I	I	TS	22

*R = BeO Flat Pack
F = Cerdip
I = Ceramic Dip
G = Leadless 28 PINS
W = Ceramic Flat Pack

JAN M-38510			
DEVICE	SLASH SHEET	PKG	QUAL STATUS
82S23	/20701	F	QPL I
82S123	/20702	F	QPL I
82S126	/20301	F	QPL I
82S129	/20302	F	QPL I
82S130	/20401	F	QPL I
82S131	/20402	F	QPL I
82S137	/20602	F	QPL I
82S141	/20802	F	QPL I
82S115	/20803	F	QPL II
82S181	/20904	F	QPL I
82S185	/20902	I, F	QPL I
82S2708	/20905	I	QPL II
82S191	/21002	I	QPL II
82S100	/(Draft)	I	Planned

+ Per QPL M38510-38 dated June 1982

© IC MASTER 1983

MILITARY PRODUCT GUIDE

BIPOLAR MEMORY CROSS REFERENCE

AMD	SIGNETICS
2700/27LS00	82S16
27S08/27LS08	82S23
27S09/27LS09	82S123
27S10	82S126
27S11	82S129
3101	82S25

FAIRCHILD	SIGNETICS
93403	82S25
93417	82S126
93419	82S09
93421	82S16
93427	82S129
93431	82S130
93436	82S130
93441	82S131
93446	82S131
93448	82S141
93453	82S137
93457	82S126
93467	82S129
93451	82S181
———	82S191

HARRIS	SIGNETICS
0064	82S25
HM7602-2	82S23
HM7603-2	82S123
HM7608-2	82S2708
HM7610-2	82S126
HM7611-2	82S129
HM7620-2	82S130
HM7621-2	82S131
HM7641-2	82S141
HM7643-2	82S137
HM7647-2	82S115
HM7681-2	82S181
HM7685-2	82S185
HM76161	82S191

INTEL	SIGNETICS
2708	82S2708
3101	82S25
3106/A	82S16
3601	82S126
3602	82S130
3605	82S136
3622	82S131
3624	82S141
3625	82S137
3628	82S181
3636	82S191

INTERSIL	SIGNETICS
5501	82S25
5523A	82S16
5533	54S301
5600	82S23
5603A	82S126
5604	82S130
5610	82S123
5623A	82S129
5624	82S131
5625	82S141
56526	82S137

MOTOROLA	SIGNETICS
4064	82S25
4256	82S16
5005	82S126

MMI	SIGNETICS
5300-1	82S126
5301-1	82S129
5305-1	82S130
5306-1	82S131
5330	82S23
5331	82S123
5341	82S141
5353	82S137
5381	82S181
5385	82S2708
5531	82S16
5560	82S25

NATIONAL	SIGNETICS
54S188	82S23
54S287	82S129
54S288	82S123
54S387	82S126
54S570	82S130
54S571	82S131
54S573	82S137
86L99	82S25
87S296	82S141
87S181	82S181
87S191	82S191

T.I.	SIGNETICS
54S188	82S23
54S189	54S189
54S287	82S129
54S288	82S123
54S301	54S301
54S387	82S126
54S474	82S141
54S476	82S137
54S478	82S181

NOTE

Parts are pin for pin functional replacements except where noted.

© IC MASTER 1983

MILITARY PRODUCT GUIDE

BIPOLAR MICROPROCESSORS

PRODUCT	DESCRIPTION	AVAILABILITY	
		DIP	FLAT PACK
3001	Microprogram Control Unit	I	R
3002	Central Processing Element (2-bit slice)	I	R
8X300	Interpreter/Microcontroller	I	•

* Under development

MICROPROCESSOR SUPPORT CIRCUITS

PRODUCT	DESCRIPTION	AVAILABILITY	
		DIP	FLAT PACK
LOGIC			
54123	Retriggerable Monostable Multivibrator	F	R
54180	8-Bit Odd/Even Parity Checker	F	R
54LS194	4-Bit Bidirectional Shift Register	I	•
54LS195	4-Bit Parallel Access Shift Register	I	•
54LS365	High Speed Hex 3-State Buffer	F	W
54LS366	High Speed Hex 3-State Buffer	F	W
54LS367	High Speed Hex 3-State Buffer	F	W
54LS368	High Speed Hex 3-State Buffer	F	W
	INTERFACE		
8T09	Quad Bus Driver with 3-State Output	F	W
8T13	Dual Line Driver	F	W
8T26A	Quad Bus Driver/Receiver (3-State)	F	W
8T28	Quad Bus Non-Inverting Driver/Receiver (3-State)	F	W
8T32	Programmable 8-Bit I/O Port (3-State), IV Byte	I	•
8T35	Asynchronous Programmable 8-Bit I/O Port (Open Collector)	I	•
8T95	High Speed Hex Buffer (3-State)	F	R
8T97	High Speed Hex Buffer (3-State)	F	R
8T98	High Speed Hex Inverter (3-State)	F	R
8T126	Quad 3-State Transceivers	F	W
8T127	Quad 3-State Transceivers	F	W
8T128	Quad 3-State Transceivers	F	W
8T129	Quad 3-State Transceivers	F	W

* Under development

© IC MASTER 1983

STATIC RANDOM ACCESS MEMORIES Military (T_A = -55°C to +125°C)

Part Number	Organization	Access Time (ns)	Maximum Current (mA)		Power Supply (Volts)	Number of Pins	Package Type (Note 1)
			Operating	Standby			
SYM2114A-3	1024 x 4	150	70	--	+5	18	C, D, F
SYM2114A-4	1024 x 4	200	70	--	+5	18	C, D, F
SYM2114A-5	1024 x 4	250	70	--	+5	18	C, D, F
SYM2148H-3	1024 x 4	55	150	30	+5	18	C, D, F
SYM2148H	1024 x 4	70	150	30	+5	18	C, D, F
SYM2148H-6	1024 x 4	85	150	30	+5	18	C, D, F
SYM2149H-3	1024 x 4	55	150	--	+5	18	C, D, F
SYM2149H	1024 x 4	70	150	--	+5	18	C, D, F
SYM2149H-6	1024 x 4	85	150	--	+5	18	C, D, F
SYM2147-3	4096 x 1	55	180	30	+5	18	C, D, F
SYM2147	4096 x 1	70	180	30	+5	18	C, D, F
SYM2147-6	4096 x 1	85	180	30	+5	18	C, D, F
SYM2128-3	2048 x 8	150	100	30	+5	24	C, D, K
SYM2128-4	2048 x 8	200	100	30	+5	24	C, D, K
SYM2129-3	2048 x 8	150	100	--	+5	24	C, D, K
SYM2129-4	2048 x 8	200	100	--	+5	24	C, D, K
SYM2167 [2]	16,384 x 1	70	Note 3	Note 3	+5	24	C, D, K
SYM2168 [2]	4096 x 4	70	Note 3	Note 3	+5	24	C, D, K
SYM2169 [2]	4096 x 4	70	Note 3	—	+5	24	C, D, K

READ ONLY MEMORIES (ROMs) Military (T_A = -55°C to +125°C)

SYM3316	2048 x 8	100	150	--	+5	24	82S191	C, D
SYM3316A	2048 x 8	100	150	30	+5	24	82S191	C, D
SYM2332	4096 x 8	450	100	--	+5	24	TMS2532	C, D
SYM2333	4096 x 8	450	100	--	+5	24	2732/A	C, D
SYM2364	8192 x 8	450	100	--	+5	24	TMS2564	C, D, K
SYM2364A	8192 x 8	450	100	12	+5	24	TMS2564	C, D, K
SYM2365	8192 x 8	450	100	--	+5	28	2764	C, D, K
SYM2365A	8192 x 8	450	100	12	+5	28	2764	C, D, K
SYM23128	16,384 x 8	450	100	—	+5	28	27128	C, D, K
SYM23128-3	16,384 x 8	300	100	—	+5	28	27128	C, D, K
SYM23128A	16,384 x 8	450	100	10	+5	28	27128	C, D, K
SYM23128A-3	16,384 x 8	300	100	10	+5	28	27128	C, D, K

Notes:
1. C = Ceramic, D = Cerdip, F = Flatpack, P = Plastic, K = Leadless Chip Carrier.
2. Advanced Information.
3. Not Available.

Synertek.

SYNERTEK INC. • A SUBSIDIARY OF HONEYWELL, 3001 STENDER WAY, SANTA CLARA, CA 95054
TELEPHONE (408) 988-5600 • TWX: 910-388-0135

© IC MASTER 1983

Synertek.

SYM2114A
Military 1024 x 4 Static Random Access Memory
Extended Temperature Range (-55° C to +125° C)

Features

- Totally TTL Compatible:
  All Inputs, Outputs, and Power Supply
- Common Data I/O
- 400 mV Noise Immunity
- High Density 18 Pin Package
- 150ns Maximum Access
- Low Operating Power
  - 385 mW Max.
- No Clocks or Strobes Required
- Identical Cycle and Access Times
- Single +5V Supply

Description

The SYM2114A is a 4096-Bit static Random Access Memory organized 1024 words by 4-bits and is fabricated using Synertek's N-channel Silicon-Gate MOS technology. It is designed using fully DC stable (static) circuitry in both the memory array and the decoding and therefore requires no clock or refreshing to operate. Address setup times are not required and the data is read out nondestructively with the same polarity as the input data. Common Input/Output pins are provided to simplify design of the bus oriented systems, and can drive 1 TTL load.

The SYM2114A is designed for memory applications where high performance, low cost, large bit storage, and simple interfacing are important design objectives. It is totally TTL compatible in all respects: inputs, outputs, and the single +5V supply. A separate Chip Select ($\overline{CS}$) input allows easy selection of an individual device when outputs are or-tied.

The SYM2114A is packaged in an 18-pin DIP for the highest possible density and is fabricated with N-channel, Ion Implanted, Silicon-Gate technology — a technology providing excellent performance characteristics as well as improved protection against contamination.

SYM2147
Military 4096 x 1 Static Random Access Memory
Extended Temperature Range (-55° C to +125° C)

Features

- 55 ns Maximum Access
- No Clocks or Strobes Required
- Automatic $\overline{CE}$ Power Down
- Identical Cycle and Access Times
- Single +5V Supply (±10%)
- Totally TTL Compatible
  All Inputs and Outputs
- Separate Data Input and Output
- High Density 18-Pin Package
- Three-State Output

Description

The Synertek SYM2147 is a 4096-Bit Static Random Access Memory organized 4096 words by 1-bit and is fabricated using Synertek's new N-Channel Silicon-Gate HMOS technology. It is designed using fully static circuitry, therefore requiring no clock or refreshing to operate. Address set-up times are not required and the data is read out non-destructively with the same polarity as the input data. Separate data input and output pins provide maximum design flexibility. The three-state output facilitates memory expansion by allowing the outputs to be OR-tied to other devices.

The SYM2147 offers an automatic power down feature. Power down is controlled by the Chip Enable input. When Chip Enable ($\overline{CE}$) goes high, thus de-selecting the SYM2147, the device will automatically power down and remain in a standby power mode as long as $\overline{CE}$ remains high. This unique feature provides system level power savings as much as 80%.

The SYM2147 is packaged in an 18-pin DIP for the highest possible density. The device is fully TTL compatible and has a single +5V power supply.

© IC MASTER 1983

Synertek.

SYM2148H/SYM2149H

Military 1024 x 4 Static Random Access Memory

Extended Temperature Range (-55° C to +125° C)

Features

- 55 ns Maximum Access
- No Clocks or Strobes Required
- Automatic $\overline{CE}$ Power Down (SYM2148H)
- Fast Chip Select Access Time: 25 ns Max. (SYM2149H)
- Identical Cycle and Access Times
- Single +5V Supply (±10%)
- Industry Standard 2114 Pinout
- Totally TTL Compatible All Inputs and Outputs
- Common Data Input and Output
- High Density 18-Pin Package
- Three-State Output

Description

The Synertek SYM2148H/SYM2149H are 4096-Bit Static Random Access Memories organized 1024 words by 4 bits and are fabricated using Synertek's new N-Channel Silicon Gate technology. They are designed using fully static circuitry, therefore requiring no clock or refreshing to operate. Address set-up times are not required and the data is read out non-destructively with the same polarity as the input data. Common data input and output pins provide maximum design flexibility. The three-state output facilitates memory expansion by allowing the outputs to be OR-tied to other devices.

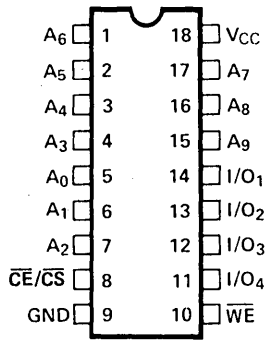
The SYM2148H offers an automatic power down feature. Power down is controlled by the Chip Enable input. When Chip Enable ($\overline{CE}$) goes high, thus de-selecting the SYM2148H, the device will automatically power down and remain in a standby power mode as long as $\overline{CE}$ remains high. This unique feature provides system level power savings as much as 85%.

The SYM2149H offers a chip select access that is faster than its address access. In a typical application, the address access begins as soon as the address is valid. At this time, the high order addresses are decoded and the desired memory is then selected. With the faster chip select access, this decode time will not add to the overall access time thus significantly improving system performance.

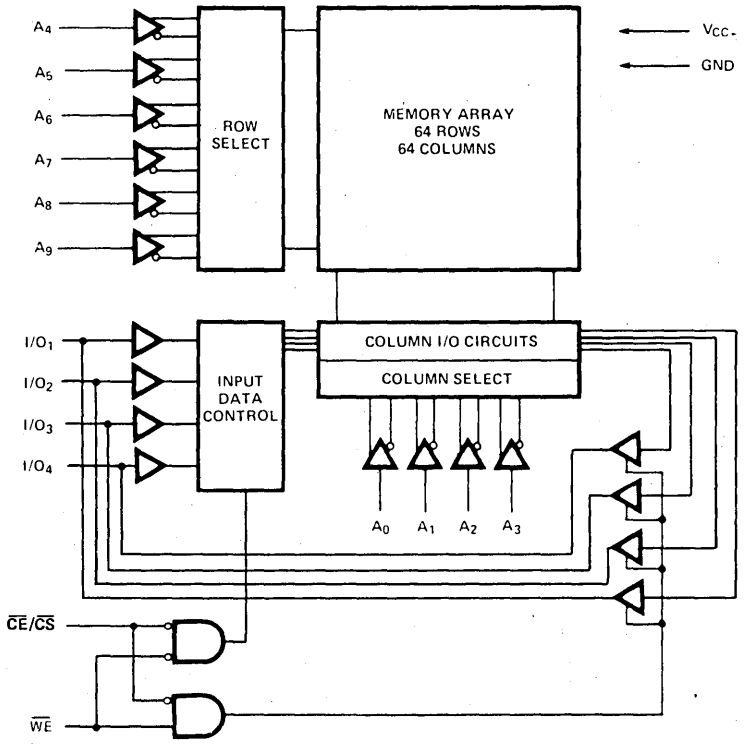
The SYM2148H/SYM2149H is packaged in an 18-pin DIP for the highest possible density. The device is fully TTL compatible and has a single +5V power supply.

Pin Configuration

SYM2148H/SYM2149H



Block Diagram



© IC MASTER 1983

Synertek.

SYM2128/SYM2129

Military 2048 x 8 Static Random Access Memory

Extended Temperature Range (-55° C to +125° C)

Features

- 150 nsec Maximum Access Time
- Fully Static Operation: No Clocks or Strobes Required
- Fast Chip Select Access Time: 60 ns Max. (SYM2129)
- Automatic $\overline{CE}$ Power Down (SYM2128)
- Identical Cycle and Access Times
- Single +5V Supply (±10%)
- Pin Compatible with 2716 16K EPROM
- Totally TTL Compatible: All Inputs and Outputs
- Common Data Input and Output
- Three-State Output
- JEDEC Approved Pinout

Description

The Synertek SYM2128/SYM2129 are 16,384 bit static Random Access Memories organized 2048 words by eight bits and are fabricated using Synertek's new scaled n-channel silicon gate technology. They are designed using fully static circuitry, therefore requiring no clock or refreshing to operate. The common data input and three-state output pins optimize compatibility with systems utilizing a bidirectional data bus.

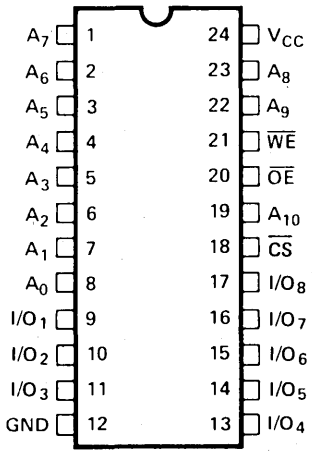
The SYM2128 offers an automatic power down feature under the control of the chip enable ($\overline{CE}$) input. When $\overline{CE}$ goes high, thus deselecting the chip, the device will automatically power down and remain in a standby power mode as long as $\overline{CE}$ remains high. This feature provides significant system level power savings.

The SYM2129 offers a chip select access that is faster than its address access. In a typical application, the address access begins as soon as the address is valid. At this time, the high order addresses are decoded and the desired memory is then selected. With the faster chip select access, this decode time will not add to the overall access time thus significantly improving system performance.

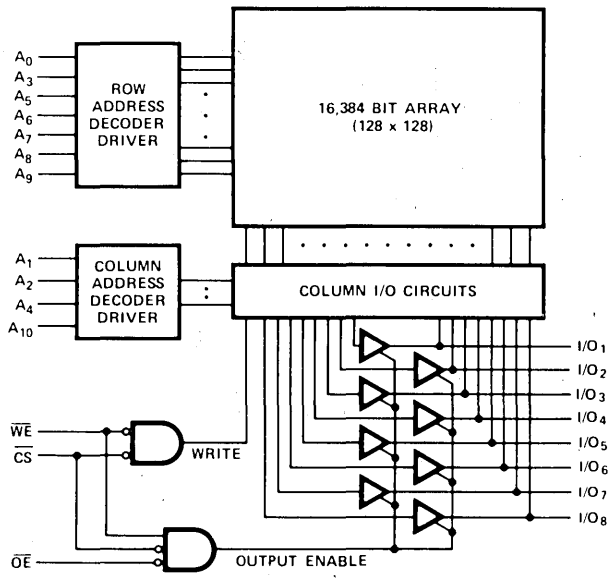
The SYM2128/SYM2129 are configured in the JEDEC approved pinout for 24 pin byte organized memories and are pin compatible with 16K ROMs, EPROMs and EEPROMs. This offers the user the flexibility of being able to switch between RAM, ROM, EPROM, or EEPROM as his needs dictate with a minimum of board changes.

Pin Configuration

SYM2128/SYM2129



Block Diagram



© IC MASTER 1983

Synertek.

SYM2167

Military 16,384 x 1 Static Random Access Memory

Extended Temperature Range (-55°C to +125°C)

ADVANCED INFORMATION
OCTOBER 1982

Features

- 70 ns Maximum Access
- No Clocks or Strobes Required
- Automatic $\overline{CE}$ Power Down
- Identical Cycle and Access Times
- Single +5V Supply
- Available in Ceramic (C), Cerdip (D), Flat Pack (F) and Leadless Chip Carrier (K)
- Totally TTL Compatible All Inputs and Outputs
- Separate Data Input and Output
- High Density 20 Pin Package
- Three-State Output

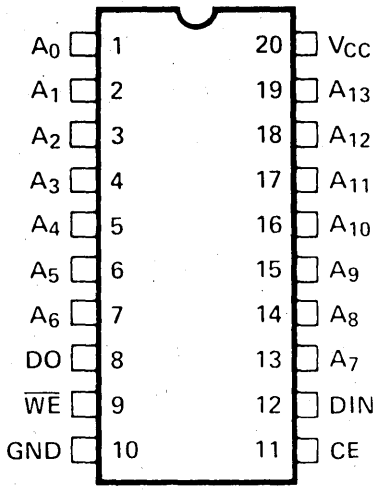
Description

The Synertek SY2167 is a 16,384-Bit Static Random Access Memory organized 16,384 words by 1-bit and is fabricated using Synertek's new N-Channel Double Polysilicon Gate HMOS technology. It is designed using fully static circuitry, therefore requiring no clock or refreshing to operate. Address set-up times are not required and the data is read out non-destructively with the same polarity as the input data. Separate data input and output pins provide maximum design flexibility. The three-state output facilitates memory expansion by allowing the outputs to be OR-tied to other devices.

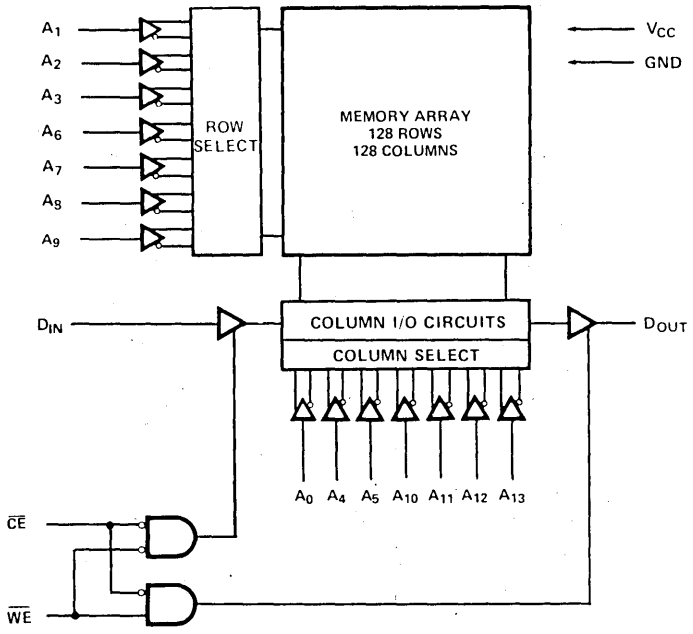
The SY2167 offers an automatic power down feature. Power down is controlled by the Chip Enable input. When Chip Enable ($\overline{CE}$) goes high, thus de-selecting the SY2167, the device will automatically power down and remain in a standby power mode as long as $\overline{CE}$ remains high. This unique feature provides system level power savings as much as 80%.

The SY2167 is packaged in a 20-pin DIP for the highest possible density. The device is fully TTL compatible and has a single +5V power supply.

Pin Configuration



Block Diagram



© IC MASTER 1983

Synertek

SYM2168/SYM2169

Military 4096 x 4 Static Random Access Memory

Extended Temperature Range (-55°C to +125°C)

Advanced Information

October 1982

Features

- 70 ns Maximum Access Time
- No Clocks or Strobes Required
- Fast Chip Select Access Time: 50 ns Max. (SY2169)
- Automatic $\overline{CE}$ Power Down (SY2168)
- Identical Cycle and Access Times
- Available in Ceramic (C), Cerdip (D), Flatpack (F) and Leadless Chip Carrier (K)
- Single +5V Supply (±10%)
- JEDEC Standard Pinout
- Totally TTL Compatible All Inputs and Outputs
- Common Data Input and Output
- High Density 20-Pin Package
- Three-State Output

Description

The Synertek SY2168/SY2169 is a 16,384-Bit Static Random Access Memories organized 4096 words by 4 bits and are fabricated using Synertek's scaled n-channel double poly silicon gate technology. They are designed using fully static circuitry, therefore requiring no clock or refreshing to operate. Address set-up times are not required and the data is read out non-destructively with the same polarity as the input data. Common data input and output pins provide maximum design flexibility. The three-state output facilitates memory expansion by allowing the outputs to be OR-tied to other devices.

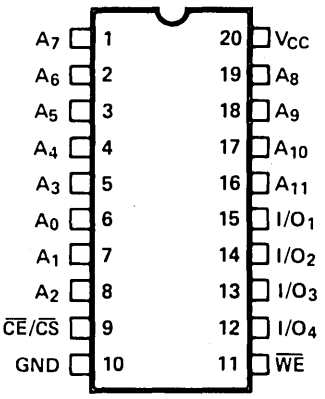
The SY2168 offers an automatic power down feature. Power down is controlled by the Chip Enable input. When Chip Enable ($\overline{CE}$) goes high, thus de-selecting the SY2168, the device will automatically power down and remain in a standby power mode as long as $\overline{CE}$ remains high. This unique feature provides system level power savings as much as 85%.

The SY2169 offers a chip select access that is faster than its address access. In a typical application, the address access begins as soon as the address is valid. At this time, the high order addresses are decoded and the desired memory is then selected. With the faster chip select access, this decode time will not add to the overall access time thus significantly improving system performance.

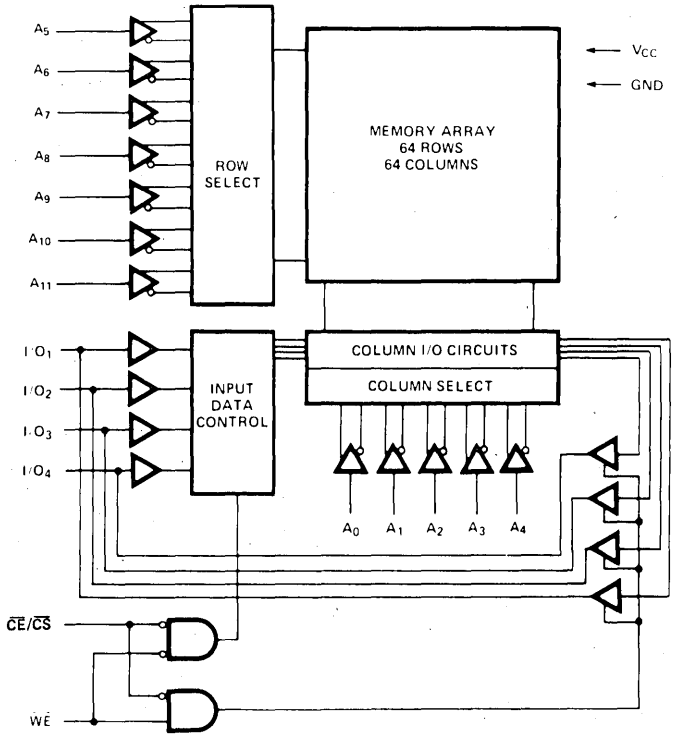
Both parts are packaged in a 20-pin DIP for the highest possible density. Both devices are fully TTL compatible and have a single +5V power supply.

Pin Configuration

SYM2168/SYM2169



Block Diagram



© IC MASTER 1983

Synertek.

SYM2316B

2048 x 8 Static Read Only Memory

Features

- Access Time 200/300/450 ns (max)
- 2048 x 8 Bit Organization
- Single +5 Volt Supply
- Totally Static Operation
- JEDEC Approved Pinout
- Completely TTL Compatible
- Three-State Outputs for Wire-OR Expansion
- Three Programmable Chip Selects
- Pin Compatible with 2716 EPROM
- Replacement for Two 2708s

Description

The SY2316B high performance Read Only Memories are organized 2048 words by 8 bits with access times from 200 to 450 ns. The ROMs are designed to be compatible with all microprocessor and similar applications where high performance, large bit storage and simple interfacing are important design considerations. This device offers TTL input and output levels with a minimum of 0.4 Volt noise immunity in conjunction with a +5 Volt power supply.

The SY2316B operates totally asynchronously. No clock input is required. The three programmable Chip Select inputs allow eight 16K ROMs to be OR-tied without external decoding. The device offers three-state output buffers for memory expansion.

Designed to replace the 2716 EPROM, the SY2316B can eliminate the need to redesign printed circuit boards for volume mask programmed ROMs after prototyping with EPROMs.

SYM2332/SYM2333

Military 4096 x 8 Static Random Access Memory

Extended Temperature Range (-55° C to +125° C)

Features

- SYM2333-273 EPROM Pin Compatible
- 4092 x 8 Bit Organizations
- Single +5 Volt Supply (±10%)
- Access Time — 450 ns (max.)
- Totally Static Operation
- Completely TTL Compatible
- SYM2332-2532 EPROM Pin Compatible
- Three-State Outputs for Wire-OR Expansion
- Two Programmable Chip Selects
- EPROMS Accepted as Program Data Inputs

Description

The SYM2332 and SYM2333 high performance read only memories are organized 4096 words by 8 bits with access times of less than 450 ns. They are designed to be compatible with all microprocessor and similar applications where high performance, large bit storage and simple interfacing are important design considerations. These devices offer TTL input and output levels with a minimum of 0.4 Volt noise immunity in conjunction with a +5 Volt power supply.

The SYM2332 and SYM2333 operate totally asynchronously. No clock input is required. The two programmable Chip Select inputs allow four 32K ROMs to be OR-tied without external decoding. Both devices offer three-state output buffers for memory expansion.

Designed to replace 32K EPROMs, the SYM2332 and SYM2333 can eliminate the need to redesign printed circuit boards for volume mask programmed ROMs after prototyping with EPROMs.

© IC MASTER 1983

Synertek.

SYM2364/SYM2364A
Military 8192 x 8 Static Random Access Memory
Extended Temperature Range (-55°C to +125°C)

Features

- 2564 EPROM Pin Compatible
- 8192 x 8 Bit Organization
- Single +5 Volt Supply
- Access Time — 450 ns (max)
- Totally Static Operation
- Completely TTL Compatible
- 24 Pin JEDEC Approved Pinout
- SYM2364A — Automatic Power Down ($\overline{CE}$)
- SYM2364 — Non Power Down Version
  — Programmable Chip Select
- Three State Outputs for Wire-OR Expansion
- EPROMs Accepted as Program Data Input

Description

The SYM2364 and SYM2364A high performance Read Only Memories are organized 8192 words by 8 bits with an access time of 450 ns. The ROMs are designed to be compatible with all microprocessor and similar applications where high performance, large bit storage and simple interfacing are important design considerations. Both ROMs conform to the JEDEC approved pinout for 24 pin 64K ROMs.

The SYM2364 offers the simplest operation (no power down.) Its programmable chip select allows two 64K ROMs to be OR-tied without external decoding.

The SYM2364A offers an automatic power down feature. Power down is controlled by the Chip Enable ($\overline{CE}$) input. When $\overline{CE}$ goes high, the device will automatically power down and remain in a low power standby mode as long as $\overline{CE}$ remains high. This unique feature provides system level power savings as much as 90%.

Both the SYM2364 and SYM2364A are pin compatible with the 2564 EPROM thus eliminating the need to redesign printed circuit boards for volume mask programmed ROMs after prototyping with EPROMs.

SYM2365/SYM2365A
Military 8192 x 8 Static Random Access Memory
Extended Temperature Range (-55°C to +125°C)

Features

- 2764 EPROM Pin Compatible
- 8192 x 8 Bit Organization
- Single +5 Volt Supply
- Access Time — 450 ns (max)
- Totally Static Operation
- Completely TTL Compatible
- 28 Pin JEDEC Approved Pinout
- SYM2365A — Automatic Power Down ($\overline{CE}$)
  — Output Enable Function ($\overline{OE}$)
  — Two Programmable Chip Selects
- SYM2365 — Non Power Down Version
  — Four Programmable Chip Selects
- Three State Outputs for Wire-OR Expansion
- EPROMs Accepted as Program Data Input

Description

The SYM2365 and SYM2365A high performance Read Only Memories are organized 8192 words by 8 bits with an access time of 450 ns. The ROMs are designed to be compatible with all microprocessor and similar applications where high performance, large bit storage and simple interfacing are important design considerations. Both ROMs conform to the JEDEC approved pinout for 28 pin 64K ROMs.

The SYM2365 offers the simplest operation (no power down.) Its four programmable chip selects allow up to sixteen 64K ROMs to be OR-tied without external decoding.

The SYM2365A offers an automatic power down feature. Power down is controlled by the Chip Enable ($\overline{CE}$) input. When $\overline{CE}$ goes high, the device will automatically power down and remain in a low power standby mode as long as $\overline{CE}$ remains high. This unique feature provides system level power savings as much as 90%. An additional feature of the SYM2365A is the Output Enable ($\overline{OE}$) function. This eliminates bus contention in multiple bus microprocessor systems. The two programmable chip selects allow up to four 64K ROMs to be OR-tied without external decoding.

Both the SYM2365 and SYM2365A are pin compatible with the 2764 EPROM thus eliminating the need to redesign printed circuit boards for volume mask programmed ROMs after prototyping with EPROMs.

© IC MASTER 1983

Synertek.

SYM3316/SYM3316A

2048 x 8 High Speed Read Only Memory

Extended Temperature Range (-55° C to +125° C)

Features

- Access Time – 100ns (max.)
- Single +5 Volt Supply (± 10%)
- Contact Programming
- Four Week Prototype Turnaround
- Completely TTL Compatible
- Totally Static Operation
- SYM3316A – Automatic Power Down ($\overline{CE}$)
- Pin Compatible with 16K Bipolar PROMs — Replaces 3636 or 82S191
- Three-State Outputs for Wire-OR Expansion
- Three Programmable Chip Selects (two on SYM3316A)
- 16K Bipolar PROMs Accepted as Program Data Inputs

Description

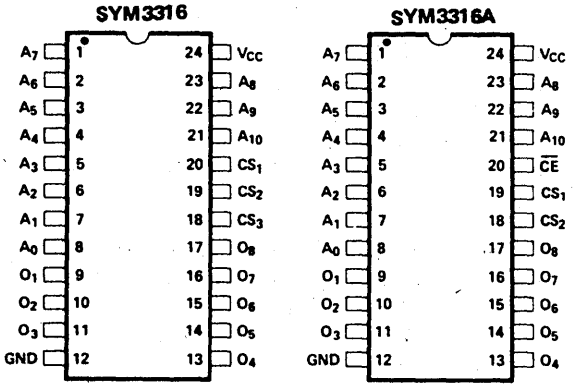
The SYM3316 and SYM3316A are high speed 16,384 bit static mask programmable Read Only Memories organized 2048 words by 8 bits. Designed to be pin compatible with 16K bipolar PROMs, they eliminate the need to redesign printed circuit boards for volume production after prototyping with PROMs.

The SYM3316A offers an automatic power down feature. Power down is controlled by the Chip Enable ($\overline{CE}$) input. When $\overline{CE}$ goes high, the device will automatically power down and remain in a standby power mode as long as $\overline{CE}$ remains high. This unique feature provides system level power savings of as much as 80%. The two programmable chip selects (CS) allow as many as four ROMs to be OR-tied without external decoding.

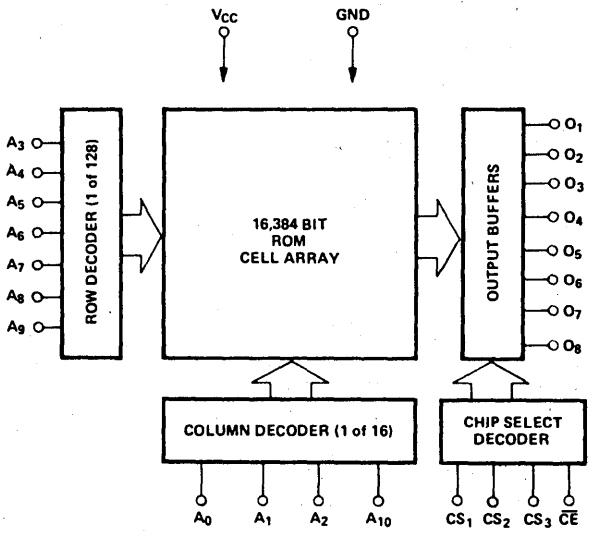
The SYM3316 offers somewhat simpler operation than the SYM3316A. It's three programmable chip selects allow up to eight ROMs to be OR-tied without external decoding.

Both devices are fabricated using Synertek's scaled high performance N-channel MOS technology. This, combined with innovative design techniques, provides the high performance and ease-of-use features associated with static memories.

Pin Configurations



Block Diagram



© IC MASTER 1983

TEXAS INSTRUMENTS MILITARY PRODUCTS

Texas Instruments Military program offers high reliability integrated circuits covering a complete product spectrum. The program is designed to meet and support Military processing requirements. Processing to JM-38510 (JANB) and MIL-Standard-883 Class B assures the user of quality products and reliable performance.

GENERIC TYPE AND JAN DEVICE CROSS REFERENCE GUIDE†††

TTL 54 SERIES

CIRCUIT TYPE	JAN /NO.
5400	**00104**
5401	**00107**
5402	**00401**
5403	**00109**
5404	**00105**
5405	**00108**
5406	**00801**
5407	**00803**
5408	01601
5409	01602
5410	**00103**
5412	**00106**
5413	15101
5414	15102
5416	**00802**
5417	**00804**
5420	**00102**
5423	**00402**
5425	**00403**
5426	00805
5427	**00404**
5428	16201
5430	**00101**
5432	16101
5437	**00302**
5438	**00303**
5440	**00301**
5442	01001
5443	01002
5444	01003
5445	01004
5446	01006
5447	01007
5448	01008
5449	01009
5450	**00501**
5451	**00502**
5453	**00503**
5454	**00504**
5470	**00206**
5472	**00201**
5473	**00202**
5474	**00205**
5475	01501
5476	**00204**
5477	01502
5479	00207
5480	00604
5482	00601
5483	**00602**
5485	15001
5486	**00701**
5490	01307
5492	01301
5493	01302
5495	00901
5496	00902
54107	**00203**
54116	01503
54120	15401†

TTL 54 SERIES

CIRCUIT TYPE	JAN /NO.
54121	01201
54122	01202
54123	01203
54125	15301
54126	15302
54132	15103
54145	01005
54147	15601
54148	15602
54150	01401
54151	01406
54153	01403
54154	15201
54155	15202
54156	15203
54157	01405
54160	01303
54161	01306
54162	01305
54163	01304
54164	00903
54165	00904
54166	00910†
54170	01801
54173	01703†
54174	01701
54175	01702
54177	01312†
54180	01901
54181	01101
54182	01102
54186	20101
54192	01308
54193	01309
54194	00905
54195	00906
54196	01310†
54197	01311†
54198	00909†
54365	16301
54366	16302
54367	16303
54368	16304

TTL 54H SERIES

CIRCUIT TYPE	JAN /NO.
54H00	**02304**
54H01	**02306**
54H04	**02305**
54H08	15501
54H10	**02303**
54H11	15502
54H20	**02302**
54H21	15503
54H22	02307
54H30	**02301**

TTL 54H SERIES

CIRCUIT TYPE	JAN /NO.
54H40	**02401**
54H50	04001
54H51	04002
54H53	04003
54H54	04004
54H55	04005
54H72	02201
54H73	02202
54H74	02203
54H76	**02204**
54H101	02205
54H103	02206

TTL 54L SERIES

CIRCUIT TYPE	JAN /NO.
54L00	02004
54L01	02006
54L02	02701
54L03	02006
54L04	02005
54L10	02003
54L20	02002
54L30	02001
54L42	02901
54L43	02902
54L44	02903
54L46	02904
54L47	02905
54L51	04101
54L54	04102/04104
54L55	04103
54L71	02101
54L72	02102
54L73	02103
54L74	02105
54L78	02104
54L86	02601
54L90	02501
54L91	02806
54L93	02502
54L95	02801
54L121	04201
54L122	04202
54L164	02802
54L193	02503

TTL 54LS SERIES

CIRCUIT TYPE	JAN /NO.
54LS00	**30001**
54LS02	**30301**
54LS03	**30002**
54LS04	**30003**
54LS05	**30004**
54LS08	**31004**
54LS09	31005
54LS10	**30005**
54LS11	**31001**
54LS12	**30006**

TTL 54LS SERIES

CIRCUIT TYPE	JAN /NO.
54LS13	**31301**
54LS14	**31302**
54LS15	**31002**
54LS20	**30007**
54LS21	**31003**
54LS22	**30008**
54LS26	**32102**
54LS27	**30302**
54LS28	30204
54LS30	**30009**
54LS32	**30501**
54LS37	**30202**
54LS38	**30203**
54LS40	**30201**
54LS42	**30703**
54LS47	**30704**
54LS51	**30401**
54LS54	**30402**
54LS73A	**30101**
54LS74A	**30102**
54LS75	**31601**
54LS76A	**30110**
54LS83A	**31201**
54LS85	**31101**
54LS86	**30502**
54LS90	**31501**
54LS92	**31510**
54LS93	**31502**
54LS95B	**30603**
54LS96	**30604**
54LS107A	**30108**
54LS109A	**30109**
54LS112A	**30103**
54LS113A	**30104**
54LS114A	**30105**
54LS122	**31403**
54LS123	**31401**
54LS124	31701†
54LS125A	**32301**
54LS126A	**32302**
54LS132	**31303**
54LS138	**30701**
54LS139	**30702**
54LS148	**36001**
54LS151	**30901**
54LS153	**30902**
54LS155	**32601**
54LS156	**32602**
54LS157	**30903**
54LS158	**30904**
54LS160A	**31503**
54LS161A	**31504**
54LS162A	**31511**
54LS163A	**31512**
54LS164	**30605**
54LS165	**30608**
54LS166	**30609**
54LS168	31505
54LS169	31506
54LS170	31902

TTL 54LS SERIES

CIRCUIT TYPE	JAN /NO.
54LS174	**30106**
25LS174	**33106**
54LS175	**30107**
25LS175	33107
54LS181	30801
54LS190	**31513**
54LS191	**31509**
54LS192	**31507**
54LS193	**31508**
54LS194A	**30601**
54LS195A	**30602**
54LS196	32001†
54LS197	32002†
54LS221	**31402**
54LS240	**32401**
54LS241	**32402**
54LS242	**32801**
54LS243	**32802**
54LS244	**32403**
54LS245	**32803**
54LS251	**30905**
54LS253	**30908**
54LS257A	**30906**
54LS258A	**30907**
54LS259	**31603**
54LS261	31801
54LS266	**30303**
54LS273	**32501**
54LS279	**31602**
54LS280	**32901**
54LS283	**31202**
54LS290	**32003**
54LS293	**32004**
54LS295B	**30606**
54LS298	30909
54LS324	31702†
54LS348	**36002**
54LS363	32505†
54LS365A	**32201**
54LS366A	**32202**
54LS367A	**32203**
54LS368A	**32204**
54LS373	**32502**
54LS374	**32503**
54LS375	**31604**
54LS377	**32504**
54LS390	**32701**
54LS393	**32702**
54LS395A	**30607**
54LS424	42201
54LS490	**32703**
54LS624	31704†
54LS629	31703†
54LS640	32804†
54LS641	32805†
54LS642	32806†
54LS645	32807†
54LS670	31901
54LS906	44102
54LS907	44103

†††BOLDFACE TYPE INDICATES PART IS TI QUALIFIED

NOTE: Only the basic JAN and commercial numbers are shown.
†Slash sheets not released as of date of this publication.
‡Not recommended for new designs

•Class S only
⊗Flat pack only
#DIP only

▲ Max 85 C
• Max 100 C
* * Faster access time

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

TEXAS INSTRUMENTS MILITARY PRODUCTS

GENERIC TYPE AND JAN DEVICE CROSS REFERENCE GUIDE†††

TTL 54LS SERIES

CIRCUIT TYPE	JAN /NO.
54LS915	44104
54LS916	44105
54LS917	44106

TTL 54S SERIES

CIRCUIT TYPE	JAN /NO.
54S00	**07001**
54S02	07301
54S03	**07002**
54S04	**07003**
54S05	07004
54S08	08003
54S09	08004
54S10	**07005**
54S11	08001
54S15	08002
54S20	**07006**
54S22	**07007**
54S30	**07008**
54S40	07201
54S51	07401
54S64	07402
54S65	07403
54S74	07101
54S85	08201
54S86	07501
54S112	07102
54S113	07103
54S114	07104
54S133	07009
54S134	07010

TTL 54S SERIES

CIRCUIT TYPE	JAN /NO.
54S135	07502
54S138	07701
54S139	07702
54S140	08101
54S151	07901
54S153	07902
54S157	07903
54S158	07904
54S174	07105
54S175	07106
54S181	07801
54S182	07802
54S194	07601
54S195	07602
54S251	07905
54S253	07908
54S257	07906
54S258	07907
54S280	07703†
54S412	42101
54S428	42301

LINEAR CONTROL SERIES

CIRCUIT TYPE	JAN /NO.
LM101A	10103
LM102	10601
LM104	10202†
LM105	10203†
LM106	10601

LINEAR INTERFACE SERIES

CIRCUIT TYPE	JAN /NO.
LM108A	10104
LM109	10701
LM110	10602
LM111	10304
LM118	10107
LM124	11005
LM137H	11803
LM137K	11804
LM138K	11706
LM139	11201
LM148	11001
LM149	11002
LM150K	11705
LM193	11202
LF155	11401
LF155A	11404
LF156	11402
LF156A	11405
LF157	11403
LF157A	11406
RM4136	11004†
SE555	10901
SE556	10902
μA710	10301
μA711	10302
μA723	10201
μA741	10101
μA747	10102
TL061	11901
TL062	11902
TL064	11903
TL071	11904
TL072	11905
TL074	11906

LINEAR INTERFACE SERIES

CIRCUIT TYPE	JAN /NO.
55107	**10401**
55108	**10402**
55113	**10405**
55114	**10403**
55115	**10404**
55182	10408†
55183	10409†
55325	13001†
55326	13002†
55327	13003†
55450	12901†
55451	12902†
55452	12093†
55453	12904†
55454	12905†
55460	12906†
55461	12907†
55462	12908†
55463	12909†
55464	12910†

MEMORY

CIRCUIT TYPE	JAN /NO.
2114	23802
2114A	23804
2147	23801
2147H	23803
2147H-2	23807

MEMORY

CIRCUIT TYPE	JAN /NO.
2147H-3	23805
2516	22101†
2532	22202†
2708	22001
2716	22101
4060▲	23501
4060 *	23503
4050▲	23502
4050 *	23504
4116 * *	24001
4116	24002

MICROPROCESSOR

CIRCUIT TYPE	JAN /NO.
9900A	46001
9989	46501†

JAN INTEGRATED CIRCUITS AND GENERIC TYPE CROSS REFERENCE†††

JAN /NO.	CIRCUIT TYPE
00101	**5430**
00102	**5420**
00103	**5410**
00104	**5400**
00105	**5404**
00106	**5412**
00107	**5401**
00108	**5405**
00109	**5403**
00201	**5472**
00202	**5473**
00203	**54107**
00204	**5476**
00205	**5474**
00206	**5470**
00207	5479
00301	5440
00302	5437
00303	5438
00401	5402
00402	**5423**
00403	**5425**
00404	**5427**
00501	**5450**
00502	**5451**
00503	**5453**
00504	**5454**
00601	5482
00602	**5483**
00603	9304

JAN /NO.	CIRCUIT TYPE
00604	5480
00701	**5486**
00801	**5406**
00802	**5416**
00803	**5407**
00804	**5417**
00805	5426
00901	5495
00902	5496
00903	54164
00904	54165
00905	54194
00906	54195
00907†	9300
00908†	9328
00909†	54198
00910†	54166
01001	5442
01002	5443
01003	5444
01004	5445
01005	54145
01006	5446
01007	5447
01008	5448
01009	5449
01101	54181
01102	54182
01201	54121
01202	54122

JAN /NO.	CIRCUIT TYPE
01203	54123
01204	9601
01205	9602
01301	5492
01302	5493
01303	54160
01304	54163
01305	54162
01306	54161
01307	5490
01308	54192
01309	54193
01310†	54196
01311†	54197
01312†	54177
01401	54150
01402	9312
01403	54153
01404	9309
01405	54157
01406	54151
01501	5475
01502	5477
01503	54116
01504	9314
01601	5408
01602	5409
01701	54174
01702	54175
01703†	54173

JAN /NO.	CIRCUIT TYPE
01801	54170
01901	54180
02001	54L30
02002	54L20
02003	54L10
02004	54L00
02005	54L04
02006#	54L03
02006⊗	54L01
02101	54L71
02102	54L72
02103	54L73
02104	54L78
02105	54L74
02201	54H72
02202	54H73
02203	54H74
02204	**54H76**
02205	54H101
02206	54H103
02301	**54H30**
02302	**54H20**
02303	**54H10**
02304	**54H00**
02305	**54H04**
02306	**54H01**
02307	54H22
02401	**54H40**
02501	54L90
02502	54L93

JAN /NO.	CIRCUIT TYPE
02503	54L193
02504	93L10
02505	93L16
02601	54L86
02701	54L02
02801	54L95
02802	54L164
02803	93L28
02804	93L00
02805	76L70
02806	54L91
02901	54L42
02902	54L43
02903	54L44
02904	54L46
02905	54L47
02906	76L42A
02907	93L01
03001	15930
03002	15935
03003	15936
03004	15946
03005	15962
03101	15932
03102	15944
03103	15957
03104	15958
03105	15933
03201	15951
03301	15945

†††BOLDFACE TYPE INDICATES PART IS TI QUALIFIED

NOTE: Only the basic JAN and commercial numbers are shown.
†Slash sheets not released as of date of this publication.
‡Not recommended for new designs

⊗Flat pack only
#DIP only

▲Max 85°C
* Max 100°C
* * Faster access time

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

JAN INTEGRATED CIRCUITS AND GENERIC TYPE CROSS REFERENCE†††

JAN /NO.	CIRCUIT TYPE
03302	15948
03303	15950
03304	9093
03501	MH0026
04001	54H50
04002	54H51
04003	54H53
04004	54H54
04005	54H55
04101	54L51
04102	54L54
04103	54L55
04104	54L54
04201	54L121
04202	54L122
04301	93L18
04401	93L24
04501	93L14
04502	93L08
04601	93L09
04602	93L12
04603	93L22
05001	4011A
05002	4012A
05003	4023A
05051	4011B
05052	4012B
05053	4023B
05101	4013A
05102	4027A
05103	4043A
05151	4013B
05152	4027B
05153	4043B
05154†	4050B
05155†	4041UB
05201	4000A
05202	4001A
05203	4002A
05204	4025A
05251	4000B
05252	4001B
05253	4002B
05254	4025B
05301	4007A
05302	4019A
05303	4030A
05304	4048A
05351	4007UB
05352	4019B
05353	4030B
05354	4048B
05401	4008A
05451	4008B
05501	4009A
05502	4010A
05503	4049A
05504	4050A
05505	4041A
05551†	4009B
05552†	4010B
05553†	4049B
05554†	4050B
05555†	4041UB
05601	4017A
05602	4018A
05603	4020A
05604	4022A
05605	4024A
05651†	4017B

JAN /NO.	CIRCUIT TYPE
05652†	4018B
05653†	4020B
05654†	4022B
05655†	4024B
05701	4006A
05702	4014A
05703	4015A
05704	4021A
05705	4031A
05706	4034A
05751	4006B
05752	4014B
05753	4015B
05754	4021B
05755	4031B
05756	4034B
05801	4016A
05802	4066A
05851	4016B
05852	4066B
05901	4028A
05951	4028B
06001	10501
06002	10502
06003	10505
06004	10506
06005	10507
06006	10509
06101	10531
06102	10631
06103	10576
06104	10535
06201	10504
06202	10597
06301	10524
06302	10525
07001	**54S00**
07002	**54S03**
07003	**54S04**
07004	**54S05**
07005	**54S10**
07006	**54S20**
07007	**54S22**
07008	**54S30**
07009	54S133
07010	54S134
07101	54S74
07102	54S112
07103	54S113
07104	54S114
07105	54S174
07106	54S175
07201	54S40
07301	54S02
07401	54S51
07402	54S64
07403	54S65
07501	54S86
07502	54S135
07601	54S194
07602	54S195
07701	54S138
07702	54S139
07703†	54S280
07801	54S181
07802	54S182
07901	54S151
07902	54S153
07903	54S157
07904	54S158

JAN /NO.	CIRCUIT TYPE
07905	54S51
07906	54S57
07907	54S258
07908	54S253
08001	54S11
08002	54S15
08003	54S08
08004	54S09
08101	54S140
08201	54S85
10101	μA741
10102	μA747
10103	LM101A
10104	LM108A
10105	LH201A
10106	LH2108A
10107	LM118
10108	1558,7558
10201	μA723
10202†	LM104
10203†	LM105
10301	μA710
10302	μA711
10303	LM106
10304	LM111
10305	LH2111
10401	**55107**
10402	**55108**
10403	**55114**
10404	**55115**
10405	**55113**
10406	7831
10407	7832
10408†	55182,7820
10409†	55183,7830
10501	5040
10502	5041
10503	5042
10504	5043
10505	5044
10506	5045
10507	5046
10508	5047
10601	LM102
10602	LM110
10603	LH2110
10701	LM109
10702	LM141H-05
10703	LM141H-12
10704	LM141H-15
10705	LM141H-24
10706	LM140K-05
10707	LM140K-12
10708	LM140K-15
10709	LM140K-24
10801	3018A
10802	3045
10901	SE555
10902	SE556
10903	SE555(60mA)
11001	LM148
11002	LM149
11003	4741,4156
11004	RM4136
11005	LM124
11101	DG181A
11102	DG182A
11103	DG184A
11104	DG185A
11105	DG187A

JAN /NO.	CIRCUIT TYPE
11106	DG188A
11107	DG190A
11108	DG191A
11201	LM139
11202	LM193
11301	DAC-08
11302	DAC-08A
11401	LF155
11402	LF156
11403	LF157
11404	LF155A
11405	LF156A
11406	LF157A
11501	LM120H-05
11502	LM120H-12
11503	LM120H-15
11504	LM120H-24
11505	LM120K-05
11506	LM120K-12
11507	LM120K-15
11508	LM120K-24
11601	DG300
11602	DG301
11603	DG302
11604	DG303
11605	DG304
11606	DG305
11607	DG306
11608	DG307
11701	78MG
11702	78G
11703	LM117H
11704	LM117K
11705†	LM138K
11706†	LM138K
11801	79MG
11802	79G
11803	LM137H
11804	LM137K
11901	TL061
11902	TL062
11903	TL064
11904	TL071
11905	TL072
11906	TL074
12101†	562(2MA)
12102†	562(5MA)
12103†	563
12201	HA2700
12202	HA2600
12203	HA2620
12204	HA2500
12205	HA2510
12206	HA2520
12301	HI200
12302	HI201
12303	DG200
12304	DG201
12401	LM199A
12402	LM129A
12501	LF198
12502	SE5537
12601	SG1524
12701†	7523
12702†	7520
12703†	7521
12704†	7541
12705†	DAC1020
12706†	DAC1220
12707†	DAC1218

JAN /NO.	CIRCUIT TYPE
12801†	584S
12802†	584T
12901	55450
12902	55451
12903	55452
12904	55453
12905	55454
12906	55460
12907	55461
12908	55462
12909	55463
12910	55464
13001	55325
13002	55326
13003	55327
13301†	55561
15001	5485
15002	9324
15101	5413
15102	5414
15103	54132
15201	54154
15202	54155
15203	54156
15204	8250
15205	8251
15206	8252,9301
15301	54125
15302	54126
15401†	54120
15501	54H08
15502	54H11
15503	54H21
15504⊗	54H08
15601	54147
15602	54148
15603	9318
15701	9338
15801	9321
15802	9317
15901	9300
15902	9328
16001	9334
16101	5432
16201	5428
16301	54365
16302	54366
16303	54367
16304	54368
17001	4081B
17002	4082B
17003	4073B
17101	4071B
17102	4072B
17103	4075B
17201	4085B
17202	4086B
17203	4070B
17204	4077B
17301	4514B
17302	4515B
17303	4532B
17304	4555B
17305	4556B
17401	4069B
17402	40107B
17403	4502B
17404	40109B
17501	4076B
17502	4095B

†††BOLDFACE TYPE INDICATES PART IS TI QUALIFIED

NOTE: Only the basic JAN and commercial numbers are shown.
†Slash sheets not released as of date of this publication.
‡Not recommended for new designs

⊗Flat pack only
#DIP only

▲Max 85°C
* Max 100°C
* * Faster access time

© IC MASTER 1983

TEXAS INSTRUMENTS MILITARY PRODUCTS

JAN INTEGRATED CIRCUITS AND GENERIC TYPE CROSS REFERENCE†††

JAN /NO.	CIRCUIT TYPE
17503	4096B
17504	4098B
17505	40174B
17601	4099B
17602	4508B
17701	4093B
17702	40106B
17801	4067B
17802	4097B
17803	40257B
17901†	4094B
17902†	40100B
17903†	40104B
17904†	40105B
17905†	40108B
17906†	40194B
17907†	40208B
18001†	40160B
18002†	40161B
18003†	40162B
18004†	40163B
18101†	40102B
18102†	40103B
18103†	40192B
18104†	40193B
18105†	4510B
18106†	4516B
18107†	4518B
18108†	4520B
19001	506
19002	506A
19003	507
19004	507A
19005	508A
19006	509A
19007†	508.6108
19008†	509.6208
2010	54186
20102	5304
20201	5603A
20202	5623
20301	82S126
20302	82S129
20401	82S130
20402	82S131
20501†	7620-8
20502†	7621-8
20601	82S136
20602	82S137
20603	7644
20701	82S23
20702	82S123
20801	82S140
20802	82S141
20803	82S115
20804	5348-1
20805	5349-1
20901	82S184
20902	82S185
20903	82S180
20904	82S181
20905	82S2708
20906	93460
21001	82S190
21002	82S191
21901	6654
22001	2708
22101	2516.2716
22201†	2732
22202†	2532

JAN /NO.	CIRCUIT TYPE
22501†	ER2810
23001	93410
23002	93421
23003	93411
23004	93L420
23101	93415
23102	93425
23103	93L415
23104	93L425
23105	93415
23106	93425
23107	82S10
23108	82S11
23109	93412
23110	93422
23111	93L412
23112	93L422
23201	93419
23301	93470
23302	93471
23501	4060▲
23502	4050▲
23503	4060 *
23504	4050 *
23505	5280.7280▲
23506	5280.7280 *
23601	6605▲
23602	6604A▲
23603	6605 *
23604	6604A *
23701	9130▲ * *
23702	9130▲
23703	9130 * * *
23704	9130 *
23705	91L30▲ * *
23706	91L30▲
23707	91L30 * * *
23708	91L30 *
23709	9140▲ * *
23710	9410▲
23711	9140 * * *
23712	9140 *
23713	91L40▲ * *
23714	91L40▲
23715	91L40 * * *
23716	91L40 *
23801	2147
23802	2114
23803	2147H
23804	2114A
23805	2147H-3
23806	2148H
23807	2147H-2
23901	6508.54C929
23902	6518.54C930
24001	4116* *
24002	4116
24501†	6504
24502†	6514
26001†	AM27S07A
26002†	AM27S03A
26003†	AM27S07
26004†	AM27S03
30001	**54LS00**
30002	**54LS03**
30003	**54LS04**
30004	**54LS05**
30005	**54LS10**
30006	**54LS12**
30007	**54LS20**

JAN /NO.	CIRCUIT TYPE
30008	**54LS22**
30009	**54LS30**
30101	**54LS73A**
30102	**54LS74A**
30103	**54LS112A**
30104	**54LS113A**
30105	**54LS114A**
30106	**54LS174**
30107	**54LS175**
30108	**54LS107A**
30109	**54LS109A**
30110	**54LS76A**
30201	**54LS40**
30202	**54LS37**
30203	**54LS38**
30204	54LS28
30301	**54LS02**
30302	**54LS27**
30303	**54LS266**
30401	**54LS51**
30402	**54LS54**
30501	**54LS32**
30502	**54LS86**
30601	**54LS194A**
30602	**54LS195A**
30603	**54LS95B**
30604	**54LS96**
30605	**54LS164**
30606	**54LS295B**
30607	**54LS395A**
30608	**54LS165**
30609	**54LS166**
30701	**54LS138**
30702	**54LS139**
30703	**54L42**
30704	**54LS47**
30801	54LS181
30901	**54LS151**
30902	**54LS153**
30903	**54LS157**
30904	**54LS158**
30905	**54LS251**
30906	**54LS257A**
30907	**54LS258A**
30908	54LS253
30909	54LS298
31001	**54LS11**
31002	**54LS15**
31003	**54LS21**
31004	**54LS08**
31005	54LS09
31101	**54LS85**
31201	**54LS83A**
31202	**54LS283**
31301	**54LS13**
31302	**54LS14**
31303	**54LS132**
31401	**54LS123**
31402	**54LS221**
31403	**54LS122**
31501	**54LS90**
31502	**54LS93**
31503	**54LS160A**
31504	**54LS161A**
31505	54LS168
31506	54LS169
31507	**54LS192**
31508	**54LS193**
31509	**54LS191**
31510	**54LS92**

JAN /NO.	CIRCUIT TYPE
31511	**54LS162A**
31512	**54LS163A**
31513	**54LS190**
31601	**54LS75**
31602	**54LS279**
31603	**54LS259**
31604	**54LS375**
31701†	54LS124
31702†	54LS324
31703†	54LS629
31704†	54LS624
31801	54LS261
31901	54LS670
31902	54LS170
32001	54LS196
32002	54LS197
32003	**54LS290**
32004	**54LS293**
32102	**54LS26**
32201	**54LS365A**
32202	**54LS366A**
32203	**54LS367A**
32204	**54LS368A**
32301	**54LS125A**
32302	**54LS126A**
32401	**54LS240**
32402	**54LS241**
32403	**54LS244**
32501	**54LS273**
32502	**54LS373**
32503	**54LS374**
32504	**54LS377**
32505†	54LS363
32601	**54LS155**
32602	**54LS156**
32701	**54LS390**
32702	**54LS393**
32703	**54LS490**
32801	**54LS242**
32802	**54LS243**
32803	**54LS245**
32804†	54LS640
32805†	54LS641
32806†	54LS642
32807†	54LS645
32901	**54LS280**
33001	54F00
33002	54F04
33003	54F10
33004	54F20
33106	**25LS174**
33107	25LS175
33301	54F02
33401	54F64
33501	54F32
34001	54F08
34002	54F11
34101†	54F074
34102†	54F109
34103†	54F112
34104†	54F175
34105†	54F374
34106†	54F534
36001	**54LS148**
36002	**54LS348**
40001	6800
40101†	MC6821
40201†	6810
40301†	68316B
40302†	6831B

JAN /NO.	CIRCUIT TYPE
42001	8080A
42101	54S412
42201	54LS424
42301	54S428
44001	2901A
44101	54LS905
44102	54LS906
44103	54LS907
44104	54LS915
44105	54LS916
44106	54LS917
44201	2918
44301†	2909
44401†	2914
44501†	2910
46001	**9900**
46501†	9989
47001	1802D
47101	1821
47102	1822
47201†	1832
47301	1852
47401	1853
47601	1856
47602	1857
48001	Z80A
48002	Z80
48003	Z80B
48101†	Z80AS10 2
48102†	Z80S10 2
48201†	Z80A DMA
48202†	Z80 DMA
49001†	8048
49002†	8035L
50001	TDC1008JM
50002	TDC1009JM
50003	TDC1010JM
50004	MPY-8HJM
50005	MPY-12HJM
50006	MPY-16HJM
50007†	MPY-24HJM
50101†	HD15530
50201	82S101
50202	82S100
50301†	PAL10H8
50302†	PAL12H6
50303†	PAL14H4
50304†	PAL16H2
50305†	PAL16C1
50306†	PAL10L8
50307†	PAL12L6
50308†	PAL14L4
50309†	PAL16L2
52001	Z8001
52002	Z8002
52003	Z8001A
52004	Z8002A
53001	8086

†††BOLDFACE TYPE INDICATES PART IS TI QUALIFIED

NOTE: Only the basic JAN and commercial numbers are shown.
†Slash sheets not released as of date of this publication.
‡Not recommended for new designs

⊗Flat pack only
#DIP only

▲Max 85°C
* Max 100°C
* * Faster access time

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

ADVANCED LOW POWER SCHOTTKY TTL

54ALS00A	Quadruple 2-Input NAND Gates
54ALS02	Quadruple 2-Input NOR Gates
54ALS03A	Quadruple 2-Input NAND Gates with O/C Output
54ALS04	HEX Inverter
54ALS05	HEX Inverter With O/C Output
54ALS08	Quadruple 2-Input And Gate
54ALS09	Quadruple 2-Input And Gate With O/C Output
54ALS10	Triple 3-Input NAND Gates
54ALS11	Triple 3-Input AND Gates
54ALS12	Triple 3-Input NAND Gates with O/C Output
54ALS15	Triple 3-Input AND Gates With O/C Output
54ALS20A	Dual 4-Input NAND Gates
54ALS21	Dual 4-Input AND Gates
54ALS22A	Dual 4-Input NAND Gates With O/C Output
54ALS27	Triple 3-Input NOR Gates
54ALS28	Triple 3-Input NOR Buffers
54ALS30	8-Input NAND Gates

54ALS32	Quadruple 2-Input OR Gates
54ALS33	Quadruple 2-Input NOR Buffers With O/C Output
54ALS37	Quadruple 2-Input NAND Buffers
54ALS38	Quadruple 2-Input NAND Buffers with O/C Output
54ALS74	Dual D-Type Flip-Flop With PRESET And CLEAR
54ALS109	Dual J-K Flip-Flop (Positive Edge Triggered)
54ALS112A	Dual J-K Flip-Flop (Negative Edge Triggered)
54ALS114A	Dual J-K Flip-Flop
54ALS240	Octal Buffers/Line Drivers/Line Receivers
54ALS241	Octal Buffers/Line Drivers/Line Receivers
54ALS244	Octal Buffers/Line Drivers/Line Receivers
54ALS245	Octal Bus Tranceivers
54ALS573	Octal D-Type Transparent Latches
54ALS574	Octal D-Type Edge-Triggered Flip-Flops
54ALS576	Octal D-Type Flip-Flop With Inverted Outputs
54ALS580	Octal D-Type Latches With Inverted Outputs
54ALS874	Dual 4-Bit D-Type Flip-Flop

LOGIC PRODUCT SPECTRUM CROSS REFERENCE AND NOMENCLATURE

LOGIC PRODUCT SPECTRUM*

TTL FAMILY	DUAL-IN-LINE (J)	FLAT-PACK (W)	CHIP CARRIER (FH)	CHIP CARRIER (FK)
54	X	X		
54H	X	X		
54L	X	X		
54LS	X	X	X	X
54S	X	X	X	X
54ALS	X		X	X
54AS	X		X	X

*SNJ Processing Level

LOGIC CROSS REFERENCE GUIDE

MANUFACTURER	PREFIX	DUAL-IN-LINE	FLAT PACK
TI	SNJ XXXX	J	W
Motorola	54XXBXBJC	L	F
National	DM XXXX	J 883B	W 883B
Signetics	S XXXX	F 883B	W 883B
Fairchild	XXXX	DMOB	FMQB
AMD	SN XXXX	DMB	FMB

LOGIC NOMENCLATURE

EXAMPLE: SNJ 54LS00 FH

1. PREFIX
Must contain three or four letters

SNJ—MIL-STD-883B, JEDEC Standard 101
JANB—JM 38510/JANB Qualified*

2. CIRCUIT DESIGNATOR
Must contain four to nine digits

54—Standard TTL Circuits
54H—High Speed TTL
54L—Low-Power TTL
54LS—Low-Power Schottky TTL
54S—Schottky TTL
54ALS—Advanced Low-power Schottky TTL
54AS—Advanced Schottky TTL

3. PACKAGE TYPE
Must contain one or two letters

J, W, FH, FK

***Where devices are qualified under military specification MIL-M-38510**

© IC MASTER 1983

TEXAS INSTRUMENTS MILITARY PRODUCTS

LOGIC ARRAY PRODUCT SELECTION GUIDE/PACKAGE

LOGIC ARRAY PRODUCT SELECTION GUIDE

DEVICE TECHNOLOGY	GATE SIZE (μm)	USABLE GATES	SPEED POWER	AUTO ROUTE
TAT004/STL	4.5	400	2.5ns 600μW	Yes
TAT008/STL	4.5	800	2.5ns 600μW	Yes
TAT010/STL	2	1000	1ns/300μW	Yes
TAT020/STL†	2	2000	1ns/300μW	Yes
STL700/STL	4.5	560	3ns/300μW	Yes
SBP96600/I²L	4.5	2120	15ns/100μW	No
SBP96700/I²L†	4.5	1120	15ns/100μW	No
DMDD5000/I²L†	2	4000	7ns/50μW	No

†Future Product

Note: Contact the factory for ordering information.

LOGIC ARRAY PACKAGING*

DEVICE	40 PIN DIP	64 PIN FLAT PACK	LCCC		PIN GRID ARRAY		
			68 PAD	84 PAD	84 PIN	108 PIN	132 PIN
TAT004	X	X	X				
TAT008	X	X	X				
TAT010	X		X	X	X	X	
TAT020†				X	X	X	X
STL700	X	X	X				
SBP96600†	X		X	X		X	X
SBP96700†	X		X	X		X	X
DMDD5000†				X		X	X

*1. Based on Custom Circuit Design I/O
2. Package options subject to change at TI discretion.

†Future projections

LINEAR/INTERFACE PRODUCT SELECTION GUIDE

DEVICE	PACKAGE	FUNCTION DESCRIPTION
JANB55107	J	Dual Line Receiver
JANB55108	J	Dual Line Receiver
JANB55113	J	Dual Line Driver
JANB55114	J	Dual Line Driver
JANB55115	J	Dual Line Receiver
SN55107A	J,W,FH	Dual Line Receiver
SN55107B	J,W,FH	Dual Line Receiver
SN55108A	J,W,FH	Dual Line Receiver
SN55108B	J,FH	Dual Line Receiver
SN55109A	J,W,FH	Dual Line Driver
SN55110A	J,W,FH	Dual Line Driver
SN55113	J,W,FH	Dual Line Driver
SN55114	J,W,FH	Dual Line Driver
SN55115	J,W,FH	Dual Line Receiver
SN55116	J,FH	Line Transceiver
SN55117	JG,FH	Line Transceiver
SN55118	J,FH	Dual Transceiver
SN55119	JG,FH	Line Transceiver
SN55120	W,FH	Dual Input Amp
SN55121	J,W,FH	Dual Line Driver
SN55122	J,W,FH	Triple Line Receiver
SN55138	J,W,FH	Quad Bus Transceiver
SN55140	JG,FH	Dual Line Receiver
SN55141	JG,FH	Dual Line Receiver
SN55142A	J,FH	Dual Line Receiver
SN55143A	J,FH	Dual Line Receiver
SN55150	JG,FH	Dual Line Driver
SN55152	J,FH	Line Receiver
SN55154	J,FH	Quad Line Receiver
SN55157	JG	Dual Line Receiver
SN55173	J,FH	Line Receiver
SN55180	J,FH	Dual TTL-MOS Driver
SN55182	J,W,FH	Dual Line Receiver
SN55183	J,W,FH	Dual Line Driver
SN55188	J,FH	Quad Line Driver
SN55189	J,FH	Quad Line Receiver
SN55189A	J,FH	Quad Line Receiver
SN55234	J,W	Dual Sense Amp
SN55236	WC,FH	Dual Sense Amp
SN55325	J,W,FH	Core Driver
SN55326	J,W,FH	Core Driver
SN55327	J,W,FH	Core Driver
SN55355	J,W,FH	Quad TTL-MOS Driver
SN55363	J,FH	Dual TTL-MOS Driver
SN55365	J,FH	Quad TTL-MOS Driver
SN55369	J,FH	Dual MOS Driver
SN55426B	J,FH	Display Driver
SN55427B	J,FH	Display Driver
SN55446	JG,FH	Peripheral Driver
SN55450B	J,FH	Peripheral Driver
SN55451B	JG,U,FH	Peripheral Driver
SN55452B	JG,U,FH	Peripheral Driver
SN55453B	JG,U,FH	Peripheral Driver
SN55454B	JG,U,FH	Peripheral Driver
SN55461	JG,FH	Peripheral Driver
SN55462	JG,FH	Peripheral Driver
SN55463	JG,FH	Peripheral Driver
SN55464	JG,FH	Peripheral Driver
SN55471	JG,FH	Peripheral Driver
SN55472	JG,FH	Peripheral Driver
SN55473	JG,FH	Peripheral Driver
SN55474	JG,FH	Peripheral Driver
μA78M05M	JG,FH	+5V Volt. Reg.
μA78M06M	JG,FH	+6V Volt. Reg.
μA78M08M	JG,FH	+8V Volt. Reg.
μA78M12M	JG,FH	+12V Volt. Reg.
μA78M15M	JG,FH	+15V. Volt. Reg.
μA79M05M	JG,FH	−5V Volt. Reg.
μA79M06M	JG,FH	−6V Volt. Reg.
μA79M08M	JG,FH	−8V Volt. Reg.
μA79M12M	JG,FH	−12V Volt. Reg.
μA79M15M	JG,FH	−15V Volt. Reg.
μA9637AM	JG,FH	Dual Line Receiver
μA9638M	JG,FH	Dual Line Driver
AM26S10M	J	Quad Bus Transceiver

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

LINEAR/INTERFACE PRODUCT SELECTION GUIDE

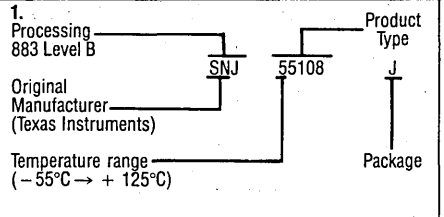
DEVICE	PACKAGE	FUNCTION DESCRIPTION
AM26S11M	J	Quad Bus Transceiver
AM26LS32AM	J,W,FH	Quad Line Receiver
AM26LS33AM	J,W,FH	Quad Line Receiver
ULN2001A	J,W,FH	Transistor Array
ULN2002A	J,W,FH	Transistor Array
ULN2003A	J,W,FH	Transistor Array
ULN2004A	J,W,FH	Transistor Array
TL022M	JG,FH	Dual Lo Pwr Op Amp
TL044M	J,FH	Quad Lo Pwr Op Amp
TL061M	JG,U,FH	Single Bifet Op Amp
TL062M	JG,U,FH	Dual Bifet Op Amp
TL064M	J,W,FH	Quad Bifet Op Amp
TL071M	JG,U,FH	Single Bifet Op Amp
TL072M	JG,U,FH	Dual Bifet Op Amp
TL074M	J,W,FH	Quad Bifet Op Amp
TL081M	JG,U,FH	Single Bifet Op Amp
TL082M	JG,U,FH	Dual Bifet Op Amp
TL084M	J,W,FH	Quad Bifet Op Amp
TL088M	JG,FH	JFET Input Op Amp
TL092M	JG	Dual JFET Op Amp
TL094M	J,FH	Quad JFET Op Amp
TL288M	JG,U,FH	Input Op Amp
TL331M	JG,FH	Comparator
TL430M	JG	ADJ Shunt Regulator
TL431M	JG,FH	Log Amp
TL441M	J,FH	Log Amp
TL494M	J,FH	PWM Regulator
TL497AM	J,FH	Switching Regulator
TL506M	J,W,FH	Dual Comparator
TL514M	J,W,FH	Dual Comparator
TL601M	JG,FH	Analog Switch
TL604M	JG,FH	Analog Switch
TL607M	JG,FH	Analog Switch
TL610M	JG,FH	Analog Switch
TL710M	J,JG,U,FH	Comparator

DEVICE	PACKAGE	FUNCTION DESCRIPTION
TL811M	J,U,FH	Dual Comparator
TL820M	J,FH	Dual Comparator
LM101A	J,JG,U,FH	Op Amp
LM106	J,JG,FH	Comparator
LM107	J,JG,U,FH	Op Amp
LM111	J,JG,U,FH	Comparator
LM124	J,W,FH	Quad Op Amp
LM124A	J	Quad Op Amp
LM139	J,W,FH	Quad Comparator
LM139A	J,W,FH	Quad Comparator
LM148	J,W,FH	Quad μA741 Op Amp
LM158	JG,U,FH	Dual Op Amp
LM193	JG,U,FH	Dual Comparator
μA702	J,U,FH	Op Amp
μA709M	J,JG,U,FH	Op Amp
μA709AM	J,JG,U,FH	Op Amp
μA710M	J,JG,U,FH	Comparator
μA711M	J,U,FH	Dual Comparator
μA723M	J,U,FH	Voltage Regulator
μA733M	J,U,FH	Video Amp
μA741M	J,JG,W,FH	Op Amp
μA747M	J,JG,W,FH	Dual Op Amp
μA748M	J,JG,W,FH	Op Amp
SG1524	J,FH	Voltage Regulator
MC1545	J,W,FH	Video Amp
MC1558	JG,FH	Dual Op Amp
MC3503	J,FH	Quad Lo Pwr Op Amp
RM4136	J,W,FH	Quad Op Amp
RM4558	JG,FH	Dual Op Amp
DS7831	J,W,FH	Quad Transceiver
DS7832	J,W,FH	Quad Transceiver
SE555	JG,FH	Timer
SE556	J,FH	Dual Timer
SE5534	JG,FH	Hi Gain Op Amp

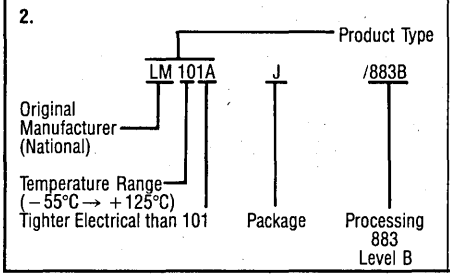
LINEAR/INTERFACE CROSS REFERENCE GUIDE

Examples:

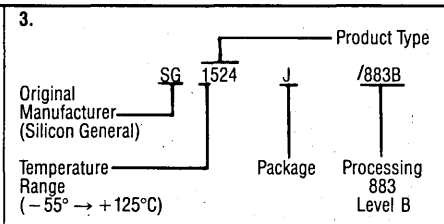
1.



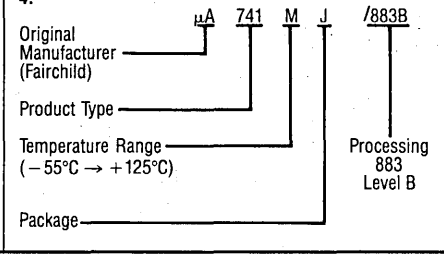
2.



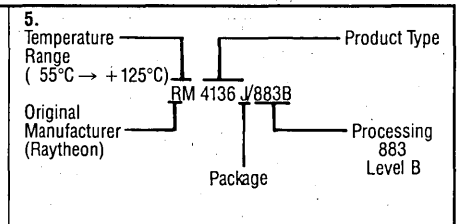
3.



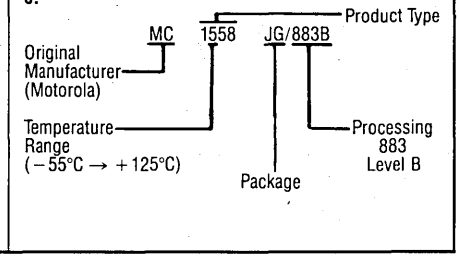
4.



5.



6.



© IC MASTER 1983

TEXAS INSTRUMENTS MILITARY PRODUCTS

LINEAR/INTERFACE NOMENCLATURE/BIPOLAR MEMORY SELECTION GUIDE

LINEAR/INTERFACE NOMENCLATURE

The nomenclature used in linear IC designation is both varied and informative. Part numbers indicate the following:

- Product type
- Original manufacturer
- Temperature range
- Package type
- Screening and lot conformance

EXAMPLE TL 022M JG /883B

1. PREFIX

Must contain two, three or four letters

TL	TI Linear Control Products
SNJ	MIL-STD-883 Method 5004 Level B
JANB	JM 38510 JANB qualified*

Standard prefixes per original vendor

DS,LF or LM	National	MC	Motorola
NE, SE	Signetics	SG	Silicon General
RC,RM	Raytheon	μA	Fairchild

2. CIRCUIT DESIGNATOR INCLUDING TEMPERATURE RANGE

Must contain three to seven characters
(From individual data sheets)
Examples 022M 1524
101A 55450B
107 78M05M

3. MIL STD 883B METHOD 5004, CLASS B

Not used with part numbers having an SN prefix

4. PACKAGE

Must contain one or two letters
J, JG, U, W, WC, RA, FH, FK
(From pin connection diagram on individual data sheet)

*Where devices are qualified under military specification MIL-M-38510

BIPOLAR MEMORY PRODUCT SELECTION GUIDE

PROMS

DEVICE	TEMP.	SPEED (ns) TYP./MAX $t_{a(A)}$*	ORGANIZATION	PACKAGE TYPE C-DIP	PACKAGE TYPE CHIP CARRIER
18S030	−55/125°C	25/50	32 × 8	16 Pin (J)	20 Pad (FH,FK)
18SA030	−55/125°C	25/50	32 × 8	16 Pin (J)	20 Pad (FH,FK)
24S10	−55/125°C	35/75	256 × 4	16 Pin (J)	20 pad (FH,FK)
24SA10	−55/125°C	35/75	256 × 4	16 Pin (J)	20 Pad (FH,FK)
28L22	−55/125°C	45/75	256 × 8	20 Pin (J)	28 Pad (FH,FK)
24S41	−55/125°C	40/75	1K × 4	18 Pin (J)	28 Pad (FH,FK)
28S42	−55/125°C	35/70	512 × 8	20 Pin (J)	28 Pad (FH,FK)
28L42	−55/125°C	55/110	512 × 8	20 Pin (J)	28 Pad (FH,FK)
28S46	−55/125°C	35/70	512 × 8	24 Pin (J)	28 Pad (FH,FK)
28R46†	−55/125°C	20* *	512 × 8	24 Pin (J)	28 Pad (FH,FK)
24S81	−55/125°C	45/85	2K × 4	18 Pin (J)	32 Pad (FE)
28S86A	−55/125°C	35/80	1K × 8	24 Pin (J)	32 Pad (FE)
28L86A	−55/125°C	85/175	1K × 8	24 Pin (J)	32 Pad (FE)
28R86†	−55/125°C	* *	1K × 8	24 Pin (J)	32 Pad (FE)
28S166†	−55/125°C	35/—	2K × 8	24 Pin (J)	32 Pad (FE)
28L166†	−55/125°C	65/—	2K × 8	24 Pin (J)	32 Pad (FE)
28R166†	−55/125°C	20* *	2K × 8	24 Pin (J)	32 Pad (FE)

†Future product
*$t_{a(A)}$ Access time from address
* *$t_{a(C)}$ Access time from clock

RAMS

DEVICE	TEMP.	SPEED (ns) TYP./MAX $t_{a(A)}$*	ORGANIZATION	PACKAGE TYPE C-DIP	PACKAGE TYPE CHIP CARRIER
54LS189A	−55/125°C	50/90	16 × 4	16 Pin (J)	20 Pad (FH,FK)
54LS289A	−55/125°C	50/90	16 × 4	16 Pin (J)	20 Pad (FH,FK)
54LS219A	−55/125°C	50/90	16 × 4	16 Pin (J)	20 Pad (FH,FK)
54LS319A	−55/125°C	50/90	16 × 4	16 Pin (J)	20 Pad (FH,FK)
54ALS218†	−55/125°C	40/	32 × 8	16 Pin (J)	20 Pad (FH,FK)
54ALS318†	−55/125°C	40/	32 × 8	16 Pin (J)	20 Pad (FH,FK)
54ALS217†	−55/125°C	40/	64 × 8	16 Pin (J)	20 Pad (FH,FK)
54ALS317†	−55/125°C	40/	64 × 8	16 Pin (J)	20 Pad (FH,FK)

MEMORY SUPPORT FUNCTIONS

DEVICE	TEMP	FUNCTION	PACKAGE TYPE C-DIP	PACKAGE TYPE CHIP CARRIER
54184	−55/125°C	BCD to Binary	16 Pin (J)	20 Pad (FH,FK)
54185A	−55/125°C	Binary to BCD	16 Pin (J)	20 Pad (FH,FK)
54LS601	−55/125°C	Memory Refresh Controller	20 Pin (J)	20 Pad (FH,FK)
54LS603	−55/125°C	Memory Refresh Controller	20 Pin (J)	20 Pad (FH,FK)
54LS630	−55/125°C	Error Detection & Correction	28 Pin (J)	28 Pad (FH,FK)
54LS631	−55/125°C	Error Detection & Correction	28 Pin (J)	28 Pad (FH,FK)

†Future product
*$t_{a(A)}$ Access time from address
* *$t_{a(C)}$ Access time from clock

© IC MASTER 1983

BIPOLAR PROM CROSS REFERENCE AND BIPOLAR MEMORY NOMENCLATURE

BIPOLAR PROM CROSS REFERENCE

ORG	TI	NATIONAL	SIGNETICS	INTEL	MMI	HARRIS	INTERSIL	AMD	FAIRCHILD	RAYTHEON	MOTOROLA
32 × 8	JBP18S030MJ JBP18SA030MJ	DM54S288J DM54S188J	S82S123F S82S23F		5331-1J 5330-1J	HM7603-8 HM7602-8	IM5610MJ IM5600MJ	27S19DMB 27S18DMB			
256 × 4	JBP24S10MJ JBP24SA10MJ	DM54S287J DM54S387J	S82S129F S82S126F	M3621 M3601	5301-1J 5300-1J	HM7611-8 HM7610-8	IM5623MJ IM5603MJ	27S21DMB 27S20DMB	93427DMQB 93417DMQB	29661DMB 29660DMB	
256 × 8	JBP28L22MJ	DM54S471J			5309-1J					29601DMB	
512 × 8	JBP28S42MJ	DM54S472J	S82S147F		5349-1J	HM7649-8		27S29DMB		29621DMB	
512 × 8	JBP28S46MJ	DM54S474J	S825141F	M3624	5341-1J	HM7641-8	IM5625MJ	27531DMB	93448DMQB	29625DMB	MCM7641
1024 × 4	JBP24S41MJ	DM54S573J	S82S137F	M3625	5353-1J	HM7643-8		27S33DMB	93453DMQB	29641DMB	MCM7643
1024 × 8	JBP28S86MJ	DM77S181J	S82S181F	M3628	5381-1J	HM7681-8		27S181DMB	93451DMQB	29631DMB	MCM7681
2048 × 4	JBP24S81MJ	DM77S185J	S82S185F			HM7685-8		27S185DMB		29651DMB	MCM7685
2048 × 8	JBP28S156MJ	DM77S191J	S82S191F	M3636		HM76161-8		27S191DMB	93511DMQB	29681DMB	

Note: This is a functional cross-reference
National, Signetics and MMI use "883B" suffix to indicate military processing to MIL-STD-883B.

BIPOLAR MEMORY NOMENCLATURE

These two digits comprise the series designation

JBP 2 3 S 8 6 M J

PREFIX

JBP—MIL-STD-883B JEDEC Standard 101
JANB—JM 38510/JANB
Qualified, Note 1

GENERIC PROGRAMMING FAMILY

1—Single Level
2—Double Level
3—Oxide Isolated
4—Other

OUTPUT WORD WIDTH

4 OR 8

OUTPUT TYPE

S = Standard Three-State
L = Low-Power Three-State
P = Power-Down Three-State
R = Registered Three-State
D = Power-Down and Registered Three-State
T = Latched Three-State
SA = Standard Open-Collector
LA = Low-Power Open-Collector
PA = Power-Down Open-Collector
RA = Registered Open-Collector
DA = Power-Down and Registered Open-Collector
TA = Latched Open-Collector

BIT COMPLEXITY

03 = 256 Bits
1 = 1,024 Bits
2 = 2,048 Bits
4 = 4,096 Bits
8 = 8,192 Bits
16 = 16,384 Bits
32 = 32,768 Bits

PACKAGE SIZE‡

No. of Pins	Row Spacing Inches (Millimeters) 0.300 (7,62)	0.400 (10,16)	0.600 (15,24)
16	0	—	—
18	1	—	—
20	2	—	—
22	3	4	—
24	5	—	6
28	—	—	7
40	—	—	8

‡Package-size designation is not applicable with chip carrier (PH,FK,or FE), and should be replaced with the letter X for this package type.

TEMPERATURE RANGE

No Designator = 0°C to 70°C
E = −40°C to 85°C
M = −55°C to 125°C

PACKAGE TYPE

J = Ceramic Dual-in-Line
FH/FK/FE = Ceramic Chip Carrier

Note 1: Where devices are qualified under Military specification MIL-M-38510

© IC MASTER 1983

TEXAS INSTRUMENTS MILITARY PRODUCTS

MOS MEMORY PRODUCTS SELECTION GUIDE AND NOMENCLATURE

RAMS

DEVICE	TEMP.	MAX. ACCESS TIME (ns)	ORGANIZATION	PACKAGE TYPE C-DIP	PACKAGE TYPE CHIP CARRIER
SRAM					
2114	M,S,E,L	200,250,450	1K × 4	18 Pin (JD)	18 Pad (FG)
4016	M,S,E,L	200,250,450	2K × 8	24 Pin (JD)	32 Pad (FE)
DRAM					
4164	S,E,L	150,200,250	64K × 1	16 Pin (JD)	28/18 Pad (FE/FG)
4416††	M,S,E,L	150,200,250	16K × 4	18 Pin (JD)	28/18 Pad (FE/FG)

EPROMS

DEVICE	TEMP.	MAX. ACCESS TIME (ns)	ORGANIZATION	PACKAGE TYPE C-DIP	PACKAGE TYPE CHIP CARRIER
2516	M,S,E,L	350,450	2K × 8	24 Pin (J)	32 Pad (FE)
2532	M,S,E,L	350,450	4K × 8	24 Pin (J)	32 Pad (FE)
25L32	M,S,E,L	450	4K × 8	24 Pin (J)	32 Pad (FE)
2564	M,S,E,L	450	8K × 8	28 Pin (JD)	32 Pad (FE)
2708	M,S,E,L	350,450	1K × 8	24 Pin (J)	32 Pad (FE)
27L08	M,S,E,L	350,450	1K × 8	24 Pin (J)	32 Pad (FE)

†S temperature range only
††Future product

MOS MEMORY CROSS REFERENCE GUIDE

SMJ XXXX-XXJX	TI
MKB XXXX	MOSTEK
M XXXX B	INTEL
MCM XXXX BXBA	MOTOROLA

MM XXXX XX/883	NATIONAL
XXXX DMB	AMD
XXXX DMQB	FAIRCHILD

MOS MEMORY NOMENCLATURE

EXAMPLE: SMJ 2564 −45 JD M

1. PREFIX
Must contain three letters
SMJ—MIL STD-883B, JEDEC Standard 101

2. CIRCUIT DESIGNATOR
Must contain four or five characters
All standard types have four digits
All low-power versions have five characters
Examples: Standard 32K EPROM-2532
Low-power 32K EPROM-25L32

3. ACCESS TIME
Device types are available with various speeds

4. TEMPERATURE RANGE
Must contain one letter only
M— −55 to 125°C E— −40 to 85°C
S— −55 to 100°C L— 0 to 70°C

5. PACKAGE TYPE
Must contain one or two letters J, JD, FE, FG

MEMORY MODULE

The high speed, 256K-bit, Dynamic Random Access Memory module is fabricated using state-of-the-art SMOS N-channel technology for very high performance combined with low cost and improved reliability. This new technology permits operation from a single +5 volt power supply which reduces system power supply and decoupling requirements making board layout easier.

The module features four 64K DRAMs in Leadless Ceramic Chip Carriers mounted on top of a standard 600-mil, 28 pin dual-in-line substrate package.

MEMORY MODULE NOMENCLATURE

EXAMPLE: SMJ 4 4 4164 −15 S

1. PREFIX
Must contain three letters
SMJ—MIL-STD-883

2. WORD WIDTH
Must contain one digit only
1, 2, 4, 8

3. DEVICES PER UNIT
Must contain one digit only
2, 4, 8

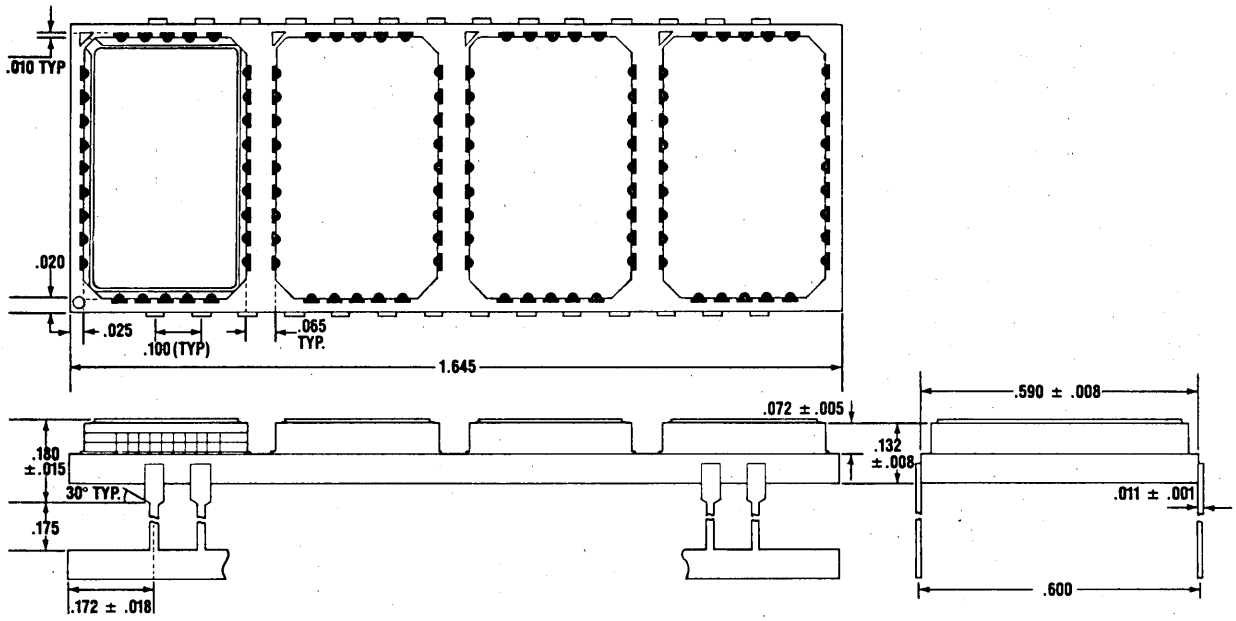
4. TEMPERATURE RANGE
Must contain one letter only
S— −55 to 100°C E— −40 to 85°C
L— 0 to 70°C

5. ACCESS TIME
Device types are available with various speeds

6. CIRCUIT DESIGNATOR
Must contain at least four digits

© IC MASTER 1983

MEMORY MODEL DIMENSIONAL OUTLINE



SBP 9989 MICROPROCESSOR

PRODUCT FEATURES

- 4.4-MHz clock rate, single phase, 50% duty cycle
- Designed-in support for advanced multiprocessor system architecture
- 16 bit data and address bus
- Serial I/O via Communications Register Unit (CRU)
- 16 prioritized hardware interrupts/16 software interrupts
- 9900 Family instruction set including signed multiply (MPY) and signed divide (DIV).
- Direct access to 128K bytes of memory (via new output in MPEN)
- Operation over full MIL-TEMP range (– 55°C to 125°C)
- Radiation tolerance characteristics of I^2L Technology

9989 MICROPROCESSOR NOMENCLATURE

EXAMPLE: SBP 9989 N J

1. PREFIX

Must contain three or four letters
SBP—Military Designator
JAN B—JM38510/JANB Qualified†

2. CIRCUIT DESIGNATOR

Must contain four digits
9989—advanced 4.4MHz 16 bit processor

3. TEMPERATURE RANGE

Must contain one letter only
N— – 55°C to 125°C

4. PACKAGE TYPE

Must contain two letters—J, FK

†Future product

PACKAGES AVAILABLE

PACKAGE TYPE	DESCRIPTION
J, JG	Ceramic Dip
JD	Side Braze Ceramic Dip
W, WC	Ceramic Flat-Pack
U	Ceramic Flat-Pack
FH	Single Layer Square Chip Carrier (JEDEC Pin Out)
FK	Three Layer Square Chip Carrier (JEDEC Pin Out)
FE	Three Layer Rectangular Chip Carrier (28- and 32-Pad)
FG	Three Layer Rectangular Chip Carrier (18- and 20-Pad)

PACKAGE TYPE	DIGITAL	LINEAR INTERFACE	BIPOLAR MEMORY	MOS MEMORY
J	X	X	X	X
JG		X		
JD				X
W	X	X		
WC		X		
U		X		
FH	X	X	X	
FK	X	X	X	
FE			X	X
FG				X

© IC MASTER 1983

INTRODUCTION TO DIGITAL

The Master Selection Guide provides sufficient information for making initial product selections. All devices that appear in this section, both in the initial selection guide and the data pages, are included in all other indexes.

The first two pages of the digital section present performance comparisons of the major digital families. These are followed by lists of the devices in each family arranged into functional groups (arithmetic, buffers/inverters, etc.). The initial selection lists are followed by the device data pages provided by the manufacturers. Page number references to these data pages are given with the initial selection listings.

Some digital circuits—calculator, watch chips, and electronic organ circuits—not included in this section are covered in detail in the Linear-Consumer section. Digital circuits not included in one of the major logic families are listed in the heading Digital-Other Devices.

This section is not complicated by reference to package styles; the package style suffixes are usually deleted. For more information on each companies' suffixes, see the Part Number Guide. Throughout the Master Selection Guide, each full military temperature range (−55°C to 125°C) device is indicated by a dagger (†) before the manufacturer's name. Manufacturers' names are normally spelled out; however, a few are abbreviated and the abbreviations are explained on page 772.

Page Number Index—Digital Devices

	CMOS	ECL 10K	ECL 95K	ECL 100K	ECL III	HNIL/ HTL	TTL
Arithmetic Functions	449	467		470		472	474
Buffers	450	467		470		472	476
Inverters	450	467				472	477
Counters							
Binary	451	467	469	470	470	472	478
Decade	452	467	469			472	480
Miscellaneous	453						482
Decoders	453	467		470		472	482
Drivers	454	467		470		472	484
Flip-Flops							
D-Type	455	467	469	470	471	472	485
J-K	456	467	469			472	487
Gates							
AND	456	467				472	488
NAND	457					472	489
AND-OR	457						492
AND-OR-Invert	457			470		472	492
OR	458	467	469		471	472	493
NOR	458	468	469		471	472	493
OR/NOR		468	469	470	471		494
Exclusive OR/NOR	459	468	470	470	471	473	494
Miscellaneous	459		470			473	495
Latches	459	468	470	470	471	473	495
Memories	460	468		470			496
Multiplexers (Digital)	461	469		470		473	497
Multivibrators	462	469			471	473	500
Oscillators/Dividers	462						
Shift Registers	462	469	470	470	471	473	501
Transceivers, Bus							503
Translators	463	469	470	470		473	505
Miscellaneous	464	469	470	470	471	473	505
Digital-Special							510

Detailed Product Information provided by:

Advanced Micro Devices	601
American Microsystems, Inc.	618
Fairchild	619
Harris Semiconductor	669
LSI Computer	696
Mitel Semiconductor	697
Monolithic Memories, Inc.	715
Motorola Semiconductor	729
National Semiconductor	734
RCA	739
Semi-Process	761
Signetics	773
TRW-LSI Products	812
Texas Instruments	821
Weitek	1036

The manufacturers listed above have provided detailed information on their latest and most significant products.

© IC MASTER 1983

EINFÜHRUNG DIGITAL-SCHALTUNGEN

Der Master Selection Guide für Digitalschaltungen enthält alle Informationen, die Sie für die Erstauswahl Ihres Produkts benötigen. Die Bauteile, die in diesem Abschnitt erscheinen, sowohl im Selection Guide als auch auf den Datenblättern, sind in allen Master Indexes enthalten.

Die ersten beiden Seiten des Digital-Teils beinhalten Leistungs-vergleiche der wichtigsten Digitalfamilien. Daran anschließend finden Sie ein Verzeichnis der Bauteile jeder Familie nach Funktionen (arithmetische Funktionen, Buffers/Inverters usw.). Diesen Listen folgen die Datenblätter der Hersteller. Der Master Selection Guide verweist jeweils auf das entsprechende Datenblatt.

Einige Digital-Schaltungen (Rechner, Uhren-Chips und elektronische Orgel-Schaltungen), die in diesem Teil nicht enthalten sind, werden ausführlich im Abschnitt Linear-Consumer behandelt. Digital-Schaltungen, die nicht in einer der größeren Logik-Familien enthalten sind, finden sich unter der Rubrik "Digital-Sonstige Bauteile" (Digital — Other Devices).

Dieser Abschnitt wird nicht durch Hinweise auf Gehäuseformen Kompliziert. Die entsprechenden Suffix wurden meistens weggelassen. Weitere Information über die Suffixe jedes Herstellers erhalten Sie über das Numerische Typenverzeichnis. Im ganzen Master Selection Guide sind alle Bauteile mit militärischem Temperaturebereich (—55° bis 125°C) durch ein Kreuz (†) vor dem Namen des Herstellers gekennzeichnet. Die Namen der Hersteller sind normalerweise ausgerschrieben; einige jedoch sind abgekurst. Die Abkürzungen werden auf S. 772 erklärt.

© IC MASTER 1983

INTRODUCTION AU SYSTEME DIGITAL

Le Guide Général de Sélection fournit suffisamment de renseignements pour permettre des selections initiales de produits. Tous les appareils énumérés dans cette Section, à la fois dans le Premier Guide de Sélection et le feuilles de données, apparaissent également dans tous les autres index.

Les deux premières pages de la Section "Digital" présentent des comparaisons de performance entre les principales familles de système digital. Suivent ensuite des listes d'appareils de chaque famille, classés par groupes fonctionnels (arithmétique, registres, invertisseurs, etc.). Les listes de première sélection sont suivies par des feuilles de données par appareil, fournies par les fabricants. Les références de numéros de pages de ces données sont communiquées dans les listes de première sélection.

Quelques circuits digitaux — calculatrices, circuits de montre, et circuits électroniques primaires — no signalés dans cette Section, sont étudiés en detail dans la Section "Linéaire". Les circuits digitaux non inclus dans l'une des familles principales de Legique, sont énumérés dans la rubrique "Autres Systemes Digitaux" (Digital-Other Devices).

Cette Section ne fait pas apparaître les types de boitier. Les suffixes indiquant les types de boitier sont généralement omis. Pour obtenir des renseignements supplémentaires sur les suffixes utilsés par chaque société, veuillez vous reporter au Guide des Numéros de Pièces. Dans tout le Guide Général de Sélection chaque appareil possédant la variante complète de température imposée par l'Armée (—55°C à 125°C) est indiqué par le symbole (†) inscrit devant le nom du fabricant. Les noms des fabricants sont généralement écrits en entier, il arrive cependant que certains soient abrégés. Voir page 772 pour obtenir la signification de ces abréviations.

© IC MASTER 1983

INTRODUCCIÓN A DIGITAL

La Guía Maestra de Selección provee suficiente información para hacer selecciones iniciales de producto. Todas las componentes que aparecen en esta sección, ya sea en la guía de selección inicial o en las páginas de datos, están incluidas en todos los otros índices.

Las primeras dos páginas de la sección digital presenta comparación de funcionamiento entre las familias digitales mayores. Estas están sequidas por listas de las componentes correspondiente a cada familia y organizadas en grupos funcionales (aritmético, separadores, invertidores, etc). Las listas de selección inicial están sequidas por las páginas de datos, de las componentes proveídas por los fabricantes. Referencias del número de la página a estas páginas de datos están dadas con las listas de selección incial.

Algunos circuitos digitales — calculadoras, circuitos integrados de relojes, y circuitos de órganos eléctricos — no incluídas en esta sección son detalladas en la sección de Consumidor-Lineal. Los circuitos digitales no incluídos entre las familias lógicas mayores aparecen bajo el título Digital-Otras Componentes.

Esta sección no es complicada por referencias al estilo constructivo; los sufijos que denotan estilo constructivo han sido generalmente omitidos. Para información adicional sobre sufijos de las compañías, refiérase a la Guía de Número de Pieza. A lo largo de la Guía de Selección Maestra, cada intérvalo completo de temperatura para uso militar (—55° a 125°C) de la componente aparece indicada por el signo fabricantes no son generalmente deletreados; sin embargo, algunos aparecen abreviados y las abreviaturas son explicadas en la página 772.

© IC MASTER 1983

ディジタルへの案内

マスターセレクションガイドは最初の製品選択には充分の資料を揃えています。本セレクション中のセレクションガイドとデータののっているページに記載されている全製品は他の全てのインデックスにも入っています。

ディジタルセレクションの最初の２ページには主要なディジタルファミリーの性能比較がのっています。次のページからはそのファミリーが機能グループ毎に分類されています（例えばアリスメティック，バッファ／インバータ…と云うように）。その次にのせてあるのは各メーカーのデータシートです。このデータシートを見つけるにはセレクションガイドにのっているページをめくって下さい。

カルキュレーター用，時計用チップ，電子オルガン用回路はこのセクションでなく，リニアーコンシューマーセクションに詳細に紹介されています。

このセクションではパッケージにはふれていません。パッケージ形状のサフィックスについての情報は"パーツナンバーガイド"を参照して下さい。

マスターセレクションガイドの全ページ，ミリタリー温度範囲（－５５℃～－１２５℃）の製品は剣じるし（　）をメーカー名の前につけてあります。メーカー名は通常簡略化はしていません。簡略化されているものについては１３７ページにその説明があります。

© IC MASTER 1983

DIGITAL-CMOS

Arithmetic Functions

Function	Device	Source		Line
Adder, NBCD (natural binary coded decimal)				
	MC14560BA	† Motorola		
	MC14560BC	Motorola		
	TC4560B	Toshiba		
Adder, Triple Serial, Negative Logic, with Internal Carry				
	HD14038B	Hitachi		
	MC14038BA	† Motorola		
	MC14038BC	Motorola		
	CD4038A	**† RCA**	**(748)**	
	CD4038AE	**RCA**	**(748)**	
	CD4038B	**† RCA**	**(748)**	
	CD4038BE	**RCA**	**(748)**	10
	HCC4038B	† SGS		
	HCF4038B	SGS		
	CM4038A	† Solitron		
	CM4038AE	Solitron		
	TC4038B	Toshiba		
Adder, Triple Serial, Positive Logic, with Internal Carry				
	HD14032B	Hitachi		
	MC14032BA	† Motorola		
	MC14032BC	Motorola		
	MSM4032	OKI		
	CD4032A	**† RCA**	**(748)**	20
	CD4032AE	**RCA**	**(748)**	
	CD4032B	**† RCA**	**(748)**	
	CD4032BE	**RCA**	**(748)**	
	HCC4032B	† SGS		
	HCF4032B	SGS		
	CM4032A	† Solitron		
	CM4032AE	Solitron		
	TC4032B	Toshiba		
Adder, 4-Bit, Full				
	54HC283	**† Fairchild**	**(667)**	
	74HC283	**Fairchild**	**(667)**	30
	F4008BC	Fairchild		
	F4008BM	† Fairchild		
	HD14008B	Hitachi		
	MC14008BA	† Motorola		
	MC14008BC	Motorola		
	CD4008BC	National		
	CD4008BM	† National		
	MM54C83	† National		
	MM74C83	National		
	CD4008A	**† RCA**	**(748)**	40
	CD4008AE	**RCA**	**(748)**	
	CD4008B	**† RCA**	**(748)**	
	CD4008BE	**RCA**	**(748)**	
	HCC4008B	† SGS		
	HCF4008B	SGS		
	883/4008B	† SSS		
	SCL4008B	SSS		
	CM4008A	† Solitron		
	CM4008AE	Solitron		
	TC4008B	Toshiba		50
Data Access Register (for memory address arithmetic)				
	F4707BC	Fairchild		
	F4707BM	† Fairchild		
Data Path Switch				
	F4704BC	Fairchild		
	F4704BM	† Fairchild		
Equality Comparator, 8-Bit				
	CD54HC688	**† RCA**	**(739)**	
	CD74HC688	**RCA**	**(739)**	
Full Adder, Gated				
	SP74HC80	**SPI**	**(767)**	
Logic Register Stack				
	F4705BC	Fairchild		
	F4705BM	† Fairchild		
Logic Unit 4-Bit				
	HD14581B	Hitachi		60
	MC14581BA	† Motorola		
	MC14581BC	Motorola		
	CD40181B	**† RCA**	**(749)**	
	CD40181BE	**RCA**	**(749)**	
	CD4057A	† RCA		
	HCC40181B	† SGS		
	HCF40181B	SGS		
	883/4581B	† SSS		
	SCL4581B	SSS		
Look-Ahead Carry Block				
	F4582BC	Fairchild		70
	F4582BM	† Fairchild		
	HD14582B	Hitachi		
	MC14582BA	† Motorola		
	MC14582BC	Motorola		
	CD40182B	**† RCA**	**(749)**	
	CD40182BE	**RCA**	**(749)**	
	HCC40182	† SGS		
	HCF40182	SGS		
	883/4582B	† SSS		
	SCL4582B	SSS		80
Magnitude Comparator 4-Bit				
	54HC85	**† Fairchild**	**(667)**	
	74HC85	**Fairchild**	**(667)**	
	F40085BC	Fairchild		
	F40085BM	† Fairchild		
	HD14585B	Hitachi		
	MC14585BA	† Motorola		
	MC14585BC	Motorola		
	MC54HC85	† Motorola		
	MC74HC85	Motorola		
	MM54C85	† National		90
	MM74C85	National		
	CD4063B	**† RCA**	**(748)**	
	CD4063BE	**RCA**	**(748)**	
	CD4585B	**† RCA**	**(749)**	
	CD4585BE	**RCA**	**(749)**	
	CD54HC85	**† RCA**	**(739)**	
	CD74HC85	**RCA**	**(739)**	
	HCC4063B	† SGS		
	HCF4063B	SGS		
	883/4585B	† SSS		100
	SCL4585B	SSS		
	TC4063B	Toshiba		
	TC4585B	Toshiba		
Magnitude Comparator 8-Bit				
	54HC688	**† Fairchild**	**(667)**	
	74HC688	**Fairchild**	**(667)**	
Parity Generator/Checker, 9-Bit Odd/Even				
	54HC280	**† Fairchild**	**(667)**	
	74HC280	**Fairchild**	**(667)**	
	MC54HC280	† Motorola		
	MC74HC280	Motorola		
	MM54HC280	† National		110
	MM74HC280	National		
	CD54HC280	**† RCA**	**(739)**	
	CD74HC280	**RCA**	**(739)**	
	SP74HC280	**SPI**	**(771)**	
Serial Multiplier, 8-Bit				
	CD54HC384	**† RCA**	**(739)**	
	CD74HC384	**RCA**	**(739)**	
Nines Complementer				
	MC14561BA	† Motorola		
	MC14561BC	Motorola		
	TC4561B	Toshiba		
2's Complement Multiplier (16x16). Allows unsigned magnitude inputs as well (NMOS)				
	WTL1016	Weitek		120
2's Complement Multiplier (16x16) with Accumulator (allows unsigned magnitude inputs as well)—NMOS				
	WTL1010	Weitek		
2x2-Bit, Parallel Multiplier, Binary				
	MC14554BA	† Motorola		
	MC14554BC	Motorola		
8x8 Bit Multiplier				
	ADSP-1080K	**AD**	**(3185)**	
	ADSP-1080T	**† AD**	**(3185)**	
8x8 Bit Multiplier/Accumulator				
	ADSP-1008K	**AD**	**(3183,3186)**	
	ADSP-1008T	**† AD**	**(3183,3186)**	
16x16 Bit Multiplier				
	ADSP-1016K	**AD**	**(3184,3186)**	
	ADSP-1016T	**† AD**	**(3184,3186)**	
16x16 Bit Multiplier/Accumulator				
	ADSP-1010K	**AD**	**(3182,3186)**	130
	ADSP-1010T	**† AD**	**(3182,3186)**	

Buffers

Function	Device	Source		Line
Quad Gated, Three-State (inverted control)				
	SP74HC126	**SPI**	**(768)**	
Quad Gated, Three-State				
	SP74HC125	**SPI**	**(768)**	
Quad Low Impedance				
	883/4441UB	† SSS		
	SCL4441UB	SSS		
Quad True/Complement				
	F4041BC	Fairchild		
	F4041BM	† Fairchild		
	CD4041C	National		
	CD4041M	National		
	CD4041A	**† RCA**	**(748)**	140
	CD4041AE	**RCA**	**(748)**	
	CD4041UB	**† RCA**	**(748)**	
	CD4041UBE	**RCA**	**(748)**	
	HCC4041UB	† SGS		
	HCF4041UB	SGS		
	883/4041UB	† SSS		
	SCL4041UB	SSS		
	CM4041A	† Solitron		
	CM4041AE	Solitron		
Quad Three-State Non-Inverting				
	TC5024	Toshiba		150
	TC5025	Toshiba		
Quad Three-State				
	54HC125	**† Fairchild**	**(667)**	
	74HC125	**Fairchild**	**(667)**	
Hex CMOS Compatible				
	DS1630	† National		
	DS3630	National		
Hex High Voltage				
	TC5064B	Toshiba		
	TC5065B	Toshiba		
Hex (Inverting) Three-State, Strobed				
	HD14502B	Hitachi		
	MC14502BA	† Motorola		
	MC14502BC	Motorola		160
	CD4502B	**† RCA**	**(749)**	
	CD4502BE	**RCA**	**(749)**	
	HCC4502B	† SGS		
	HCF4502B	SGS		
	883/4502B	† SSS		
	SCL4502B	SSS		
Hex (Inverting) Three-State				
	54HC366	**† Fairchild**	**(667)**	
	54HC368	**† Fairchild**	**(667)**	
	74HC366	**Fairchild**	**(667)**	
	74HC368	**Fairchild**	**(667)**	170

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–CMOS (Cont'd)

Buffers (Cont'd)

Function	Device	Source		Line
Hex (Inverting)	HD14009B	Hitachi		
	CD4009AC	National		
	CD4009AM	† National		
	CD4009A	**† RCA**	**(748)**	
	CD4009AE	**RCA**	**(748)**	
	CD4009UB	**† RCA**	**(748)**	
	CD4009UBE	**RCA**	**(748)**	
	883/4009UB	† SSS		
	SCL4009UB	SSS		
	CM4009A	† Solitron		10
	CM4009AE	Solitron		
	TC4009UB	Toshiba		
Hex (Inverting)-Improved				
	54HC4049	**† Fairchild**	**(667)**	
	74HC4049	**Fairchild**	**(667)**	
	F4049BC	Fairchild		
	F4049BM	† Fairchild		
	HD14049B	Hitachi		
	MC14049UBA	† Motorola		
	MC14049UBC	Motorola		
	CD4049UB	National		20
	MM54HC4049	† National		
	MM74HC4049	National		
	CD4049A	**† RCA**	**(748)**	
	CD4049AE	**RCA**	**(748)**	
	CD4049UB	**† RCA**	**(748)**	
	CD4049UBE	**RCA**	**(748)**	
	CD54HC4049	† RCA		
	CD54HC4099	RCA		
	CD74HC4049	RCA		
	HCC4049UB	† SGS		30
	HCF4049UB	SGS		
	883/4049UB	† SSS		
	SCL4049UB	SSS		
	CM4049A	† Solitron		
	CM4049AE	Solitron		
	TC4049B	Toshiba		
Hex Non-Inverting				
	HD14010B	Hitachi		
	CD4010A	National		
	CD4010A	**† RCA**	**(740,748)**	
	CD4010AE	**RCA**	**(740,748)**	40
	CD4010B	**† RCA**	**(740,748)**	
	CD4010BE	**RCA**	**(740,748)**	
	883/4010B	† SSS		
	SCL4010B	SSS		
	CM4010A	† Solitron		
	CM4010AE	Solitron		
	TC4010B	Toshiba		
Hex Non-Inverting-Improved				
	54HC4050	**† Fairchild**	**(667)**	
	74HC4050	**Fairchild**	**(667)**	
	F4050BC	Fairchild		50
	F4050BM	† Fairchild		
	HD14050B	Hitachi		
	MC14050BA	† Motorola		
	MC14050BC	Motorola		
	CD4050BC	National		
	CD4050BM	National		
	CD4050A	**† RCA**	**(748)**	
	CD4050AE	**RCA**	**(748)**	
	CD4050B	**† RCA**	**(748)**	
	CD4050BE	**RCA**	**(748)**	60
	CD54HC4050	**† RCA**	**(740)**	
	CD74HC4050	**RCA**	**(740)**	
	HCC4050B	† SGS		
	HCF4050B	SGS		
	883/4050B	† SSS		
	SCL4050B	SSS		
	CM4050A	† Solitron		

(Continued)

Function	Device	Source		Line
Hex Non-Inverting-Improved				
				(Cont'd)
	CM4050AE	Solitron		
	TC4050B	Toshiba		
Hex Open Drain Active Pull Down				
	MM54C906	† National		70
	MM74C906	National		
Hex Open Drain Active Pull Up				
	MM54C907	† National		
	MM74C907	National		
Hex PMOS Inverting (PMOS to CMOS or TTL)				
	MM54C903	† National		
	MM74C903	National		
Hex PMOS Non-Inverting (PMOS to CMOS or TTL)				
	MM54C904	† National		
	MM74C904	National		
Hex, TTL Input	**54HCT07**	**† Fairchild**	**(667)**	
	74HCT07	**Fairchild**	**(667)**	
Hex TTL Inverting (CMOS to TTL)				
	MM54C901	† National		80
	MM74C901	National		
Hex TTL Non-Inverting (CMOS to TTL)				
	MM54C902	† National		
	MM74C902	National		
Hex Three-State, Inverting				
	MM54HC366	† National		
	MM54HC368	† National		
	MM74HC366	National		
	MM74HC368	National		
Hex Three-State				
	54HC365	**† Fairchild**	**(667)**	
	54HC367	**† Fairchild**	**(667)**	
	74HC365	**Fairchild**	**(667)**	90
	74HC367	**Fairchild**	**(667)**	
	F40097BC	Fairchild		
	F40097BM	† Fairchild		
	HD14503B	Hitachi		
	MC14503BA	† Motorola		
	MC14503BC	Motorola		
	MC54HC367	† Motorola		
	MC74HC367	Motorola		
	CD4503BC	National		
	CD4503BM	† National		100
	MM54HC365	† National		
	MM54HC367	† National		
	MM70C95	† National		
	MM70C97	† National		
	MM74HC365	National		
	MM74HC367	National		
	MM80C95	National		
	MM80C97	National		
	CD4503BD	**† RCA**	**(749)**	
	CD4503BE	**RCA**	**(749)**	110
	CD54HC365	**† RCA**	**(740)**	
	CD54HC366	**† RCA**	**(740)**	
	CD54HC367	**† RCA**	**(740)**	
	CD54HC368	**† RCA**	**(740)**	
	CD74HC365	**RCA**	**(740)**	
	CD74HC366	**RCA**	**(740)**	
	CD74HC367	**RCA**	**(740)**	
	CD74HC368	**RCA**	**(740)**	
	TC40H367	Toshiba		
	TC5012B	Toshiba		120
Hex	**54HC07**	**† Fairchild**	**(667)**	
	74HC07	**Fairchild**	**(667)**	
	MM54HC4050	National		
	MM74HC4050	National		
Octal Buffer/Level Translator, Inverting				
	MM54HC4305	National		
	MM74HC4305	National		

Function	Device	Source		Line
Octal Buffer/Line Driver, Three State				
	CD54HC540	**† RCA**	**(740)**	
	CD54HC541	**† RCA**	**(740)**	
	CD74HC540	**RCA**	**(740)**	
	CD74HC541	**RCA**	**(740)**	130
Octal Buffer/Line Driver				
	MM54C941	† National		
	MM74C941	National		
Octal	**MD54SC540**	**† Mitel**	**(702)**	
	MD54SC541	**† Mitel**	**(702)**	
	MD74SC540	**Mitel**	**(702)**	
	MD74SC541	**Mitel**	**(702)**	
	HS74C540	Supertex		
	HS74C541	Supertex		
	M54C540	† Supertex		
	M54C541	† Supertex		140
	S74C540	Supertex		
	S74C541	Supertex		
7-Line High Voltage				
	TC5066B	Toshiba		
	TC5067B	Toshiba		

Inverters

Dual Complementary Pair Plus Inverter				
	F4007UBC	Fairchild		
	F4007UBM	† Fairchild		
	HD14007B	Hitachi		
	MC14007UBA	† Motorola		
	MC14007UBC	Motorola		
	CD4007C	National		150
	CD4007M	† National		
	CD4007A	**† RCA**	**(748)**	
	CD4007AE	**RCA**	**(748)**	
	CD4007UB	**† RCA**	**(748)**	
	CD4007UBE	**RCA**	**(748)**	
	HCC4007UB	† SGS		
	HCF4007UB	SGS		
	883/4007UB	† SSS		
	SCL4007UB	SSS		
	CM4007A	† Solitron		160
	CM4007AE	Solitron		
	TC4007UB	Toshiba		
Hex Schmitt Trigger				
	54HC14	**† Fairchild**	**(667)**	
	74HC14	**Fairchild**	**(667)**	
Hex, TTL Input	**54HCT04**	**† Fairchild**	**(667)**	
	74HCT04	**Fairchild**	**(667)**	
Hex Unbuffered				
	MC54HCU04	† Motorola		
	MC74HCU04	Motorola		
Hex Three-State				
	F40098BC	Fairchild		
	F40098BM	† Fairchild		170
	MM70C96	† National		
	MM70C98	† National		
	MM80C96	National		
	MM80C98	National		
Hex	F4069UBC	Fairchild		
	F4069UBM	† Fairchild		
	HD14069B	Hitachi		
	MC14069UBA	† Motorola		
	MC14069UBC	Motorola		
	MC54HC04	† Motorola		180
	MC74HC04	Motorola		
	CD4069C	National		
	CD4069M	† National		
	MM54C04	† National		
	MM54HC04	† National		
	MM74C04	National		
	MM74HC04	National		
	MM74PC04	National		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL-CMOS (Cont'd)

Inverters (Cont'd)

Function	Device	Source		Line
Hex			(Cont'd)	
	CD4069UB	**† RCA**	**(748)**	
	CD4069UBE	**RCA**	**(748)**	
	CD54HC04	**† RCA**	**(740)**	
	CD74HC04	**RCA**	**(740)**	
	LC4069UB	Sanyo		
	SP74HC04	**SPI**	**(766)**	
	HCC4069UB	† SGS		
	HCF4069UB	SGS		
	883/4069UB	† SSS		
	883/4449UB	† SSS		10
	SCL4069UB	SSS		
	SCL4449UB	SSS		
	CM4069A	† Solitron		
	CM4069AE	Solitron		
	TC4069UB	Toshiba		
	TC40H004	Toshiba		
	TC7404UB	Toshiba		

Counters, Binary

Function	Device	Source		Line
Clock Generator with 4-Bit				
	TC5018	Toshiba		
Divide by 2, 8 or 16				
	MM54C93	† National		
	MM74C93	National		20
Divider with 4-Bit				
	TC5027B	Toshiba		
Presettable Fully Synchronous, Synchronous Clear				
	54HC163	**† Fairchild**	**(668)**	
	74HC163	**Fairchild**	**(668)**	
	F40163BC	Fairchild		
	F40163BM	† Fairchild		
	HD14163B	Hitachi		
	MC14163BA	† Motorola		
	MC14163BC	Motorola		
	MC54HC163	† Motorola		
	MC74HC163	Motorola		30
	CD40163BC	National		
	CD40163BM	† National		
	MM54C163	† National		
	MM54HC163	† National		
	MM74C163	National		
	MM74HC163	National		
	CD40163B	**† RCA**	**(749)**	
	CD40163BE	**RCA**	**(749)**	
	CD54HC163	**† RCA**	**(739)**	
	CD74HC163	**RCA**	**(739)**	40
	SP74HC163	**SPI**	**(770)**	
	HCC40163	† SGS		
	HCF40163	SGS		
	883/4163B	† SSS		
	SCL4163B	SSS		
	TC40163B	Toshiba		
	TC40H163	Toshiba		
Presettable Synchronous, Asynchronous Clear				
	F40161BC	Fairchild		
	F40161BM	† Fairchild		
	HD14161B	Hitachi		50
	MC14161BA	† Motorola		
	MC14161BC	Motorola		
	MC54HC161	† Motorola		
	MC74HC161	Motorola		
	CD40161BC	National		
	CD40161BM	† National		
	MM54C161	† National		
	MM54HC161	† National		
	MM74C161	National		
	MM74HC161	National		60
	CD40161B	**† RCA**	**(749)**	
	CD40161BE	**RCA**	**(749)**	
			(Continued)	

Function	Device	Source		Line
Presettable Synchronous, Asynchronous Clear			(Cont'd)	
	CD54HC161	**† RCA**	**(739)**	
	CD74HC161	**RCA**	**(739)**	
	SP74HC161	**SPI**	**(770)**	
	HCC40161B	† SGS		
	HCF40161B	SGS		
	883/4161B	† SSS		
	SCL4161B	SSS		
	TC40161B	Toshiba		70
	TCH0H161	Toshiba		
Presettable Up/Down				
	54HC193	**† Fairchild**	**(668)**	
	54HC4516	**† Fairchild**	**(665,668)**	
	54HC569	**† Fairchild**	**(668)**	
	74HC193	**Fairchild**	**(668)**	
	74HC4516	**Fairchild**	**(668)**	
	74HC569	**Fairchild**	**(668)**	
	F40193BC	Fairchild		
	F40193BM	† Fairchild		
	F4516BC	Fairchild		80
	F4516BM	† Fairchild		
	HD14516B	Hitachi		
	MC14516BA	† Motorola		
	MC14516BC	Motorola		
	MC54HC193	† Motorola		
	MC74HC193	Motorola		
	CD40193BC	National		
	CD40193BM	† National		
	CD4516BC	National		
	CD4516BM	† National		90
	MM54C193	† National		
	MM54HC193	† National		
	MM74C193	National		
	MM74HC193	National		
	CD40193B	**† RCA**	**(749)**	
	CD40193BE	**RCA**	**(749)**	
	CD4516B	**† RCA**	**(749)**	
	CD4516BE	**RCA**	**(749)**	
	CD54HC191	**† RCA**	**(739)**	
	CD54HC193	**† RCA**	**(739)**	100
	CD74HC191	**RCA**	**(739)**	
	CD74HC193	**RCA**	**(739)**	
	SP74HC193	**SPI**	**(770)**	
	HCC4516B	† SGS		
	HCF4516B	SGS		
	883/4193B	† SSS		
	883/4516B	† SSS		
	SCL4193B	SSS		
	SCL4516B	SSS		
	TC40H193	Toshiba		110
	TC4516B	Toshiba		
Presettable 8-Bit Down				
	CD40103B	**† RCA**	**(749)**	
	CD40103BE	**RCA**	**(749)**	
	HCC40103B	† SGS		
	HCF40103B	SGS		
Programmable Divide-by-N, 4-Bit				
	F4526BC	Fairchild		
	F4526BM	† Fairchild		
	HD14526B	Hitachi		
	MC14526BA	† Motorola		
	MC14526BC	Motorola		120
	CD4526BC	National		
	CD4526BM	† National		
	883/4526B	† SSS		
	SCL4526B	SSS		
Dual Synchronous				
	F4520BC	Fairchild		
	F4520BM	† Fairchild		
	HD14520B	Hitachi		
	MC14520BA	† Motorola		
			(Continued)	

Function	Device	Source		Line
Dual Synchronous			(Cont'd)	
	MC14520BC	Motorola		
	CD4520BC	National		130
	CD4520BM	† National		
	CD4520B	**† RCA**	**(749)**	
	CD4520BE	**RCA**	**(749)**	
	HCC4520B	† SGS		
	HCF4520B	SGS		
	883/4520B	† SSS		
	SCL4520B	SSS		
	CM4520B	† Solitron		
	CM4520BE	Solitron		
	TC4520B	Toshiba		140
Dual 4-Bit	**54HC393**	**† Fairchild**	**(668)**	
	74HC393	**Fairchild**	**(668)**	
	MM54HC393	† National		
	MM74HC393	National		
Dual, 4-Bit	**CD54HC393**	**† RCA**	**(739)**	
	CD74HC393	**RCA**	**(739)**	
Dual	**CD54HC4520**	**† RCA**	**(739)**	
	CD74HC4520	**RCA**	**(739)**	
4-Bit, Divide by 2 and by 5				
	SP74HC93	**SPI**	**(768)**	
5, 6, 7, 8, 9-Stage				
	TC5048	Toshiba		150
7-Stage	F4024BC	Fairchild		
	F4024BM	† Fairchild		
	HD14024B	Hitachi		
	MC14024BA	† Motorola		
	MC14024BC	Motorola		
	MC54HC4024	† Motorola		
	MC74HC4024	Motorola		
	CD4024BC	National		
	CD4024BM	† National		
	CD4024A	**† RCA**	**(748)**	160
	CD4024AE	**RCA**	**(748)**	
	CD4024B	**† RCA**	**(748)**	
	CD4024BE	**RCA**	**(748)**	
	CD54HC4024	**† RCA**	**(739)**	
	CD74HC4024	**RCA**	**(739)**	
	HCC4024B	† SGS		
	HCF4024B	SGS		
	883/4024B	† SSS		
	SCL4024B	SSS		
	CM4024A	† Solitron		170
	CM4024AE	Solitron		
	TC4024B	Toshiba		
8-Stage Synchronous				
	883/4404B	† SSS		
	SCL4404B	SSS		
12 Stage	MM54HC4040	† National		
	MM74HC4040	National		
12-Stage	**54HC4040**	**† Fairchild**	**(668)**	
	74HC4040	**Fairchild**	**(668)**	
	F4040BM	† Fairchild		
	F404BC	Fairchild		180
	HD14040B	Hitachi		
	MC14040BA	† Motorola		
	MC14040BC	Motorola		
	MC54HC4040	† Motorola		
	MC74HC4040	Motorola		
	CD4040BC	National		
	CD4040BM	† National		
	CD4040A	**† RCA**	**(748)**	
	CD4040AE	**RCA**	**(748)**	
	CD4040B	**† RCA**	**(748)**	190
	CD4040BE	**RCA**	**(748)**	
	CD54HC4040	**† RCA**	**(739)**	
	CD74HC4040	**RCA**	**(739)**	
	HCC4040B	† SGS		
			(Continued)	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

DIGITAL–CMOS (Cont'd)

Counters, Binary (Cont'd)

Function	Device	Source		Line
12-Stage			(Cont'd)	
	HCF4040B	SGS		
	883/4040B	† SSS		
	SCL4040B	SSS		
	CM4040A	† Solitron		
	CM4040AE	Solitron		
	TC4040B	Toshiba		
14 Stage	MM54HC4020	† National		
	MM54HC4060	† National		
	MM74HC4020	National		
	MM74HC4060	National		10
14, 15, 16-Stage (with reset)				
	TC5036	Toshiba		
14-Stage	**54HC4020**	**† Fairchild**	**(668)**	
	74HC4020	**Fairchild**	**(668)**	
	F4020BC	Fairchild		
	F4020BM	† Fairchild		
	HD14020B	Hitachi		
	MC14020BA	† Motorola		
	MC14020BC	Motorola		
	MC54HC4020	† Motorola		
	MC74HC4020	Motorola		20
	CD4020BC	National		
	CD4020BM	† National		
	CD4020A	**† RCA**	**(748)**	
	CD4020AE	**RCA**	**(748)**	
	CD4020B	**† RCA**	**(748)**	
	CD4020BE	**RCA**	**(748)**	
	CD54HC4020	**† RCA**	**(739)**	
	CD74HC4020	**RCA**	**(739)**	
	HCC4020B	† SGS		
	HCF4020B	SGS		30
	883/4020B	† SSS		
	SCL4020B	SSS		
	CM4020A	† Solitron		
	CM4020AE	Solitron		
	TC4020B	Toshiba		
14-Stage with Oscillator				
	MC14060B	Motorola		
	MC54HC4060	† Motorola		
	MC74HC4060	Motorola		
	CD4060BC	National		
	CD4060BM	† National		40
	CD4060A	**† RCA**	**(748)**	
	CD4060AE	**RCA**	**(748)**	
	CD4060B	**† RCA**	**(748)**	
	CD4060BE	**RCA**	**(748)**	
	CD54HC4060	**† RCA**	**(739)**	
	CD74HC4060	**RCA**	**(739)**	
	HCC4060B	† SGS		
	HCF4060B	SGS		
	SCL4060B	SSS		

Counters, Decade

Function	Device	Source		Line
Counter/Divider with 10 Decoded Outputs				
	54HC4017	**† Fairchild**	**(668)**	50
	74HC4017	**Fairchild**	**(668)**	
	MM54HC4017	† National		
	MM74HC4017	National		
Counter/Divider, 7 Segment Display Output and Display Enable	**CD4026A**	**† RCA**	**(748)**	
	CD4026AE	**RCA**	**(748)**	
	CD4026B	**† RCA**	**(748)**	
	CD4026BE	**RCA**	**(748)**	
	HCC4026B	† SGS		
	HCF4026B	SGS		
	883/4026AB	† SSS		60
	883/4426AB	† SSS		
	SCL4026AB	SSS		
	SCL4426AB	SSS		

(Continued)

Function	Device	Source		Line
Counter/Divider, 7 Segment Display Output and Display Enable			(Cont'd)	
	CM4026A	† Solitron		
	CM4026AE	Solitron		
Counter/Divider, 7 Segment Display Output and Ripple Blanking	**CD4033A**	**† RCA**	**(748)**	
	CD4033AE	**RCA**	**(748)**	
	CD4033B	**† RCA**	**(748)**	
	CD4033BE	**RCA**	**(748)**	
	HCC4033B	† SGS		70
	HCF4033B	SGS		
	883/4033AB	† SSS		
	883/4433AB	† SSS		
	SCL4033AB	SSS		
	SCL4433AB	SSS		
	CM4033A	† Solitron		
	CM4033AE	Solitron		
Counter/Divider, 10 Line Output				
	F4017BC	Fairchild		
	F4017BM	† Fairchild		
	HD14017B	Hitachi		80
	MC14017BA	† Motorola		
	MC14017BC	Motorola		
	MC54HC4017	† Motorola		
	MC74HC4017	Motorola		
	CD4017BC	National		
	CD4017BM	† National		
	CD4017A	**† RCA**	**(748)**	
	CD4017AE	**RCA**	**(748)**	
	CD4017B	**† RCA**	**(748)**	
	CD4017BE	**RCA**	**(748)**	90
	CD54HC4017	**† RCA**	**(739)**	
	CD74HC4017	**RCA**	**(739)**	
	HCC4017B	† SGS		
	HCF4017B	SGS		
	883/4017B	† SSS		
	SCL4017B	SSS		
	CM4017A	† Solitron		
	CM4017AE	Solitron		
	TC4017B	Toshiba		
Counter/Latch/Display Driver				
	ICM7208	Intersil		100
Divide by 2 and by 5	**SP74HC90**	**SPI**	**(768)**	
Presettable Fully Synchronous, Synchronous Clear	**54HC162**	**† Fairchild**	**(668)**	
	74HC162	**Fairchild**	**(668)**	
	F40162BC	Fairchild		
	F40162BM	† Fairchild		
	HD14162B	Hitachi		
	MC14162BA	† Motorola		
	MC14162BC	Motorola		
	MC54HC162	† Motorola		
	MC74HC162	Motorola		110
	CD40162BC	National		
	CD40162BM	† National		
	MM54C162	† National		
	MM54HC162	† National		
	MM74C162	National		
	MM74HC162	National		
	CD40162B	**† RCA**	**(749)**	
	CD40162BE	**RCA**	**(749)**	
	CD54HC162	**† RCA**	**(739)**	
	CD74HC162	**RCA**	**(739)**	120
	SP74HC162	**SPI**	**(770)**	
	HCC40162B	† SGS		
	HCF40162B	SGS		
	883/4162B	† SSS		
	SCL4162B	SSS		
	TC40162B	Toshiba		
	TC40H162	Toshiba		

Function	Device	Source		Line
Presettable (sets to 0 or 9, divides by 2, 5 or 10)	MM54C90	† National		
Presettable (Sets to 0 or 9, divides by 2, 5 or 10)	MM74C90	National		
Presettable Synchronous, Asynchronous Clear	**54HC160**	**† Fairchild**	**(668)**	130
	74HC160	**Fairchild**	**(668)**	
	F40160BC	Fairchild		
	F40160BM	† Fairchild		
	HD14160	Hitachi		
	MC14160BA	† Motorola		
	MC14160BC	Motorola		
	MC54HC160	† Motorola		
	MC74HC160	Motorola		
	CD40160BC	National		
	CD40160BM	† National		140
	MM54C160	† National		
	MM54HC160	† National		
	MM74C160	National		
	MM74HC160	National		
	CD40160B	**† RCA**	**(749)**	
	CD40160BE	**RCA**	**(749)**	
	CD54HC160	**† RCA**	**(739)**	
	CD74HC160	**RCA**	**(739)**	
	SP74HC160	**SPI**	**(769)**	
	HCC40160B	† SGS		150
	HCF40160B	SGS		
	883/4160B	† SSS		
	SCL4160B	SSS		
	TC40160B	Toshiba		
	TC40H160	Toshiba		
Presettable Up/Down	**54HC192**	**† Fairchild**	**(668)**	
	74HC192	**Fairchild**	**(668)**	
	F40192BC	Fairchild		
	F40192BM	† Fairchild		
	F4510BC	Fairchild		160
	F4510BM	† Fairchild		
	HD14510B	Hitachi		
	HCTR0200	Hughes		
	MC14510BA	† Motorola		
	MC14510BC	Motorola		
	MC54HC192	† Motorola		
	MC74HC192	Motorola		
	CD40192BC	National		
	CD40192BM	† National		
	CD4510BC	National		170
	CD4510BM	† National		
	MM54C192	† National		
	MM54HC192	† National		
	MM74C192	National		
	MM74HC192	National		
	CD40192B	**† RCA**	**(749)**	
	CD40192BE	**RCA**	**(749)**	
	CD4510B	**† RCA**	**(749)**	
	CD4510BE	**RCA**	**(749)**	
	CD54HC192	**† RCA**	**(739)**	180
	CD74HC192	**RCA**	**(739)**	
	SP74HC192	**SPI**	**(770)**	
	HCC40192B	† SGS		
	HCC4510B	† SGS		
	HCF40192B	SGS		
	HCF4510B	SGS		
	883/4192B	† SSS		
	883/4510B	† SSS		
	SCL4192B	SSS		
	SCL4510B	SSS		190
	TC40H192	Toshiba		
	TC4510B	Toshiba		
Presettable, with Decoder/Driver	TC5034	Toshiba		

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL-CMOS (Cont'd)

Counters, Decade (Cont'd)

Function	Device	Source		Line
Presettable 2-Decade Down, BCD				
	CD40102B	**† RCA**	**(749)**	
	CD40102BE	**RCA**	**(749)**	
	HCC40102B	† SGS		
	HCF40102B	SGS		
Programmable Divide-by-N, 4-Bit				
	F4522BC	Fairchild		
	F4522BM	† Fairchild		
	HD14522B	Hitachi		
	MC14522BA	† Motorola		
	MC14522BC	Motorola		
	CD4522BC	National		10
	CD4522BM	† National		
	883/4522B	† SSS		
	SCL4522B	SSS		
Up/Down Counter/Decoder/Latch/Driver (direct 7-segment driver)	**CD40110B**	**† RCA**	**(749)**	
	CD40110BE	**RCA**	**(749)**	
Up/Down, Programmable				
	54HC4510	**† Fairchild**	**(668)**	
	74HC4510	**Fairchild**	**(668)**	
Up/Down, Three-State				
	54HC568	**† Fairchild**	**(668)**	
	74HC568	**Fairchild**	**(668)**	
Dual Synchronous				
	F4518BC	Fairchild		20
	F4518BM	† Fairchild		
	HD14518B	Hitachi		
	MC14518BA	† Motorola		
	MC14518BC	Motorola		
	CD4518BC	National		
	CD4518BM	† National		
	CD4518B	**† RCA**	**(749)**	
	CD4518BE	**RCA**	**(749)**	
	HCC4518B	† SGS		
	HCF4518B	SGS		30
	883/4518B	† SSS		
	SCL4518B	SSS		
	CM4518B	† Solitron		
	CM4518BE	Solitron		
	TC4518B	Toshiba		
Dual, 4-Bit	MM54HC390	† National		
	MM74HC390	National		
Dual	**54HC390**	**† Fairchild**	**(668)**	
	74HC390	**Fairchild**	**(668)**	
	CD54HC390	**† RCA**	**(739)**	40
	CD74HC390	**RCA**	**(739)**	
3- 1/2 Digit Counter to BCD Driver				
	HCTR4010	Hughes		
	HCTR6010	Hughes		
	CM4102	† Solitron		
3-Decade, Decoder, Driver				
	LC7960	Sanyo		
3-Decade Multiplexed Output				
	F4553BC	Fairchild		
	F4553BM	† Fairchild		
	HD14533B	Hitachi		
	MC14553BA	† Motorola		
	MC14553BC	Motorola		50
4- 1/2 Digit Counter/Timer				
	ICM7236A	Intersil		
4- 1/2 Digit Up Counter				
	ICM7224	Intersil		
	ICM7224A	Intersil		
	ICM7225	Intersil		
	ICM7225A	Intersil		
4- 1/2 Digit Up-Down Counter/Latch/Decoder Driver, LCD				
	MM74C946	**National**	**(735)**	
4- 1/2 Digit	ICM7236	Intersil		
4- 1/2-Digit, Programmable				
	TC9122	Toshiba		
4-Digit, Multiplexed Output, Left Digit Counts to 2- (Maximum count 1999.)				
	MM74C928	National		
4-Digit, Multiplexed Output, Second Digit Counts to 6 (Maximum count 9599.)				
	MM74C927	National		60
4-Digit Up/Down, Counter/Latch/Decoder Driver, LCD				
	MM74C945	**National**	**(735)**	
	MM74C947	**National**	**(735)**	
4-Digit Up/Down Counter/Latch/Display Driver				
	ICM7217	Intersil		
	ICM7217A	Intersil		
	ICM7217B	Intersil		
	ICM7217C	Intersil		
	ICM7227	Intersil		
	ICM7227A	Intersil		
	ICM7227B	Intersil		
	ICM7227C	Intersil		70
4-Decade, Decoder, Driver				
	LC7961	Sanyo		
4-Decade Divider				
	RDD104	**LSI Comp**	**(696)**	
4-Decade Divide-by-N				
	CD4059A	**† RCA**	**(748)**	
	CD4059AE	**RCA**	**(748)**	
4-Decade, Multiplexed Output (The 926 gives carry at 6000.)	MM74C925	National		
	MM74C926	National		
4-Decade Up/Down, with Timer				
	TC5010	Toshiba		
4-Decade	TC5001	Toshiba		
	TC5037	Toshiba		
	TC5051	Toshiba		80
	TC5052	Toshiba		
	TC5053	Toshiba		
	TC5054	Toshiba		
5-Decade, Multiplexed Output				
	HD14534B	Hitachi		
	MC14534BA	† Motorola		
	MC14534BC	Motorola		
6-Digit	TC5032	Toshiba		

Counters, Miscellaneous

Function	Device	Source		Line
Divide-by-8 Counter/Divider, Decoded Output				
	F4022BC	Fairchild		
	F4022BM	† Fairchild		
	MC14022BA	† Motorola		90
	MC14022BC	Motorola		
	CD4022BC	National		
	CD4022BM	† National		
	CD4022A	**† RCA**	**(748)**	
	CD4022AE	**RCA**	**(748)**	
	CD4022B	**† RCA**	**(748)**	
	CD4022BE	**RCA**	**(748)**	
	HCC4022B	† SGS		
	HCF4022B	SGS		
	883/4022B	† SSS		100
	SCL4022B	SSS		
	CM4022A	† Solitron		
	CM4022AE	Solitron		
	TC4022B	Toshiba		
Divide-by-60, BCD Output (industrial time base generator)				
	HD14566B	Hitachi		
	MC14566BA	† Motorola		
	MC14566BC	Motorola		
Frequency Counter				
	ICM7216	Intersil		
	ICM7226	Intersil		
Phase Comparator and Programmable				
	HD14568B	Hitachi		110
	MC14568BA	† Motorola		
	MC14568BC	Motorola		
Presettable Divide-by-N				
	F4018BC	Fairchild		
	F4018BM	† Fairchild		
	HD14018B	Hitachi		
	MC14018BA	† Motorola		
	MC14018BC	Motorola		
	CD4018BC	National		
	CD4018BM	† National		
	CD4018A	**† RCA**	**(748)**	120
	CD4018AE	**RCA**	**(748)**	
	CD4018B	**† RCA**	**(748)**	
	CD4018BE	**RCA**	**(748)**	
	HCC4018B	† SGS		
	HCF4018B	SGS		
	883/4018B	† SSS		
	SCL4018B	SSS		
	CM4018A	† Solitron		
	CM4018AE	Solitron		
	TC4018B	Toshiba		130
Presettable Up/Down Binary or Decade				
	F4029BC	Fairchild		
	F4029BM	† Fairchild		
	MC14029BA	† Motorola		
	MC14029BC	Motorola		
	CD4029BC	National		
	CD4029BM	† National		
	CD4029A	**† RCA**	**(748)**	
	CD4029B	**† RCA**	**(748)**	
	CD4029BE	**RCA**	**(748)**	
	HCC4029B	† SGS		140
	HCF4029B	SGS		
	883/4029B	† SSS		
	SCL4029B	SSS		
	CM4029A	† Solitron		
	CM4029AE	Solitron		
	TC4029B	Toshiba		
Programmable Divide-by-N	TC5080	Toshiba		
See also CMOS Oscillators/Dividers and Digital-Special				
Binary/Decade with Two Reset Functions	TC5026B	Toshiba		
Dual Programmable Divide-by-N Binary/Decade				
	HD14022B	Hitachi		150
	HD14569B	Hitachi		
	MC14569BC	† Motorola		

Decoders

Function	Device	Source		Line
N-Bit (for I/O interface)				
	HCMP1853	Hughes		
	HCMP1853C	Hughes		
	HMMP1853	† Hughes		
	HMMP1853C	† Hughes		
	CDP1853	**RCA**	**(1466)**	
	CDP1853C	**RCA**	**(1466)**	
BCD-to-Decimal				
	54HC42	**† Fairchild**	**(666)**	
	73HC42	Fairchild		160
	F4028BC	Fairchild		
	F4028BM	† Fairchild		
	HD14028B	Hitachi		
	MC14028BA	† Motorola		
	MC14028BC	Motorola		
	MC54HC42	† Motorola		
	MC74HC42	Motorola		
	CD4028BC	National		
	CD4028BM	† National		
	MM54C42	† National		170

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–CMOS (Cont'd)

Decoders (Cont'd)

Function	Device	Source		Line
BCD-to-Decimal (Cont'd)				
	MM54HC42	† National		
	MM74C42	National		
	MM74HC42	National		
	CD4028A	**† RCA**	**(748)**	
	CD4028AE	**RCA**	**(748)**	
	CD4028B	**† RCA**	**(748)**	
	CD4028BE	**RCA**	**(748)**	
	CD54HC42	**† RCA**	**(739)**	
	CD74HC42	**RCA**	**(739)**	
	SP74HC42	**SPI**	**(767)**	10
	HCC4028B	† SGS		
	HCF4028B	SGS		
	883/4028B	† SSS		
	SCL4028B	SSS		
	CM4028A	† Solitron		
	CM4028AE	Solitron		
	TC4028B	Toshiba		
	TC40H042	Toshiba		
BCD-to-7 Segment Decoder/Driver				
	MC14547BA	† Motorola		
	MC14547BC	Motorola		20
BCD-to-7-Segment				
	HD14558B	Hitachi		
	MC14558BA	† Motorola		
	MC14558BC	Motorola		
	MM54C48	† National		
	MM74C48	National		
	TC5002B	Toshiba		
Dual Binary to 1 of 4 Decoder/Demultiplexer (high)				
	F4555BC	Fairchild		
	F4555BM	† Fairchild		
	HD14555B	Hitachi		
	MC14555BA	† Motorola		30
	MC14555BC	Motorola		
	CD4555B	**† RCA**	**(749)**	
	CD4555BE	**RCA**	**(749)**	
	HCC4555B	† SGS		
	HCF4555B	SGS		
	883/4555B	† SSS		
	SCL4555B	SSS		
	TC4555B	Toshiba		
Dual Binary to 1 of 4 Decoder/Demultiplexer (low)				
	F4556BC	Fairchild		
	F4556BM	† Fairchild		40
	MC14556BA	† Motorola		
	MC14556BC	Motorola		
	CD4556B	**† RCA**	**(749)**	
	CD4556BE	**RCA**	**(749)**	
	HCC4556B	† SGS		
	HCF4556B	SGS		
	883/4556B	† SSS		
	SCL4556B	SSS		
	TC4556B	Toshiba		
Dual 2-Line to 4-Line Decoder/Demultiplexer				
	54HC139	**† Fairchild**	**(666)**	50
	74HC139	**Fairchild**	**(666)**	
	G74SC139	GTE Micro		
	G74SC239	GTE Micro		
	MD545C239	† Mitel		
	MD54SC139	**† Mitel**	**(697)**	
	MD54SC239	**† Mitel**	**(697)**	
	MD74SC139	**Mitel**	**(697)**	
	MD74SC239	**Mitel**	**(697)**	
	MC54HC139	† Motorola		
	MC74HC139	Motorola		60
	MM54HC139	† National		
	MM74HC139	National		
	MV74SC239	Plessey		
	CD54HC139	**† RCA**	**(739)**	
			(Continued)	

Function	Device	Source		Line
Dual 2-Line to 4-Line Decoder/Demultiplexer (Cont'd)				
	CD74HC139	**RCA**	**(739)**	
	SP74HC139	**SPI**	**(769)**	
	HS74C139	Supertex		
	HS74C239	Supertex		
	M54C139	† Supertex		
	M54C239	† Supertex		70
	S74C139	Supertex		
	S74C239	Supertex		
	TC40H139	Toshiba		
1 of 8 Strobed	883/4428B	† SSS		
	SCL4428B	SSS		
3-Line to 8-Line Decoder/Demultiplexer				
	54HC138	**† Fairchild**	**(666)**	
	74HC138	**Fairchild**	**(666)**	
	G74SC138	GTE Micro		
	G74SC238	GTE Micro		
	MD54SC138	**† Mitel**	**(697)**	80
	MD54SC238	**† Mitel**	**(697)**	
	MD74SC138	**Mitel**	**(697)**	
	MD74SC238	**Mitel**	**(697)**	
	MC54HC138	† Motorola		
	MC74HC138	Motorola		
	MM54HC138	† National		
	MM74HC138	National		
	MM74PC138	National		
	CD54HC138	**† RCA**	**(739)**	
	CD74HC138	**RCA**	**(739)**	90
	CDP1873C	**RCA**	**(1467)**	
	SP75HC138	SPI		
	HS74C138	Supertex		
	HS74C238	Supertex		
	M54C138	† Supertex		
	M54C238	† Supertex		
	S74C138	Supertex		
	S74C238	Supertex		
	TC40H138	Toshiba		
3-Line to 8-Line Decoder/Demultiplexer with Input Latches				
	G74SC137	GTE Micro		100
	G74SC237	GTE Micro		
	MD54SC137	**† Mitel**	**(697)**	
	MD54SC237	**† Mitel**	**(697)**	
	MD74SC137	**Mitel**	**(697)**	
	MD74SC237	**Mitel**	**(697)**	
	MV74SC137	Plessey		
	MV74SC237	Plessey		
	HS74C137	Supertex		
	HS74C237	Supertex		
	M54C137	† Supertex		110
	M54C237	† Supertex		
	S74C137	Supertex		
	S74C237	Supertex		
4-Bit Latch/4-to-16-Line Decoder (high)				
	F4514BC	Fairchild		
	F4514BM	† Fairchild		
	F4515BC	Fairchild		
	F4515BM	† Fairchild		
	HD14514B	Hitachi		
	HD14515B	Hitachi		
	MC14514BA	† Motorola		120
	MC14514BC	Motorola		
	MC14515BA	† Motorola		
	MC14515BC	Motorola		
	MC54HC4514	† Motorola		
	MC74HC4514	Motorola		
	CD4514BC	National		
	CD4514BM	† National		
	CD4515BC	National		
	CD4515BM	† National		
	MM54HC4514	† National		130
	MM74HC4514	National		
	CD4514B	**† RCA**	**(749)**	
			(Continued)	

Function	Device	Source		Line
4-Bit Latch/4-to-16-Line Decoder (high) (Cont'd)				
	CD4514BE	**RCA**	**(749)**	
	CD4515B	**† RCA**	**(749)**	
	CD4515BE	**RCA**	**(749)**	
	CD54HC4514	**† RCA**	**(739)**	
	CD74HC4514	**RCA**	**(739)**	
	HCC4514B	† SGS		
	HCC4515B	† SGS		
	HCF4514B	SGS		140
	HCF4515B	SGS		
	883/4514B	SSS		
	883/4515B	† SSS		
	SCL4514B	SSS		
	SCL4515B	SSS		
	CM4514B	Solitron		
	CM4514BE	Solitron		
	CM4515B	† Solitron		
	CM4515BE	Solitron		
	TC4514B	Toshiba		150
	TC4515B	Toshiba		
4-Line-to-16-Line DecoderDemultiplexer				
	54HC154	**† Fairchild**	**(666)**	
	54HC4514	**† Fairchild**	**(666)**	
	74HC154	**Fairchild**	**(666)**	
	74HC4514	**Fairchild**	**(666)**	
	MM54C154	† National		
	MM54HC154	† National		
	MM74C154	National		
	MM74HC154	National		
	CD54HC154	**† RCA**	**(739)**	160
	CD74HC154	**RCA**	**(739)**	
8 to 3-Line Priority Encoder				
	SP74HC148	**SPI**	**(769)**	
10 to 4-Line Priority Encoder				
	MC54HC147	† Motorola		
	MC74HC147	Motorola		
	SP74HC147	**SPI**	**(769)**	
10-Line-to-4-Line Priority Encoder				
	CD54HC147	**† RCA**	**(739)**	
	CD74HC147	**RCA**	**(739)**	

Drivers

Also See: Interface—Display Drivers, Memory and Peripheral Drivers

Bus, Bidirectional	**HD6432-2**	**† Harris**	**(1343)**	
	HD6432-9	**Harris**	**(1343)**	170
Bus, Latching	**HD6431-2**	**† Harris**	**(1343)**	
	HD6431-9	**Harris**	**(1343)**	
	HD6431A-2	**Harris**	**(1343)**	
	HD6431A-9	**Harris**	**(1343)**	
Bus Separator/Driver				
	HD6433-2	**† Harris**	**(1343)**	
	HD6433-9	**Harris**	**(1343)**	
Fluorescent Display, 4-Digit/8 Segment				
	COP470	National		
LCD, Dot Matrix				
	HLCD0488	Hughes		
	HLCD0538A	Hughes		
	HLCD0539A	Hughes		180
	HLCD0540	Hughes		
	HLCD0541	Hughes		
	HLCD0542	Hughes		
	HLCD0548	Hughes		
	HLCD0550	Hughes		
	HLCD0551	Hughes		
	HLCD0607	Hughes		

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–CMOS (Cont'd)

Drivers (Cont'd)

Function	Device	Source		Line
LCD, BCD-to-7-Segment Decoder/Driver with "Display Frequency Output"				
	CD4055B	**† RCA**	**(748)**	
	CD4055BE	**RCA**	**(748)**	
	HCC4055B	† SGS		
	HCF4055B	SGS		
	TC4055B	Toshiba		
LCD, BCD-to-7-Segment Decoder/Driver with Strobed-Latch Function				
	CD4056B	**† RCA**	**(748)**	
	CD4056BE	**RCA**	**(748)**	
	HCC4056B	† SGS		
	HCF4056B	SGS		
	TC4056B	Toshiba		10
LCD, BCD-to-7-Segment Latch/Decoder/Driver				
	HD14543B	Hitachi		
	MC14543BA	† Motorola		
	MC14543BC	Motorola		
	MC54HC4543	† Motorola		
	MC74HC4543	Motorola		
	CD4543BC	National		
	CD4543BM	† National		
	883/4543B	† SSS		
	SCL4543B	SSS		
	TC4543B	Toshiba		20
LCD, 4-Digit, Microprocessor Interface				
	ICM7211AM	Intersil		
	ICM7211M	Intersil		
	CD22105	**RCA**	**(749)**	
	CD22105A	**RCA**	**(749)**	
LCD, 4-Digit Multiplex Input				
	HLCD0437	Hughes		
LCD, 4-Digit, Multiplexed BCD to LCD Decoder/Driver, AC Drive	ICM7211	Intersil		
	ICM7211A	Intersil		
	CD22104	**RCA**	**(749)**	
	CD22104A	**RCA**	**(749)**	
	DF412	Siliconix		30
LCD, 4-Digit Serial Input				
	HLCD0438A	Hughes		
LCD, 4-Line	**CD4054B**	**† RCA**	**(748)**	
	CD4054BE	**RCA**	**(748)**	
	HCC4054B	† SGS		
	HCF4054B	SGS		
	TC4054B	Toshiba		
LED, 4-Digit Multiplexed BCD or Binary to 7-Segment Decoder/Driver				
	ICM7212	Intersil		
	ICM7212A	Intersil		
LED, 4-Digit BCD or Binary to 7-Segment Decoder/Driver, Data and Digit Select Input Latches for μP Interface				
	ICM7212AM	Intersil		
	ICM7212M	Intersil		40
LED, 4-Digit, 17-Segment Alphanumeric Display with Memory, Decoder				
	MM74C956	National		
BCD (hexadecimal) to 7-Segment Latch/Decoder/Driver				
	MC14495	Motorola		
	MV4311	Plessey		
BCD-to-7-Segment Latch/Decoder/Driver				
	F4511BC	Fairchild		
	F4511BM	† Fairchild		
	F4734BC	† Fairchild		
	F4734BM	Fairchild		
	HD14511B	Hitachi		
	MC14511BA	† Motorola		
	MC14511BC	Motorola		50
	MC14513BA	† Motorola		
	MC14513BC	Motorola		
	MC54HC4511	† Motorola		

(Continued)

Function	Device	Source		Line
BCD-to-7-Segment Latch/Decoder/Driver				(Cont'd)
	MC74HC4511	Motorola		
	CD4511BC	National		
	CD4511BM	† National		
	MM54HC4511	† National		
	MM54HC4543	† National		
	MM74HC4511	National		
	MM74HC4543	National		60
	CD4511B	**† RCA**	**(749)**	
	CD4511BE	**RCA**	**(749)**	
	CD54HC4511	**† RCA**	**(739)**	
	CD74HC4511	**RCA**	**(739)**	
	HCC4511B	† SGS		
	HCF4511B	SGS		
	883/4511B	† SSS		
	SCL4511B	SSS		
	CM4511B	† Solitron		
	CM4511BE	Solitron		70
	TC4511B	Toshiba		
	TC5022B	Toshiba		
	TC5042B	Toshiba		
Dual and Quad Line Drivers-See Miscellaneous				
Dual High Voltage, Source 250 MA				
	MM74C908	National		
	MM74C918	National		
Hex Buffer/Driver, Three-State				
	HD6495-2	**† Harris**	**(1344)**	
	HD6495-9	**Harris**	**(1344)**	
One-of-Eight Decoder/Driver, Latched				
	HD6440-2	**† Harris**	**(1344)**	
	HD6440-9	**Harris**	**(1344)**	80
4-Digit Display (stores segment and address data, drives 7-8 segment digits)				
	MM74C911	**National**	**(735)**	
6-Digit BCD Display (stores segment and address data, drives 7-8 segment digits)				
	MM74C912	**National**	**(735)**	
6-Digit Hex Display (stores segment and address data, drives 7-segment digits)				
	MM74C917	**National**	**(735)**	
7-Segment to BCD Converter/Driver				
	MM54C915	† National		
	MM74C915	National		

Flip-Flops, D-Type

Function	Device	Source		Line
Dual	**54HC74**	**† Fairchild**	**(666)**	
	74HC74	**Fairchild**	**(666)**	
	F4013BC	Fairchild		
	F4013BM	† Fairchild		
	HD14013B	Hitachi		90
	MC14013BA	† Motorola		
	MC14013BC	Motorola		
	MC54HC74	† Motorola		
	MC74HC74	Motorola		
	CD4013BC	National		
	CD4013BM	† National		
	MM54C74	† National		
	MM54HC74	† National		
	MM74C74	National		
	MM74HC74	National		100
	MM74PC74	National		
	CD4013A	**† RCA**	**(748)**	
	CD4013AE	**RCA**	**(748)**	
	CD4013B	**† RCA**	**(748)**	
	CD4013BE	**RCA**	**(748)**	
	CD54HC74	**† RCA**	**(739)**	
	CD74HC74	**RCA**	**(739)**	
	LC4013B	Sanyo		
	SP74HC74	**SPI**	**(767)**	
	HCC4013B	† SGS		110

(Continued)

Function	Device	Source		Line
Dual				(Cont'd)
	HCF4013B	SGS		
	883/4013B	† SSS		
	SCL4013B	SSS		
	CM4013A	† Solitron		
	CM4013AE	Solitron		
	CM4013B	† Solitron		
	CM4013BE	Solitron		
	TC4013B	Toshiba		
	TC40H074	Toshiba		
Quad Three-State				
	54HC173	**† Fairchild**	**(665)**	120
	74HC173	**Fairchild**	**(665)**	
	F4076BC	Fairchild		
	F4076BM	† Fairchild		
	HD14076B	Hitachi		
	MC14076BA	Motorola		
	MC14076BC	Motorola		
	MC54HC173	† Motorola		
	MC74HC173	Motorola		
	CD4076BC	National		
	CD4076BM	† National		130
	MM54C173	† National		
	MM74C173	National		
	CD4076B	**† RCA**	**(748)**	
	CD4076BE	**RCA**	**(748)**	
	CD54HC173	**† RCA**	**(739)**	
	CD74HC173	**RCA**	**(739)**	
	HCC4076B	† SGS		
	HCF4076B	SGS		
	883/4076B	† SSS		
	SCL4076B	SSS		140
	CM4076A	† Solitron		
	CM4076AE	Solitron		
	TC4076B	Toshiba		
Quad	**54HC175**	**† Fairchild**	**(666)**	
	74HC175	**Fairchild**	**(666)**	
	F40175BC	Fairchild		
	F40175BM	† Fairchild		
	HD14175B	Hitachi		
	MC14175BA	† Motorola		
	MC14175BC	Motorola		150
	MC54HC175	† Motorola		
	MC74HC175	Motorola		
	CD40175B	National		
	MM54C175	† National		
	MM54HC175	† National		
	MM74C175	National		
	MM74HC175	National		
	CD54HC175	**† RCA**	**(739)**	
	CD74HC175	**RCA**	**(739)**	
	SP74HC175	**SPI**	**(770)**	160
	TC40175B	Toshiba		
	TC40H175	Toshiba		
Hex	F40174BC	Fairchild		
	F40174BM	† Fairchild		
	HD14174B	Hitachi		
	MC14174BA	† Motorola		
	MC14174BC	Motorola		
	MC54HC174	† Motorola		
	MC74HC174	† Motorola		
	CD40174BC	National		170
	CD40174BM	† National		
	MM54C174	† National		
	MM74C174	National		
	CD40174B	**† RCA**	**(749)**	
	CD40174BE	**RCA**	**(749)**	
	CD54HC174	**† RCA**	**(739)**	
	CD74HC174	**† RCA**	**(739)**	
	SP74HC174	**SPI**	**(770)**	
	HCC40174B	† SGS		
	HCF40174B	SGS		180
	883/4174B	† SSS		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–CMOS (Cont'd)

Flip-Flops, D-Type (Cont'd)

Function	Device	Source		Line
Hex			(Cont'd)	
	SCL4174B	SSS		
	TC40174B	Toshiba		
	TC40H174	Toshiba		
Octal Edge-Triggered with Clear				
	54HC273	**† Fairchild**	**(665)**	
	74HC273	**Fairchild**	**(665)**	
Octal, TTL Input, Three-State				
	MM54HC4304	† National		
	MM74HC4304	National		
Octal, TTL Input, Three-State, Inverting				
	MM54HC4303	† National		
	MM74HC4303	National		
Octal Three-State, Inverting				
	54HC534	**† Fairchild**	**(666)**	10
	54HC564	**† Fairchild**	**(666)**	
	74HC534	**Fairchild**	**(666)**	
	74HC564	**Fairchild**	**(666)**	
	MM54HC534	† National		
	MM54HC564	† National		
	MM74HC534	National		
	MM74HC564	National		
	CD54HC534	**† RCA**	**(739)**	
	CD54HC564	**† RCA**	**(739)**	
	CD74HC534	**RCA**	**(739)**	20
	CD74HC564	**RCA**	**(739)**	
	HS74C534	Supertex		
	HS74C564	Supertex		
	M54C534	† Supertex		
	M54C564	† Supertex		
	S74C534	Supertex		
	S74C564	Supertex		
Octal Three-State, Non-Inverting				
	54HC374	**† Fairchild**	**(666)**	
	54HC574	**† Fairchild**	**(666)**	
	74HC374	**Fairchild**	**(666)**	30
	74HC574	**Fairchild**	**(666)**	
	G74SC374	GTE Micro		
	MD54SC374	**† Mitel**	**(710)**	
	MD54SC574	**† Mitel**	**(710)**	
	MD74SC374	**Mitel**	**(710)**	
	MD74SC574	**Mitel**	**(710)**	
	MC54HC374	† Motorola		
	MC54HC574	† Motorola		
	MC74HC374	Motorola		
	MC74HC574	Motorola		40
	MM54C374	† National		
	MM54HC374	† National		
	MM54HC574	† National		
	MM74C374	National		
	MM74HC374	National		
	MM74HC574	National		
	MV74SC374	Plessey		
	MV74SC574	Plessey		
	CD54HC374	**† RCA**	**(739)**	
	CD54HC574	**† RCA**	**(739)**	50
	CD74HC374	**RCA**	**(739)**	
	CD74HC574	**RCA**	**(739)**	
	SP54SC374	† SPI		
	SP54SC574	† SPI		
	SP74SC374	**SPI**	**(761)**	
	SP74SC574	**SPI**	**(761)**	
	HS74C374	Supertex		
	HS74C574	Supertex		
	M54C374	† Supertex		
	M54C574	† Supertex		60
	S74C374	Supertex		
	S74C574	Supertex		

Flip-Flops, J-K Type

Function	Device	Source		Line
AND-Gated Master-Slave				
	CD4095B	**† RCA**	**(748)**	
	CD4095BE	**RCA**	**(748)**	
	CD4096B	**† RCA**	**(748)**	
	CD4096BE	**RCA**	**(748)**	
	HCF4095B	RCA		
	HCC4095B	† SGS		
	HCC4096B	† SGS		
	HCF4096B	SGS		70
Dual Negative Edge-Triggered, Separate Preset and Clock				
	SP74HC113	**SPI**	**(768)**	
Dual Negative Edge-Triggered with Preset and Clear				
	MC54HC112	† Motorola		
	MC74HC112	Motorola		
	SP74HC112	**SPI**	**(768)**	
Dual w/o Preset				
	MC54HC107	† Motorola		
	MC54HC73	† Motorola		
	MC74HC107	Motorola		
	MC74HC73	Motorola		
	MM54C107	† National		
	MM54C73	† National		80
	MM54HC107	† National		
	MM74C107	National		
	MM74C73	National		
	MM74HC107	National		
	CD54HC107	**† RCA**	**(739)**	
	CD54HC73	**† RCA**	**(739)**	
	CD74HC107	**RCA**	**(739)**	
	CD74HC73	**RCA**	**(739)**	
	SP74HC107	**SPI**	**(768)**	
	SP74HC73	**SPI**	**(767)**	90
	TC40H107	Toshiba		
	TC40H107A	Toshiba		
Dual	**54HC109**	**† Fairchild**	**(666)**	
	54HC112	**† Fairchild**	**(666)**	
	54HC76	**† Fairchild**	**(666)**	
	74HC109	**Fairchild**	**(666)**	
	74HC112	**Fairchild**	**(666)**	
	74HC76	**Fairchild**	**(666)**	
	F4027BC	Fairchild		
	F4027BM	† Fairchild		100
	HD14027B	Hitachi		
	MC14027BA	† Motorola		
	MC14027BC	Motorola		
	MC54HC109	† Motorola		
	MC54HC76	† Motorola		
	MC74HC109	Motorola		
	MC74HC76	Motorola		
	CD4027BC	National		
	CD4027BM	† National		
	MM54C76	† National		110
	MM54HC109	† National		
	MM54HC112	† National		
	MM54HC76	† National		
	MM74C76	National		
	MM74HC109	National		
	MM74HC112	National		
	MM74HC76	National		
	CD4027A	**† RCA**	**(748)**	
	CD4027AE	**RCA**	**(748)**	
	CD4027B	**† RCA**	**(748)**	120
	CD4027BE	**RCA**	**(748)**	
	CD54HC109	**† RCA**	**(739)**	
	CD54HC112	**† RCA**	**(739)**	
	CD54HC76	**† RCA**	**(739)**	
	CD74HC109	**RCA**	**(739)**	
	CD74HC112	**RCA**	**(739)**	
	CD74HC76	**RCA**	**(739)**	
	SP74HC109	**SPI**	**(768)**	
	SP74HC76	**SPI**	**(767)**	
			(Continued)	

Function	Device	Source		Line
Dual			(Cont'd)	
	HCC4027B	† SGS		130
	HCF4027B	SGS		
	883/4027B	† SSS		
	SCL4027B	SSS		
	CM4027A	† Solitron		
	CM4027AE	Solitron		
	TC4027B	Toshiba		
	TC7476B	Toshiba		

Gates, AND

Function	Device	Source		Line
Dual 4-Input	F4082BC	Fairchild		
	F4082BM	† Fairchild		
	HD14082B	Hitachi		140
	MC14082BA	† Motorola		
	MC14082BC	Motorola		
	CD4082BC	National		
	CD4082BM	† National		
	CD4082B	**† RCA**	**(748)**	
	CD4082BE	**RCA**	**(748)**	
	HCC4082B	† SGS		
	HCF4082B	SGS		
	883/4082B	† SSS		
	SCL4082B	SSS		150
	TC4082B	Toshiba		
	TC40H021	Toshiba		
Triple 3-Input	F4073BC	Fairchild		
	F4073BM	† Fairchild		
	HD14073B	Hitachi		
	MC14073BA	† Motorola		
	MC14073BC	Motorola		
	MC54HC11	† Motorola		
	MC74HC11	Motorola		
	CD4073BC	National		160
	CD4073BM	† National		
	CD4073B	**† RCA**	**(748)**	
	CD4073BE	**RCA**	**(748)**	
	CD54HC11	**† RCA**	**(740)**	
	CD74HC11	**RCA**	**(740)**	
	SP74HC11	**SPI**	**(766)**	
	HCC4073B	† SGS		
	HCF4073B	SGS		
	883/4073B	† SSS		
	SCL4073B	SSS		170
	CM4073A	† Solitron		
	CM4073AE	Solitron		
	TC40H011	Toshiba		
Quad 2-Input	**54HC08**	**† Fairchild**	**(665)**	
	74HC08	**Fairchild**	**(665)**	
	F4081BC	Fairchild		
	F4081BM	† Fairchild		
	HD14081B	Hitachi		
	MC14081BA	† Motorola		
	MC14081BC	Motorola		180
	MC54HC08	† Motorola		
	MC74HC08	Motorola		
	CD4081BC	National		
	CD4081BM	† National		
	MM54C08	† National		
	MM54HC08	† National		
	MM74C08	National		
	MM74HC08	National		
	MM74PC08	National		
	CD4081B	**† RCA**	**(748)**	190
	CD4081BE	**RCA**	**(748)**	
	CD54HC08	**† RCA**	**(740)**	
	CD74HC08	**RCA**	**(740)**	
	LC4081B	Sanyo		
	HCC4081B	† SGS		
	HCF4081B	SGS		
	883/4081B	† SSS		
	SCL4081B	SSS		
			(Continued)	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL-CMOS (Cont'd)

Gates, AND (Cont'd)

Function	Device	Source		Line
Quad 2-Input			(Cont'd)	
	CM4081A	† Solitron		
	CM4081AE	Solitron		
	TC4081B	Toshiba		
	TC40H008	Toshiba		

Gates, NAND

Function	Device	Source		Line
Dual 2-Input (Driver)				
	CD40107B	**† RCA**	**(749)**	
	CD40107BE	**RCA**	**(749)**	
	HCC40107B	† SGS		
	HCF40107B	SGS		
Dual 4-Input Expandable				
	883/4412B	† SSS		
	SCL4412B	SSS		10
Dual 4-Input	**54HC20**	**† Fairchild**	**(665)**	
	74HC20	**Fairchild**	**(665)**	
	F4012BC	Fairchild		
	F4012BM	† Fairchild		
	HD14012B	Hitachi		
	MC14012BA	† Motorola		
	MC14012BC	Motorola		
	MC14012UBA	† Motorola		
	MC14012UBC	Motorola		
	MC54HC20	† Motorola		20
	MC74HC20	Motorola		
	CD4012A	National		
	CD4012BC	National		
	CD4012BM	† National		
	MM54C20	† National		
	MM74C20	National		
	CD4012A	**† RCA**	**(748)**	
	CD4012AE	**RCA**	**(748)**	
	CD4012B	**† RCA**	**(748)**	
	CD4012BE	**RCA**	**(748)**	30
	CD4012UB	**† RCA**	**(748)**	
	CD4012UBE	**RCA**	**(748)**	
	CD54HC20	**† RCA**	**(740)**	
	CD74HC20	**RCA**	**(740)**	
	SP74HC20	**SPI**	**(766)**	
	HCC4012B	† SGS		
	HCF4012B	SGS		
	883/4012B	† SSS		
	SCL4012B	SSS		
	CM4012A	† Solitron		40
	CM4012AE	Solitron		
	TC4012B	Toshiba		
	TC40H020	Toshiba		
	TC7420B	Toshiba		
Triple 3-Input	**54HC10**	**† Fairchild**	**(665)**	
	74HC10	**Fairchild**	**(665)**	
	F4023BC	Fairchild		
	F4023BM	† Fairchild		
	HD14023B	Hitachi		
	MC14023BA	† Motorola		50
	MC14023BC	Motorola		
	MC14023UBA	† Motorola		
	MC14023UBC	Motorola		
	MC54HC10	† Motorola		
	MC74HC10	Motorola		
	CD4023BC	National		
	CD4023BM	† National		
	MM54C10	† National		
	MM54HC10	† National		
	MM54HC20	† National		60
	MM74C10	National		
	MM74HC10	National		
	MM74HC20	National		
	CD4023A	**† RCA**	**(748)**	
	CD4023AE	**RCA**	**(748)**	
			(Continued)	

Function	Device	Source		Line
Triple 3-Input			(Cont'd)	
	CD4023B	**† RCA**	**(748)**	
	CD4023BE	**RCA**	**(748)**	
	CD4023UB	**† RCA**	**(748)**	
	CD4023UBE	**RCA**	**(748)**	
	CD54HC10	**† RCA**	**(740)**	70
	CD74HC10	**RCA**	**(740)**	
	SP74HC10	**SPI**	**(766)**	
	HCC4023B	† SGS		
	HCF4023B	SGS		
	883/4023B	† SSS		
	SCL4023B	SSS		
	CM4023A	† Solitron		
	CM4023AE	Solitron		
	TC4023B	Toshiba		
	TC40H010	Toshiba		80
	TC7410B	Toshiba		
Quad 2-Input (open drain)				
	MC54HC03	† Motorola		
	MC74HC03	Motorola		
	TC5029B	Toshiba		
	TC5030B	Toshiba		
Quad 2-Input	**54HC00**	**† Fairchild**	**(665)**	
	74HC00	**Fairchild**	**(665)**	
	F4011BC	Fairchild		
	F4011BM	† Fairchild		
	HD14011B	Hitachi		90
	MC14011BA	† Motorola		
	MC14011BC	Motorola		
	MC14011UBA	† Motorola		
	MC14011UBC	Motorola		
	MC54HC00	**† Motorola**	**(733)**	
	MC74HC00	**Motorola**	**(733)**	
	CD4011AC	National		
	CD4011AM	† National		
	CD4011BC	National		
	CD4011BM	† National		100
	MM54C00	† National		
	MM54HC00	† National		
	MM74C00	National		
	MM74HC00	National		
	MM74PC00	National		
	CD4011A	**RCA**	**(748)**	
	CD4011AE	**RCA**	**(748)**	
	CD4011B	**† RCA**	**(748)**	
	CD4011BE	**RCA**	**(748)**	
	CD4011UB	**† RCA**	**(748)**	110
	CD4011UBE	**RCA**	**(748)**	
	CD54HC00	**† RCA**	**(740)**	
	CD74HC00	**RCA**	**(740)**	
	LC4011B	Sanyo		
	SP74HC00	**SPI**	**(766)**	
	HCC4011B	† SGS		
	HCF4011B	SGS		
	883/4011B	† SSS		
	883/4011UB	† SSS		
	SCL4011B	SSS		120
	SCL4011UB	SSS		
	CM4011A	† Solitron		
	CM4011AE	Solitron		
	CM4011B	† Solitron		
	CM4011BE	Solitron		
	TC4011B	Toshiba		
	TC4011UB	Toshiba		
	TC40H000	Toshiba		
	TC7400B	Toshiba		
8-Input	**54HC30**	**† Fairchild**	**(665)**	130
	74HC30	**Fairchild**	**(665)**	
	F4068BC	Fairchild		
	F4068BM	† Fairchild		
	HD14068B	Hitachi		
	MC14068BA	† Motorola		
	MC14068BC	Motorola		
			(Continued)	

Function	Device	Source		Line
8-Input			(Cont'd)	
	MC54HC30	† Motorola		
	MC74HC30	Motorola		
	MM54C30	† National		
	MM54HC30	† National		140
	MM74C30	National		
	MM74HC30	National		
	CD4068B	**† RCA**	**(748)**	
	CD4068BE	**RCA**	**(748)**	
	CD54HC30	**† RCA**	**(740)**	
	CD74HC30	**RCA**	**(740)**	
	SP74HC30	**SPI**	**(767)**	
	HCC4068B	† SGS		
	HCF4068B	SGS		
	883/4068B	† SSS		150
	SCL4068B	SSS		
	CM4068A	† Solitron		
	CM4068AE	Solitron		
	TC4068B	Toshiba		
13-Input	**54HC133**	**† Fairchild**	**(665)**	
	74HC133	**Fairchild**	**(665)**	
	MM54HC133	† National		
	MM74HC133	National		
	CD54HC133	**† RCA**	**(740)**	
	CD74HC133	**RCA**	**(740)**	160

Gates, AND-OR

Function	Device	Source		Line
Triple Bi-Phase Pairs				
	CD4037A	**† RCA**	**(748)**	
	CD4037AE	**RCA**	**(748)**	
	CM4037A	† Solitron		
	CM4037AE	Solitron		
Quad Select	F4019BC	Fairchild		
	F4019BM	† Fairchild		
	HD14519B	Hitachi		
	CD4019BC	National		
	CD4019BM	† National		
	CD4019A	**† RCA**	**(748)**	170
	CD4019AE	**RCA**	**(748)**	
	CD4019B	**† RCA**	**(748)**	
	CD4019BE	**RCA**	**(748)**	
	HCC4019B	† SGS		
	HCF4019B	SGS		
	883/4019B	† SSS		
	SCL4019B	SSS		
	CM4019A	† Solitron		
	CM4019AE	Solitron		
	TC4019B	Toshiba		180
2-Wide, 2-Input/2-Wide, 3-Input				
	MC54HC58	† Motorola		
	MC74HC58	Motorola		

Gates, AND-OR-Invert

Function	Device	Source		Line
Dual 2-Wide 2-Input				
	F4085BC	Fairchild		
	F4085BM	Fairchild		
	HD14506B	Hitachi		
	MC14506BA	† Motorola		
	MC14506BC	Motorola		
	CD4085B	**† RCA**	**(748)**	
	CD4085BE	**RCA**	**(748)**	
	HCC4085B	† SGS		190
	HCF4085B	SGS		
	883/4085B	† SSS		
	SCL4085B	SSS		
	TC4085B	Toshiba		
	TC40H051	Toshiba		
2-Wide, 2-Input/2-Wide, 3-Input				
	MC54HC51	† Motorola		
	MC74HC51	Motorola		

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–CMOS (Cont'd)

Gates, AND-OR-Invert (Cont'd)

Function	Device	Source		Line
4-Wide 2-Input Expandable				
	F4086BC	Fairchild		
	F4086BM	† Fairchild		
	CD4086B	**† RCA**	**(748)**	
	CD4086BE	**RCA**	**(748)**	
	HCC4086B	† SGS		
	HCF4086B	SGS		
	883/4086B	† SSS		
	SCL4086B	SSS		
	TC4086B	Toshiba		

Gates, OR

Function	Device	Source		Line
Dual 4-Input	F4072BC	Fairchild		10
	F4072BM	† Fairchild		
	HD14072B	Hitachi		
	MC14072BA	† Motorola		
	MC14072BC	Motorola		
	CD4072BC	National		
	CD4072BM	† National		
	CD4072B	**† RCA**	**(748)**	
	CD4072BE	**RCA**	**(748)**	
	HCC4072B	† SGS		
	HCF4072B	SGS		20
	883/4072B	† SSS		
	SCL4072B	SSS		
	TC4072B	Toshiba		
Triple 3-Input	F4075BC	Fairchild		
	F4075BM	† Fairchild		
	HD14075B	Hitachi		
	MC14075BA	† Motorola		
	MC14075BC	Motorola		
	MC54HC4075	† Motorola		
	MC74HC4075	Motorola		30
	CD4075BC	National		
	CD4075BM	† National		
	MM54HC266	† National		
	MM74HC266	National		
	CD4075B	**† RCA**	**(748)**	
	CD4075BE	**RCA**	**(748)**	
	HCC4075B	† SGS		
	HCF4075B	SGS		
	883/4075B	† SSS		
	SCL4075B	SSS		40
	TC4075B	Toshiba		
Quad 2-Input	**54HC32**	**† Fairchild**	**(665)**	
	74HC32	**Fairchild**	**(665)**	
	F4071BC	Fairchild		
	F4071BM	† Fairchild		
	HD14071B	Hitachi		
	MC14071BA	† Motorola		
	MC14071BC	Motorola		
	MC54HC32	† Motorola		
	MC74HC32	Motorola		50
	CD4071BC	National		
	CD4071BM	† National		
	MM54C32	† National		
	MM54HC32	† National		
	MM74C32	National		
	MM74HC32	National		
	CD4071B	**† RCA**	**(748)**	
	CD4071BE	**RCA**	**(748)**	
	CD54HC32	**† RCA**	**(740)**	
	CD74HC32	**RCA**	**(740)**	60
	LC4071B	Sanyo		
	SP74HC32	**SPI**	**(767)**	
	HCC4071B	† SGS		
	HCF4071B	SGS		
	883/4071B	† SSS		
	SCL4071B	SSS		
	CM4071A	† Solitron		

(Continued)

Function	Device	Source		Line
Quad 2-Input			(Cont'd)	
	CM4071AE	Solitron		
	TC4071B	Toshiba		
	TC40H032	Toshiba		70

Gates, NOR

Function	Device	Source		Line
Dual 3-Input plus Inverter				
	MC14000UBA	**† Motorola**	**(729)**	
	MC14000UBC	**Motorola**	**(729)**	
	CD4000C	National		
	CD4000M	† National		
	CD4000A	**† RCA**	**(407,748)**	
	CD4000AE	**RCA**	**(407,748)**	
	CD4000B	**RCA**	**(407,748)**	
	CD4000BE	**RCA**	**(407,748)**	
	CD4000UB	**† RCA**	**(407,748)**	
	CD4000UBE	**RCA**	**(407,748)**	80
	HCC4000B	† SGS		
	HCF4000B	SGS		
	883/4000B	† SSS		
	SCL4000B	SSS		
	CM4000A	Solitron		
	CM4000AE	Solitron		
Dual 4-Input	F4002BC	Fairchild		
	F4002BM	† Fairchild		
	HD14002B	Hitachi		
	MC14002BA	† Motorola		90
	MC14002BC	Motorola		
	MC14002UBA	† Motorola		
	MC14002UBC	Motorola		
	MC54HC4002	† Motorola		
	MC74HC4002	Motorola		
	CD4002A	National		
	CD4002BC	National		
	CD4002BM	† National		
	MM54HC4002	† National		
	MM74HC4002	National		100
	CD4002A	**† RCA**	**(748)**	
	CD4002AE	**RCA**	**(748)**	
	CD4002B	**† RCA**	**(748)**	
	CD4002BE	**RCA**	**(748)**	
	CD4002UB	**† RCA**	**(748)**	
	CD4002UBE	**RCA**	**(748)**	
	CD54HC4002	**† RCA**	**(740)**	
	CD74HC4002	**RCA**	**(740)**	
	HCC4002B	† SGS		
	HCF4002B	SGS		110
	883/4002B	† SSS		
	SCL4002B	SSS		
	CM4002A	† Solitron		
	CM4002AE	Solitron		
	TC4002B	Toshiba		
Triple 3-Input	**54HC27**	**† Fairchild**	**(665)**	
	74HC27	**Fairchild**	**(665)**	
	F4025BC	Fairchild		
	F4025BM	† Fairchild		
	HD14025B	Hitachi		120
	MC14025BA	† Motorola		
	MC14025BC	Motorola		
	MC14025UBA	† Motorola		
	MC14025UBC	Motorola		
	MC54HC27	† Motorola		
	MC74HC27	Motorola		
	CD4025A	National		
	CD4025BC	National		
	CD4025BM	† National		
	MM54HC27	† National		130
	MM74HC27	National		
	CD4025A	**† RCA**	**(748)**	
	CD4025AE	**RCA**	**(748)**	
	CD4025B	**† RCA**	**(748)**	
	CD4025BE	**RCA**	**(748)**	

(Continued)

Function	Device	Source		Line
Triple 3-Input			(Cont'd)	
	CD4025UB	**† RCA**	**(748)**	
	CD4025UBE	**RCA**	**(748)**	
	CD54HC27	**† RCA**	**(740)**	
	CD74HC27	**RCA**	**(740)**	
	SP74HC27	**SPI**	**(766)**	140
	HCC4025B	† SGS		
	HCF4025B	SGS		
	883/4025B	† SSS		
	SCL4025B	SSS		
	CM4025A	Solitron		
	CM4025AE	Solitron		
	TC4025B	Toshiba		
	TC40H027	Toshiba		
Quad 2-Input	**54HC02**	**† Fairchild**	**(665)**	
	74HC02	**Fairchild**	**(665)**	150
	F4001BC	Fairchild		
	F4001BM	† Fairchild		
	HD14001B	Hitachi		
	MC14001BA	† Motorola		
	MC14001BC	Motorola		
	MC14001UBA	† Motorola		
	MC14001UBC	Motorola		
	MC54HC02	† Motorola		
	MC74HC02	Motorola		
	CD4001A	National		160
	CD4001BC	National		
	CD4001BM	† National		
	MM54C02	† National		
	MM54HC02	† National		
	MM74C02	National		
	MM74HC02	National		
	MM74PC02	National		
	CD4001A	**† RCA**	**(748)**	
	CD4001AE	**RCA**	**(748)**	
	CD4001B	**† RCA**	**(748)**	170
	CD4001BE	**RCA**	**(748)**	
	CD4001UB	**† RCA**	**(748)**	
	CD4001UBE	**RCA**	**(748)**	
	CD54HC02	**† RCA**	**(740)**	
	CD74HC02	**RCA**	**(740)**	
	LC4001B	Sanyo		
	SP74HC02	**SPI**	**(766)**	
	HCC4001B	† SGS		
	HCF4001B	SGS		
	883/4001B	† SSS		180
	883/4001UB	† SSS		
	SCL4001B	SSS		
	SCL4001UB	SSS		
	CM4001A	† Solitron		
	CM4001AE	Solitron		
	CM4001B	† Solitron		
	CM4001BE	Solitron		
	TC4001B	Toshiba		
	TC4001UB	Toshiba		
	TC40H002	Toshiba		190
8-Input	F4078BC	Fairchild		
	F4078BM	† Fairchild		
	HD14078B	Hitachi		
	MC14078BA	† Motorola		
	MC14078BC	Motorola		
	MC54HC407B	† Motorola		
	MC74HC4078	Motorola		
	MM54HC4018	† National		
	MM74HC4018	National		
	CD4078B	**† RCA**	**(748)**	200
	CD4078BE	**RCA**	**(748)**	
	HCC4078B	† SGS		
	HCF4078B	SGS		
	883/4078B	† SSS		
	SCL4078B	SSS		
	883/4402B	† Solitron		
	CM4078A	† Solitron		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL-CMOS (Cont'd)

Gates, NOR (Cont'd)

Function	Device	Source		Line
8-Input			(Cont'd)	
	CM4078AE	Solitron		
	SCL4402B	Solitron		
	TC4078B	Toshiba		

Gates, Exclusive OR

Function	Device	Source		Line
Quad	**54HC86**	**† Fairchild**	**(665)**	
	74HC86	**Fairchild**	**(665)**	
	F4030BC	Fairchild		
	F4030BM	† Fairchild		
	F4070BC	Fairchild		
	F4070BM	† Fairchild		
	HD14070B	Hitachi		10
	MC14070BA	† Motorola		
	MC14070BC	Motorola		
	MC54HC86	† Motorola		
	MC74HC86	Motorola		
	CD4030A	National		
	CD4070BC	National		
	CD4070BM	† National		
	CD4507BC	National		
	CD4507BM	† National		
	MM54C86	† National		20
	MM54HC86	† National		
	MM74C86	National		
	MM74HC86	National		
	CD4030A	**† RCA**	**(748)**	
	CD4030AE	**RCA**	**(748)**	
	CD4030B	**† RCA**	**(748)**	
	CD4030BE	**RCA**	**(748)**	
	CD4070B	**† RCA**	**(748)**	
	CD4070BE	**RCA**	**(748)**	
	CD54HC86	**† RCA**	**(740)**	30
	CD74HC86	**RCA**	**(740)**	
	SP74HC86	**SPI**	**(767)**	
	HCC4030B	† SGS		
	HCC4070B	† SGS		
	HCF4030B	SGS		
	HCF4070B	SGS		
	883/4030B	† SSS		
	883/4070B	† SSS		
	SCL4030B	SSS		
	SCL4070B	SSS		40
	CM4030A	† Solitron		
	CM4030AE	Solitron		
	CM4070A	† Solitron		
	CM4070AE	Solitron		
	TC4030B	Toshiba		

Gates, Exclusive NOR

Function	Device	Source		Line
Quad	F4077BC	Fairchild		
	F4077BM	† Fairchild		
	HD14077B	Hitachi		
	MC14077BA	† Motorola		
	MC14077BC	Motorola		50
	MC54HC266	† Motorola		
	MC74HC266	Motorola		
	CD4077B	**† RCA**	**(748)**	
	CD4077BE	**RCA**	**(748)**	
	CD54HC266	**† RCA**	**(740)**	
	CD74HC266	**RCA**	**(740)**	
	SP74HC266	**SPI**	**(771)**	
	HCC4077B	† SGS		
	HCF4077B	SGS		
	883/4077B	† SSS		60
	SCL4077B	SSS		
	CM4077A	† Solitron		
	CM4077AE	Solitron		

Gates, Miscellaneous

Function	Device	Source		Line
Dual 5-Input Majority Logic	MC14530BA	† Motorola		
	MC14530BC	Motorola		
Triple (dual 4-input NAND and 2-input OR/NOR)	HD14501	Hitachi		
	MC14501UBA	† Motorola		
	MC14501UBC	Motorola		
Hex Function (quad inverter plus 2-input NOR gate plus 2-input NAND gate)	HD14572	Hitachi		
	MC14572A	† Motorola		70
	MC14572C	Motorola		
8-Input Expandable Multifunction	CD4048BC	National		
	CD4048BM	† National		
	CD4048A	**† RCA**	**(748)**	
	CD4048AE	**RCA**	**(748)**	
	CD4048B	**† RCA**	**(748)**	
	CD4048BE	**RCA**	**(748)**	
	HCC4048B	† SGS		
	HCF4048B	SGS		
	883/4402B	† SSS		80
	SCL4402B	SSS		
	CM4048A	† Solitron		
	CM4048AE	Solitron		

Latches

Function	Device	Source		Line
Dual 4-Bit Addressable	F4723BC	Fairchild		
	F4723BM	† Fairchild		
	CD4723BC	National		
	CD4723BM	National		
Dual 4-Bit	HD14508B	Hitachi		
	MC14508BA	† Motorola		
	MC14508BC	Motorola		90
	MC54HC77	† Motorola		
	MC74HC77	Motorola		
	MN1201	Panasonic		
	CD4508B	**† RCA**	**(749)**	
	CD4508BE	**RCA**	**(749)**	
	HCC4508B	† SGS		
	HCF4058B	SGS		
	883/4508B	† SSS		
	SCL4508B	SSS		
	CM4508	Solitron		100
	TC4508B	Toshiba		
Quad, Bistable	TC40H375	Toshiba		
Quad Clocked D	**54HC75**	**† Fairchild**	**(665)**	
	74HC75	**Fairchild**	**(665)**	
	F4042BC	Fairchild		
	F4042BM	† Fairchild		
	HD14042B	Hitachi		
	MC14042BA	† Motorola		
	MC14042BC	Motorola		
	MC54HC75	† Motorola		110
	MC74HC75	Motorola		
	CD4042BC	National		
	CD4042BM	† National		
	MM54HC75	† National		
	MM74HC75	National		
	CD4042A	**† RCA**	**(748)**	
	CD4042AE	**RCA**	**(748)**	
	CD4042B	**† RCA**	**(748)**	
	CD4042BE	**RCA**	**(748)**	
	HCC4042B	† SGS		120
	HCF4042B	SGS		
	883/4042B	† SSS		
	SCL4042B	SSS		
	CM4042A	† Solitron		

(Continued)

Function	Device	Source		Line
Quad Clocked D			(Cont'd)	
	CM4042AE	Solitron		
	TC4042B	Toshiba		
Quad NAND R/S	F4044BC	Fairchild		
	F4044BM	† Fairchild		
	HD14044B	Hitachi		
	MC14044BA	† Motorola		130
	MC14044BC	Motorola		
	CD4044A	National		
	CD4044BC	National		
	CD4044BM	† National		
	CD4044A	**† RCA**	**(748)**	
	CD4044A/B	**† RCA**	**(748)**	
	CD4044A/BE	**RCA**	**(748)**	
	CD4044AE	**RCA**	**(748)**	
	CD4044B	**RCA**	**(748)**	
	HCC4044B	† SGS		140
	HCF4044B	SGS		
	883/4044B	† SSS		
	SCL4044B	SSS		
	CM4044A	† Solitron		
	TC4044B	Toshiba		
Quad NOR R/S	F4043BC	Fairchild		
	F4043BM	† Fairchild		
	HD14043B	Hitachi		
	MC14043BA	† Motorola		
	MC14043BC	Motorola		150
	CD4043A	National		
	CD4043BC	National		
	CD4043BM	† National		
	CD4043A	**† RCA**	**(748)**	
	CD4043AE	**RCA**	**(748)**	
	CD4043B	**† RCA**	**(748)**	
	CD4043BE	**RCA**	**(748)**	
	HCC4043B	† SGS		
	HCF4043B	SGS		
	883/4043B	† SSS		160
	SCL4043B	SSS		
	CM4043A	† Solitron		
	CM4043AE	Solitron		
	TC4043B	Toshiba		
Octal Transparent, D-Type, Three State	**54HC373**	**† Fairchild**	**(665)**	
	54HC573	**† Fairchild**	**(665)**	
	74HC373	**Fairchild**	**(665)**	
	74HC573	**Fairchild**	**(665)**	
	G74SC373	GTE Micro		
	MD54SC373	**† Mitel**	**(710)**	170
	MD54SC573	**† Mitel**	**(710)**	
	MD74SC573	**Mitel**	**(710)**	
	MC54HC373	† Motorola		
	MC54HC573	† Motorola		
	MC74HC373	Motorola		
	MC74HC573	Motorola		
	MM54HC373	† National		
	MM54HC573	† National		
	MM74HC373	National		
	MM74HC573	National		180
	MV74SC573	Plessey		
	CD54HC373	**† RCA**	**(739)**	
	CD54HC573	**† RCA**	**(739)**	
	CD74HC373	**RCA**	**(739)**	
	CD74HC573	**RCA**	**(739)**	
	SP54SC373	† SPI		
	SP54SC573	† SPI		
	SP74SC373	**SPI**	**(761)**	
	SP74SC573	**SPI**	**(761)**	
	HS74C373	Supertex		190
	HS74C573	Supertex		
	M54C373	† Supertex		
	M54C573	† Supertex		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

DIGITAL–CMOS (Cont'd)

Function	Device	Source		Line
Latches (Cont'd)				
Octal Transparent, D-Type, Three State			(Cont'd)	
	S74C373	Supertex		
	S74C573	Supertex		
	TC40H373	Toshiba		
Octal Transparent, Three-State, Inverted Output				
	54HC533	**† Fairchild**	**(665)**	
	54HC563	**† Fairchild**	**(665)**	
	74HC533	**Fairchild**	**(665)**	
	74HC563	**Fairchild**	**(665)**	
	MD54SC533	**† Mitel**	**(710)**	
	MD54SC563	**† Mitel**	**(710)**	
	MD74SC373	**Mitel**	**(710)**	10
	MD74SC533	**Mitel**	**(710)**	
	MD74SC563	**Mitel**	**(710)**	
	MC54HC533	† Motorola		
	MC54HC563	† Motorola		
	MC74HC533	Motorola		
	MC74HC563	Motorola		
	MM54HC533	† National		
	MM54HC563	† National		
	MM74HC533	National		
	MM74HC563	National		20
	MV74SC533	Plessey		
	MV74SC563	Plessey		
	CD54HC533	**† RCA**	**(739)**	
	CD54HC563	**† RCA**	**(739)**	
	CD74HC533	**RCA**	**(739)**	
	CD74HC563	**RCA**	**(739)**	
	HS74C533	Supertex		
	HS74C563	Supertex		
	M54C533	† Supertex		
	M54C563	† Supertex		30
	S74C533	Supertex		
	S74C563	Supertex		
Octal, TTL Input, Three-State				
	MM54HC4302	† National		
	MM74HC4302	National		
Octal, TTL Input, Three-State, Inverting				
	MM54HC4301	† National		
	MM74HC4301	National		
8-Bit Addressable, Bidirectional Data Port (serial in/out and parallel out)				
	MC14599BA	† Motorola		
	MC14599BC	Motorola		
8-Bit Addressable Input, Parallel Output, Three-State				
	MC14598BA	† Motorola		
	MC14598BC	Motorola		40
8-Bit Addressable (serial in, parallel out)				
	54HC259	**† Fairchild**	**(665)**	
	74HC259	**Fairchild**	**(665)**	
	F4724BC	Fairchild		
	F4724BM	† Fairchild		
	HD14099B	Hitachi		
	MC14099BA	† Motorola		
	MC14099BC	Motorola		
	MC54HC259	† Motorola		
	MC74HC259	Motorola		
	CD4099BC	National		50
	CD4099BM	† National		
	CD4724BC	National		
	CD4724BM	† National		
	MM54HC259	† National		
	MM54HC77	† National		
	MM74HC259	National		
	MM74HC77	National		
	CD4099B	**† RCA**	**(749)**	
	CD4099BE	**RCA**	**(749)**	
	CD4724B	**† RCA**	**(749)**	60
	CD4724BE	**RCA**	**(749)**	
	CD54HC259	**† RCA**	**(739)**	
			(Continued)	

Function	Device	Source		Line
8-Bit Addressable (serial in, parallel out)			(Cont'd)	
	CD74HC259	**RCA**	**(739)**	
	HCC4099B	† SGS		
	HCF4099B	SGS		
	883/4099B	† SSS		
	SCL4099B	SSS		
	TC4099B	Toshiba		
	TC40H259	Toshiba		
8-Bit, Counter, Incremented Input, Parallel Output, Three-State	MC14597BA	† Motorola		70
	MC14597BC	Motorola		
Memories				
For additional information see Master Selection Guide-Memory Sections.				
16-Bit FIFO (4x4)				
	CD40105B	**† RCA**	**(749)**	
	CD40105BE	**RCA**	**(749)**	
	HCC40105B	† SGS		
	HCF40105B	SGS		
16-Bit Multiport Register File (4x4 read while write RAM)				
	HD14580B	Hitachi		
	MC14580BA	† Motorola		
	MC14580BC	Motorola		
	CD40108B	**† RCA**	**(749)**	80
	CD40108BE	**RCA**	**(749)**	
	CD40208B	**† RCA**	**(749)**	
	CD40208BE	**RCA**	**(749)**	
	HCC40208B	† SGS		
	HCF40208B	SGS		
32-Bit RAM (binary addressing)				
	CD4036A	**† RCA**	**(3875)**	
	CD4036AE	**RCA**	**(3875)**	
	CM4036A	† Solitron		
	CM4036AE	† Solitron		
	TC4036B	Toshiba		90
32-Bit RAM (direct word line addressing)				
	CD4039A	**† RCA**	**(3875)**	
	CD4039AE	**RCA**	**(3875)**	
	CM4039A	† Solitron		
	CM4039AE	Solitron		
	TC4039B	Toshiba		
64-Bit FIFO (16x4)				
	F4703BC	Fairchild		
	F4703BM	† Fairchild		
64-Bit Program Stack (16x4 LIFO)				
	F4706BC	Fairchild		
	F4706BM	† Fairchild		
64-Bit RAM (16x4)				
	F4725BC	Fairchild		100
	F4725BM	† Fairchild		
	MM54C89	† National		
	MM74C89	National		
	CD40114B	**† RCA**	**(3874)**	
	CD40114BE	**RCA**	**(3874)**	
64-Bit RAM (16x4 clocked RAM, three state output register)	F4710BC	Fairchild		
	F4710BM	† Fairchild		
64-Bit RAM (64x1)				
	MCM14505A	† Motorola		
	MCM14505C	Motorola		
256K Synchronous RAM Module				
	HM6641	**Harris (669,1333,3783)**		110
256-Bit RAM (256x1)				
	WD74HC200	**Western**	**(3997)**	
256-Bit RAM (256x1)				
	F4720AC	Fairchild		
	F4720AM	† Fairchild		
	F4720C	Fairchild		
			(Continued)	

Function	Device	Source		Line
256-Bit RAM (256x1)			(Cont'd)	
	F4720M	† Fairchild		
	HD14537	Hitachi		
	MCM14537A	† Motorola		
	MCM14537C	Motorola		
	MM54C200	† National		
	MM74C200	National		120
	CD40061	**RCA**	**(3874)**	
	CD40061A	**† RCA**	**(3874)**	
	CD4061A	**† RCA**	**(3874)**	
256-Bit RAM (32x8)				
	HCMP1824	Hughes		
	HCMP1824C	Hughes		
	HMMP1824	† Hughes		
	HMMP1824C	† Hughes		
	CDP1824	**† RCA**	**(3874)**	
	CDP1824C	**† RCA**	**(3874)**	
256-Bit RAM (64x4)				
	MCM14552A	† Motorola		130
	MCM14552C	Motorola		
	COP498	National		
	MM54C910	† National		
	MM74C910	National		
768-Bit RAM (64x12)				
	IM6512	Intersil		
	IM6512M	† Intersil		
1024-Bit PROM (256x4)				
	HM6611	† Harris		
1024-Bit RAM (1024x1)				
	S23128	**AMI**	**(3610)**	
	S4264	AMI		
	S6504	AMI		140
	S6508	AMI		
	S6508A	AMI		
	S6516	AMI		
	S6528	AMI		
	S68B364	AMI		
	F4736BC	Fairchild		
	F4736BM	† Fairchild		
	HM6508	**Harris (669,1333,3754)**		
	HM6518	**Harris (669,1333,3756)**		
	MCM6508	Motorola		150
	MCM6518	Motorola		
	MM54C929	† National		
	MM54C930	† National		
	MM74C929	National		
	MM74C930	National		
	NMC6508	National		
	NMC6516	National		
	NMC6518	National		
	CDP1821	**RCA**	**(3874)**	
	SCM21C02	SSS		160
	TC5508	Toshiba		
1024-Bit RAM (128x8)				
	CDP1823	**RCA**	**(3874)**	
1024-Bit RAM (256x4)				
	S5101L	**AMI**	**(3614)**	
	F4721BC	Fairchild		
	F4721BM	Fairchild		
	HM6551	**Harris (669,1333,3758)**		
	HM6561	**Harris (669,1333,3760)**		
	HM6562	Harris		
	HM435101	Hitachi		
	HCMP1822C	Hughes		170
	HMMP1822C	† Hughes		
	MCM5101	Motorola		
	MM54C920	† National		
			(Continued)	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL-CMOS (Cont'd)

Memories (Cont'd)

Function	Device	Source		Line
1024-Bit RAM (256x4) (Cont'd)				
	MM54C921	† National		
	MM74C920	National		
	MM74C921	National		
	NMC6551	National		
	NMC6552	National		
	μPD5101L	NEC-Micro		
	CDP1822	**† RCA**	**(3874)**	
	CDP1822C	**† RCA**	**(3874)**	
	SCM5101	† SSS		
	TC5501	Toshiba		10
1024-Bit ROM (256x4)				
	MCM14524A	**† Motorola**	**(3840)**	
	MCM14524C	**Motorola**	**(3840)**	
2048-Bit ROM (256x8)				
	F4735BC	Fairchild		
	F4735BM	† Fairchild		
4096-Bit RAM (1024x4)				
	SRM2114	Epson		
	SRM6514	Epson		
4096-Bit RAM (1024x4)				
	G5114	GTE Micro		
	HM4334	**Hitachi**	**(3789)**	
	NMC6414	National		
	μPD445L	NEC-Micro		20
	MSM5114	**OKI**	**(3873)**	
	MSM5115	**OKI**	**(3873)**	
	CDP1825	RCA		
	CDP1825C	RCA		
	CM2114	Supertex		
	TC5047A	Toshiba		
4096-Bit RAM (4096x1)				
	SRM6504	Epson		
4096-Bit RAM (4096x1)				
	HM4315	**Hitachi**	**(3789)**	
	HM6147	**Hitachi**	**(3789)**	
	NMC6504	National		30
	MSM5104	**OKI**	**(3873)**	
	TC5504	Toshiba		
4096-Bit ROM (512x8)				
	HCMP1831	Hughes		
	HCMP1831C	Hughes		
	HCMP1832	Hughes		
	HCMP1832C	Hughes		
	HMMP1831	† Hughes		
	HMMP1831C	† Hughes		
	HMMP1832	† Hughes		
	HMMP1832C	† Hughes		40
	CDP1831	**† RCA**	**(3876)**	
	CDP1831C	**† RCA**	**(3876)**	
	CDP1832	† RCA		
	CDP1832C	† RCA		
8192-Bit ROM (1024x8)				
	HCMP1833	Hughes		
	HCMP1833C	Hughes		
	HCMP1834	Hughes		
	HCMP1834C	Hughes		
	HMMP1833	† Hughes		
	HMMP1833C	† Hughes		50
	HMMP1834	† Hughes		
	HMMP1834C	† Hughes		
	CDP1833	**† RCA**	**(3876)**	
	CDP1833C	**† RCA**	**(3876)**	
	CDP1834	**† RCA**	**(3877)**	
	CDP1834C	**† RCA**	**(3877)**	
16384-Bit RAM	**MSM5128**	**OKI**	**(3873)**	
16384-Bit ROM (2048x8)				
	SRM2016C20	Epson		
	SRM2016C25	Epson		
	SRM2017C20	Epson		60
	SRM2017C25	Epson		
	SRM2018C20	Epson		
	SRM2018C25	Epson		
16384-Bit ROM (2048x8)				
	G5316	GTE Micro		
	HCMP1835	Hughes		
	HCMP1835C	Hughes		
	HCMP1836	Hughes		
	HCMP1836C	Hughes		
	HMMP1835	† Hughes		
	HMMP1835C	† Hughes		70
	HMMP1836	† Hughes		
	HMMP1836C	† Hughes		
	CDP1835	**† RCA**	**(3876)**	
	CDP1835C	**† RCA**	**(3876)**	
	SCM23C16	SSS		

Multiplexers (Digital)

See also Interface—Analog Switches, Multiplexers

Function	Device	Source		Line
Dual 4-Channel, Three-State				
	54HC253	**† Fairchild**	**(666)**	
	74HC253	**Fairchild**	**(666)**	
Dual 4-Channel				
	F4539BC	Fairchild		
	F4539BM	† Fairchild		80
	HD14539B	Hitachi		
	MC14539BA	† Motorola		
	MC14539BC	Motorola		
	MC54HC153	† Motorola		
	MC74HC153	Motorola		
	SP74HC153	**SPI**	**(769)**	
	TC40H153	Toshiba		
	TC4539B	Toshiba		
Dual 4-Input, Three-State				
	MC54HC253	† Motorola		
	MC74HC253	Motorola		90
	MM54HC253	† National		
	MM74HC253	National		
	SP74HC253	**SPI**	**(771)**	
Dual 4-Input	MM54HC153	† National		
	MM74HC153	National		
	CD54HC153	**† RCA**	**(740)**	
	CD74HC153	**RCA**	**(740)**	
Quad 2-Input Data Selector				
	MC54HC157	† Motorola		
	MC74HC157	Motorola		
	MM54C157	† National		100
	MM54HC157	† National		
	MM54HC158	† National		
	MM74C157	National		
	MM74HC157	National		
	MM74HC158	National		
	SP74HC157	**SPI**	**(769)**	
	TC40H157	Toshiba		
Quad 2-Input Data Selector, Inverting				
	MC54HC158	† Motorola		
	MC74HC158	Motorola		
	SP74HC158	**SPI**	**(769)**	110
	TC40H158	Toshiba		
Quad 2-Input Data Selector, Three-State				
	54HC257	**† Fairchild**	**(666)**	
	74HC257	**Fairchild**	**(666)**	
	MC54HC257	† Motorola		
	MC74HC257	Motorola		
	MM54HC257	† National		
	MM74HC257	National		
	CD40257B	**† RCA**	**(749)**	

(Continued)

Function	Device	Source		Line
Quad 2-Input Data Selector, Three-State (Cont'd)				
	CD40257BE	**RCA**	**(749)**	
	CD54HC257	**† RCA**	**(740)**	120
	CD74HC257	**RCA**	**(740)**	
	SP74HC257	**SPI**	**(771)**	
	HCC40257B	† SGS		
	HCF40257B	SGS		
Quad 2-Input, Inverting, Three-State				
	SP74HC258	**SPI**	**(771)**	
4-Bit AND/OR Selector				
	F4519BC	Fairchild		
	F4519BM	† Fairchild		
	HD14519	Hitachi		
	MC14519BA	† Motorola		
	MC14519BC	Motorola		130
	CD4519BC	National		
	CD4519BM	† National		
8-Channel	**54HC151**	**† Fairchild**	**(666)**	
	74HC151	**Fairchild**	**(666)**	
	MM54C151	† National		
	MM54HC151	† National		
	MM74C151	National		
	MM74HC151	National		
	CD54HC151	**† RCA**	**(740)**	
	CD74HC151	**RCA**	**(740)**	140
	TC40H151	Toshiba		
8-Channel Data Selector				
	F4512BC	Fairchild		
	F4512BM	† Fairchild		
	HD14512	Hitachi		
	MC14512A	† Motorola		
	MC14512C	Motorola		
	CD4512BC	National		
	CD4512BM	† National		
	CD4512B	**† RCA**	**(749)**	
	CD4512BE	**RCA**	**(749)**	150
	HCC4512B	† SGS		
	HCF4512B	SGS		
	883/4512B	† SSS		
	SCL4512B	SSS		
	TC4512B	Toshiba		
8-Channel Differential Multiplexer/Demultiplexer				
	MC14067BA	† Motorola		
	MC14067BC	Motorola		
8-Channel, Three-State				
	54HC153	**† Fairchild**	**(666)**	
	54HC251	**† Fairchild**	**(666)**	
	54HC4512	**† Fairchild**	**(666)**	160
	74HC153	**Fairchild**	**(666)**	
	74HC251	**Fairchild**	**(666)**	
	74HC4512	**Fairchild**	**(666)**	
8-Input with Latch, Three-State				
	MM54HC354	† National		
	MM54HC356	† National		
	MM74HC354	National		
	MM74HC356	National		
8-Input, Three State				
	CD54HC354	**† RCA**	**(740)**	
	CD54HC356	**† RCA**	**(740)**	
	CD74HC354	**RCA**	**(740)**	170
	CD74HC356	**RCA**	**(740)**	
8-Input, Three-State				
	MC54HC251	† Motorola		
	MC54HC354	† Motorola		
	MC54HC356	† Motorola		
	MC74HC251	Motorola		
	MC74HC354	Motorola		
	MC74HC356	Motorola		
	CD54HC251	**† RCA**	**(740)**	
	CD74HC251	**RCA**	**(740)**	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL-CMOS (Cont'd)

Multiplexers (Digital) (Cont'd)

Function	Device	Source		Line
16-Channel	MM54C150	† National		
	MM74C150	National		
	TP4320A	TI		
16-Channel Multiplexer/Demultiplexer				
	MC14097BA	† Motorola		
	MC14097BC	Motorola		
16-Channel, Three-State				
	MM72C19	† National		
	MM82C19	National		

Multivibrators

Function	Device	Source		Line
Monostable/Astable, Retriggerable				
	54HC4046	**† Fairchild**	**(668)**	
	54HC4047	**† Fairchild**	**(668)**	
	74HC4046	**Fairchild**	**(668)**	10
	74HC4047	**Fairchild**	**(668)**	
	F4047BC	Fairchild		
	F4047BM	† Fairchild		
	CD4047BC	National		
	CD4047BM	† National		
	CD4047A	**† RCA**	**(748)**	
	CD4047AE	**RCA**	**(748)**	
	CD4047B	**† RCA**	**(748)**	
	CD4047BE	**RCA**	**(748)**	
	HCC4047B	† SGS		20
	HCF4047B	SGS		
	883/4047B	† SSS		
	SCL4047B	SSS		
	CM4047A	† Solitron		
	CM4047AE	Solitron		
	TC4047B	Toshiba		
Dual Monostable, Retriggerable				
	F4528BC	Fairchild		
	F4528BM	† Fairchild		
	HD14528B	Hitachi		
	MC14528BA	† Motorola		30
	MC14528BC	Motorola		
	CD4528BC	National		
	CD4528BM	† National		
	MM54HC123	† National		
	MM74HC123	National		
	CD4098B	**† RCA**	**(749)**	
	CD4098BE	**RCA**	**(749)**	
	HCC4098B	† SGS		
	HCF4098B	SGS		
	883/4528B	† SSS		40
	SCL4528B	SSS		
	TC4528B	Toshiba		
Dual Monostable				
	54HC221	**† Fairchild**	**(668)**	
	54HC4538	**† Fairchild**	**(668)**	
	74HC221	**Fairchild**	**(668)**	
	74HC4538	**Fairchild**	**(668)**	
	MC14538BA	† Motorola		
	MC14538BC	Motorola		
	MC54HC4538	† Motorola		
	MC74HC4538	Motorola		50
	CD4538BC	National		
	CD4538BM	† National		
	MM54C221	† National		
	MM74C221	National		
	CD4538B	**† RCA**	**(749)**	
	CD4538BE	**RCA**	**(749)**	
	CD54HC221	**† RCA**	**(740)**	
	CD54HC4538	**† RCA**	**(740)**	
	CD74HC221	**RCA**	**(740)**	
	CD74HC4538	**RCA**	**(740)**	60

Oscillators/Dividers

Function	Device	Source		Line
Divider, Divide by 5/6				
	RED5/6	**LSI Comp**	**(696)**	
Divider, Divide by 6				
	D6	LSI Comp		
Divider, Divide by 50/60				
	RED50/60	**LSI Comp**	**(696)**	
Divider, Divide by 60				
	D60	LSI Comp		
Divider, Divide by 100/120				
	RED100/120	**LSI Comp**	**(696)**	
Divider, Divide by 300/360				
	RED300/360	**LSI Comp**	**(696)**	
Divider, Divide by 3000/3600				
	RED3000/3600	**LSI Comp**	**(696)**	
Divider, Divide by 3600				
	D3600	LSI Comp		
Oscillator/Divider (programmable timer)				
	HD14541B	Hitachi		
	MC14541BA	† Motorola		70
	MC14541BC	Motorola		
Oscillator/230 to 2324 Divider (programmable timer)				
	HD14536B	Hitachi		
	MC14536BA	† Motorola		
	MC14536BC	Motorola		
	CD4536B	**† RCA**	**(749)**	
	CD4536BE	**RCA**	**(749)**	
Oscillator/238 Divider (2-5 V supplies)				
	ICM7209	Intersil		
Oscillator/238, 2310, Divider (10 V supply)				
	TC5082L	Toshiba		
Oscillator/238, 2310, 2311, and 2312 Divider (10 V supply)				
	TC5082	Toshiba		
Oscillator/2312 and 2317 Divider, also 2317x10 (0.01 and 0.1 output, 6.4 MHz crystal, 3-5 V supply)				
	ICM7207	Intersil		80
Oscillator/2312 and 2320 Divider, also 2320x10 (0.1 and 1 second output with 5.2 MHz crystal, 5 V supply)				
	ICM7207A	Intersil		
Oscillator/2312, 2318, 2321, and 2317 Divider (also 2321x60, 2-5 V supplies)				
	ICM7213	Intersil		
Oscillator/2316 Divider/Buffer				
	ICM7051A	Intersil		
	SCL5411	SSS		
Oscillator/2316 Divider with 2313 Output (supply 1-2 V 7038B, 2-5 V 7038A)				
	ICM7038A	Intersil		
	ICM7038B	Intersil		
Oscillator/2317 Divider with 2313 Output (supply 1-2 V 7038D, 2-5 V 7038C)				
	ICM7038C	Intersil		
	ICM7038D	Intersil		
Oscillator/2317 Divider (2.5-6 V supplies)				
	MM53107	National		
Oscillator/2318 Divider with 2313 Output (supply 1-2 V 7038E, 2-5 V 7038F)				
	ICM7038E	Intersil		90
	ICM7038F	Intersil		
Oscillator/2319 Divider with 2313 Output (supply 1-2 V 7038G, 2-5 V 7038H)				
	ICM7038G	Intersil		
Oscillator/2321 Divider/Buffer				
	CD4045A	**† RCA**	**(748)**	
	CD4045AE	**RCA**	**(748)**	
	CD4045B	**† RCA**	**(748)**	
	CD4045BE	**RCA**	**(748)**	
	HCC4045B	† SGS		
	HCF4045B	SGS		

(Continued)

Function	Device	Source		Line
Oscillator/2321 Divider/Buffer				
				(Cont'd)
	883/4445B	† SSS		
	SCL4445B	SSS		100
	CM4045A	† Solitron		
	CM4045AE	Solitron		
Oscillator/2322 Divider				
	ICM7049A	Intersil		
Oscillator/2323 Divider				
	ICM7050	Intersil		
	ICM7051B	Intersil		
	ICM7052	Intersil		
	SCL5419	SSS		
Oscillator/2324 Divider				
	MC14521BA	† Motorola		
	MC14521BC	Motorola		
	TC4521B	Toshiba		110
Oscillator/32768 Hz Divider				
	MM5368	National		
	MM5369	National		
See also CMOS-Counters				

Shift Registers

Function	Device	Source		Line
Dual 4-Bit Serial In/Parallel Out				
	F4015BC	Fairchild		
	F4015BM	Fairchild		
	HD14015B	Hitachi		
	MC14015BA	Motorola		
	MC14015BC	Motorola		
	CD4015AC	National		
	CD4015BC	National		120
	CD4015BM	National		
	CD4015A	**RCA**	**(748)**	
	CD4015AE	**RCA**	**(748)**	
	CD4015B	**RCA**	**(748)**	
	CD4015BE	**RCA**	**(748)**	
	HCC4015B	SGS		
	HCF4015B	SGS		
	883/4015B	SSS		
	SCL4015B	SSS		
	CM4015A	Solitron		130
	CM4015AE	Solitron		
	TC4015B	Toshiba		
Dual 16-Bit Static				
	HSSR0321	† Hughes		
	HSSR0351	† Hughes		
Dual 50/64-Bit Static				
	TC5000	Toshiba		
Dual 64-Bit Static				
	HD14517B	Hitachi		
	MC14517BA	† Motorola		
	MC14517BC	Motorola		
	CD4517B	**† RCA**	**(749)**	
	CD4517BE	**RCA**	**(749)**	140
	883/4517B	† SSS		
	SCL4517B	SSS		
	TC5050	Toshiba		
Dual 512-Bit Dynamic				
	TC5004	Toshiba		
Quad 64-Bit Static, Separate Clock				
	F4731BC	Fairchild		
	F4731BM	† Fairchild		
4-Bit Bidirectional				
	F40194BC	Fairchild		
	F40194BM	† Fairchild		
	HD14194B	Hitachi		
	MC14194BA	† Motorola		150
	MC14194BC	Motorola		
	MC54HC194	† Motorola		
	MC74HC194	Motorola		
	MM54C95	National		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL-CMOS (Cont'd)

Shift Registers (Cont'd)

Function	Device	Source		Line
4-Bit Bidirectional (Cont'd)				
	MM54HC194	† National		
	MM74C95	† National		
	MM74HC194	National		
	CD54HC194	**† RCA**	**(740)**	
	CD74HC194	**RCA**	**(740)**	
	HCC40194B	† SGS		
	HCF40194B	SGS		
4-Bit Parallel	**54HC195**	**† Fairchild**	**(665)**	
	74HC195	**Fairchild**	**(665)**	
	F40195BC	Fairchild		10
	F40195BM	† Fairchild		
	MC54HC195	† Motorola		
	MC74HC195	Motorola		
	CD40195BC	National		
	CD40195BM	† National		
	MM54C195	† National		
	MM54HC195	† National		
	MM74C195	National		
	MM74HC195	National		
	CD54HC195	**† RCA**	**(740)**	20
	CD74HC195	**RCA**	**(740)**	
4-Bit Parallel In/Parallel Out				
	F4035BC	Fairchild		
	F4035BM	† Fairchild		
	HD14035B	Hitachi		
	MC14035BA	† Motorola		
	MC14035BC	Motorola		
	CD4035BC	National		
	CD4035BM	† National		
	CD40104B	**RCA**	**(749)**	
	CD40194B	**RCA**	**(749)**	30
	CD4035A	**† RCA**	**(748)**	
	CD4035AE	**RCA**	**(748)**	
	CD4035B	**† RCA**	**(748)**	
	CD4035BE	**RCA**	**(748)**	
	HCC40104B	† SGS		
	HCC4035B	† SGS		
	HCF40104B	SGS		
	HCF4035B	SGS		
	883/4035B	† SSS		
	SCL4035B	SSS		40
	CM4035A	† Solitron		
	CM4035AE	Solitron		
	TC4035B	Toshiba		
8-Bit (asynchronous parallel or synchronous serial operation) Parallel In/Serial Out				
	F4021BC	Fairchild		
	F4021BM	† Fairchild		
	HD14021B	Hitachi		
	MC14021BA	† Motorola		
	MC14021BC	Motorola		
	CD4021A	National		
	CD4021BC	National		50
	CD4021BM	† National		
	CD4021A	**† RCA**	**(748)**	
	CD4021AE	**RCA**	**(748)**	
	CD4021B	**† RCA**	**(748)**	
	CD4021BE	**RCA**	**(748)**	
	HCC4021B	† SGS		
	HCF4021B	SGS		
	883/4021B	† SSS		
	SCL4021B	SSS		
	CM4021A	† Solitron		60
	CM4021AE	Solitron		
	TC4021B	Toshiba		
8-Bit Bidirectional Parallel/Serial Input/Output Bus Register	F4034BC	Fairchild		
	F4034BM	† Fairchild		
	HD14034B	Hitachi		
			(Continued)	

Function	Device	Source		Line
8-Bit Bidirectional Parallel/Serial Input/Output Bus Register (Cont'd)				
	MC14034BA	† Motorola		
	MC14034BC	Motorola		
	CD4034BC	National		
	CD4034BM	† National		
	CD4034A	**† RCA**	**(748)**	70
	CD4034AE	**RCA**	**(748)**	
	CD4034B	**† RCA**	**(748)**	
	CD4034BE	**RCA**	**(748)**	
	HCC4034B	† SGS		
	HCF4034B	SGS		
	883/4034B	† SSS		
	SCL4034B	SSS		
	CM4034A	† Solitron		
	CM4034AE	Solitron		
8-Bit Bus Register, Shift and Store	HD14094B	Hitachi		80
	MC14094BA	† Motorola		
	MC14094BC	Motorola		
	CD4094B	**† RCA**	**(748)**	
	CD4094BE	**RCA**	**(748)**	
	HCC4094B	† SGS		
	HCF4094B	SGS		
	883/4094B	† SSS		
	SCL4094B	SSS		
	TC4094B	Toshiba		
	TC40H194	Toshiba		90
8-Bit Parallel In/Serial Out	**54HC165**	**† Fairchild**	**(665)**	
	74HC165	**Fairchild**	**(665)**	
	MC54HC165	† Motorola		
	MC74HC165	Motorola		
	MM54C165	† National		
	MM54HC165	† National		
	MM74C165	National		
	MM74HC165	National		
	CD54HC165	**† RCA**	**(740)**	
	CD74HC165	**RCA**	**(740)**	100
	TC40H166	Toshiba		
8-Bit Serial In/Parallel Out	**54HC164**	**† Fairchild**	**(665)**	
	74HC164	**Fairchild**	**(665)**	
	MC54HC164	† Motorola		
	MC74HC164	Motorola		
	MM54C164	† National		
	MM54HC164	† National		
	MM74C164	National		
	MM74HC164	National		
	CD54HC164	**† RCA**	**(740)**	110
	CD74HC164	**RCA**	**(740)**	
	TC40H164	Toshiba		
8-Bit Synchronous Parallel In/Serial Out	F4014BC	Fairchild		
	F4014BM	† Fairchild		
	HD14014B	Hitachi		
	MC14014BA	† Motorola		
	MC14014BC	Motorola		
	CD4014A	National		
	CD4014BC	National		
	CD4014BM	† National		120
	CD4014A	**† RCA**	**(748)**	
	CD4014AE	**RCA**	**(748)**	
	CD4014B	**† RCA**	**(748)**	
	CD4014BE	**RCA**	**(748)**	
	HCC4014B	† SGS		
	HCF4014B	SGS		
	883/4014B	† SSS		
	SCL4014B	SSS		
	CM4014A	† Solitron		
	CM4014AE	Solitron		130
	TC4014B	Toshiba		

Function	Device	Source		Line
8-Bit, Three-State	**54HC299**	**† Fairchild**	**(665)**	
	74HC299	**Fairchild**	**(665)**	
	MM54HC299	† National		
	MM74HC299	National		
18-Bit Static (4, 5, 8, 9, 10, 12, 13, 14, 16, 17, 18-bits)	F4006BC	Fairchild		
	F4006BM	† Fairchild		
	HD14006B	Hitachi		
	MC14006BA	† Motorola		
	MC14006BC	Motorola		140
	CD4006A	National		
	CD4006BC	National		
	CD4006BM	† National		
	CD4006A	**† RCA**	**(748)**	
	CD4006AE	**RCA**	**(748)**	
	CD4006B	**† RCA**	**(748)**	
	CD4006BE	**RCA**	**(748)**	
	HCC4006B	† SGS		
	HCF4006B	SGS		
	883/4006B	† SSS		150
	SCL4006B	SSS		
	CM4006A	† Solitron		
	CM4006AD	Solitron		
	CM4006AE	Solitron		
	TC4006B	Toshiba		
30-Bit Static	MD4330B	† Mitel		
	MV4330	Plessey		
32-Bit Bidirectional Serial In/Serial Out	**CD40100B**	**† RCA**	**(749)**	
	CD40100BE	**RCA**	**(749)**	
	HCC40100B	† SGS		160
	HCF40100B	SGS		
32-Bit Serial In/Parallel Out	MD4332B	† Mitel		
	MV4332	Plessey		
64-Bit Static	F4031BC	Fairchild		
	F4031BM	† Fairchild		
	CD4031BC	National		
	CD4031BM	† National		
	CD4031A	**† RCA**	**(748)**	
	CD4031AE	**RCA**	**(748)**	
	CD4031B	**† RCA**	**(748)**	170
	CD4031BE	**RCA**	**(748)**	
	MS612	RTC		
	HCC4031B	† SGS		
	HCF4031B	SGS		
64-Bit Variable Length	F4557BC	† Fairchild		
	F4557BM	Fairchild		
	HD14557B	Hitachi		
	MC14557BA	† Motorola		
	MC14557BC	Motorola		
96-Bit Variable Length Elastic	MS618	† RTC		180
128-Bit Static with Control Logic	MS625	† RTC		
128-Bit Static (16-bit increments)	MC14562BA	† Motorola		
	MC14562BC	Motorola		

Translators

HNIL/HTL is suitable for translation/input protection. See HNIL/HTL section

Quad Level Shifter (lot to high voltage)			
	CD40109B	**† RCA**	**(749)**
	CD40109BE	**RCA**	**(749)**
	HCC40109B	† SGS	
	HCF40109B	SGS	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

DIGITAL–CMOS (Cont'd)

Translators (Cont'd)

Function	Device	Source	
Quad Voltage Up Level Translator			
	F4104BE	Fairchild	
	F4104BM	† Fairchild	
Hex Level Shifter (CMOS or TTL to CMOS)			
	MC14504BA	† Motorola	
	MC14504BC	Motorola	
Hex Level Shifter (low-to-high voltage)			
	TC5020B	Toshiba	
Octal Bidirectional Level (CMOS/TTL)			
	CD40116	**RCA**	**(749)**

Miscellaneous

Function	Device	Source	
Microprocessor, 1-Bit, Industrial Control Unit			
	MC14500B	**Motorola**	**(729)**
Addressable Asynchronous Receiver/Transmitter			
	MC14469	Motorola	
ARINC 429 Single Channel Serial to Parallel Decoder			
	MT70003	**Micro Eng**	**(4440)**
ARINC 429 Dual Channel Parallel to Serial Decoder			
	MT70014	**Micro Eng**	**(4440)**
ARINC 429 Eight Channel Serial to Parallel Decoder			
	MT34009	**Micro Eng**	**(4440)**
Asynchronous Serial Manchester Adapter			
	HD6408-9	**Harris**	**(669,675,1333)**
Bit Rate Generator			
	F4702BC	Fairchild	
	F4702BM	† Fairchild	
	HD4702-2	**† Harris**	**(669,1333)**
	HD4702-9	**Harris**	**(669,1333)**
	MC14411	**Motorola**	**(3298)**
CMOS Transistor Array (See also 4007 Dual Complementary Pair and Inverter-listed under Buffers/Inverters)	CA3600	† RCA	
Code Identification System			
	HD15530-2	**† Harris**	**(669,688,1333)**
	HD15530-9	**Harris**	**(669,688,1333)**
	HD15531-2	**† Harris**	**(669,693,1333)**
	HD15531-9	**Harris**	**(669,693,1333)**
Comparator, Linear, Dual with Dual Op Amp			
	MC14574	Motorola	
Comparator, Linear, Dual with Quad Op Amp			
	MC14573	Motorola	
Comparator, Linear, Quad			
	MC14575	Motorola	
	MM54C909	† National	
	MM74C909	National	
Comparator Phase			
	MM74C932	National	
	TC5081	Toshiba	
Digital Logic (for 3- 1/2 digit A/D systems)			
	MC14435	Motorola	
	MC14435E	† Motorola	
Encoder	TC40H147	Toshiba	
	TC40H148	Toshiba	
Equality Comparator, 8-Bit			
	MM54HC688	† National	
	MM74HC688	National	
FIFO Memory, 512 Bit			
	MT003	Micro Eng	
FIFO, 16x4	**54HC4703**	**† Fairchild**	**(665)**
	74HC4703	**Fairchild**	**(665)**
Heart Rate Monitor			
	HLSS0533	Hughes	
Local Network Terminal Controller			
	MT006	Micro Eng	
Low voltage CMOS devices (Counters, Display Drivers, Counter-Timers) not usually mixed with 5-20v CMOS logic are listed under Digital-Special or CMOS-Oscillators/Dividers			
Modem (0-600 b/s)			
	MC14412	**Motorola**	**(3298)**
Parity Generator and Checker, 9-Bit			
	CD40101B	**† RCA**	**(749)**
	CD40101BE	**RCA**	**(749)**
	HCC40101B	† SGS	
	HCF40101B	SGS	
Phase-Locked Loop			
	F4046BC	Fairchild	
	F4046BM	† Fairchild	
	HD14046B	Hitachi	
	MC14046BA	† Motorola	
	MC14046BC	Motorola	
	CD4046BC	National	
	CD4046BM	† National	
	CD4046A	**† RCA**	**(748)**
	CD4046AE	**RCA**	**(748)**
	CD4046B	**† RCA**	**(748)**
	CD4046BE	**RCA**	**(748)**
	HCC4046B	† SGS	
	HCF4046B	SGS	
	883/4046B	† SSS	
	883/4446B	† SSS	
	SCL4046B	SSS	
	SCL4446B	SSS	
Programmable Digital Delay Timer			
	LS7210	**LSI Comp**	**(696)**
Remote Control Receiver/Transmitter Pair			
	MCC14457	Motorola	
	MCC14458	Motorola	
Remote Control Transmitter/Receiver (encoder/decoder)			
	DC-7	Supertex	
Serial Manchester Encoder-Decoder			
	HD6409	**Harris**	**(669,680,1333)**
Successive Approximation Register			
	HD14559B	Hitachi	
	MC14559BA	† Motorola	
	MC14559BC	Motorola	
	MM54C905	† National	
	MM74C905	National	
Successive Approximation Register, Cascadable			
	HD14549B	Hitachi	
	MC14549BA	† Motorola	
	MC14549BC	Motorola	
Synthesizers, see Linear-Phase Locked Loop Circuits			
Touch Switch	TC9130	Toshiba	
	TC9135	Toshiba	
UART	HCMP1854	Hughes	
	HCMP1854C	Hughes	
	HMMP1854	† Hughes	
	HMMP1854C	† Hughes	
	MT80001	**Micro Eng**	**(4440)**
	CDP1854A	**† RCA**	**(1476)**
	CDP6402D	**† RCA**	**(1476)**
	CDP6402E	**RCA**	**(1476)**
Binary Rate Multiplier			
	CD4089BC	National	
	CD4089BM	† National	
	CD4089B	**† RCA**	**(748)**
	CD4089BE	**RCA**	**(748)**
	HCC4089B	† SGS	
	HCF4089B	SGS	
Binary-to-Phone Pulse Converter (See also linear-telecommunication circuits.)			
	MC14408	**Motorola**	**(3298)**
	MC14409	**Motorola**	**(3298)**
BCD Rate Multiplier			
	HD14527B	Hitachi	
	MC14527BA	† Motorola	
	MC14527BC	Motorola	
	CD4527BC	National	
	CD4527BM	† National	
	CD4527B	**† RCA**	**(749)**
	CD4527BE	**RCA**	**(749)**
	HCC4527B	† SGS	
	HCF4527B	SGS	
	883/4527B	† SSS	
	SCL4527B	SSS	
	TC4527B	Toshiba	
Dual Differential Line Driver			
	MM78C30	† National	
	MM88C30	National	
Dual Schmitt Trigger			
	F4583BC	Fairchild	
	F4583BM	† Fairchild	
	HD14583B	Hitachi	
	MC14583BA	† Motorola	
	MC14583BC	Motorola	
	TC4583B	Toshiba	
Dual 4-Bit Terminator			
	CD40117B	**RCA**	**(749,752)**
Dual 4-Channel Analog Multiplexer/Demultiplexer			
	54HC4052	**† Fairchild**	**(666)**
	74HC4052	**Fairchild**	**(666)**
Triple 2-Channel Analog Multiplexer/Demultiplexer			
	54HC4053	**† Fairchild**	**(666)**
	74HC4053	**Fairchild**	**(666)**
Quad Bus Tranceiver, Three-State, Inverting			
	54HC242	**† Fairchild**	**(667)**
	74HC242	**Fairchild**	**(667)**
	MC54HC242	† Motorola	
	MC74HC242	Motorola	
	MM54HC242	† National	
	MM74HC242	National	
	CD54HC242	**† RCA**	**(739)**
	CD74HC242	**RCA**	**(739)**
	HS74C242	Supertex	
	M54C242	† Supertex	
	S74C242	Supertex	
Quad Bus Tranceiver, Three-State, Non-Inverting			
	54HC243	**† Fairchild**	**(667)**
	74HC243	**Fairchild**	**(667)**
	MC54HC243	† Motorola	
	MC74HC243	Motorola	
	CD54HC243	**† RCA**	**(739)**
	CD74HC243	**RCA**	**(739)**
	HS74C243	Supertex	
	M54C243	† Supertex	
	S74C243	Supertex	
Quad Precision Timer/Driver (inputs cause outputs to switch state for 100 clock pulses)			
	MC14415	Motorola	
	MC14415E	† Motorola	
Quad Single Ended Line Driver			
	MM78C29	† National	
	MM88C29	National	
Quad 2-Input NAND Schmitt Trigger			
	54HC132	**† Fairchild**	**(665)**
	74HC132	**Fairchild**	**(665)**
	F4093BC	† Fairchild	
	F4093BM	Fairchild	
	HD14093B	Hitachi	
	MC14093BA	† Motorola	
	MC14093BC	Motorola	

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL-CMOS (Cont'd)

Miscellaneous (Cont'd)

Function	Device	Source		Line
Quad 2-Input NAND Schmitt Trigger			(Cont'd)	
	MC54HC132	† Motorola		
	MC74HC132	Motorola		
	CD4093BC	National		
	CD4093BM	† National		
	MM54HC132	† National		
	MM74HC132	National		
	CD4093B	**† RCA**	**(748)**	
	CD4093BE	**RCA**	**(748)**	
	HCC4093B	† SGS		
	HCF4093B	SGS		10
	883/4093B	† SSS		
	SCL4093B	SSS		
	TC4093B	Toshiba		
Hex Bus Driver, Three-State				
	SP74HC365	**SPI**	**(771)**	
Hex Contact Bounce Eliminator				
	MC14490	Motorola		
	MC14490E	† Motorola		
Hex Schmitt Trigger Inverter				
	MM54HC14	† National		
	MM74HC14	National		
Hex Schmitt Trigger				
	F40014AM	† Fairchild		
	F40014BC	Fairchild		20
	HD14584B	Hitachi		
	MC14584BA	† Motorola		
	MC14584BC	Motorola		
	MC54HC14	† Motorola		
	MC74HC14	Motorola		
	CD40106BC	National		
	CD40106BM	† National		
	CD4584BC	National		
	CD4584BM	† National		
	MM54C14	† National		30
	MM54C914	† National		
	MM74C14	National		
	MM74C914	National		
	CD40106B	**† RCA**	**(749)**	
	CD40106BE	**RCA**	**(749)**	
	CD54HC14	**† RCA**	**(740)**	
	CD74HC14	**RCA**	**(740)**	
	SP74HC14	**SPI**	**(766)**	
	HCC40106B	† SGS		
	HCF40106B	SGS		40
	883/4584B	† SSS		
	SCL4584B	SSS		
Octal/Bus Driver (schmitt trigger), Non-Inverting, Three-State, Complementary Controls				
	54HC244	**† Fairchild**	**(667)**	
	74HC244	**Fairchild**	**(667)**	
	G74SC244	GTE Micro		
	MD54SC244	**† Mitel**	**(702)**	
	MD74SC244	**Mitel**	**(702)**	
	MC54HC244	† Motorola		
	MC74HC244	Motorola		
	MM54C244	National		50
	MM54HC244	† National		
	MM74C244	National		
	MM74HC244	National		
	CD54HC244	**† RCA**	**(740)**	
	CD74HC244	**RCA**	**(740)**	
	SP54SC244	† SPI		
	SP74SC244	**SPI**	**(761)**	
	HS74C244	Supertex		
	M54C244	† Supertex		
	S74C244	Supertex		60
	TC40H244	Toshiba		
Octal Bus Driver (schmitt trigger), Inverting, Three-State				
	54HC240	**† Fairchild**	**(667)**	
	74HC240	**Fairchild**	**(667)**	
	G74SC240	GTE Micro		
	MD54SC240	**† Mitel**	**(702)**	
	MD74SC240	**Mitel**	**(702)**	
	MC54HC240	† Motorola		
	MC74HC240	Motorola		
	MM54C240	† National		
	MM54HC240	† National		70
	MM74C240	National		
	MM74HC240	National		
	CD54HC240	**† RCA**	**(740)**	
	CD74HC240	**RCA**	**(740)**	
	SP54SC240	† SPI		
	SP74HC240	**SPI**	**(770)**	
	SP74SC240	**SPI**	**(761)**	
	HS74C240	Supertex		
	M54C240	† Supertex		
	S74C240	Supertex		80
Octal Bus Driver (schmitt trigger), Non-Inverting, Three-State, Symmetrical Controls				
	54HC241	**† Fairchild**	**(667)**	
	74HC241	**Fairchild**	**(667)**	
	G742C241	GTE Micro		
	MD54SC241	**† Mitel**	**(702)**	
	MD74SC241	**Mitel**	**(702)**	
	MC54HC241	† Motorola		
	MC74HC241	Motorola		
	MM54HC241	† National		
	MM74HC241	National		
	CD54HC241	**† RCA**	**(740)**	90
	CD74HC241	**RCA**	**(740)**	
	SP54SC241	† SPI		
	SP74SC241	**SPI**	**(761)**	
	HS74C241	Supertex		
	M54C241	† Supertex		
	S74C241	Supertex		
	TC40H241	Toshiba		
Octal Bus Transceiver and Register, Inverting, Three-State	**54HC648**	**† Fairchild**	**(665,667)**	
	74HC648	**Fairchild**	**(665,667)**	
	MC54HC648	† Motorola		100
	MC74HC648	Motorola		
	MM54HC648	† National		
	MM74HC648	National		
	CD54HC648	**† RCA**	**(739)**	
	CD74HC648	**RCA**	**(739)**	
Octal Bus Transceiver and Register, Non-Inverting, Three-State	**54HC646**	**† Fairchild**	**(665,667)**	
	74HC646	**Fairchild**	**(665,667)**	
	MC54HC646	† Motorola		
	MC74HC646	Motorola		
	MM54HC646	† National		110
	MM74HC646	National		
	CD54HC646	**† RCA**	**(739)**	
	CD74HC646	**RCA**	**(739)**	
Octal Bus Transceiver, Inverting/Non-Inverting	**54HC643**	**† Fairchild**	**(667)**	
	74HC643	**Fairchild**	**(667)**	
Octal Bus Transceiver, Inverting	**54HC640**	**† Fairchild**	**(667)**	
	74HC640	**Fairchild**	**(667)**	
Octal Bus Transceiver, Three-State	MC54HC640	† Motorola		
	MC54HC643	† Motorola		
	MC74HC640	Motorola		120
	MC74HC643	Motorola		
Octal Bus Transceiver, Three-State, Inverting	**CD54HC640**	**† RCA**	**(739)**	
	CD54HC643	**† RCA**	**(739)**	
	CD74HC640	**RCA**	**(739)**	
	CD74HC643	**RCA**	**(739)**	
Octal Bus Transceiver, Three-State, Non-Inverting	**54HC245**	**† Fairchild**	**(667)**	
	74HC245	**Fairchild**	**(667)**	
	G74SC245	GTE Micro		
	G74SC545	GTE Micro		
	MD54SC245	**† Mitel**	**(706)**	130
	MD54SC545	**† Mitel**	**(706)**	
	MD74SC245	**Mitel**	**(702.706)**	
	MD74SC545	**Mitel**	**(706)**	
	MC54HC245	† Motorola		
	MC54HC645	† Motorola		
	MC74HC245	Motorola		
	MC74HC645	Motorola		
	CD54HC245	**† RCA**	**(739)**	
	CD54HC645	**† RCA**	**(739)**	
	CD74HC245	**RCA**	**(739)**	140
	CD74HC645	**RCA**	**(739)**	
	SP54SC245	† SPI		
	SP74SC245	**SPI**	**(761)**	
	HS74C245	Supertex		
	M54C245	† Supertex		
	S74C245	Supertex		
Octal Bus Transceiver	**54HC645**	**† Fairchild**	**(667)**	
	74HC645	**Fairchild**	**(667)**	
Octal D Register/Bus Transceiver	**54HC543**	**† Fairchild**	**(665,667)**	
	54HC544	**† Fairchild**	**(665,667)**	150
	74HC543	**Fairchild**	**(665,667)**	
	74HC544	**Fairchild**	**(665,667)**	
Octal Register/Bus Transceiver, Inverting	54HC648	† Fairchild		
	74HC648	Fairchild		
Octal Register/Bus Transceiver	**54HC550**	**† Fairchild**	**(665,667)**	
	54HC551	**† Fairchild**	**(665,667)**	
	54HC646	† Fairchild		
	74HC550	**Fairchild**	**(665,667)**	
	74HC551	**Fairchild**	**(665,667)**	
	74HC646	Fairchild		160
Octal Registered Transceiver	54HC550	† Fairchild		
	54HC551	† Fairchild		
	74HC550	Fairchild		
	74HC551	Fairchild		
2 of 8 Keyboard to Binary Encoder	**MC14419**	**Motorola**	**(3298)**	
4-Bit Binary Counter/Clock Generator	TC5018B	Toshiba		
8-Bit I/O Port	HCMP1852	Hughes		
	HCMP1852C	Hughes		
	HMMP1852	† Hughes		
	HMMP1852C	† Hughes		170
	CDP1852	**† RCA**	**(1471)**	
	CDP1872C	**† RCA**	**(1473)**	
	CDP1874C	**† RCA**	**(1473)**	
	CDP1875C	**† RCA**	**(1473)**	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–CMOS (Cont'd)

Function	Device	Source		Line
Miscellaneous (Cont'd)				
8-Bit Priority Encoder				
	F4532BC	Fairchild		
	F4532BM	† Fairchild		
	HD14532B	Hitachi		
	MC14532BA	† Motorola		
	MC14532BC	Motorola		
	CD4532B	† **RCA**	(749)	
	CD4532BE	**RCA**	(749)	
	HCC4532B	† SGS		
	HCF4532B	SGS		
	883/4532B	† SSS		10
	SCL4532B	SSS		
	TC4532B	Toshiba		
8-Channel Analog Multiplexer/Demultiplexer				
	54HC4051	† **Fairchild**	(666)	
	74HC4051	**Fairchild**	(666)	
8-Channel, Three State				
	MM54HC251	† National		
	MM74HC251	National		
10-Line to 4-Line DCD Priority Encoder				
	54HC147	† **Fairchild**	(666)	
	74HC147	**Fairchild**	(666)	
	MM54HC147	† National		
	MM74HC147	National		20
	CD40147B	† **RCA**	(749)	
	CD40147BE	**RCA**	(749)	
12-Bit Parity Tree				
	F4531BC	Fairchild		
	F4531BM	† Fairchild		
	HD14531B	Hitachi		
	MC14531BA	† Motorola		
	MC14531BC	Motorola		
	883/4531B	† SSS		
	SCL4531B	SSS		
	TC4531B	Toshiba		30

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL-ECL

10000 Series

Arithmetic Functions

Function	Device	Source		Line
Look-Ahead Carry Circuit				
	F10179	Fairchild		
	F10579	† Fairchild		
	HD10179	Hitachi		
	MC10179	Motorola		
	MC10579	† Motorola		
	MC10H179	**Motorola**	**(730)**	
	10179	Signetics		
The ECL-10000, 95000, 100K and III-Other Series are presented as separate groups in that sequence. The ECL-10H000 Series is twice the speed of the ECL-10000 Series				
Dual High Speed Adder/Subtractor				
	F10180	Fairchild		
	F10580	† Fairchild		10
	HD10180	Hitachi		
	MC10180	Motorola		
	MC10580	† Motorola		
	MC10H180	**Motorola**	**(730)**	
	10180	Signetics		
2-Bit Logic Unit/Function Generator				
	MC10182	Motorola		
	MC10582	† Motorola		
2-Bit Multiplier, High Speed				
	MC10287	Motorola		
	MC10687	Motorola		
4x2-Bit Multiplier				
	MC10183	Motorola		20
4-Bit ALU Slice (microprocessor)				
	MC10800	Motorola		
4-Bit Logic Unit/Function Generator				
	F10181	Fairchild		
	F10581	† Fairchild		
	HD10181	Hitachi		
	MC10181	Motorola		
	MC10581	† Motorola		
	MC10H181	**Motorola**	**(730)**	
	10181	Signetics		
5-Bit Comparator				
	F10566	† Fairchild		
	MC10166	Motorola		30
	MC10566	† Motorola		
8x8-Bit Expandable Multiplier				
	MC10901	Motorola		
8-Bit ALU with Parity				
	MC10900	Motorola		
8-Bit BCD/Binary ALU				
	MC10902	Motorola		

Buffers

Function	Device	Source	Line
Hex	MC10188	Motorola	
	10188	Signetics	

Inverters

Function	Device	Source	Line
Hex Inverter/Buffer			
	MC10195	Motorola	
	MC10595	† Motorola	
Hex	MC10189	Motorola	
	10189	Signetics	40

Counters, Binary

Function	Device	Source	Line
4-Bit	F10016C	Fairchild	
	F10016M	† Fairchild	
	MC10178	Motorola	
	MC10578	† Motorola	
4-Bit Universal	F10136	Fairchild	
	F10536	† Fairchild	
	HD10136	Hitachi	
	MC10136	Motorola	
	MC10536	† Motorola	
	MC10H136	**Motorola**	**(730)** 50
	10136	Signetics	

Counters, Decade

Function	Device	Source	Line
Bi-Quinary	MC10138	Motorola	
	MC10538	† Motorola	
Universal	F10137	Fairchild	
	F10537	Fairchild	
	MC10137	Motorola	
	MC10537	Motorola	
	10137	Signetics	
Decade Counter			
	F10010C	Fairchild	
	F10010M	† Fairchild	60

Decoders

Function	Device	Source	Line
Binary to 1-8 (high)			
	F10162	Fairchild	
	F10562	† Fairchild	
	HD10162	Hitachi	
	DG10H162	Motorola	
	MC10162	Motorola	
	MC10562	† Motorola	
	MC10H162	**Motorola**	**(730)**
	10162	Signetics	
Binary to 1-8 (low)			
	F10161	Fairchild	
	F10561	† Fairchild	70
	HD10161	Hitachi	
	DG10H161	Motorola	
	MC10161	Motorola	
	MC10561	† Motorola	
	MC10H161	**Motorola**	**(730)**
	10161	Signetics	
Dual Binary to 1-4 (high)			
	F10172	Fairchild	
	F10572	† Fairchild	
	MC10172	Motorola	
	MC10572	† Motorola	80
	10172	Signetics	
Dual Binary to 1-4 (low)			
	F10171	Fairchild	
	F10571	† Fairchild	
	MC10171	Motorola	
	MC10571	† Motorola	
	10171	Signetics	

Drivers

Function	Device	Source	Line
Dual TTL/MST Bus			
	MC10128	Motorola	
Triple 4-3 Input Bus			
	F10123	Fairchild	
	F10523	† Fairchild	
	MC10123	Motorola	90
	10123	Signetics	
Quad Bus	F10192	Fairchild	
	F10592	† Fairchild	
	MC10192	Motorola	
	10192	Signetics	

Flip-Flops, D-Type

Function	Device	Source		Line
Dual Master-Slave				
	F10131	Fairchild		
	F10231	Fairchild		
	F10531	† Fairchild		
	F10631	† Fairchild		
	HD10131	Hitachi		100
	HD10231	Hitachi		
	MC10131	Motorola		
	MC10231	Motorola		
	MC10531	† Motorola		
	MC10631	† Motorola		
	MC10H131	**Motorola**	**(730)**	
	10131	Signetics		
	10231	Signetics		
Hex Master-Slave (with common reset)				
	F10186	Fairchild		
	F10586	† Fairchild		110
	MC10186	Motorola		
	MC10586	† Motorola		
Hex Master-Slave				
	F10176	Fairchild		
	F10576	† Fairchild		
	MC10176	Motorola		
	MC10576	† Motorola		
	MC10H176	**Motorola**	**(730)**	
	10176	Signetics		
	SN54L47	**† TI**	**(847)**	

Flip-Flops, J-K Type

Function	Device	Source		Line
Dual J-K- Master-Slave				
	F10135	Fairchild		120
	F10535	† Fairchild		
	MC10135	Motorola		
	MC10535	† Motorola		
	10135	Signetics		

Gates, AND

Function	Device	Source		Line
Dual 4-Input	10108	Signetics		
Quad 2-Input (3 AND, 1 AND/NAND)				
	F10104	Fairchild		
	F10504	† Fairchild		
	HD10104	Fairchild		
	HD10104	Hitachi		
	MC10104	Motorola		130
	MC10504	† Motorola		
	MC10H104	**Motorola**	**(730)**	
	10104	Signetics		
Hex	MC10197	Motorola		
	MC10597	† Motorola		
	SN54L46	**† TI**	**(847)**	

Gates, OR

Function	Device	Source		Line
Dual 3-Input 3-Output (line driver)				
	F10110	Fairchild		
	F10210	Fairchild		
	F10510	† Fairchild		
	F10610	† Fairchild		140
	HD10110	Hitachi		
	MC10110	Motorola		
	MC10210	Motorola		
	MC10610	† Motorola		
	10110	Signetics		
Quad 2-Input (3 OR, 1 OR/NOR)				
	F10103	Fairchild		
	F10503	† Fairchild		
	MC10103	Motorola		
	MC10503	† Motorola		
	10103	Signetics		150

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–ECL (Cont'd)

Function	Device	Source		Line
10000 Series				
Gates, OR (Cont'd)				
Gates, NOR				
Dual 3-Input 3-Output (line driver)	F10111	Fairchild		
	F10211	Fairchild		
	F10511	† Fairchild		
	F10611	† Fairchild		
	HD10111	Hitachi		
	MC10111	Motorola		
	MC10211	Motorola		
	MC10611	† Motorola		
	10111	Signetics		
	10210	Signetics		10
	10211	Signetics		
Dual 3-Input 3-Output (1 OR, 2 NOR) (line driver)	F10212	Fairchild		
	F10612	† Fairchild		
	MC10212	Motorola		
	MC10612	† Motorola		
	10112	Signetics		
Triple 4-3-3 Input	F10106	Fairchild		
	F10506	† Fairchild		
	HD10106	Hitachi		
	MC10106	Motorola		20
	MC10506	† Motorola		
	10106	Signetics		
Quad 2-Input (3 NOR, 1 OR/NOR)	F10102	Fairchild		
	F10502	† Fairchild		
	HD10102	Hitachi		
	MC10102	Motorola		
	MC10502	† Motorola		
	MC10H102	**Motorola**	**(730)**	
	10102	Signetics		
Quad 3-Input (one input common)	F10100	Fairchild		30
	F105100	† Fairchild		
	MC10100	Motorola		
	MC10500	† Motorola		
	10100	Signetics		
Gates, OR/NOR				
Dual 4-5 Input	F10109	Fairchild		
	F10509	† Fairchild		
	HD10109	Hitachi		
	HD10209	Hitachi		
	MC10109	Motorola		
	MC10509	† Motorola		40
	MC10H109	**Motorola**	**(730)**	
	10109	Signetics		
Triple 2-3-2 Input	F10105	Fairchild		
	F10505	† Fairchild		
	HD10105	Hitachi		
	MC10105	Motorola		
	MC10505	† Motorola		
	MC10H105	**Motorola**	**(730)**	
	DM10105	National		
	10105	Signetics		50
Quad 2-Input (one input common)	F10101	Fairchild		
	F10501	† Fairchild		
	HD10101	Hitachi		
	MC10101	Motorola		
	MC10501	† Motorola		
	MC10H101	**Motorola**	**(730)**	
	10101	Signetics		
Gates, OR-AND				
Dual 2-Wide 3-Input	F10118	Fairchild		
	F10518	† Fairchild		
	HD10118	Hitachi		60
	MC10118	Motorola		
	MC10518	† Motorola		
	10118	Signetics		
4-Wide 4-3-3-3 Input	F10119	Fairchild		
	F10519	† Fairchild		
	HD10119	Hitachi		
	MC10119	Motorola		
	MC10519	† Motorola		
	10119	Signetics		
Gates, OR-AND/OR-AND Invert				
Dual 2-Wide 2-3 Input	F10117	Fairchild		
	F10517	† Fairchild		70
	HD10117	Hitachi		
	MC10117	Motorola		
	MC10517	† Motorola		
	MC10H117	**Motorola**	**(730)**	
	10117	Signetics		
4-Wide 3-Input	F10121	Fairchild		
	F10521	† Fairchild		
	HD10121	Hitachi		
	MC10121	Motorola		80
	MC10521	† Motorola		
	MC10H121	**Motorola**	**(730)**	
	10121	Signetics		
Gates, Exclusive OR				
Quad	F10113	Fairchild		
	F10513	† Fairchild		
	MC10113	Motorola		
	MC10513	† Motorola		
	10113	Signetics		
Gates, Exclusive OR/NOR				
Triple 2-Input	F10107	Fairchild		
	F10507	† Fairchild		90
	HD10107	Hitachi		
	MC10107	Motorola		
	MC10507	† Motorola		
	MC10H107	**Motorola**	**(730)**	
	10107	Signetics		
Latches				
Dual D Clocked	F10130	Fairchild		
	F10530	† Fairchild		
	HD10130	Hitachi		
	HD10230	Hitachi		
	MC10130	Motorola		100
	MC10530	† Motorola		
	MC10H130	**Motorola**	**(730)**	
	10130	Signetics		
Dual 2 to 1 Multiplexer-Latch	F10134	Fairchild		
	F10534	† Fairchild		
	HD10134	Hitachi		
	MC10134	Motorola		
	MC10534	† Motorola		
	10134	Signetics		
Dual 2 to 1 Multiplexer-Latch, Common Reset	F10132	Fairchild		110
	F10532	† Fairchild		
	HD10132	Hitachi		
			(Continued)	
Dual 2 to 1 Multiplexer-Latch, Common Reset (Cont'd)	MC10132	Motorola		
	MC10532	† Motorola		
	10132	Signetics		
Quad, Common Clock, Separate Output Enable	F10168	Fairchild		
	F10568	† Fairchild		
	MC10168	Motorola		
	MC10568	† Motorola		
Quad D, Gated Output	F10133	Fairchild		120
	F10153	Fairchild		
	F10533	† Fairchild		
	F10553	† Fairchild		
	HD10133	Hitachi		
	MC10133	Motorola		
	MC10153	Motorola		
	MC10533	† Motorola		
	MC10553	† Motorola		
	10133	Signetics		
Quad 2-Input Multiplexer-Latch	F10173	Fairchild		130
	F10573	† Fairchild		
	MC10173	Motorola		
	MC10H173	Motorola		
	10173	Signetics		
Quintuple	F10175	Fairchild		
	F10575	† Fairchild		
	HD10175	Hitachi		
	MC10175	Motorola		
	MC10575	† Motorola		
	MC10H175	**Motorola**	**(730)**	140
	10175	Signetics		
Memories				
CAM (16-Bit content addressable)	10155	Signetics		
For additional information, see Master Selection Guide-Memory sections				
PROM (32x8)	MCM10139	Motorola		
	10139	Signetics		
PROM (256x4)	F10416	Fairchild		
	F10Z416	**Fairchild**	**(3619)**	
PROM (256x4)	MCM10149	Motorola		
	GXB10149	Siemens		
	10149	Signetics		150
RAM (8x2) Simultaneous Read-Write	**MCM10143**	**Motorola**	**(3839)**	
RAM (16x4)	F10145AC	Fairchild		
	F10545AM	† Fairchild		
	HD10145	Hitachi		
	MCM10145	**Motorola**	**(3839)**	
	10145	Signetics		
RAM (64x1)	SN10142	TI		
RAM (64x1) 50 Ohm Drive	HD10148	Hitachi		
	MC10148	Motorola		
	MCM10548	† Motorola		160
	SN10148	TI		
RAM (64x1) 90 Ohm Drive	SN10140	TI		
RAM (128x1)	HD10147	Hitachi		
	MCM10147	**Motorola**	**(3839)**	
	MCM10547	† Motorola		
	SN10147	TI		
RAM (256x1)	HM2106	Hitachi		
	MCM10144	**Motorola**	**(3839)**	
	MCM10152	**Motorola**	**(3839)**	
	MCM10544	† Motorola		170
			(Continued)	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–ECL (Cont'd)

10000 Series Memories (Cont'd)

Function	Device	Source	Line
RAM (256x1)		(Cont'd)	
	DM10414	National	
	μPB10144	NEC-Electron	
	RI10144	Raytheon	
	SN10144	TI	
RAM (256x4)	**MB7072E**	**Fujitsu (3681)**	
	MB7072N	**Fujitsu (3681)**	
	MBM10422E	**Fujitsu (3681)**	
	MBM10422H	**Fujitsu (3681)**	
	MBM10422N	**Fujitsu (3681)**	
	HM2120	Hitachi	10
	DM10422	**National (3854)**	
RAM (1024x1)	**F100415A**	**Fairchild (3615,3625)**	
	F10415	**Fairchild (3615,3618)**	
	F10415A	**Fairchild (3615,3618)**	
	F10474C	**Fairchild (3615,3622)**	
	HM2110	**Hitachi (3789)**	
	HM2112	**Hitachi (3789)**	
	MCM10146	**Motorola (3839)**	
	MCM10415A	**Motorola (3839)**	
	MCM10546	† Motorola	20
	DM10415	National	
	10415	Signetics	
RAM (4096x1)	**MBM10470A-15**	**Fujitsu (3681)**	
RAM (4096x1)	**F10470**	**Fairchild (3615,3621)**	
	MBM10470A-20	**Fujitsu (3681)**	
	HM2140	Hitachi	
	HM2142	Hitachi	
	DM10470	**National (3855)**	
	DM10470A	**National (3855)**	
	DM10470L	**National (3855)**	30
RAM (16384x1)			
	F10480	Fairchild	

Multiplexers (Digital)

Function	Device	Source	Line
Dual 4 to 1	F10174	Fairchild	
	F10574	† Fairchild	
	MC10174	Motorola	
	MC10574	† Motorola	
	MC10H174	Motorola	
	10174	Signetics	
	SN10174	TI	
Quad 2 to 1 (inverting with enable)			
	F10159	Fairchild	
	F10559	† Fairchild	40
	MC10159	Motorola	
	MC10559	† Motorola	
	10159	Signetics	
Quad 2 to 1 (non-inverting)			
	F10158	Fairchild	
	F10558	† Fairchild	
	MC10158	Motorola	
	MC10558	† Motorola	
	10158	Signetics	
8 to 1	F10164	Fairchild	
	F10564	† Fairchild	50
	MC10164	Motorola	
	MC10564	† Motorola	
	MC10H164	**Motorola (730)**	
	10164	Signetics	
	SN10164	TI	

Multivibrators

Function	Device	Source	Line
Monostable	MC10198	Motorola	

Shift Registers

Function	Device	Source	Line
4-Bit	F10000C	Fairchild	
4-Bit Universal	F10141	Fairchild	
	F10541	† Fairchild	
	MC10141	Motorola	60
	MC10541	† Motorola	
	MC10H141	**Motorola (730)**	
	10141	Signetics	

Translators

Function	Device	Source	Line
Dual ECL to MOS/TTL			
	MC75358	Motorola	
	MC75368	Motorola	
Triple ECL to NMOS			
	F10177	Fairchild	
	MC10177	Motorola	
Quad Differential Receiver/MST to ECL			
	MC10190	Motorola	
	MC10590	† Motorola	
Quad ECL to TTL (differential input)			
	F10125	Fairchild	70
	F10525	† Fairchild	
	MC10125	Motorola	
	MC10525	† Motorola	
	10125	Signetics	
Quad TTL to ECL OR/NOR			
	F10124	Fairchild	
	F10524	† Fairchild	
	MC10124	Motorola	
	MC10524	† Motorola	
	10124	Signetics	
Hex ECL to MST			
	MC10191	Motorola	80
	MC10591	† Motorola	

Miscellaneous

Function	Device	Source	Line
Active Terminator			
	F10014C	Fairchild	
	F10014M	† Fairchild	
Error Detection/Correction Circuit			
	MC10163	Motorola	
	MC10193	Motorola	
	MC10563	† Motorola	
	MC10593	† Motorola	
	MC10905	Motorola	
Micro-Code Sequencer			
	MC10904	Motorola	
Dual Simultaneous Bus Transceiver			
	MC10194	Motorola	90
	MC10594	† Motorola	
Triple Differential Line Receiver			
	F10114	Fairchild	
	F10116	Fairchild	
	F10514	† Fairchild	
	F10516	† Fairchild	
	MC10114	Motorola	
	MC10116	Motorola	
	MC10216	Motorola	
	MC10514	† Motorola	
	MC10516	† Motorola	100
	MC10616	† Motorola	
	MC10H116	**Motorola (730)**	
	DM10116	National	
	10114	Signetics	
	10116	Signetics	

Function	Device	Source	Line
Quad Bus Receiver			
	MC10129	Motorola	
	10129	Signetics	
Quad Differential Line Receiver			
	F10115	Fairchild	
	F10515	† Fairchild	
	MC10115	Motorola	110
	MC10515	† Motorola	
	10115	Signetics	
8-Input Priority Encoder			
	F10165	Fairchild	
	F10565	† Fairchild	
	MC10165	Motorola	
	MC10565	† Motorola	
	10165	Signetics	
9-Bit Parity Circuit (2 carry inputs)			
	F10570	† Fairchild	
	MC10170	Motorola	
12-Bit Parity Generator/Checker			
	F10160	Fairchild	120
	F10560	† Fairchild	
	MC10160	Motorola	
	MC10560	† Motorola	
	MC10H160	**Motorola (730)**	
	10160	Signetics	

95000 Series

Counters

Function	Device	Source	Line
Binary	F95016	Fairchild	
Decade	F95010	Fairchild	

Flip-Flops, D-Type

Function	Device	Source	Line
Dual Master-Slave			
	F95231	Fairchild	

Flip-Flops, J-K Type

Function	Device	Source	Line
	F95029	Fairchild	

Gates, OR

Function	Device	Source	Line
Dual 3-Input 3-Output (line driver)			
	F95110	Fairchild	130
Quad 2-Input (3 OR, 1 OR/NOR)			
	F95103	Fairchild	

Gates, NOR

Function	Device	Source	Line
Dual 3-Input 3-Output (line driver)			
	F95111	Fairchild	
Triple 4-3-3 Input			
	F95106	Fairchild	
Quad 2-Input (with enable)			
	F95004	Fairchild	
Quad 2-Input (3 NOR, 1 OR/NOR)			
	F95102	Fairchild	

Gates, OR/NOR

Function	Device	Source	Line
Dual 4-Input (with enable)			
	F95002	Fairchild	
Dual 4-5 Input	F95109	Fairchild	
Triple 2-Input (with enable)			
	F95003	Fairchild	
Triple 2-3-2 Input			
	F95105	Fairchild	
Quad 2-Input (one input common)			
	F95101	Fairchild	140

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–ECL (Cont'd)

Function	Device	Source	Line
95000 Series			
Gates, OR/NOR (Cont'd)			
Gates, Exclusive OR/NOR			
Triple 2-Input	F95107	Fairchild	
Latches			
Dual D Clocked	F95130	Fairchild	
Shift Registers			
4-Bit	F95000	Fairchild	
	F95H00C	Fairchild	
Translators			
Quad TTL to ECL OR/NOR	F95124	Fairchild	
Miscellaneous			
Triple Differential Line Receiver	F95116	Fairchild	
Quad Differential Line Receiver	F95115	Fairchild	
100K Series			
Arithmetic Functions			
Look Ahead Carry Circuit	**F100179**	**Fairchild (658)**	
2x8-Bit Recode Multiplier	**F100183**	**Fairchild (658)**	
4-Bit Binary/Decade Logic Unit	**F100181**	**Fairchild (658)**	10
6-Bit Adder	**F100180**	**Fairchild (658)**	
9-Bit Comparator	**F100166**	**Fairchild (658)**	
	100166	Signetics	
9-Bit Wallace Tree Adder	**F100182**	**Fairchild (658)**	
Buffers			
9-Bit	**F100122**	**Fairchild (658)**	
	100122	Signetics	
Counters			
Multipurpose Counting Register	**F100136**	**Fairchild (658)**	
Decoders			
Universal	**F100170**	**Fairchild (658)**	
	100170	Signetics	
Drivers			
Backplane	**F100126**	**Fairchild (658)**	20
High Speed Line	**F100113**	**Fairchild (658)**	
Quad	**F100112**	**Fairchild (658)**	
	100112	Signetics	
Hex Bus	**F100123**	**Fairchild (658)**	
	100123	Signetics	
Flip-Flops, D-Type			
Triple	**F100131**	**Fairchild (658)**	
	100131	Signetics	
Hex	**F100151**	**Fairchild (658)**	
	100151	Signetics	
Gates, AND-OR-Invert			
Triple	**F100117**	**Fairchild (658)**	30
	100117	Signetics	
5-Wide	**F100118**	**Fairchild (658)**	
	100118	Signetics	
Gates, OR/NOR			
Triple 5-Input	**F100101**	**Fairchild (658)**	
	100101	Signetics	
Quintuple 2-Input	**F100102**	**Fairchild (658)**	
	100102	Signetics	
Gates, Exclusive OR/NOR			
Quintuple	**F100107**	**Fairchild (658)**	
	100107	Signetics	
Latches			
Triple D	**F100130**	**Fairchild (658)**	40
Hex D	**F100150**	**Fairchild (658)**	
	100150	Signetics	
Memories			
CAM (4x4)	**F100142**	**Fairchild (658)**	
PROM (256x4)	F100Z416	Fairchild	
PROM (256x4)	**F100416**	**Fairchild (3626)**	
RAM (16x4)	**F100402**	**Fairchild (658)**	
RAM (16x4 register file)	**F100145**	**Fairchild (658)**	
RAM (16x8 or 64x2)	SH100B396	Siemens	
RAM (256x1)	**F100414**	**Fairchild (3615,3624)**	
RAM (256x4)	**F100422**	**Fairchild (3615)**	50
RAM (1024x4)	**MBM100474**	**Fujitsu (3681)**	
RAM (1024x1)	**F100415**	**Fairchild (3615,3625)**	
RAM (1024x4)	**F100474**	**Fairchild (3615,3629)**	
RAM (4096x1)	**F100470**	**Fairchild (3615,3628)**	
	MBM100470	**Fujitsu (3681)**	
RAM (16384x1)	**F100480**	**Fairchild (3630)**	
Multiplexers (Digital)			
Universal (nine 4/1)	SH100B384	Siemens	
Dual 8-Input	**F100163**	**Fairchild (658)**	
	100163	Signetics	
Triple 4-Input	**F100171**	**Fairchild (658)**	60
	100171	Signetics	
Quad 2-Input with Latch	**F100155**	**Fairchild (658)**	
	100155	Signetics	
16-Input	**F100164**	**Fairchild (658)**	
	100164	Signetics	
Shift Registers			
Mask-Merge	**F100156**	**Fairchild (658)**	
8-Bit Matrix	**F100158**	**Fairchild (658)**	
	100158	Signetics	
8-Bit Universal	**F100141**	**Fairchild (658)**	
Translators			
TTL-100K ECL	**F100124**	**Fairchild (658)**	70
100K ECL-TTL	**F100125**	**Fairchild (658)**	
Miscellaneous			
Address and Data Interface Unit	F100220	Fairchild	
Bidirectional Shifter	SH100B419	Siemens	
Clock Pulse Generator	SH100B392	Siemens	
Comparator and Multiplexer	SH100B402	Siemens	
ECL/TTL Bus Transceiver	SH100255	Siemens	
Error Correction Circuit	SH100B404	Siemens	
Interface Transceiver	SH100B250	Siemens	
Micro Program Sequencer	F100224	Fairchild	
Multi-Function Network	F100221	Fairchild	80
Program Interface Unit	F100223	Fairchild	
Programmable Timer/Counter	SH100B395	Siemens	
Register File with Ring Shifter	SH100B420	Siemens	
Register File with Shift Logic	SH100B393	Siemens	
Universal Priority Encoder	**F100165**	**Fairchild (658)**	
Universal Register File	SH100B417	Siemens	
Dual Access Stack	F100222	Fairchild	
Dual Line Transmitter and Receiver	SH100B252	Siemens	
Dual Sequencer for SH100B480	SH100B481	Siemens	
Dual 9-Bit Parity Generator/Checker	**F100160**	**Fairchild (658)**	90
	100160	Signetics	
Quintuple Line Receiver	**F100114**	**Fairchild (658)**	
	100114	Signetics	
Quintuple Transceiver	**F100194**	**Fairchild (658)**	
Nine Buffered Gates	SH100B122	Siemens	
4-Bit Microprocessor Slice	SH100B480	Siemens	
III and Other Series			
Counters			
Bi-Quinary	MC1678	Motorola	
Divide by 4 Prescaler (1 GHz)	MC1697	Motorola	
	MC1699	Motorola	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–ECL (Cont'd)

Function	Device	Source	Line
III and Other Series Counters (Cont'd)			
Divide by 4 (1 GHz)			
	11C05-2C	Fairchild	
	11C05-2M	† Fairchild	
	11C05C	Fairchild	
	11C05M	† Fairchild	
	SP8610	Plessey	
	SP8611B	Plessey	
	SP8611M	Plessey	
	SP8617B	Plessey	
	CA3199	**RCA** (3364)	
Divide by 5/6 Prescaler, 650 MHz			
	11C91C	Fairchild	10
	11C91M	† Fairchild	
Divide by 10/11 Prescaler, 650 MHz			
	11C90C	Fairchild	
	11C90M	† Fairchild	
	SP8680	Plessey	
Divide by 248/256 Prescaler, 950 MHz			
	11C82	Fairchild	
	11C83	Fairchild	
Divide-by-31/32 Prescaler, to 200 MHz			
	11C79	Fairchild	
Binary	MC1654	Motorola	
Flip-Flops, D-Type			
Master-Slave	11C70C	Fairchild	
	11C70M	† Fairchild	20
	MC1670	Motorola	
	SP1670B	Plessey	
Master-Slave (UHF prescaler)			
	11C06C	Fairchild	
	11C06M	† Fairchild	
	MC1690	Motorola	
Flip-Flops, R-S Type			
Dual, Clocked	MC1666	Motorola	
	SP1666	Plessey	
Gates, OR			
Quad 2-Input	MC1664	Motorola	
	SP1664B	Plessey	
	SP1665B	Plessey	30
Gates, NOR			
Quad 2-Input	MC1662	Motorola	
	SP1662B	Plessey	
Gates, OR/NOR			
Dual 4-Input	MC1660	Motorola	
	SP1660B	Plessey	
	SP16F60	Plessey	
Dual 4-5 Input	11C01C	Fairchild	
	MC1688	Motorola	
Gates, Exclusive OR			
Triple 2-Input	MC1672	Motorola	
	SP1672B	Plessey	
Gates, Exclusive NOR			
Triple 2-Input	MC1674	Motorola	40
	SP1674B	Plessey	

Function	Device	Source	Line
Latches			
Dual Clocked	MC1668	Motorola	
	SP1668	Plessey	
Multivibrators			
Voltage Controlled			
	11C58C	Fairchild	
	MC1658	Motorola	
	SP1658	Plessey	
Shift Registers			
4-Bit	MC1694	Motorola	
Miscellaneous			
Voltage Controlled Oscillator			
	MC1648	Motorola	
	MC1648M	† Motorola	
	SP1648	Plessey	50
Dual Analog/Digital Comparator			
	MC1650	Motorola	
	MC1651	Motorola	
	SP1650B	Plessey	
Quad Line Receiver			
	MC1692	Motorola	
	SP1692B	Plessey	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–HNIL/HTL

Arithmetic Functions

Function	Device	Source	Line
4-Bit Comparator			
	343A/C	Teledyne S	
	343B/M	† Teledyne S	

Buffers/Inverters

See also: Gates, Miscellaneous

Function	Device	Source	Line
Hex Open Collector			
	MC678	Motorola	
	MC681	Motorola	
	MC689	Motorola	
Hex Strobed, Open Collector			
	334A/C	Teledyne S	
Hex Strobed	MC677	Motorola	
	FZH201	Siemens	
	FZH205	Siemens	10
	335A/C	Teledyne S	
Hex	MC680	Motorola	
	MC690	Motorola	
	MC697	Motorola	
	332A/C	Teledyne S	
	332B/M	† Teledyne S	

Inverters

Function	Device	Source	Line
Hex Open Collector			
	MC678	Motorola	
Hex, Strobed, Open Collector			
	MC67B	Motorola	

Counters, Binary

Function	Device	Source	Line
Binary Up/Down			
	374A/C	Teledyne S	
Binary	MC685	Motorola	20
	FZJ151A	Siemens	
	FZJ155A	Siemens	
	372A/C	Teledyne S	
	372B/M	† Teledyne S	

Counters, Decade

Function	Device	Source	Line
Decade, Synchronous			
	FZJ141A	Siemens	
	FZJ145A	Siemens	
Decade Up/Down			
	373A/C	† Teledyne S	
	373B/M	† Teledyne S	
Decade	MC684	Motorola	
	371A/C	Teledyne S	30
	371B/M	† Teledyne S	

Decoders

Function	Device	Source	Line
BCD to Decimal, Open Collector			
	381A/C	Teledyne S	
	381B/M	† Teledyne S	

Decoders/Drivers

Function	Device	Source	Line
BCD to Decimal Decoder/Lamp Driver, Open Collector			
	380B/M	† Teledyne S	
BCD to Decimal (for gas discharge display tubes)			
	MC676	Motorola	
	382A/C	Teledyne S	
	382B/M	† Teledyne S	
BCD to Seven Segment			
	383A/C	Teledyne S	
	383B/M	† Teledyne S	
Quad 2-Input Power, Open Collector			
	302A/C	Teledyne S	40
	302B/M	† Teledyne S	

Drivers

Function	Device	Source	Line
BCD to Decimal Decoder/Lamp Driver, Open Collector			
	380A/C	Teledyne S	
Dual Power and Driver, Open Collector and Open Emitter (schmitt trigger)			
	MC699	Motorola	
Dual 4-Input Line Driver, Expandable			
	MC662	Motorola	
Dual 5-Input Power NAND Driver			
	301A/C	Teledyne S	
	301B/M	† Teledyne S	

Flip-Flops, D-Type

Function	Device	Source	Line
Quad	FZJ131	Siemens	
	FZJ135	Siemens	
	370A/C	Teledyne S	
	370B/M	† Teledyne S	50

Flip-Flops, J-K Type

Function	Device	Source	Line
Master-Slave or Reset			
	FZJ121	Siemens	
	FZJ125	Siemens	
	311A/C	Teledyne S	
	311B/M	† Teledyne S	
Master-Slave with N-Inputs on Master and Slave Sections			
	FZJ111	Siemens	
	FZJ115	Siemens	
Master-Slave with 2 J,K Inputs and N-Input			
	FZJ101	Siemens	
	FZJ105	Siemens	
Dual or Set-Reset			
	MC688	Motorola	
	312A/C	Teledyne S	60
	312B/M	† Teledyne S	
	313A/C	Teledyne S	
	313B/M	† Teledyne S	
Dual with Reset			
	MC663	Motorola	

Flip-Flops, R-S Type

Function	Device	Source	Line
Master-Slave	MC664	Motorola	

Gates, AND

Function	Device	Source	Line
Dual 2-Input Interface Buffer			
	391	Teledyne S	
Dual 4-Input Interface Buffer			
	390	Teledyne S	
Quad 2-Input with N-Input			
	FZH251	Siemens	
	FZH255B	Siemens	

Gates, NAND

Function	Device	Source	Line
Dual 2-Input and Quad Inverter			
	FZH261	Siemens	70
	FZH265B	Siemens	
Dual 2-Input Interface Buffer			
	392	Teledyne S	
Dual 4-Input Interface Buffer			
	395	Teledyne S	
Dual 4-Input with Extension Input and N-Input			
	FZH171	Siemens	
	FZH175	Siemens	
Dual 4-Input	**MC660**	**Motorola (729)**	
	MC661	Motorola	
Dual 5-Input	FZH121	Siemens	
	FZH125	Siemens	
	FZH131	Siemens	80
	FZH135	Siemens	
	FZH141	Siemens	
	FZH145	Siemens	
	FZH231	Siemens	
	FZH235	Siemens	
	322A/C	Teledyne S	
	322B/M	† Teledyne S	
Triple 3-Input	MC670	Motorola	
	MC671	Motorola	
	FZH191	Siemens	90
	FZH195	Siemens	
Quad 2-Input, Open Collector			
	323A/C	Teledyne S	
	323B/M	† Teledyne S	
Quad 2-Input (Schmitt trigger)			
	MC693	Motorola	
Quad 2-Input with Collector and N-Input			
	FZH211	Siemens	
	FZH215B	Siemens	
Quad 2-Input	MC668	Motorola	
	MC672	Motorola	
	FZH101A	Siemens	
	FZH105A	Siemens	100
	FZH111A	Siemens	
	FZH115B	Siemens	
	303A/C	Teledyne S	
	303B/M	† Teledyne S	
	321A/C	Teledyne S	
	321B/M	† Teledyne S	
	324A/C	Teledyne S	
	324B/M	† Teledyne S	
2,2,3,3-Input	325A/C	Teledyne S	
	325B/M	Teledyne S	110
	326A/C	Teledyne S	
	326B/M	Teledyne S	
4, 3, 4-Input	304A/C	Teledyne S	
	304B/M	† Teledyne S	

Gates, AND-OR-Invert

Function	Device	Source	Line
Expandable	344A/C	Teledyne S	
Dual 2-Wide, 2-Input			
	MC673	Motorola	
	MC674	Motorola	
	341A/C	Teledyne S	
	341B/M	† Teledyne S	

Gates, OR

Function	Device	Source	Line
Dual 2-Input Interface Buffer			
	393	Teledyne S	120
Quad 2-Input	FZH291	Siemens	
	FZH295B	Siemens	

Gates, NOR

Function	Device	Source	Line
Dual 2-Input Interface Buffer			
	394	Teledyne S	
Quad 2-Input, Open Collector			
	307A/C	Teledyne S	
Quad 2-Input with Destruction Protection			
	FZH301	Siemens	
	FZH305	Siemens	
Quad 2-Input	FZH281	Siemens	
	FZH285B	Siemens	
	306A/C	Teledyne S	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–HNIL/HTL (Cont'd)

Function	Device	Source	Line
Gates, NOR (Cont'd)			
Gates, Exclusive OR			
Dual 2-Wide, 2-Input AND-OR-Invert, Expandable	MC683	Motorola	
	FZH271	Siemens	
	FZH275	Siemens	
Gates, Miscellaneous			
Dual 4-Input Expander (for 600 series)	MC669	Motorola	
Dual 5-Input Expander (for 300 series)	331A/C	Teledyne S	
	331B/M	† Teledyne S	
Hex Inverter/Gate (quad inverter, dual NAND)	333A/C	Teledyne S	
	333B/M	† Teledyne S	
Latches			
Quad	MC682	Motorola	
Multiplexers (Digital)			
Dual 4-Bit	351A/C	Teledyne S	10
8-Bit	350A/C	Teledyne S	
Multivibrators			
Dual Monostable	MC667	Motorola	
	342A/C	Teledyne S	
	342B/M	† Teledyne S	
Dual Retriggerable Monostable	347A/C	Teledyne S	
	347B/M	† Teledyne S	
Shift Registers			
4-Bit Parallel-In Parallel-Out	MC686	Motorola	
	375A/C	Teledyne S	
	375B/M	† Teledyne S	
4-Bit with Set and Reset Inputs	FZJ161	Siemens	20
	FZJ166	Siemens	
Translators			
Level Converter and Driver	FZH211S	Siemens	
LSL-TTL Level Converter	FZH161	Siemens	
	FZH165B	Siemens	
TTL-LSL Level Converter	FZH181	Siemens	
	FZH185	Siemens	
Dual High to Low Interface (HNL to DTL, TTL)	361A/C	Teledyne S	
	361B/M	† Teledyne S	
Dual Interface Element, (line driver, receiver, ECL to TTL, MOS to TTL, Schmitt trigger)	MC696	Motorola	
	396AC	Teledyne S	30
Dual Low to High Interface (TTL to HNL)	362A/C	Teledyne S	
	362B/M	† Teledyne S	
Triple High to Low (HTL to TTL)	MC665	Motorola	
Triple Low to High (TTL to HTL)	MC666	Motorola	
Quad Low to High Interface (TTL to HNL)	363A/C	Teledyne S	
	363B/M	† Teledyne S	
Hex Inverter/Interface (low to high: TTL, CMOS to HTL, CMOS)	MC691	Motorola	
Miscellaneous			
Timer (see also linear-timers)	355A/C	Teledyne S	
Timing Circuit	FZK101	Siemens	
	FZK105	Siemens	40
Dual Pulse Stretcher	MC675	Motorola	
	349A/C	Teledyne S	
Dual 4-Input NAND Schmitt Trigger with Extension Input and N-Input	FZH241	Siemens	
	FZH245	Siemens	
Quad Schmitt Trigger/Line Receiver	367A/C	Teledyne S	
	367B/M	† Teledyne S	
Quad Schmitt Trigger/Line Receiver, Open Collector	368A/C	Teledyne S	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

DIGITAL–TTL

Arithmetic Functions

Function	Device	Source		Line
Microprocessor Co-processor Multiplier/Divider (8x8)				
TTL-S	SN54S508	† MMI		
	SN74S508	MMI		
Adder (natural binary coded decimal)				
TTL	MC4056	Motorola		
	MC4356	† Motorola		
	MC54456	† Motorola		
	MC74456	Motorola		
Adder/Subtractor Quad Serial				
TTL-LS	AM25LS15C	AMD		
	AM25LS15M	† AMD		
	SN54LS385	† AMD		
	SN74LS385	AMD		10
	SN54LS385	† Motorola		
	SN74LS385	Motorola		
	SN54LS385	**† TI**	**(942)**	
	SN74LS385	**TI**	**(942)**	
Adder, 4-Bit BCD				
TTL-S	N82S83	† Signetics		
Arithmetic Unit, Floating Point				
TTL	**TDC1022**	**† TRW**	**(813,817)**	
	TDC1022	TRW		
Comparator, Address				
TTL-ALS				
	SN54ALS677	**† TI**	**(993)**	
	SN54ALS678	**† TI**	**(993)**	
	SN54ALS679	**† TI**	**(994)**	20
	SN54ALS680	**† TI**	**(994)**	
	SN74ALS677	**TI**	**(993)**	
	SN74ALS678	**TI**	**(993)**	
	SN74ALS679	**TI**	**(994)**	
	SN74ALS680	**TI**	**(994)**	
Comparator, Registered				
TTL-F	54F524	† Fairchild		
	74F524	† Fairchild		
Comparator, Dual 4-Bit Magnitude				
TTL	MC4021	Motorola		
	MC4022	Motorola		
	MC4321	† Motorola		30
	MC4322	† Motorola		
Comparator, 4-Bit Magnitude				
TTL	DM7200	† National		
	DM8200	National		
	TD3502A	Toshiba		
Comparator, 4-Bit Magnitude, Separate A=B Output				
TTL	5485	† Fairchild		
	54LS85	† Fairchild		
	7485	Fairchild		
	74LS85	Fairchild		
	9324C	Fairchild		
	9324M	† Fairchild		40
	ZN5485	† Ferranti		
	ZN7485	Ferranti		
	HD7485	Hitachi		
	HD74LS85	Hitachi		
	MC5485	† Motorola		
	MC7485	Motorola		
	MC8324	Motorola		
	MC9324	† Motorola		
	SN54LS85	† Motorola		
	SN74LS85	Motorola		50
	DM5485	† National		
	DM54LS85	† National		
	DM7485	National		
	DM74LS85	National		
	54LS85	† SGS		
	74LS85	SGS		
	5485	† Signetics		
	54LS85	† Signetics		

(Continued)

Function	Device	Source		Line
Comparator, 4-Bit Magnitude, Separate A=B Output				
TTL			(Cont'd)	
	7485	Signetics		
	74LS85	Signetics		60
	N9324	Signetics		
	SN5485	**† TI**	**(862)**	
	SN54LS85	† TI		
	SN7485	**TI**	**(862)**	
	SN74LS85	**TI**	**(862)**	
TTL-S	54S85	† Signetics		
	74S85	Signetics		
	SN54S85	**† TI**	**(862)**	
	SN74S85	**TI**	**(862)**	
Comparator, 6-Bit Identity				
TTL	DM7160	† National		70
	DM8160	National		
TTL-S	93546M	† Fairchild		
	93S46C	Fairchild		
Comparator, 6-Bit Identity, Open Collector				
TTL-S	93S47C	Fairchild		
	93S47M	† Fairchild		
Comparator, 6-Bit, Unified Bus, Active Pull Up				
TTL	DM7131	† National		
	DM8131	National		
Comparator, 6-Bit, Unified Bus, Open Collector				
TTL	DM7136	† National		
	DM8136	National		
Comparator, 8-Bit				
TTL-ALS				
	SN54ALS520	**† TI**	**(956)**	80
	SN54ALS521	**† TI**	**(956)**	
	SN54ALS522	**† TI**	**(956)**	
	SN74ALS520	**TI**	**(956)**	
	SN74ALS521	**TI**	**(956)**	
	SN74ALS522	**TI**	**(956)**	
TTL-F	54F521	† Fairchild		
	74F521	Fairchild		
	MC54F521	**† Motorola**	**(731)**	
	MC74F521	**Motorola**	**(731)**	
	54F521	† Signetics		90
	74F521	Signetics		
TTL-LS	**AM25LS2521C**	**AMD**	**(1227)**	
	AM25LS2521M	**† AMD**	**(1227)**	
Comparator, 8-Bit Magnitude Open Collector				
TTL-ALS				
	SN54ALS518	**† TI**	**(956)**	
	SN54ALS519	**† TI**	**(956)**	
	SN54ALS689	**† TI**	**(998)**	
	SN73ALS519	TI		
	SN74ALS518	**TI**	**(956)**	
	SN74ALS689	**TI**	**(998)**	
TTL-LS	SN54LS683	† Motorola		100
	SN54LS685	† Motorola		
	SN54LS687	† Motorola		
	SN54LS689	† Motorola		
	SN74LS683	Motorola		
	SN74LS685	Motorola		
	SN74LS687	Motorola		
	SN74LS689	Motorola		
	SN54LS683	**† TI**	**(996)**	
	SN54LS685	**† TI**	**(996)**	
	SN54LS689	**† TI**	**(998)**	110
	SN74LS683	**TI**	**(996)**	
	SN74LS685	**TI**	**(996)**	
	SN74LS689	**TI**	**(998)**	
Comparator, 8-Bit Magnitude Totem-Pole				
TTL-ALS				
	SN54ALS688	**† TI**	**(998)**	
	SN74ALS688	**TI**	**(998)**	

(Continued)

Function	Device	Source		Line
Comparator, 8-Bit Magnitude Totem-Pole				
			(Cont'd)	
TTL-AS	**SN54AS885**	**† TI**	**(1012)**	
	SN74AS885	**TI**	**(1012)**	
TTL-LS	SN54LS682	† Motorola		
	SN54LS684	† Motorola		
	SN54LS686	† Motorola		120
	SN54LS688	† Motorola		
	SN74LS682	Motorola		
	SN74LS684	Motorola		
	SN74LS686	Motorola		
	SN74LS688	Motorola		
	SN74LS684	Signetics		
	SN54LS682	**† TI**	**(996)**	
	SN54LS684	**† TI**	**(996)**	
	SN54LS686	**† TI**	**(997)**	
	SN54LS688	**† TI**	**(998)**	130
	SN74LS682	**TI**	**(996)**	
	SN74LS684	**TI**	**(996)**	
	SN74LS686	**TI**	**(997)**	
	SN74LS688	**TI**	**(998)**	
Comparator, 10-Bit Identity				
TTL	DM7130	† National		
	DM8130	National		
Fast Carry Extender (for 8260)				
TTL	MC7261	Motorola		
	MC8261	† Motorola		
	RC8261	Raytheon		
	RM8261	† Raytheon		140
Full Adder, Gated				
TTL	5480	† Fairchild		
	MC5480	† Motorola		
	MC7480	Motorola		
	SN5480	**† TI**	**(860)**	
	SN7480	**TI**	**(860)**	
Full Adder, Dual				
TTL	9304C	Fairchild		
	9304M	† Fairchild		
	MC8304	Motorola		
	MC9304	Motorola		
TTL-H	54H183	† Fairchild		150
	74H183	Fairchild		
	HD74H183	Hitachi		
	SN54H183	**† TI**	**(898)**	
	SN74H183	**TI**	**(898)**	
TTL-LS	**SN54LS183**	**† TI**	**(898)**	
	SN74LS183	**TI**	**(898)**	
Full Adder, 2-Bit Binary				
TTL	5482	† Fairchild		
	7482	Fairchild		
	ZN5482	† Ferranti		
	ZN7482	Ferranti		160
	MC7482	Motorola		
	SN5482	**† TI**	**(860)**	
	SN7482	**TI**	**(860)**	
Full Adder, 4-Bit with Output Latch				
TTL	AM2506C	AMD		
	AM2506M	† AMD		
	RC2506	Raytheon		
	RM2506	† Raytheon		
Logic Element				
TTL	MC7260	Motorola		
	MC8260	† Motorola		
	RC8260	Raytheon		170
	RM8260	† Raytheon		
Logic Shift Matrix, Bit and Byte Masking				
TTL-S	9405AC	Fairchild		
	9405AM	† Fairchild		

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Arithmetic Functions (Cont'd)

Function	Device	Source		Line
Logic Unit/Function Generator				
TTL	54181	† Fairchild		
	9341C	Fairchild		
	9341M	† Fairchild		
	ZN54181	† Ferranti		
	MC54181	Motorola		
	MC74181	Motorola		
	DM54181	† National		
	54181	† Signetics		
	74181	Signetics		
	SN54181	**† TI**	**(897)**	10
	SN74181	**TI**	**(897)**	
TTL-AS	**SN54AS181**	**† TI**	**(897)**	
	SN54AS881	**† TI**	**(1011)**	
	SN74AS181	**TI**	**(897)**	
	SN74AS881	**TI**	**(1011)**	
TTL-F	**54F181**	**† Fairchild**	**(619)**	
	54F381	† Fairchild		
	54F382	† Fairchild		
	74F181	**Fairchild**	**(619)**	
	74F381	Fairchild		20
	74F382	Fairchild		
	MC54F181	**† Motorola**	**(731)**	
	MC54F381	**† Motorola**	**(731)**	
	MC54F382	**† Motorola**	**(731)**	
	MC74F181	**Motorola**	**(731)**	
	MC74F381	**Motorola**	**(731)**	
	MC74F382	**Motorola**	**(731)**	
	54F181	† Signetics		
	74F181	Signetics		
TTL-LS	AM25LS181C	AMD		30
	AM25LS181M	† AMD		
	AM25LS2517C	**AMD**	**(1227)**	
	AM25LS2517M	**AMD**	**(1227)**	
	AM25LS381C	**AMD**	**(1227)**	
	AM25LS381M	**† AMD**	**(1227)**	
	SN54LS181	† AMD		
	SN54LS381	**† AMD**	**(1227)**	
	SN74LS381	**AMD**	**(1227)**	
	54LS181	† Fairchild		
	74LS181	Fairchild		40
	HD74LS18	Hitachi		
	SN54LS181	† Motorola		
	SN74LS181	Motorola		
	54LS181	† SGS		
	74LS181	SGS		
	54LS181	† Signetics		
	74LS181	Signetics		
	SN54LS181	**† TI**	**(897)**	
	SN54LS381	**† TI**	**(940)**	
	SN54LS382	**† TI**	**(941)**	50
	SN74LS181	**TI**	**(897)**	
	SN74LS381	**TI**	**(940)**	
	SN74LS382	**TI**	**(941)**	
TTL-S	SN54S181	† AMD		
	SN74S181	AMD		
	93S41C	Fairchild		
	93S41M	† Fairchild		
	HD74S181	Hitachi		
	SN54S381	† MMI		
	SN74S381	† MMI		60
	54S181	† Signetics		
	74S181	Signetics		
	SN54S181	**† TI**	**(897)**	
	SN54S381	**† TI**	**(940)**	
	SN74S181	TI		
	SN74S381	**† TI**	**(940)**	

Function	Device	Source		Line
Look-Ahead Carry Generator				
TTL	54182	† Fairchild		
	9342C	Fairchild		
	9342M	† Fairchild		
	HD74182	Hitachi		70
	MC54182	† Motorola		
	MC74182	Motorola		
	DM54182	† National		
	DM74182	National		
	SN54182	**† TI**	**(898)**	
	SN74182	**TI**	**(898)**	
TTL-AS	**SN54AS882**	**† TI**	**(1012)**	
	SN74AS882	**TI**	**(1012)**	
TTL-F	54F182	† Fairchild		
	74F182	Fairchild		80
	MC54F182	**† Motorola**	**(731)**	
	MC74F182	**Motorola**	**(731)**	
TTL-S	93S42C	Fairchild		
	93S42M	† Fairchild		
	HD74S182	Hitachi		
	SN54S182	† MMI		
	SN74S182	MMI		
	DM74S182	National		
	54S182	† Signetics		
	74S182	Signetics		90
	SN54S182	**† TI**	**(898)**	
	SN74S182	**TI**	**(898)**	
Multiplier/Divider (8-Bit, with latch)				
TTL-F	54F559	† Fairchild		
	74F559	† Fairchild		
Multiplier/Divider, 16x16				
	SN54S516	**† MMI**	**(716)**	
	SN74S516	**MMI**	**(716)**	
Multiplier, High Speed				
	SN54S557	**† MMI**	**(719)**	
	SN54S558	**† MMI**	**(719)**	
	SN74S557	**MMI**	**(719)**	
	SN74S558	**MMI**	**(719)**	100
Multiplier, Unsigned Magnitude, 2's Complement or Mixed Operands, 8-Bit by 8-Bit				
TTL-S	**AM25S557**	**AMD**	**(601)**	
	AM25S558	**AMD**	**(601)**	
Multiplier, Unsigned Magnitude (8x8)				
TTL	**MPY08HU**	**† TRW**	**(812)**	
	MPY08HU	TRW		
Multiplier, Binary (2x4) Parallel, Serial Output				
TTL-LS	54LS261	† Signetics		
	SN54LS261	**† TI**	**(918)**	
	SN74LS261	**† TI**	**(918)**	
Multiplier, Binary (4x2)				
TTL	9344M	† Fairchild		
Multiplier, Binary (4x4) Parallel (used with 54/74284)				
TTL	**SN54285**	**† TI**	**(923)**	
	SN74285	**TI**	**(923)**	110
Multiplier, Binary (4x4) Parallel (used with 54/74285)				
TTL	DM54284	† National		
	SN54284	**† TI**	**(923)**	
	SN74284	**† TI**	**(923)**	
Multiplier, Binary (4x4) Three-State				
TTL-S	**SN74S274**	**TI**	**(920)**	
Multiplier, 2's Complement and Unsigned Magnitude (12x12)				
TTL	**MPY012H**	**† TRW**	**(812)**	
	MPY012H	TRW		
	MPY012K	**† TRW**	**(812)**	
	MPY012K	TRW		

Function	Device	Source		Line
Multiplier, 2's Complement and Unsigned Magnitude (16x16)				
TTL	**SY66016**	**Synertek**	**(1549)**	
	MPY016H	**† TRW**	**(812)**	120
	MPY016H	TRW		
	MPY016K	**† TRW**	**(812.815)**	
	MPY016K	TRW		
	MPY16HD	**† TRW**	**(812)**	
	MPY16HD	TRW		
Multiplier, 2's Complement and Unsigned Magnitude (24x24)				
TTL	MPY1024	† TRW		
	MPY1024	TRW		
Multiplier, 2's Complement (12x12)				
TTL	**MPY012A**	**† TRW**	**(812)**	
	MPY012A	TRW		
Multiplier, 2's Complement (12x12) with Accumulator (allows unsigned magnitude inputs as well)				
TTL	**TDC1009J**	**TRW**	**(812)**	130
	TDC1009JM	**† TRW**	**(812)**	
Multiplier, 2's Complement (16x16)				
TTL	**MPY016A**	**† TRW**	**(812)**	
	MPY016A	TRW		
Multiplier, 2's Complement (16x16. 'H' version allows unsigned magnitude inputs as well)				
TTL	**AM29516**	**AMD**	**(601)**	
	AM29517	**AMD**	**(601)**	
Multiplier, 2's Complement (16x16) with Accumulator (allows unsigned magnitude inputs as well)				
TTL	**TDC1010J**	**TRW**	**(812)**	
	TDC1010JM	**† TRW**	**(812)**	
Multiplier, 2's Complement (4x2)				
TTL	AM2505C	AMD		
	AM2505M	† AMD		
	RC2505	Raytheon		140
	RM2505	† Raytheon		
TTL-S	AM25S05C	AMD		
	AM25S05M	† AMD		
	93S43C	Fairchild		
	93S43M	† Fairchild		
Multiplier, 2's Complement (8x8)				
TTL	**MPY008A**	**† TRW**	**(812)**	
	MPY008A	TRW		
	MPY008H	**† TRW**	**(812)**	
	MPY008H	TRW		
Multiplier, 2's Complement (8x8)				
TTL	57558	† MMI		150
	57558-1	† MMI		
	67558	MMI		
	67558-1	MMI		
TTL-F	54F558	† Fairchild		
	74F558	Fairchild		
TTL-LS	AM25LS2516C	AMD		
	AM25LS2516M	† AMD		
Multiplier, 2's Complement (8x8) with Accumulator (allows unsigned magnitude inputs as well)				
TTL	**TDC1008J**	**TRW**	**(812)**	
	TDC1008JM	**† TRW**	**(812)**	
Multiplier, 4-Bit Three-State (two ICs to a set, 7875A and 7875B)				
TTL	DM7875	† National		160
	DM8875	National		
Multiplier (8x1) Serial/Parallel 2's Complement				
TTL-LS	AM25LS14C	AMD		
	AM25LS14M	† AMD		
	SN54LS384	† AMD		
	SN74LS384	AMD		
	SN54LS384	† Motorola		
	SN74LS384	Motorola		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

DIGITAL-TTL (Cont'd)

Arithmetic Functions (Cont'd)

Function	Device	Source	Line
Multiplier (8x1) Serial/Parallel 2's Complement			
TTL-LS			(Cont'd)
	SN54LS384	**† TI**	**(941)**
	SN74LS384	**TI**	**(941)**
Multiplier (8x8), with Latch			
TTL-F	54F557	† Fairchild	
	74F557	Fairchild	
Multiplier, 8-Bit Parallel Byte			
TTL	SBP9708C	TI	
	SBP9708M	† TI	
Multiplier, 16-Bit Product			
TTL	**MPY112K**	**† TRW**	**(812,814)**
	MPY112K	TRW	
Multiplier-Accumulator (8x8)			
TTL	**TDC1008**	**† TRW**	**(812)**
	TDC1008	TRW	10
Multiplier-Accumulator (12x12)			
TTL	**TDC1003**	**TRW**	**(812)**
	TDC1009	**† TRW**	**(812)**
	TDC1009	TRW	
Multiplier-Accumulator (16x16)			
TTL	**TDC1010**	**† TRW**	**(812)**
	TDC1010	TRW	
Register/Arithmetic Logic Unit			
TTL-LS	**SN54LS681**	**† TI**	**(995)**
	SN74LS681	**TI**	**(995)**
TTL-S	DM74S281	National	
	SN54S281	**† TI**	**(922)**
	SN74S281	**TI**	**(922)** 20
Binary 1-Hexidecimal Scalers, Multifunction			
TTL-S	SN54AS894	† TI	
	SN74AS894	TI	
4-Bit Microprocessor Slice (ALU)			
TTL-S	**AM2901AC**	**AMD**	**(1201)**
	AM2901AM	**† AMD**	**(1201)**
	AM2901BC	**AMD**	**(1201)**
	AM2901BM	**† AMD**	**(1201)**
	AM2901C	**AMD**	**(1201)**
	AM2901M	**† AMD**	**(1201)**
	AM2903C	**AMD**	**(1203)**
	AM2903M	**† AMD**	**(1203)** 30
	AM29203	**AMD**	**(1203)**
	F2901AC	Fairchild	
	F2901AM	† Fairchild	
	F2903C	Fairchild	
	F2903M	† Fairchild	
	3002	Intel	
	ADM2901AC	National	
	IDM2901AM	**† National**	**(3856)**
	N3002	Signetics	
	S3002	† Signetics	40
	SN74S481	TI	
4-Bit ALU with Look-Ahead Carry			
TTL	9340C	Fairchild	
	9340M	† Fairchild	
4-Bit Binary Full Adder, Look-Ahead Carry			
TTL	54283	† Fairchild	
	5483	† Fairchild	
	74283	Fairchild	
	7483	Fairchild	
	ZN54283A	† Ferranti	
	ZN5483A	† Ferranti	
	ZN74283A	Ferranti	50
	ZN7483A	Ferranti	
	HD74283	Hitachi	
	HD7483A	Hitachi	
	MC5483	† Motorola	
	MC7483	Motorola	
	DM5483	† National	

(Continued)

Function	Device	Source	Line
4-Bit Binary Full Adder, Look-Ahead Carry			
TTL			(Cont'd)
	DM7483	National	
	5483	† Signetics	
	7483	Signetics	
	SN54283	**† TI**	**(922)** 60
	SN5483A	**† TI**	**(861)**
	SN74283	**TI**	**(922)**
	SN7483A	**TI**	**(861)**
TTL-LS	54LS283	† Fairchild	
	54LS83	† Fairchild	
	74LS283	Fairchild	
	74LS83	Fairchild	
	HD74LS283A	Hitachi	
	HD74LS83A	Hitachi	
	M74LS283	Mitsubishi	70
	SN54LS283	† Motorola	
	SN54LS83A	† Motorola	
	SN74LS283	Motorola	
	SN74LS83A	Motorola	
	DM54LS283	† National	
	DM54LS83A	† National	
	DM74LS283	National	
	DM74LS83A	National	
	54LS283	† SGS	
	54LS83A	† SGS	80
	74LS283	SGS	
	74LS83A	SGS	
	54LS283	† Signetics	
	54LS83A	† Signetics	
	74LS283	Signetics	
	74LS83A	Signetics	
	SN54LS283	**† TI**	**(922)**
	SN54LS83A	**† TI**	**(861)**
	SN74LS283	**TI**	**(922)**
	SN74LS83A	**TI**	**(861)** 90
TTL-S	**SN54S283**	**† TI**	**(922)**
	SN74S283	**TI**	**(922)**
4-Bit BCD (add, subtract, compare)			
TTL-S	N82S82	Signetics	
7-Bit Slice Wallace Tree (to build multipliers)			
TTL-LS	**SN54LS275**	**† TI**	**(920)**
	SN74LS275	**TI**	**(920)**
TTL-S	SN54S275	† TI	
	SN74S275	TI	
8-Bit Serial/Parallel Register (for use with 25LS14/ 74LS384)			
TTL-LS	**AM25LS22C**	**AMD**	**(1227)**
	AM25LS22M	**† AMD**	**(1227)**
	SN54LS322	† AMD	100
	SN74LS322	AMD	
	SN54LS322	† Motorola	
	SN74LS322	Motorola	
	SN54LS322A	**TI**	**(930)**
	SN74LS322A	**TI**	**(930)**

Buffers

Function	Device	Source	Line
Quad Gated, Three-State (inverted control)			
TTL	54126	† Fairchild	
	74126	Fairchild	
	HD74126	Hitachi	
	DM7094	† National	
	DM8094	National	110
	54126	† Signetics	
	74126	Signetics	
	SN54126	**† TI**	**(875)**
	SN54426	**† TI**	**(946)**
	SN74126	**TI**	**(875)**
	SN74426	**TI**	**(946)**
TTL-LS	54LS126	† Fairchild	

(Continued)

Function	Device	Source	Line
Quad Gated, Three-State (inverted control)			
TTL-LS			(Cont'd)
	74LS126	Fairchild	
	M74LS126A	Mitsubishi	
	SN54LS126A	† Motorola	120
	SN74LS126A	Motorola	
	DM54LS126	† National	
	DM74LS126	National	
	54LS126	† SGS	
	74LS126	SGS	
	54LS126A	† Signetics	
	74LS126A	Signetics	
	SN54LS126A	**† TI**	**(875)**
	SN74LS126A	**TI**	**(875)**
Quad Gated, Three-State			
TTL	54125	† Fairchild	130
	74125	Fairchild	
	HD74125	Hitachi	
	DM54125	† National	
	DM7093	† National	
	DM74125	National	
	DM8093	National	
	54125	† Signetics	
	74125	Signetics	
	SN54125	**† TI**	**(875)**
	SN54425	**† TI**	**(946)** 140
	SN74125	**TI**	**(875)**
	SN74425	**TI**	**(946)**
TTL-LS	74LS125	Fairchild	
	M74LS125A	Mitsubishi	
	SN54LS125A	† Motorola	
	SN74LS125A	Motorola	
	DM54LS125A	† National	
	DM74LS125A	National	
	54LS125A	† SGS	
	74LS125A	SGS	150
	54LS125A	† Signetics	
	74LS125A	Signetics	
	SN54LS125A	**† TI**	**(875)**
	SN74LS125A	**TI**	**(875)**
Hex, Open Collector			
TTL-ALS			
	SN54ALS1035	**† TI**	**(1017)**
	SN74ALS1035	**TI**	**(1017)**
Hex, Three-State			
TTL	DM54365	† National	
	DM54367	† National	
	DM7095	† National	
	DM7097	† National	160
	DM74366	National	
	DM74367	National	
	DM8095	National	
	DM8097	National	
	54365A	† Signetics	
	54367A	† Signetics	
	74365A	Signetics	
	74367A	Signetics	
	SN54365A	**† TI**	**(935)**
	SN54367A	**† TI**	**(936)** 170
	SN74365A	**TI**	**(935)**
	SN74367A	**TI**	**(936)**
TTL-ALS			
	SH74ALS1034	TI	
	SN54ALS1034	**† TI**	**(1017)**
	SN54ALS367	† TI	
	SN74ALS367	TI	
TTL-AS	**SN54AS1034**	**† TI**	**(1017)**
TTL-LS	54LS365	† Fairchild	
	54LS367	† Fairchild	
	74LS365	Fairchild	180
	74LS367	Fairchild	

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Buffers (Cont'd)

Function		Device	Source		Line
Hex, Three-State					
	TTL-LS			(Cont'd)	
		HD74LS367	Hitachi		
		M74LS365A	Mitsubishi		
		M74LS367A	Mitsubishi		
		SN54LS365A	† Motorola		
		SN54LS367A	† Motorola		
		SN74LS365A	Motorola		
		SN74LS367A	Motorola		
		DM54LS365A	† National		
		DM54LS367A	† National		
		DM74LS365A	National		10
		DM74LS367A	National		
		54LS365	† SGS		
		54LS367	† SGS		
		74LS365	SGS		
		74LS367	SGS		
		54LS365A	† Signetics		
		54LS367A	† Signetics		
		74LS365A	Signetics		
		74LS367A	Signetics		
		SN54LS365A	**† TI**	**(935)**	20
		SN54LS367A	**† TI**	**(936)**	
		SN74LS365A	**TI**	**(935)**	
		SN74LS367A	**TI**	**(936)**	
	TTL-S	MC8T95	Motorola		
		MC8T97	Motorola		
		N8T95	Signetics		
		N8T97	Signetics		
		S8T95	† Signetics		
		S8T97	† Signetics		
Octal Buffer/Latch, Three-State					
	TTL-S	**MC3482**	**Motorola**	**(2752)**	30
		MC3482A	**Motorola**	**(2752)**	
		MC3482B	**Motorola**	**(2752)**	
		MC6482	Motorola		
		MC6482A	Motorola		
		MC6482B	Motorola		
Octal, Inverting, with Parity Generator/Checker					
	TTL-F	74F581	Signetics		
Octal, with Parity Generator Checker					
	TTL-F	74F582	Signetics		
Octal, Three-State					
	TTL-LS	DM71LS95	† AMD		
		DM71LS97	† AMD		
		DM81LS95	AMD		40
		DM81LS97	AMD		
		DM71LS95	† National		
		DM71LS97	† National		
		DM81LS95	National		
		DM81LS97	National		
		SN54LS465	**† TI**	**(952)**	
		SN54LS467	**† TI**	**(952)**	
		SN74LS465	**TI**	**(952)**	
		SN74LS467	**TI**	**(952)**	
10-Bit (bus interface)					
	TTL-S	**AM29827**	**AMD**	**(2604)**	50
		AM29828	**AMD**	**(2604)**	

Buffers/Inverters

Function		Device	Source		Line
Hex, Three-State					
	TTL-ALS				
		SN54ALS366	† TI		
		SN74ALS366	TI		
		SN74ALS366-1	TI		

Inverters

Function		Device	Source		Line
Hex, Open Collector					
	TTL	5405	† Fairchild		
		7405	Fairchild		
		ZN5405	† Ferranti		
		ZN7405	Ferranti		
		HD7405	Hitachi		
		MC5405	† Motorola		60
		MC7405	Motorola		
		DM5405	† National		
		DM7405	National		
		7405	Signetics		
		S8T90	† Signetics		
		SN5405	**† TI**	**(834)**	
		SN7405	**TI**	**(834)**	
	TTL-ALS				
		SN54ALS05	**† Motorola**	**(732)**	
		SN74ALS05	**Motorola**	**(732)**	
		SN54ALS05	**† TI**	**(834)**	70
		SN54ALS1005	**† TI**	**(1014)**	
		SN74ALS05	**TI**	**(834)**	
		SN74ALS1005	**TI**	**(1014)**	
	TTL-H	54H05	† Fairchild		
		74H05	Fairchild		
		MC3009	Motorola		
		MC3109	† Motorola		
		DM54H05	† National		
		DM74H05	National		
		SN54H05	**† TI**	**(834)**	80
		SN74H05	**TI**	**(834)**	
	TTL-LS	54LS05	† Fairchild		
		74LS05	Fairchild		
		HD74LS05	Hitachi		
		M74LS05	Mitsubishi		
		SN54LS05	† Motorola		
		SN74LS05	Motorola		
		DM54LS05	† National		
		DM74LS05	National		
		54LS05	† SGS		90
		74LS05	SGS		
		54LS05	† Signetics		
		74LS05	Signetics		
		SN54LS05	**† TI**	**(834)**	
		SN74LS05	**TI**	**(834)**	
	TTL-S	54S05	† Fairchild		
		74S05	Fairchild		
		HD74S05	Hitachi		
		DM54S05	† National		
		DM74S05	National		100
		54S05	† Signetics		
		74S05	Signetics		
		SN54S05	**† TI**	**(834)**	
		SN74S05	**TI**	**(834)**	
Hex, Three-State					
	TTL	DM54366	† National		
		DM54368	† National		
		DM7096	† National		
		DM7098	† National		
		DM74365	National		
		DM74368	National		110
		DM8096	National		
		DM8098	National		
		54366A	† Signetics		
		54368A	† Signetics		
		74366A	Signetics		
		74368A	Signetics		
		SN54366A	**† TI**	**(935)**	
		SN54368A	**† TI**	**(936)**	
		SN74366A	**TI**	**(935)**	
		SN74368A	**TI**	**(936)**	120

(Continued)

Function		Device	Source		Line
Hex, Three-State					
				(Cont'd)	
	TTL-LS	54LS366	† Fairchild		
		54LS368	† Fairchild		
		74LS366	Fairchild		
		74LS368	Fairchild		
		HD74LS368	Hitachi		
		M74LS366A	Mitsubishi		
		M74LS368A	Mitsubishi		
		SN54LS366A	† Motorola		
		SN54LS368A	† Motorola		
		SN74LS366A	Motorola		130
		SN74LS368A	Motorola		
		DM54LS366A	† National		
		DM54LS368A	† National		
		DM74LS366A	National		
		DM74LS368A	National		
		54LS366	† SGS		
		54LS368	† SGS		
		74LS366	SGS		
		74LS368	SGS		
		54LS366A	† Signetics		140
		54LS368A	† Signetics		
		74LS366A	Signetics		
		74LS368A	Signetics		
		SN54LS366A	**† TI**	**(935)**	
		SN54LS368A	**† TI**	**(936)**	
		SN74LS366A	**TI**	**(935)**	
		SN74LS368A	**TI**	**(936)**	
	TTL-S	MC8T96	Motorola		
		MC8T98	Motorola		
		N8T96	Signetics		150
		N8T98	Signetics		
		S8T98	† Signetics		
Hex					
	TTL	5404	† Fairchild		
		7404	Fairchild		
		ZN5404	† Ferranti		
		ZN7404	Ferranti		
		HD7404	Hitachi		
		MC5404	† Motorola		
		MC7404	Motorola		
		DM5404	† National		160
		DM7404	National		
		DM9016C	National		
		5404	† Signetics		
		7404	Signetics		
		SN5404	**† TI**	**(834)**	
		SN54L04	**† TI**	**(834)**	
		SN7404	**TI**	**(834)**	
	TTL-ALS				
		SN54ALS04	**† Motorola**	**(732)**	
		SN74ALS04	**Motorola**	**(732)**	
		DM54ALS04	† National		170
		DM74ALS04	National		
		SN54ALS04	**† TI**	**(834)**	
		SN54ALS1004	**† TI**	**(1014)**	
		SN74ALS04	**TI**	**(834)**	
		SN74ALS1004	**TI**	**(1014)**	
	TTL-F	54F04	Fairchild		
		74F04	Fairchild		
		MC54F04	**Motorola**	**(731)**	
		MC74F04	**Motorola**	**(731)**	
		54F04	Signetics		180
		74F04	Signetics		
	TTL-H	54H04	† Fairchild		
		74H04	Fairchild		
		MC3008	Motorola		
		MC3108	† Motorola		
		DM54H04	† National		
		DM74H04	National		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Inverters (Cont'd)

Function	Device	Source		Line
Hex				
TTL-H			(Cont'd)	
	SN54H04	**† TI**	**(834)**	
	SN74H04	**TI**	**(834)**	
TTL-LS	54LS04	† Fairchild		
	74LS04	Fairchild		
	HD74LS04	Hitachi		
	M74LS04	Mitsubishi		
	SN54LS04	† Motorola		
	SN74LS04	Motorola		
	DM54LS04	† National		
	DM74LS04	National		10
	54LS04	† SGS		
	74LS04	SGS		
	54LS04	† Signetics		
	74LS04	Signetics		
	SN54LS04	**† TI**	**(834)**	
	SN74LS04	**TI**	**(834)**	
TTL-S	54S04	† Fairchild		
	74S04	Fairchild		
	HD74S04	Hitachi		
	DM54S04	† National		20
	DM74S04	National		
	54S04	† Signetics		
	74S04	Signetics		
	N8T93	Signetics		
	SN54S04	**† TI**	**(834)**	
	SN74S04	**TI**	**(834)**	
Octal, Three-State				
TTL-LS	DM71LS96	† AMD		
	DM71LS98	† AMD		
	DM81LS96	AMD		
	DM81LS98	AMD		30
	DM71S96	† National		
	DM71S98	† National		
	DM81LS96	National		
	DM81LS98	National		
	SN54LS466	**† TI**	**(952)**	
	SN54LS468	**† TI**	**(952)**	
	SN74LS466	**TI**	**(952)**	
	SN74LS468	**TI**	**(952)**	
TTL-S	**SN54S210**	**† MMI**	**(715)**	
	SN74S210	**MMI**	**(715)**	40

Counters, Binary Count Up

Function	Device	Source		Line
Counter/Latch (divide-by-2, 4, 8, 16), Preset Input				
TTL	54177	† Fairchild		
	54197	Fairchild		
	74177	Fairchild		
	74197	Fairchild		
	HD74177	Hitachi		
	HD74197	Hitachi		
	MC54177	† Motorola		
	MC54197	† Motorola		
	MC7281	Motorola		
	MC74177	Motorola		50
	MC74197	Motorola		
	MC8281	Motorola		
	DM54177	† National		
	DM54197	† National		
	DM7281	† National		
	DM7291	† National		
	DM74177	National		
	DM74197	National		
	DM8281	National		
	DM8291	National		60
	RC8281	Raytheon		
	RC8291	Raytheon		
	RM8281	† Raytheon		
			(Continued)	
Counter/Latch (divide-by-2, 4, 8, 16), Preset Input				
TTL			(Cont'd)	
	RM8291	† Raytheon		
	N8281	Signetics		
	S8281	† Signetics		
	SN54177	**† TI**	**(896)**	
	SN54197	**† TI**	**(904)**	
	SN74177	**TI**	**(896)**	
	SN74197	**TI**	**(904)**	70
TTL-LS	54LS197	† Fairchild		
	74LS197	Fairchild		
	HD74LS197	Hitachi		
	SN54LS197	† Motorola		
	SN74LS197	Motorola		
	DM54LS197	† National		
	DM74LS197	National		
	54LS197	† SGS		
	74LS197	SGS		
	74LS197	Signetics		80
	SN54LS197	**† TI**	**(904)**	
	SN74LS197	**TI**	**(904)**	
TTL-S	**SN54S197**	**† TI**	**(904)**	
	SN74S197	**TI**	**(904)**	
Counter/Register with Multiplexed Output, Three-State				
TTL-ALS				
	SN54ALS691	**† Motorola**	**(732)**	
	SN54ALS693	**† Motorola**	**(732)**	
	SN74ALS691	**Motorola**	**(732)**	
	SN74ALS693	**Motorola**	**(732)**	
	DM54ALS691	† National		
	DM54ALS693	† National		90
	DM74ALS691	National		
	DM74ALS693	National		
TTL-LS	**SN54LS691**	**TI**	**(999)**	
	SN54LS693	**TI**	**(999)**	
	SN74LS691	**TI**	**(999)**	
	SN74LS693	**TI**	**(999)**	
Synchronous (both conventional and three-state outputs) Preset Input				
TTL	DM7556	National		
	DM8556	National		
Synchronous, Preset Input (asynchronous clear)				
TTL	54161	† Fairchild		
	74161	Fairchild		100
	9316C	Fairchild		
	9316M	† Fairchild		
	ZN54161	† Ferranti		
	ZN74161	Ferranti		
	HD74161	Hitachi		
	M74LS161	Mitsubishi		
	MC54161	† Motorola		
	MC74161	Motorola		
	MC8316	Motorola		
	MC9316	† Motorola		110
	DM54161A	† National		
	DM74161A	National		
	DM8316	† National		
	DM9316	National		
	54161	† Signetics		
	74161	Signetics		
	N9316	Signetics		
	SN29316	TI		
	SN39316	† TI		
	SN54161	**† TI**	**(889)**	120
	SN74161	**TI**	**(889)**	
TTL-ALS				
	SN54ALS161	**† Motorola**	**(732)**	
	SN74ALS161	**Motorola**	**(732)**	
	DM54ALS161	† National		
	DM74ALS161	National		
			(Continued)	
Synchronous, Preset Input (asynchronous clear)				
TTL-ALS				
			(Cont'd)	
	SN54ALS161	**† TI**	**(889)**	
	SN74ALS161	**TI**	**(889)**	
TTL-AS	**SN54AS161**	**† TI**	**(889)**	
	SN74AS161	**TI**	**(889)**	
TTL-F	54F161	† Fairchild		130
	74F161	Fairchild		
	MC54F161	**† Motorola**	**(731)**	
	MC74F161	**Motorola**	**(731)**	
TTL-LS	AM25LS161C	AMD		
	AM25LS161M	† AMD		
	SN74LS161	AMD		
	54LS161	† Fairchild		
	74LS161	Fairchild		
	HD74LS161A	Hitachi		
	SN54LS161A	† Motorola		140
	SN74LS161A	Motorola		
	DM54LS161A	† National		
	DM74LS161A	National		
	54LS161	† SGS		
	74LS161	SGS		
	54LS161A	† Signetics		
	74LS161A	Signetics		
	SN54LS161A	**† TI**	**(889)**	
	SN74LS161A	**TI**	**(889)**	
TTL-S	93S16C	AMD		150
	93S16M	† AMD		
	SN54S161	**† AMD**	**(1227)**	
	SN74S161	**AMD**	**(1227)**	
	93S16C	Fairchild		
	93S16M	† Fairchild		
Synchronous, Preset Input (synchronous clear)				
TTL	54163	† Fairchild		
	74163	Fairchild		
	ZN54163	† Ferranti		
	ZN74163	Ferranti		
	HD74163	Hitachi		160
	MC54163A	† Motorola		
	MC74163A	Motorola		
	DM54163	† National		
	DM74163	National		
	54163	Signetics		
	74163	Signetics		
	SN54163	**† TI**	**(890)**	
	SN74163	**TI**	**(890)**	
TTL-ALS				
	SN54ALS163	**† Motorola**	**(732)**	
	SN74ALS163	**Motorola**	**(732)**	170
	DM54ALS163	† National		
	DM74ALS163	National		
	SN54ALS163	**† TI**	**(890)**	
	SN74ALS163	**TI**	**(890)**	
TTL-AS	**SN54AS163**	**† TI**	**(890)**	
	SN74AS163	**TI**	**(890)**	
TTL-F	54F163	† Fairchild		
	74F163	Fairchild		
	MC54F163	**† Motorola**	**(731)**	
	MC74F163	**Motorola**	**(731)**	180
TTL-LS	AM25LS163M	† AMD		
	SN54LS163	† AMD		
	74LS163	Fairchild		
	HD74LS163A	Hitachi		
	M74LS163	Mitsubishi		
	SN74LS163A	Motorola		
	DM74LS163A	National		
	74LS163	SGS		
	74LS163A	Signetics		
	SN74LS163A	**TI**	**(890)**	190
			(Continued)	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Counters, Binary Count Up (Cont'd)

Function	Device	Source		Line
Synchronous, Preset Input (synchronous clear)			(Cont'd)	
TTL-S	DM54LS163A	† National		
	SN54S163	† TI	(890)	
	SN74S163	TI	(890)	
Dual Synchronous				
TTL	MC4053	Motorola		
	MC4353	† Motorola		
	MC54453	† Motorola		
	MC74453	Motorola		
Dual 4-Bit, Ripple (dual 54/7493A)				
TTL	**SN54393**	† TI	(943)	
	SN74393	TI	(943)	
TTL-LS	54LS393	† Fairchild		10
	74LS393	Fairchild		
	M74LS393	Mitsubishi		
	SN54LS393	† Motorola		
	SN74LS393	Motorola		
	DM54LS393	† National		
	DM74LS393	National		
	T54LS393	† SGS		
	T74LS393	SGS		
	54LS393	† Signetics		
	74LS393	Signetics		20
	SN54LS393	† TI	(943)	
	SN74LS393	TI	(943)	
4-Bit, Ripple				
TTL	54293	† Fairchild		
	5493	† Fairchild		
	74293	Fairchild		
	7493	Fairchild		
	9305C	Fairchild		
	9305M	† Fairchild		
	ZN5493A	† Ferranti		
	ZN7493A	Ferranti		30
	HD74293	Hitachi		
	HD7493A	Hitachi		
	MC54293	† Motorola		
	MC5493	† Motorola		
	MC74293	Motorola		
	MC7493	Motorola		
	DM5493A	† National		
	DM7493A	National		
	5493	† Signetics		
	7493	Signetics		40
	SN54293	† TI	(925)	
	SN5493A	† TI	(865)	
	SN74293	TI	(925)	
	SN7493A	TI	(865)	
	TD3505A	Toshiba		
TTL-LS	54LS293	† Fairchild		
	54LS93	† Fairchild		
	74LS293	Fairchild		
	74LS93	Fairchild		
	HD74LS293	Hitachi		50
	HD74LS93	Hitachi		
	SN54LS293	† Motorola		
	SN54LS93	† Motorola		
	SN74LS293	Motorola		
	SN74LS93	Motorola		
	DM54LS293	† National		
	DM54LS93	† National		
	DM74LS293	National		
	DM74LS93	National		
	54LS293	† SGS		60
	54LS93	† SGS		
	74LS293	SGS		
	74LS93	SGS		
	54LS293	† Signetics		

(Continued)

Function	Device	Source		Line
4-Bit, Ripple				
TTL-LS			(Cont'd)	
	54LS93	† Signetics		
	74LS293	Signetics		
	74LS93	Signetics		
	SN54LS293	† TI	(925)	
	SN54LS93	† TI	(865)	
	SN74LS293	TI	(925)	70
	SN74LS93	TI	(865)	
(8-Bit) with Input Registers				
TTL-LS	**SN54LS592**	† TI	(967)	
	SN54LS593	† TI	(967)	
	SN74LS592	TI	(967)	
8-Bit with Input Registers				
TTL-LS	SN74S593	TI		
(8-Bit) with Output Registers				
TTL-LS	**SN54LS590**	† TI	(966)	
	SN54LS591	† TI	(966)	
	SN74LS590	TI	(966)	
	SN74LS591	TI	(966)	

Counters, Binary Count Up/Down

	74F191	Signetics		80
Counter/Register with Multiplexed Three-State Output				
TTL-LS	**SN54LS697**	† TI	(1000)	
	SN54LS699	† TI	(1000)	
	SN74LS697	TI	(1000)	
	SN74LS699	TI	(1000)	
Internal Clock Generator				
TTL-LS	DN851	Panasonic		
Synchronous				
TTL-ALS				
	SN54ALS569	† Motorola	(732)	
	SN54ALS569	† TI	(963)	
	SN54AS867	† TI	(1005)	
	SN54AS869	† TI	(1005)	
	SN74-ALS569	TI		90
	SN74AL867	TI		
	SN74AL869	TI		
Synchronous, Preset Input, Mode Control, Look-Ahead Carry				
TTL-ALS				
	SN54ALS169	**Motorola**	(732)	
	SN74ALS169	**Motorola**	(732)	
	SN54ALS169	TI	(892)	
	SN74ALS169	TI	(892)	
TTL-AS	**SN54AS169**	† TI	(892)	
	SN74AS169	TI	(892)	
TTL-LS	AM25LS169AC	AMD		
	AM25LS169AM	† AMD		100
	SN54LS169A	† AMD		
	54LS169	† Fairchild		
	74LS169	Fairchild		
	HD74LS169	Hitachi		
	SN54LS169	† Motorola		
	SN74LS169	Motorola		
	DM54LS169A	† National		
	DM74LS169A	National		
	T54LS169	† SGS		
	T74LS169	SGS		110
	54LS169A	† Signetics		
	74LS169A	Signetics		
	SN54LS169	† TI		
	SN54LS169A	† TI		
	SN54LS669	† TI	(990)	
	SN74LS169A	TI		
	SN74LS169B	TI		
	SN74LS669	TI	(990)	
TTL-S	74S169	Signetics		

(Continued)

Function	Device	Source		Line
Synchronous, Preset Input, Mode Control, Look-Ahead Carry				
TTL-S			(Cont'd)	
	SN54S169	† TI	(892)	120
	SN74S169	TI	(892)	
Synchronous, Preset Input with Mode Control				
TTL	54191	† Fairchild		
	74191	Fairchild		
	ZN54191	† Ferranti		
	ZN74191	Ferranti		
	HD74191	Hitachi		
	MC54191	† Motorola		
	MC74191	Motorola		
	DM54191	† National		
	DM74191	National		130
	54191	† Signetics		
	74191	Signetics		
	SN54191	† TI	(901)	
	SN74191	TI	(901)	
TTL-ALS				
	SN54ALS191	† Motorola	(732)	
	SN54ALS697	† Motorola	(732)	
	SN74ALS191	Motorola	(732)	
	SN74ALS697	Motorola	(732)	
	SN74ALS699	Motorola	(732)	
	DM54ALS697	† National		140
	DM54ALS699	† National		
	DM74ALS697	National		
	DM74ALS699	National		
	SN54ALS191	† TI	(901)	
	SN74ALS191	TI	(901)	
TTL-F	**54F191**	† Fairchild	(623)	
	74F191	Fairchild	(623)	
	MC54F191	† Motorola	(731)	
	MC74F191	Motorola	(731)	
TTL-LS	AM25LS191C	AMD		150
	AM25LS191M	† AMD		
	SN54LS191	† AMD		
	74LS191	Fairchild		
	HD74LS191	Hitachi		
	SN54LS191	† Motorola		
	SN74LS191	Motorola		
	DM54LS191	† National		
	DM74LS191	National		
	54LS191	† SGS		
	74LS191	SGS		160
	54LS191	† Signetics		
	74LS191	Signetics		
	SN54LS191	† TI	(901)	
	SN74LS191	TI	(901)	
Synchronous, Preset Input, Three-State				
TTL-LS	**AM25LS2569C**	**AMD**	(1227)	
	AM25LS2569M	† AMD	(1227)	
	SN54LS569	† Motorola		
	SN74LS569	Motorola		
	74LS569	Signetics		
Synchronous, Preset Input (2 clocks)				
TTL	54193	† Fairchild		170
	74193	Fairchild		
	ZN54193	† Ferranti		
	ZN74193	Ferranti		
	HD74193	Hitachi		
	MC54193	† Motorola		
	MC74193	Motorola		
	DM54193	† National		
	DM74193	National		
	DM7563	† National		
	DM8563	National		180
	54193	† Signetics		
	74193	Signetics		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Counters, Binary Count Up/ Down (Cont'd)

Synchronous, Preset Input (2 clocks)

Function	Device	Source	Line
TTL			(Cont'd)
	SN54193	**† TI**	**(902)**
	SN74193	**TI**	**(902)**
TTL-ALS			
	SN54ALS193	**† Motorola**	**(732)**
	SN74ALS193	**Motorola**	**(732)**
	SN54ALS193	**† TI**	**(902)**
	SN74ALS193	**TI**	**(902)**
TTL-F	**54F193**	**† Fairchild**	**(627)**
	74F193	**Fairchild**	**(627)**
	MC54F193	**† Motorola**	**(731)**
	MC74F193	**Motorola**	**(731)** 10
TTL-L	**SN54L193**	**† TI**	**(902)**
TTL-LS	AM25LS193C	AMD	
	AM25LS193M	† AMD	
	SN54LS193	AMD	
	54LS193	† Fairchild	
	74LS193	Fairchild	
	HD74LS193	Hitachi	
	SN54LS193	† Motorola	
	SN74LS193	Motorola	
	DM54LS193	† National	20
	DM74LS193	National	
	54LS193	† SGS	
	74LS193	SGS	
	54LS193	Signetics	
	74LS193	Signetics	
	SN54LS193	**† TI**	**(902)**
	SN74LS193	**TI**	**(902)**

Synchronous with Mode Control

Function	Device	Source	Line
TTL	AM2501C	AMD	
	AM2501M	† AMD	
	RC8284	Raytheon	30
	RM8284	† Raytheon	
	S8284	† Signetics	

Dual, Synchronous, Preset Input

Function	Device	Source	Line
TTL	MC4055	Motorola	
	MC4355	† Motorola	
	MC54455	† Motorola	
	MC74455	Motorola	

Counters, Decade Count Up

Divide-by-2 and by-5

Function	Device	Source	Line
TTL	5490	† Fairchild	
	74290	Fairchild	
	7490	Fairchild	
	ZN5490A	† Ferranti	40
	ZN7490A	Ferranti	
	HD74290	Hitachi	
	HD7490A	Hitachi	
	MC54290	† Motorola	
	MC5490	† Motorola	
	MC74290	Motorola	
	MC7490	Motorola	
	DM5490	† National	
	DM7490	National	
	5490	† Signetics	50
	7490	Signetics	
	SN54290	**† TI**	**(924)**
	SN5490A	**† TI**	**(864)**
	SN74290	**TI**	**(924)**
	SN7490A	**TI**	**(864)**
	TD3501A	Toshiba	
TTL-LS	54LS290	† Fairchild	
	HD74LS290	Hitachi	
	SN54LS290	† Motorola	
	SN54LS90	† Motorola	60

(Continued)

Divide-by-2 and by-5

Function	Device	Source	Line
TTL-LS			(Cont'd)
	SN74LS290	Motorola	
	SN74LS90	Motorola	
	DM54LS290	† National	
	DM54LS90	† National	
	DM74LS290	National	
	DM74LS90	National	
	54LS290	† SGS	
	54LS90	† SGS	
	74LS290	SGS	
	74LS90	SGS	70
	54LS290	† Signetics	
	54LS90	† Signetics	
	74LS290	Signetics	
	74LS90	Signetics	
	SN54LS290	**† TI**	**(924)**
	SN54LS90	**† TI**	**(864)**
	SN74LS290	**TI**	**(924)**
	SN74LS90	**TI**	**(864)**

(divide-by-2 and divide-by-5) Counter/Latch, Ripple, Preset Input

Function	Device	Source	Line
TTL	54176	† Fairchild	
	54196	† Fairchild	80
	74176	Fairchild	
	74196	Fairchild	
	HD74176	Hitachi	
	HD74196	Hitachi	
	MC54176	† Motorola	
	MC54196	† Motorola	
	MC7280	† Motorola	
	MC74176	Motorola	
	MC74196	Motorola	
	DM54176	† National	90
	DM54196	† National	
	DM7280	† National	
	DM7290	† National	
	DM74176	National	
	DM74196	National	
	DM8280	National	
	DM8290	National	
	RC8280	Raytheon	
	RC8290	Raytheon	
	RM8280	† Raytheon	100
	RM8290	† Raytheon	
	N8280	Signetics	
	S8280	† Signetics	
	SN54176	**† TI**	**(896)**
	SN54196	**† TI**	**(903)**
	SN74176	**TI**	**(896)**
	SN74196	**TI**	**(903)**
TTL-LS	54LS196	† Fairchild	
	74LS196	Fairchild	
	HD74LS196	Hitachi	110
	SN54LS196	† Motorola	
	SN74LS196	Motorola	
	DM54LS196	† National	
	DM74LS196	National	
	54LS196	† SGS	
	74LS196	SGS	
	SN54LS196	**† TI**	**(903)**
	SN74LS196	**TI**	**(903)**
TTL-S	DM54S196	† National	
	DM74S196	National	120
	SN54L196	† TI	
	SN74S196	**TI**	**(903)**

Synchronous (both conventional and three-state outputs), Preset Inputs

Function	Device	Source	Line
TTL	DM7555	† National	
	DM8555	National	

Synchronous, Preset Input (asynchronous clear)

Function	Device	Source	Line
TTL	54160	† Fairchild	
	74160	Fairchild	
	9310C	Fairchild	
	9310M	† Fairchild	
	HD74160	Hitachi	
	MC54160	† Motorola	130
	MC74160	Motorola	
	MC8310	Motorola	
	MC9310	Motorola	
	DM54160A	† National	
	DM74160A	National	
	DM8310	National	
	DM9310	† National	
	54160	† Signetics	
	74160	Signetics	
	N9310	Signetics	140
	SN29310	TI	
	SN39310	TI	
	SN54160	**† TI**	**(889)**
	SN74160	**TI**	**(889)**
TTL-ALS			
	SN54ALS160	**† Motorola**	**(732)**
	SN74ALS160	**Motorola**	**(732)**
	DM54ALS160	† National	
	DM74ALS160	National	
	SN54ALS160	**† TI**	**(889)**
	SN74ALS160	**TI**	**(889)** 150
TTL-AS	**SN54AS160**	**† TI**	**(889)**
	SN74AS160	**TI**	**(889)**
TTL-F	54F160	† Fairchild	
	74F160	Fairchild	
	MC54F160	**† Motorola**	**(731)**
	MC74F160	**Motorola**	**(731)**
TTL-LS	AM25LS160C	AMD	
	AM25LS160M	† AMD	
	SN54LS160	† AMD	
	74LS160	Fairchild	160
	HD74LS160A	Hitachi	
	SN54LS160A	† Motorola	
	SN74LS160A	Motorola	
	DM54LS160A	† National	
	DM74LS160A	National	
	54LS160	† SGS	
	74LS160	SGS	
	54LS160A	† Signetics	
	74LS160A	Signetics	
	SN54LS160A	**† TI**	**(889)** 170
	SN74LS160A	**TI**	**(889)**
TTL-S	**93S10C**	**AMD**	**(1227)**
	93S10M	**† AMD**	**(1227)**
	SN54S160	**† AMD**	**(1227)**
	SN74S160	**AMD**	**(1227)**
	93S10C	Fairchild	
	93S10M	† Fairchild	

Synchronous, Preset Input (synchronous clear)

Function	Device	Source	Line
TTL	54162	† Fairchild	
	74162	Fairchild	
	HD74162	Hitachi	180
	MC54162	† Motorola	
	MC74162	Motorola	
	DM54162A	† National	
	DM74162A	National	
	SN54162	**† TI**	**(890)**
	SN74162	**TI**	**(890)**
TTL-ALS			
	SN54ALS162	**† Motorola**	**(732)**
	SN54ALS690	**† Motorola**	**(732)**
	SN54ALS692	**† Motorola**	**(732)**
	SN74ALS162	**Motorola**	**(732)** 190
	SN74ALS690	**Motorola**	**(732)**

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Counters, Decade Count Up (Cont'd)

Synchronous, Preset Input (synchronous clear)

Function	Device	Source		Line
TTL-ALS			(Cont'd)	
	SN74ALS692	**Motorola**	**(732)**	
	DM54ALS162	† National		
	DM54ALS690	† National		
	DM54ALS692	† National		
	DM74ALS162	National		
	DM74ALS690	National		
	DM74ALS692	National		
	SN54ALS162	**† TI**	**(890)**	
	SN74ALS162	**TI**	**(890)**	
TTL-AS	**SN54AS162**	**† TI**	**(890)**	10
	SN74AS162	**TI**	**(890)**	
TTL-F	54F162	† Fairchild		
	74F162	Fairchild		
	MC54F162	**† Motorola**	**(731)**	
	MC74F162	**Motorola**	**(731)**	
TTL-LS	AM25LS162C	AMD		
	AM25LS162M	† AMD		
	SN54LS162	† AMD		
	74LS162	Fairchild		
	HD74LS162A	Hitachi		20
	SN54LS162A	† Motorola		
	SN74LS162A	Motorola		
	DM54LS162	† National		
	DM74LS162	National		
	54LS162	† SGS		
	74LS162	SGS		
	54LS162A	† Signetics		
	74LS162A	Signetics		
	SN54LS162A	**† TI**	**(890)**	
	SN54LS690	**† TI**	**(999)**	30
	SN54LS692	**† TI**	**(999)**	
	SN74LS690	**TI**	**(999)**	
	SN74LS692	**TI**	**(999)**	
TTL-S	DM54S162	† National		
	DM74S162	National		
	SN54S162	**† TI**	**(890)**	
	SN74S162	**TI**	**(890)**	

Dual, Ripple (dual 54/7490A)

Function	Device	Source		Line
TTL	MC4052	Motorola		
	MC4352	† Motorola		
	SN54390	**† TI**	**(943)**	40
	SN54490	**† TI**	**(955)**	
	SN74390	**TI**	**(943)**	
	SN74490	**TI**	**(955)**	
TTL-LS	54LS390	† Fairchild		
	54LS490	† Fairchild		
	74LS390	Fairchild		
	74LS490	Fairchild		
	SN54LS390	† Motorola		
	SN54LS490	† Motorola		
	SN74LS390	Motorola		50
	SN74LS490	Motorola		
	DM54LS390	† National		
	DM74LS390	National		
	T54LS390	† SGS		
	T54LS490	† SGS		
	T74LS390	SGS		
	T74LS490	SGS		
	54LS390	† Signetics		
	54LS490	† Signetics		
	74LS390	Signetics		60
	74LS490	Signetics		
	SN54LS390	**† TI**	**(943)**	
	SN54LS490	**† TI**	**(955)**	

(Continued)

Dual, Ripple (dual 54/7490A)

Function	Device	Source		Line
TTL-LS			(Cont'd)	
	SN74LS390	**TI**	**(943)**	
	SN74LS490	**TI**	**(955)**	

Dual, Synchronous

Function	Device	Source	Line
TTL	MC54452	† Motorola	
	MC74452	Motorola	

4-Bit, Three-State

Function	Device	Source		Line
TTL-ALS				
	SN54ALS560	**† Motorola**	**(732)**	
	SN74ALS560	**Motorola**	**(732)**	
	SN54ALS560	**† TI**	**(961)**	70
	SN74ALS560	**TI**	**(961)**	

10-Line Output (resettable 2-10)

Function	Device	Source	Line
TTL	9319C	Fairchild	
	9319M	† Fairchild	
	9320M	† Fairchild	

Counters, Decade Count Up/ Down

Device	Source	Line
74F190	Signetics	

Counter/Register with Multiplexed Three-State Output

Function	Device	Source		Line
TTL-ALS				
	SN54ALS696	**† Motorola**	**(732)**	
	SN54ALS698	**† Motorola**	**(732)**	
	SN74ALS696	**Motorola**	**(732)**	
	SN74ALS698	**Motorola**	**(732)**	
	DM54ALS696	† National		80
	DM54ALS698	† National		
	DM74ALS696	National		
	DM74ALS698	National		
TTL-LS	**SN54LS696**	**† TI**	**(1000)**	
	SN54LS698	**† TI**	**(1000)**	
	SN74LS696	**TI**	**(1000)**	
	SN74LS698	**TI**	**(1000)**	

Synchronous

Function	Device	Source	Line
TTL	RC8285	Raytheon	
	RM8285	† Raytheon	

Function	Device	Source		Line
TTL-ALS				
	SN54ALS568	**† Motorola**	**(732)**	90
	SN74ALS568	**Motorola**	**(732)**	
	SN54ALS568	**† TI**	**(963)**	
	SN74ALS568	**TI**	**(963)**	

Synchronous, Preset Input, Mode Control, Look-Ahead Carry

Function	Device	Source		Line
TTL-ALS				
	SN54ALS168	**† Motorola**	**(732)**	
	SN74ALS168	**Motorola**	**(732)**	
	SN54ALS168	**† TI**	**(892)**	
	SN74ALS168	**TI**	**(892)**	
TTL-AS	SN54AS168	† TI		
	SN74AS168	TI		
TTL-LS	AM25LS168AC	AMD		100
	AM25LS168AM	† AMD		
	SN54LS168A	† AMD		
	54LS168	† Fairchild		
	74LS168	Fairchild		
	HD74LS168	Hitachi		
	SN54LS168	† Motorola		
	SN74LS168	Motorola		
	DM54LS168A	National		
	DM74LS168A	National		
	T54LS168	† SGS		110
	T74LS168	SGS		
	54LS168A	† Signetics		
	74LS168A	Signetics		
	74S168	Signetics		
	SN54LS168	† TI		
	SN54LS668	**† TI**	**(990)**	
	SN74LS668	**TI**	**(990)**	

(Continued)

Synchronous, Preset Input, Mode Control, Look-Ahead Carry

Function	Device	Source		Line
			(Cont'd)	
TTL-S	**SN54S168**	**† TI**	**(892)**	
	SN74S168	**TI**	**(892)**	

Synchronous, Preset Input, Three-State

Function	Device	Source	Line
TTL-LS	AM25LS2568C	AMD	120
	AM25LS2568M	† AMD	
	SN54LS568	† Motorola	
	SN74LS568	Motorola	

Synchronous, Preset Input (2 clocks)

Function	Device	Source		Line
TTL	54192	† Fairchild		
	74192	Fairchild		
	ZN54192	† Ferranti		
	ZN74192	Ferranti		
	HD74192	Hitachi		
	MC54192	† Motorola		
	MC74192	Motorola		130
	DM54192	† National		
	DM74192	National		
	DM7560	† National		
	DM8560	National		
	74192	Signetics		
	SN54192	**† TI**	**(902)**	
	SN74192	**TI**	**(902)**	
TTL-ALS				
	SN54ALS192	**† Motorola**	**(732)**	
	SN74ALS192	**Motorola**	**(732)**	
	SN54ALS192	**† TI**	**(902)**	140
	SN74ALS192	**TI**	**(902)**	
TTL-F	**54F192**	**† Fairchild**	**(627)**	
	74F192	**Fairchild**	**(627)**	
	MC54F192	**† Motorola**	**(731)**	
	MC74F192	**Motorola**	**(731)**	
TTL-L	**SN54L192**	**† TI**	**(902)**	
TTL-LS	AM25LS192C	AMD		
	AM25LS192M	† AMD		
	SN54LS192	† AMD		
	54LS192	† Fairchild		150
	74LS192	Fairchild		
	HD74LS192	Hitachi		
	SN54LS192	† Motorola		
	SN74LS192	Motorola		
	DM54LS192	† National		
	DM74LS192	National		
	54LS192	† SGS		
	74LS192	SGS		
	54LS192	† Signetics		
	74LS192	Signetics		160
	SN54LS192	**† TI**	**(902)**	
	SN74LS192	**TI**	**(902)**	

Synchronous, Preset, with Mode Control

Function	Device	Source		Line
TTL	54190	† Fairchild		
	74190	Fairchild		
	HD74190	Hitachi		
	MC54190	† Motorola		
	MC74190	Motorola		
	DM54190	† National		
	DM74190	National		
	54190	† Signetics		170
	74190	Signetics		
	SN54190	**† TI**	**(901)**	
	SN74190	**TI**	**(901)**	
TTL-ALS				
	SN54ALS190	**† Motorola**	**(732)**	
	SN74ALS190	**Motorola**	**(732)**	
	SN54ALS190	**† TI**	**(901)**	
	SN74ALS190	**TI**	**(901)**	
TTL-F	**54F190**	**† Fairchild**	**(623)**	

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

DIGITAL-TTL (Cont'd)

Counters, Decade Count Up/Down (Cont'd)

Function	Device	Source		Line
Synchronous, Preset, with Mode Control				
TTL-F			(Cont'd)	
	74F190	**Fairchild**	**(623)**	
	MC54F190	**† Motorola**	**(731)**	
	MC74F190	**Motorola**	**(731)**	
TTL-LS	AM25LS190C	AMD		
	AM35LS190M	† AMD		
	SN54LS190	† AMD		
	74LS190	Fairchild		
	HD74LS190	Hitachi		
	SN54LS190	† Motorola		
	SN74LS190	Motorola		10
	DM54LS190	† National		
	DM74LS190	National		
	54LS190	† SGS		
	74LS190	SGS		
	54LS190	† Signetics		
	SN54LS190	**† TI**	**(901)**	
	SN74LS190	**TI**	**(901)**	
Dual, Synchronous, Preset Input				
TTL	MC4054	Motorola		
	MC4354	† Motorola		
	MC54454	Motorola		20
	MC74454	Motorola		
Four Counter/Latch/Display Driver (synchronous, BCD and segment drives)				
TTL	ZN1040AE	Ferranti		

Counters, Miscellaneous

Function	Device	Source		Line
Divide-by-4				
TTL	TD6100	Toshiba		
Divide-by-12 (divide by 2 and 6), Preset Input				
TTL	DM7288	† National		
	DM8288	National		
Divide-by-12 (divide by 2 and 6), Ripple				
TTL	5492	† Fairchild		
	7492	Fairchild		
	ZN5492A	† Ferranti		
	ZN7492A	Ferranti		
	HD7492A	Hitachi		30
	MC5492	† Motorola		
	MC7492	Motorola		
	DM5492A	† National		
	DM7492A	National		
	SN5492A	† RIFA		
	5492	† Signetics		
	7492	Signetics		
	SN5492A	**† TI**	**(864)**	
	SN7492A	**TI**	**(864)**	
TTL-LS	74LS92	Fairchild		40
	HD74LS92	Hitachi		
	SN54LS92	† Motorola		
	SN74LS92	Motorola		
	DM54LS92	† National		
	DM74LS92	National		
	54LS92	† SGS		
	74LS92	SGS		
	54LS92	† Signetics		
	74LS92	Signetics		
	SN54LS92	**† TI**	**(864)**	50
	SN74LS92	**TI**	**(864)**	
Programmable Modulo-N Binary				
TTL	MC4018	Motorola		
	MC4019	Motorola		
	MC4318	† Motorola		
	MC4319	† Motorola		
Programmable Modulo-N Decade				
TTL	MC4016	Motorola		
	MC4017	Motorola		
	MC4316	† Motorola		
	MC4317	† Motorola		
Binary Counter/Latch, Three-State				
TTL	DM7554	† National		60
	DM8554	National		
Dual 4-Bit Binary Counter				
TTL-LS	**SN54LS69**	**† TI**	**(854)**	
	SN74LS69	**TI**	**(854)**	
Dual 4-Bit Decade Counter				
TTL-LS	**SN54LS68**	**† TI**	**(854)**	
	SN74LS68	**TI**	**(854)**	
Decade Counter/Latch/Decoder (nixie driver)				
TTL	**SN74142**	**TI**	**(881)**	
Decade Counter/Latch, LED/Lamp Driver (constant current output)				
TTL	**SN54143**	**† TI**	**(882)**	
	SN74143	**TI**	**(882)**	
Decade Counter/Latch LED/Lamp Driver (high current output)				
TTL	**SN54144**	**† TI**	**(882)**	
	SN74144	**TI**	**(882)**	70
Decade Counter/Latch, Three-State				
TTL	DM7552	† National		
	DM8552	National		
Decade Counter/Latch/7 Segment Decoder				
TTL	MC4050	Motorola		
	MC4051	Motorola		
	MC4350	† Motorola		
TTL-LS	**SN54LS294**	**† TI**	**(925)**	
4-Bit Universal				
TTL	MC4023	Motorola		
4-Bit Binary				
TTL-ALS				
	SN54ALS561	**† Motorola**	**(732)**	
	SN74ALS561	**Motorola**	**(732)**	
	SN54ALS561	† TI		80
	SN74ALS561	**TI**	**(961)**	
6-Bit Universal				
TTL	DM75S50	National		
8-Bit Synchronous				
TTL-LS	SN54LS461	† MMI		
	SN74LS461	MMI		
8-Bit Binary Counter/Latch				
TTL-LS	**SN74LS593**	**TI**	**(967)**	
10-Bit Up/Down (provides CRT vertical and horizontal timing generation)				
TTL-LS	SN54LS491	† MMI		
	SN74LS491	MMI		
16-Bit Programmable Modulo				
TTL-LS	**SN74LS294**	**TI**	**(925)**	
32-Bit Programmable Modulo				
TTL-LS	**SN54LS292**	**† TI**	**(924)**	
	SN74LS292	**TI**	**(924)**	90

Decoders

Function	Device	Source		Line
Demultiplexer, (2-lines in-2 of 4 out) Three-State				
TTL	DM7230	† National		
	DM8230	National		
Excess 3 Gray-to-Decimal (1 of 10)				
TTL	5444	† Fairchild		
	HD7444A	Hitachi		
	MC5444	† Motorola		
	MC7444	Motorola		
	SN5444A	**† TI**	**(846)**	
	SN54L44	**† TI**	**(846)**	
	SN7444A	**TI**	**(846)**	
Excess 3-to-Decimal (1 of 10)				
TTL	5443	† Fairchild		100
	7443	Fairchild		
	HD7443A	Hitachi		
	MC5443	† Motorola		
	MC7443	Motorola		
	SN5443A	**† TI**	**(846)**	
	SN54L43	**† TI**	**(846)**	
	SN7443A	**TI**	**(846)**	
Binary to Octal, Inverting/Non-Inverting, Open Collector				
TTL	MC4038	Motorola		
Binary to Octal, Non-Inverting				
TTL	MC4048	Motorola		
Binary to Octal (1 of 8)				
TTL	MC4006	Motorola		110
	MC4306	† Motorola		
	MC7250	Motorola		
	MC8250	† Motorola		
	DN852	Panasonic		
	RC8250	Raytheon		
	RM8250	† Raytheon		
	N8250	Signetics		
	N9301	Signetics		
	S8250	† Signetics		
TTL-S	N82S50	Signetics		120
Binary to Octal (1 of 8(, Polarity Control, Three-State				
TTL-LS	**AM2921C**	**AMD**	**(1214)**	
	AM2921M	**† AMD**	**(1214)**	
Binary to 2-of-8, Open Collector				
TTL	MC4040	Motorola		
BCD-to-Binary and Binary-to-BCD Converter, Open Collector				
TTL	MC4001	Motorola		
BCD-to-Decimal Decoder/Driver, Open Collector				
TTL-LS	54LS445	† Signetics		
	74LS445	Signetics		
	SN54LS445	**† TI**	**(947)**	
	SN74LS445	**TI**	**(947)**	
BCD-to-Decimal Decoder/Driver, Open Collector to 30 V Output				
TTL	5445	† Fairchild		
	7445	Fairchild		130
	HD7445	Hitachi		
	MC5445	† Motorola		
	MC7445	Motorola		
	DM5445	† National		
	DM7445	National		
	7445	Signetics		
	SN5445	**† TI**	**(846)**	
	SN7445	**TI**	**(846)**	
BCD-to-Decimal Decoder/Driver, Open Collector, 15 V				
TTL	54145	† Fairchild		
	74145	Fairchild		140
	HD74145	† Hitachi		
	MC54145	† Motorola		
	MC74145	Motorola		
	DM54145	† National		
	DM74145	National		
	54145	† Signetics		
	74145	Signetics		
	SN54145	**† TI**	**(882)**	
	SN74145	**TI**	**(882)**	
TTL-LS	74LS145	Fairchild		150
	SN54LS145	**† TI**	**(882)**	
	SN74LS145	**TI**	**(882)**	
BCD-to-Decimal (1 of 10)				
TTL	5442	† Fairchild		
	7442	Fairchild		
	9301C	Fairchild		
	9301M	† Fairchild		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Decoders (Cont'd)

Function	Device	Source		Line
BCD-to-Decimal (1 of 10)				
TTL			(Cont'd)	
	9302C	Fairchild		
	9302M	† Fairchild		
	ZN5442	† Ferranti		
	ZN7442	Ferranti		
	HD7442A	Hitachi		
	MC5442	† Motorola		
	MC7442	Motorola		
	MC8301	Motorola		
	MC9301	† Motorola		
	DM5442	† National		10
	DM7442	National		
	DM8301	National		
	DM9301	† National		
	RC8251	Raytheon		
	RC8252	Raytheon		
	RM8251	† Raytheon		
	RM8252	† Raytheon		
	5442	† Signetics		
	7442	Signetics		
	N8252	Signetics		20
	SN29301	TI		
	SN39301	† TI		
	SN5442A	**† TI**	**(845)**	
	SN54L42	**† TI**	**(845)**	
	SN7442A	**TI**	**(845)**	
TTL-LS	54LS42	† Fairchild		
	74LS42	Fairchild		
	HD74LS42	Hitachi		
	SN54LS42	† Motorola		
	SN74LS42	Motorola		30
	DM54LS42	† National		
	DM74LS42	National		
	54LS42	† SGS		
	74LS42	SGS		
	54LS42	† Signetics		
	74LS42	Signetics		
	SN54LS42	**† TI**	**(845)**	
	SN74LS42	**TI**	**(845)**	
TTL-S	N82S52	Signetics		
BCD-to-Decimal (1 of 10), Three-State				
TTL-F	54F537	† Fairchild		40
	74F537	Fairchild		
	MC54F537	**† Motorola**	**(731)**	
	MC74F537	**Motorola**	**(731)**	
TTL-LS	**AM25LS2537C**	**AMD**	**(1227)**	
	AM25LS2537M	**† AMD**	**(1227)**	
Dual Binary to One-of-Four Line Gated				
TTL	MC4007	Motorola		
	MC4307	† Motorola		
Dual 1-of-4 Decoder/Demultiplexer (independent address)				
TTL	9321C	Fairchild		
	9321M	† Fairchild		
Dual 2-Line to 4-Line Decoder/Demultiplexer				
TTL-ALS				
	SN54ALS539	**† Motorola**	**(732)**	50
	SN74ALS539	**Motorola**	**(732)**	
	SN54ALS539	**† TI**	**(959)**	
	SN74ALS539	**TI**	**(959)**	
TTL-AS	**SN54ALS139**	**† Motorola**	**(732)**	
	SN74ALS139	**Motorola**	**(732)**	
	SN54ALS139	**† TI**	**(880)**	
	SN74ALS139	**TI**	**(880)**	
TTL-F	54F139	† Fairchild		
	74F139	Fairchild		
	MC54F139	**† Motorola**	**(731)**	60
	MC74F139	**Motorola**	**(731)**	
			(Continued)	

Function	Device	Source		Line
Dual 2-Line to 4-Line Decoder/Demultiplexer				
TTL-F			(Cont'd)	
	54F139	† Signetics		
	74F139	Signetics		
TTL-LS	AM25LS139C	AMD		
	AM25LS139M	AMD		
	SN54LS139	† AMD		
	54LS139	† Fairchild		
	74LS139	Fairchild		
	HD74LS139	Hitachi		
	SN54LS139	† Motorola		70
	SN74LS139	Motorola		
	DM54LS139	† National		
	DM74LS139	National		
	54LS139	† SGS		
	74LS139	SGS		
	54LS139	† Signetics		
	74LS139	Signetics		
	SN54LS139	**† TI**	**(880)**	
	SN74LS139	**TI**	**(880)**	
TTL-S	SN54S139	† AMD		80
	SN74S139	AMD		
	54S139	† Fairchild		
	74S139	Fairchild		
	DM54S139	† National		
	DM74S139	National		
	54S139	† Signetics		
	74S139	Signetics		
	SN54S139	**† TI**	**(880)**	
	SN74S139	**TI**	**(880)**	
Dual 2-Line to 4-Line Decoder/Demultiplexer, Open Collector (or 3-line to 8-line decoder/demultiplexer)				
TTL	54156	† Fairchild		90
	74156	Fairchild		
	HD74156	Hitachi		
	MC54156	† Motorola		
	MC74156	Motorola		
	DM54156	† National		
	DM74156	National		
	54156	† Signetics		
	74156	Signetics		
	SN54156	**† TI**	**(886)**	
	SN74156	**TI**	**(886)**	100
TTL-LS	54LS156	† Fairchild		
	74LS156	Fairchild		
	HD74LS156	Hitachi		
	SN54LS156	† Motorola		
	SN74LS156	Motorola		
	DM54LS156	† National		
	DM74LS156	National		
	54LS156	† SGS		
	74LS156	SGS		
	54LS156	† Signetics		110
	74LS156	Signetics		
	SN54LS156	**† TI**	**(886)**	
	SN74LS156	**TI**	**(886)**	
Dual 2-Line to 4-Line Decoder/Demultiplexer, Three-State				
TTL-F	**AM25LS2539C**	**AMD**	**(1227)**	
	54F539	† Fairchild		
	74F539	Fairchild		
	MC54F539	**† Motorola**	**(731)**	
	MC74F539	**Motorola**	**(731)**	
TTL-LS	**AM25LS2539M**	**† AMD**	**(1227)**	
Dual 2-Line to 4-Line Decoder/Demultiplexer, Totem Pole Output (or 3-line to 8-line decoder/demultiplexer)				
TTL	54155	† Fairchild		120
	74155	Fairchild		
	ZN54155	† Ferranti		
	ZN74155	Ferranti		
	HD74155	Hitachi		
	MC54155	† Motorola		
			(Continued)	

Function	Device	Source		Line
Dual 2-Line to 4-Line Decoder/Demultiplexer, Totem Pole Output (or 3-line to 8-line decoder/demultiplexer)				
TTL			(Cont'd)	
	MC74155	Motorola		
	DM54155	† National		
	DM74155	National		
	54155	† Signetics		
	74155	Signetics		130
	SN54155	**† TI**	**(886)**	
	SN74155	**TI**	**(886)**	
TTL-LS	54LS155	† Fairchild		
	74LS155	Fairchild		
	HD74LS155	Hitachi		
	SN54LS155	† Motorola		
	SN74LS155	Motorola		
	DM54LS155	† National		
	DM74LS155	National		
	54LS155	† SGS		140
	74LS155	SGS		
	54LS155	† Signetics		
	74LS155	Signetics		
	SN54LS155	**† TI**	**(886)**	
	SN74LS155	**TI**	**(886)**	
1-Line to 8-Line Demultiplexer				
TTL	DM7223	† National		
	DM8223	National		
3-Line to 8-Line Decoder/Demultiplexer				
TTL-ALS				
	SN54ALS138	**† Motorola**	**(732)**	
	SN54ALS538	**† Motorola**	**(732)**	
	SN74ALS138	**Motorola**	**(732)**	150
	SN74ALS538	**Motorola**	**(732)**	
	SN54ALS138	**† TI**	**(880)**	
	SN54ALS538	**† TI**	**(958)**	
	SN74ALS138	**TI**	**(880)**	
	SN74ALS538	**TI**	**(958)**	
TTL-F	54F138	† Fairchild		
	74F138	Fairchild		
	MC54F138	**† Motorola**	**(731)**	
	MC74F138	**Motorola**	**(731)**	
	74F138	Signetics		160
TTL-LS	AM25LS138C	AMD		
	AM25LS138M	AMD		
	AM25LS2548C	AMD		
	AM25LS533C	**AMD**	**(1227)**	
	AM25LS533M	**† AMD**	**(1227)**	
	AM25LS534C	**AMD**	**(1227)**	
	AM25LS534M	**† AMD**	**(1227)**	
	SN54LS138	† AMD		
	54LS138	† Fairchild		
	74LS138	Fairchild		170
	HD74LS138	Hitachi		
	M74LS138	Mitsubishi		
	SN54LS138	† Motorola		
	SN74LS138	Motorola		
	DM54LS138	† National		
	DM74LS138	National		
	54LS138	† SGS		
	74LS138	SGS		
	54LS138	† Signetics		
	74LS138	Signetics		180
	SN54LS138	**† TI**	**(880)**	
	SN74LS138	**TI**	**(880)**	
TTL-S	SN54S138	† AMD		
	SN74S138	AMD		
	54S138	† Fairchild		
	74S138	Fairchild		
	DM54S138	† National		
	DM74S138	National		
	74S138	† Signetics		
			(Continued)	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL-TTL (Cont'd)

Decoders (Cont'd)

Function	Device	Source		Line
3-Line to 8-Line Decoder/Demultiplexer				
TTL-S			(Cont'd)	
	SN54S138	**† TI**	**(880)**	
	SN74S138	**TI**	**(880)**	
3-Line to 8-Line Decoder/Demultiplexer, Inverting/Non-Inverting, Input Latches				
TTL-LS	**AM25LS2536C**	**AMD**	**(1227)**	
	AM25LS2536M	**† AMD**	**(1227)**	
3-Line to 8-Line Decoder/Demultiplexer, Inverting/Non-Inverting, Three-State				
TTL-F	54F538	† Fairchild		
	74F538	Fairchild		
	MC54F538	**† Motorola**	**(731)**	
	MC74F538	**Motorola**	**(731)**	
TTL-LS	**AM25LS2538C**	**AMD**	**(1227)**	
	AM25LS2538M	**† AMD**	**(1227)**	10
3-Line to 8-Line Decoder/Demultiplexer with Input Latches				
TTL-ALS				
	SN54ALS137	**† TI**	**(879)**	
	SN74ALS137	**TI**	**(879)**	
TTL-LS	**SN54LS137**	**† TI**	**(879)**	
	SN74LS137	**TI**	**(879)**	
TTL-S	54S137	† Fairchild		
	93S137C	Fairchild		
	93S137M	† Fairchild		
3-Line to 8-Line Decoders/Demultiplexer with Address Registers				
TTL-ALS				
	SN54ALS131	**† TI**	**(876)**	
	SN74ALS131	**TI**	**(876)**	
4-Line to 16-Line Decoder/Demultiplexer				
TTL	54154	† Fairchild		20
	9311C	Fairchild		
	9311M	† Fairchild		
	ZN54154	† Ferranti		
	ZN74154	Ferranti		
	HD74154	Hitachi		
	MC54154	† Motorola		
	MC74154	Motorola		
	MC8311	Motorola		
	MC9311	† Motorola		
	DM54154	† National		30
	DM74154	National		
	DM8311	National		
	DM9311	† National		
	54154	† Signetics		
	74154	Signetics		
	SN29311	TI		
	SN39311	† TI		
	SN54154	**† TI**	**(885)**	
	SN74154	**TI**	**(885)**	
TTL-LS	DM54LS154	† National		40
	DM74LS154	National		
	54LS154	† Signetics		
	74LS154	Signetics		
4-Line to 16-Line Decoder/Demultiplexer, Open Collector Output				
TTL	**SN54159**	**† TI**	**(888)**	
	SN74159	**TI**	**(888)**	
TTL-LS	HD74159	Hitachi		

Drivers

See Also Interface-Memory and Peripheral Drivers

Function	Device	Source		Line
Dual 3-Input 3-Output AND Series Terminated Line Driver				
TTL-H	MC3028	Motorola		
	MC3128	† Motorola		
Dual 3-Input 3-Output NAND Series Terminated Line Driver				
TTL-H	MC3029	Motorola		50
	MC3129	† Motorola		
Dual 4-Input Positive NAND 50 Ohm Line Driver				
TTL-S	54S140	† Fairchild		
	74S140	† Fairchild		
	HD74S140	Hitachi		
	DM54S140	† National		
	DM74S140	National		
	54S140	† Signetics		
	74S140	Signetics		
	SN54S140	**† TI**	**(881)**	
	SN74S140	**TI**	**(881)**	60
Quad Bus Driver, Three-State				
TTL	RC8T09	Raytheon		
	RM8T09	† Raytheon		
	N8T09	Signetics		
	S8T09	† Signetics		
Quad Predriver, Open Collector				
TTL	MC4042	Motorola		
Quad 2-Input AND Buffer, Open Collector, to 15 V Output (high voltage 54/74109)				
TTL	DS7819	† National		
	DS8819	National		
Quad 2-Input AND Power Driver, Open Collector (to 100 V, sinks 500 mA)				
TTL	UHC/D-400	† Sprague		
	UHC/D-406	† Sprague		
	UHC/D-500	† Sprague		70
	UHC/D-506	† Sprague		
	UHP-400	**Sprague**	**(2843)**	
	UHP-406	**Sprague**	**(2843)**	
	UHP-500	**Sprague**	**(2843)**	
	UHP-506	**Sprague**	**(2843)**	
Quad 2-Input AND Power Driver (to 70 V, sinks 300ma)				
TTL	**UDN-5706A**	**Sprague**	**(2843)**	
	UDS-5706H	† Sprague		
Quad 2-Input NAND Buffer, Open Collector, to 15 V Output				
TTL	5426	† Fairchild		
	7426	Fairchild		
	HD7426	Hitachi		80
	MC5426	† Motorola		
	MC7426	Motorola		
	DM5426	† National		
	DM7426	National		
	DS7810	† National		
	DS7811	† National		
	DS8810	National		
	DS8811	National		
	5426	† Signetics		
	7426	Signetics		90
	SN5426	**† TI**	**(841)**	
	SN7426	**TI**	**(841)**	
Quad 2-Input NAND Buffer, Open Collector, to 30 V Output				
TTL	N8T80	Signetics		
	S8T80	† Signetics		
Quad 2-Input NAND Bus Driver, Open Collector, 80ma				
TTL	96101	Fairchild		
Quad 2-Input NAND Power Driver, Open Collector (to 100 V, sinks 500 mA)				
TTL	UHC/D-407	† Sprague		
	UHC/D-408	† Sprague		
	UHC/D-507	† Sprague		
	UHC/D-508	† Sprague		
	UHP-407	**Sprague**	**(2843)**	100
	UHP-408	**Sprague**	**(2843)**	
	UHP-507	**Sprague**	**(2843)**	
	UHP-508	**Sprague**	**(2843)**	
Quad 2-Input NOR Power Driver, Open Collector (to 100 V, sinks 500 mA)				
TTL	UHC/D-432	† Sprague		
	UHC/D-433	† Sprague		
	UHC/D-532	† Sprague		
	UHC/D-533	† Sprague		
	UHP-432	**Sprague**	**(2843)**	
	UHP-433	**Sprague**	**(2843)**	
	UHP-532	**Sprague**	**(2843)**	110
	UHP-533	**Sprague**	**(2843)**	
Quad 2-Input NOR 74-Ohm/50-Ohm Line Driver				
TTL	74128	Signetics		
	SN54128	**† TI**	**(876)**	
	SN74128	**TI**	**(876)**	
Quad 2-Input OR Power Driver, Open Collector (to 100 V, sinks 500 mA)				
TTL	UHC/D-402	† Sprague		
	UHC/D-403	† Sprague		
	UHC/D-502	† Sprague		
	UHC/D-503	† Sprague		
	UHP-402	**Sprague**	**(2843)**	
	UHP-403	**Sprague**	**(2843)**	120
	UHP-502	**Sprague**	**(2843)**	
	UHP-503	**Sprague**	**(2843)**	
Hex Buffer/Driver, Open Collector High Voltage Output, to 15 V				
TTL	5417	† Fairchild		
	7417	Fairchild		
	HD7417	Hitachi		
	MC5417	† Motorola		
	MC7417	Motorola		
	DM5417	† National		
	DM7417	National		
	5417	† Signetics		130
	7417	Signetics		
	SN5417	**† TI**	**(838)**	
	SN7417	**TI**	**(838)**	
Hex Buffer/Driver, Open Collector High Voltage Output, to 30 V				
TTL	5407	† Fairchild		
	7407	Fairchild		
	HD7407	Hitachi		
	MC5407	† Motorola		
	MC7407	Motorola		
	DM5407	† National		
	DM7407	National		140
	7407	Signetics		
	SN5407	**† TI**	**(835)**	
	SN7407	**TI**	**(835)**	
Hex Bus Driver, 2-Line and 4-Line Enable, Three-State				
TTL-LS	M74LS367A	Mitsubishi		
Hex Inverter Buffer/Driver Open Collector High Voltage Output, to 15 V				
TTL	5416	† Fairchild		
	7416	Fairchild		
	HD7416	Hitachi		
	MC5416	† Motorola		
	MC7416	Motorola		
	DM5416	† National		150
	DM7416	National		
	DS7812	† National		
	DS8812	National		
	5416	† Signetics		
	7416	Signetics		
	SN5416	**† TI**	**(838)**	
	SN7416	**TI**	**(838)**	
Hex Inverter Buffer/Driver Open Collector High Voltage Output, to 30 V				
TTL	5406	† Fairchild		
	7406	Fairchild		
	HD7406	Hitachi		160
	MC5406	† Motorola		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Drivers (Cont'd)

Function	Device	Source		Line
Hex Inverter Buffer/Driver Open Collector High Voltage Output, to 30 V				
TTL			(Cont'd)	
	MC7406	Motorola		
	DM5406	† National		
	DM7406	National		
	7406	Signetics		
	SN5406	**† TI**	**(835)**	
	SN7406	**TI**	**(835)**	
Hex Inverter/MOS Memory				
TTL	DS16149	† National		
	DS16179	† National		
	DS36149	National		
	DS36179	National		10
	SN54S436	**† TI**	**(947)**	
	SN54S437	**† TI**	**(947)**	
	SN74S436	**TI**	**(947)**	
	SN74S437	**TI**	**(947)**	
Hex, Three-State				
TTL	DM54366	† National		
	DM54367	† National		
	DM74366	National		
	DM74367	National		
	54366A	† Signetics		
	54367A	† Signetics		20
	74366A	Signetics		
	74367A	Signetics		
	SN54366A	† TI		
	SN54367A	† TI		
	SN74367A	TI		
TTL-LS	HD74LS367	Hitachi		
4-Input NAND High Voltage, High Current Driver (40 to 50 V, sinks 150 to 500 mA)				
TTL	SH2001C	Fairchild		
	SH2001M	† Fairchild		
	SH2002C	Fairchild		
	SH2002M	† Fairchild		30
	SH2200C	Fairchild		
	SH2200M	† Fairchild		

Flip-Flops, D-Type

Function	Device	Source		Line
Dual Edge-Triggered				
TTL-ALS				
	SN54ALS874	**† Motorola**	**(732)**	
	SN54ALS876	**† Motorola**	**(732)**	
	SN74ALS874	**Motorola**	**(732)**	
	SN74ALS876	**Motorola**	**(732)**	
	DM54ALS876	† National		
	DM74ALS874	National		
	DM74ALS876	National		
	SN54ALS874	**† TI**	**(1008)**	40
	SN54ALS876	**† TI**	**(1009)**	
	SN54ALS878	**† TI**	**(1010)**	
	SN54ALS879	**† TI**	**(1010)**	
	SN74ALS874	**TI**	**(1008)**	
	SN74ALS876	**TI**	**(1009)**	
	SN74ALS878	**TI**	**(1010)**	
	SN74ALS879	**TI**	**(1010)**	
TTL-AS	**SN54AS879**	**† TI**	**(1010)**	
	SN74AS879	**TI**	**(1010)**	
Dual Gated				
TTL	DM7511	† National		50
	DM7613	† National		
	DM8511	National		
	DM8613	National		
Dual Positive Edge-Triggered with Preset and Clear				
TTL	5474	† Fairchild		
	7474	Fairchild		
	ZN5474	† Ferranti		
			(Continued)	

Function	Device	Source		Line
Dual Positive Edge-Triggered with Preset and Clear				
TTL			(Cont'd)	
	ZN7474	Ferranti		
	HD7474	Hitachi		
	MC5474	† Motorola		
	MC7474	Motorola		60
	DM5474	† National		
	DM7474	National		
	5474	† Signetics		
	7474	Signetics		
	SN5474	**† TI**	**(857)**	
	SN7474	**TI**	**(857)**	
TTL-ALS				
	SN54ALS74	**† Motorola**	**(732)**	
	SN74ALS74	**Motorola**	**(732)**	
	DM54ALS74	† National		
	DM74ALS74	National		70
	SN54ALS74	**† TI**	**(857)**	
	SN74ALS74	**TI**	**(857)**	
TTL-AS	**SN54AS74**	**† TI**	**(857)**	
	SN74AS74	**TI**	**(857)**	
TTL-F	54F74	† Fairchild		
	74F74	Fairchild		
	MC54F74	**† Motorola**	**(731)**	
	MC74F74	**Motorola**	**(731)**	
	74F74	Signetics		
TTL-H	54H74	† Fairchild		80
	74H74	Fairchild		
	MC3060	Motorola		
	MC3160	† Motorola		
	DM54H74	† National		
	DM74H74	National		
	SN54H74	**† TI**	**(857)**	
	SN74H74	**TI**	**(857)**	
TTL-LS	54LS74	† Fairchild		
	74LS74	Fairchild		
	HD74LS74A	Hitachi		90
	M74LS74	Mitsubishi		
	SN54LS74A	† Motorola		
	SN74LS74A	Motorola		
	DM54LS74	† National		
	DM74LS74	National		
	54LS74	† SGS		
	74LS74	SGS		
	54LS74A	† Signetics		
	74LS74A	Signetics		
	SN54LS74A	**† TI**	**(857)**	100
	SN74LS74A	**TI**	**(857)**	
TTL-S	54S74	† Fairchild		
	74S74	Fairchild		
	HD74S74	Hitachi		
	DM74S74	National		
	54S74	† Signetics		
	74S74	Signetics		
	SN54S74	**† TI**	**(857)**	
	SN74S74	**TI**	**(857)**	
Quad, Common Clock				
TTL	MC4015	Motorola		110
Quad Edge-Triggered with Clear, Complementary Output				
TTL	54175	† Fairchild		
	74175	Fairchild		
	ZN54175	† Ferranti		
	ZN74175	Ferranti		
	HD74175	Hitachi		
	MC54175	† Motorola		
	MC74175	Motorola		
	DM54175	† National		
	DM74175	National		
	54175	† Signetics		120
	74175	Signetics		
			(Continued)	

Function	Device	Source		Line
Quad Edge-Triggered with Clear, Complementary Output				
TTL			(Cont'd)	
	SN54175	**† TI**	**(895)**	
	SN74175	**TI**	**(895)**	
TTL-ALS				
	SN54ALS175	**† TI**	**(895)**	
	SN74ALS175	**TI**	**(895)**	
TTL-F	54F175	† Fairchild		
	74F175	Fairchild		
	MC54F175	**† Motorola**	**(731)**	
	MC74F175	**Motorola**	**(731)**	
TTL-LS	AM25LS175C	AMD		130
	AM25LS175M	AMD		
	SN54LS175	† AMD		
	54LS175	† Fairchild		
	74LS175	Fairchild		
	HD74LS175	Hitachi		
	M74LS175	Mitsubishi		
	SN54LS175	† Motorola		
	SN74LS175	Motorola		
	DM54LS175	† National		
	DM74LS175	National		140
	54LS175	† SGS		
	74LS175	SGS		
	54LS175	† Signetics		
	74LS175	Signetics		
	SN54LS175	**† TI**	**(895)**	
	SN74LS175	**TI**	**(895)**	
TTL-S	SN54S175	† AMD		
	SN74S175	AMD		
	54S175	† Fairchild		
	74S175	Fairchild		150
	HD74S175	Hitachi		
	DM54S175	† National		
	DM74S175	National		
	54S175	† Signetics		
	74S175	Signetics		
	SN54S175	**† TI**	**(895)**	
	SN74S175	**TI**	**(895)**	
Quad I/O Register, Three-State (two terminals per flip-flop can be used as input or output)				
TTL	DM7542	† National		
	DM8542	National		
Quad, Standard TTL and Three-State Outputs				
TTL	**AM2918C**	**AMD**	**(1213)**	160
	AM2918M	**† AMD**	**(1213)**	
	AM2918C	Raytheon		
	AM2918M	† Raytheon		
TTL-LS	AM25LS18C	AMD		
	AM25LS18M	† AMD		
	AM25LS2518C	**AMD**	**(1227)**	
	AM25LS2518M	**† AMD**	**(1227)**	
	SN54LS388	† AMD		
	SN74LS388	AMD		
TTL-S	**AM25S18C**	**AMD**	**(1227)**	170
	AM25S18M	**† AMD**	**(1227)**	
	SN54S388	† AMD		
	SN74S388	AMD		
Quad with clear				
TTL-LS	**SN54LS171**	**† TI**	**(893)**	
	SN74LS171	**TI**	**(893)**	
Quad with Common Clock Enable				
TTL-F	54F379	† Fairchild		
	74F379	Fairchild		
	MC54F379	**† Motorola**	**(731)**	
	MC74F379	**Motorola**	**(731)**	
TTL-LS	**AM25LS08C**	**AMD**	**(1227)**	180
	AM25LS08M	**† AMD**	**(1227)**	
	AM25LS379C	AMD		
	AM25LS379M	† AMD		
			(Continued)	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Flip-Flops, D-Type (Cont'd)

Function	Device	Source		Line
Quad with Common Clock Enable				
TTL-LS			(Cont'd)	
	SN54LS379	† AMD		
	SN74LS379	AMD		
	54LS379	† Fairchild		
	74LS379	Fairchild		
	SN54LS379	† Motorola		
	SN74LS379	Motorola		
	T54LS379	† SGS		
	T74LS379	SGS		
	SN54LS379	† TI		
	SN74LS379	**TI**	**(940)**	10
TTL-S	**AM25S08C**	**AMD**	**(1227)**	
	AM25S08M	**† AMD**	**(1227)**	
	SN54S379	† AMD		
	SN74S379	AMD		
Quad, Dual Three-State Outputs				
TTL-LS	**AM25LS2519C**	**AMD**	**(1227)**	
	AM25LS2519M	**† AMD**	**(1227)**	
Quad Three-State				
TTL	54173	† Fairchild		
	74173	Fairchild		
	HD74173	Hitachi		
	DM54173	† National		20
	DM74173	National		
	DM7551	† National		
	DM8551	National		
	RC8T10	Raytheon		
	RM8T10	† Raytheon		
	54173	† Signetics		
	74173	Signetics		
	N8T10	Signetics		
	S8T10	† Signetics		
	SN54173	**† TI**	**(894)**	30
	SN74173	**TI**	**(894)**	
TTL-LS	54LS173A	† Fairchild		
	74LS173A	Fairchild		
	SN54LS173A	† Motorola		
	SN74LS173A	Motorola		
	DM54LS173	† National		
	DM74LS173	National		
	54LS173	† Signetics		
	74LS173	Signetics		
	SN54LS173A	**† TI**	**(894)**	40
	SN74LS173A	**TI**	**(894)**	
Hex Edge-Triggered with Clear				
TTL	54174	† Fairchild		
	74174	Fairchild		
	93174C	Fairchild		
	ZN54174	† Ferranti		
	ZN74174	Ferranti		
	HD74174	Hitachi		
	MC54174	† Motorola		
	MC74174	Motorola		
	DM54174	† National		50
	DM74174	National		
	54174	† Signetics		
	74174	Signetics		
	SN54174	**† TI**	**(895)**	
	SN74174	**TI**	**(895)**	
TTL-ALS				
	MC54ALS174	† Motorola		
	MC74ALS174	Motorola		
	SN54ALS174	**† TI**	**(895)**	
	SN74ALS174	**TI**	**(895)**	
TTL-AS	**SN54AS174**	**† TI**	**(895)**	60
	SN74AS174	**TI**	**(895)**	
TTL-LS	AM25LS174C	AMD		

(Continued)

Function	Device	Source		Line
Hex Edge-Triggered with Clear				
TTL-LS			(Cont'd)	
	AM25LS174M	† AMD		
	SN54LS174	† AMD		
	54LS174	† Fairchild		
	74LS174	Fairchild		
	HD74LS174	Hitachi		
	M74LS174	Mitsubishi		
	SN74LS174	Motorola		
	DM54LS174	† National		70
	DM74LS174	National		
	54LS174	† SGS		
	74LS174	SGS		
	54LS174	† Signetics		
	74LS174	Signetics		
	SN54LS174	**† TI**	**(895)**	
	SN74LS174	**TI**	**(895)**	
TTL-S	SN54S174	† AMD		
	SN74S174	AMD		
	54S174	† Fairchild		80
	74S174	Fairchild		
	HD74S174	Hitachi		
	DM54S174	† National		
	DM74S174	National		
	54S174	† Signetics		
	74S174	Signetics		
	SN54S174	**† TI**	**(895)**	
	SN74S174	**TI**	**(895)**	
Hex with Common Enable				
TTL-LS	**AM25LS07C**	**AMD**	**(1227)**	
	AM25LS07M	**† AMD**	**(1227)**	90
	AM25LS378C	AMD		
	AM25LS378M	† AMD		
	SN54LS378	† AMD		
	SN74LS378	AMD		
	54LS378	† Fairchild		
	74LS378	Fairchild		
	SN54LS378	† Motorola		
	SN74LS378	Motorola		
	T54LS378	† SGS		
	T74LS378	SGS		100
	54LS378	† Signetics		
	74LS378	Signetics		
	SN54LS378	**† TI**	**(939)**	
	SN74LS378	**TI**	**(939)**	
TTL-S	**AM25S07C**	**AMD**	**(1227)**	
	AM25S07M	**† AMD**	**(1227)**	
	SN54S378	† AMD		
	SN74S378	AMD		
Octal Common Clear and Enable, Three-State				
TTL-LS	**AM25LS2520C**	**AMD**	**(1227)**	
	AM25LS2520M	**† AMD**	**(1227)**	110
	AM2920C	**AMD**	**(1214)**	
	AM2920M	**† AMD**	**(1214)**	
	8TS806	**Signetics**	**(793)**	
	8TS808	**Signetics**	**(799)**	
Octal Edge-Triggered, Inverting, Three-State				
TTL-ALS				
	SN54ALS534	**† Motorola**	**(732)**	
	SN54ALS564	**† Motorola**	**(732)**	
	SN74ALS534	**Motorola**	**(732)**	
	SN74ALS564	**Motorola**	**(732)**	
	SN54ALS534	**† TI**	**(957)**	
	SN54ALS564	**† TI**	**(962)**	120
	SN54ALS576	**† TI**	**(965)**	
	SN54AS534	**† TI**	**(957)**	
	SN74ALS534	**TI**	**(957)**	
	SN74ALS564	**TI**	**(962)**	
	SN74ALS576	**TI**	**(965)**	
	SN74AS534	**TI**	**(957)**	
TTL-F	54F534	† Fairchild		

(Continued)

Function	Device	Source		Line
Octal Edge-Triggered, Inverting, Three-State				
TTL-F			(Cont'd)	
	74F534	Fairchild		
	MC54F534	**† Motorola**	**(731)**	
	MC74F534	**Motorola**	**(731)**	130
	54F534	† Signetics		
	74F534	Signetics		
TTL-LS	**SN54LS534**	**† AMD**	**(1227)**	
	SN74LS534	**AMD**	**(1227)**	
	74LS534	Fairchild		
	SN54LS534	**† MMI**	**(715)**	
	SN74LS534	**MMI**	**(715)**	
TTL-S	**SN54S534**	**† AMD**	**(1227)**	
	SN74S534	**AMD**	**(1227)**	
	SN54S534	**MMI**	**(715)**	140
	SN74S534	**MMI**	**(715)**	
	SN74S536	**MMI**	**(715)**	
	54S534	**† Signetics**	**(789)**	
	74S534	**Signetics**	**(789)**	
Octal Edge-Triggered, with Clear				
TTL	**SN74273**	**TI**	**(919)**	
TTL-ALS				
	SN54ALS273	**† Motorola**	**(732)**	
	SN74ALS273	**Motorola**	**(732)**	
	DM54ALS273	† National		
	DM74ALS273	National		
	SN54ALS273	**† TI**	**(919)**	150
	SN74ALS273	**TI**	**(919)**	
TTL-LS	**AM25LS273B**	**AMD**	**(1227)**	
	AM25LS273C	**AMD**	**(1227)**	
	AM25LS273M	**† AMD**	**(1227)**	
	SN54LS273	**† AMD**	**(1227)**	
	SN74LS273	**AMD**	**(1227)**	
	54LS273	† Fairchild		
	74LS273	Fairchild		
	M74LS273	Mitsubishi		
	SN54LS273	**† MMI**	**(715)**	160
	SN74LS273	**MMI**	**(715)**	
	SN54LS273	† Motorola		
	SN74LS273	Motorola		
	T74LS273	SGS		
	54LS273	† Signetics		
	74LS273	Signetics		
	SN54LS273	**† TI**	**(919)**	
	SN74LS273	**TI**	**(919)**	
TTL-S	54S273	† Signetics		
	74S273	Signetics		170
Octal Edge-Triggered, Three-State				
TTL-ALS				
	SN54ALS374	**† Motorola**	**(732)**	
	SN54ALS574	**† Motorola**	**(732)**	
	SN74ALS374	**Motorola**	**(732)**	
	SN74ALS574	Motorola		
	DM54ALS374	† National		
	DM54ALS574	† National		
	DM74ALS374	National		
	DM74ALS574	National		
	SN54ALS374	† TI		
	SN54ALS574	**† TI**	**(964)**	180
	SN54ALS575	**† TI**	**(964)**	
	SN54ALS577	**† TI**	**(965)**	
	SN74ALS374	TI		
	SN74ALS574	**TI**	**(964)**	
	SN74ALS575	**TI**	**(964)**	
	SN74ALS577	**TI**	**(965)**	
TTL-AS	SN54AS374	† TI		
	SN54AS575	**† TI**	**(964)**	
	SN54AS577	**† TI**	**(965)**	
	SN74AS374	TI		190
	SN74AS575	**TI**	**(964)**	
	SN74AS577	**TI**	**(965)**	

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Flip-Flops, D-Type (Cont'd)

Octal Edge-Triggered, Three-State (Cont'd)

Function	Device	Source		Line
TTL-F	**54F374**	**† Fairchild**	**(634)**	
	74F374	**Fairchild**	**(634)**	
	MC54F374	**† Motorola**	**(731)**	
	MC74F374	**Motorola**	**(731)**	
	54F374	† Signetics		
	74F374	Signetics		
TTL-LS	**AM25LS374C**	**AMD**	**(1227)**	
	AM25LS374M	**† AMD**	**(1227)**	
	SN54LS374	**† AMD**	**(1227)**	
	SN74LS374A	**AMD**	**(1227)**	10
	74LS374	Fairchild		
	74LS574	Fairchild		
	M74LS374	Mitsubishi		
	SN54LS374	**† MMI**	**(715)**	
	SN74LS374	**MMI**	**(715)**	
	SN54LS374	† Motorola		
	SN54LS574	† Motorola		
	SN74LS374	Motorola		
	SN74LS574	Motorola		
	DM54LS374	† National		20
	DM74LS374	National		
	T74LS374	SGS		
	54LS374	**† Signetics**	**(783)**	
	74LS374	Signetics		
	SN54LS374	**† TI**	**(938)**	
	SN74LS374	**TI**	**(938)**	
TTL-S	**SN54S374**	**† AMD**	**(1227)**	
	SN74S374	**AMD**	**(1227)**	
	SN54S374	**† MMI**	**(715)**	
	SN74S374	**MMI**	**(715)**	30
	SN74S532	**MMI**	**(715)**	
	DM54S374	† National		
	DM74S374	National		
	54S374	† Signetics		
	74S374	Signetics		
	SN54S374	**† TI**	**(938)**	
	SN74S374	**TI**	**(938)**	

Octal with Enable

Function	Device	Source		Line
TTL-ALS				
	SN54ALS377	**Motorola**	**(732)**	
	SN74ALS377	**Motorola**	**(732)**	
	DM54ALS377	National		40
	DM74ALS377	National		
TTL-LS	**AM25LS377B**	**AMD**	**(1227)**	
	AM25LS377C	**AMD**	**(1227)**	
	AM25LS377M	**† AMD**	**(1227)**	
	SN54LS377	**† AMD**	**(1227)**	
	SN74LS377	**AMD**	**(1227)**	
	54LS377	† Fairchild		
	74LS377	Fairchild		
	M74LS377	Mitsubishi		
	SN54LS377	**† MMI**	**(715)**	50
	SN74LS377	**MMI**	**(715)**	
	SN54LS377	† Motorola		
	SN74LS377	Motorola		
	T74LS377	SGS		
	54LS377	† Signetics		
	74LS377	Signetics		
	SN54LS377	**† TI**	**(939)**	
	SN74LS377	**TI**	**(939)**	

Flip-Flops, J-K Type

AND Gated, Edge-Triggered with Preset and Clear

Function	Device	Source		Line
TTL	5470	† Fairchild		
	7470	Fairchild		60
	ZN5470	† Ferranti		
	ZN7470	Ferranti		

(Continued)

AND Gated, Edge-Triggered with Preset and Clear (Cont'd)

Function	Device	Source		Line
TTL	MC5470	† Motorola		
	MC7470	Motorola		
	DM5470	† National		
	DM7470	National		
	S8270	† Signetics		
	SN5470	**† TI**	**(855)**	
	SN7470	**TI**	**(855)**	

AND Gated Master-Slave with Data Lockout

Function	Device	Source		Line
TTL	**SN54110**	**† TI**	**(870)**	70
	SN74110	**TI**	**(870)**	

AND Gated Master-Slave with Preset and Clear

Function	Device	Source		Line
TTL	5472	† Fairchild		
	7472	Fairchild		
	ZN5472	† Ferranti		
	ZN7472	Ferranti		
	HD7472	Hitachi		
	MC5472	† Motorola		
	MC7472	Motorola		
	DM5472	† National		
	DM7472	National		80
	SN5472	**† TI**	**(856)**	
	SN7472	**TI**	**(856)**	
TTL-H	54H72	† Fairchild		
	74H72	Fairchild		
	MC3051	Motorola		
	MC3151	† Motorola		
	DM54H72	† National		
	DM74H72	National		
	SN54H72	**† TI**	**(856)**	
	SN54L72	**† TI**	**(856)**	90
	SN74H72	**TI**	**(856)**	

AND Input J-J--K-K-

Function	Device	Source		Line
TTL-H	MC3052	Motorola		
	MC3152	† Motorola		

Master-Slave

Function	Device	Source		Line
TTL	54104	† Fairchild		
	54105	† Fairchild		
	9000M	† Fairchild		
	9001C	Fairchild		
	9001M	† Fairchild		

Master-Slave, AND-OR Input

Function	Device	Source		Line
TTL-H	54H71	† Fairchild		
	DM54H71	† National		100
	DM74H71	National		
	SN54H71	**† TI**	**(855)**	
	SN74H71	**TI**	**(855)**	

Negative Edge-Triggered, AND Input

Function	Device	Source		Line
TTL-H	54H102	† Fairchild		
	SN54H102	**† TI**	**(868)**	
	SN74H102	**TI**	**(868)**	

Negative Edge-Triggered, AND-OR Input

Function	Device	Source		Line
TTL-H	54H101	† Fairchild		
	74H101	Fairchild		
	SN54H101	**† TI**	**(868)**	
	SN74H101	**TI**	**(868)**	110

Dual JK/D Gated Master-Slave

Function	Device	Source		Line
TTL	DM7512	† National		
	DM8512	National		

Dual J-K- Positive Edge-Triggered, Preset and Clear

Function	Device	Source		Line
TTL	9024C	Fairchild		
	9024M	† Fairchild		
	DM54109	† National		
	DM74109	National		
	54109	† Signetics		
	74109	Signetics		
	SN54109	**† TI**	**(870)**	
	SN74109	**TI**	**(870)**	120
TTL-ALS				
	SN54ALS109	**† Motorola**	**(732)**	

(Continued)

Dual J-K- Positive Edge-Triggered, Preset and Clear (Cont'd)

Function	Device	Source		Line
TTL-ALS				
	SN74ALS109	**Motorola**	**(732)**	
	DM54ALS109	† National		
	DM74ALS109	National		
	SN54ALS109	**† TI**	**(870)**	
	SN74ALS109	**TI**	**(870)**	
TTL-AS	**SN54AS109**	**† TI**	**(870)**	
	SN74AS109	**TI**	**(870)**	
TTL-F	54F109	† Fairchild		
	74F109	Fairchild		130
	MC54F109	**† Motorola**	**(731)**	
	MC74F109	**Motorola**	**(731)**	
	74F109	Signetics		
TTL-LS	54LS109	† Fairchild		
	74LS109	Fairchild		
	HD74LS109	Hitachi		
	M74LS109A	Mitsubishi		
	SN54LS109A	† Motorola		
	SN74LS109A	Motorola		
	DM54LS109	† National		140
	DM74LS109	National		
	54LS109	† SGS		
	74LS109	SGS		
	54LS109	† Signetics		
	74LS109	Signetics		
	SN54LS109A	**† TI**	**(870)**	
	SN74LS109A	**TI**	**(870)**	
TTL-S	54S109	† Fairchild		
	74S109	Fairchild		

Dual J-K- with Preset, Common Clock and Common Clear

Function	Device	Source		Line
TTL-H	54H78	† Fairchild		150
	DM54H78	† National		
	DM74H78	National		
	SN54H78	**† TI**	**(859)**	
	SN74H78	**TI**	**(859)**	
TTL-LS	HD74LS78	Hitachi		
	SN54LS78A	† Motorola		
	SN74LS78A	Motorola		
	DM54LS78	† National		
	DM74LS78	National		
	SN54LS78A	**† TI**	**(859)**	160
	SN74LS78A	**TI**	**(859)**	

Dual Master-Slave with Clear

Function	Device	Source		Line
TTL	54107	† Fairchild		
	5473	† Fairchild		
	74107	Fairchild		
	7473	Fairchild		
	ZN54107	† Ferranti		
	ZN5473	† Ferranti		
	ZN74107	Ferranti		
	ZN7473	Ferranti		
	HD74107	Hitachi		170
	HD7473	Hitachi		
	MC54107	† Motorola		
	MC5473	† Motorola		
	MC74107	Motorola		
	MC7473	Motorola		
	DM54107	† National		
	DM5473	† National		
	DM74107	National		
	DM7473	National		
	54107	† Signetics		180
	5473	† Signetics		
	74107	Signetics		
	7473	Signetics		
	SN54107	**† TI**	**(869)**	
	SN5473	**† TI**	**(856)**	
	SN54L73	**† TI**	**(856)**	

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Flip-Flops, J-K Type (Cont'd)

Function	Device	Source		Line
Dual Master-Slave with Clear				
TTL			(Cont'd)	
	SN74107	**TI**	**(869)**	
	SN7473	**† TI**	**(856)**	
TTL-H	54H73	† Fairchild		
	74H73	Fairchild		
	MC3061	Motorola		
	MC3062	Motorola		
	MC3161	† Motorola		
	MC3162	† Motorola		
	DM54H73	† National		
	DM74H73	National		10
	SN54H73	**† TI**	**(856)**	
	SN74H73	**TI**	**(856)**	
TTL-LS	74LS107	Fairchild		
	HD74LS107	Hitachi		
	HD74LS73	Hitachi		
	M74LS107A	Mitsubishi		
	M74LS73A	Mitsubishi		
	SN54LS107A	† Motorola		
	SN54LS73A	† Motorola		
	SN74LS107A	Motorola		20
	SN74LS73A	Motorola		
	DM54LS107A	† National		
	DM54LS73A	† National		
	DM74LS107A	National		
	DM74LS73A	National		
	54LS107	† Signetics		
	54LS73	† Signetics		
	74LS107	Signetics		
	74LS73	Signetics		
	SN54LS107A	**† TI**	**(869)**	30
	SN54LS73A	**† TI**	**(856)**	
	SN74LS107A	**TI**	**(869)**	
	SN74LS73A	**TI**	**(856)**	
Dual Master-Slave with Data Lockout				
TTL	**SN54111**	**† TI**	**(871)**	
	SN74111	**TI**	**(871)**	
Dual Master-Slave with Preset and Clear				
TTL	5476	† Fairchild		
	7476	Fairchild		
	ZN5476	† Ferranti		
	ZN7476	Ferranti		
	HD7476	Hitachi		40
	MC5476	† Motorola		
	MC7476	Motorola		
	DM5476	† National		
	DM7476	National		
	5476	† Signetics		
	7476	Signetics		
	SN5476	**† TI**	**(858)**	
	SN7476	**TI**	**(858)**	
TTL-H	54H76	† Fairchild		
	DM54H76	† National		50
	DM74H76	National		
	SN54H76	**† TI**	**(858)**	
	SN74H76	**TI**	**(858)**	
TTL-LS	HD74LS76	Hitachi		
	M74LS76A	Mitsubishi		
	SN54LS76A	† Motorola		
	SN74LS76A	Motorola		
	DM54LS76	† National		
	DM74LS76	National		
	54LS76	† Signetics		60
	74LS76	Signetics		
	SN54LS76A	**† TI**	**(858)**	
	SN74LS76A	**TI**	**(858)**	

Function	Device	Source		Line
Dual Negative Edge-Triggered, Preset, Common Clear, Common Clock				
TTL-H	54H108	† Fairchild		
	74H108	Fairchild		
	DM54H108	† National		
	DM74H108	National		
	SN54H108	**† TI**	**(870)**	
	SN74H108	**TI**	**(870)**	
Dual Negative Edge-Triggered, Separate Preset and Clock, (no clear)				
TTL-ALS				
	DM54ALS113	† National		70
	SN54ALS113	**† TI**	**(871)**	
	SN74ALS113	**TI**	**(871)**	
TTL-AS	**SN54AS113**	**† TI**	**(871)**	
	SN74AS113	**TI**	**(871)**	
TTL-LS	54LS113	† Fairchild		
	74LS113	Fairchild		
	HD74LS113	Hitachi		
	M74LS113A	Mitsubishi		
	SN54LS113A	† Motorola		
	SN74LS113A	Motorola		80
	DM54LS113A	† National		
	DM74LS113A	National		
	54LS113	† SGS		
	74LS113	SGS		
	54LS113	† Signetics		
	74LS113	Signetics		
	SN54LS113A	**† TI**	**(871)**	
	SN74LS113A	**TI**	**(871)**	
TTL-S	54S113	† Fairchild		
	74S113	Fairchild		90
	HD74S113	Hitachi		
	DM54S113	† National		
	DM74S113	National		
	54S113	† Signetics		
	74S113	Signetics		
	SN54S113	**† TI**	**(871)**	
	SN74S113	**TI**	**(871)**	
Dual Negative Edge-Triggered, with Clear				
TTL-H	54H103	† Fairchild		
	74H103	Fairchild		
	DM54H103	† National		100
	DM74H103	National		
	SN54H103	**† TI**	**(868)**	
	SN74H103	**TI**	**(868)**	
Dual Negative Edge-Triggered with Preset and Clear				
TTL-ALS				
	SN54ALS112	**† TI**	**(871)**	
	SN74ALS112	**TI**	**(871)**	
TTL-AS	**SN54AS112**	**† TI**	**(871)**	
	SN74AS112	**TI**	**(871)**	
TTL-H	54H106	† Fairchild		
	74H106	Fairchild		
	DM54H106	† National		110
	DM74H106	National		
	SN54H106	**† TI**	**(869)**	
	SN74H106	**TI**	**(869)**	
TTL-LS	54LS112	† Fairchild		
	74LS112	Fairchild		
	HD74LS112	Hitachi		
	M74LS112A	Mitsubishi		
	SN54LS112A	† Motorola		
	SN74LS112A	Motorola		
	DM54LS112	† National		120
	DM74LS112	National		
	54LS112	Signetics		
	74LS112	Signetics		
	SN54LS112A	**† TI**	**(871)**	
	SN74LS112A	**TI**	**(871)**	
TTL-S	54S112	† Fairchild		

(Continued)

Function	Device	Source		Line
Dual Negative Edge-Triggered with Preset and Clear				
TTL-S			(Cont'd)	
	74S112	Fairchild		
	HD74S112	Hitachi		
	DM54S112	† National		
	DM74S112	National		130
	54S112	† Signetics		
	74S112	Signetics		
	SN54S112	**† TI**	**(871)**	
	SN74S112	**TI**	**(871)**	
Dual Negative Edge-Triggered with Preset, Common Clock and Common Clear				
TTL-ALS				
	SN54ALS114	**† TI**	**(872)**	
	SN74ALS114	**TI**	**(872)**	
TTL-AS	**SN54AS114**	**† TI**	**(872)**	
	SN74AS114	**TI**	**(872)**	
TTL-LS	54LS114	† Fairchild		
	74LS114	Fairchild		140
	HD74LS114	Hitachi		
	M74LS114A	Mitsubishi		
	SN54LS114A	† Motorola		
	SN74LS114A	Motorola		
	DM54LS114A	† National		
	DM74LS114A	National		
	54LS112	† SGS		
	74LS112	SGS		
	T54LS114	† SGS		
	T74LS114	SGS		150
	SN54LS114A	† TI		
	SN74LS114A	TI		
TTL-S	54S114	† Fairchild		
	HD74S114	Hitachi		
	DM54S114	† National		
	DM74S114	National		
	SN54S114	**† TI**	**(872)**	
	SN74S114	**TI**	**(872)**	
Quad J-K- Edge-Triggered with Clear				
TTL	**SN54376**	**† TI**	**(939)**	
	SN74376	**TI**	**(939)**	160
Quad J-K- Edge-Triggered with Preset and Clear				
TTL	**SN54276**	**† TI**	**(920)**	
	SN74276	**TI**	**(920)**	

Gates, AND

Dual 4-Input Power				
TTL-H	MC3026	Motorola		
	MC3126	† Motorola		
Dual 4-Input				
TTL	5421	† Fairchild		
	7421	Fairchild		
	5421	† Signetics		
	7421	Signetics		
TTL-ALS				
	SN54ALS21	**† TI**	**(839)**	
	SN74ALS21	**TI**	**(840)**	170
TTL-AS	**SN54AS21**	**† TI**	**(840)**	
	SN74AS21	**TI**	**(840)**	
TTL-H	54H21	† Fairchild		
	74H21	Fairchild		
	MC3011	Motorola		
	MC3111	† Motorola		
	DM54H21	† National		
	DM74H21	National		
	SN54H21	**† TI**	**(840)**	
	SN74H21	**TI**	**(840)**	180
TTL-LS	54LS21	† Fairchild		
	74LS21	Fairchild		
	HD74LS21	Hitachi		
	M74LS21	Mitsubishi		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Gates, AND (Cont'd)

Function	Device	Source		Line
Dual 4-Input				
TTL-LS			(Cont'd)	
	SN54LS21	† Motorola		
	SN74LS21	Motorola		
	DM54LS21	† National		
	DM74LS21	National		
	54LS21	† SGS		
	74LS21	SGS		
	54LS21	† Signetics		
	74LS21	Signetics		
	SN54LS21	**† TI**	**(840)**	
	SN74LS21	**TI**	**(840)**	10
Triple 3-Input, Open Collector				
TTL-ALS				
	SN54ALS15	**† Motorola**	**(732)**	
	SN74ALS15	**Motorola**	**(732)**	
	SN54ALS15	**† TI**	**(838)**	
	SN74ALS15	**TI**	**(838)**	
TTL-H	**SN54H15**	**† TI**	**(838)**	
	SN74H15	**TI**	**(838)**	
TTL-LS	54LS15	† Fairchild		
	74LS15	Fairchild		
	HD74LS15	Hitachi		
	M74LS15	Mitsubishi		20
	SN54LS15	† Motorola		
	SN74LS15	Motorola		
	DM54LS15	† National		
	DM74LS15	National		
	54LS15	† SGS		
	74LS15	SGS		
	SN54LS15	**† TI**	**(838)**	
	SN74LS15	**TI**	**(838)**	
TTL-S	54S15	† Fairchild		
	74S15	Fairchild		30
	HD74S15	Hitachi		
	DM54S15	† National		
	DM74S15	National		
	SN54S15	**† TI**	**(838)**	
	SN74S15	**TI**	**(838)**	
Triple 3-Input				
TTL	5411	† Fairchild		
	7411	Fairchild		
	HD74LS11	Hitachi		
	DM5411	† National		
	DM7411	National		40
	5411	† Signetics		
	7411	Signetics		
TTL-ALS				
	SN54ALS11	**† Motorola**	**(732)**	
	SN74ALS11	**Motorola**	**(732)**	
	SN54ALS1011	**† TI**	**(1015)**	
	SN54ALS11	**† TI**	**(836)**	
	SN74ALS1011	**TI**	**(1015)**	
	SN74ALS11	**TI**	**(836)**	
TTL-AS	**SN54AS11**	**† TI**	**(836)**	
	SN74AS11	**TI**	**(836)**	50
TTL-F	54F11	† Fairchild		
	74F11	Fairchild		
	MC54F11	**† Motorola**	**(731)**	
	MC74F11	**Motorola**	**(731)**	
	74F11	Signetics		
TTL-H	54H11	† Fairchild		
	74H11	Fairchild		
	MC3006	Motorola		
	MC3106	† Motorola		
	DM54H11	† National		60
	DM74H11	National		
	SN54H11	**† TI**	**(836)**	
	SN74H11	**TI**	**(836)**	

(Continued)

Function	Device	Source		Line
Triple 3-Input				
			(Cont'd)	
TTL-LS	54LS11	† Fairchild		
	74LS11	Fairchild		
	M74LS11	Mitsubishi		
	SN54LS11	† Motorola		
	SN74LS11	Motorola		
	DM54LS11	† National		
	DM74LS11	National		70
	54LS11	† SGS		
	74LS11	SGS		
	54LS11	† Signetics		
	74LS11	Signetics		
	SN54LS11	**TI**	**(836)**	
	SN74LS11	**† TI**	**(836)**	
TTL-S	54S11	† Fairchild		
	74S11	Fairchild		
	HD74S11	Hitachi		
	DM54S11	† National		80
	DM74S11	National		
	54S11	† Signetics		
	74S11	Signetics		
	SN54S11	**† TI**	**(836)**	
	SN74S11	**TI**	**(836)**	
Quad 2-Input, Open Collector				
TTL	5409	† Fairchild		
	7409	Fairchild		
	ZN5409	† Ferranti		
	ZN7409	Ferranti		
	HD7409	Hitachi		90
	MC5409	† Motorola		
	MC7409	Motorola		
	DM5409	† National		
	DM7409	National		
	SN5409	**† TI**	**(836)**	
	SN7409	**TI**	**(836)**	
TTL-ALS				
	SN54ALS09	**† Motorola**	**(732)**	
	SN74ALS09	**Motorola**	**(732)**	
	SN54ALS09	**† TI**	**(836)**	
	SN74ALS09	**TI**	**(836)**	100
TTL-H	54H09	† Fairchild		
	74H09	Fairchild		
TTL-LS	54LS09	† Fairchild		
	74LS09	Fairchild		
	HD74LS09	Hitachi		
	M74LS09	Mitsubishi		
	SN54LS09	† Motorola		
	SN74LS09	Motorola		
	DM54LS09	† National		
	DM74LS09	National		110
	DM74S09	National		
	54LS09	† SGS		
	74LS09	SGS		
	54LS09	† Signetics		
	74LS09	Signetics		
	SN54LS09	**† TI**	**(836)**	
	SN74LS09	**† TI**	**(836)**	
TTL-S	54S09	† Fairchild		
	DM54S09	† National		
	SN54S09	**† TI**	**(836)**	120
	SN74S09	**TI**	**(836)**	
Quad 2-Input				
TTL	5408	† Fairchild		
	7408	Fairchild		
	ZN5408	† Ferranti		
	ZN7408	Ferranti		
	HD7408	Hitachi		
	MC5408	† Motorola		
	MC7408	Motorola		
	DM5408	† National		

(Continued)

Function	Device	Source		Line
Quad 2-Input				
TTL			(Cont'd)	
	DM7408	National		130
	5408	Signetics		
	7408	Signetics		
	SN5408	**† TI**	**(835)**	
	SN7408	**TI**	**(835)**	
TTL-ALS				
	SN54ALS08	**† Motorola**	**(732)**	
	SN54ALS576	**† Motorola**	**(732)**	
	SN74ALS08	**Motorola**	**(732)**	
	SN74ALS576	**Motorola**	**(732)**	
	DM54ALS08	† National		
	DM54ALS576	† National		140
	DM74ALS08	National		
	DM74ALS576	National		
	SN54ALS08	**† TI**	**(835)**	
	SN54ALS1008	**† TI**	**(1015)**	
	SN74ALS08	**TI**	**(835)**	
	SN74ALS1008	**TI**	**(1015)**	
TTL-AS	**SN54AS08**	**† TI**	**(835)**	
	SN74AS08	**TI**	**(835)**	
TTL-F	54F08	† Fairchild		
	74F08	Fairchild		150
	MC54F08	**† Motorola**	**(731)**	
	MC74F08	**Motorola**	**(731)**	
	74F08	Signetics		
TTL-H	54H08	† Fairchild		
	74H08	Fairchild		
	MC3001	Motorola		
	MC3101	† Motorola		
	DM54H08	† National		
	DM74H08	National		
TTL-LS	54LS08	† Fairchild		160
	74LS08	Fairchild		
	HD74LS08	Hitachi		
	M74LS08	Mitsubishi		
	SN54LS08	† Motorola		
	SN74LS08	Motorola		
	DM54LS08	† National		
	DM74LS08	National		
	54LS08	† SGS		
	74LS08	SGS		
	54LS08	† Signetics		170
	74LS08	Signetics		
	SN54LS08	**† TI**	**(835)**	
	SN74LS08	**TI**	**(835)**	
TTL-S	54S08	† Fairchild		
	74S08	Fairchild		
	DM54S08	† National		
	DM74S08	National		
	54S08	† Signetics		
	74S08	Signetics		
	SN54S08	**† TI**	**(835)**	180
	SN74S08	**TI**	**(835)**	
Hex 2-Input Line Driver/Buffer				
TTL-ALS				
	SN54ALS808	**† TI**	**(1003)**	
	SN74ALS808	**TI**	**(1003)**	
TTL-AS	SN54AS808	† TI		
	SN74AS808	TI		

Gates, NAND

Function	Device	Source		Line
Dual 4-Input Buffer				
TTL	5440	† Fairchild		
	7440	Fairchild		
	ZN5440	† Ferranti		
	ZN7440	Ferranti		
	HD7440	Hitachi		190
	MC5440	† Motorola		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL-TTL (Cont'd)

Gates, NAND (Cont'd)

Function	Device	Source		Line
Dual 4-Input Buffer				
TTL			(Cont'd)	
	MC7440	Motorola		
	DM5440	† National		
	DM7440	National		
	DM9009C	National		
	5440	† Signetics		
	7440	Signetics		
	SN5440	**† TI**	**(845)**	
	SN7440	**TI**	**(845)**	
TTL-ALS				
	SN54ALS40	**† Motorola**	**(732)**	
	SN74ALS40	**Motorola**	**(732)**	10
	SN54ALS40	**† TI**	**(845)**	
	SN74ALS40	**TI**	**(845)**	
TTL-H	54H40	† Fairchild		
	74H40	Fairchild		
	MC3024	Motorola		
	MC3025	Motorola		
	MC3124	† Motorola		
	MC3125	† Motorola		
	DM54H40	† National		
	DM74H40	National		20
	SN54H40	**† TI**	**(845)**	
	SN74H40	**TI**	**(845)**	
TTL-LS	54LS40	† Fairchild		
	74LS40	Fairchild		
	HD74LS40	Hitachi		
	M74LS40	Mitsubishi		
	SN54LS40	† Motorola		
	SN74LS40	Motorola		
	DM54LS40	† National		
	DM74LS40	National		30
	54LS40	† SGS		
	74LS40	SGS		
	54LS40	† Signetics		
	74LS40	Signetics		
	SN54LS40	**† TI**	**(845)**	
	SN74LS40	**TI**	**(845)**	
TTL-S	54S40	† Fairchild		
	74S40	Fairchild		
	HD74S40	Hitachi		
	DM54S40	† National		40
	DM74S40	National		
	54S40	† Signetics		
	74S40	Signetics		
	SN54S40	**† TI**	**(845)**	
	SN74S40	**TI**	**(845)**	
Dual 4-Input, Open Collector				
TTL	5422	† Fairchild		
	7422	Fairchild		
	HD7422	Hitachi		
	SN5422	**† TI**	**(840)**	
	SN7422	**TI**	**(840)**	50
TTL-ALS				
	SN54ALS22	**† Motorola**	**(732)**	
	SN74ALS22	**Motorola**	**(732)**	
	SN54ALS22	**† TI**	**(840)**	
	SN74ALS22	**TI**	**(840)**	
TTL-H	54H22	† Fairchild		
	74H22	Fairchild		
	MC3012	Motorola		
	MC3112	† Motorola		
	DM54H22	† National		
	DM74H22	National		60
	SN54H22	**† TI**	**(840)**	
	SN74H22	**TI**	**(840)**	
TTL-LS	54LS22	† Fairchild		

(Continued)

Function	Device	Source		Line
Dual 4-Input, Open Collector				
TTL-LS			(Cont'd)	
	74LS22	Fairchild		
	HD74LS22	Hitachi		
	M74LS22	Mitsubishi		
	SN54LS22	† Motorola		
	SN74LS22	Motorola		
	DM54LS22	† National		
	DM74LS22	National		70
	54LS22	† SGS		
	74LS22	SGS		
	SN54LS22	**† TI**	**(840)**	
	SN74LS22	**TI**	**(840)**	
TTL-S	54S22	† Fairchild		
	74S22	Fairchild		
	HD84S22	Hitachi		
	DM54S22	† National		
	DM74S22	National		
	SN54S22	**† TI**	**(840)**	80
	SN74S22	**TI**	**(840)**	
Dual 4-Input				
TTL	5420	† Fairchild		
	7420	Fairchild		
	ZN5420	† Ferranti		
	ZN7420	Ferranti		
	HD7420	Hitachi		
	MC5420	† Motorola		
	MC7420	Motorola		
	DM5420	† National		
	DM7420	National		90
	DM9004C	National		
	5420	† Signetics		
	7420	Signetics		
	SN5420	**† TI**	**(839)**	
	SN54L20	**† TI**	**(839)**	
	SN7420	**TI**	**(839)**	
TTL-ALS				
	SN54ALS20	**† Motorola**	**(732)**	
	SN74ALS20	**Motorola**	**(732)**	
	SN54ALS1020	**† TI**	**(1016)**	
	SN54ALS20	**† TI**	**(839)**	100
	SN74ALS1020	**TI**	**(1016)**	
	SN74ALS20	**TI**	**(839)**	
TTL-AS	**SN54AS20**	**† TI**	**(839)**	
	SN74AS20	**TI**	**(839)**	
TTL-F	54F20	† Fairchild		
	74F20	Fairchild		
	MC54F20	**† Motorola**	**(731)**	
	MC74F20	**Motorola**	**(731)**	
	54F20	† Signetics		
	74F20	Signetics		110
TTL-H	54H20	† Fairchild		
	74H20	Fairchild		
	MC3010	Motorola		
	MC3110	† Motorola		
	DM54H20	† National		
	DM74H20	National		
	SN54H20	**† TI**	**(839)**	
	SN74H20	**TI**	**(839)**	
TTL-LS	54LS20	† Fairchild		
	74LS20	Fairchild		120
	HD74LS20	Hitachi		
	M74LS20	Mitsubishi		
	SN54LS20	† Motorola		
	SN74LS20	Motorola		
	DM54LS20	† National		
	DM74LS20	National		
	54LS20	† SGS		
	74LS20	SGS		
	54LS20	† Signetics		
	74LS20	Signetics		130

(Continued)

Function	Device	Source		Line
Dual 4-Input				
TTL-LS			(Cont'd)	
	SN54LS20	**† TI**	**(839)**	
	SN74LS20	**TI**	**(839)**	
TTL-S	54S20	† Fairchild		
	74S20	Fairchild		
	HD74S20	Hitachi		
	DM54S20	† National		
	DM74S20	National		
	54S20	† Signetics		
	74S20	Signetics		
	SN54S20	**† TI**	**(839)**	140
	SN74S20	**TI**	**(839)**	
Dual 5-Input				
TTL	DM7092	† National		
	DM8092	National		
Triple 3-Input, Open Collector				
TTL	5412	† Fairchild		
	7412	Fairchild		
	ZN5412	† Ferranti		
	ZN7412	Ferranti		
	HD7412	Hitachi		
	SN5412	**† TI**	**(837)**	
	SN7412	TI		150
TTL-ALS				
	SN54ALS12	**† Motorola**	**(732)**	
	SN74ALS12	**Motorola**	**(732)**	
	SN54ALS12	**† TI**	**(837)**	
	SN74ALS12	**TI**	**(837)**	
TTL-H	MC3007	Motorola		
	MC3107	† Motorola		
TTL-LS	HD74LS12	Hitachi		
	M74LS12	Mitsubishi		
	SN54LS12	† Motorola		
	SN74LS12	Motorola		160
	DM54LS12	† National		
	DM74LS12	National		
	SN54LS12	**† TI**	**(837)**	
	SN74LS12	**TI**	**(837)**	
TTL-S	HD74S12	Hitachi		
Triple 3-Input				
TTL	5410	† Fairchild		
	7410	Fairchild		
	ZN5410	† Ferranti		
	ZN7410	Ferranti		
	HD7410	Hitachi		170
	MC5410	† Motorola		
	MC54F10	**† Motorola**	**(731)**	
	MC7410	Motorola		
	DM5410	† National		
	DM7410	National		
	DM9003C	National		
	5410	† Signetics		
	7410	Signetics		
	SN5410	**† TI**	**(836)**	
	SN54L10	**† TI**	**(836)**	180
	SN7410	**TI**	**(836)**	
TTL-ALS				
	SN54ALS10	**† Motorola**	**(732)**	
	SN74ALS10	**Motorola**	**(732)**	
	SN54ALS10	**† TI**	**(836)**	
	SN54ALS1010	**† TI**	**(1015)**	
	SN74ALS10	**TI**	**(836)**	
	SN74ALS1010	**TI**	**(1015)**	
TTL-AS	**SN54AS10**	**† TI**	**(836)**	
	SN74AS10	**TI**	**(836)**	
TTL-F	54F10	† Fairchild		190
	74F10	Fairchild		
	MC74F10	**Motorola**	**(731)**	
	74F10	Signetics		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Gates, NAND (Cont'd)

Function	Device	Source		Line
Triple 3-Input			(Cont'd)	
TTL-H	54H10	† Fairchild		
	74H10	Fairchild		
	MC3005	Motorola		
	MC3105	† Motorola		
	DM54H10	† National		
	DM74H10	National		
	SN54H10	**† TI**	**(836)**	
	SN74H10	**TI**	**(836)**	
TTL-LS	54LS10	† Fairchild		
	74LS10	Fairchild		10
	HD74LS10	Hitachi		
	M74LS10	Mitsubishi		
	SN54LS10	† Motorola		
	SN74LS10	Motorola		
	DM54LS10	† National		
	DM74LS10	National		
	54LS10	† SGS		
	74LS10	SGS		
	54LS10	† Signetics		
	74LS10	Signetics		20
	SN54LS10	**† TI**	**(836)**	
	SN74LS10	**TI**	**(836)**	
TTL-S	54S10	† Fairchild		
	74S10	Fairchild		
	HD74S10	Hitachi		
	DM54S10	† National		
	DM74S10	National		
	54S10	† Signetics		
	74S10	Signetics		
	SN54S10	**† TI**	**(836)**	30
	SN74S10	**TI**	**(836)**	
Quad 2-Input Buffer, Open Collector				
TTL	5438	† Fairchild		
	7438	Fairchild		
	7439	Fairchild		
	ZN5438	† Ferranti		
	ZN7438	Ferranti		
	HD7438	Hitachi		
	MC5438	† Motorola		
	MC7438	Motorola		
	DM5438	† National		40
	DM7438	National		
	5439	† Signetics		
	7438	Signetics		
	7439	Signetics		
	SN5438	**† TI**	**(844)**	
	SN5439	**† TI**	**(844)**	
	SN7438	**TI**	**(844)**	
	SN7439	**TI**	**(844)**	
TTL-ALS				
	SN54ALS38	**† Motorola**	**(732)**	
	SN74ALS38	**Motorola**	**(732)**	50
	SN54ALS38	**† TI**	**(844)**	
	SN74ALS38	**TI**	**(844)**	
TTL-LS	54LS38	† Fairchild		
	74LS38	Fairchild		
	HD74LS38	Hitachi		
	M74LS38	Mitsubishi		
	SN54LS38	† Motorola		
	SN74LS38	Motorola		
	DM54LS38	† National		
	DM74LS38	National		60
	54LS38	† Signetics		
	74LS38	Signetics		
	SN54LS38	**† TI**	**(844)**	
	SN74LS38	**TI**	**(844)**	
TTL-S	54S38	† Signetics		

(Continued)

Function	Device	Source		Line
Quad 2-Input Buffer, Open Collector				
TTL-S			(Cont'd)	
	74S38	Signetics		
	SN54S38	**† TI**	**(844)**	
	SN74S38	**TI**	**(844)**	
Quad 2-Input Buffer, Open Collector, to 15 V				
TTL-LS	54LS26	† Fairchild		
	74LS26	Fairchild		70
	SN54LS26	† Motorola		
	SN74LS26	Motorola		
	DM54LS26	† National		
	DM74LS26	National		
	T74LS26	SGS		
	54LS26	† Signetics		
	74LS26	Signetics		
	SN54LS26	**† TI**	**(841)**	
	SN74LS26	**TI**	**(841)**	
Quad 2-Input, Buffer, Three-State				
TTL	DM7099	† National		80
	DM8099	National		
Quad 2-Input Buffer				
TTL	5437	† Fairchild		
	7437	Fairchild		
	ZN5437	† Ferranti		
	ZN7437	Ferranti		
	HD7437	Hitachi		
	MC5437	† Motorola		
	MC7437	Motorola		
	DM5437	† National		
	DM7091	† National		90
	DM7437	National		
	DM8091	National		
	5437	† Signetics		
	7437	Signetics		
	SN5437	**† TI**	**(844)**	
	SN7437	**TI**	**(844)**	
TTL-ALS				
	SN54ALS37	**† Motorola**	**(732)**	
	SN74ALS37	**Motorola**	**(732)**	
	SN54ALS37	**† TI**	**(844)**	
	SN74ALS37	**TI**	**(844)**	100
TTL-LS	54LS37	† Fairchild		
	74LS37	Fairchild		
	HD74LS37	Hitachi		
	M74LS37	Mitsubishi		
	SN54LS37	† Motorola		
	SN74LS37	Motorola		
	DM54LS37	† National		
	DM74LS37	National		
	54LS37	† SGS		
	74LS37	SGS		110
	54LS37	† Signetics		
	74LS37	Signetics		
	SN54LS37	**† TI**	**(844)**	
	SN74LS37	**TI**	**(844)**	
TTL-S	54S37	† Signetics		
	74S37	Signetics		
	SN54S37	**† TI**	**(844)**	
	SN74S37	**TI**	**(844)**	
Quad 2-Input, Open Collector				
TTL	5401	† Fairchild		
	5403	† Fairchild		120
	7401	Fairchild		
	7403	Fairchild		
	ZN5401	† Ferranti		
	ZN5403	† Ferranti		
	ZN7401	Ferranti		
	ZN7403	Ferranti		
	HD7401	Hitachi		
	HD7403	Hitachi		
	MC5401	† Motorola		

(Continued)

Function	Device	Source		Line
Quad 2-Input, Open Collector				
TTL			(Cont'd)	
	MC5403	† Motorola		130
	MC7401	Motorola		
	MC7403	Motorola		
	DM5401	† National		
	DM5403	† National		
	DM7401	National		
	DM7403	National		
	DM9012C	National		
	5403	† Signetics		
	7403	Signetics		
	SN5401	**† TI**	**(833)**	140
	SN5403	**† TI**	**(834)**	
	SN54L03	**† TI**	**(834)**	
	SN7401	**TI**	**(833)**	
	SN7403	**TI**	**(834)**	
TTL-ALS				
	SN54ALS01	**† Motorola**	**(732)**	
	SN54ALS03	**† Motorola**	**(732)**	
	SN74ALS01	**Motorola**	**(732)**	
	SN74ALS03	**Motorola**	**(732)**	
	SN54ALS01	**† TI**	**(833)**	
	SN54ALS03	**† TI**	**(834)**	150
	SN54ALS1003	**† TI**	**(1014)**	
	SN74ALS01	**TI**	**(833)**	
	SN74ALS03	**TI**	**(834)**	
	SN74ALS1003	**TI**	**(1014)**	
TTL-H	54H01	† Fairchild		
	74H01	Fairchild		
	MC3004	Motorola		
	MC3104	† Motorola		
	DM54H01	† National		
	DM74H01	National		160
	SN54H01	**† TI**	**(833)**	
	SN74H01	**TI**	**(833)**	
TTL-LS	54LS03	† Fairchild		
	74LS03	Fairchild		
	HD74LS01	Hitachi		
	HD74LS03	Hitachi		
	M74LS03	Mitsubishi		
	SN54LS01	† Motorola		
	SN54LS03	† Motorola		
	SN74LS01	Motorola		170
	SN74LS03	Motorola		
	DM54LS01	† National		
	DM54LS03	† National		
	DM74LS01	National		
	DM74LS03	† National		
	54LS03	† SGS		
	74LS03	† SGS		
	54LS01	† Signetics		
	54LS03	† Signetics		
	74LS01	Signetics		180
	SN54LS01	**† TI**	**(833)**	
	SN54LS03	**† TI**	**(834)**	
	SN74LS01	**† TI**	**(833)**	
	SN74LS03	**† TI**	**(834)**	
TTL-S	74S03	Fairchild		
	HD74S03	Hitachi		
	DM54S03	† National		
	DM74S03	National		
	54LS38	† SGS		
	74LS38	SGS		190
	74S03	Signetics		
	SN54S03	**† TI**	**(834)**	
	SN74S03	**TI**	**(834)**	
Quad 2-Input				
TTL	5400	† Fairchild		
	7400	Fairchild		
	ZN5400	† Ferranti		
	ZN7400	Ferranti		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

DIGITAL–TTL (Cont'd)

Gates, NAND (Cont'd)

Function	Device	Source		Line
Quad 2-Input				
TTL			(Cont'd)	
	HD7400	Hitachi		
	MC5400	† Motorola		
	MC7400	Motorola		
	DM5400	† National		
	DM7400	National		
	DM9002C	National		
	5400	† Signetics		
	7400	Signetics		
	SN5400	**† TI**	**(833)**	
	SN7400	**TI**	**(833)**	10
TTL-ALS				
	SN54ALS00	**† Motorola**	**(732)**	
	SN74ALS00	**Motorola**	**(732)**	
	DM54ALS00	† National		
	DM74ALS00	National		
	SN54ALS00	**† TI**	**(833)**	
	SN54ALS1000	**† TI**	**(1013)**	
	SN74ALS00	**TI**	**(833)**	
	SN74ALS1000	**TI**	**(1013)**	
TTL-AS	**SN54AS00**	**† TI**	**(833)**	
	SN74AS00	**TI**	**(833)**	20
TTL-F	54F00	† Fairchild		
	74F00	Fairchild		
	MC54F00	**† Motorola**	**(731)**	
	MC74F00	**Motorola**	**(731)**	
	54F00	Signetics		
	74F00	Signetics		
TTL-H	54H00	† Fairchild		
	74H00	Fairchild		
	MC3000	**Motorola**	**(729)**	
	MC3100	**† Motorola**	**(729)**	30
	DM54H00	† National		
	DM74H00	National		
	SN74H00	**TI**	**(833)**	
TTL-LS	54LS00	† Fairchild		
	74LS00	Fairchild		
	HD74LS00	Hitachi		
	M74LS00	Mitsubishi		
	SN54LS00	† Motorola		
	SN74LS00	Motorola		
	DM54LS00	† National		40
	DM74LS00	National		
	54LS00	† SGS		
	74LS00	SGS		
	54LS00	† Signetics		
	74LS00	Signetics		
	SN54LS00	**† TI**	**(833)**	
	SN74LS00	**TI**	**(833)**	
TTL-S	54S00	† Fairchild		
	74S00	† Fairchild		
	HD74S00	Hitachi		50
	DM54S00	† National		
	DM74S00	National		
	54S00	† Signetics		
	74S00	Signetics		
	SN54S00	**† TI**	**(833)**	
	SN74S00	**TI**	**(833)**	
Hex 2-Input Line Driver/Buffer				
TTL-ALS				
	SN74ALS804	**TI**	**(1002)**	
TTL-AS	**SN54AS804**	**† TI**	**(1002)**	
	SN74AS804	**TI**	**(1002)**	
8-Input				
TTL	5430	† Fairchild		60
	7430	Fairchild		
	ZN5430	† Ferranti		
	ZN7430	Ferranti		

(Continued)

Function	Device	Source		Line
8-Input				
TTL			(Cont'd)	
	HD7430	Hitachi		
	MC5430	† Motorola		
	MC7430	Motorola		
	DM5430	† National		
	DM7430	National		
	5430	† Signetics		
	7430	Signetics		70
	SN5430	**† TI**	**(842)**	
	SN54L30	**† TI**	**(842)**	
	SN7430	**TI**	**(842)**	
TTL-ALS				
	SN54ALS30	**† TI**	**(842)**	
	SN74ALS30	**TI**	**(842)**	
TTL-AS	**SN54AS30**	**† TI**	**(842)**	
	SN74AS30	**TI**	**(842)**	
TTL-H	54H30	† Fairchild		
	74H30	Fairchild		
	MC3015	Motorola		80
	MC3016	Motorola		
	MC3115	† Motorola		
	MC3116	† Motorola		
	DM54H30	† National		
	DM74H30	National		
	SN54H30	**† TI**	**(842)**	
	SN74H30	**TI**	**(842)**	
TTL-LS	54LS30	† Fairchild		
	74LS30	Fairchild		
	HD74LS30	Hitachi		90
	M74LS30	Mitsubishi		
	SN54LS30	† Motorola		
	SN74LS30	Motorola		
	DM54LS30	† National		
	DM74LS30	National		
	54LS30	† SGS		
	74LS30	SGS		
	54LS30	† Signetics		
	74LS30	Signetics		
	SN54LS30	**† TI**	**(842)**	100
	SN74LS30	**TI**	**(842)**	
TTL-S	54S30	† Fairchild		
	74S30	Fairchild		
	DM54S30	† National		
	DM74S30	National		
	SN54S30	**† TI**	**(842)**	
	SN74S30	**TI**	**(842)**	
12-Input, Three-State				
TTL-S	54S134	† Fairchild		
	74S134	Fairchild		
	HD74S134	Hitachi		110
	DM54S134	† National		
	DM74S134	National		
	54S134	† Signetics		
	74S134	Signetics		
	SN54S134	**† TI**	**(877)**	
	SN74S134	**TI**	**(877)**	
13-Input				
TTL-ALS				
	SN54ALS133	**† TI**	**(877)**	
	SN74ALS133	**TI**	**(877)**	
TTL-LS	54LS133	† Fairchild		
	74LS133	Fairchild		120
	M74LS133	Mitsubishi		
	SN54LS133	† Motorola		
	SN74LS133	Motorola		
	54LS133	† SGS		
	74LS133	SGS		
TTL-S	54S133	† Fairchild		
	74S133	Fairchild		
	HD74S133	Hitachi		

(Continued)

Function	Device	Source		Line
13-Input				
TTL-S			(Cont'd)	
	DM54S133	† National		
	DM74S133	National		130
	54S133	† Signetics		
	74S133	Signetics		
	SN54S133	**† TI**	**(877)**	
	SN74S133	**TI**	**(877)**	

Gates, AND-OR

2-2-2-3-Input, Expandable				
TTL-H	54H52	† Fairchild		
	74H52	Fairchild		
	MC3031	Motorola		
	MC3131	† Motorola		
	DM54H52	† National		
	DM74H52	National		140
	SN54H52	† TI		
	SN74H52	TI		

Gates, AND-OR-Invert

Dual 2-Wide 2-Input (one gate is expandable)				
TTL	5450	† Fairchild		
	7450	Fairchild		
	ZN5450	† Ferranti		
	ZN7450	Ferranti		
	HD7450	Hitachi		
	MC5450	† Motorola		
	MC7450	Motorola		
	DM5450	† National		150
	DM7450	National		
	DM9005C	National		
	5450	† Signetics		
	7450	Signetics		
	SN5450	**† TI**	**(848)**	
	SN7450	**TI**	**(848)**	
TTL-H	54H50	† Fairchild		
	74H50	Fairchild		
	MC3020	Motorola		
	MC3120	† Motorola		160
	DM54H50	† National		
	DM74H50	National		
	SN54H50	**† TI**	**(848)**	
	SN74H50	**TI**	**(848)**	
Dual 2-Wide 2-Input				
TTL	5451	† Fairchild		
	7451	Fairchild		
	ZN5451	† Ferranti		
	ZN7451	Ferranti		
	HD7451	Hitachi		
	MC5451	† Motorola		170
	MC7451	Motorola		
	DM5451	† National		
	DM7451	National		
	5451	† Signetics		
	7451	Signetics		
	SN5451	**† TI**	**(848)**	
	SN54L51	**† TI**	**(848)**	
	SN7451	**TI**	**(848)**	
TTL-H	54H51	† Fairchild		
	74H51	Fairchild		180
	MC3023	Motorola		
	MC3123	† Motorola		
	DM54H51	† National		
	DM74H51	National		
	SN54H51	**† TI**	**(848,849)**	
	SN74H51	**TI**	**(848,849)**	
TTL-LS	54LS51	† Fairchild		
	74LS51	Fairchild		
	HD74LS51	Hitachi		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Gates, AND-OR-Invert (Cont'd)

Function	Device	Source		Line
Dual 2-Wide 2-Input				
TTL-LS			(Cont'd)	
	SN54LS51	† Motorola		
	SN74LS51	Motorola		
	DM54LS51	† National		
	DM74LS51	National		
	LS5451	† SGS		
	LS7451	SGS		
	54LS51	† Signetics		
	74LS51	Signetics		
	SN54LS51	**† TI**	**(848)**	
	SN74LS51	**TI**	**(848)**	10
TTL-S	54S51	† Fairchild		
	74S51	Fairchild		
	DM54S51	† National		
	DM74S51	National		
	54S51	† Signetics		
	74S51	Signetics		
	SN54S51	**† TI**	**(848)**	
	SN74S51	**TI**	**(848)**	
Dual 4-Input Expander (for 54/7423, 54/7450, 54/7453)				
TTL	5460	† Fairchild		
	7460	Fairchild		20
	HD7460	Hitachi		
	MC5460	† Motorola		
	MC7460	Motorola		
	DM5460	† National		
	DM7460	National		
	5460	† Signetics		
	SN5460	**† TI**	**(852)**	
	SN7460	**TI**	**(852)**	
Dual 4-Input Extender (for 9005, 9008)				
TTL	DM9006C	National		
2-Wide, 4-Input				
TTL	**SN54L55**	**TI**	**(851)**	30
TTL-LS	54LS55	† Fairchild		
	74LS55	Fairchild		
	HD74LS55	Hitachi		
	SN54LS55	† Motorola		
	SN74LS55	Motorola		
	DM54LS55	† National		
	DM74LS55	National		
	54LS55	† SGS		
	74LS55	SGS		
	SN54LS55	**† TI**	**(851)**	40
	SN74LS55	**TI**	**(851)**	
2-Wide, 4-Input, Expandable				
TTL-H	54H55	† Fairchild		
	74H55	Fairchild		
	DM54H55	† National		
	DM74H55	National		
	SN54H55	**† TI**	**(851)**	
	SN74H55	**TI**	**(851)**	
2-2-2-3-Input				
TTL-H	54H54	† Fairchild		
	74H54	Fairchild		
	DM54H54	† National		50
	DM74H54	National		
	SN54H54	**† TI**	**(850)**	
	SN74H54	**TI**	**(850)**	
2-2-2-3-Input, Expandable				
TTL	DM9008C	National		
TTL-H	54H53	† Fairchild		
	74H53	Fairchild		
	MC3032	Motorola		
	MC3132	† Motorola		
	DM54H53	† National		
	DM74H53	National		60
			(Continued)	

Function	Device	Source		Line
2-2-2-3-Input, Expandable				
TTL-H			(Cont'd)	
	SN54H53	**† TI**	**(849)**	
	SN74H53	**TI**	**(849)**	
4-Wide 2-Input				
TTL	5454	† Fairchild		
	7454	Fairchild		
	ZN5454	† Ferranti		
	ZN7454	Ferranti		
	HD7454	Hitachi		
	MC5454	† Motorola		
	MC7454	Motorola		
	DM5454	† National		70
	DM7454	National		
	SN5454	**† TI**	**(850)**	
	SN54L54	**† TI**	**(850)**	
	SN7454	**TI**	**(850)**	
4-Wide 2-Input, Expandable				
TTL	5453	† Fairchild		
	7453	Fairchild		
	ZN5453	† Ferranti		
	ZN7453	Ferranti		
	HD7453	Hitachi		
	MC5453	† Motorola		80
	MC7453	Motorola		
	DM5453	† National		
	DM7453	National		
	SN5453	**† TI**	**(849)**	
	SN7453	**TI**	**(849)**	
4-Wide 2-2-3-3-Input				
TTL-LS	54LS54	† Fairchild		
	74LS54	Fairchild		
	HD74LS54	Hitachi		
	SN54LS54	† Motorola		
	SN74LS54	Motorola		90
	DM54LS54	† National		
	DM74LS54	National		
	54LS54	† SGS		
	74LS54	SGS		
	54LS54	† Signetics		
	74LS54	Signetics		
	SN54LS54	**† TI**	**(850)**	
	SN74LS54	**TI**	**(850)**	
4-2-3-2-Input				
TTL-F	54F64	† Fairchild		
	74F64	Fairchild		100
	MC54F64	**† Motorola**	**(731)**	
	MC74F64	**Motorola**	**(731)**	
	54F64	† Signetics		
TTL-S	54S64	† Fairchild		
	74S64	† Fairchild		
	HD74S64	Hitachi		
	DM54S64	† National		
	DM74S64	National		
	54S64	† Signetics		
	74S64	† Signetics		110
	SN54S64	**TI**	**(853)**	
	SN74S64	**TI**	**(853)**	
4-2-3-2-Input, Open Collector				
TTL-S	74S65	† Fairchild		
	HD74S65	† Hitachi		
	DM54S65	† National		
	DM74S65	† National		
	54S65	† Signetics		
	SN54S65	**† TI**	**(853)**	
	SN74S65	**† TI**	**(853)**	

Function	Device	Source		Line
Gates, OR				
Quad 2-Input				
TTL	5432	† Fairchild		120
	7432	Fairchild		
	ZN5432	† Ferranti		
	ZN7432	Ferranti		
	HD7432	Hitachi		
	DM5432	† National		
	DM7432	National		
	5432	† Signetics		
	7432	Signetics		
	SN5432	**† TI**	**(843)**	
	SN7432	**TI**	**(843)**	130
TTL-ALS				
	SN54ALS32	**† Motorola**	**(732)**	
	SN74ALS32	**Motorola**	**(732)**	
	DM54ALS32	† National		
	DM74ALS32	National		
	SN54ALS1032	**† TI**	**(1016)**	
	SN54ALS32	**† TI**	**(843)**	
	SN74ALS1032	**TI**	**(1016)**	
	SN74ALS32	**TI**	**(843)**	
TTL-F	54F32	† Fairchild		
	74F32	Fairchild		140
	MC54F32	**† Motorola**	**(731)**	
	MC74F32	**Motorola**	**(731)**	
	74F32	Signetics		
TTL-H	MC3003	Motorola		
	MC3103	† Motorola		
TTL-LS	54LS32	† Fairchild		
	74LS32	Fairchild		
	HD74LS32	Hitachi		
	M74LS32	Mitsubishi		
	SN54LS32	† Motorola		150
	SN74LS32	Motorola		
	DM54LS32	† National		
	DM74LS32	National		
	54LS32	† SGS		
	74LS32	SGS		
	54LS32	† Signetics		
	74LS32	Signetics		
	SN54LS32	**† TI**	**(843)**	
	SN74LS32	**TI**	**(843)**	
TTL-S	54S32	† Fairchild		160
	74S32	Fairchild		
	DM54S32	† National		
	DM74S32	National		
	54S32	† Signetics		
	74S32	Signetics		
	SN54S32	**† TI**	**(843)**	
	SN74S32	**TI**	**(843)**	
Hex 2-Input Line Driver/Buffer				
TTL-ALS				
	SN54ALS832	**† TI**	**(1004)**	
	SN74ALS832	**† TI**	**(1004)**	
TTL-AS	SN54AS832	† TI		170
	SN74AS832	TI		
Gates, NOR				
Dual 4-Input, with Strobe				
TTL	5425	† Fairchild		
	7425	Fairchild		
	ZN5425	† Ferranti		
	ZN7425	Ferranti		
	HD7425	Hitachi		
	MC5425	† Motorola		
	MC7425	Motorola		
	DM5425	† National		
	DM7425	National		180
	5425	† Signetics		
			(Continued)	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Gates, NOR (Cont'd)

Function	Device	Source		Line
Dual 4-Input, with Strobe				
TTL			(Cont'd)	
	7425	Signetics		
	SN5425	† TI		
	SN7425	**TI**	**(841)**	
Dual 4-Input, with Strobe, Expandable (see 54/7460 expander)				
TTL	5423	† Fairchild		
	7423	Fairchild		
	HD7423	Hitachi		
	MC5423	† Motorola		
	MC7423	Motorola		
	DM5423	† National		
	DM7423	National		10
	SN5423	**† TI**	**(840)**	
	SN7423	**TI**	**(840)**	
Dual 5-Input				
TTL-ALS				
	SN54ALS260	† TI		
TTL-LS	54LS260	† Fairchild		
	74LS260	Fairchild		
	SN54LS260	† Motorola		
	SN74LS260	Motorola		
	T54LS260	† SGS		
	T74LS260	SGS		
	54LS260A	† Signetics		20
	74LS260	Signetics		
	SN54LS260A	† TI		
TTL-S	54S260	† Fairchild		
	74S260	Fairchild		
	DM74S260	National		
	54S260	† Signetics		
	74S260	Signetics		
	SN54S260	**† TI**	**(918)**	
	SN74S260	**TI**	**(918)**	
Triple 3-Input				
TTL	5427	† Fairchild		30
	7427	Fairchild		
	ZN5427	† Ferranti		
	ZN7427	Ferranti		
	HD7427	Hitachi		
	MC5427	† Motorola		
	MC7427	Motorola		
	DM5427	† National		
	DM7427	National		
	5427	† Signetics		
	7427	Signetics		40
	SN5427	**† TI**	**(842)**	
	SN7427	**TI**	**(842)**	
TTL-ALS				
	SN54ALS27	**† Motorola**	**(732)**	
	SN74ALS27	**Motorola**	**(732)**	
	SN54ALS27	**† TI**	**(842)**	
	SN74ALS27	**TI**	**(842)**	
TTL-AS	**SN54AS27**	**† TI**	**(842)**	
	SN74AS27	**TI**	**(842)**	
TTL-LS	54LS27	† Fairchild		
	74LS27	Fairchild		50
	HD74LS27	Hitachi		
	M74LS27	Mitsubishi		
	SN54LS27	† Motorola		
	SN74LS27	Motorola		
	DM54LS27	† National		
	DM74LS27	National		
	54LS27	† SGS		
	74LS27	SGS		
	54LS27	† Signetics		
	74LS27	Signetics		60

(Continued)

Function	Device	Source		Line
Triple 3-Input				
TTL-LS			(Cont'd)	
	SN54LS27	**† TI**	**(842)**	
	SN74LS27	**TI**	**(842)**	
Quad 2-Input Buffer, Open Collector				
TTL	5433	† Signetics		
	7433	Signetics		
	SN5433	**† TI**	**(843)**	
	SN7433	**TI**	**(843)**	
TTL-ALS				
	SN54ALS33	**† Motorola**	**(732)**	
	SN74ALS33	**Motorola**	**(732)**	
	SN54ALS33	**† TI**	**(843)**	
	SN74ALS33	**TI**	**(843)**	70
TTL-LS	54LS33	† Fairchild		
	74LS33	Fairchild		
	SN54LS33	† Motorola		
	SN74LS33	Motorola		
	T54LS33	† SGS		
	T74LS33	SGS		
	54LS33	† Signetics		
	74LS33	Signetics		
	SN54LS33	**† TI**	**(843)**	
	SN74LS33	**TI**	**(843)**	80
Quad 2-Input (54/7428 devices are also buffers)				
TTL	5402	† Fairchild		
	7402	Fairchild		
	ZN5402	† Ferranti		
	ZN5428	† Ferranti		
	ZN7402	Ferranti		
	ZN7428	Ferranti		
	HD7402	Hitachi		
	MC5402	† Motorola		
	MC7402	Motorola		
	DM5402	† National		90
	DM7402	National		
	5402	† Signetics		
	5428	† Signetics		
	7402	Signetics		
	7428	Signetics		
	SN5402	**† TI**	**(833)**	
	SN5428	**† TI**	**(842)**	
	SN7402	**TI**	**(833)**	
	SN7428	**TI**	**(842)**	
TTL-ALS				
	SN54ALS02	**† Motorola**	**(732)**	100
	SN54ALS28	**† Motorola**	**(732)**	
	SN74ALS02	**Motorola**	**(732)**	
	SN74ALS28	**Motorola**	**(732)**	
	DM54ALS02	† National		
	DM74ALS02	National		
	SN54ALS02	**† TI**	**(833)**	
	SN54ALS1002	**† TI**	**(1013)**	
	SN54ALS28	**† TI**	**(842)**	
	SN74ALS02	**TI**	**(833)**	
	SN74ALS1002	**TI**	**(1013)**	110
	SN74ALS28	**TI**	**(842)**	
TTL-AS	**SN54AS02**	**† TI**	**(833)**	
	SN74AS02	**TI**	**(833)**	
TTL-F	54F02	† Fairchild		
	74F02	Fairchild		
	MC54F02	**† Motorola**	**(731)**	
	MC74F02	**Motorola**	**(731)**	
	74F02	Signetics		
TTL-LS	54LS02	† Fairchild		
	54LS28	† Fairchild		120
	74LS02	Fairchild		
	74LS28	Fairchild		
	HD74LS02	Hitachi		
	M74LS02	Mitsubishi		
	SN54LS02	† Motorola		

(Continued)

Function	Device	Source		Line
Quad 2-Input (54/7428 devices are also buffers)				
TTL-LS			(Cont'd)	
	SN54LS28	† Motorola		
	SN74LS02	Motorola		
	SN74LS28	Motorola		
	DM54LS02	† National		
	DM74LS02	National		130
	54LS02	† SGS		
	74LS02	SGS		
	T54LS28	† SGS		
	T74LS28	SGS		
	54LS02	† Signetics		
	54LS28	† Signetics		
	74LS02	Signetics		
	SN54LS02	**† TI**	**(833)**	
	SN54LS28	**† TI**	**(842)**	
	SN74LS02	**TI**	**(833)**	140
	SN74LS28	**TI**	**(842)**	
TTL-S	54S02	† Fairchild		
	74S02	Fairchild		
	HD74S02	Hitachi		
	DM54S02	† National		
	DM74S02	National		
	54S02	† Signetics		
	74S02	Signetics		
	SN54S02	**† TI**	**(833)**	
	SN74S02	**TI**	**(833)**	150
Quad 2-Input				
TTL-H	MC3002	Motorola		
	MC3102	† Motorola		
Hex 2-Input Line Driver/Buffer				
TTL-ALS				
	SN54ALS805	**† TI**	**(1003)**	
	SN74ALS805	**TI**	**(1003)**	
TTL-AS	SN54AS805	† TI		
	SN74AS805	TI		

Gates, OR/NOR

Function	Device	Source		Line
Quad 2-Input				
TTL-S	54S135	† Fairchild		
	74S135	Fairchild		
	HD74S135	Hitachi		
	DM54S135	† National		160
	DM74S135	National		
	54S135	† Signetics		
	74S135	Signetics		
	SN54S135	**† TI**	**(878)**	
	SN74S135	**TI**	**(878)**	

Gates, Exclusive OR

Function	Device	Source		Line
Quad 2-Input, Open Collector				
TTL	HD74136	Hitachi		
	MC54136	† Motorola		
	MC74136	Motorola		
	S8241	Signetics		
	SN54136	**† TI**	**(878)**	170
	SN74136	**TI**	**(878)**	
TTL-LS	54LS136	Fairchild		
	74LS136	Fairchild		
	HD74LS136	Hitachi		
	M74LS136	Mitsubishi		
	SN54LS136	† Motorola		
	SN74LS136	Motorola		
	DM54LS136	† National		
	DM74LS136	National		
	54LS136	† SGS		180
	74LS136	SGS		
	54LS136	† Signetics		
	74LS136	Signetics		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Gates, Exclusive OR (Cont'd)

Function	Device	Source		Line
Quad 2-Input, Open Collector				
TTL-LS			(Cont'd)	
	SN54LS136	**† TI**	**(878)**	
	SN74LS136	**TI**	**(878)**	
TTL-S	DM54S136	† National		
	DM74S136	National		
	N82S41	Signetics		
Quad 2-Input, Totem Pole Outputs				
TTL	5486	† Fairchild		
	7486	Fairchild		
	ZN5486	† Ferranti		
	ZN7486	Ferranti		
	HD7486	Hitachi		10
	MC5486	† Motorola		
	MC7241	Motorola		
	MC7486	Motorola		
	MC8241	† Motorola		
	DM5486	National		
	DM7486	National		
	DM74LS386	National		
	RC8241	Raytheon		
	RM8241	† Raytheon		
	5486	† Signetics		20
	7486	Signetics		
	SN5486	**† TI**	**(862)**	
	SN7486	**TI**	**(862)**	
TTL-ALS				
	SN54ALS86	**† TI**	**(862)**	
	SN74ALS86	**TI**	**(862)**	
TTL-F	54F86	† Fairchild		
	74F86	Fairchild		
	MC54F86	**† Motorola**	**(731)**	
	MC74F86	**Motorola**	**(731)**	
	54F86	† Signetics		30
	74F86	Signetics		
TTL-LS	74LS86	Fairchild		
	HD74LS386	Hitachi		
	HD74LS86	Hitachi		
	M74LS386	Mitsubishi		
	M74LS86	Mitsubishi		
	SN54LS386	† Motorola		
	SN54LS86	† Motorola		
	SN74LS386	Motorola		
	SN74LS86	Motorola		40
	DM54LS386	† National		
	DM54LS86	† National		
	DM74LS86	National		
	54LS86	† SGS		
	74LS86	SGS		
	54LS86	† Signetics		
	74LS86	Signetics		
	SN54LS386	**† TI**	**(942)**	
	SN54LS86	**† TI**	**(862)**	
	SN74LS386	**TI**	**(942)**	50
	SN74LS86	**TI**	**(862)**	
TTL-S	54S86	† Fairchild		
	74S86	Fairchild		
	HD74S86	Hitachi		
	DM74S86	National		
	54S86	† Signetics		
	74S86	Signetics		
	SN54S86	**† TI**	**(862)**	
	SN74S86	**TI**	**(862)**	
Quad 2-Input				
TTL-H	MC3021	Motorola		60
	MC3121	† Motorola		

Gates, Exclusive NOR

Function	Device	Source		Line
Quad 2-Input, Open Collector				
TTL	9386C	Fairchild		
	9386M	† Fairchild		
	MC7242	Motorola		
	MC8242	† Motorola		
	RC8242	Raytheon		
	RM8242	† Raytheon		
	9386	Signetics		
	N8242	Signetics		
TTL-LS	54LS266	† Fairchild		70
	74LS266	Fairchild		
	M74LS266	Mitsubishi		
	SN54LS266	† Motorola		
	SN74LS266	Motorola		
	DM54LS266	† National		
	DM74LS266	National		
	54LS266	† SGS		
	74LS266	SGS		
	N8242	Signetics		
	S8242	† Signetics		80
	SN54LS266	**† TI**	**(918)**	
	SN74LS266	**TI**	**(918)**	
TTL-S	N82S42	Signetics		
Quad 2-Input				
TTL-H	MC3022	Motorola		
	MC3122	† Motorola		

Gates, Miscellaneous

Function	Device	Source		Line
Dual Majority Logic				
TTL	MC4062	Motorola		
Quad Inverter and Dual 2-Input NAND				
TTL	DM7090	† National		
	DM8090	National		

Latches

Function	Device	Source		Line
Dual 4-Bit Addressable				
TTL-LS	54LS256	† Fairchild		
	74LS256	Fairchild		90
	M74LS256	Mitsubishi		
	SN54LS256	† Motorola		
	SN74LS256	Motorola		
	T54LS256	† SGS		
	T74LS256	SGS		
	74LS256	Signetics		
Dual 4-Bit with Clear				
TTL	9308C	Fairchild		
	9308M	† Fairchild		
	MC8308	Motorola		
	RC9308	Raytheon		100
	54116	† Signetics		
	74116	Signetics		
	SN29308	TI		
	SN39308	† TI		
	SN54116	**† TI**	**(872)**	
	SN74116	**TI**	**(872)**	
Dual 4-Bit				
TTL	MC54100	† Motorola		
	MC74100	Motorola		
	SN54100	**† TI**	**(867)**	
	SN74100	**TI**	**(867)**	110
TTL-ALS				
	SN54ALS873	**† Motorola**	**(732)**	
	SN74ALS873	**Motorola**	**(732)**	
	DM54ALS873	† National		
	DM74ALS873	National		
	SN54ALS873	**† TI**	**(1008)**	
	SN74ALS873	**TI**	**(1008)**	

Function	Device	Source		Line
Quad Bistable, Complementary Outputs				
TTL	5475	† Fairchild		
	7475	Fairchild		
	ZN5475	† Ferranti		
	ZN7475	Ferranti		120
	HD7475	Hitachi		
	MC5475	† Motorola		
	MC7475	Motorola		
	DM5475	† National		
	DM7475	National		
	5475	† Signetics		
	7475	Signetics		
	SN5475	**† TI**	**(858)**	
	SN7475	**TI**	**(858)**	
TTL-LS	54LS375	† Fairchild		130
	74LS375	Fairchild		
	HD74LS375	Hitachi		
	M74LS375	Mitsubishi		
	M74LS75	Mitsubishi		
	SN54LS375	† Motorola		
	SN54LS75	† Motorola		
	SN74LS375	Motorola		
	SN74LS75	Motorola		
	DM54LS75	† National		
	DM74LS75	National		140
	54LS375	† Signetics		
	54LS75	† Signetics		
	74LS375	Signetics		
	74LS75	Signetics		
	SN54LS375	**† TI**	**(938)**	
	SN54LS75	**† TI**	**(858)**	
	SN74LS375	**TI**	**(938)**	
	SN74LS75	**TI**	**(858)**	
Quad Bistable, Single Output				
TTL	5477	† Fairchild		
	MC5477	† Motorola		150
	MC7477	Motorola		
	SN5477	**† TI**	**(859)**	
TTL-LS	DM54LS377	† National		
	DM74LS77	National		
	SN54LS77	**† TI**	**(859)**	
Quad Multifunction				
TTL	9314C	Fairchild		
	9314M	† Fairchild		
	MC8314	Motorola		
	MC9314	† Motorola		
	S9314	† Signetics		160
Quad Set-Reset				
TTL	54279	† Fairchild		
	74279	Fairchild		
	HD74279	Hitachi		
	54279	† Signetics		
	74279	Signetics		
	SN54279	**† TI**	**(921)**	
	SN74279	**TI**	**(921)**	
TTL-LS	54LS279	† Fairchild		
	74LS279	Fairchild		
	HD74LS279	Hitachi		170
	M74LS279	Mitsubishi		
	SN54LS279	† Motorola		
	SN74LS279	Motorola		
	DM54LS279	† National		
	DM74LS279	National		
	54LS279	† SGS		
	74LS279	SGS		
	54LS279	† Signetics		
	SN54LS279	**† TI**	**(921)**	
	SN74LS279	**TI**	**(921)**	180

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

DIGITAL-TTL (Cont'd)

Latches (Cont'd)

Function	Device	Source		Line
Hex Set-Reset				
TTL	ZN54118	† Ferranti		
	ZN54119	† Ferranti		
	ZN74118	Ferranti		
	ZN74119	Ferranti		
Octal Transparent, Inverting				
TTL-ALS	**SN54ALS880**	**† Motorola**	**(732)**	
	SN74ALS880	**Motorola**	**(732)**	
	DM54ALS880	† National		
	DM74ALS880	National		
	SN54ALS880	**† TI**	**(1011)**	
	SN74ALS880	**TI**	**(1011)**	10
Octal 2-Input Multiplexed, Three-State Outputs				
TTL-LS	**SN54LS604**	**† TI**	**(973)**	
	SN54LS605	**† TI**	**(973)**	
	SN54LS606	**† TI**	**(973)**	
	SN54LS607	**† TI**	**(973)**	
	SN54LS608	**† TI**	**(974)**	
	SN74LS604	**TI**	**(973)**	
	SN74LS605	**TI**	**(973)**	
	SN74LS606	**TI**	**(973)**	
	SN74LS607	**TI**	**(973)**	
	SN74LS608	**TI**	**(974)**	20
6-Bit (Independent 2 and 4-Bit)				
TTL-S	3404	Intel		
	8T3404	Signetics		
8-Bit, Addressable, with Clear				
TTL	9334C	Fairchild		
	9334M	† Fairchild		
	DM54259	† National		
	DM74259	National		
	DM8334	National		
	DM9334	† National		
	N9334	Signetics		
	S9334	† Signetics		30
	SN54259	**† TI**	**(917)**	
	SN74259	**TI**	**(917)**	
TTL-ALS				
	SN54ALS259	**† TI**	**(917)**	
	SN74ALS259	**TI**	**(917)**	
TTL-LS	54LS259	† Fairchild		
	74LS259	Fairchild		
	M74LS259	Mitsubishi		
	SN54LS259	† Motorola		
	SN74LS259	Motorola		
	DM54LS259	† National		40
	DM74LS259	National		
	54LS259	† SGS		
	74LS259	SGS		
	54LS259	† Signetics		
	74LS259	Signetics		
	SN54LS259	**† TI**	**(917)**	
	SN74LS259	**TI**	**(917)**	
8-Bit, Transparent, D Type, Three-State				
TTL-ALS	**SN54ALS373**	**† Motorola**	**(732)**	
	SN54ALS573	**† Motorola**	**(732)**	
	SN74ALS373	**Motorola**	**(732)**	50
	SN74ALS573	**Motorola**	**(732)**	
	DM54ALS373	† National		
	DM54ALS573	† National		
	DM74ALS373	National		
	DM74ALS573	National		
	SN54ALS373	† TI		
	SN54ALS573	**† TI**	**(964)**	
	SN74ALS373	TI		
	SN74ALS573	**TI**	**(964)**	

(Continued)

Function	Device	Source		Line
8-Bit, Transparent, D Type, Three-State			(Cont'd)	
TTL-AS	SN54AS373	† TI		60
	SN74AS373	TI		
TTL-F	**54F373**	**† Fairchild**	**(632)**	
	74F373	**Fairchild**	**(632)**	
	MC54F373	**† Motorola**	**(731)**	
	MC74F373	**Motorola**	**(731)**	
	54F373	† Signetics		
	74F373	Signetics		
TTL-LS	**AM25LS373C**	**AMD**	**(1227)**	
	AM25LS373M	**† AMD**	**(1227)**	
	SN54LS373	**† AMD**	**(1227)**	70
	SN74LS373	**AMD**	**(1227)**	
	74LS373	Fairchild		
	74LS573	Fairchild		
	M74LS373	Mitsubishi		
	SN54LS373	**† MMI**	**(715)**	
	SN74LS373	**MMI**	**(715)**	
	SN54LS373	† Motorola		
	SN54LS573	† Motorola		
	SN74LS373	Motorola		
	SN74LS573	Motorola		80
	DM54LS373	† National		
	DM74LS373	National		
	T74LS373	SGS		
	54LS363	† Signetics		
	54LS373	**† Signetics**	**(783)**	
	74LS363	Signetics		
	74LS373	**Signetics**	**(783)**	
	8TS805	**Signetics**	**(793)**	
	8TS807	**Signetics**	**(799)**	
	SN54LS373	**† TI**	**(937)**	90
	SN74LS373	**TI**	**(937)**	
TTL-S	**SN54S373**	**† AMD**	**(1227)**	
	SN74S373	**AMD**	**(1227)**	
	SN54S373	**† MMI**	**(715)**	
	SN54S531	† MMI		
	SN74S373	**MMI**	**(715)**	
	SN74S531	**MMI**	**(715)**	
	DM54S373	† National		
	DM74S373	National		
	54S373	Signetics		100
	74S373	Signetics		
	SN54S373	**† TI**	**(937)**	
	SN54S412	**† TI**	**(945)**	
	SN74S373	**TI**	**(937)**	
	SN74S412	**TI**	**(945)**	
8-Bit, Transparent, D-Type, Inverting Three-State				
TTL-ALS	**SN54ALS533**	**† Motorola**	**(732)**	
	SN54ALS563	**† Motorola**	**(732)**	
	SN54ALS580	**† Motorola**	**(732)**	
	SN74ALS533	**Motorola**	**(732)**	
	SN74ALS563	**Motorola**	**(732)**	110
	SN74ALS580	**Motorola**	**(732)**	
	DM54ALS580	† National		
	DM74ALS580	National		
	SN54ALS533	**† TI**	**(957)**	
	SN54ALS563	**† TI**	**(962)**	
	SN54ALS580	**† TI**	**(966)**	
	SN74ALS533	**TI**	**(957)**	
	SN74ALS563	**TI**	**(962)**	
	SN74ALS580	**TI**	**(966)**	
TTL-AS	**SN54AS533**	**† TI**	**(957)**	120
	SN74AS533	**TI**	**(957)**	
TTL-F	54F533	† Fairchild		
	74F533	Fairchild		
	MC54F533	**† Motorola**	**(731)**	
	MC74F533	**Motorola**	**(731)**	

(Continued)

Function	Device	Source		Line
8-Bit, Transparent, D-Type, Inverting Three-State				
TTL-F			(Cont'd)	
	54F533	† Signetics		
	74F533	Signetics		
TTL-LS	**SN54LS533**	**† AMD**	**(1227)**	
	SN74LS533	**AMD**	**(1227)**	
	74LS533	Fairchild		130
	SN54LS533	**† MMI**	**(715)**	
	SN74LS533	**MMI**	**(715)**	
TTL-S	**SN54S533**	**† AMD**	**(1227)**	
	SN74S533	**AMD**	**(1227)**	
	SN54S533	**† MMI**	**(715)**	
	SN74S533	**MMI**	**(715)**	
	SN74S535	**MMI**	**(715)**	
8-Bit, Transparent D-Type, Three-State (bus interface)				
TTL	**AM29845**	**AMD**	**(2607)**	
	AM29846	**AMD**	**(2607)**	
8-Bit, Three-State (input and output through the same pins)				
TTL	DM7553	† National		140
	DM8553	National		
9-Bit, Transparent D-Type, Three-State (bus interface)				
TTL	**AM29843**	**AMD**	**(2607)**	
	AM29844	**AMD**	**(2607)**	
10-Bit, Transparent D-Type, Three-State (bus interface)				
TTL	**AM29841**	**AMD**	**(2607)**	
	AM29842	**AMD**	**(2607)**	

Memories

For additional information on these and larger TTL compatible memories, see the Master Selection Guide-Memory section

Dual Rank 8-Bit Shift Register (8-Bit I/O buffer, "D" register, and serial "B" register)				
TTL-LS	DM74LS62	† National		
	DM76LS52	† National		
	DM86LS52	National		
	DM86LS62	National		150
Dual 16-Word x 4-Bit Register File				
TTL-AS	**SN54AS870**	**† TI**	**(1006)**	
	SN54AS871	**† TI**	**(1007)**	
	SN74AS870	**TI**	**(1006)**	
	SN74AS871	**TI**	**(1007)**	
Octal Storage Register (two stage, 4-Bit wide shift register)				
TTL-LS	**SN54LS396**	**† TI**	**(944)**	
	SN74LS396	**TI**	**(944)**	
8-Bit Multiport Register (RAM with simultaneous read/write)				
TTL	9338C	Fairchild		
	9338M	† Fairchild		
16-Bit Active Element Memory				
TTL	93407C	Fairchild		
	93407M	† Fairchild		160
	MC4004	Motorola		
	MC4005	Motorola		
	MC4304	† Motorola		
	MC4305	† Motorola		
	SN7481A	**TI**	**(860)**	
16-Bit Active Element Memory, Gated Write				
TTL	**SN7484A**	**TI**	**(861)**	
16-Bit (4x4) Register File, Simultaneous Read/Write, Open Collector				
TTL	54170	† Fairchild		
	74170	Fairchild		
	ZN54170	† Ferranti		
	ZN74170	Ferranti		170
	DM74170	National		
	54170	† Signetics		
	74170	Signetics		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Memories (Cont'd)

Function		Device	Source		Line
16-Bit (4x4) Register File, Simultaneous Read/Write, Open Collector					
	TTL			(Cont'd)	
		SN54170	**† TI**	**(893)**	
		SN74170	**TI**	**(893)**	
	TTL-LS	54LS170	† Fairchild		
		74LS170	Fairchild		
		SN54SL170	† Motorola		
		SN74LS170	Motorola		
		DM54LS170	† National		
		DM74LS170	National		
		54LS170	† SGS		
		74LS170	SGS		10
		74LS170	Signetics		
		SN54LS170	**† TI**	**(893)**	
		SN74LS170	**TI**	**(893)**	
16-Bit (4x4) Register File, Simultaneous Read/Write, Three-State					
	TTL-LS	54LS670	† Fairchild		
		74LS670	Fairchild		
		M74LS670	Mitsubishi		
		SN54LS670	† Motorola		
		SN74LS670	Motorola		
		DM54LS670	† National		
		DM74LS670	National		20
		54LS670	† SGS		
		74LS670	SGS		
		54LS670	† Signetics		
		74LS670	Signetics		
		SN54LS670	**† TI**	**(990)**	
		SN74LS670	**TI**	**(990)**	
16-Bit (8x2) Multiport Register File, Simultaneous Read/Write, Three-State					
	TTL	**SN74172**	**TI**	**(894)**	
	TTL-S	54S172	† Signetics		
		74S172	Signetics		
32-Bit (4x8) Register File, O/C					
	TTL-F	54F571	† Fairchild		30
		74F571	Fairchild		
32-Bit (4x8) Register File, Three-State					
	TTL-F	54F570	† Fairchild		
		74F570	Fairchild		
64-Bit (16x4) RAM, Open Collector					
	TTL	AM29704C	AMD		
		AM29704M	† AMD		
		ZN5489	† Ferranti		
		ZN7489	Ferranti		
		DM7489B	National		
		DM7589	National		
		DM8589	National		40
		SN7489	**TI**	**(440,863)**	
	TTL-S	DM74S289	National		
		IDM29704C	National		
		IDM29704M	† National		
64-Bit (16x4) RAM, Three-State					
	TTL	**AM29705C**	**AMD**	**(1225)**	
		AM29705M	**† AMD**	**(1225)**	
		DM7599	National		
		DM8599	National		
	TTL-S	DM74S189	National		
		IDM29705AC	National		50
		IDM29705AM	† National		
		IDM29705C	National		
		IDM29705M	† National		
64-Bit (16x4) Register File with Latch, Three-State					
	TTL-S	DM85S68	National		
64-Bit (16x4) Simultaneous Read/Write RAM with Output Register					
	TTL	9410C	Fairchild		
		9410M	† Fairchild		
64-Bit (32x2) Simultaneous Read/Write RAM					
	TTL-S	N82S21	Signetics		
80-Bit (16x5) First-In/First-Out Memory, Asynchronous, Three-State					
	TTL-S	**SN74S225**	**TI**	**(908)**	
256-Bit (256x1) RAM, Open Collector					
	TTL-LS	N74LS301	Signetics		
		S54LS301	† Signetics		60
	TTL-S	DM74S206	National		
256-Bit (256x1) RAM, Three-State					
	TTL-S	DM74S200	National		
256-Bit (32x8) RAM, Open-Collector					
	TTL-ALS				
		SN54ALS318	**† TI**	**(440,928)**	
		SN74ALS318	**TI**	**(928)**	
256-Bit (32x8) RAM, Three-State					
	TTL-ALS				
		SN54ALS218	**† TI**	**(440,906)**	
		SN74ALS218	**TI**	**(906)**	
256-Bit (64x4) RAM, Open-Collector					
	TTL-ALS				
		SN54ALS317	**† TI**	**(440,928)**	
		SN74ALS317	**TI**	**(928)**	
256-Bit (64x4) RAM, Three-State					
	TTL-ALS				
		SN54ALS217	**† TI**	**(440,905)**	
		SN74ALS217	**TI**	**(905)**	70
1024x8 PROM					
		MB7131	**Fujitsu**	**(3679)**	
		MB7132	**Fujitsu**	**(3679)**	
1024x10 ROM, Sine (030 to 9030) Look-Up Table					
	TTL-S	5086	† MMI		
		5087	† MMI		
		6086	MMI		
		6087	MMI		
2048x4 PROM					
		MB7128	**Fujitsu**	**(3679)**	
2048x8 PROM					
		MB7138E-W	**Fujitsu**	**(3679)**	
4096x8 PROM					
		MB7142E-W	**Fujitsu**	**(3679)**	

Multiplexers (Digital)

	74F153	Signetics		80
	74F253	Signetics		
Synchronous Address				
TTL-LS	MC6883	Motorola		
	SN74LS783	Motorola		
Dual 3-Input, Inverting, Three-State				
TTL-ALS				
	SN54ALS353	**† Motorola**	**(732)**	
	SN54ALS353	**† TI**	**(933)**	
	SN54AS353	**† TI**	**(933)**	
	SN74ALS353	**TI**	**(933)**	
	SN74AS353	**TI**	**(933)**	
TTL-F	54F353	† Fairchild		
	74F353	Fairchild		90
	MC54F353	**† Motorola**	**(731)**	
	MC74F353	**Motorola**	**(731)**	
	74F353	Signetics		
TTL-LS	54LS353	† Fairchild		
	74LS353	Fairchild		
	M74LS353	Mitsubishi		
	SN54LS353	† Motorola		
	SN74LS353	Motorola		

(Continued)

Function		Device	Source		Line
Dual 3-Input, Inverting, Three-State					
TTL-LS				(Cont'd)	
		DM54LS353	† National		
		DM74LS353	National		100
		T54LS353	† SGS		
		T74LS353	SGS		
		SN54LS353	**† TI**	**(933)**	
		SN74LS353	**TI**	**(933)**	
Dual 4-Input, Complementary Output					
	TTL	9309C	Fairchild		
		9309M	† Fairchild		
		MC8309	Motorola		
		MC9309	† Motorola		
		DM8309	National		
		DM9309	National		110
		N9309	Signetics		
		S9309	† Signetics		
		SN29309	TI		
		SN39309	† TI		
Dual 4-Input, Inverting					
TTL-ALS					
		SN54ALS352	**† Motorola**	**(732)**	
		SN74ALS352	**Motorola**	**(732)**	
		SN54ALS352	**† TI**	**(932)**	
		SN74ALS352	**TI**	**(932)**	
	TTL-AS	**SN54AS352**	**† TI**	**(932)**	
		SN74AS352	**TI**	**(932)**	120
	TTL-F	54F352	† Fairchild		
		74F352	Fairchild		
		MC54F352	**† Motorola**	**(731)**	
		MC74F352	**Motorola**	**(731)**	
		74F352	Signetics		
	TTL-LS	54LS352	† Fairchild		
		74LS352	Fairchild		
		M74LS352	Mitsubishi		
		SN54LS352	† Motorola		
		SN74LS352	Motorola		130
		DM54LS352	† National		
		DM74LS352	National		
		T54LS352	† SGS		
		T74LS352	SGS		
		SN54LS352	**† TI**	**(932)**	
		SN74LS352	**TI**	**(932)**	
Dual 4-Input (three-state 54/75153)					
	TTL	DM7214	† National		
		DM8214	National		
Dual 4-Input, Three-State					
TTL-ALS					
		SN54ALS253	**† Motorola**	**(732)**	
		SN54ALS253	**† TI**	**(915)**	140
		SN74ALS253	**TI**	**(915)**	
	TTL-AS	**SN54AS253**	**† TI**	**(915)**	
		SN74AS253	**TI**	**(915)**	
	TTL-F	54F253	† Fairchild		
		74F253	Fairchild		
		MC54F253	**† Motorola**	**(731)**	
		MC74F253	**Motorola**	**(731)**	
	TTL-LS	AM25LS253C	AMD		
		AM25LS253M	† AMD		
		SN54LS253	† AMD		150
		54LS253	† Fairchild		
		74LS253	Fairchild		
		HD74LS253	Hitachi		
		M74LS253	Mitsubishi		
		SN54LS253	† Motorola		
		SN74LS253	Motorola		
		DM54LS253	† National		
		DM74LS253	National		
		54LS253	† SGS		
		74LS253	SGS		160
		54LS253	† Signetics		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Multiplexers (Digital) (Cont'd)

Function	Device	Source		Line
Dual 4-Input, Three-State				
TTL-LS			(Cont'd)	
	74LS253	Signetics		
	SN54LS253	† TI		
	SN74LS253	TI		
TTL-S	SN54S253	† AMD		
	SN74S253	AMD		
	54S253	† Fairchild		
	74S253	Fairchild		
	DM54S253	† National		
	DM74S253	National		
	54S253	† Signetics		10
	74S253	Signetics		
Dual 4-Input				
TTL	54153	† Fairchild		
	74153	Fairchild		
	ZN54153	† Ferranti		
	ZN74153	Ferranti		
	HD74153	Hitachi		
	MC4000	**Motorola**	**(729)**	
	MC4300	**† Motorola**	**(729)**	
	MC54153	† Motorola		
	MC74153	Motorola		20
	DM54153	† National		
	DM74153	National		
	54153	† Signetics		
	74153	Signetics		
	SN54153	**† TI**	**(884)**	
	SN74153	**TI**	**(884)**	
TTL-ALS				
	SN54ALS153	**† Motorola**	**(732)**	
	SN74ALS153	**Motorola**	**(732)**	
	SN54ALS153	**† TI**	**(884)**	
	SN74ALS153	**TI**	**(884)**	30
TTL-AS	**SN54AS153**	**† TI**	**(884)**	
	SN74AS153	**TI**	**(884)**	
TTL-F	54F153	† Fairchild		
	74F153	Fairchild		
	MC54F153	**† Motorola**	**(731)**	
	MC74F153	**Motorola**	**(731)**	
TTL-LS	AM25LS153C	AMD		
	AM25LS153M	† AMD		
	SN54LS153	† AMD		
	54LS153	† Fairchild		40
	74LS153	Fairchild		
	HD74LS153	Hitachi		
	M74LS153	Mitsubishi		
	SN54LS153	† Motorola		
	SN74LS153	Motorola		
	DM54LS153	† National		
	DM74LS153	National		
	54LS153	† SGS		
	74LS153	SGS		
	54LS153	† Signetics		50
	74LS153	Signetics		
	SN54LS153	**† TI**	**(884)**	
	SN74LS153	**TI**	**(884)**	
TTL-S	SN54S153	† AMD		
	SN74S153	AMD		
	54S153	† Fairchild		
	74S153	Fairchild		
	DM54S153	† National		
	DM74S153	National		
	54S153	† Signetics		60
	74S153	Signetics		
	SN54S153	**† TI**	**(884)**	
	SN74S153	**TI**	**(884)**	

Function	Device	Source		Line
Dual 8-Input (two 8-to-1 sections)				
TTL	SN54LS451	† MMI		
	SN74LS451	MMI		
	SN74351	**TI**	**(932)**	
Quad 2-Input, Conditional Complementing, Open Collector				
TTL	N8235	Signetics		
Quad 2-Input Digital (suitable for driving adders, registers)				
TTL	MC7266	Motorola		
	MC8266	† Motorola		
	RC8266	Raytheon		70
	RM8266	† Raytheon		
	N8266	Signetics		
	S8266	† Signetics		
Quad 2-Input, Inverting, Open Collector				
TTL	RC8234	Raytheon		
	RM8234	† Raytheon		
	N8234	Signetics		
	S8234	† Signetics		
Quad 2-Input, Inverting Three-State				
TTL-ALS				
	SN54ALS258	**† Motorola**	**(732)**	
	SN74ALS258	**Motorola**	**(732)**	
	SN54ALS258	**† TI**	**(917)**	80
	SN74ALS258	**TI**	**(917)**	
TTL-F	54F258	† Fairchild		
	74F258	Fairchild		
	MC54F258	**† Motorola**	**(731)**	
	MC74F258	**Motorola**	**(731)**	
	54F258	† Signetics		
	74F258	Signetics		
TTL-LS	AM25LS258C	AMD		
	AM25LS258M	† AMD		
	SN54LS258	† AMD		90
	74LS258	Fairchild		
	HD74LS258	Hitachi		
	M74LS258	Mitsubishi		
	SN54LS258A	† Motorola		
	SN74LS258A	Motorola		
	DM54LS258B	† National		
	DM74LS258B	National		
	54LS258	† SGS		
	74LS258	SGS		
	54LS256	† Signetics		100
	54LS258	† Signetics		
	74LS258A	Signetics		
	SN54LS258A	**† TI**	**(917)**	
	SN74LS258A	**TI**	**(917)**	
TTL-S	SN54S258	† AMD		
	SN74S258	AMD		
	54S258	† Fairchild		
	74S258	Fairchild		
	HD74S258	Hitachi		
	DM54S258	† National		110
	DM74S258	National		
	54S258	† Signetics		
	74S258	Signetics		
	SN54S258	**† TI**	**(917)**	
	SN74S258	**TI**	**(917)**	
Quad 2-Input, Inverting				
TTL	54158	† Signetics		
	74158	Signetics		
TTL-ALS				
	SN54ALS158	**† Motorola**	**(732)**	
	SN74ALS158	**Motorola**	**(732)**	
	SN54ALS158	**† TI**	**(887)**	120
	SN74ALS158	**TI**	**(887)**	
TTL-F	54F158	† Fairchild		
	74F158	Fairchild		
	MC54F158	**† Motorola**	**(731)**	
	MC74F158	**Motorola**	**(731)**	

(Continued)

Function	Device	Source		Line
Quad 2-Input, Inverting				
TTL-F			(Cont'd)	
	54F158	† Signetics		
	74F158	Signetics		
TTL-LS	AM25LS158C	AMD		
	AM25LS158M	† AMD		
	SN54LS158	† AMD		130
	54LS158	† Fairchild		
	74LS158	Fairchild		
	HD74LS158	Hitachi		
	M74LS158	Mitsubishi		
	SN54LS158	† Motorola		
	SN74LS158	Motorola		
	DM54LS158	† National		
	DM74LS158	National		
	54LS158	† SGS		
	74LS158	SGS		140
	54LS158	† Signetics		
	74LS158	Signetics		
	SN54LS158	**† TI**	**(887)**	
	SN74LS158	**TI**	**(887)**	
TTL-S	SN54S158	† AMD		
	SN74S158	AMD		
	54S158	† Fairchild		
	74S158	Fairchild		
	HD74S158	Hitachi		
	DM54S158	† National		150
	DM74S158	National		
	54S158	† Signetics		
	74S158	Signetics		
	SN54S158	**† TI**	**(887)**	
	SN74S158	**TI**	**(887)**	
Quad 2-Input, Non-Inverting, Three-State				
TTL-ALS				
	SN54ALS257	**† Motorola**	**(732)**	
	SN74ALS257	**Motorola**	**(732)**	
	SN54ALS257	**† TI**	**(916)**	
	SN74ALS257	**TI**	**(916)**	
TTL-F	54F257	† Fairchild		160
	74F257	Fairchild		
	MC54F257	**† Motorola**	**(731)**	
	MC74F257	**Motorola**	**(731)**	
	54F257	† Signetics		
	74F257	Signetics		
TTL-LS	AM25LS257C	AMD		
	AM25LS257M	† AMD		
	SN54LS257	† AMD		
	74LS257	Fairchild		
	HD74LS257	Hitachi		170
	M74LS257	Mitsubishi		
	SN54LS257A	† Motorola		
	SN74LS257A	Motorola		
	DM54LS257B	† National		
	DM74LS257B	National		
	54LS257	† SGS		
	74LS257	SGS		
	54LS257	† Signetics		
	74LS257A	Signetics		
	SN54LS257A	**† TI**	**(916)**	180
	SN74LS257A	**TI**	**(916)**	
TTL-S	SN54S257	† AMD		
	SN74S257	AMD		
	74S257	Fairchild		
	HD74S257	Hitachi		
	DM54S257	† National		
	DM74S257	National		
	54S257	† Signetics		
	74S257	Signetics		
	SN54S257	**† TI**	**(916)**	190
	SN74S257	**TI**	**(916)**	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Multiplexers (Digital) (Cont'd)

Function	Device	Source		Line
Quad 2-Input, Non-Inverting				
TTL	54157	† Fairchild		
	74157	Fairchild		
	9322C	Fairchild		
	9322M	† Fairchild		
	ZN54157	† Ferranti		
	HD74157	Hitachi		
	MC54157	† Motorola		
	MC74157	Motorola		
	MC8322	Motorola		
	MC9322	† Motorola		10
	DM54157	† National		
	DM74157	National		
	DM8322	National		
	DM9322	† National		
	RC8233	Raytheon		
	RM8233	† Raytheon		
	54157	† Signetics		
	74157	Signetics		
	N8233	Signetics		
	N9322	Signetics		20
	S8233	† Signetics		
	SN54157	**† TI**	**(887)**	
	SN74157	**TI**	**(887)**	
TTL-ALS				
	SN54ALS157	**† Motorola**	**(732)**	
	SN74ALS157	**Motorola**	**(732)**	
	SN54ALS157	**† TI**	**(887)**	
	SN74ALS157	**TI**	**(887)**	
TTL-F	54F157	† Fairchild		
	74F157	Fairchild		
	MC54F157	**† Motorola**	**(731)**	30
	MC74F157	**Motorola**	**(731)**	
	54F157	† Signetics		
	74F157	Signetics		
TTL-LS	AM25LS157C	AMD		
	AM25LS157M	AMD		
	SN54LS157	† AMD		
	54LS157	† Fairchild		
	74LS157	Fairchild		
	HD74LS157	Hitachi		
	M74LS157	Mitsubishi		40
	SN54LS157	† Motorola		
	SN74LS157	Motorola		
	DM54LS157	† National		
	DM74LS157	National		
	54LS157	† SGS		
	74LS157	SGS		
	54LS157	Signetics		
	74LS157	Signetics		
	SN54LS157	**† TI**	**(887)**	
	SN74LS157	**TI**	**(887)**	50
TTL-S	SN54S157	† AMD		
	SN74S157	AMD		
	54S157	† Fairchild		
	74S157	Fairchild		
	HD74S157	Hitachi		
	DM54S157	† National		
	DM74S157	National		
	54S157	† Signetics		
	74S157	Signetics		
	SN54S157	**† TI**	**(887)**	60
	SN74S157	**TI**	**(887)**	
Quad 2-Input, Open Collector (for adder, register input)				
TTL	MC7267	Motorola		
	MC8267	† Motorola		
	RC8267	Raytheon		
	RM8267	† Raytheon		

Function	Device	Source		Line
Quad 2-Input, (three-state 54/74157)				
TTL	DM7123	National		
	DM8123	† National		
Quad 2-Input with Output Register				
TTL	54298	† Fairchild		
	74298	Fairchild		
	MC54298	† Motorola		70
	MC74298	Motorola		
	54298	† Signetics		
	74298	Signetics		
	SN54298	**† TI**	**(926)**	
	SN74298	**TI**	**(926)**	
TTL-F	54F398	† Fairchild		
	54F399	† Fairchild		
	74F398	Fairchild		
	74F399	Fairchild		
TTL-LS	**AM25LS09C**	**AMD**	**(1227)**	80
	AM25LS09M	**† AMD**	**(1227)**	
	AM25LS399C	AMD		
	AM25LS399M	† AMD		
	SN54LS298	† AMD		
	SN54LS399	† AMD		
	SN74LS399	AMD		
	54LS298	† Fairchild		
	74LS298	Fairchild		
	9LS298C	Fairchild		
	9LS298M	† Fairchild		90
	HD74LS298	Hitachi		
	M74LS298	Mitsubishi		
	SN54LS298	† Motorola		
	SN54LS398	† Motorola		
	SN54LS399	† Motorola		
	SN74LS298	Motorola		
	SN74LS398	Motorola		
	SN74LS399	Motorola		
	DM54LS298	† National		
	DM74LS298	National		100
	54LS298	† SGS		
	74LS298	SGS		
	54LS298	† Signetics		
	74LS298	Signetics		
	SN54LS298	**† TI**	**(926)**	
	SN54LS398	**† TI**	**(944)**	
	SN54LS399	**† TI**	**(944)**	
	SN74LS298	**TI**	**(926)**	
	SN74LS398	**TI**	**(944)**	
	SN74LS399	**TI**	**(944)**	110
TTL-S	**AM25S09C**	**AMD**	**(1227)**	
	AM25S09M	**† AMD**	**(1227)**	
	SN54S399	† AMD		
	SN74S399	AMD		
Quad 3-Input, Conditional Complementing				
TTL	RC8263	Raytheon		
	RM8263	† Raytheon		
Quad 3-Input, Open Collector, Conditional Complementing, Output Enable				
TTL	RC8264	Raytheon		
	RM8264	† Raytheon		
Quad 4-Input				
TTL-LS	SN54LS453	† MMI		
	SN74LS453	MMI		120
8-Input, Complementary Output				
TTL	9312C	Fairchild		
	9312M	† Fairchild		
	MC8312	Motorola		
	MC9312	† Motorola		
	DM8312	National		
	DM9312	† National		
	RC8230	Raytheon		
	RC8232	Raytheon		
	RM8230	† Raytheon		

(Continued)

Function	Device	Source		Line
8-Input, Complementary Output				
TTL			(Cont'd)	
	RM8232	† Raytheon		130
	N8230	Signetics		
	N9312	Signetics		
	SN29312	TI		
	SN39312	† TI		
TTL-S	S82S30	† Signetics		
	S82S31	† Signetics		
	S82S32	† Signetics		
8-Input, Complementary Output, Open Collector				
TTL	9313C	Fairchild		
	9313M	† Fairchild		
	RC8231	Raytheon		140
	RM8231	† Raytheon		
8-Input, Complementary Output, Strobe				
TTL	54151	† Fairchild		
	74151	Fairchild		
	ZN54151	† Ferranti		
	ZN74151	Ferranti		
	HD74151	Hitachi		
	MC54151	† Motorola		
	MC74151	Motorola		
	DM54151A	† National		
	DM74151A	National		150
	54151	† Signetics		
	74151	Signetics		
	SN54151A	**† TI**	**(884)**	
	SN74151A	**TI**	**(884)**	
TTL-ALS				
	SN54ALS151	**† Motorola**	**(732)**	
	SN74ALS151	**Motorola**	**(732)**	
	SN54ALS151	**† TI**	**(884)**	
	SN74ALS151	**TI**	**(884)**	
TTL-AS	**SN54AS151**	**† TI**	**(884)**	
	SN74AS151	**TI**	**(884)**	160
TTL-F	54F151	† Fairchild		
	74F151	Fairchild		
	MC54F151	**† Motorola**	**(731)**	
	MC74F151	**Motorola**	**(731)**	
TTL-LS	AM25LS151C	AMD		
	AM25LS151M	† AMD		
	SN54LS151	† AMD		
	54LS151	† Fairchild		
	74LS151	Fairchild		
	HD74LS151A	Hitachi		170
	M74LS151	Mitsubishi		
	SN54LS151	† Motorola		
	SN74LS151	Motorola		
	DM54LS151	† National		
	DM74LS151	National		
	54LS151	† SGS		
	74LS151	SGS		
	54LS151	† Signetics		
	74LS151	Signetics		
	SN54LS151	**† TI**	**(884)**	180
	SN74LS151	**TI**	**(884)**	
TTL-S	SN54S151	† AMD		
	SN74S151	AMD		
	54S151	† Fairchild		
	74S151	Fairchild		
	93S12C	Fairchild		
	93S12M	† Fairchild		
	HD74S151	Hitachi		
	DM54S151	† National		
	DM74S151	National		190
	54S151	† Signetics		
	74S151	Signetics		
	SN54S151	**† TI**	**(884)**	
	SN74S151	**TI**	**(884)**	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Multiplexers (Digital) (Cont'd)

Function	Device	Source		Line
8-Input, Complementary Output (three-state 54/74151)				
TTL	DM7121	† National		
	DM8121	National		
8-Input, Inverted Output				
TTL	54152	† Fairchild		
	MC54152	† Motorola		
	MC74152	Motorola		
	DM7210	† National		
	DM7211	† National		
	DM8210	National		
	DM8211	National		
	SN54152A	**† TI**	**(884)**	10
TTL-LS	54LS152	† Fairchild		
	HD74LS152	Hitachi		
	SN54LS152	† Motorola		
	SN74LS152	Motorola		
	T74LS152	SGS		
	SN54LS152	**† TI**	**(884)**	
	SN54LS152A	**† TI**	**(884)**	
8-Input, Inverting/Non Inverting, Control Storage				
TTL-LS	**AM25LS2535C**	**AMD**	**(1227)**	
	AM25LS2535M	**† AMD**	**(1227)**	
	AM2922C	**AMD**	**(1215)**	20
	AM2922M	**† AMD**	**(1215)**	
8-Input Multiplexer/Data Selector/Register, Complementary Output, Open Collector				
TTL-LS	**SN54LS355**	**† TI**	**(934)**	
	SN54LS357	**† TI**	**(935)**	
	SN74LS355	**TI**	**(934)**	
	SN74LS357	**TI**	**(935)**	
8-Input Multiplexer/Data Selector/Register, Complementary Output, Three-State				
TTL-LS	**SN54LS354**	**† TI**	**(933)**	
	SN54LS356	**† TI**	**(934)**	
	SN74LS354	**TI**	**(933)**	
	SN74LS356	**TI**	**(934)**	
8-Input, Strobe, Complementary Output, Three-State				
TTL	HD74251	Hitachi		30
	DM54251	† National		
	DM74251	National		
	SN54251	**† TI**	**(915)**	
	SN74251	**TI**	**(915)**	
TTL-ALS				
	SN54ALS251	**† Motorola**	**(732)**	
	SN74ALS251	**Motorola**	**(732)**	
	SN54ALS251	**† TI**	**(915)**	
	SN74ALS251	**TI**	**(915)**	
TTL-AS	**SN54AS251**	**† TI**	**(915)**	
	SN74AS251	**TI**	**(915)**	40
TTL-F	54F251	† Fairchild		
	74F251	Fairchild		
	MC54F251	**† Motorola**	**(731)**	
	MC74F251	**Motorola**	**(731)**	
TTL-LS	AM25LS251C	AMD		
	AM25LS251M	† AMD		
	SN54LS251	† AMD		
	54LS251	† Fairchild		
	74LS251	Fairchild		
	HD74LS251	Hitachi		50
	M74LS251	Mitsubishi		
	SN54LS251	† Motorola		
	SN74LS251	Motorola		
	DM54LS251	† National		
	DM74LS251	National		
	54LS251	† SGS		
	74LS251	SGS		
	54LS251A	† Signetics		
	74LS251A	Signetics		

(Continued)

Function	Device	Source		Line
8-Input, Strobe, Complementary Output, Three-State				
TTL-LS			(Cont'd)	
	SN54LS251	**† TI**	**(915)**	60
	SN74LS251	**TI**	**(915)**	
TTL-S	SN54S251	† AMD		
	SN74S251	AMD		
	HD74S251	Hitachi		
	DM54S251	† National		
	DM74S251	National		
	54LS251	† Signetics		
	54S251	† Signetics		
	74S251	Signetics		
	SN54S251	**† TI**	**(915)**	70
	SN74S251	**TI**	**(915)**	
10-Input, Quad 8-to-1 Programmable, Three-State				
TTL	29693C	Raytheon		
	29693M	† Raytheon		
16-Input, Inverted Output, Strobe				
TTL	54150	† Fairchild		
	74150	Fairchild		
	ZN54150	† Ferranti		
	ZN74150	Ferranti		
	HD74150	Hitachi		
	MC54150	† Motorola		
	MC74150	Motorola		80
	DM54150	† National		
	DM74150	National		
	54150	† Signetics		
	74150	Signetics		
	SN54150	**† TI**	**(883)**	
	SN74150	**TI**	**(883)**	
TTL-LS	SN54LS450	† MMI		
	SN74LS450	MMI		
16-Input (three-state 54/74150)				
TTL	DM7219	† National		
	DM8219	National		90

Multivibrators

Bidirectional Monostable (low level input)				
TTL	RC8T20	Raytheon		
	RM8T20	† Raytheon		
	N8T20	Signetics		
Monostable, Schmitt Trigger Input				
TTL	54121	† Fairchild		
	74121	Fairchild		
	ZN54121	† Ferranti		
	ZN74121	Ferranti		
	HD74121	Hitachi		
	MC54121	† Motorola		
	MC74121	Motorola		100
	DM54121	† National		
	DM74121	National		
	54121	† Signetics		
	74121	Signetics		
	SN54121	**† TI**	**(873)**	
	SN74121	**TI**	**(873)**	
Retriggerable Monostable				
TTL	9601C	Fairchild		
	9601M	† Fairchild		
	MC8601	Motorola		
	MC9601	† Motorola		110
	DM8601	National		
	DM9601	† National		
	9601	Signetics		
	N8T22	Signetics		
	SN29601	TI		
TTL-LS	**SN54LS422**	**† TI**	**(945)**	
	SN74LS422	**TI**	**(945)**	

Function	Device	Source		Line
Retriggerable Monostable with Clear				
TTL	54122	† Fairchild		
	74122	Fairchild		
	ZN54122	† Ferranti		120
	ZN74122	Ferranti		
	MC54122	† Motorola		
	MC74122	Motorola		
	SN54122	**† TI**	**(873)**	
	SN74122	**TI**	**(873)**	
TTL-LS	HD74LS122	Hitachi		
	SN54LS122	† Motorola		
	SN74LS122	Motorola		
	DM54LS122	† National		
	DM74LS122	National		130
	SN54LS122	**† TI**	**(873)**	
	SN74LS122	**TI**	**(873)**	
Retriggerable Monostable, with Reset				
TTL	9600C	Fairchild		
	9600M	† Fairchild		
Dual Monostable (dougle-edge)				
TTL	DM7853	† National		
	DM8853	National		
Dual Monostable, Schmitt-Trigger Input (dual 54/74121)				
TTL	HD74221	Hitachi		
	54221	† Signetics		
	74221	Signetics		
	SN54221	**† TI**	**(906)**	140
	SN74221	**TI**	**(906)**	
TTL-LS	HD74LS221	Hitachi		
	SN54LS221	† Motorola		
	SN74LS221	Motorola		
	DM54LS221	† National		
	DM74LS221	National		
	54LS221	† Signetics		
	SN54LS221	**TI**	**(906)**	
	SN74LS221	**TI**	**(906)**	
Dual Retriggerable Monostable (AND triggered)				
TTL-LS	**SN54LS423**	**† TI**	**(945)**	150
	SN74LS423	**TI**	**(945)**	
Dual Retriggerable Monostable with Clear (AND triggered)				
TTL	AM26123C	AMD		
	AM26123M	† AMD		
	54123	† Fairchild		
	74123	Fairchild		
	ZN54123	† Ferranti		
	ZN74123	Ferranti		
	HD74123	Hitachi		
	MC54123	† Motorola		
	MC74123	Motorola		160
	DM54123	† National		
	DM74123	National		
	54123	† Signetics		
	74123	Signetics		
	SN54123	**† TI**	**(874)**	
	SN74123	**TI**	**(874)**	
TTL-LS	HD74LS123	Hitachi		
	SN54LS123	† Motorola		
	SN74LS123	Motorola		
	DM54LS123	† National		170
	DM74LS123	National		
	SN54LS123	**† TI**	**(874)**	
	SN74LS123	**TI**	**(874)**	
Dual Retriggerable Monostable with Reset (OR triggered)				
TTL	AM2602C	AMD		
	AM2602M	† AMD		
	9602C	Fairchild		
	9602M	† Fairchild		
	96L02C	Fairchild		
	96L02M	† Fairchild		
	MC8602	Motorola		180
	MC9602	† Motorola		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Multivibrators (Cont'd)

Function	Device	Source		Line
Dual Retriggerable Monostable with Reset (OR triggered)				
TTL (Cont'd)				
	DM8602	National		
	DM9602	† National		
	N9602	Signetics		
	S9602	† Signetics		
TTL-LS	96LS02C	Fairchild		
	96LS02M	† Fairchild		
TTL-S	AM26S02C	AMD		
	AM26S02M	† AMD		
	96S02C	Fairchild		
	96S02M	† Fairchild		10
Dual Voltage-Controlled				
TTL	11C24C	Fairchild		
	11C24M	† Fairchild		
	MC4024	Motorola		
	MC4324	† Motorola		
Triple Monostable				
TTL	DN850	Panasonic		

Shift Registers

Function	Device	Source		Line
Parallel-In, Parallel-Out, Registered Outputs				
TTL-ALS				
	SN54ALS671	**† Motorola**	**(732)**	
	SN54ALS672	**† Motorola**	**(732)**	
	SN74ALS671	**Motorola**	**(732)**	
	SN74ALS672	**Motorola**	**(732)**	
TTL-LS	**SN54LS671**	**† TI**	**(991)**	20
	SN54LS672	**† TI**	**(991)**	
	SN74LS671	**TI**	**(991)**	
	SN74LS672	**TI**	**(991)**	
4-Bit Parallel In, Parallel Out, Right/Left, Three-State				
TTL-LS	74LS295	Fairchild		
	M74LS295B	Mitsubishi		
	SN54LS295A	† Motorola		
	SN74LS295A	Motorola		
	54LS295A	† SGS		
	74LS295A	SGS		
	54LS295B	† Signetics		30
	74LS295B	Signetics		
	SN54LS295B	**† TI**	**(925)**	
	SN74LS295B	**TI**	**(925)**	
4-Bit Parallel Input, Parallel Output				
TTL	54195	† Fairchild		
	74195	Fairchild		
	9300C	Fairchild		
	9300M	† Fairchild		
	HD74195	Hitachi		
	MC54195	† Motorola		
	MC74195	Motorola		40
	MC8300	Motorola		
	MC9300	† Motorola		
	DM54195	† National		
	DM74195	National		
	DM8300	National		
	DM9300	† National		
	54195	† Signetics		
	74195	Signetics		
	N9300	Signetics		
	SN54195	**† TI**	**(903)**	50
	SN74195	**TI**	**(903)**	
TTL-F	74F195	Signetics		
TTL-LS	AM25LS195AC	AMD		
	AM25LS195AM	† AMD		
	SN54LS195A	† AMD		
	54LS195	† Fairchild		
	74LS195	Fairchild		
	HD74LS195A	Hitachi		
			(Continued)	

Function	Device	Source		Line
4-Bit Parallel Input, Parallel Output				
TTL-LS (Cont'd)				
	M74LS195A	Mitsubishi		
	SN54LS195A	† Motorola		60
	SN74LS195A	Motorola		
	DM54LS195A	† National		
	DM74LS195A	National		
	74LS195A	Signetics		
	SN54LS195A	**† TI**	**(903)**	
	SN74LS195A	**TI**	**(903)**	
TTL-S	SN54S195	† AMD		
	SN74S195	AMD		
	93S00C	Fairchild		
	93S00M	† Fairchild		70
	DM54S195	† National		
	DM74S195	National		
	54S195	† Signetics		
	74S195	Signetics		
	SN54S195	**† TI**	**(903)**	
	SN74S195	**TI**	**(903)**	
4-Bit Parallel-In, Parallel Out, Right/Left				
TTL	5495	† Fairchild		
	7495	Fairchild		
	AN8495A	Ferranti		
	ZN5495A	† Ferranti		80
	MC4012	Motorola		
	MC4312	† Motorola		
	MC5495A	† Motorola		
	MC7495A	Motorola		
	DM5495	† National		
	DM7495	National		
	5495A	† Signetics		
	7495A	Signetics		
	SN5495A	**† TI**	**(866)**	
	SN7495A	**TI**	**(866)**	90
TTL-LS	54LS95B	† Fairchild		
	74LS95B	Fairchild		
	HD74LS95B	Hitachi		
	M74LS95B	Mitsubishi		
	SN54LS95B	† Motorola		
	SN74LS95B	Motorola		
	54LS95B	† SGS		
	74LS95B	SGS		
	54LS95B	† Signetics		
	74LS95B	Signetics		100
	SN54LS95B	**† TI**	**(866)**	
	SN74LS95B	**TI**	**(866)**	
4-Bit Parallel-In, Parallel Out, (with load, shift, hold control)				
TTL	54178	† Fairchild		
	MC7270	Motorola		
	MC8270	† Motorola		
	RC8270	Raytheon		
	RM8270	† Raytheon		
	SN54178	**† TI**	**(896)**	
	SN74178	**TI**	**(896)**	
4-Bit Parallel-In, Parallel Out, with Reset, Complementary Output for Last Bit				
TTL	54179	† Fairchild		110
	74179	Fairchild		
	MC7271	Motorola		
	MC8271	† Motorola		
	RC8271	Raytheon		
	RM8271	† Raytheon		
	N8271	Signetics		
	S8271	† Signetics		
	SN54179	**† TI**	**(897)**	
	SN74179	**TI**	**(897)**	
TTL-S	N82S71	Signetics		120

Function	Device	Source		Line
4-Bit Parallel-In, Parallel-Out, Cascadable, Three-State				
TTL-LS	74LS395	Fairchild		
	M74LS395A	Mitsubishi		
	SN54LS395A	† Motorola		
	SN74LS395A	Motorola		
	T54LS395	† SGS		
	T74LS395	SGS		
	54LS395A	† Signetics		
	74LS395A	Signetics		
	SN54LS395A	**† TI**	**(943)**	
	SN74LS395A	**TI**	**(943)**	130
4-Bit Parallel-In, Serial-Out				
TTL	5494	† Fairchild		
	7494	Fairchild		
	ZN7494A	Ferranti		
	MC5494	† Motorola		
	MC7494	Motorola		
	7494	Signetics		
	SN5494	**† TI**	**(865)**	
	SN7494	**TI**	**(865)**	
4-Bit Universal Bidirectional				
TTL	54194	† Fairchild		
	74194	Fairchild		140
	ZN54194	† Ferranti		
	ZN74194	Ferranti		
	HD74194	Hitachi		
	MC54194	† Motorola		
	MC74194	Motorola		
	DM54194	† National		
	DM74194	National		
	54194	† Signetics		
	74194	Signetics		
	SN54194	**† TI**	**(902)**	150
	SN74194	**TI**	**(902)**	
TTL-F	54F194	† Fairchild		
	74F194	Fairchild		
	MC54F194	**† Motorola**	**(731)**	
	MC74F194	**Motorola**	**(731)**	
TTL-LS	AM25LS194AC	AMD		
	AM25LS194AM	† AMD		
	SN54LS194A	† AMD		
	54LS194A	† Fairchild		
	HD74LS194A	Hitachi		160
	M74LS194A	Mitsubishi		
	SN54LS194A	† Motorola		
	SN74LS194A	Motorola		
	DM54LS194A	† National		
	DM74LS194A	National		
	54LS194A	† Signetics		
	74LS194A	Signetics		
	SN54LS194A	**† TI**	**(902)**	
	SN74LS194A	**TI**	**(902)**	
TTL-S	SN54S194	† AMD		170
	SN74S194	AMD		
	54S194	† Fairchild		
	74S194	Fairchild		
	DM54S194	† National		
	DM74S194	National		
	SN54S194	**† TI**	**(902)**	
	SN74S194	**TI**	**(902)**	
5-Bit Parallel-In, Parallel-Out				
TTL	5496	† Fairchild		
	7496	Fairchild		
	ZN5496	† Ferranti		180
	ZN7496	Ferranti		
	HD7496	Hitachi		
	MC5496	† Motorola		
	MC7496	Motorola		
	DM5496	† National		
	DM7496	National		
	5496	† Signetics		
			(Continued)	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

DIGITAL–TTL (Cont'd)

Shift Registers (Cont'd)

Function	Device	Source		Line
5-Bit Parallel-In, Parallel-Out				
TTL			(Cont'd)	
	7496	Signetics		
	SN5496	† **TI**	**(866)**	
	SN7496	**TI**	**(866)**	
TTL-LS	M74LS96	Mitsubishi		
	54LS96	† Signetics		
	74LS96	Signetics		
	SN54LS96	† **TI**	**(866)**	
	SN74LS96	**TI**	**(866)**	
5-Bit Dual Parallel-In, Parallel-Out Buffer Register, (clocked flip-flops)				
TTL	RC8200	Raytheon		
	RM8200	† Raytheon		10
5-Bit Dual Parallel-In, Parallel-Out Buffer Register, Inverting Output (clocked flip-flops)				
TTL	RC8201	Raytheon		
	RM8201	† Raytheon		
8-Bit Gated Serial-In, Parallel-Out				
TTL	54164	† Fairchild		
	74164	Fairchild		
	ZN54164	† Ferranti		
	ZN74164	Ferranti		
	HD74164	Hitachi		
	DM54164	† National		
	DM74164	National		
	DM7570	† National		20
	DM8570	National		
	54164	† Signetics		
	74164	Signetics		
	SN54164	† **TI**	**(891)**	
	SN74164	**TI**	**(891)**	
TTL-ALS				
	SN54ALS164	† **Motorola**	**(732)**	
	SN74ALS164	**Motorola**	**(732)**	
	SN54ALS164	† **TI**	**(891)**	
	SN74ALS164	**TI**	**(891)**	
TTL-LS	AM25LS164C	AMD		30
	AM25LS164M	AMD		
	SN54LS164	† AMD		
	54LS164	† Fairchild		
	74LS164	Fairchild		
	HD74LS164	Hitachi		
	M74LS164	Mitsubishi		
	SN54LS164	† Motorola		
	SN74LS164	Motorola		
	DM54LS164	† National		
	DM74LS164	National		40
	54LS164	† SGS		
	74LS164	SGS		
	54LS164	† Signetics		
	74LS164	Signetics		
	SN54LS164	† **TI**	**(891)**	
	SN74LS164	**TI**	**(891)**	
8-Bit Parallel-In, Parallel-Out, Right/Left				
TTL	54198	† Fairchild		
	74198	Fairchild		
	HD74198	Hitachi		
	DM54198	† National		50
	DM74198	National		
	SN54198	† **TI**	**(904)**	
	SN74198	**TI**	**(904)**	
8-Bit Parallel-In, Parallel-Out, Unidirectional				
TTL	54199	† Fairchild		
	74199	Fairchild		
	HD74199	Hitachi		
	DM54199	† National		
	DM74199	National		
	54199	† Signetics		

(Continued)

Function	Device	Source		Line
8-Bit Parallel-In, Parallel-Out, Unidirectional				
TTL			(Cont'd)	
	74199	Signetics		60
	SN54199	† **TI**	**(905)**	
	SN74199	**TI**	**(905)**	
8-Bit Parallel-In, Parallel-Out, Three-State, with Positive Edge-Triggered D-Type Flip Flops (bus interface)				
TTL	**AM29825**	**AMD**	**(2602)**	
	AM29826	**AMD**	**(2602)**	
8-Bit Parallel-In, Serial-Out, Complementary Output				
TTL	54165	† Fairchild		
	74165	Fairchild		
	ZN54165	† Ferranti		
	ZN74165	Ferranti		
	MC54165	† Motorola		
	MC74165	Motorola		70
	DM54165	† National		
	DM74165	National		
	54165	† Signetics		
	74165	Signetics		
	SN54165	† **TI**	**(891)**	
	SN74165	**TI**	**(891)**	
TTL-ALS				
	SN54ALS165	† **TI**	**(891)**	
	SN74ALS165	**TI**	**(891)**	
TTL-LS	54LS165	† Fairchild		
	74LS165	Fairchild		80
	M74LS165	Mitsubishi		
	SN54LS165	† Motorola		
	SN74LS165	Motorola		
	SN54LS165	† **TI**	**(891)**	
	SN74LS165	**TI**	**(891)**	
8-Bit Parallel-In, Serial-Out with Clear				
TTL	54166	† Fairchild		
	74166	Fairchild		
	ZN54166	Ferranti		
	ZN74166	Ferranti		
	HD74166	Hitachi		90
	DM54166	† National		
	DM74166	National		
	54166	† Signetics		
	74166	Signetics		
	SN54166	† **TI**	**(891)**	
	SN74166	**TI**	**(891)**	
TTL-ALS				
	SN54ALS166	† **TI**	**(891)**	
	SN74ALS166	**TI**	**(891)**	
TTL-LS	M74LS166	Mitsubishi		
	SN54LS166	† Motorola		100
	SN74LS166	Motorola		
	DM54LS166	† National		
	DM74LS166	National		
	SN54LS166	† **TI**	**(891)**	
	SN74LS166	**TI**	**(891)**	
8-Bit Parallel-In, Serial-Out with Input Latches				
TTL-LS	**SN54LS597**	† **TI**	**(969)**	
	SN54LS598	† **TI**	**(969)**	
	SN74LS597	**TI**	**(969)**	
	SN74LS598	**TI**	**(969)**	
8-Bit Serial/Parallel-In Register with Sign Extend (for use with 25LS14/74LS384 multiplier)				
TTL-F	54F322	† Fairchild		110
	74F322	Fairchild		
TTL-LS	74LS322	Fairchild		
8-Bit Serial-In, Parallel-Out Register with Output Latches				
TTL-LS	**SN54LS594**	† **TI**	**(968)**	
	SN54LS595	† **TI**	**(968)**	
	SN54LS596	† **TI**	**(968)**	
	SN54LS599	† **TI**	**(970)**	
	SN74LS594	**TI**	**(968)**	
	SN74LS595	**TI**	**(968)**	

(Continued)

Function	Device	Source		Line
8-Bit Serial-In, Parallel-Out Register with Output Latches				
TTL-LS			(Cont'd)	
	SN74LS596	**TI**	**(968)**	
	SN74LS599	**TI**	**(970)**	120
8-Bit Serial-In, Serial-Out				
TTL	5491	† Fairchild		
	7491	Fairchild		
	ZN5491A	† Ferranti		
	ZN7491	Ferranti		
	HD7491A	Hitachi		
	MC5491	† Motorola		
	MC7491	Motorola		
	DM5491A	† National		
	DM7491A	National		
	5491	† Signetics		130
	7491	Signetics		
	SN5491A	† **TI**	**(864)**	
	SN7491A	**TI**	**(864)**	
TTL-LS	HD74LS91	Hitachi		
	M74LS91	Mitsubishi		
	SN54LS91	† **TI**	**(864)**	
	SN74LS91	**TI**	**(864)**	
8-Bit Synchronous with Parallel Load and Hold				
TTL-LS	SN54LS498	† MMI		
	SN74LS498	MMI		
8-Bit Synchronous with Parallel Load, Load Complement, Preset, Clear and Hold				
TTL-LS	SN54LS380	† MMI		140
	SN74LS380	MMI		
8-Bit Universal Shift/Storage, Three-State				
TTL	DM7546	† National		
	DM8546	National		
TTL-ALS				
	SN54ALS299	† **TI**	**(927)**	
	SN54ALS323	† **TI**	**(930)**	
	SN74ALS299	**TI**	**(927)**	
	SN74ALS323	**TI**	**(930)**	
TTL-F	54F299	† Fairchild		
	54F323	† Fairchild		
	74F299	Fairchild		150
	74F323	Fairchild		
	MC54F299	† **Motorola**	**(731)**	
	MC74F299	**Motorola**	**(731)**	
TTL-LS	**AM25LS23C**	**AMD**	**(1227)**	
	AM25LS23M	† **AMD**	**(1227)**	
	AM25LS299C	**AMD**	**(1227)**	
	AM25LS299M	† **AMD**	**(1227)**	
	SN54LS299	† **AMD**	**(1227)**	
	SN54LS323	† AMD		
	SN74LS299	**AMD**	**(1227)**	160
	SN74LS323	AMD		
	54LS299	† Fairchild		
	54LS323	† Fairchild		
	74LS299	Fairchild		
	74LS323	Fairchild		
	HD74LS299	Hitachi		
	M74LS299	Mitsubishi		
	M74LS323	Mitsubishi		
	SN54LS299	† Motorola		
	SN54LS323	† Motorola		170
	SN74LS299	Motorola		
	SN74LS323	Motorola		
	SN54LS299	† **TI**	**(927)**	
	SN54LS323	† **TI**	**(930)**	
	SN74LS299	**TI**	**(927)**	
	SN74LS323	**TI**	**(930)**	
TTL-S	DM54S299	† National		
	DM74S299	National		
	SN54S299	† **TI**	**(927)**	
	SN74S299	**TI**	**(927)**	180

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Shift Registers (Cont'd)

Function	Device	Source		Line
8-Bit Dual Serial-In, Serial-Out				
TTL	9328C	Fairchild		
	9328M	† Fairchild		
	MC8328	Motorola		
	MC9328	† Motorola		
	RC8277	Raytheon		
	RM8277	† Raytheon		
	N8277	Signetics		
9-Bit Parallel-In, Parallel-Out, Three-State, with Positive Edge-Triggered D-Type Flip-Flops (bus interface)				
TTL	**AM29823**	**AMD**	**(2602)**	
	AM29824	**AMD**	**(2602)**	
10-Bit Parallel-In, Parallel-Out Buffer Register, with Reset (clocked flip-flops)				
TTL	RC8202	Raytheon		10
	RM8202	† Raytheon		
	N8202	Signetics		
	S8202	† Signetics		
10-Bit Parallel-In, Parallel-Out Buffer Register, with Reset, Inverting Output (clocked flip-flops)				
TTL	RC8203	Raytheon		
	RM8203	† Raytheon		
10-Bit Parallel-In, Parallel-Out, Three-State, with Positive Edge-Triggered D-Type Flip-Flops (bus interface)				
TTL	**AM29821**	**AMD**	**(2602)**	
	AM29822	**AMD**	**(2602)**	
10-Bit Parallel-In, Serial Out				
TTL	RC8274	Raytheon		
	RM8274	† Raytheon		
	N8274	Signetics		20
10-Bit Serial-In, Parallel-Out				
TTL	RC8273	Raytheon		
	RM8273	† Raytheon		
	N8273	Signetics		
	S8273	† Signetics		
16-Bit Parallel-In, Serial-Out				
TTL-LS	**SN54LS674**	**† TI**	**(992)**	
	SN74LS674	**TI**	**(992)**	
16-Bit Serial-In, Serial-Out Register plus Stored Parallel Output				
TTL-LS	**SN54LS673**	**† TI**	**(992)**	
	SN74LS673	**TI**	**(992)**	

Transceivers, Bus

Function	Device	Source		Line
	74F245	Signetics		
	74F545	Signetics		30
Quad Bus Transceiver				
TTL-ALS				
	SN54ALS242	**† Motorola**	**(732)**	
	SN54ALS243	**† Motorola**	**(732)**	
	SN74ALS242	**Motorola**	**(732)**	
	SN74ALS243	**Motorola**	**(732)**	
	DM54ALS242	† National		
	DM54ALS243	† National		
	DM74ALS242	National		
	DM74ALS243	National		
	SN54ALS1242	**† TI**	**(1018)**	
	SN54ALS1243	**† TI**	**(1019)**	40
	SN54ALS242	**† TI**	**(911)**	
	SN54ALS243	**† TI**	**(912)**	
	SN74ALS1242	**TI**	**(1018)**	
	SN74ALS1243	**TI**	**(1019)**	
	SN74ALS242	**TI**	**(911)**	
	SN74ALS243	**TI**	**(912)**	
TTL-AS	SN54AS1242	† TI		
	SN54AS1243	† TI		
	SN54AS242	**† TI**	**(911)**	
	SN54AS243	**† TI**	**(912)**	50
	SN74AS1242	TI		

(Continued)

Function	Device	Source		Line
Quad Bus Transceiver				
TTL-AS			(Cont'd)	
	SN74AS242	**TI**	**(911)**	
	SN74AS243	**TI**	**(912)**	
TTL-F	54F242	† Fairchild		
	54F243	† Fairchild		
	74F242	Fairchild		
	74F243	Fairchild		
	MC54F242	**† Motorola**	**(731)**	
	MC54F243	**† Motorola**	**(731)**	
	MC74F242	**Motorola**	**(731)**	60
	MC74F243	**Motorola**	**(731)**	
	54F242	† Signetics		
	54F243	† Signetics		
	74F242	Signetics		
	74F243	Signetics		
TTL-LS	AM25LS242C	AMD		
	AM25LS242M	† AMD		
	AM25LS243C	AMD		
	AM25LS243M	† AMD		
	SN54LS242	† AMD		70
	SN54LS243	† AMD		
	SN74LS242	AMD		
	SN74LS243	AMD		
	74LS242	Fairchild		
	74LS243	Fairchild		
	M74LS242	Mitsubishi		
	M74LS243	Mitsubishi		
	SN54LS242	† Motorola		
	SN54LS243	† Motorola		
	SN74LS242	Motorola		80
	SN74LS243	Motorola		
	DM54LS242	† National		
	DM54LS243	† National		
	DM74LS242	National		
	DM74LS243	National		
	74LS242	Signetics		
	74LS243	Signetics		
	SN54LS242	**† TI**	**(911)**	
	SN54LS243	**† TI**	**(912)**	
	SN74LS242	**TI**	**(911)**	90
	SN74LS243	**TI**	**(912)**	
TTL-S	SN54S242	† AMD		
	SN54S243	† AMD		
	SN74S242	AMD		
	SN74S243	AMD		
	DM54S242	† National		
	DM54S243	† National		
	DM74S242	National		
	DM74S243	National		
Quad Tridirectional Bus Transceiver, Three-State				
TTL-LS	**SN54LS442**	**† TI**	**(947)**	100
	SN54LS443	**† TI**	**(947)**	
	SN54LS444	**† TI**	**(947)**	
	SN54LS448	**† TI**	**(951)**	
	SN74LS442	**TI**	**(947)**	
	SN74LS443	**TI**	**(947)**	
	SN74LS444	**TI**	**(947)**	
	SN74LS448	**TI**	**(951)**	
Octal Bus Driver, Inverting, Three-State				
TTL-S	SN545740	† TI		
	SN745740	TI		
Octal Bus Driver, Non-Inverting, Three-State Complementary Controls				
TTL-ALS				
	SN54ALS244	**† Motorola**	**(732)**	110
	SN74ALS244	**Motorola**	**(732)**	
	DM54ALS244	† National		
	DM74ALS244	National		
TTL-S	SN54S744	† TI		
	SN74S744	TI		

Function	Device	Source		Line
Octal Bus Driver (Schmitt trigger), Inverting, Three-State				
TTL-ALS				
	SN54ALS240	**† Motorola**	**(732)**	
	SN74ALS240	**Motorola**	**(732)**	
	DM54ALS240	† National		
	DM74ALS240	National		
TTL-AS	**SN54ALS1240**	**† TI**	**(1018)**	120
	SN54ALS240	**† TI**	**(910)**	
	SN74ALS1240	**TI**	**(1018)**	
	SN74ALS240	**TI**	**(910)**	
TTL-F	**54F240**	**† Fairchild**	**(630)**	
	74F240	**Fairchild**	**(630)**	
	MC54F240	**† Motorola**	**(731)**	
	MC74F240	**Motorola**	**(731)**	
	74F240	Signetics		
TTL-LS	AM25LS240C	AMD		
	AM25LS240M	† AMD		130
	SN54LS240	† AMD		
	SN74LS240	AMD		
	54LS240	† Fairchild		
	74LS240	Fairchild		
	74LS540	Fairchild		
	HD74LS240	Hitachi		
	SN54LS210	**† MMI**	**(715)**	
	SN54LS240	**† MMI**	**(715)**	
	SN54LS340	**† MMI**	**(715)**	
	SN74LS210	**MMI**	**(715)**	140
	SN74LS240	**MMI**	**(715)**	
	SN74LS340	**MMI**	**(715)**	
	SN54LS240	† Motorola		
	SN54LS540	† Motorola		
	SN74LS240	Motorola		
	SN74LS540	Motorola		
	DM54LS240	† National		
	DM74LS240	National		
	74LS240	Signetics		
	SN54LS240	**† TI**	**(910)**	150
	SN54LS540	**† TI**	**(960)**	
	SN74LS240	**TI**	**(910)**	
	SN74LS540	**TI**	**(960)**	
TTL-S	SN54S240	† AMD		
	SN74S240	AMD		
	M74LS240	Mitsubishi		
	SN54S240	**† MMI**	**(715)**	
	SN74S240	**MMI**	**(715)**	
	54LS240	† Signetics		
	54S240	† Signetics		160
	74S240	Signetics		
	SN54S240	**† TI**	**(910)**	
	SN74S240	**TI**	**(910)**	
	SN74S340	TI		
Octal Bus Driver (Schmitt trigger), Non-Inverting, Three-State, Complementary Controls				
TTL-ALS				
	SN54ALS244	**† TI**	**(912)**	
	SN74ALS1244	**TI**	**(1019)**	
TTL-AS	**SN54AS230**	**† TI**	**(910)**	
	SN74AS230	**TI**	**(910)**	
	SN74AS244	**TI**	**(912)**	
TTL-F	**54F244**	**† Fairchild**	**(630)**	170
	74F244	**Fairchild**	**(630)**	
	MC54F244	**† Motorola**	**(731)**	
	MC74F244	**Motorola**	**(731)**	
	54F244	† Signetics		
	74F244	Signetics		
TTL-LS	AM25LS244C	AMD		
	AM25LS244M	† AMD		
	SN54LS244	† AMD		
	SN74LS244	AMD		
	54LS244	† Fairchild		180
	74LS244	Fairchild		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Transceivers, Bus (Cont'd)

Function	Device	Source		Line
Octal Bus Driver (Schmitt trigger), Non-Inverting, Three-State, Complementary Controls				
TTL-LS			(Cont'd)	
	HD74LS244	Hitachi		
	M74LS244	Mitsubishi		
	SN54LS244	**† MMI**	**(715)**	
	SN54LS344	**† MMI**	**(715)**	
	SN74LS244	**MMI**	**(715)**	
	SN74LS344	**MMI**	**(715)**	
	SN54LS244	† Motorola		
	SN74LS244	Motorola		
	54LS244	† Signetics		
	74LS244	Signetics		10
	SN54LS244	**† TI**	**(912)**	
	SN74LS244	**TI**	**(912)**	
TTL-S	SN54S244	† AMD		
	SN74S244	AMD		
	SN54S244	**† MMI**	**(715)**	
	SN74S244	**MMI**	**(715)**	
	54S244	† Signetics		
	74S244	Signetics		
	SN54S244	**† TI**	**(912)**	
	SN74S344	TI		20
Octal Bus Driver (Schmitt trigger), Non-Inverting, Three-State, Symmetrical Controls				
TTL-ALS				
	SN54ALS241	**† Motorola**	**(732)**	
	SN74ALS241	**Motorola**	**(732)**	
	DM54ALS241	† National		
	DM74ALS241	National		
	SN54ALS1241	**TI**	**(1018)**	
	SN54ALS1244	**† TI**	**(1019)**	
	SN54ALS241	**† TI**	**(911)**	
	SN74ALS1241	**TI**	**(1018)**	
	SN74ALS241	**TI**	**(911)**	
TTL-AS	**SN54AS241**	**† TI**	**(911)**	30
	SN54AS244	**† TI**	**(912)**	
	SN74AS241	**TI**	**(911)**	
TTL-F	**54F241**	**† Fairchild**	**(630)**	
	74F241	**Fairchild**	**(630)**	
	MC54F241	**† Motorola**	**(731)**	
	MC74F241	**Motorola**	**(731)**	
	54F241	† Signetics		
	74F241	Signetics		
TTL-LS	AM25LS241C	AMD		
	AM25LS241M	† AMD		40
	SN54LS241	† AMD		
	SN74LS241	AMD		
	54LS241	† Fairchild		
	74LS241	Fairchild		
	74LS541	Fairchild		
	HD74LS241	Hitachi		
	M74LS241	Mitsubishi		
	SN54LS241	**† MMI**	**(715)**	
	SN54LS310	**† MMI**	**(715)**	
	SN54LS341	**† MMI**	**(715)**	50
	SN74LS241	**MMI**	**(715)**	
	SN74LS310	**MMI**	**(715)**	
	SN74LS341	**MMI**	**(715)**	
	SN54LS241	† Motorola		
	SN54LS541	† Motorola		
	SN74LS241	Motorola		
	SN74LS541	Motorola		
	DM54LS241	† National		
	DM54LS244	† National		
	DM74LS241	† National		60
	DM74LS244	National		
	54LS541	**† Signetics**	**(2775)**	
	74LS241	Signetics		
	74LS541	**Signetics**	**(2775)**	
			(Continued)	

Function	Device	Source		Line
Octal Bus Driver (Schmitt trigger), Non-Inverting, Three-State, Symmetrical Controls				
TTL-LS			(Cont'd)	
	SN54LS241	**† TI**	**(911)**	
	SN54LS541	**† TI**	**(960)**	
	SN74LS241	**TI**	**(911)**	
	SN74LS541	**TI**	**(960)**	
TTL-S	SN54S241	† AMD		
	SN74S241	AMD		70
	SN54S241	**† MMI**	**(715)**	
	SN74S241	**MMI**	**(715)**	
	54S241	† Signetics		
	74S241	Signetics		
	SN54S241	**† TI**	**(911)**	
	SN74S241	**TI**	**(911)**	
	SN74S341	TI		
Octal Bus Transceiver, GPIB Compatible				
TTL-F	74F588	Signetics		
Octal Bus Transceiver, Interface Between OC and TS Buses				
TTL-ALS				
	SN54ALS638	**† Motorola**	**(732)**	
	SN54ALS639	**† Motorola**	**(732)**	80
	SN74ALS638	**Motorola**	**(732)**	
	SN74ALS639	**Motorola**	**(732)**	
	SN54ALS1638	**† TI**	**(1022)**	
	SN54ALS1639	**TI**	**(1022)**	
	SN54ALS638	**† TI**	**(983)**	
	SN54ALS639	**† TI**	**(983)**	
	SN74ALS1638	**TI**	**(1022)**	
	SN74ALS1638-1	**† TI**	**(1022)**	
	SN74ALS1639	**† TI**	**(1022)**	
	SN74ALS1639-1	**TI**	**(1022)**	90
	SN74ALS638	**TI**	**(983)**	
	SN74ALS639	**TI**	**(983)**	
Octal Bus Transceiver, Inverting, Open Collector				
TTL-ALS				
	SN54ALS642	**† Motorola**	**(732)**	
	SN74ALS642	**Motorola**	**(732)**	
	DM54ALS642	† National		
	DM74ALS642	National		
	SN54ALS1642	**† TI**	**(1023)**	
	SN54ALS642	**† TI**	**(984)**	
	SN74ALS1642	**TI**	**(1023)**	
	SN74ALS1642-1	**† TI**	**(1023)**	100
	SN74ALS642	**† TI**	**(984)**	
TTL-LS	M74LS642-1	Mitsubishi		
	SN54LS642	† Motorola		
	SN74LS642	Motorola		
	74LS642	**Signetics**	**(2772)**	
	74LS642-1	**Signetics**	**(2772)**	
	SN54LS642	**† TI**	**(984)**	
	SN74LS642	**TI**	**(984)**	
	SN74LS642-1	**TI**	**(984)**	
Octal Bus Transceiver, Inverting, Three-State				
TTL-ALS				
	SN54ALS640	**† Motorola**	**(732)**	110
	SN54ALS643	**† Motorola**	**(732)**	
	SN74ALS640	**Motorola**	**(732)**	
	SN74ALS643	**Motorola**	**(732)**	
	DM54ALS643	† National		
	DM74ALS640	National		
	DM74ALS643	National		
	SN54ALS1640	**† TI**	**(1023)**	
	SN54ALS1643	**TI**	**(1023)**	
	SN54ALS640	**† TI**	**(984)**	
	SN54ALS643	**† TI**	**(984)**	120
	SN74ALS1640	**TI**	**(1023)**	
	SN74ALS1640-1	**† TI**	**(1023)**	
	SN74ALS1643	**† TI**	**(1023)**	
	SN74ALS1643-1	**TI**	**(1023)**	
	SN74ALS640	**TI**	**(984)**	
			(Continued)	

Function	Device	Source		Line
Octal Bus Transceiver, Inverting, Three-State				
TTL-ALS			(Cont'd)	
	SN74ALS643	**TI**	**(984)**	
	SN74ALS651	**TI**	**(988)**	
	SN74ALS652	**TI**	**(988)**	
TTL-LS	M74LS640-1	Mitsubishi		
	M74LS643-1	Mitsubishi		130
	SN54LS640	† Motorola		
	SN74LS640	Motorola		
	74LS640	Signetics		
	74LS640-1	Signetics		
	N8T125	Signetics		
	S8T125	† Signetics		
	SN54LS640	**† TI**	**(984)**	
	SN54LS643	**† TI**	**(984)**	
	SN74LS640	**TI**	**(984)**	
	SN74LS640-1	**TI**	**(984)**	140
	SN74LS643	**TI**	**(984)**	
	SN74LS643-1	**TI**	**(984)**	
	SN74LS651	**TI**	**(988)**	
	SN74LS652	**TI**	**(988)**	
Octal Bus Transceiver, Noninverting, Open Collector				
TTL-ALS				
	SN54ALS641	**† Motorola**	**(732)**	
	SN74ALS641	**Motorola**	**(732)**	
	DM54ALS641	† National		
	DM74ALS641	National		
	SN54ALS1641	† TI		
	SN54ALS641	**† TI**	**(984)**	150
	SN74ALS1641	**TI**	**(1023)**	
	SN74ALS1641-1	**TI**	**(1023)**	
	SN74ALS641	**TI**	**(984)**	
TTL-LS	M74LS641	Mitsubishi		
	SN54LS641	† Motorola		
	SN74LS641	Motorola		
	54LS641	**† Signetics**	**(2772)**	
	74LS641	Signetics		
	74LS641-1	Signetics		
	SN54LS641	**† TI**	**(984)**	160
	SN74LS641	**TI**	**(984)**	
	SN74LS641-1	**TI**	**(984)**	
Octal Bus Transceiver, Noninverting, Three-State				
TTL-ALS				
	SN54ALS245	**† Motorola**	**(732)**	
	SN74ALS245	Motorola		
	DM54ALS245	† National		
	DM74ALS245	National		
	SN54ALS1245	**† TI**	**(1019)**	
	SN54ALS1645	**† TI**	**(1023)**	
	SN54ALS245	**† TI**	**(913)**	
	SN54ALS645	**† TI**	**(984)**	170
	SN54ALS651	**† TI**	**(988)**	
	SN54ALS652	**† TI**	**(988)**	
	SN74ALS1245	**TI**	**(1019)**	
	SN74ALS1645	**TI**	**(1023)**	
	SN74ALS1645-1	**TI**	**(1023)**	
	SN74ALS245	**TI**	**(913)**	
	SN74ALS645	**TI**	**(984)**	
TTL-F	54F245	† Fairchild		
	54F545	† Fairchild		
	74F245	Fairchild		180
	74F545	Fairchild		
	MC54F245	**† Motorola**	**(731)**	
	MC74F245	**Motorola**	**(731)**	
TTL-LS	8304	AMD		
	MPS65245	CSG		
	54LS245	† Fairchild		
	74LS245	Fairchild		
	M74LS245	Mitsubishi		
	M74LS645-1	Mitsubishi		
			(Continued)	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL-TTL (Cont'd)

Transceivers, Bus (Cont'd)

Function	Device	Source		Line
Octal Bus Transceiver, Noninverting, Three-State				
TTL-LS			(Cont'd)	
	SN54LS245	**† MMI**	**(715)**	
	SN54LS645	**† MMI**	**(715)**	
	SN54LS645-1	**† MMI**	**(715)**	
	SN74LS245	**MMI**	**(715)**	
	SN74LS645	**MMI**	**(715)**	
	SN74LS645-1	**MMI**	**(715)**	
	SN54LS245	† Motorola		
	SN54LS645	† Motorola		
	SN74LS245	Motorola		
	SN74LS645	Motorola		10
	DM54LS245	† National		
	DM74LS245	National		
	54LS245	**† Signetics**	**(779)**	
	54LS645	† Signetics		
	74LS245	**Signetics**	**(779)**	
	74LS645	Signetics		
	N8T245	Signetics		
	S8T245	† Signetics		
	SN54LS245	**† TI**	**(913)**	
	SN54LS645	**† TI**	**(984)**	20
	SN54LS651	**† TI**	**(988)**	
	SN54LS652	**† TI**	**(988)**	
	SN74LS245	**TI**	**(913)**	
	SN74LS645	**TI**	**(984)**	
	SN74LS645-1	**TI**	**(984)**	
Octal Bus Transceiver, True, Inverting, Open Collector				
TTL-ALS				
	SN54ALS644	**† Motorola**	**(732)**	
	SN74ALS644	**Motorola**	**(732)**	
	DM54ALS644	† National		
	DM74ALS644	National		
	SN54ALS1644	**† TI**	**(1023)**	30
	SN54ALS644	**† TI**	**(984)**	
	SN74ALS1644	**TI**	**(1023)**	
	SN74ALS1644-1	**† TI**	**(1023)**	
	SN74ALS644	**TI**	**(984)**	
TTL-LS	M74LS644-1	Mitsubishi		
	SN54LS644	**† TI**	**(984)**	
	SN74LS644	**TI**	**(984)**	
	SN74LS644-1	**TI**	**(984)**	
Octal Bus Transceiver with Register, Inverting				
TTL-ALS				
	SN54ALS653	**† TI**	**(989)**	
	SN74ALS653	**TI**	**(989)**	40
	SN74ALS653-1	**† TI**	**(989)**	
Octal Bus Transceiver with Register, Non-inverting				
TTL-ALS				
	SN54ALS654	**TI**	**(989)**	
	SN74ALS654	**† TI**	**(989)**	
	SN74ALS654-1	**TI**	**(989)**	
Octal Bus Transceiver with Register, Open Collector				
TTL-ALS				
	SN54ALS647	**† Motorola**	**(732)**	
	SN54ALS649	**† Motorola**	**(732)**	
	SN74ALS647	**Motorola**	**(732)**	
	SN74ALS649	**Motorola**	**(732)**	
	DM54ALS647	† National		
	DM54ALS649	† National		50
	DM74ALS647	National		
	DM74ALS649	National		
TTL-F	74F647	Signetics		
	74F649	Signetics		
Octal Bus Transceiver with Register, Open-Collector				
TTL-ALS				
	SN54ALS647	**TI**	**(986)**	
	SN54ALS649	TI		
	SN74ALS647	**† TI**	**(986)**	
	SN74ALS647-1	**TI**	**(986)**	

(Continued)

Function	Device	Source		Line
Octal Bus Transceiver with Register, Open-Collector				
TTL-ALS			(Cont'd)	
	SN74ALS649	† TI		
	SN74ALS649-1	TI		60
Octal Bus Transceiver with Register, Three-State				
TTL-ALS				
	SN54ALS646	**† TI**	**(986)**	
	SN54ALS648	**† TI**	**(986)**	
	SN54ALS651	† TI		
	SN54ALS652	† TI		
	SN54LS651	† TI		
	SN54LS652	† TI		
	SN74ALS646	**TI**	**(986)**	
	SN74ALS646-1	**† TI**	**(986)**	
	SN74ALS648	**TI**	**(986)**	
	SN74ALS648-1	**† TI**	**(986)**	70
	SN74ALS651	TI		
	SN74ALS651-1	**† TI**	**(988)**	
	SN74ALS652	TI		
	SN74ALS652-1	**TI**	**(988)**	
	SN74LS651	TI		
	SN74LS652	TI		
TTL-F	74F646	Signetics		
	74F648	Signetics		
Octal Bus Transceiver with Storage, Open Collector				
TTL-ALS				
	SN54ALS622	**Motorola**	**(732)**	
	SN74ALS622	**Motorola**	**(732)**	80
Octal Bus Transceiver with Storage, Open-Collector				
TTL-ALS				
	SN54ALS621	**† Motorola**	**(732)**	
	SN74ALS621	**Motorola**	**(732)**	
	SN54ALS1621	**TI**	**(1021)**	
	SN54ALS1622	**† TI**	**(1021)**	
	SN54ALS621	**† TI**	**(976)**	
	SN54ALS622	**† TI**	**(976)**	
	SN74ALS1621	**† TI**	**(1021)**	
	SN74ALS1621-1	**TI**	**(1021)**	
	SN74ALS1622	**TI**	**(1021)**	
	SN74ALS1622-1	**† TI**	**(1021)**	90
	SN74ALS621	**TI**	**(976)**	
	SN74ALS622	**TI**	**(976)**	
Octal Bus Transceiver with Storage, Three-State				
TTL-ALS				
	SN54ALS620	**† Motorola**	**(732)**	
	SN54ALS623	**† Motorola**	**(732)**	
	SN74ALS620	**Motorola**	**(732)**	
	SN74ALS623	**Motorola**	**(732)**	
	DM54ALS620	† National		
	DM54ALS622	† National		
	DM54ALS623	† National		
	DM74ALS620	National		100
	DM74ALS622	National		
	DM74ALS623	National		
	SN54ALS1620	**† TI**	**(1021)**	
	SN54ALS1623	**TI**	**(1021)**	
	SN54ALS620	**† TI**	**(976)**	
	SN74ALS1620	**TI**	**(1021)**	
	SN74ALS1620-1	**† TI**	**(1021)**	
	SN74ALS1623	**† TI**	**(1021)**	
	SN74ALS1623-1	**TI**	**(1021)**	
	SN74ALS620	**TI**	**(976)**	110
TTL-LS	54LS623	† Signetics		
	74LS620	Signetics		
	74LS623	Signetics		
Octal Bus Transceiver, Three-State, with Latch				
TTL-F	54F526	† Fairchild		
	74F526	Fairchild		

Function	Device	Source		Line
8-Bit Bidirectional Bus Transceiver, Tri-State I/O				
TTL-LS	MM82C08	National		
	MM82PC08	National		
8-Bit to 9-Bit Parity Bidirectional Bus Transceivers, Three-State				
TTL	**AM29833**	**AMD**	**(2606)**	
	AM29834	**AMD**	**(2606)**	
9-Bit Bidirectional Bus Transceiver, Three-State				
TTL	**AM29864**	**AMD**	**(2604)**	120
TTL-LS	**AM29863**	**AMD**	**(2604)**	
10-Bit Bidirectional Bus Transceiver, Three-State				
TTL	AM2986	AMD		
	AM29861	**AMD**	**(2604)**	
	AM29862	**AMD**	**(2604)**	

Translators

For other translators, see Interface-Sense Amplifiers and also Memory and Peripheral Drivers

Dual MOS to TTL Level Converter				
TTL	9625C	Fairchild		
	9625M	† Fairchild		
Dual MOS to TTL Level, Three-State				
TTL	MC4068	Motorola		
	MC4368	† Motorola		
	MC54468	† Motorola		130
	MC74468	Motorola		
Dual TTL to MOS Voltage				
TTL	D139A	† Siliconix		
	D139B	Siliconix		
TTL-ALS				
	SN54ALS646	**† Motorola**	**(732)**	
	SN54ALS648	**† Motorola**	**(732)**	
	SN74ALS646	**Motorola**	**(732)**	
	SN74ALS648	**Motorola**	**(732)**	
	DM54ALS646	† National		
	DM54ALS648	† National		
	DM74ALS646	National		140
	DM74ALS648	National		
Dual 2-Input NAND TTL to MOS Voltage				
TTL	9624C	Fairchild		
	9624M	† Fairchild		
	DH0034	**† National**	**(3344)**	
	DH0034C	**National**	**(3344)**	
	DS7800	† National		
	DS8800	National		
	SN55180	† TI		
Quad TTL to MOS Inverter/Driver, Three-State				
TTL	SN75367	TI		
Hex DTL to TTL Inverter				
TTL	91009C	Fairchild		150
Hex TTL to MOS Voltage				
TTL	DS78L12	† National		
	DS88L12	National		
	D123A	† Siliconix		
	D123B	Siliconix		
	D125A	† Siliconix		
	D125B	Siliconix		
7-Unit MOS to TTL Level Converter				
TTL	SN75270	TI		

Miscellaneous

	74F280	Signetics		
Bidirectional Bus Extender and Repeater, Asynchronous				
TTL	N8X41	Signetics		
Bubble Memory Controller (chevron)				
TTL-LS	SN54LS361	† TI		160
Bubble Memory Controller (t-bar)				
TTL-LS	SN54LS360	† TI		

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Miscellaneous (Cont'd)

Function	Device	Source		Line
Bus Transfer Switch (transmit-receive connections to 4 bus terminals)				
TTL	MC4060	Motorola		
	MC4363	† Motorola		
	MC54460	† Motorola		
	MC74460	Motorola		
Contact Bounce Eliminator				
TTL	DM7544	† National		
	DM8544	National		
Counter, 50 MHz				
TTL-LS	SN54LS104	† TI		
	SN54LS105	† TI		
	SN74LS104	TI		
	SN74LS105	TI		10
Cyclic Redundancy Checker				
TTL	9401C	Fairchild		
	9401M	† Fairchild		
	9411C	Fairchild		
	9411M	† Fairchild		
	N8X01A	**Signetics**	**(1514)**	
	N9401	**Signetics**	**(1514)**	
Data Encryption, (4 device set)				
I^2L	9414STC	Fairchild		
	9414STM	† Fairchild		
Delay Element				
TTL-LS	**SN54LS31**	**† TI**	**(843)**	
	SN74LS31	**TI**	**(843)**	20
Dynamic RAM Refresh Controller				
TTL-LS	**SN54LS600**	**† TI**	**(440,971)**	
	SN54LS601	**† TI**	**(440,971)**	
	SN54LS602	**† TI**	**(440,972)**	
	SN54LS603	**† TI**	**(440,972)**	
	SN74LS600	**TI**	**(971)**	
	SN74LS601	**TI**	**(971)**	
	SN74LS602	**TI**	**(972)**	
	SN74LS603	**TI**	**(972)**	
Error Correction Chip (ECC)				
TTL-LS	MB1412A	Fujitsu		
Error Detection and Correction Circuit				
	SN74ALS790	**Motorola**	**(732)**	30
Fiber Optics Transmitter, Expandable, Octal to Serial				
TTL-LS	SN74LS462	TI		
Fiber Optics Transmitter, Expandable, Serial to Octal				
TTL-LS	SN74LS463	TI		
Field Programmable Array Logic				
TTL	**PAL10H8C**	**MMI**	**(4449)**	
	PAL10H8M	**† MMI**	**(4449)**	
	PAL10L8C	**MMI**	**(4449)**	
	PAL10L8M	**† MMI**	**(4449)**	
	PAL12H6C	**MMI**	**(4449)**	
	PAL12H6M	**† MMI**	**(4449)**	
	PAL12L6C	**MMI**	**(4449)**	
	PAL12L6M	**† MMI**	**(4449)**	40
	PAL14H4C	**MMI**	**(4449)**	
	PAL14H4M	**† MMI**	**(4449)**	
	PAL14L4C	**MMI**	**(4449)**	
	PAL14L4M	**† MMI**	**(4449)**	
	PAL16A4C	**MMI**	**(4449)**	
	PAL16A4M	**† MMI**	**(4449)**	
	PAL16H2C	**MMI**	**(4449)**	
	PAL16H2M	**† MMI**	**(4449)**	
	PAL16L2C	**MMI**	**(4449)**	
	PAL16L2M	**† MMI**	**(4449)**	50
	PAL16L8C	**MMI**	**(4449)**	
	PAL16L8M	**† MMI**	**(4449)**	
	PAL16R4C	**MMI**	**(4449)**	
	PAL16R4M	**† MMI**	**(4449)**	
	PAL16R6C	**MMI**	**(4449)**	
	PAL16R6M	**† MMI**	**(4449)**	

(Continued)

Function	Device	Source		Line
Field Programmable Array Logic (Cont'd)				
TTL	**PAL16R8C**	**MMI**	**(4449)**	
	PAL16R8M	**† MMI**	**(4449)**	
	PAL16X4C	**MMI**	**(4449)**	
	PAL16X4M	**† MMI**	**(4449)**	60
	DMPAL10H8C	**National**	**(737)**	
	DMPAL10H8M	**† National**	**(737)**	
	DMPAL10L8C	**National**	**(737)**	
	DMPAL10L8M	**† National**	**(737)**	
	DMPAL12H6C	**National**	**(737)**	
	DMPAL12H6M	**† National**	**(737)**	
	DMPAL12L6C	**National**	**(737)**	
	DMPAL12L6M	**† National**	**(737)**	
	DMPAL14H4C	**National**	**(737)**	
	DMPAL14H4M	**† National**	**(737)**	70
	DMPAL14L4C	**National**	**(737)**	
	DMPAL14L4M	**† National**	**(737)**	
	DMPAL16A4C	National		
	DMPAL16A4M	† National		
	DMPAL16C1C	**National**	**(737)**	
	DMPAL16C1M	**† National**	**(737)**	
	DMPAL16H2C	**National**	**(737)**	
	DMPAL16H2M	**† National**	**(737)**	
	DMPAL16L2C	**National**	**(737)**	
	DMPAL16L2M	**† National**	**(737)**	80
	DMPAL16L8C	**National**	**(737)**	
	DMPAL16L8M	**† National**	**(737)**	
	DMPAL16R4C	**National**	**(737)**	
	DMPAL16R4M	**† National**	**(737)**	
	DMPAL16R6C	**National**	**(737)**	
	DMPAL16R6M	**† National**	**(737)**	
	DMPAL16R8C	**National**	**(737)**	
	DMPAL16R8M	**† National**	**(737)**	
	DMPAL16X4C	National		
	DMPAL16X4M	† National		90
	FP54ALS16L8	† TI		
	FP74ALS16L8	TI		
TTL-ALS				
	FP54ALS16R4	† TI		
	FP54ALS16R6	† TI		
	FP54ALS16R8	† TI		
	FP74ALS16R4	TI		
	FP74ALS16R6	TI		
	FP74ALS16R8	TI		
TTL-AS	FP54AS839	† TI		
	FP54AS840	† TI		100
	FP74AS839	TI		
	FP74AS840	TI		
Field Programmable Logic Sequencer				
TTL-LS	FP54LS333	† TI		
	FP54LS335	† TI		
	FP74LS333	TI		
	FP74LS335	TI		
FIFO RAM Emulator (12-Bit address)				
TTL-LS	**N8X60**	**Signetics**	**(1517)**	
GPIB Adapter (IEEE 488 bus)				
TTL-LS	96LS488DC	Fairchild		
	96LS488DM	† Fairchild		
GPIB Data Transceiver				
TTL-F	54F588	† Fairchild		110
	74F588	Fairchild		
Hard Array Logic				
TTL	HAL10H8C	MMI		
	HAL10H8M	MMI		
	HAL10L8C	MMI		
	HAL10L8M	† MMI		
	HAL12H6C	MMI		
	HAL12H6M	MMI		
	HAL12L6C	MMI		
	HAL12L6M	† MMI		

(Continued)

Function	Device	Source		Line
Hard Array Logic (Cont'd)				
TTL	HAL14H4C	MMI		120
	HAL14H4M	MMI		
	HAL14L4C	MMI		
	HAL14L4M	† MMI		
	HAL16A4C	MMI		
	HAL16A4M	MMI		
	HAL16C1C	MMI		
	HAL16C1M	† MMI		
	HAL16H2C	MMI		
	HAL16H2M	MMI		
	HAL16L2C	MMI		130
	HAL16L2M	† MMI		
	HAL16L8C	MMI		
	HAL16L8M	† MMI		
	HAL16R4C	MMI		
	HAL16R4M	MMI		
	HAL16R6C	MMI		
	HAL16R6M	MMI		
	HAL16R8C	MMI		
	HAL16R8M	MMI		
	HAL16X4C	MMI		140
	HAL16X4M	† MMI		
I/O Register Array (16x8 or 8x16)				
TTL-LS	**N8X320**	**Signetics**	**(1501,1506)**	
Memory Mapper, Expands 4 Address Lines to 12 Address Lines				
TTL-LS	**SN54LS610**	**† TI**	**(975)**	
	SN54LS611	**† TI**	**(975)**	
	SN54LS612	**† TI**	**(975)**	
	SN54LS613	**† TI**	**(975)**	
	SN74LS610	**TI**	**(975)**	
	SN74LS611	**TI**	**(975)**	
	SN74LS612	**TI**	**(975)**	
	SN74LS613	**TI**	**(975)**	150
Microprogram Sequencer				
TTL-LS	**AM2909A**	**AMD**	**(1207)**	
	AM2909C	**AMD**	**(1207)**	
	AM2909M	**† AMD**	**(1207)**	
	AM2911A	**AMD**	**(1207)**	
	AM2911C	**AMD**	**(1207)**	
	AM2911M	**† AMD**	**(1207)**	
	M3001	Intel		
	IDM2909AC	National		
	IDM2909AM	† National		
	IDM2911AC	National		160
	IDM2911AM	† National		
	N3001	Signetics		
	N8X02A	**Signetics**	**(1513)**	
	S3001	† Signetics		
Micro-Address Generator (for bit slice microprocessor)				
TTL-S	**SN54S482**	**† TI**	**(954)**	
	SN74S482	**TI**	**(954)**	
MOS Dynamic Memory Refresh Logic Circuit				
TTL	MC8505	Motorola		
Multilevel Pipeline Register				
TTL	**AM29520**	**AMD**	**(602)**	
	AM29521	**AMD**	**(602)**	
Multimode Associative Stack				
TTL-S	DP8402	National		170
Oscillator Clock/Driver				
TTL-LS	**SN54LS320**	**† TI**	**(929)**	
	SN54LS321	**† TI**	**(929)**	
	SN74LS320	**TI**	**(929)**	
	SN74LS321	**TI**	**(929)**	
Phase Locked Loop				
TTL	**MC12500**	**Motorola**	**(733)**	
TTL-LS	**SN54LS297**	**† TI**	**(926)**	
	SN74LS297	**TI**	**(926)**	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Miscellaneous (Cont'd)

Function	Device	Source	Line
Phase-Frequency Detector			
TTL	11C44C	Fairchild	
	11C44M	† Fairchild	
	MC4044	Motorola	
	MC4344	† Motorola	
Polymonial Generator			
TTL	MC8506	Motorola	
Programmable FET Address Sequencer			
TTL	**AM29540**	**AMD**	**(603)**
Programmable Logic Array, Mask Programmed (see also memory-PLAs)			
TTL	DM7575	† National	
	DM7576	† National	
	DM8575	National	
	DM8576	National	10
Programmable Logic Arrays, Field Programmable (see also memory-PLAs)			
TTL	IM5200	Intersil	
TTL-S	N82S100	Signetics	
	N82S101	Signetics	
	S82S100	† Signetics	
	S82S101	† Signetics	
	SN74S330	TI	
	SN74S331	TI	
Signal Processor, 8-Bit Slice Programmable			
TTL	**AM29501**	**AMD**	**(602)**
Synchronous Decade Rate Multiplier			
TTL	54167	† Fairchild	
	MC54167	† Motorola	20
	MC74167	Motorola	
	SN544167	† TI	
	SN74167	**TI**	**(892)**
TTL-S	54S167	† Fairchild	
	74S167	Fairchild	
Voltage Comparator (analog input-digital output)			
TTL-S	686C	AMD	
	686M	† AMD	
Voltage Controlled Oscillator (or crystal controlled)			
TTL-LS	**SN54LS624**	**† TI**	**(977)**
	SN54LS628	**† TI**	**(978)**
	SN74LS324	TI	30
	SN74LS624	**TI**	**(977)**
	SN74LS628	**TI**	**(978)**
Binary-To-BCD Converter			
TTL	DM54185A	† National	
	DM74185A	National	
	DM8899	National	
	SN54185A	**† TI**	**(900)**
	SN74185A	**TI**	**(900)**
BCD-To-Binary Converter (three-state 54/74184)			
TTL	DM8898	National	
BCD-To-Binary Converter			
TTL	ZN54184	† Ferranti	
	ZN74184	Ferranti	40
	DM54184	† National	
	DM74184	National	
	SN54184	**† TI**	**(440,899)**
	SN74184	**TI**	**(899)**
Single Error Hamming Code Detector and Generator			
TTL	MC4041	Motorola	
Dual Pulse Synchronizer/Driver			
TTL	MC54120	† Motorola	
	MC74120	Motorola	
	SN54120	**† TI**	**(873)**
	SN74120	**TI**	**(873)**
Dual Voltage Controlled Oscillator (or crystal controlled)			
TTL-LS	SN54LS325	† TI	50
	SN54LS326	† TI	
	SN54LS327	† TI	
	SN74LS124	TI	
	SN74LS325	TI	
	SN74LS326	TI	
	SN74LS327	TI	
TTL-S	**SN54LS625**	**† TI**	**(977)**
	SN54LS626	**† TI**	**(977)**
	SN54LS627	**† TI**	**(978)**
	SN54LS629	**† TI**	**(978)** 60
	SN74LS328	TI	
	SN74LS625	**TI**	**(977)**
	SN74LS626	**TI**	**(977)**
	SN74LS627	**TI**	**(978)**
	SN74LS629	**TI**	**(978)**
Dual 4-Bit Parity Tree			
TTL	MC4010	Motorola	
	MC4310	† Motorola	
Dual 4-Input NAND Schmitt-Trigger			
TTL	5413	† Fairchild	
	7413	Fairchild	
	ZN5413	† Ferranti	70
	ZN7413	Ferranti	
	HD7413	Hitachi	
	MC5413	† Motorola	
	MC7413	Motorola	
	5413	† National	
	DM7413	National	
	5413	† Signetics	
	7413	Signetics	
	SN5413	**† TI**	**(837)**
	SN7413	**TI**	**(837)** 80
TTL-LS	54LS13	† Fairchild	
	74LS13	Fairchild	
	HD74LS13	Hitachi	
	M74LS13	Mitsubishi	
	SN54LS13	† Motorola	
	SN74LS13	Motorola	
	DM54LS13	† National	
	DM74LS13	National	
	54LS132	† SGS	
	74LS132	SGS	90
	T54LS13	† SGS	
	T74LS13	SGS	
	54LS13	† Signetics	
	74LS13	Signetics	
	SN54LS13	**† TI**	**(837)**
	SN54LS18	**† TI**	**(839)**
	SN74LS13	**TI**	**(837)**
	SN74LS18	**TI**	**(839)**
TTL-S	54S13	† Signetics	
Dual 6-Input Expander (for H50, H53, H55)			
TTL-H	54H60	† Fairchild	100
	DM54H60	† National	
	DM74H60	National	
	SN54H60	**† TI**	**(852)**
	SN74H60	**TI**	**(852)**
Triple Bidirectional Bus Switch, Three-State (connects any 2 of 3 inputs together)			
TTL-S	MC3449	Motorola	
	MC6881	Motorola	
Triple 3-Input Expander (for H52)			
TTL-H	54H61	† Fairchild	
	74H61	Fairchild	
	DM54H61	† National	
	DM74H61	National	110
	SN54H61	**† TI**	**(852)**
	SN74H61	**TI**	**(852)**
Quad Bus Transceiver			
TTL-AS	SN74AS1243	TI	
Quad Complementary-Output Elements (for symmetrical generation of complementary outputs)			
TTL	**SN54265**	**† TI**	**(918)**
	SN74265	**TI**	**(918)**
Quad Power Strobe (Vcc strobe or digit driver)			
TTL	**HD6600-2**	**† Harris**	**(3745)**
	HD6600-5	**Harris**	**(3745)**
Quad 2-Input NAND Schmitt-Trigger			
TTL	54132	† Fairchild	
	74132	Fairchild	
	HD74132	Hitachi	120
	MC54132	† Motorola	
	MC74132	Motorola	
	DM54132	† National	
	DM74132	National	
	54132	† Signetics	
	74132	Signetics	
	SN54132	**† TI**	**(877)**
	SN74132	**TI**	**(877)**
TTL-LS	74LS132	Fairchild	
	HD74LS132	Hitachi	130
	M74LS132	Mitsubishi	
	SN54LS132	† Motorola	
	SN74LS132	Motorola	
	DM54LS132	† National	
	DM74LS132	National	
	54LS132	† Signetics	
	74LS132	Signetics	
	SN54LS132	**† TI**	**(877)**
	SN54LS24	**† TI**	**(841)**
	SN74LS132	TI	140
	SN74LS24	**TI**	**(840,841)**
TTL-S	54S132	† Fairchild	
	74S132	Fairchild	
	SN54S132	**† TI**	**(877)**
	SN74S132	**TI**	**(877)**
Hex Current Sensing Interface Gate			
TTL-LS	**SN54LS63**	**† TI**	**(853)**
	SN74LS63	**TI**	**(853)**
Hex Schmitt Trigger, Inverting			
TTL	5414	† Fairchild	
	7414	Fairchild	
	HD7414	Hitachi	150
	MC5414	† Motorola	
	MC7414	Motorola	
	DM5414	† National	
	DM7414	National	
	5414	† Signetics	
	7414	Signetics	
	SN5414	**† TI**	**(837)**
	SN7414	**TI**	**(837)**
TTL-LS	54LS14	† Fairchild	
	74LS14	Fairchild	160
	HD74LS14	Hitachi	
	M74LS14	Mitsubishi	
	SN54LS14	† Motorola	
	SN74LS14	Motorola	
	DM54LS14	† National	
	DM74LS14	National	
	54LS14	† SGS	
	74LS14	SGS	
	54LS14	† Signetics	
	74LS14	Signetics	170
	SN54LS14	**† TI**	**(837)**
	SN54LS19	**† TI**	**(839)**
	SN74LS14	**TI**	**(837)**
	SN74LS19	**TI**	**(839)**
Octal Buffer/Transceiver with Parity Generator/Checker			
TTL-F	74F585	Signetics	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

DIGITAL–TTL (Cont'd)

Miscellaneous (Cont'd)

Function	Device	Source	Line
Decade Sequencer (sequential 1 of 10 decoder), Adjustable Sequence Length			
TTL	9320C	Fairchild	
3-2-2-3-Input AND-OR Expander (for H50, H53, H55)			
TTL-H	54H62	† Fairchild	
	74H62	Fairchild	
	DM54H62	† National	
	DM74H62	National	
	SN54H62	**† TI**	**(853)**
	SN74H62	**TI**	**(853)**
4-Bit Parallel Bus Transceiver; Inverting Three-State			
TTL-S	N8T26	AMD	
	N8T26A	AMD	
	S8T26	† AMD	10
	S8T26A	† AMD	
	HD268T26	Hitachi	
	MC8T26A	Motorola	
	DS8T26A	National	
	DS8T26AM	† National	
	N8T127	Signetics	
	N8T26A	Signetics	
	S8T126	† Signetics	
	S8T127	† Signetics	
	N8T26	TI	20
	N8T26A	TI	
	SN75136	TI	
4-Bit Parallel Bus Transceiver, Non-Inverting, Three-State			
TTL-S	N8T28	AMD	
	MC6889	Motorola	
	MC8T28	Motorola	
	DS8T28	National	
	DS8T28M	† National	
	N8T128	Signetics	
	N8T129	Signetics	
	N8T28	Signetics	30
	S8T128	† Signetics	
	S8T129	† Signetics	
4-Bit Parallel Bus Transceiver, Open Collector Drivers			
TTL-S	AM25S11C	AMD	
	AM25S12AC	AMD	
	AM25S12AM	† AMD	
	AM25S12M	† AMD	
	AM26S10C	AMD	
	AM26S10M	† AMD	
	AM26S11M	† AMD	
	AM26S12C	AMD	40
	9640C	Fairchild	
	9640M	† Fairchild	
	9641M	† Fairchild	
	MC26S10	Motorola	
	MC26S11	Motorola	
	DS26S10C	National	
	DS26S10M	† National	
	DS26S11C	National	
	DS26S11M	† National	
	AM	† TI	50
	AM26S10C	† TI	
	AM26S10M	† TI	
	AM26S11C	TI	
4-Bit Parallel Universal Bus Transceiver, Storage, Three-State			
TTL-S	**SN54S226**	**† TI**	**(908)**
	SN74S226	**TI**	**(908)**
4-Bit Priority Register, Cascadable			
TTL	**SN54278**	**† TI**	**(921)**
	SN74278	**TI**	**(921)**
4-Bit Shifter (shifts data 0, 1, 2, or 3 places as determined by 2-bit selector code)			
TTL-F	74F350	Signetics	
TTL-S	SN54S350	† AMD	

(Continued)

Function	Device	Source	Line
4-Bit Shifter (shifts data 0, 1, 2, or 3 places as determined by 2-bit selector code)			
TTL-S			(Cont'd)
	SN74S350	AMD	60
	54S350	† Signetics	
	74S350	Signetics	
4-Bit Shifter, Three-State (shifts 0, 1, 2, or 3-bits under 2-line select control)			
TTL-F	54F510	† Fairchild	
	74F510	Fairchild	
TTL-S	**AM25S10C**	**AMD**	**(1227)**
	AM25S10M	**† AMD**	**(1227)**
	N25S10	Signetics	
4-Bit True/Complement Zero/One Element			
TTL-H	54H87	† Fairchild	
	74H87	Fairchild	
	MC54H87	† Motorola	70
	MC74H87	Motorola	
	SN54H87	**† TI**	**(863)**
	SN74H87	**TI**	**(863)**
4-Bit Universal Presettable Polynomial Generator			
TTL	MC8504	Motorola	
6-Bit Synchronous Binary Rate Multiplier			
TTL	5497	† Fairchild	
	7497	Fairchild	
	MC5497	† Motorola	
	MC7497	Motorola	
	SN5497	**† TI**	**(866)**
	SN7497	**TI**	**(866)**
8-Bit Bidirection I/O Port			
TTL-S	**N8T31**	**Signetics (1502,1504)**	
	N8X31	**Signetics (1502,1504)**	
8-Bit Bidirectional I/O Port, Latched, Addressable			
TTL-S	**N8T32**	**Signetics (1502,1504)**	
	N8T33	**Signetics (1502,1504)**	
	N8T35	**Signetics (1502,1504)**	
	N8T36	**Signetics (1502,1504)**	
	N8T39	**Signetics (1502,1504,1511)**	
	N8X32	**Signetics (1502,1504)**	
	N8X36	**Signetics (1502,1504)**	
	S8T32	**† Signetics (1502,1504)**	90
	S8T33	**† Signetics (1502,1504)**	
	S8T35	**† Signetics (1502,1504)**	
	S8T36	**† Signetics (1502,1504)**	
	S8T39	**† Signetics (1502,1504,1511)**	
8-Bit Parallel Error Detection and Correction Circuit			
TTL-ALS	SN54ALS636	† TI	
	SN54ALS637	† TI	
	SN74ALS636	TI	
	SN74ALS637	TI	
8-Bit Parity Tree			
TTL	MC4008	Motorola	
	MC4308	† Motorola	100
	MC54408	† Motorola	
	MC74408	Motorola	

Function	Device	Source	Line
8-Bit Position Scaler (The output is shiftd with respect to the input up to 8 positions as determined by a 3-bit selector code.)			
TTL	RC8243	Raytheon	
	RM8243	† Raytheon	
8-Bit Successive Approximation Register			
TTL	AM2502C	AMD	
	AM2502M	† AMD	
	AM2503C	AMD	
	AM2503M	† AMD	
	AM2502	Intersil	
	AM2503	Intersil	110
	AM25L02	Intersil	
	AM25L03	Intersil	
	DM2502C	National	
	DM2502M	† National	
	DM2503C	National	
	DM2503M	† National	
TTL-LS	54LS503	† Fairchild	
	74LS502	Fairchild	
	74LS503	Fairchild	
	SN54LS502	† Motorola	120
	SN54LS503	† Motorola	
	SN74LS502	Motorola	
	SN74LS503	Motorola	
8-Bit Universal Transceiver/Port Controller			
TTL-AS	**SN54AS877**	**† TI**	**(1009)**
	SN74AS877	**TI**	**(1009)**
8-Input Priority Encoder			
TTL	9318C	Fairchild	
	9318M	† Fairchild	
	HD74148	Hitachi	
	MC8318	Motorola	
	MC9318	† Motorola	130
	DM54148	† National	
	DM74148	National	
	DM8318	National	
	DM9318	† National	
	54148	† Signetics	
	74148	Signetics	
	SN29318	TI	
	SN39318	† TI	
	SN54148	**† TI**	**(883)**
	SN74148	**TI**	**(883)** 140
TTL-LS	AM25LS148C	AMD	
	AM25LS148M	† AMD	
	AM25LS2513C	**AMD**	**(1227)**
	AM25LS2513M	**† AMD**	**(1227)**
	AM2913C	**AMD**	**(1209)**
	AM2913M	**† AMD**	**(1209)**
	SN54LS148	† AMD	
	HD74LS148	Hitachi	
	SN54LS148	**† TI**	**(883)**
	SN54LS348	**† TI**	**(931)** 150
	SN74LS148	**TI**	**(883)**
	SN74LS348	**TI**	**(931)**
9-Bit Odd/Even Parity Generator/Checker			
TTL	54180	† Fairchild	
	74180	Fairchild	
	ZN54180	† Ferranti	
	ZN74180	Ferranti	
	HD74180	Hitachi	
	MC54180	† Motorola	
	MC74180	Motorola	
	DM54180	† National	160
	DM74180	National	
	RC8262	Raytheon	
	RM8262	† Raytheon	
	54180	† Signetics	
	74180	Signetics	
	N8262	Signetics	

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–TTL (Cont'd)

Miscellaneous (Cont'd)

Function	Device	Source	Line
9-Bit Odd/Even Parity Generator/Checker			
TTL		(Cont'd)	
	S8262	† Signetics	
	SN54180	**† TI** (897)	
	SN74180	**TI** (897)	
TTL-AS	**SN54AS280**	**† TI** (921)	
	SN74AS280	**TI** (921)	
TTL-F	54F280	† Fairchild	
	74F280	Fairchild	
	MC54F280	**† Motorola** (731)	
	MC74F280	**Motorola** (731)	
TTL-LS	HD74LS280	Hitachi	10
	SN54LS280	**† TI** (921)	
	SN74LS280	**TI** (921)	
TTL-S	**82S62C**	**AMD** (1227)	
	82S62M	**† AMD** (1227)	
	54S280	† Fairchild	
	93S62C	Fairchild	
	93S62M	† Fairchild	
	HD74S280	Hitachi	
	DM54S280	† National	
	DM74S280	National	20
	54S280	† Signetics	
	74S280	Signetics	
	N82S62	Signetics	
	SN54S280	**† TI** (921)	
	SN74S280	**TI** (921)	
9-Bit Parity Generator/Checker			
TTL	DM7220	† National	
	DM8220	National	
10-Bit Priority Encoder			
TTL	HD74147	Hitachi	
	DM54147	† National	
	DM74147	National	30
	54147	† Signetics	
	74147	Signetics	
	SN54147	**† TI** (882)	
	SN74147	**TI** (882)	
TTL-LS	**SN54LS147**	**† TI** (882)	
	SN74LS147	**TI** (882)	
12-Bit Successive Approximation Register			
TTL	AM2504C	AMD	
	AM2504M	† AMD	
	AM2504	Intersil	
	AM25L04	Intersil	40
	DM2504C	National	
	DM2504M	† National	
TTL-LS	SN54LS504	† Motorola	
	SN74LS504	Motorola	
12-Input Odd/Even Parity Checker/Generator			
TTL	9348C	Fairchild	
	9348M	† Fairchild	
TTL-S	**93S48C**	**AMD** (1227)	
	93S48M	**† AMD** (1227)	
32-Bit Parallel Error Detection and Correction Circuit			
TTL-ALS			
	SN54ALS632	† TI	
	SN54ALS633	† TI	50
	SN54ALS634	† TI	
	SN54ALS635	† TI	
	SN74ALS632	TI	
	SN74ALS633	TI	
	SN74ALS634	TI	
	SN74ALS635	TI	
50-1 Frequency Divider			
TTL-LS	**SN54LS56**	**† TI** (851)	
	SN74LS56	**TI** (851)	
60-1 Frequency Divider			
TTL-LS	**SN54LS57**	**† TI** (852)	
	SN74LS57	**TI** (852)	60

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–SPECIAL

Other Digital Devices

Function	Device	Source	Line
Arithmetic Processor (supply 5-12 V)	**9511A**	**AMD (1231)**	
	9511A-5	AMD	
Baud Rate Generator/Programmable Divider, Dual (ROM controlled divider)	COM5016	SMC	
	COM5016T	SMC	
	COM5036	SMC	
	COM5036T	SMC	
	COM8116	SMC	
	COM8116T	SMC	
	COM8136	SMC	
	COM8136T	SMC	10
	BR1941	Western	
	WD1943	**Western (2874)**	
Baud Rate Generator/Programmable Divider (ROM controlled divider)	MM5307	National	
	COM5026	SMC	
	COM5026T	SMC	
	COM5046	SMC	
	COM5046T	SMC	
	COM8046	SMC	
	COM8046T	SMC	
	COM8126	SMC	20
	COM8126T	SMC	
	COM8146	SMC	
	COM8146T	SMC	
Calculators: See Linear-Consumer			
Comparator/Mux, 6 Decade, 7 Level, Latched and Multiplexed Output (use with 6 decade counter)	LS7240	LSI Comp	
Correlator (continually compares two independently clocked serial inputs and gives correlation output)	**TDC1004**	**† TRW (813)**	
	TDC1004	TRW	
	TDC1023	**† TRW (813,819)**	
	TDC1023	TRW	
Counter/Display Decoder, 4 Decade (7 segment and BCD outputs, 0.25 MHz	MK5002	Mostek	30
	MK5005	Mostek	
	MK5007	Mostek	
Counter/Display Driver, 1 Decade Up/Down, Preset (7 segment and BCD output, 1 MHz)	HCTR0107	Hughes	
Counter/Display Driver, 6 Decade Up/Down (7 segment and BCD output, 1 MHz, presettable compare register, latched output, LED drive maximum count 999999, 995959, or 595999 versions supply 10-15 V)	MK50395	Mostek	
	MK50396	Mostek	
	MK50397	Mostek	
	MK50398	Mostek	
	MK50399	Mostek	
Counter Time-Base (oscillator, programmable divider, 10' to 1038, 2x1037, 6x1037, 6x1038 and 36x1038, supply -12,5 V)	MK5009	Mostek	
Counter, Universal (8 decade)/Latch/Display Driver (direct 7 segment and digit drivers for common anode LEDs: 'A' types	ICM7216A	Intersil	40
	ICM7216B	Intersil	
	ICM7226A	Intersil	
	ICM7226B	Intersil	
Counter, Up/Down, 4-Digit	MN6031	Panasonic	
Counter, Dual (two 3-decade up/down counters with latch, BCD output, 0.5 MHz, supply 5-15 V)	**LS7040**	**LSI Comp (696)**	
Counter, Dual 16-Bit Binary Up Counter with 32-Bit Latch, Multiplexer and Three-State Drivers	**LS7062**	**LSI Comp (696)**	
Counter, 4 Decade, Up/Down, Quad, Non-Volatile Storage (supply 5, – 12 V)	MN9105	Plessey	
Counter, 5 Decade (includes storage, multiplexed BCD output, 0.6 MHz, supply -12,5 V)	3815	Fairchild	
Counter, 6 Decade Up/Down (predetermining, 3 pre-set storage registers, latched output)	**LS7050**	**LSI Comp (696)**	
	LS7055/56	**LSI Comp (696)**	50
Counter, 6 Decade Up, Non-Volatile Storage, Direct Drive for 7 Segment Displays (12 V supply)	NC7107	Nitron	
Counter, 6 Decade Up, Non-Volatile Storage (12 V supply)	MN9106	Plessey	
	MN9107	Plessey	
	MN9108	Plessey	
Counter, 6 Decade, BCD Output, 5 MHz, 8 Latches (supply 5-15 V)	**LS7031**	**LSI Comp (696)**	
Counter, 8 Decade Frequency Counter/Latch/Display Driver (Direct 7 segment and digit drivers for common anode LEDs: 7216C. common cathode LEDs: 7216D. DC to 10 MHz, 5 V supply)	ICM7216C	Intersil	
	ICM7216D	Intersil	
Counter, 8 Decade, BCD and 7 Segment Outputs, 5 MHz, Latches (supply 5-15 V)	**LS7030**	**LSI Comp (696)**	
Counter, 8-Bit, Programmable	MN8025	Panasonic	
Counter, 16-Bit, Non-Volatile Storage, Parallel Input/ Output, 500 KHz (supply -29,5 V)	NCR2900	NCR	60
Counter, 32-Bit, Multiplexed and Latched Outputs (5 V supply)	**LS7060**	**LSI Comp (696)**	
Counter, 32-Bit, 8-Bit Prescalable, Multiplexed and Latched Outputs (5 V supply)	**LS7061**	**LSI Comp (696)**	
Counters-See also CMOS and TTL-Counters			
Data Encryption Device (NBS standard)	**WD2001**	**Western (2876)**	
	WD2002	**Western (2876)**	
Data Security Device (data encryption standard)	**MC6859**	**Motorola (1351)**	
Divider, Adjustable, for 500 MHz	S89	Siemens	
Divider, Divide by 2, 0.2 to 1 GHz	SP8602A	† Plessey	
	SP8602B	Plessey	
	SP8605B	Plessey	70
	SP8605M	Plessey	
	SP8607A	† Plessey	
	SP8607B	Plessey	
Divider, Divide by 2, 525, Supply -12 V	MN115P	Panasonic	
Divider, Divide by 2, 625, Supply -12 V	MN116P	Panasonic	
Divider, Divide by 3/4, 40 to 300 MHz	SP8720	Plessey	
Divider, Divide by 3/4/8/12/16	AN6811	Panasonic	
Divider, Divide by 4, 0.07 to 1 GHz	SP8613	Plessey	
	SP8616	Plessey	
	SA1034	Signetics	80
	SA1534	Signetics	
Divider, Divide by 4, 0.1 to 1.5 GHz	S1534	Signetics	
Divider, Divide by 4, 0.15 to 1 GHz	SP8600A	† Plessey	
	SP8600B	Plessey	
Divider, Divide by 5/6, to 1 MHz	RED5/6	LSI Comp	
Divider, Divide by 5/6, 0.2 to 1 GHz	95H91C	Fairchild	
	95H91M	† Fairchild	
	MC12009	Motorola	
	MC12509	† Motorola	
	SP8740A	† Plessey	90
	SP8740B	Plessey	
Divider, Divide by 6/7, 0.2 to 1 GHz	SP8741A	† Plessey	
	SP8741B	Plessey	
Divider, Divide by 8, 0.25 to 1 GHz	SP8735B	Plessey	
Divider, Divide by 8/9, 0.25 to 1 GHz	MC12011	Motorola	
	MC12511	† Motorola	
	SP8743B	Plessey	
	SP8743M	Plessey	
	SP8791A	Plessey	
	SP8791B	Plessey	100
Divider, Divide by 10, Above 1 GHz	SP8665B	Plessey	
	SP8668B	Plessey	
Divider, Divide by 10, 0.2 to 1 GHz	SP8630A	† Plessey	
	SP8630B	Plessey	
Divider, Divide by 10/100/1000/10,000 to 2 MHz	RDD104	LSI Comp	
Divider, Divide by 10/11, 0.2 to 1 GHz	95H90C	Fairchild	
	95H90M	† Fairchild	
	MC12013	Motorola	
	MC12513	† Motorola	
	SP8643B	Plessey	110
	SP8647A	† Plessey	
	SP8647B	Plessey	
	SP8680A	† Plessey	
	SP8680B	Plessey	
	SP8685A	† Plessey	
	SP8685B	Plessey	
	SP8690A	† Plessey	
	SP8690B	Plessey	
Divider, Divide by 16, 0.2 to 1 GHz	SP8659A	† Plessey	
	SP8659B	Plessey	120
Divider, Divide by 20, 0.2 to 1 GHz	DS8628	National	
	AN6820	Panasonic	
	AN6821	Panasonic	
	SP8657A	† Plessey	
	SP8657B	Plessey	
	SP8658	Plessey	
Divider, Divide by 20/21, to 225 MHz	**DS8614**	**National (2771)**	
Divider, Divide by 24, 0.2 GHz	DS8627	National	
	SP8656	Plessey	
Divider, Divide by 32, 0.2 to 1 GHz	SP8655A	† Plessey	130
	SP8655B	Plessey	
Divider, Divide by 32/33, to 225 MHz	**DS8615**	**National (2771)**	
Divider, Divide by 40, to 120 MHz	DS8626	National	

† Military Temperature Range (– 55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

DIGITAL–SPECIAL (Cont'd)

Other Digital Devices (Cont'd)

Function	Device	Source	Line
Divider, Divide by 40/41, to 225 MHz	**DS8616**	**National**	**(2771)**
Divider, Divide by 50/60, to 1 MHz	RED50/60	LSI Comp	
Divider, Divide by 64, above 1 GHz	SP8755A	† Plessey	
	SP8755B	Plessey	
	SP8757	Plessey	
	U264	Telefunken	
Divider, Divide by 64, 0.08 to 1 GHz	S0436	Siemens	
	SDA2001	Siemens	
Divider, Divide by 64, 0.2 to 1 GHz	SAB1047	Signetics	
Divider, Divide by 64/256, 90-1000 MHz	MC12071	Motorola	10
	DS8621	National	
	CA3163	RCA	
	CA3179	**RCA**	**(3363)**
Divider, Divide by 64/65, to 225 MHz	**DS8617**	**National**	**(2771)**
Divider, Divide by 100, to 150 MHz	DS8629	National	
	SP8628	Plessey	
	SP8629	Plessey	
Divider, Divide by 100/120	RED100/120	LSI Comp	
Divider, Divide by 126/128 (VHF) or 252/256 (UHF)	DS8622	National	
Divider, Divide by 239,240,255,256, to 0.5 GHz	SP8906	Plessey	20
Divider, Divide by 248/256, to 1 GHz	SAB1077	Signetics	
Divider, Divide by 256, above 1 GHz	SP8770B	Plessey	
	SP8772B	Plessey	
	U266	Telefunken	
Divider, Divide by 256, 0.2 to 1 GHz	SAB1018	Signetics	
	SAB1018A	Signetics	
	SAB1046	Signetics	
Divider, Divide by 300/360	RED300/360	LSI Comp	
Divider, Divide by 478,480,510,512, to 1 GHz	SP8901	Plessey	
Divider, Divide by 960/1024, above 1 GHz	U265	Telefunken	30
	U465	Telefunken	
Divider, Divide by 3000/3600	RED3000/3600	LSI Comp	
Divider, Divide-by-1, 10, 100, 1000	SAJ141	Siemens	
Divider, Divide-by-2, Above 1 GHz	SP8606B	Plessey	
	SP8606M	Plessey	
Divider, Divide-by-80, to 150 MHz	SP8627	Plessey	
Divider, Divide-by-1000, 0-25 KHz (supply -15 V)	SAJ135	Siemens	
Divider Extender, Divide by 4, to Extend Division Ratios of Two Modulus Counters while Maintaining the Difference (i.e., 5/6 to 20/21)	SP8790A	† Plessey	
	SP8790B	Plessey	
Divider Extender, Divide by 8 (i.e., extends 5/6 to 40/41)	SP8794A	† Plessey	40
	SP8794B	Plessey	
DVM Logic: See also Interface-Analog to Digital Converters, Decimal Output			
DVM Logic, 3-Drive, Direct LCD Drive	MP7104A	Micro Pwr	
DVM Logic, 4 Digits (supply -17 V)	MN6032	Panasonic	
DVM Logic, 4-1/2 Digit, (dual slope integration, supply -15,5)	ADB4500	National	
DVM Logic, 4-1/2 Decade (multiplexed BCD output	3814	Fairchild	
Elapsed Time Counter, Decimal (7 segment and digit driver for common cathode LEDs	ICM7045A	Intersil	
Elapsed Time Counter, 6 Decade (7 segment and digit drivers for common cathode LEDs	ICM7215	Intersil	
Elapsed Time Counter, 8 Decade (7 segment and digit drivers for common cathode LED	ICM7045	Intersil	
Filter, Finite Impulse Response	**TDC1028**	**† TRW**	**(813,818)** 50
	TDC1028	TRW	
Floating Point ALU (32x32)	WTL1033	Weitek	
Floating Point Arithmetic Multiplier/ALU (32x32)	WTL1032	Weitek	
Frequency Synthesizers: See Linear-Phase Locked Loop Circuits			
Frequency to Voltage: See Linear-Other Devices			
Hall Effect Switch (senses magnetic field)	DN6835	Panasonic	
	DN6837	Panasonic	
	DN6838	Panasonic	
	DN6839	Panasonic	
	DN830	Panasonic	60
	DN831	Panasonic	
	DN834	Panasonic	
	DN835	Panasonic	
	DN837	Panasonic	
	DN838	Panasonic	
	DN839	Panasonic	
	SAS231L	Siemens	
	SAS241	Siemens	
	SAS251	Siemens	
	SAS261	Siemens	70
	UGN-3013	Sprague	
	UGN-3019	Sprague	
	UGN-3020	Sprague	
	UGN-3030	Sprague	
	UGN-3040	Sprague	
	UGN-3201	Sprague	
	UGN-3203	Sprague	
	UGN-3220	Sprague	
	UGN-3501	Sprague	
	UGS-3019	† Sprague	80
	UGS-3020	† Sprague	
	UGS-3030	† Sprague	
	TL170	TI	
	TL172	TI	
	TL175	TI	
	TL176	TI	
Inverter, Triple PMOS	LM8942	Sanyo	
Keyboard Interface, Serial (96 or 144 key)	MM57499	National	
Latch, Quad with Non-Volatile Memory	MN9102	Plessey	
LED Driver System, 8 Decade 8x8 Memory, Decoder (versions either hardwire or processor controlled	ICM7218A	Intersil	90
	ICM7218B	Intersil	
	ICM7218C	Intersil	
	ICM7218D	Intersil	
	ICM7218E	Intersil	
Multiplexer/Demultiplexer, 8-Channel Latched, Binary Addressable (supply -5 to -70 V)	**LS7110**	**LSI Comp**	**(696)**
Multiplier/Accumulator (16x16)	**WTL1010**	**Weitek**	**(1041)**
Multiplier, Low Power (16x16)	**WTL2516**	**Weitek**	**(1039)**
	WTL2517	**Weitek**	**(1039)**
Multiplier (16x16)	**WTL1016**	**Weitek**	**(1036)**
	WTL1516	**Weitek**	**(1038)** 100
	WTL1517	**Weitek**	**(1038)**
Multiplier (24x24)	**WTL1024**	**Weitek**	**(1040)**
Multivibrator, Astable (programmable pulse width, current controlled pulse rep. rate, supply 3-7 V)	MC3380	Motorola	
PIN Diode Drivers	**DH0035**	**† National**	**(3344)**
	DH0035C	**National**	**(3344)**
	UDS-5790H	**† Sprague**	**(2843)**
	UDS-5791H	**† Sprague**	**(2843)**
Programmable Diode Matrix, 4x10	**HM0410**	**Harris**	**(3742)**
Programmable Diode Matrix, 6x8	**HM0168**	**Harris**	**(3742)**
Programmable Diode Matrix, 8x6	**HM0186**	**Harris**	**(3742)** 110
Programmable Diode Matrix, 9x8	**HM0198**	**Harris**	**(3742)**
Programmable Diode Matrix, 10x16	S353	Siemens	
Programmable Diode Matrix, 10x4	**HM0104**	**Harris**	**(3742)**
Programmable Divider	HEF4751	Signetics	
Programmable Divider (any modulo from 3 to 262,145, supply -12,5)	3816	Fairchild	
Programmable Divider (divide by 2 to 8191)	S0437	Siemens	
Regulators, Switching: See Linear-Other Devices			
Schmitt Trigger, Programmable	CA3098	† RCA	
	CA3099	† RCA	
Schmitt Trigger (supply 8 to 16 V)	LB8015	Sanyo	120
Schmitt Trigger, Zener Clamped Output (supply 2.2 to 6 V)	CS102	Cherry	
	ULN-3304M	Sprague	
Schmitt Trigger, Dual, Complementary Open Collector Outputs (supply 2.2 to 6 V)	CS122	Cherry	
	ULN-3305M	Sprague	
Schmitt Trigger, Dual, Low Voltage	SN76811	TI	
Schmitt Trigger, Dual One Open Collector Output, One Zener Clamped Output (supply 2.2 to 6 V)	ULN-3306M	Sprague	
Schmitt Trigger, Dual, 5 to 40 V Output	MK111	Analog Sys	
Schmitt Trigger, Hex	AN605	Panasonic	

† Military Temperature Range (−55° to 125°C)

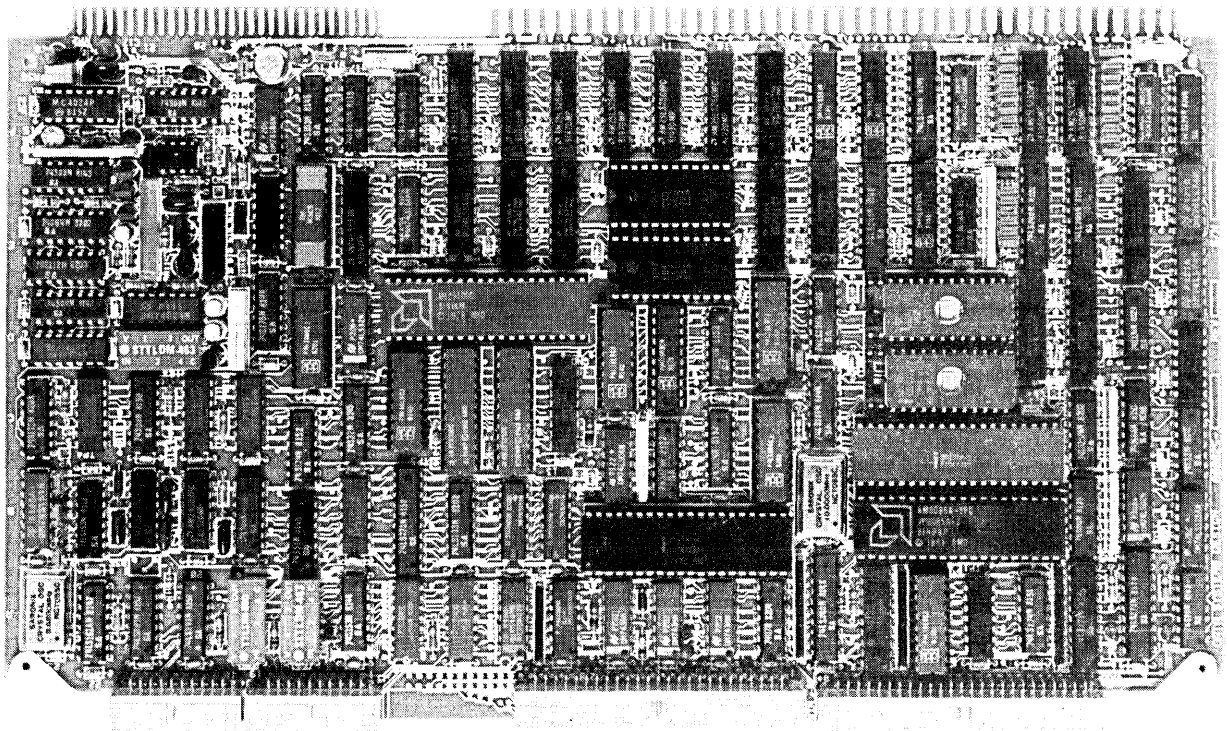
* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

Last Page This Section. Next Page 601.

For Key Data On Every IC On This Board, The Place To Look Is...



The Data System Design 7215 is a single-board controller with pipelined architecture that can simultaneously control Winchester, streaming tape, and floppy drives.

Device No.	Description
AM25LS2569	Up-Down Binary Counter with Synchronous Preset
AM2910	Dual Retriggerable Monostable Multivibrator
AM26S02	Programmable Schottky Read-Only Memory
AM27S35	12-Bit Microprogram Controller
AM8085	Complete 8-Bit Parallel Central Processing Unit
CA3130	5-to-16-Volt Single Stash Supply Op Amp
2732	4096 x 8 TTL PROM
8237	DMA Controller
DM7438	Quad 2-Input TTL NAND Buffer
DM8334	8-Bit Addressable TTL Latch
DS75107	Differential Line Receiver
F74S132	Quad 2-Input NAND Schmitt-Trigger
MC4024	Dual Voltage-Controlled TTL Multivibrator
MK4802	2048 x 8 Static NMOS RAM
PAL16L8	Field Programmable Logic Array
PAL16R6	Field Programmable Logic Array
PAL16R8	Field Programmable Logic Array
7407	Hex Buffer/Driver
74123	Dual Retriggerable Monostable Multivibrator
74368	Hex Inverter, 3-State
74LS02	Quad 2-Input TTL NOR Gate
74LS04	Hex Inverter
74LS125	Quad Gated TTL Buffer, 3-State
74LS138	3 Line to 8 Line Decoder/Demultiplexer
74LS151	8-Input Multiplexer
74LS161	Binary Counter
74LS166	8-Bit Parallel-In, Serial-Out Shift Register with Clear

Device No.	Description
74LS174	Hex D-Type Edge-Triggered Flip-Flop with Clear
74LS240	Octal Bus Driver (Schmitt Trigger)
74LS244	Octal Bus Driver (Schmitt Trigger), Non-Inverting
74LS257	Quad 2-Input Multiplexer, Non-Inverting
74LS273	Octal D-Type Edge-Triggered Flip-Flop, 3-State
74LS299	8-Bit Universal Shift Register
74LS365	Hex Buffer, 3-State
74LS373	8-Bit Latch
74LS374	Octal D-Type Edge-Triggered Flip-Flop, 3-State
74LS393	Dual 4-Bit Binary Counter
74LS533	D-Type 8-Bit Latch
74LS670	16-Bit (4x4) Register File with Simultaneous Read/Write
74S00	Quad 2-Input NAND Gate
74S03	Quad 2-Input NAND Gate, Open Collector
74S04	Hex Inverter
74S112	Dual "J-K" Negative Edge-Triggered Flip-Flop
74S151	8-Input Multiplexer
74S153	Dual 4-Input Multiplexer
74S174	Hex D-Type Edge-Triggered Flip-Flop with Clear
74S175	Quad D-Type Edge-Triggered Flip-Flop with Clear
74S240	Line Driver, Single Ended, 3-State, Inverting
74S32	Quad 2-Input OR Gate
74S51	Dual 2-Wide 2-Input AND-OR-Invert Gate
74S64	4-2-3-2-Input AND-OR-Invert Gate
74S74	Dual D-Type Positive Edge-Triggered Flip-Flop
75110	Line Driver, Differential, Twisted Pair Level Shifting

Representative list of ICs on the Data Systems Design 7215 board.
Key specifications for all of these ICs can be found in IC MASTER.

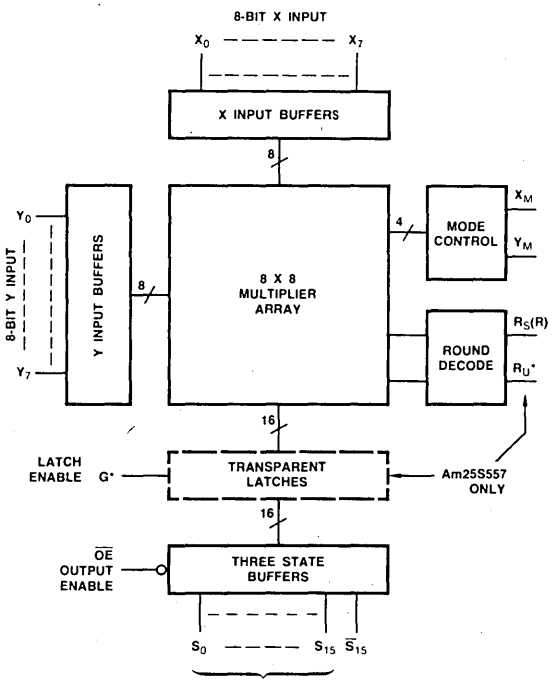
IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

BIPOLAR LSI AND SUPPORT PRODUCTS
Digital Signal Processing Products

Am25S557/Am25S558 8-Bit by 8-Bit Combinatorial Multiplier

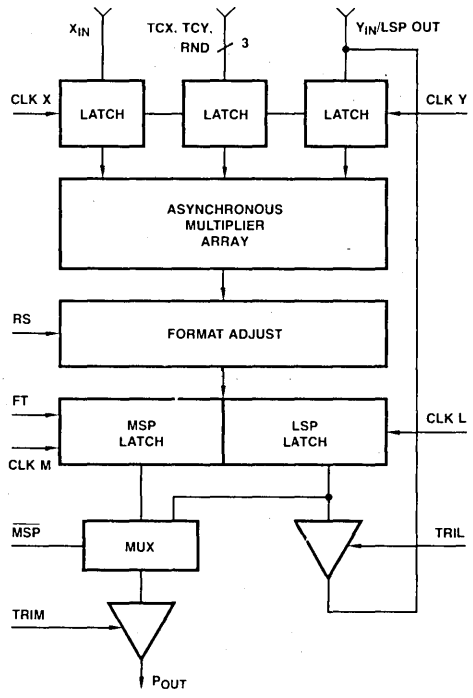
- Multiplies Two 8-Bit Numbers – 16-Bit Output
- Combinatorial – No Clocks Required
- Full 8 x 8 Multiply in 45ns (Typ)
- Cascades to 16 x 16 in 110ns (Typ)
- Expandable to Multiples of Eight Bits
- MSB and $\overline{MSB}$ Outputs for Easy Expansion
- Unsigned, Twos Complement or Mixed Operands
- Implements Common Rounding Algorithms with Additional Logic
- 3-State Outputs
- Transparent 16-Bit Latch in Am25S557
- Industry Standard Pinouts
- 40-Pin DIP



*Pin 11 is G for Am25S557 and R_U for Am25S558.

Am29516/Am29517 16 by 16 Combinatorial Multipliers

- Twos Complement, Unsigned or Mixed Numbers
- LSP Available at Y_{IN} or P_{OUT}
- Am29516 Pin Compatible with TRW MPY-16HJ
- Am29517 Has Single Clock Input with X, Y and P Clock Enables
- Internal ECL Array Provides Multiply Time of 75ns (Typ)
- 64-Pin DIP

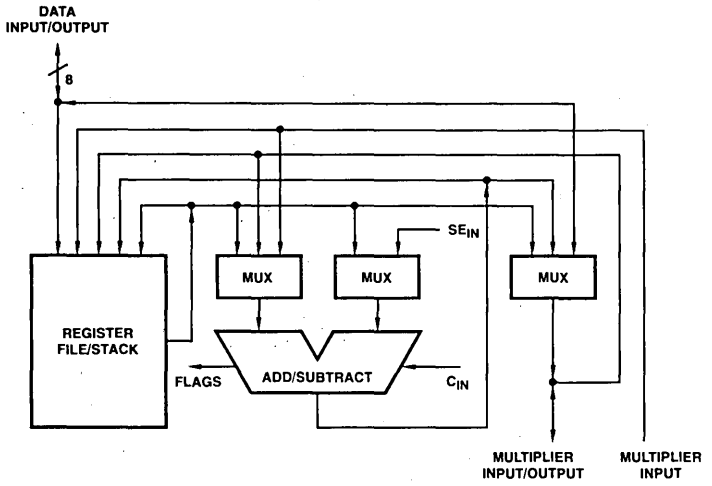


© IC MASTER 1983

SUPPORT PRODUCTS

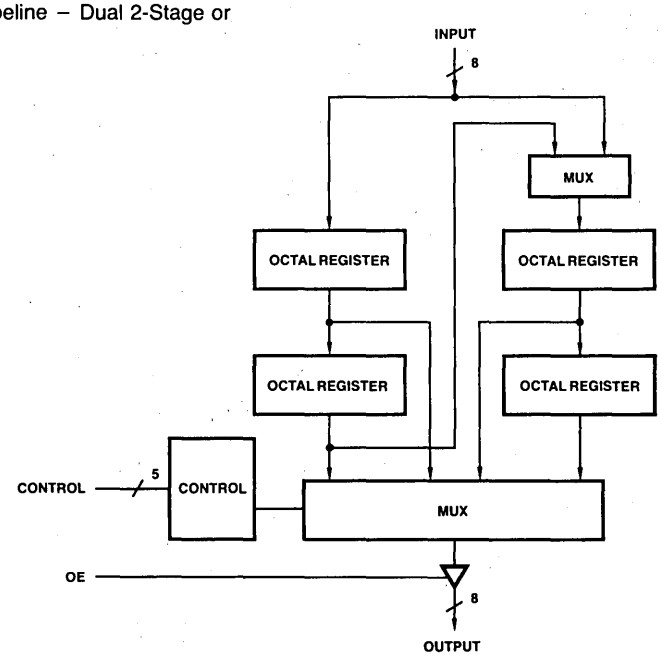
Am29501 Programmable Signal Processor

- 8-Bit Slice
- 8-Bit ALU
- Six 8-Bit Register File
- Designed to Operate with Am29516/Am29517
- 29-Bit Microcode Control
- Multiple Simultaneous Data Moves
- Supports 100ns Microcycle Time
- 64-Pin DIP



Am29520/Am29521 Multilevel Pipeline Register

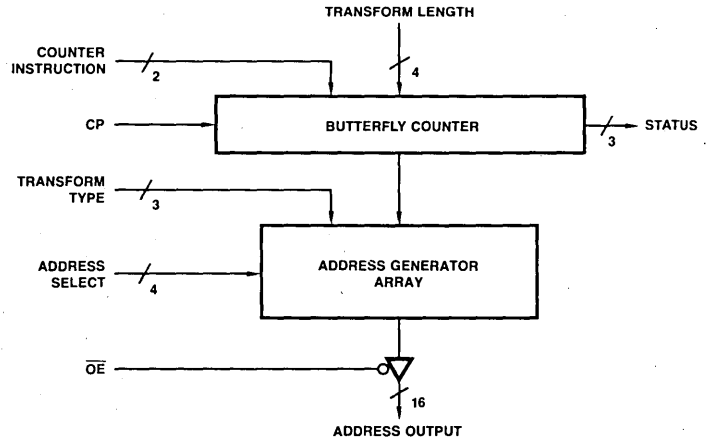
- Four 8-Bit Vipeline Registers
- All Registers Mux to Output
- Programmable Pipeline – Dual 2-Stage or Single 4-Stage
- Am29520 Has Separate Load and Shift
- 24-Pin 0.3" Wide DIP



© IC MASTER 1983

Am29540 Programmable FFT Address Sequencer

- Generates Data/Coefficient Addresses
- Programmable Length – 2 to 65536 Point Transforms
- DIF or DIT Algorithms
- Bit-Reversed I or O (In-Place)
- Radix-2 or -4 Address Sequence
- Radix-2 RVI Transforms
- 40-Pin DIP



© IC MASTER 1983

Advanced Micro Devices

BIPOLAR LSI AND SUPPORT PRODUCTS
20-Pin IMOX™ Programmable Array Logic Elements

AMD 20-Pin PAL* Family

- **Fast**
  - High speed "A" versions (t_{pd} = 25ns, t_s = 20ns, t_{co} = 15ns, max)
  - Standard speed versions (t_{pd} = 35ns, t_s = 30ns, t_{co} = 25ns, max)
- **Flexible**
  - User programmability allows customized designs
  - Eases design updates in prototype or product
- **Low Cost**
  - Reduces board space/chip count
  - Reduces design time
  - Reduces inventory cost
- **Reliable**
  - Proven Platinum-Silicide fuse technology
  - Fully AC and DC tested
  - Preload of output registers allows full logical testing

FUNCTIONAL DESCRIPTION

AMD PALs are high speed electrically programmable array logic elements. They utilize the familiar sum-of-products (AND-OR) structure allowing users to program custom logic functions to fit most applications precisely.

Initially the AND gates are connected, via fuses, to both the true and complement of every input. By selective programming of fuses the AND gates may be "connected" to only the true input (by blowing the complement fuse), to only the complement input (by blowing the true fuse), or to neither type of input (by blowing both fuses) establishing a logical "don't care." When both the true and complement fuses are left intact a logical false results on the output of the AND gate. An AND gate with all fuses blown will assume the logical true state. The outputs of the AND gates are connected to fixed OR gates. The only limitations imposed are the number of inputs to the AND gates (up to 16) and the number of AND gates per OR (up to 8).

The part types in the AMD PAL family are differentiated by the allocation of registered (with internal feedback) and combinatorial (bi-directional and dedicated) outputs. All combinatorial AMD PALs are available in both active HIGH (AND-OR) and active LOW (AND-OR-INVERT) versions.

AMD PAL FAMILY CHARACTERISTICS

All members of the AMD PAL family have common electrical characteristics and programming procedures. All parts in this family are produced with a fusible link at each input to the AND gate array. Connections may be selectively removed by applying appropriate voltages to the circuit.

All parts are fabricated with AMD's fast programming, highly reliable Platinum-Silicide Fuse technology. Utilizing an easily implemented programming algorithm, these products can be rapidly programmed to any customized pattern. Extra test words are pre-programmed during manufacturing to insure extremely high field programming yields (>98%), and provide extra test paths to achieve excellent parametric correlation.

Platinum-Silicide was selected as the fuse link material to achieve a well controlled melt rate resulting in large non-conductive gaps that ensure very stable, long term reliability. Extensive operating testing has proven that this low-field, large-gap technology offers the best reliability for fusible link programmable logic.

The AMD PAL family is manufactured using Advanced Micro Devices' selective oxidation process, IMOX. This advanced process permits an increase in density and a decrease in internal capacitance resulting in the fastest possible programmable logic devices.

The AMD PAL family also incorporates the unique capability of preloading the output registers during testing to any desired value. Preload is invaluable when testing the logical functionality of a programmed AMD PAL.

AMD PAL FAMILY TABLE

Part Number	Array Inputs	Logic	OE	Outputs	t_{pd} (MAX) STD	t_{pd} (MAX) A	t_s (MAX) STD	t_s (MAX) A	t_{co} (MAX) STD	t_{co} (MAX) A	
AmPAL16R8	(8) Dedicated (8) Feedback	(8) 8-Wide AND-OR	Dedicated	Registered Inverting	–	–	30	20	25	15	ns
AmPAL16R6	(8) Dedicated (6) Feedback (2) Bidirectional	(6) 8-Wide AND-OR	Dedicated	Registered Inverting	35	25	30	20	25	15	ns
		(2) 7-Wide AND-OR-INVERT	Programmable	Bidirectional							
AmPAL16R4	(8) Dedicated (4) Feedback (4) Bidirectional	(4) 8-Wide AND-OR	Dedicated	Registered Inverting	35	25	30	20	25	15	ns
		(4) 7-Wide AND-OR-INVERT	Programmable	Bidirectional							
AmPAL16L8	(10) Dedicated (6) Bidirectional	(8) 7-Wide AND-OR-INVERT	Programmable	(6) Bidirectional (2) Dedicated	35	25	–	–	–	–	ns
AmPAL16H8	(10) Dedicated (6) Bidirectional	(8) 7-Wide AND-OR	Programmable	(6) Bidirectional (2) Dedicated	35	25	–	–	–	–	ns
AmPAL16LD8	(10) Dedicated (6) Bidirectional	(8) 8-Wide AND-OR-INVERT	–	Dedicated	35	25	–	–	–	–	ns
AmPAL16HD8	(10) Dedicated (6) Bidirectional	(8) 8-Wide AND-OR	–	Dedicated	35	25	–	–	–	–	ns

*PAL is a registered trademark of Monolithic Memories, Inc.
IMOX is a trademark of Advanced Micro Devices, Inc.

© IC MASTER 1983

BIPOLAR LSI AND SUPPORT PRODUCTS
20-Pin IMOX™ Programmable Array Logic Elements

MAXIMUM RATINGS (Above which the useful life may be impaired)

Storage Temperature	−65 to +150°C
Temperature (Ambient) Under Bias	−55 to +125°C
Supply Voltage to Ground Potential (Pin 20 to Pin 10) Continuous	−0.5 to +7V
DC Voltage Applied to Outputs (Except During Programming)	−0.5V to +V_{CC} max
DC Voltage Applied to Outputs During Programming	21V
Output Current Into Outputs During Programming (Max Duration of 1 sec)	200mA
DC Input Voltage	−0.5 to +5.5V
DC Input Current	−30 to +5mA

OPERATING RANGE

		Commercial		Military		
Parameters	**Description**	**Min**	**Max**	**Min**	**Max**	**Units**
V_{CC}	Supply Voltage	4 75	5.25	4.50	5.50	V
T_A	Operating Free Air Temperature	0	75	−55		°C
T_C	Operating Case Temperature				125	°C

ELECTRICAL CHARACTERISTICS OVER OPERATING RANGE (Unless Otherwise Noted)

Parameters	**Description**	**Test Conditions**			**Min**	**Typ** (Note 1)	**Max**	**Units**
V_{OH}	Output HIGH Voltage	V_{CC} = MIN, V_{IN} = V_{IH} or V_{IL}	I_{OH} = −3.2mA	COM'L	2.4	3.5		Volts
			I_{OH} = −2mA	MIL				
V_{OL}	Output LOW Voltage	V_{CC} = MIN, V_{IN} = V_{IH} or V_{IL}	I_{OL} = 24mA	COM'L			0.50	Volts
			I_{OL} = 12mA	MIL				
V_{IH} (Note 2)	Input HIGH Level	Guaranteed input logical HIGH voltage for all inputs			2.0			Volts
V_{IL} (Note 2)	Input LOW Level	Guaranteed input logical LOW voltage for all inputs					0.8	Volts
I_{IL}	Input LOW Current	V_{CC} = MAX, V_{IN} = 0.40V				−20	−250	μA
I_{IH}	Input HIGH Current	V_{CC} = MAX, V_{IN} = 2.7V					25	μA
I_I	Input HIGH Current	V_{CC} = MAX, V_{IN} = 5.5V					1.0	mA
I_{SC}	Output Short Circuit Current	V_{CC} = MAX, V_{OUT} = 0.5V (Note 3)			−30	−60	−90	mA
I_{CC}	Power Supply Current	All inputs = GND, V_{CC} = MAX	16L8, 16H8, 16HD8, 16LD8 16L8A, 16H8A, 16HD8A, 16LD8A			110	155	mA
			16R8, 16R6, 16R4 16R8A, 16R6A, 16R4A			120	180	
V_I	Input Clamp Voltage	V_{CC} = MIN, I_{IN} = −18mA				−0.9	−1.2	Volts
I_{OZH}	Output Leakage Current (Note 4)	V_{CC} = MAX, V_{IL} = 0.8V V_{IH} = 2.0V	V_O = 2.7V				100	μA
I_{OZL}			V_O = 0.4V				−100	
C_{IN}	Input Capacitance	V_{IN} = 2.0V @f = 1MHz (Note 5)				6		pF
C_{OUT}	Output Capacitance	V_{OUT} = 2.0V @f = 1MHz (Note 5)				9		

Notes: 1. Typical limits are at V_{CC} = 5.0V and T_A = 25°C.
2. These are absolute values with respect to device ground and all overshoots due to system or tester noise are included.
3. Not more than one output should be tested at a time. Duration of the short circuit should not be more than one second. V_{OUT} = 0.5V has been chosen to avoid test problems caused by tester ground degradation.
4. I/O pin leakage is the worst case of I_{OZX} or I_{IX} (where X = H or L).
5. These parameters are not 100% tested, but are periodically sampled.

© IC MASTER 1983

BIPOLAR LSI AND SUPPORT PRODUCTS
20-Pin IMOX™ Programmable Array Logic Elements

SWITCHING CHARACTERISTICS OVER OPERATING RANGE (Unless otherwise noted)
HIGH SPEED

Parameters	Description	Test Conditions	Typ (Note 1)	COM'L Min	COM'L Max	MIL Min	MIL Max	Units
t_{PD}	Input or Feedback to Non-Registered Output 16L8A, 16R6A, 16R4A, 16LD8A, 16H8A, 16HD8A	COM'L $R_1 = 200$ $R_2 = 390$	12		25		30	ns
t_{EA}	Input to Output Enable 16L8A, 16R6A, 16R4A, 16H8A		12		25		30	ns
t_{ER}	Input to Output Disable 16L8A, 16R6A, 16R4A, 16H8A		12		25		30	ns
t_{PZX}	Pin 11 to Output Enable 16R8A, 16R6A, 16R4A		8		20		25	ns
t_{PXZ}	Pin 11 to Output Disable 16R8A, 16R6A, 16R4A		8		20		25	ns
t_{CO}	Clock to Output 16R8A, 16R6A, 16R4A		8		15		20	ns
t_S	Input or Feedback Setup Time 16R8A, 16R6A, 16R4A	MIL $R_1 = 390$ $R_2 = 750$	10	20		25		ns
t_H	Hold Time 16R8A, 16R6A, 16R4A		−10	0		0		ns
t_P	Clock Period			35		45		ns
t_W	Clock Width			15		20		ns
f_{MAX}	Maximum Frequency				28.5		22	MHz

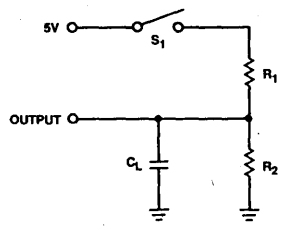
Notes: 1. Typical limits are at $V_{CC} = 5.0V$ and $T_A = 25°C$.
2. t_{PD} is tested with switch S_1 closed and $C_L = 50pF$.
3. For three-state outputs, output enable times are tested with $C_L = 50pF$ to the 1.5V level; S_1 is open for high impedance to HIGH tests and closed for high impedance to LOW tests. Output disable times are tested with $C_L = 5pF$. HIGH to high impedance tests are made to an output voltage of $V_{OH} - 0.5V$ with S_1 open; LOW to high impedance tests are made to the $V_{OL} + 0.5V$ level with S_1 closed.

SWITCHING CHARACTERISTICS OVER OPERATING RANGE (Unless otherwise noted)
STANDARD SPEED

Parameters	Description	Test Conditions	Typ (Note 1)	COM'L Min	COM'L Max	MIL Min	MIL Max	Units
t_{PD}	Input or Feedback to Non-Registered Output 16L8, 16R6, 16R4, 16LD8, 16H8, 16HD8	COM'L $R_1 = 200$ $R_2 = 390$	17		35		40	ns
t_{EA}	Input to Output Enable 16L8, 16R6, 16R4, 16H8		17		35		40	ns
t_{ER}	Input to Output Disable 16L8, 16R6, 16R4, 16H8		17		35		40	ns
t_{PZX}	Pin 11 to Output Enable 16R8, 16R6, 16R4		12		25		25	ns
t_{PXZ}	Pin 11 to Output Disable 16R8, 16R6, 16R4		12		25		25	ns
t_{CO}	Clock to Output 16R8, 16R6, 16R4		12		25		25	ns
t_S	Input or Feedback Setup Time 16R8, 16R6, 16R4	MIL $R_1 = 390$ $R_2 = 750$	15	30		35		ns
t_H	Hold Time 16R8, 16R6, 16R4		−10	0		0		ns
t_P	Clock Period			55		60		ns
t_W	Clock Width			20		25		ns
f_{MAX}	Maximum Frequency				18		16.5	MHz

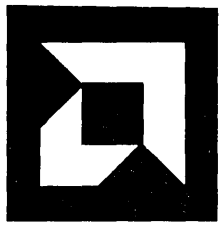
Notes: 1. Typical limits are at $V_{CC} = 5.0V$ and $T_A = 25°C$.
2. t_{PD} is tested with switch S_1 closed and $C_L = 50pF$.
3. For three-state outputs, output enable times are tested with $C_L = 50pF$ to the 1.5V level; S_1 is open for high impedance to HIGH tests and closed for high impedance to LOW tests. Output disable times are tested with $C_L = 5pF$. HIGH to high impedance tests are made to an output voltage of $V_{OH} - 0.5V$ with S_1 open; LOW to high impedance tests are made to the $V_{OL} + 0.5V$ level with S_1 closed.

AC TEST LOAD

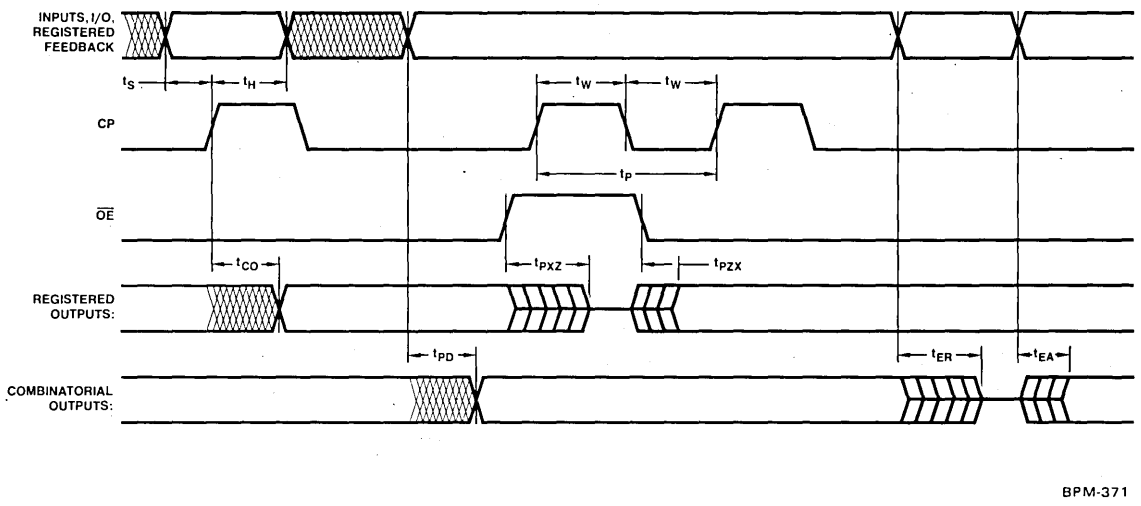


BPM-370

© IC MASTER 1983



SWITCHING WAVEFORMS



BPM-371

KEY TO TIMING DIAGRAM

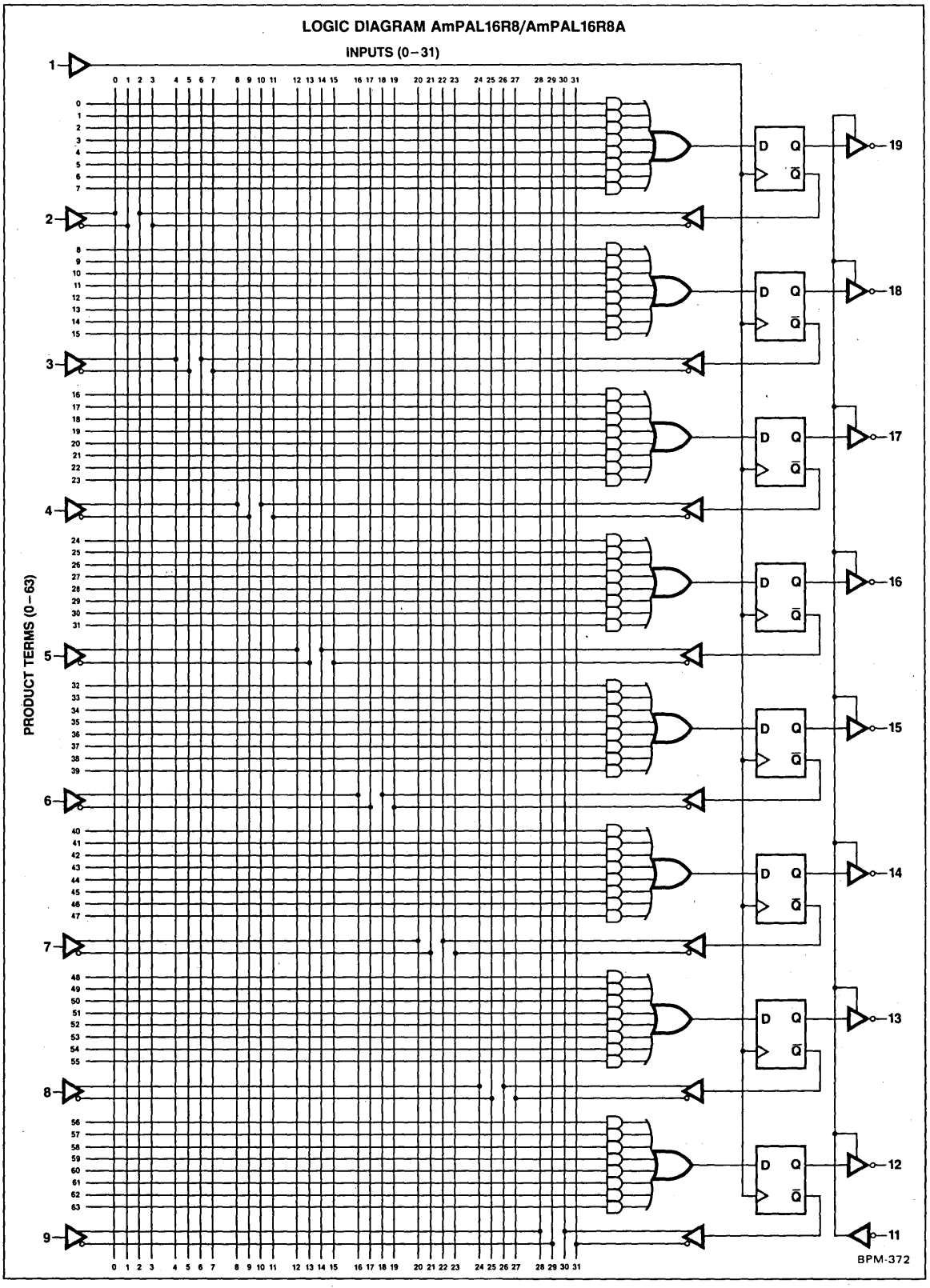
WAVEFORM	INPUTS	OUTPUTS
———	MUST BE STEADY	WILL BE STEADY

WAVEFORM	INPUTS	OUTPUTS
	DON'T CARE; ANY CHANGE PERMITTED	CHANGING; STATE UNKNOWN
	DOES NOT APPLY	CENTER LINE IS HIGH IMPEDANCE "OFF" STATE

© IC MASTER 1983

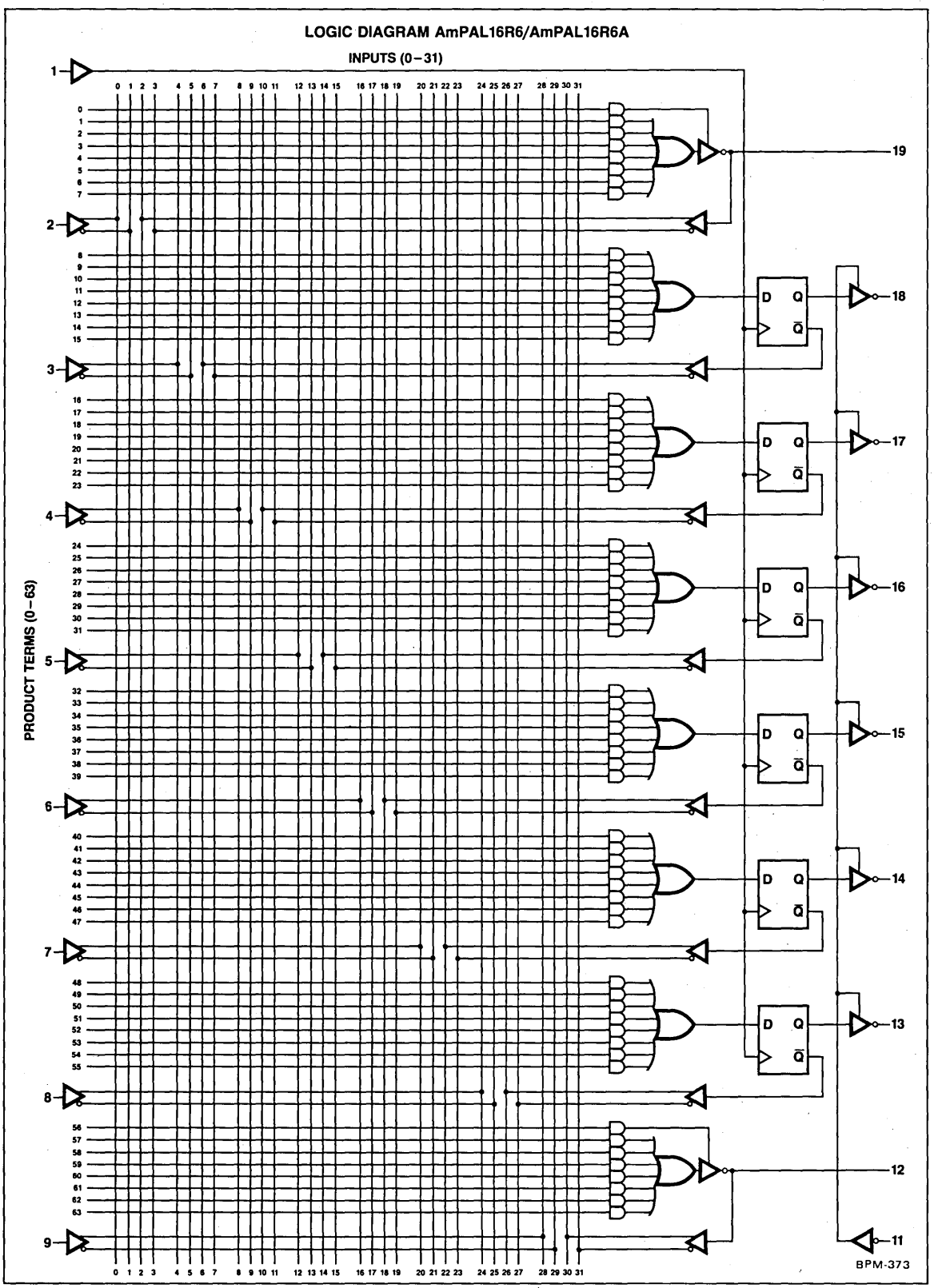
BIPOLAR LSI AND SUPPORT PRODUCTS
20-Pin IMOX™ Programmable Array Logic Elements

LOGIC DIAGRAM AmPAL16R8/AmPAL16R8A



© IC MASTER 1983

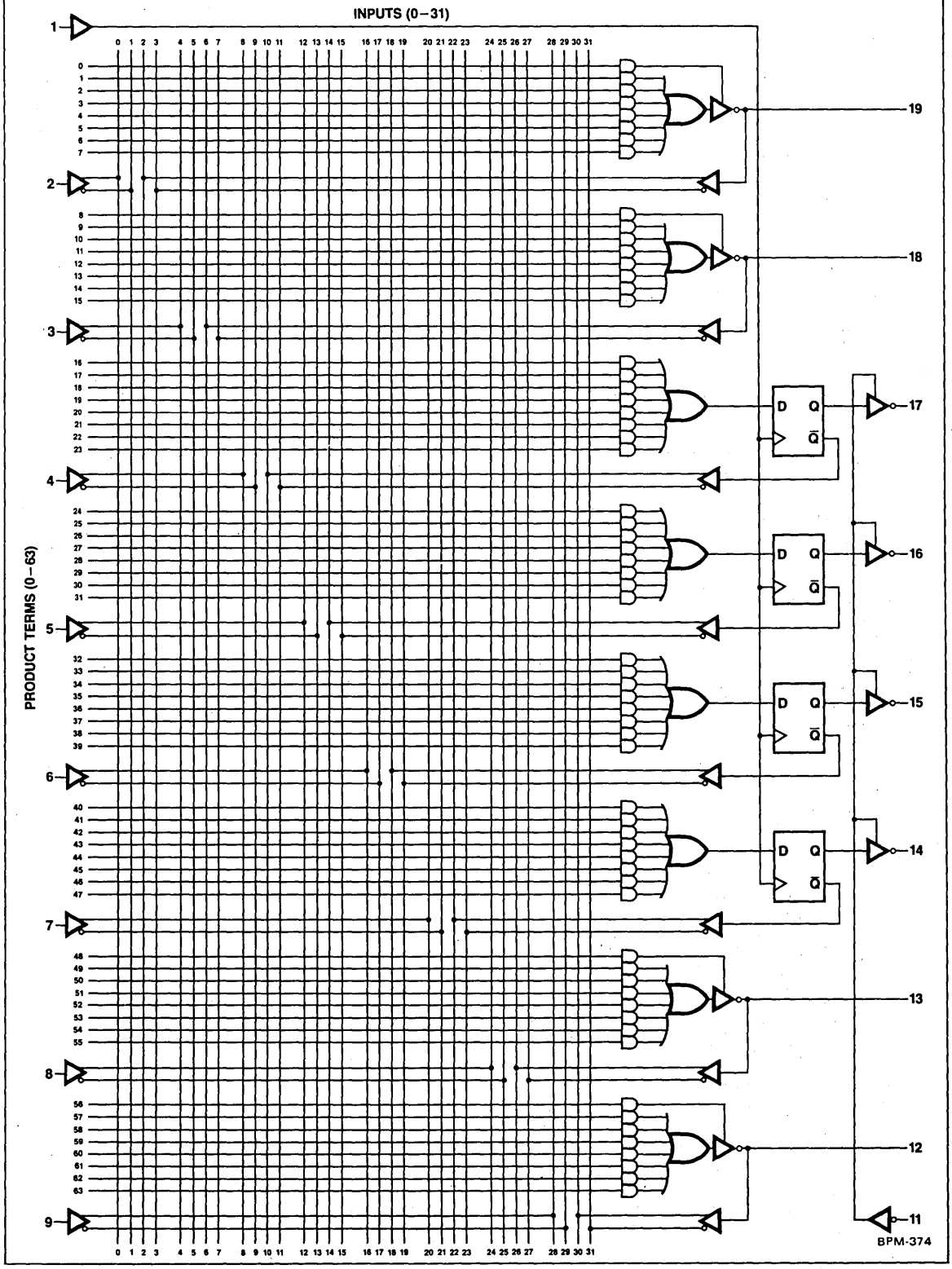
BIPOLAR LSI AND SUPPORT PRODUCTS
20-Pin IMOX™ Programmable Array Logic Elements



© IC MASTER 1983

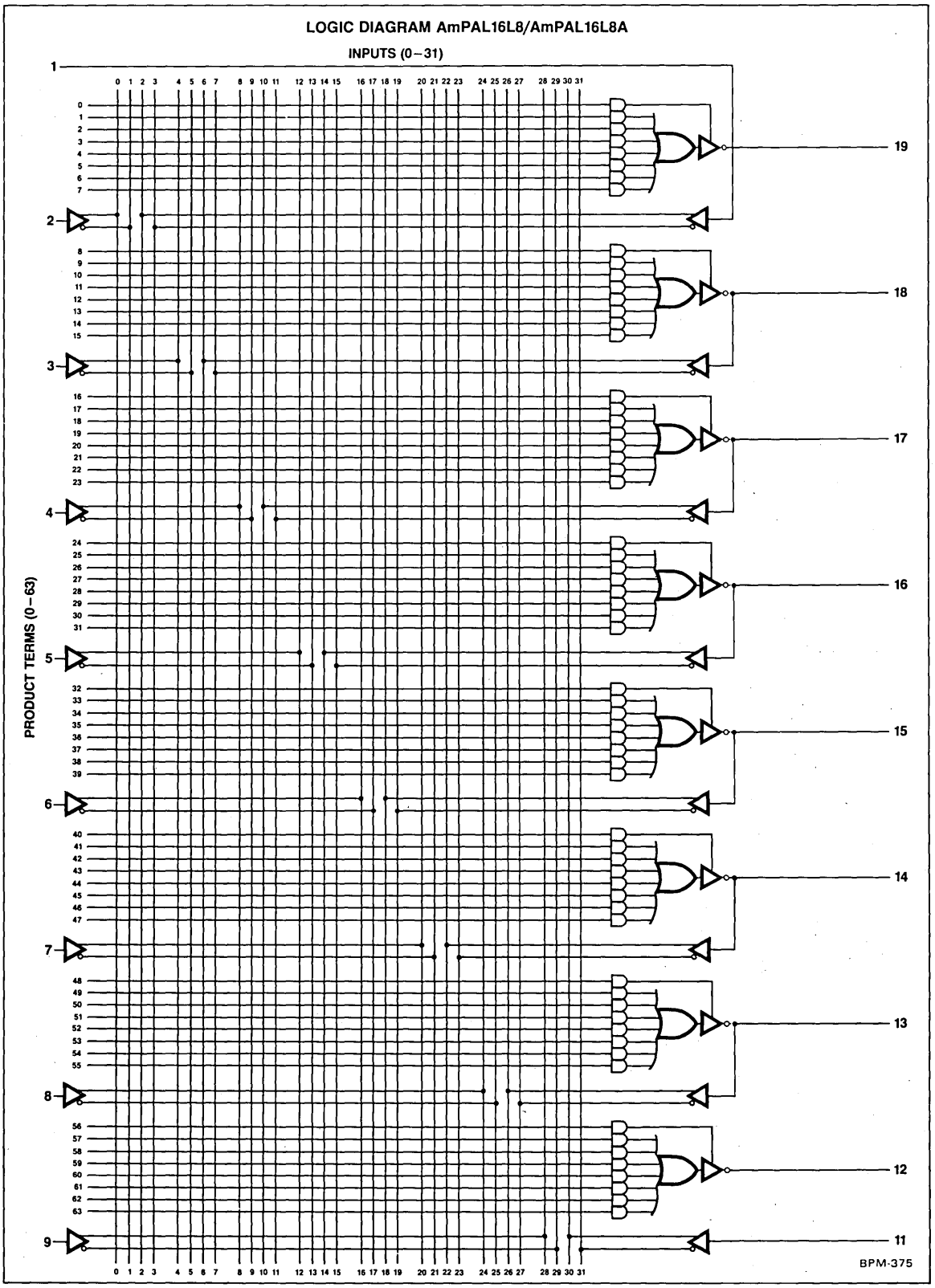
BIPOLAR LSI AND SUPPORT PRODUCTS
20-Pin IMOX™ Programmable Array Logic Elements

LOGIC DIAGRAM AmPAL16R4/AmPAL16R4A



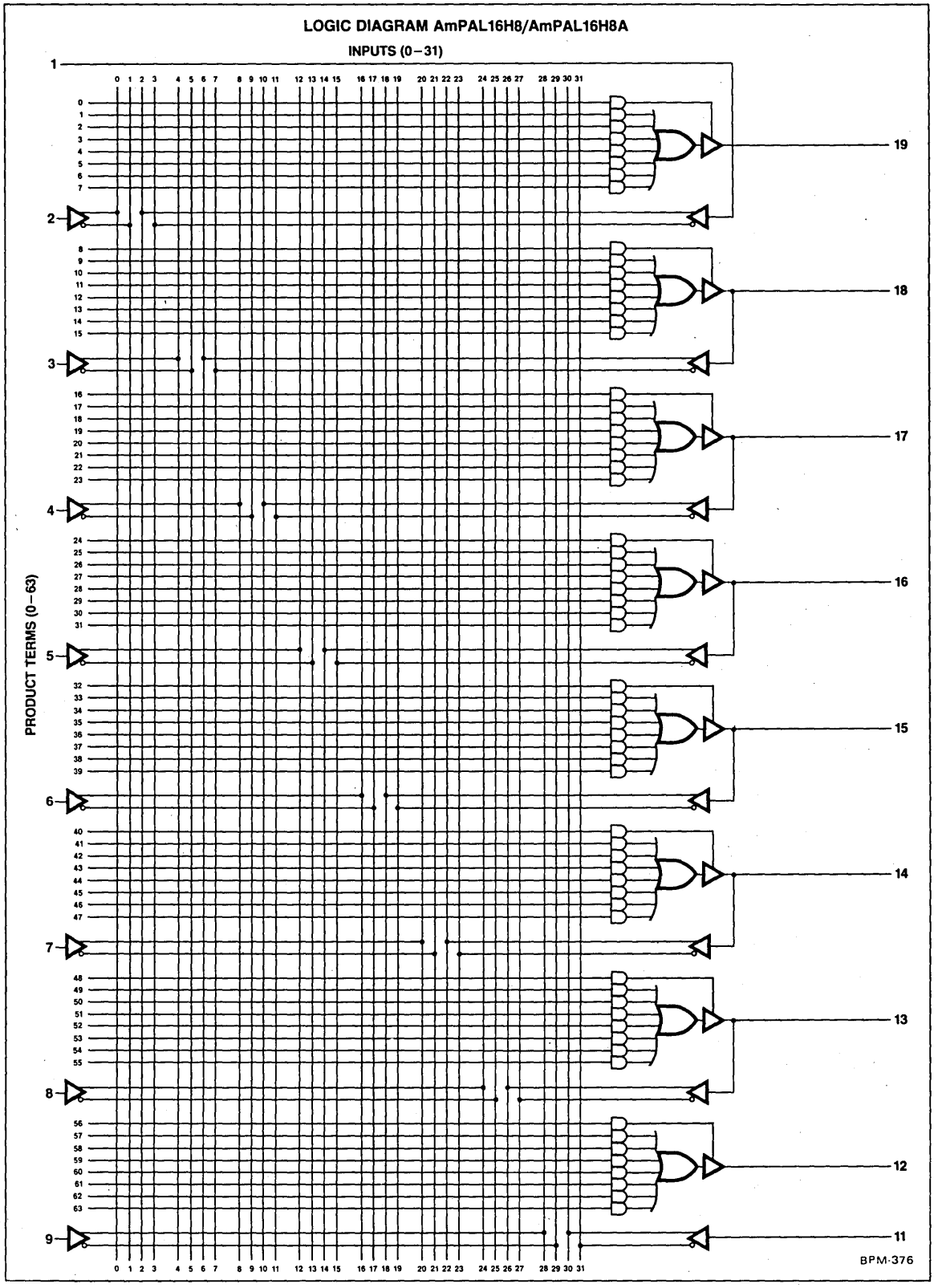
© IC MASTER 1983

BIPOLAR LSI AND SUPPORT PRODUCTS
20-Pin IMOX™ Programmable Array Logic Elements



© IC MASTER 1983

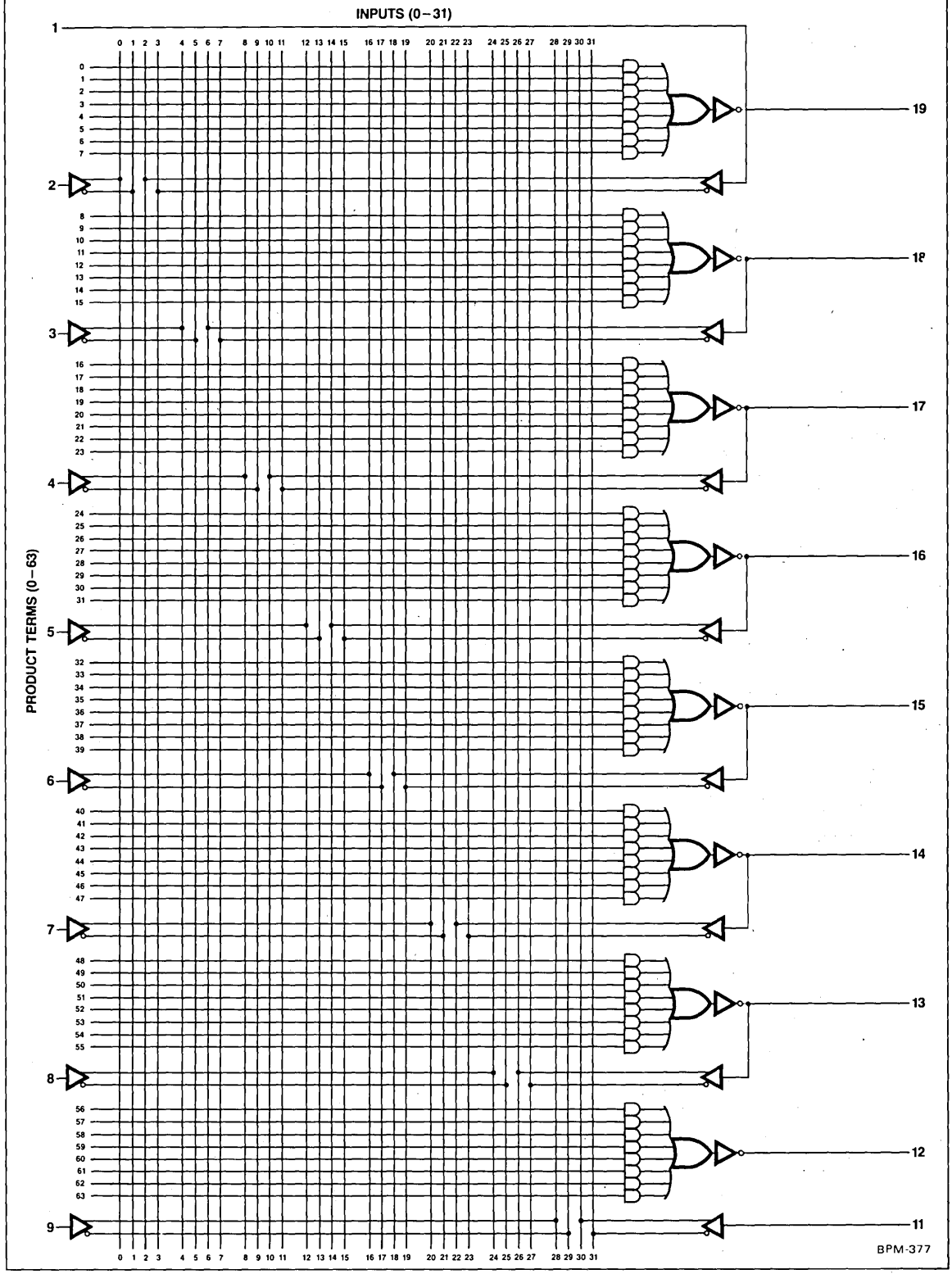
BIPOLAR LSI AND SUPPORT PRODUCTS
20-Pin IMOX™ Programmable Array Logic Elements



© IC MASTER 1983

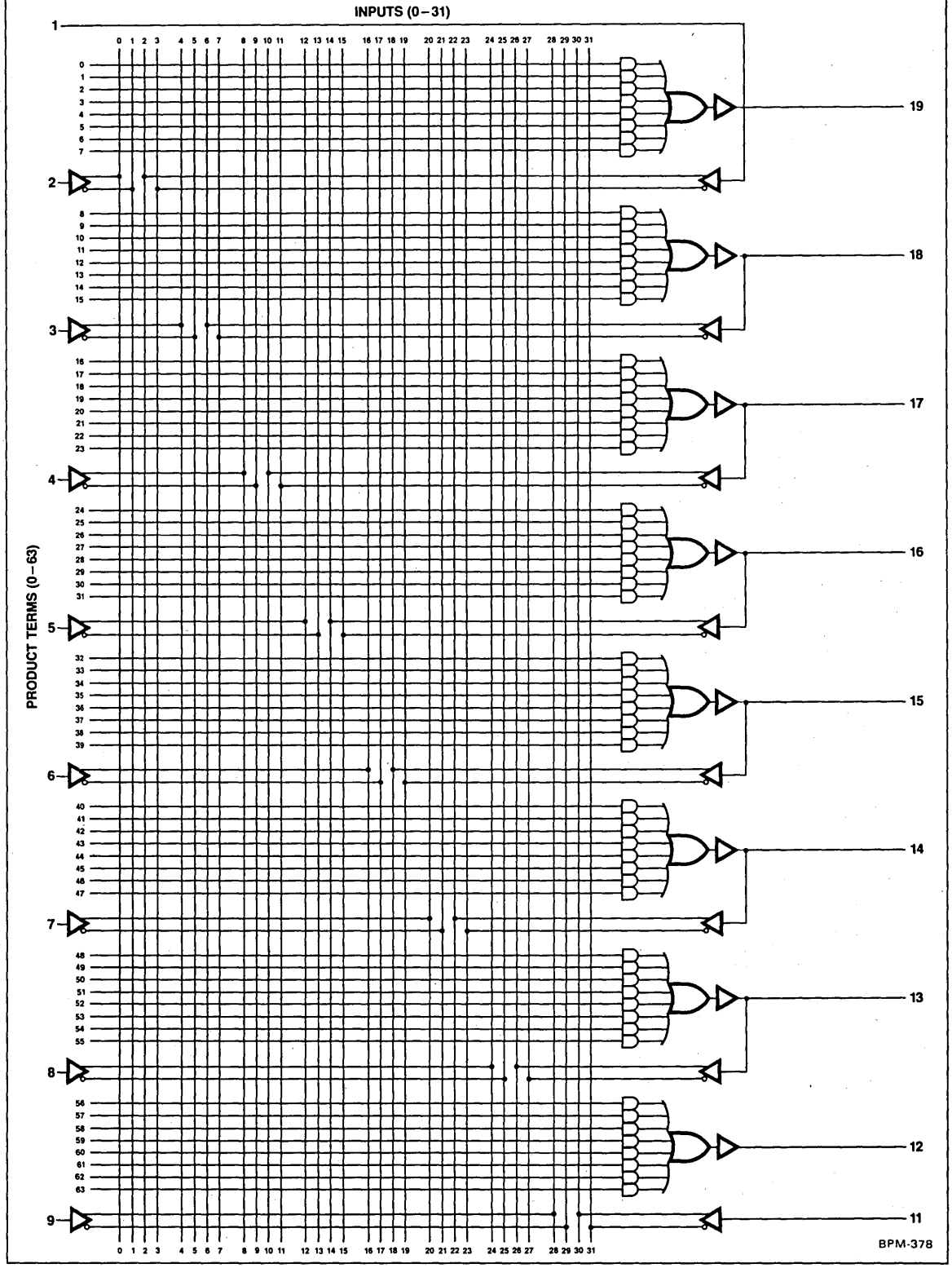
BIPOLAR LSI AND SUPPORT PRODUCTS
20-Pin IMOX™ Programmable Array Logic Elements

LOGIC DIAGRAM AmPAL16LD8/AmPAL16LD8A



© IC MASTER 1983

LOGIC DIAGRAM AmPAL16HD8/AmPAL16HD8A



© IC MASTER 1983

BIPOLAR LSI AND SUPPORT PRODUCTS
20-Pin IMOX™ Programmable Array Logic Elements

PROGRAMMING

Each AMD PAL fuse is programmed with a simple sequence of voltages applied to two control pins (1 and 11) and a programming voltage pulse applied to the output under programming. Addressing of the 2048 element fuse array is accomplished with normal TTL levels on eight input pins (five select the input line number and three select the product term number). V_{CC} is maintained at a normal level throughout the programming and verify cycle – no extra high levels are required.

The necessary sequence of levels for programming any fuse is shown in the Programming Timing Diagram. The address of each fuse in terms of Input Line Number and Product Term Line Number is defined by the Fuse Address Tables 1 and 2. Current, voltage and timing requirements for each pin are specified in the Programming Parameter Table below.

The 16L8, 16R8, 16R6, 16R4, 16H8, 16LD8 and 16HD8 use identical programming conditions and sequences.

After all programming has been completed, the entire array should be reverified at V_{CCL} and again at V_{CCH}. Reverification can be accomplished by reading all eight outputs in parallel rather than one at a time. The array fuse verification cycle checks that the correct array fuses have been blown and can be sensed by the outputs.

AMD PALs have been designed with many internal test features that are used to assure high programming yield and correct logical operation for a correctly programmed part.

An additional fuse is provided on each AMD PAL circuit to prevent unauthorized copying of AMD PAL fuse patterns when design security is desired. Blowing the security fuse blocks entry to the fuse pattern verify mode.

To blow the security fuse:
1. Power up part to V_{CCP}
2. Raise Pin 5 to V_{HH}.
3. Pulse Pin 11 from ground to V_{OP} for a 50μsec duration.
4. Perform a normal end-of-programming verify cycle at V_{CCL} and V_{CCH}. All fuse locations should be sensed as blown if the security fuse has been successfully blown.

Note that parts with the security fuse blown may not be returned as programming rejects.

AMD PALs normally have high programming yields (>98%). Programming yield losses are frequently due to poor socket contact, equipment out of calibration or improperly used.

PROGRAMMING PARAMETERS T_A = 25°C

Parameters	Description		Min	Typ	Max	Units
V_{HH}	Control Pin Extra High Level	Pin 1 @ 10–40mA	10	11	12	Volts
		Pin 11 @ 10–40mA	10	11	12	
V_{OP}	Program Voltage Pins 12–19 @ 15–200mA		18	20	22	Volts
V_{IHP}	Input High Level During Programming and Verify		2.4	5	5.5	Volts
V_{ILP}	Input Low Level During Programming and Verify		0.0	0.3	0.5	Volts
V_{CCP}	V_{CC} During Programming @ I_{CC} = 50–200mA		5	5.2	5.5	Volts
V_{CCL}	V_{CC} During First Pass Verification @ I_{CC} = 50–200mA		4.1	4.3	4.5	Volts
V_{CCH}	V_{CC} During Second Pass Verification @ I_{CC} = 50–200mA		5.4	5.7	6.0	Volts
V_{Blown}	Successful Blown Fuse Sense Level @ Output	16L8, 16R8, 16R6, 16R4, 16LD8 16L8A, 16R8A, 16R6A, 16R4A, 16LD8A		0.3	0.5	Volts
		16H8, 16HD8, 16H8A, 16HD8A	2.4	3		
dV_{OP}/dt	Rate of Output Voltage Change		20		250	V/μsec
dV_{11}/dt	Rate of Fusing Enable Voltage Change (Pin 11 Rising Edge)		100		1000	V/μsec
t_P	Fusing Time First Attempt		40	50	100	μsec
	Subsequent Attempts		4	5	10	msec
t_D	Delays Between Various Level Changes		100	200	1000	ns
t_V	Period During which Output is Sensed for V_{Blown} Level				500	ns
V_{ONP}	Pull-Up Voltage On Outputs Not Being Programmed		V_{CCP} – 0.3	V_{CCP}	V_{CCP} + 0.3	Volts
R	Pull-Up Resistor On Outputs Not Being Programmed		1.9	2	2.1	KΩ

AMD PAL PROGRAMMING EQUIPMENT INFORMATION

Source and Location	Data I/O 10525 Willows Rd. N.E. Redmond, WA 98052	Kontron Electronics, Inc. 630 Price Avenue Redwood City, CA 94063	Stag Microsystems 528-5 Weddel Drive Sunnyvale, CA 94086
Programmer Model(s)	Model-100, 29, 19 or 17	Model-MPP-80S or EPP80	Model-PPX
AMD PAL Personality Module	Logicpak 950-1942-001	MOD-33	PPM2200
Socket Adapter	715-1947-003	SA37	Am202S

© IC MASTER 1983

BIPOLAR LSI AND SUPPORT PRODUCTS
20-Pin IMOX™ Programmable Array Logic Elements

PROGRAMMING WAVEFORMS

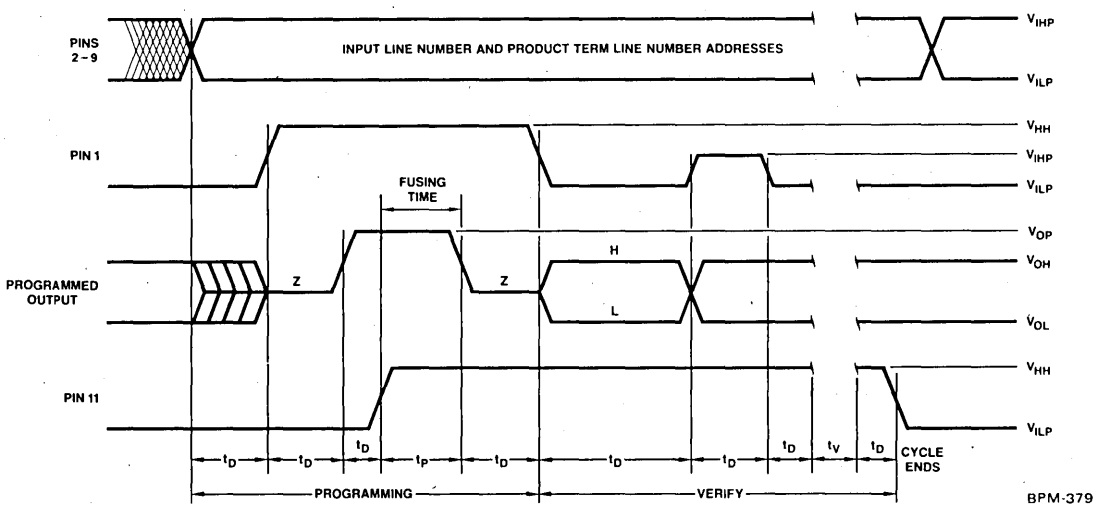


TABLE 1. INPUT ADDRESSING

Input Line Number	Input Line Number Address Pin States				
	9	8	7	6	5
0	L	L	L	L	L
1	L	L	L	L	H
2	L	L	L	H	L
3	L	L	L	H	H
4	L	L	H	L	L
5	L	L	H	L	H
6	L	L	H	H	L
7	L	L	H	H	H
8	L	H	L	L	L
9	L	H	L	L	H
10	L	H	L	H	L
11	L	H	L	H	H
12	L	H	H	L	L
13	L	H	H	L	H
14	L	H	H	H	L
15	L	H	H	H	H
16	H	L	L	L	L
17	H	L	L	L	H
18	H	L	L	H	L
19	H	L	L	H	H
20	H	L	H	L	L
21	H	L	H	L	H
22	H	L	H	H	L
23	H	L	H	H	H
24	H	H	L	L	L
25	H	H	L	L	H
26	H	H	L	H	L
27	H	H	L	H	H
28	H	H	H	L	L
29	H	H	H	L	H
30	H	H	H	H	L
31	H	H	H	H	H

L = V_{ILP}
H = V_{IHP}

SIMPLIFIED PROGRAMMING DIAGRAM

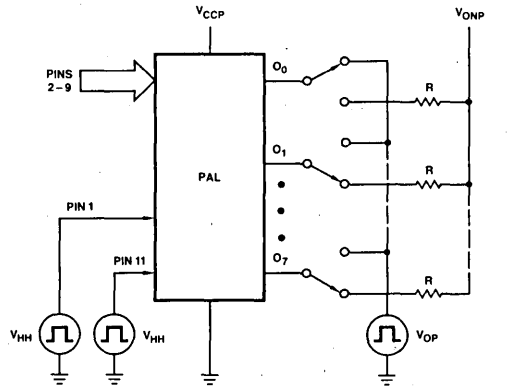


TABLE 2. PRODUCT TERM ADDRESSING

Product Term Line Number								Product Term Select Address Pin		
								4	3	2
0	8	16	24	32	40	48	56	L	L	L
1	9	17	25	33	41	49	57	L	L	H
2	10	18	26	34	42	50	58	L	H	L
3	11	19	27	35	43	51	59	L	H	H
4	12	20	28	36	44	52	60	H	L	L
5	13	21	29	37	45	53	61	H	L	H
6	14	22	30	38	46	54	62	H	H	L
7	15	23	31	39	47	55	63	H	H	H
Pin 19	Pin 18	Pin 17	Pin 16	Pin 15	Pin 14	Pin 13	Pin 12			
Programming Access and Verify Pin										

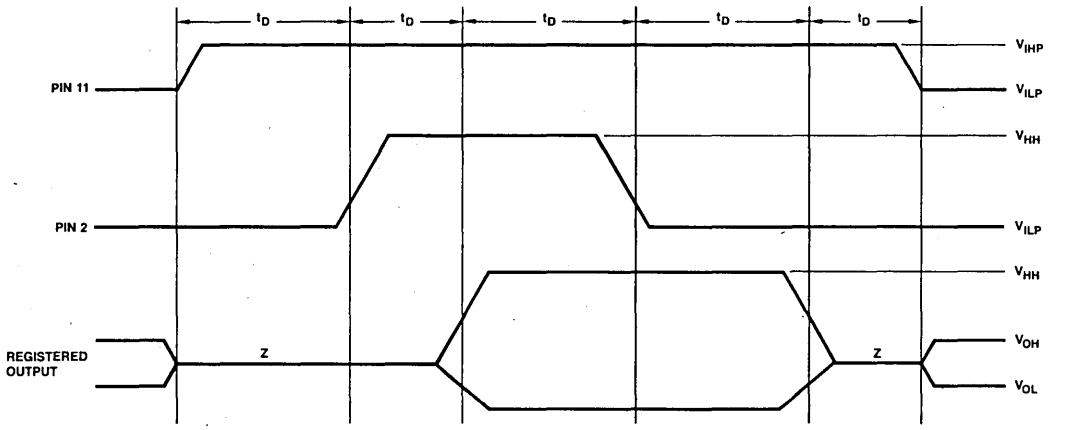
L = V_{ILP}
H = V_{IHP}

© IC MASTER 1983

PRELOAD OF REGISTERED OUTPUTS

AMD PAL registered outputs are designed with extra circuitry to allow loading each register asynchronously to either a HIGH or LOW state. This feature simplifies testing since any initial state for the registers can be set to optimize test sequencing.

The pin levels and timing necessary to perform the PRELOAD function are detailed below:



Level forced on registered output pin during preload cycle	Output state at the output pin after cycle
V_{HH}	HIGH
0V to V_{CCH} or OPEN	LOW

BPM-381

ORDERING INFORMATION

AmPAL XXXXX X X X X

Basic Device
16R8
16R6
16R4
16L8
16H8
16LD8
16HD8

Speed Selection
= Standard
A = High Speed

Screening
C = 883C Basic Flow
B = 883B (Burn-in)

Temperature Range
C = Commercial
M = Military

Package
P = Molded DIP (Commercial Only)
D = Hermetic DIP
L = Chip-Pak™*

*Chip-Paks are rated at maximum case temperature only.

Chip-Pak is a trademark of Advanced Micro Devices, Inc.

© IC MASTER 1983

AUTO CLOCK

Features

- ☐ **12 Hour, 4 Digit Auto Clock.**
- ☐ **Elapsed Time Counter (resettable, range to 99 hours).**
- ☐ **Calendar (4-year calendar with pin option for European date/month reversal).**
- ☐ **Ignition-Sensing Display Cut-off (to reduce battery drain when the auto is not operating).**
- ☐ **Crystal Input Accuracy (uses inexpensive 4.194 mHz crystal).**
- ☐ **Direct Display Drive (4-digit vacuum fluorescent displays, 24 Volts).**

Applications/Markets

- ☐ Automotive
- ☐ Avionics
- ☐ Marine
- ☐ Portable Clocks
- ☐ Industrial

General Description

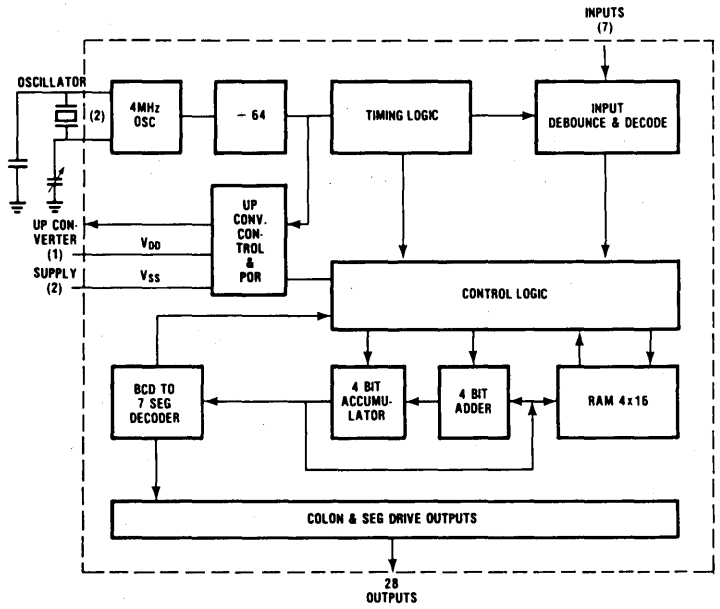
The S4003 Auto Clock is a PMOS integrated circuit which has found wide application in auto, avionic and marine applications as a portable or dashboard clock and as an industrial timer.

A functional description of the inputs/outputs and registers follows:

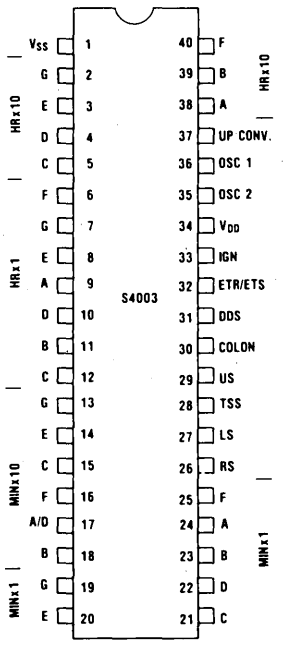
1. **Set Inputs**—Left digits set and right digits set will index the selected register at a 2Hz rate. Indexing either input will not upset the unselected digits.

2. **Time Set Select**—Enables set inputs to the timekeeping register. When updating hours, the minutes display will blank out and MX1 digit will display A or P. Minutes will update in a normal manner and reset seconds to zero. Seconds will restart on release of the time set select line. When deselected, the time will continue to be displayed for 5 seconds ±1 seconds. AM and PM indications will switch on the transfer from 11:59 to 12:00.

Block Diagram



Pin Configuration



© IC MASTER 1983

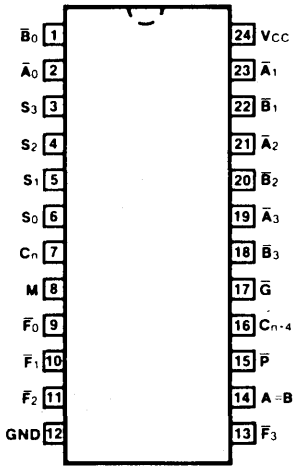
54F/74F181

4-BIT ARITHMETIC LOGIC UNIT

DESCRIPTION—The 'F181 is a 4-bit Arithmetic Logic Unit (ALU) which can perform all the possible 16 logic operations on two variables and a variety of arithmetic operations. It is 40% faster than the Schottky ALU and only consumes 30% as much power.

- **PROVIDES 16 ARITHMETIC OPERATIONS ADD, SUBTRACT, COMPARE, DOUBLE, PLUS TWELVE OTHER ARITHMETIC OPERATIONS**
- **PROVIDES ALL 16 LOGIC OPERATIONS OF TWO VARIABLES EXCLUSIVE-OR, COMPARE, AND, NAND, OR, NOR, PLUS TEN OTHER LOGIC OPERATIONS.**
- **FULL LOOKAHEAD FOR HIGH-SPEED ARITHMETIC OPERATION ON LONG WORDS**

CONNECTION DIAGRAM



ORDERING CODE:

PKGS	COMMERCIAL GRADE	MILITARY GRADE	PKG TYPE
	V_{CC} = +5.0 V ±5%, T_A = 0°C to +70°C	V_{CC} = +5.0 V ±10%, T_A = -55°C to +125°C	
Plastic DIP (P)	74F181PC		9N
Ceramic DIP (D)	74F181DC	54F181DM	6N
Flatpak (F)		54F181FM	4M

INPUT LOADING/FAN-OUT:

PIN NAMES	DESCRIPTION	54F/74F (U.L.) HIGH/LOW
$\overline{A}_0 - \overline{A}_3$	A Operand Inputs (Active LOW)	0.5/1.125
$\overline{B}_0 - \overline{B}_3$	B Operand Inputs (Active LOW)	0.5/1.125
$S_0 - S_3$	Function Select Inputs	0.5/1.50
M	Mode Control Input	0.5/0.375
C_n	Carry Input	0.5/1.875
$\overline{F}_0 - \overline{F}_3$	Function Outputs (Active LOW)	25/12.5
A = B	Comparator Output	OC*/12.5
$\overline{G}$	Carry Generate Output (Active LOW)	25/12.5
$\overline{P}$	Carry Propagate Output (Active LOW)	25/12.5
C_{n+4}	Carry Output	25/12.5

*OC — Open Collector

© IC MASTER 1983

FUNCTIONAL DESCRIPTION—The 'F181 is a 4-bit high-speed parallel Arithmetic Logic Unit (ALU). Controlled by the four Function Select inputs (S_0-S_3) and the Mode Control input (M), it can perform all the 16 possible logic operations or 16 different arithmetic operations on active-HIGH or active-LOW operands. The Function Table lists these operations.

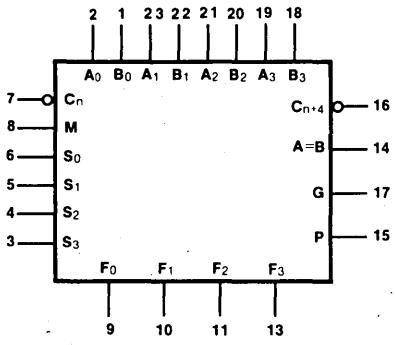
When the Mode Control input (M) is HIGH, all internal carries are inhibited and the device performs logic operations on the individual bits as listed. When the Mode Control input is LOW, the carries are enabled and the device performs arithmetic operations on the two 4-bit words. The device incorporates full internal carry lookahead and provides for either ripple carry between devices using the C_{n+4} output, or for carry lookahead between packages using the signal $\overline{P}$ (Carry Propagate) and $\overline{G}$ (Carry Generate). In the Add mode, $\overline{P}$ indicates that $\overline{F}$ is 15 or more, while $\overline{G}$ indicates that $\overline{F}$ is 16 or more. In the Subtract mode, $\overline{P}$ indicates that $\overline{F}$ is zero or less, while $\overline{G}$ indicates that $\overline{F}$ is less than zero. $\overline{P}$ and $\overline{G}$ are not affected by carry in. When speed requirements are not stringent, it can be used in a simple Ripple Carry mode by connecting the Carry output (C_{n+4}) signal to the Carry input (C_n) of the next unit. For high-speed operation the device is used in conjunction with a carry lookahead circuit. One carry lookahead package is required for each group of four 'F181 devices. Carry lookahead can be provided at various levels and offers high speed capability over extremely long word lengths.

The A=B output from the device goes HIGH when all four $\overline{F}$ outputs are HIGH and can be used to indicate logic equivalence over four bits when the unit is in the Subtract mode. The A=B output is open collector and can be wired-AND with other A=B outputs to give a comparison for more than four bits. The A=B signal can also be used with the C_{n+4} signal to indicate A>B and A<B.

The Function Table lists the arithmetic operations that are performed without a carry in. An incoming carry adds a one to each operation. Thus, select code LHHL generates A minus B minus 1 (2s complement notation) without a carry in and generates A minus B when a carry is applied. Because subtraction is actually performed by complementary addition (1s complement), a carry out means $\overline{\text{borrow}}$; thus a carry is generated when there is no underflow and no carry is generated when there is underflow. As indicated, this device can be used with either active-LOW inputs producing active-LOW outputs or with active-HIGH inputs producing active-HIGH outputs. For either case the table lists the operations that are performed to the operands labeled inside the logic system.

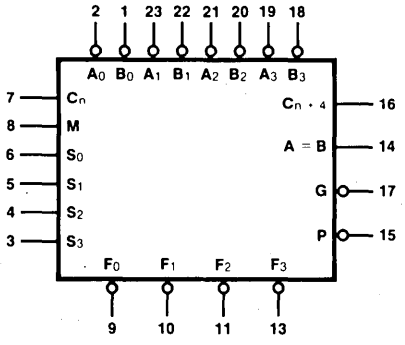
LOGIC SYMBOLS

ACTIVE-HIGH OPERANDS



V_{CC} = Pin 24
GND = Pin 12

ACTIVE-LOW OPERANDS



© IC MASTER 1983

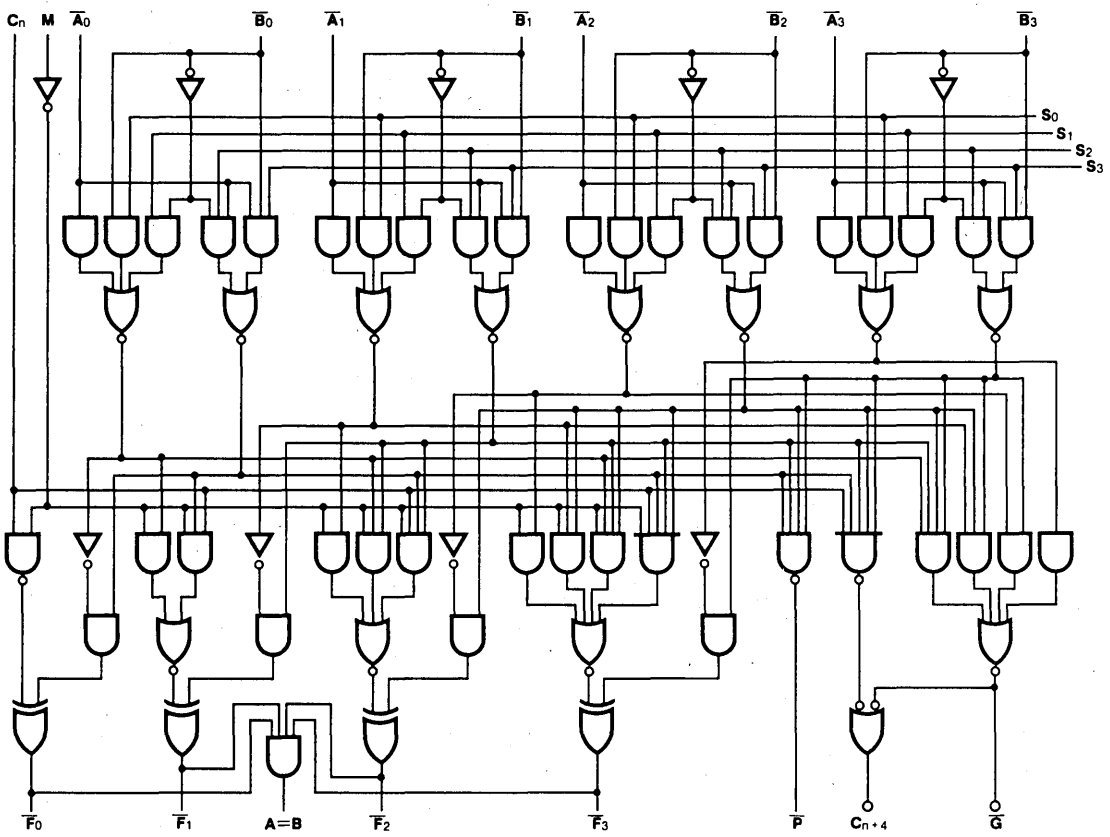
FUNCTION TABLE

MODE SELECT INPUTS				ACTIVE-LOW OPERANDS & F_n OUTPUTS		ACTIVE-HIGH OPERANDS & F_n OUTPUTS	
S_3	S_2	S_1	S_0	LOGIC (M = H)	ARITHMETIC** (M = L) (C_n = L)	LOGIC (M = H)	ARITHMETIC** (M = L) (C_n = H)
L	L	L	L	$\overline{A}$	A minus 1	$\overline{A}$	A
L	L	L	H	$\overline{AB}$	AB minus 1	$\overline{A+B}$	A + B
L	L	H	L	$\overline{A}+B$	$A\overline{B}$ minus 1	$\overline{A}B$	$A+\overline{B}$
L	L	H	H	Logic 1	minus 1	Logic 0	minus 1
L	H	L	L	$\overline{A+B}$	A plus $(A+\overline{B})$	$\overline{A\overline{B}}$	A plus $A\overline{B}$
L	H	L	H	$\overline{B}$	AB plus $(A+\overline{B})$	$\overline{B}$	$(A+B)$ plus $A\overline{B}$
L	H	H	L	$\overline{A \oplus B}$	A minus B minus 1	$A \oplus B$	A minus B minus 1
L	H	H	H	$A+\overline{B}$	$A+\overline{B}$	$A\overline{B}$	$A\overline{B}$ minus 1
H	L	L	L	$\overline{A}B$	A plus $(A+B)$	$\overline{A+B}$	A plus AB
H	L	L	H	$A \oplus B$	A plus B	$\overline{A \oplus B}$	A plus B
H	L	H	L	B	$A\overline{B}$ plus $(A+B)$	B	$(A+\overline{B})$ plus AB
H	L	H	H	A + B	A + B	AB	AB minus 1
H	H	L	L	Logic 0	A plus A*	Logic 1	A plus A*
H	H	L	H	$A\overline{B}$	AB plus A	$A+\overline{B}$	$(A+B)$ plus A
H	H	H	L	AB	$A\overline{B}$ minus A	A + B	$(A+\overline{B})$ plus A
H	H	H	H	A	A	A	A minus 1

*each bit is shifted to the next more significant position
**arithmetic operations expressed in 2s complement notation

H = HIGH Voltage Level
L = LOW Voltage Level

LOGIC DIAGRAM



© IC MASTER 1983

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER	54F/74F			UNITS	CONDITIONS
		Min	Typ	Max		
I_{OH}	Output HIGH Current			250	μA	V_{OH} = 4.5 V, V_{CC} = Min, A = B
I_{CC}	Power Supply Current		43	65	mA	V_{CC} = Max

AC CHARACTERISTICS:

SYMBOL	PARAMETER		54F/74F T_A = +25°C, V_{CC} = +5.0 V, C_L = 50 pF			54F T_A, V_{CC} = Mil, C_L 50 pF		74F T_A, V_{CC} = Com, C_L = 50 pF		UNITS
	Path	Mode	Min	Typ	Max	Min	Max	Min	Max	
t_{PLH} t_{PHL}	C_n to C_{n+4}		3.0 3.0	6.4 6.1	8.5 8.0	3.0 3.0	12 11.5	3.0 3.0	9.5 9.0	ns
t_{PLH} t_{PHL}	$\overline{A}$ or $\overline{B}$ to C_{n+4}	Sum	5.0 5.0	10 9.4	13 12	5.0 5.0	18 17	5.0 5.0	14 13	ns
t_{PLH} t_{PHL}	$\overline{A}$ or $\overline{B}$ to C_{n+4}	Dif	5.0 5.0	10.8 10	14 13	5.0 5.0	19.5 18	5.0 5.0	15 14	ns
t_{PLH} t_{PHL}	C_n to $\overline{F}$	Any	3.0 3.0	6.7 6.5	8.5 8.5	3.0 3.0	12 12	3.0 3.0	9.5 9.5	ns
t_{PLH} t_{PHL}	$\overline{A}$ or $\overline{B}$ to $\overline{G}$	Sum	3.0 3.0	5.7 5.8	7.5 7.5	3.0 3.0	10.5 10.5	3.0 3.0	8.5 8.5	ns
t_{PLH} t_{PHL}	$\overline{A}$ or $\overline{B}$ to $\overline{G}$	Dif	3.0 3.0	6.5 7.3	8.5 9.5	3.0 3.0	12 13.5	3.0 3.0	9.5 10.5	ns
t_{PLH} t_{PHL}	$\overline{A}$ or $\overline{B}$ to $\overline{P}$	Sum	3.0 3.0	5.0 5.5	7.0 7.5	3.0 3.0	10 10.5	3.0 3.0	8.0 8.5	ns
t_{PLH} t_{PHL}	$\overline{A}$ or $\overline{B}$ to $\overline{P}$	Dif	4.0 4.0	5.8 6.5	7.5 8.5	4.0 4.0	10.5 12	4.0 4.0	8.5 9.5	ns
t_{PLH} t_{PHL}	$\overline{A_i}$ or $\overline{B_i}$ to $\overline{F_i}$	Sum	3.0 3.0	7.0 7.2	9.0 10	3.0 3.0	12.5 14	3.0 3.0	10 10	ns
t_{PLH} t_{PHL}	$\overline{A_i}$ or $\overline{B_i}$ to $\overline{F_i}$	Dif	3.0 3.0	8.2 5.0	11 11	3.0 3.0	15.5 15.5	3.0 3.0	12 12	ns
t_{PLH} t_{PHL}	Any $\overline{A}$ or $\overline{B}$ to Any $\overline{F}$	Sum	4.0 4.0	8.0 7.8	10.5 10	4.0 4.0	15.5 14	4.0 4.0	11.5 11	ns
t_{PLH} t_{PHL}	Any $\overline{A}$ or $\overline{B}$ to Any $\overline{F}$	Dif	4.5 4.5	9.4 9.4	12 12	4.5 4.5	17 17	4.5 4.5	13 13	ns
t_{PLH} t_{PHL}	$\overline{A}$ or $\overline{B}$ to $\overline{F}$	Logic	4.0 4.0	6.0 6.0	9.0 10	4.0 4.0	12.5 14	4.0 4.0	10 11	ns
t_{PLH} t_{PHL}	$\overline{A}$ or $\overline{B}$ to A = B	Dif	11 7.0	18.5 9.8	27 12.5	11 7.0	35 17.5	11 7.0	29 13.5	ns

▨ Test limits in screened columns are preliminary.

© IC MASTER 1983

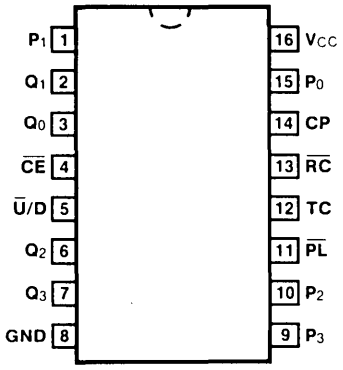
54F/74F190 • 54F/74F191

UP/DOWN COUNTERS
(WITH PRESET AND RIPPLE CLOCK)

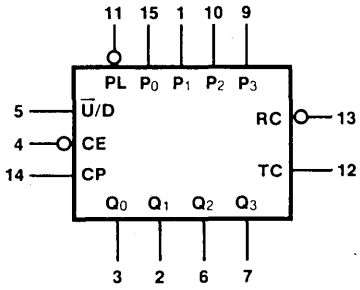
DESCRIPTION—The 'F190 is a reversible BCD(8421) decade counter. The 'F191 is a reversible modulo 16 binary counter. Both feature synchronous counting and asynchronous presetting. The preset feature allows the 'F190 and 'F191 to be used in programmable dividers. The Count Enable input, the Terminal Count output and the Ripple Clock output make possible a variety of methods of implementing multistage counters. In the counting modes, state changes are initiated by the rising edge of the clock.

- **HIGH-SPEED—110 MHz TYPICAL COUNT FREQUENCY**
- **SYNCHRONOUS COUNTING**
- **ASYNCHRONOUS PARALLEL LOAD**
- **CASCADABLE**

CONNECTION DIAGRAM



LOGIC SYMBOL



VCC = Pin 16
GND = Pin 8

PKGS	COMMERCIAL GRADE VCC = +5.0 V ±5%, TA = 0°C to +70°C	MILITARY GRADE VCC = +5.0 V ±10%, TA = -55°C to +125°C	PKG TYPE
Plastic DIP (P)	74F190PC, 74F191PC		9B
Ceramic DIP (D)	74F190DC, 74F191DC	54F190DM, 54F191DM	7B
Flatpak (F)		54F190FM, 54F191FM	4L

INPUT LOADING/FAN-OUT:

PIN NAMES	DESCRIPTION	54F/74F (U.L.) HIGH/LOW
$\overline{CE}$	Count Enable Input (Active LOW)	0.5/1.125
CP	Clock Pulse Input (Active Rising Edge)	0.5/0.375
P0 - P0	Parallel Data Inputs	0.5/0.375
$\overline{PL}$	Asynchronous Parallel Load Input (Active LOW)	0.5/0.375
$\overline{U}$/D	Up/Down Count Control Input	0.5/0.375
Q0 - Q3	Flip-flop Outputs	25/12.5
$\overline{RC}$	Ripple Clock Output (Active LOW)	25/12.5
TC	Terminal Count Output (Active HIGH)	25/12.5

© IC MASTER 1983

FUNCTIONAL DESCRIPTION—The 'F190/191 are synchronous up/down counters. The 'F190 is a BCD decade counter while the 'F191 is organized as a 4 bit binary counter. Both contain four edge triggered flip-flops with internal gating and steering logic to provide individual preset, count-up and count-down operations.

Each circuit has an asynchronous parallel load capability permitting the counter to be preset to any desired number. When the Parallel Load ($\overline{PL}$) input is LOW, information present on the Parallel Data inputs (P_0-P_3) is loaded into the counter and appears on the Q outputs. This operation overrides the counting functions, as indicated in the Mode Select Table.

A HIGH signal on the $\overline{CE}$ input inhibits counting. When $\overline{CE}$ is LOW, internal state changes are initiated synchronously by the LOW-to-HIGH transition of the clock input. The direction of counting is determined by the $\overline{U}$/D input signal, as indicated in the Mode Select Table. $\overline{CE}$ and $\overline{U}$/D can be changed with the clock in either state, provided only that the recommended setup and hold times are observed.

Two types of outputs are provided as overflow/underflow indicators. The terminal count(TC) output is normally LOW. It goes HIGH when the circuits reach zero in the count down mode or 9 ('F190) or 16 ('F191) in the count up mode. The TC output will then remain HIGH until a state change occurs, whether by counting or presetting or until $\overline{U}$/D is changed. The TC output should not be used as a clock signal because it is subject to decoding spikes.

The TC signal is also used internally to enable the Ripple Clock ($\overline{RC}$) output. The $\overline{RC}$ output is normally HIGH. When $\overline{CE}$ is LOW and TC is HIGH, the $\overline{RC}$ output will go LOW when the clock next goes LOW and will stay LOW until the clock goes HIGH again. This feature simplifies the design of multistage counters, as indicated in *Figures a* and *b*. In *Figure a*, each $\overline{RC}$ output is used as the clock input for the next higher stage. This configuration is particularly advantageous when the clock source has a limited drive capability, since it drives only the first stage. To prevent counting in all stages it is only necessary to inhibit the first stage, since a HIGH signal on $\overline{CE}$ inhibits the $\overline{RC}$ output pulse, as indicated in the $\overline{RC}$ Truth Table. A disadvantage of this configuration, in some applications, is the timing skew between state changes in the first and last stages. This represents the cumulative delay of the clock as it ripples through the preceding stages.

A method of causing state changes to occur simultaneously in all stages is shown in *Figure b*. All clock inputs are driven in parallel and the $\overline{RC}$ outputs propagate the carry/borrow signals in ripple fashion. In this configuration the LOW state duration of the clock must be long enough to allow the negative-going edge of the carry/borrow signal to ripple through to the last stage before the clock goes HIGH. There is no such restriction on the HIGH state duration of the clock, since the $\overline{RC}$ output of any device goes HIGH shortly after its CP input goes HIGH.

The configuration shown in *Figure c* avoids ripple delays and their associated restrictions. The $\overline{CE}$ input for a given stage is formed by combining the TC signals from all the preceding stages. Note that in order to inhibit counting an enable signal must be included in each carry gate. The simple inhibit scheme of *Figures a* and *b* doesn't apply, because the TC output of a given stage is not affected by its own $\overline{CE}$.

MODE SELECT TABLE

INPUTS				MODE
$\overline{PL}$	$\overline{CE}$	$\overline{U}$/D	CP	
H	L	L	⌐	Count Up
H	L	H	⌐	Count Down
L	X	X	X	Preset (Asyn.)
H	H	X	X	No Change (Hold)

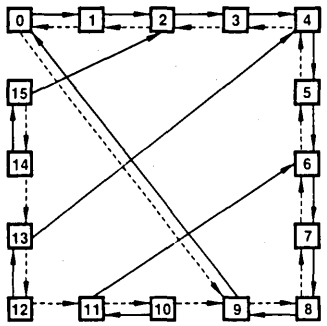
H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial

$\overline{RC}$ TRUTH TABLE

INPUTS			OUTPUT
$\overline{CE}$	TC*	CP	$\overline{RC}$
L	H	⌐	⌐
H	X	X	H
X	L	X	H

*TC is generated internally

'F191 STATE DIAGRAM



© IC MASTER 1983

FIG. A N-STAGE COUNTER USING RIPPLE CLOCK

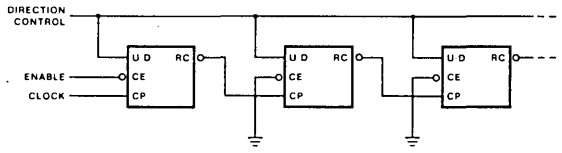


FIG. B SYNCHRONOUS N-STAGE COUNTER USING RIPPLE CARRY/BORROW

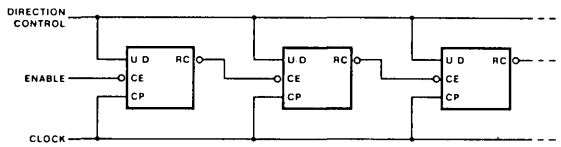
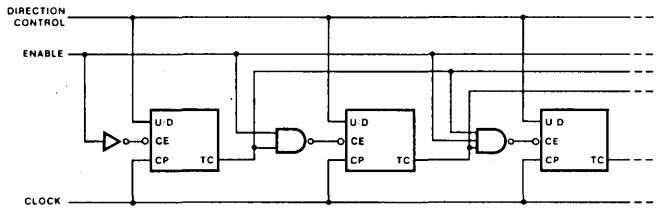


FIG. C SYNCHRONOUS N-STAGE COUNTER WITH PARALLEL GATED CARRY/BORROW



DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER	54F/74F			UNITS	CONDITIONS
		Min	Typ	Max		
I_{CC}	Power Supply Current		38	55	mA	V_{CC} = Max

AC CHARACTERISTICS:

SYMBOL	PARAMETER	54F/74F			54F		74F		UNITS
		T_A = +25°C, V_{CC} = +5.0 V C_L = 50 pF			T_A, V_{CC} Mil C_L = 50 pF		T_A, V_{CC} = Com C_L = 50 pF		
		Min	Typ	Max	Min	Max	Min	Max	
f_{max}	Maximum Count Frequency	100	125				100.		MHz
t_{PLH} t_{PHL}	Propagation Delay CP to Q_n	3.0 5.0	5.5 8.5	7.5 11.0			3.0 5.0	8.5 12.0	ns
t_{PLH} t_{PHL}	Propagation Delay CP to TC	6.0 5.0	10 8.5	13.0 11.0			6.0 5.0	14.0 12.0	
t_{PLH} t_{PHL}	Propagation Delay CP to $\overline{RC}$	3.0 3.0	5.5 5.0	7.5 7.0			3.0 3.0	8.5 8.0	ns
t_{PLH} t_{PHL}	Propagation Delay $\overline{CE}$ to $\overline{RC}$	3.0 3.0	5.0 5.5	7.0 7.0			3.0 3.0	8.0 8.0	
t_{PLH} t_{PHL}	Propagation Delay $\overline{U}$/D to $\overline{RC}$	7.0 5.5	11 9	18 12			7.0 5.5	20 13	ns
t_{PLH} t_{PHL}	Propagation Delay $\overline{U}$/D to TC	4.0 4.0	7 6.5	10 10			4.0 4.0	11 11	
t_{PLH} t_{PHL}	Propagation Delay P_n to Q_n	3.0 6.0	4.5 10	7.0 13			3.0 6.0	8.0 14	ns
t_{PLH} t_{PHL}	Propagation Delay $\overline{PL}$ to Q_n	5.0 5.5	8.5 9	11 12			5.0 5.5	12 13	ns

© IC MASTER 1983

AC OPERATING REQUIREMENTS:

SYMBOL	PARAMETER	54F/74F	54F	74F	UNITS	
		T_A = +25°C, V_{CC} = +5.0 V	T_A, V_{CC} = Mil	T_A, V_{CC} = Com		
		Min Typ Max	Min Max	Min Max		
t_s (H) t_s (L)	Setup Time, HIGH or LOW P_n to $\overline{PL}$	6.0 6.0		6.0 6.0	ns	
t_h (H) t_h (L)	Hold Time, HIGH or LOW P_n to $\overline{PL}$	4.0 4.0		4.0 4.0		
t_s (L)	Setup Time LOW $\overline{CE}$ to CP	10.0		10.0	ns	
t_h (L)	Hold Time LOW $\overline{CE}$ to CP	0		0		
t_w (L)	$\overline{PL}$ Pulse Width, LOW	6.0		6.0	ns	
t_w (L)	CP Pulse Width, LOW	7.0		7.0	ns	
t_{rec}	Recovery Time $\overline{PL}$ to CP	7.0		7.0	ns	

© IC MASTER 1983

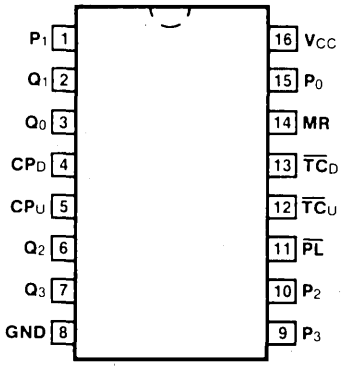
54F/74F192 • 54F/74F193

UP/DOWN COUNTERS
(WITH SEPARATE UP/DOWN CLOCKS)

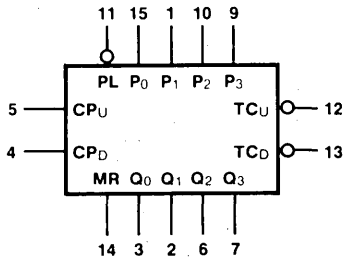
DESCRIPTION—The 'F192 is an up/down BCD decade (8421) counter. The 'F193 is an up/down modulo-16 binary counter. Separate Count Up and Count Down Clocks are used, and in either counting mode the circuits operate synchronously. The outputs change state synchronously with the LOW-to-HIGH transitions on the clock inputs.

Separate Terminal Count UP and Terminal Count Down outputs are provided that are used as the clocks for a subsequent stage without extra logic, thus simplifying multistage counter designs. Individual preset inputs allow the circuit to be used as a programmable counter. Both the Parallel Load ($\overline{PL}$) and the Master Reset (MR) inputs asynchronously override the clocks.

CONNECTION DIAGRAM



LOGIC SYMBOL



VCC = Pin 16
GND = Pin 8

ORDERING CODE:

PKGS	COMMERCIAL GRADE	MILITARY GRADE	PKG TYPE
	VCC = +5.0 V ±5%, TA = 0°C to +70°C	VCC = +5.0 V ±10%, TA = -55°C to +125°C	
Plastic DIP (P)	74F192PC,74F193PC		9B
Ceramic DIP (D)	74F192DC,74F193DC	54F192DM,54F193DM	6B
Flatpak (F)		54F192FM,54F193FM	4L

INPUT LOADING/FAN-OUT:

PIN NAMES	DESCRIPTION	54F/74F (U.L.) HIGH/LOW
CP_U	Count Up Clock Input (Active Rising Edge)	0.5/0.75
CP_D	Count Down Clock Input (Active Rising Edge)	0.5/0.75
MR	Asynchronous Master Reset Input (Active HIGH)	0.5/0.375
$\overline{PL}$	Asynchronous Parallel Load Input (Active LOW)	0.5/0.375
$P_0 - P_3$	Parallel Data Inputs	0.5/0.375
$Q_0 - Q_3$	Flip-flop Outputs	25/12.5
$\overline{TC_D}$	Terminal Count Down (Borrow) Output (Active LOW)	25/12.5
$\overline{TC_U}$	Terminal Count Up (Carry) Output (Active LOW)	25/12.5

© IC MASTER 1983

FUNCTIONAL DESCRIPTION—The 'F192, 193 are asynchronously presettable counters. The 'F192 is a decade counter while the 'F193 is organized for 4 bit binary operation. They both contain four edge triggered flip-flops, with internal gating and steering logic to provide master reset, individual preset, count up and count down operations.

A LOW-to-HIGH transition on the CP input to each flip-flop causes the output to change state. Synchronous switching, as opposed to ripple counting, is achieved by driving the steering gates of all stages from a common Count Up line and a common Count Down line, thereby causing all state changes to be initiated simultaneously. A LOW-to-HIGH transition on the Count Up input will advance the count by one; a similar transition on the Count Down input will decrease the count by one. While counting with one clock input, the other should be held HIGH, as indicated in the Function Table. Otherwise, the circuit will either count by twos or not at all, depending on the state of the first flip-flop, which cannot toggle as long as either clock input is LOW.

The Terminal Count Up ($\overline{TC}_U$) and Terminal Count Down ($\overline{TC}_D$) outputs are normally HIGH. When the circuit has reached the maximum count state; 9 ('F192) or 16 ('F193), the reset HIGH-to-LOW transition of the Count Up Clock will cause $\overline{TC}_U$ to go LOW. $\overline{TC}_U$ will stay LOW until CP_U goes HIGH again, thus effectively repeating the Count Up Clock, but delayed by two gate delays. Similarly, the $\overline{TC}_D$ output will go LOW when the circuit is in the zero state and the Count Down Clock goes LOW. Since the $\overline{TC}$ outputs repeat the clock waveforms, they can be used as the clock input signals to the next higher order circuit in a multistage counter.

$$\overline{TC}_U = Q_0 \bullet Q_3 \bullet \overline{CP}_U$$
$$\overline{TC}_D = \overline{Q}_0 \bullet \overline{Q}_1 \bullet \overline{Q}_2 \bullet \overline{Q}_3 \bullet \overline{CP}_D$$

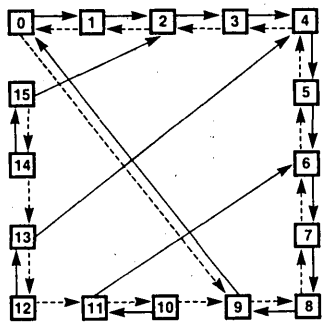
Both the 'F192 and the 'F193 have an asynchronous parallel load capability permitting the counter to be preset. When the Parallel Load ($\overline{PL}$) and the Master Reset (MR) inputs are LOW, information present on the Parallel Data input (P_0 - P_3) is loaded into the counter and appears on the outputs regardless of the conditions of the clock inputs. A HIGH signal on the Master Reset input will disable the preset gates, override both clock inputs, and latch each Q output in the LOW state. If one of the clock inputs is LOW during and after a reset or load operation, the next LOW-to-HIGH transition of that clock will be interpreted as a legitimate signal and will be counted.

FUNCTION TABLE

MR	$\overline{PL}$	CP_U	CP_D	MODE
H	X	X	X	Reset (Asyn.)
L	L	X	X	Preset (Asyn.)
L	H	H	H	No Change
L	H	⎍	H	Count Up
L	H	H	⎍	Count Down

H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial

'F192 STATE DIAGRAM



DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE

SYMBOL	PARAMETER	54F/74F			UNITS	CONDITIONS
		Min	Typ	Max		
I_{CC}	Power Supply Current		38	55	mA	V_{CC} = Max

© IC MASTER 1983

AC CHARACTERISTICS:

SYMBOL	PARAMETER	54F/74F			54F		74F		UNITS	
		T_A = 25°C, V_{CC} = +5.0 V, C_L = 50 pF			T_A, V_{CC} = Mil, C_L = 50 pF		T_A, V_{CC} = Com, C_L = 50 pF			
		Min	Typ	Max	Min	Max	Min	Max		
f_{max}	Maximum Count Frequency	100							MHz	
t_{PLH} t_{PHL}	Propagation Delay CP_U or CP_D to $\overline{TC_U}$	3.0 3.0	6.5 6.5	9.0 9.0					ns	
t_{PLH} t_{PHL}	Propagation Delay CP_U or CP_D to Q_n	5.0 3.5	9.0 6.0	13 8.5					ns	
t_{PLH} t_{PHL}	Propagation Delay P_n to Q_n	3.0 5.0	5.0 9.0	7.0 12.5					ns	
t_{PLH} t_{PHL}	Propagation Delay $\overline{PL}$ to Q_n	4.0 4.5	7.0 7.5	10 10.5					ns	
t_{PHL}	Propagation Delay MR to Q_n	5.5	9.5	13.5					ns	
t_{PLH}	Propagation Delay MR to $\overline{TC_U}$	7.5	13	18						
t_{PHL}	Propagation Delay MR to $\overline{TC_D}$	7.0	12	17						
t_{PLH} t_{PHL}	Propagation Delay $\overline{PL}$ to $\overline{TC_U}$ or $\overline{TC_D}$	7.5 6.0	13 10	18 14					ns	
t_{PLH} t_{PHL}	Propagation Delay P_n to $\overline{TC_U}$ or $\overline{TC_D}$	9.0 6.5	15 11	21 15.5					ns	

AC OPERATING REQUIREMENTS:

SYMBOL	PARAMETER	54F/74F			54F		74F		UNITS	
		T_A = +25°C, V_{CC} = +5.0 V			T_A, V_{CC} = Mil		T_A, V_{CC} = Com			
		Min	Typ	Max	Min	Max	Min	Max		
t_s (H) t_s (L)	Setup Time, HIGH or LOW P_n to $\overline{PL}$	5.0 8.0							ns	
t_h (H) t_h (L)	Hold Time, HIGH or LOW P_n to $\overline{PL}$	3.0 3.0								
t_w (L)	$\overline{PL}$ Pulse Width LOW	12							ns	
t_w (L)	CP_U or CP_D Pulse Width LOW	8.0							ns	
t_w (H)	MR Pulse Width HIGH	8.0							ns	
t_{rec}	Recovery Time $\overline{PL}$ to CP_U or CP_D	10							ns	
t_{rec}	Recovery Time MR to CP_U or CP_D	6.0							ns	

▨ Test limits in screened columns are preliminary.

© IC MASTER 1983

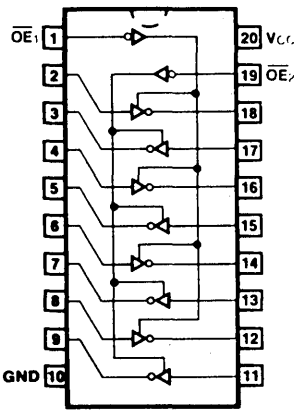
54F/74F240 • 54F/74F241 54F/74F244

OCTAL BUFFER/LINE DRIVER

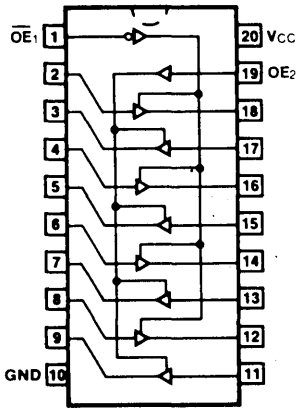
(With 3-State Outputs)

CONNECTION DIAGRAMS

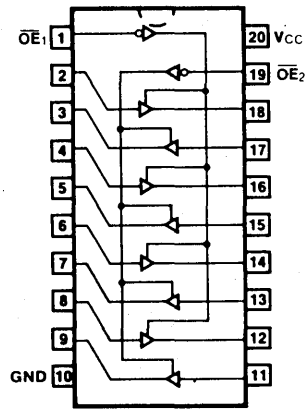
'F240



'F241



'F244



DESCRIPTION — The 'F240, 'F241 and 'F244 are octal buffers and line drivers designed to be employed as memory address drivers, clock drivers and bus oriented transmitters/receivers which provide improved PC board density.

- **HYSTERESIS AT INPUTS TO IMPROVE NOISE MARGINS**
- **3-STATE OUTPUTS DRIVE BUS LINES OR BUFFER MEMORY ADDRESS REGISTERS**
- **OUTPUTS SINK 64 mA**
- **15 mA SOURCE CURRENT**
- **INPUT CLAMP DIODES LIMIT HIGH SPEED TERMINATION EFFECTS**

ORDERING CODE:

PKGS	COMMERCIAL GRADE V_{CC} = +5.0 V ±5%, T_A = 0°C to +70°C	MILITARY GRADE V_{CC} = +5.0 V ±10%, T_A = -55°C to +125°C	PKG TYPE
Plastic DIP (P)	74F240PC, 74F241PC 74F244PC		9Z
Ceramic DIP (D)	74F240DC, 74F241DC 74F244DC	54F240DM, 54F241DM 54F244DM	4E
Flatpak (F)	74F240FC, 74F241FC 74F244FC	54F240FM, 54F241FM 54F244FM	4F

INPUT LOADING/FAN-OUT:

PIN NAMES	DESCRIPTION	54F/74F (U.L.) HIGH/LOW
$\overline{OE}_1$, $\overline{OE}_2$	3-State Output Enable (Active LOW)	0.5/0.625
OE_2	3-State Output Enable (Active HIGH)	0.5/0.625
	Inputs	0.5/1.0
	Outputs	75/40 (30)

© IC MASTER 1983

'F240

INPUTS			OUTPUT
$\overline{OE_1}$, $\overline{OE_2}$		D	
L		L	H
L		H	L
H		X	Z

'F241

INPUTS			OUTPUT
$\overline{OE_1}$	OE_2	D	
L	H	L	L
L	H	H	H
H	L	X	Z

'F244

INPUTS			OUTPUT
$\overline{OE_1}$, $\overline{OE_2}$		D	
L		L	L
L		H	H
H		X	Z

H = HIGH Voltage Level L = LOW Voltage Level X Immaterial Z High Impedance

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER		54F/74F Min	54F/74F Typ	54F/74F Max	UNITS	CONDITIONS	
V_{OH}	Output HIGH Voltage	XM, XC	2.4			V	I_{OH} = -3.0 mA, V_{CC} = Min, V_{IN} = V_{IH} or V_{IL}	
		XM	2.0			V	I_{OH} = -12 mA	V_{IH} = 2.0 V, V_{CC} = Min, V_{IL} = 0.5 V
		XC	2.0				I_{OH} = -15 mA	
V_{OL}	Output LOW Voltage	XM			0.55	V	I_{OL} = 48 mA	V_{IN} = V_{IH} or V_{IL}, V_{CC} = Min
		XC			0.55		I_{OL} = 64 mA	
$V_{T+} - V_{T-}$	Hysteresis Voltage		0.2	0.4		V	V_{CC} = Min	
I_{OS}	Output Short Circuit Current		-100		-225	mA	V_{CC} = Max, V_{OUT} = 0 V	
I_{CCH}	Power Supply Current	'F240		19	29	mA	Outputs HIGH	V_{CC} = Max
		'F241, 'F244		40	60			
I_{CCL}		'F240		50	75	mA	Outputs LOW	
		'F241, 'F244		60	90			
I_{CCZ}		'F240		42	63	mA	Outputs OFF	
		'F241, 'F244		60	90			

AC CHARACTERISTICS:

SYMBOL	PARAMETER	54F/74F: T_A = +25°C, V_{CC} = +5.0 V, C_L = 50 pF Min	Typ	Max	54F: T_A, V_{CC} = MIL, C_L = 50 pF Min	Max	74F: T_A, V_{CC} = COM, C_L = 50 pF Min	Max	UNITS
t_{PLH}	Propagation Delay	3.0	5.1	7.0	3.0	9.0	3.0	8.0	ns
t_{PHL}	Data to Output ('F240)	2.0	3.5	4.7	2.0	6.0	2.0	5.7	
t_{PZH}	Output Enable Time ('F240)	2.0	3.5	4.7	2.0	6.5	2.0	5.7	ns
t_{PZL}		4.0	6.9	9.0	4.0	10.5	4.0	10	
t_{PHZ}	Output Disable Time* ('F240)	2.0	4.0	5.3	2.0	6.5	2.0	6.3	
t_{PLZ}		2.0	6.0	8.0	2.0	12.5	2.0	9.5	
t_{PLH}	Propagation Delay	2.5	4.0	5.2	2.5	6.5	2.5	6.2	ns
t_{PHL}	Data to Output ('F241, 'F244)	2.5	4.0	5.2	2.5	7.0	2.5	6.5	
t_{PZH}	Output Enable Time	2.0	4.3	5.7	2.0	7.0	2.0	6.7	ns
t_{PZL}	('F241, 'F244)	2.0	5.4	7.0	2.0	8.5	2.0	8.0	
t_{PHZ}	Output Disable Time	2.0	4.5	6.0	2.0	7.0	2.0	7.0	
t_{PLZ}	('F241, 'F244)	2.0	4.5	6.0	2.0	7.5	2.0	7.0	

© IC MASTER 1983

54F/74F373

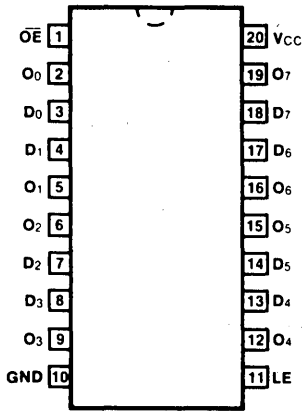
OCTAL TRANSPARENT LATCH

(With 3-State Outputs)

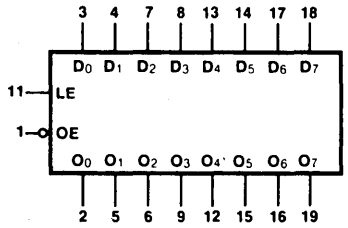
DESCRIPTION — The 'F373 consists of eight latches with 3-state outputs for bus organized system applications. The flip-flops appear transparent to the data when Latch Enable (LE) is HIGH. When LE is LOW, the data that meets the setup times is latched. Data appears on the bus when the Output Enable ($\overline{OE}$) is LOW. When $\overline{OE}$ is HIGH the bus output is in the high impedance state.

- **EIGHT LATCHES IN A SINGLE PACKAGE**
- **3-STATE OUTPUTS FOR BUS INTERFACING**

CONNECTION DIAGRAM



LOGIC SYMBOL



V_{CC} = Pin 20
GND = Pin 10

ORDERING CODE:

PKGS	COMMERCIAL GRADE V_{CC} = +5.0 V ±5%, T_A = 0°C to +70°C	MILITARY GRADE V_{CC} = +5.0 V ±10%, T_A = -55°C to +125°C	PKG TYPE
Plastic DIP (P)	74F373PC		9Z
Ceramic DIP (D)	74F373DC	54F373DM	4E
Flatpak (F)	74F373FC	54F373FM	4F

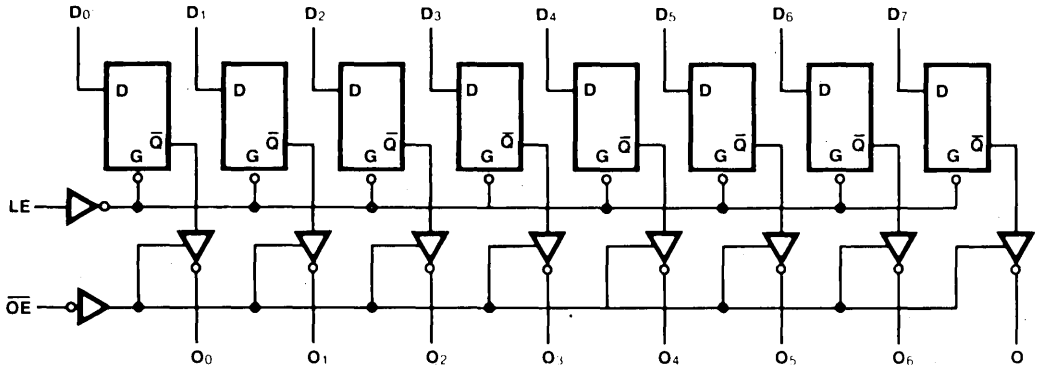
INPUT LOADING/FAN-OUT:

PIN NAMES	DESCRIPTION	54F/74F (U.L.) HIGH/LOW
$D_0 - D_7$	Data Inputs	0.5/0.375
LE	Latch Enable Input (Active HIGH)	0.5/0.375
$\overline{OE}$	Output Enable Input (Active LOW)	0.5/0.375
$O_0 - O_7$	3-State Latch Outputs	25/12.5

FUNCTIONAL DESCRIPTION — The 'F373 contains eight D-type latches with 3-state output buffers. When the Latch Enable (LE) input is HIGH, data on the D_n inputs enters the latches. In this condition the latches are transparent, i.e., a latch output will change state each time its D input changes. When LE is LOW the latches store the information that was present on the D inputs a setup time preceding the HIGH-to-LOW transition of LE. The 3-state buffers are controlled by the Output Enable ($\overline{OE}$) input. When $\overline{OE}$ is LOW, the buffers are in the bi-state mode. When $\overline{OE}$ is HIGH the buffers are in the high impedance mode but this does not interfere with entering new data into the latches.

© IC MASTER 1983

LOGIC DIAGRAM



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER	54F/74F			UNITS	CONDITIONS
		Min	Typ	Max		
I_{CC}	Power Supply Current (All Outputs OFF)		35	55	mA	V_{CC} = Max, $\overline{OE}$ = 4.5 V D_n, LE = Gnd

AC CHARACTERISTICS:

SYMBOL	PARAMETER	54F/74F T_A = +25°C, V_{CC} = +5.0 V, C_L = 50 pF			54F T_A, V_{CC} = MIL, C_L = 50 pF		74F T_A, V_{CC} = COM, C_L = 50 pF		UNITS
		Min	Typ	Max	Min	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation Delay D_n to O_n	3.0 2.0	5.3 3.7	7.0 5.0	3.0 2.0	8.5 6.0	3.0 2.0	8.0 6.0	ns
t_{PLH} t_{PHL}	Propagation Delay LE to O_n	5.0 3.0	9.0 5.2	11.5 7.0	5.0 3.0	15 8.5	5.0 3.0	13 8.0	ns
t_{PZH} t_{PZL}	Output Enable Time	2.0 2.0	5.0 5.6	11 7.5	2.0 2.0	13.5 10	2.0 2.0	12 8.5	ns
t_{PHZ} t_{PLZ}	Output Disable Time	2.0 2.0	4.5 3.8	6.5 5.0	2.0 2.0	10 7.0	2.0 2.0	7.5 6.0	ns

AC OPERATING REQUIREMENTS:

SYMBOL	PARAMETER	54F/74F T_A = +25°C, V_{CC} = +5.0 V			54F T_A, V_{CC} = MIL		74F T_A, V_{CC} = COM		UNITS
		Min	Typ	Max	Min	Max	Min	Max	
t_s (H) t_s (L)	Setup Time, HIGH or LOW D_n to LE	2.0 2.0			2.0 2.0		2.0 2.0		ns
t_h (H) t_h (L)	Hold Time, HIGH or LOW D_n to LE	3.0 3.0			3.0 3.0		3.0 3.0		ns
t_w (H)	LE Pulse Width HIGH	6.0			6.0		6.0		ns

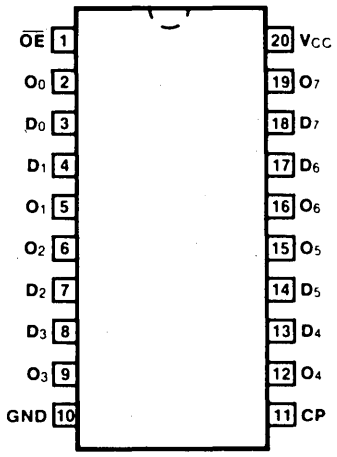
© IC MASTER 1983

54F/74F374

OCTAL D-TYPE FLIP-FLOP

(With 3-State Outputs)

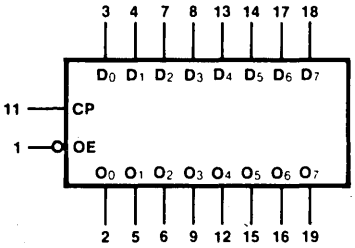
CONNECTION DIAGRAM



DESCRIPTION — The 'F374 is a high speed, low power octal D-type flip-flop featuring separate D-type inputs for each flip-flop and 3-state outputs for bus oriented applications. A buffered Clock (CP) and Output Enable ($\overline{OE}$) are common to all flip-flops.

- **EDGE-TRIGGERED D-TYPE INPUTS**
- **BUFFERED POSITIVE EDGE-TRIGGERED CLOCK**
- **3-STATE OUTPUTS FOR BUS ORIENTED APPLICATIONS**

LOGIC SYMBOL



V_{CC} = Pin 20
GND = Pin 10

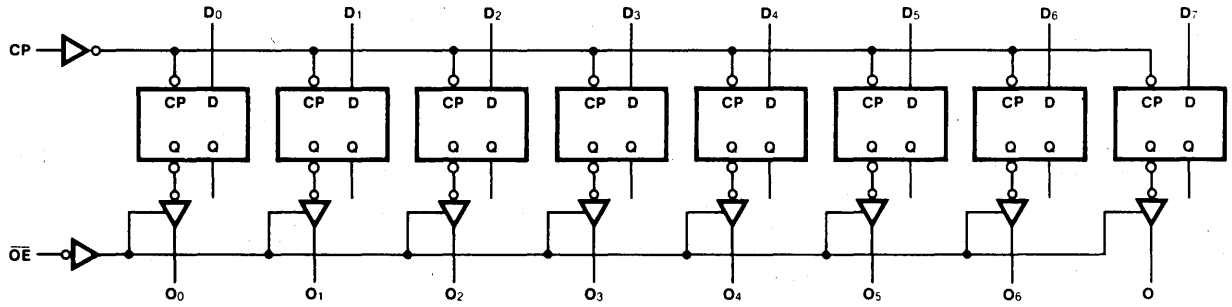
ORDERING CODE:

PKGS	COMMERCIAL GRADE V_{CC} = +5.0 V ±5%, T_A = 0°C to +70°C	MILITARY GRADE V_{CC} = +5.0 V ±10%, T_A = -55°C to +125°C	PKG TYPE
Plastic DIP (P)	74F374PC		9Z
Ceramic DIP (D)	74F374DC	54F374DM	4E
Flatpak (F)	74F374FC	54F374FM	4F

INPUT LOADING/FAN-OUT:

PIN NAMES	DESCRIPTION	54F/74F (U.L.) HIGH/LOW
$D_0 - D_7$	Data Inputs	0.5/0.375
CP	Clock Pulse Input (Active Rising Edge)	0.5/0.375
$\overline{OE}$	3-State Output Enable Input (Active LOW)	0.5/0.375
$O_0 - O_7$	3-State Outputs	25/12.5

LOGIC DIAGRAM



DIGITAL

Fairchild

© IC MASTER 1983

FUNCTIONAL DESCRIPTION — The 'F374 consists of eight edge-triggered flip-flops with individual D-type inputs and 3-state true outputs. The buffered clock and buffered Output Enable are common to all flip-flops. The eight flip-flops will store the state of their individual D inputs that meet the setup and hold times requirements on the LOW-to-HIGH Clock (CP) transition. With the Output Enable ($\overline{OE}$) LOW, the contents of the eight flip-flops are available at the outputs. When the $\overline{OE}$ is HIGH, the outputs go to the high impedance state. Operation of the $\overline{OE}$ input does not affect the state of the flip-flops.

TRUTH TABLE

INPUTS		OUTPUTS	
D_n	CP	$\overline{OE}$	O_n
H	⎍	L	H
L	⎍	L	L
X	X	H	Z

H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial
Z = High Impedance

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER	54F/74F			UNITS	CONDITIONS
		Min	Typ	Max		
I_{CC}	Power Supply Current (All Outputs OFF)		55	86	mA	V_{CC} = Max, D_n = Gnd $\overline{OE}$ = 4.5 V

AC CHARACTERISTICS:

SYMBOL	PARAMETER	54F/74F T_A = +25°C, V_{CC} = +5.0 V, C_L = 50 pF			54F T_A, V_{CC} = MIL, C_L = 50 pF		74F T_A, V_{CC} = COM, C_L = 50 pF		UNITS
		Min	Typ	Max	Min	Max	Min	Max	
f_{max}	Maximum Clock Frequency	100			60		70		MHz
t_{PLH} t_{PHL}	Propagation Delay CP to O_n	4.0 4.0	6.5 6.5	8.5 8.5	4.0 4.0	10.5 11	4.0 4.0	10 10	ns
t_{PZH} t_{PZL}	Output Enable Time	2.0 2.0	9.0 5.8	11.5 7.5	2.0 2.0	14 10	2.0 2.0	12.5 8.5	ns
t_{PHZ} t_{PLZ}	Output Disable Time	2.0 2.0	5.3 4.3	7.0 5.5	2.0 2.0	8.0 7.5	2.0 2.0	8.0 6.5	ns

AC OPERATING REQUIREMENTS:

SYMBOL	PARAMETER	54F/74F T_A = +25°C, V_{CC} = +5.0 V			54F T_A, V_{CC} = MIL		74F T_A, V_{CC} = COM		UNITS
		Min	Typ	Max	Min	Max	Min	Max	
t_s (H) t_s (L)	Setup Time, HIGH or LOW D_n to CP	2.0 2.0			2.5 2.0		2.0 2.0		ns
t_h (H) t_h (L)	Hold Time, HIGH or LOW D_n to CP	2.0 2.0			2.0 2.5		2.0 2.0		
t_w (H) t_w (L)	CP Pulse Width, HIGH or LOW	7.0 6.0			7.0 6.0		7.0 6.0		ns

© IC MASTER 1983

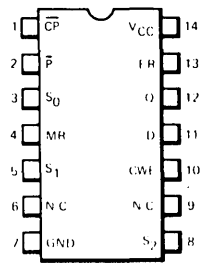
54F/74F401

CYCLIC REDUNDANCY CHECK GENERATOR/CHECKER

DESCRIPTION—The 'F401 Cyclic Redundancy Check (CRC) generator/checker implements the most widely used error detection scheme in serial digital data handling systems. On transmission, the data stream is encoded by dividing it by a set polynomial. The remainder is appended to the message as check bits. Upon reception, this data stream is divided by the same polynomial and if there is no remainder, there are no detectable errors.

- **EIGHT SELECTABLE POLYNOMIALS**
- **ERROR INDICATOR**
- **MORE EFFICIENT THAN PARITY IN CHECKING ERRORS**
- **HIGH-SPEED DATA RATE**
- **SUPPLY CURRENT 70 mA TYP**

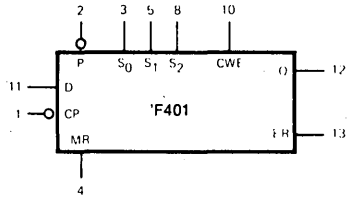
CONNECTION DIAGRAM
DIP (TOP VIEW)



Pins 6 and 9 not connected.

NOTE:
The Flatpak version has the same pinouts (Connection Diagram) as the Dual In-line Package.

LOGIC SYMBOL



V_{CC} = Pin 14
GND = Pin 7

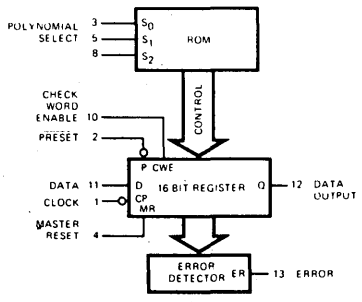
PIN NAMES

PIN NAMES	DESCRIPTION	COMMENTS
$S_0 - S_2$	Polynomial Select Inputs	
D	Data Input	
$\overline{CP}$	Clock (Operates on HIGH-to-LOW Transition) Input	
CWE	Check Word Enable Input	
$\overline{P}$	Preset (Active LOW) Input	
MR	Master Reset (Active HIGH) Input	
Q	Data Output (Note b)	
ER	Error Output (Note b)	

TABLE 1

SELECT CODE			POLYNOMIAL	REMARKS
S_2	S_1	S_0		
L	L	L	$x^{16}+x^{15}+x^2+1$	CRC-16
L	L	H	$x^{16}+x^{14}+x+1$	CRC-16 REVERSE
L	H	L	$x^{16}+x^{15}+x^{13}+x^7+x^4+x^2+x^1+1$	
L	H	H	$x^{12}+x^{11}+x^3+x^2+x+1$	CRC-12
H	L	L	$x^8+x^7+x^5+x^4+x+1$	
H	L	H	x^8+1	LRC-8
H	H	L	$x^{16}+x^{12}+x^5+1$	CRC-CCITT
H	H	H	$x^{16}+x^{11}+x^4+1$	CRC-CCITT REVERSE

BLOCK DIAGRAM



V_{CC} = Pin 14
GND = Pin 7

© IC MASTER 1983

FUNCTIONAL DESCRIPTION—The 'F401 is a 16-bit programmable device which operates on serial data streams and provides a means of detecting transmission errors. Cyclic encoding and decoding schemes for error detection are based on polynomial manipulation in modulo arithmetic. For encoding, the data stream (message polynomial) is divided by a selected polynomial. This division results in a remainder which is appended to the message as check bits. For error checking, the bit stream containing both data and check bits is divided by the same selected polynomial. If there are no detectable errors, this division results in a zero remainder. Although it is possible to choose many generating polynomials of a given degree, standards exist that specify a small number of useful polynomials. The 'F401 implements the polynomials listed in *Table 1* by applying the appropriate logic levels to the select pins S_0, S_1 and S_2.

The 'F401 consists of a 16-bit register, a Read Only Memory ($\overline{ROM}$) and associated control circuitry as shown in the block diagram. The polynomial control code presented at inputs S_0, S_1 and S_2 is decoded by the ROM, selecting the desired polynomial by establishing shift mode operation on the register with Exclusive OR gates at appropriate inputs. To generate the check bits, the data stream is entered via the Data inputs (D), using the HIGH-to-LOW transition of the Clock input ($\overline{CP}$). This data is gated with the most significant output (Q) of the register, and controls theExclusive OR gates (*Figure 1*). The Check Word Enable (CWE) must be held HIGH while the data is being entered. After the last data bit is entered, the CWE is brought LOW and the check bits are shifted out of the register and appended to the data bits using external gating (*Figure 2*).

To check an incoming messsage for errors, both the data and check bits are entered through the D input with the CWE input held HIGH. The 'F401 is not in the data path, but only monitors the message. The Error Output becomes valid after the last check bit has been entered into the 'F401 by a HIGH-to-LOW transition of $\overline{CP}$. If no detectable errors have occurred during the data transmission, the resultant internal register bits are all LOW and the Error Outputs (ER) is LOW. If a detectable error has occurred, ER is HIGH.

A HIGH on the Master Reset input (MR) asynchronously clears the register. A LOW on the Preset input ($\overline{P}$) asynchronously sets the entire register if the control code inputs specify a 16-bit polynomial; in the case of 12 or 8-bit check polynomials only the most significant 12 or 8 register bits are set and the remaining bits are cleared.

FIG. 1
EQUIVALENT CIRCUIT FOR $X^{16} + X^{15} + X^2 + 1$

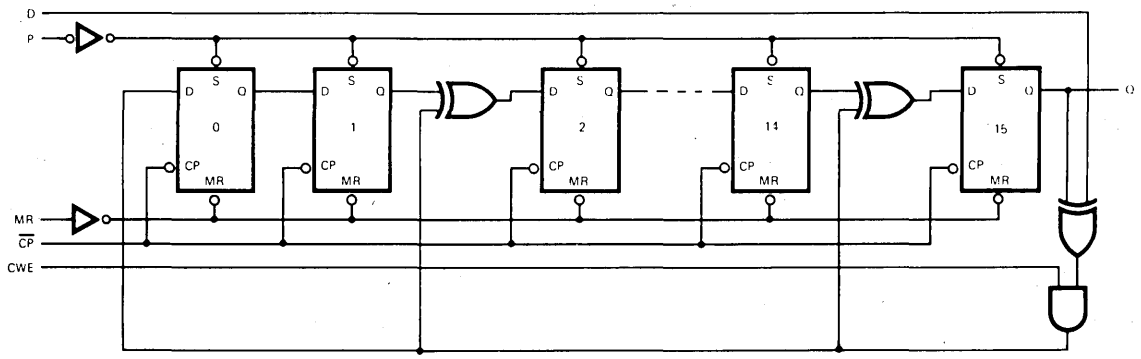
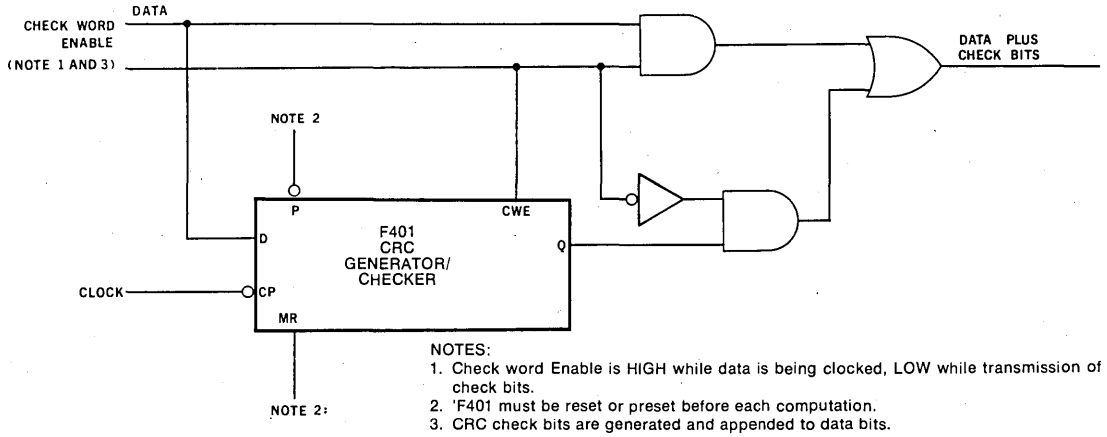


FIG. 2
CHECK WORD GENERATION



NOTES:
1. Check word Enable is HIGH while data is being clocked, LOW while transmission of check bits.
2. 'F401 must be reset or preset before each computation.
3. CRC check bits are generated and appended to data bits.

© IC MASTER 1983

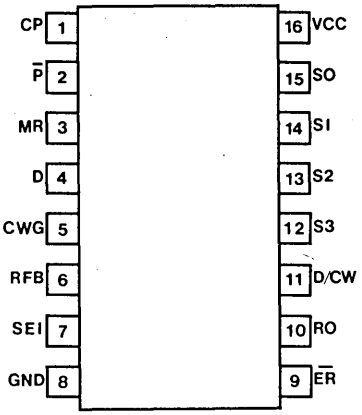
54F/74F402
EXPANDABLE CYCLIC REDUNDANCY CHECK GENERATOR/CHECKER

DESCRIPTION—The 'F402 expandable Cyclic Redundancy Check (CRC) Generator/Checker is an expandable version of the 'F401. It provides an advanced tool for the implementation of the most widely used error detection scheme in serial digital handling systems. A 4-bit control input selects one-of-six generator polynomials. The list of polynomials includes CRC-16, CRC-CCITT and Ethernet, as well as three other standard polynomials (56th order, 48th order, 32nd order). Individual clear and preset inputs are provided for floppy disk and other applications. The Error output indicates whether or not a transmission error has occurred. The CWG Control input inhibits feedback during check word transmission. The 'F402 is compatible with Fairchild Advanced Schottky TTL (FAST) devices and is fully compatible with all TTL families.

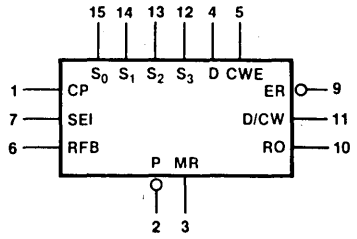
Preliminary

- **GUARANTEED 20 MHz DATA RATE**
- **SIX SELECTABLE POLYNOMIALS**
- **OTHER POLYNOMIALS AVAILABLE**
- **SEPARATE PRESET AND CLEAR CONTROLS**
- **EXPANDABLE**
- **AUTOMATIC RIGHT JUSTIFICATION**
- **ERROR OUTPUT OPEN COLLECTOR**
- **TYPICAL APPLICATIONS**
  - **FLOPPY AND OTHER DISK STORAGE SYSTEMS**
  - **DIGITAL CASSETTE AND CARTRIDGE SYSTEMS**
  - **DATA COMMUNICATION SYSTEMS**

CONNECTION DIAGRAM
DIP (TOP VIEW)



LOGIC SYMBOL



V_{CC} = Pin 16
GND = Pin 8

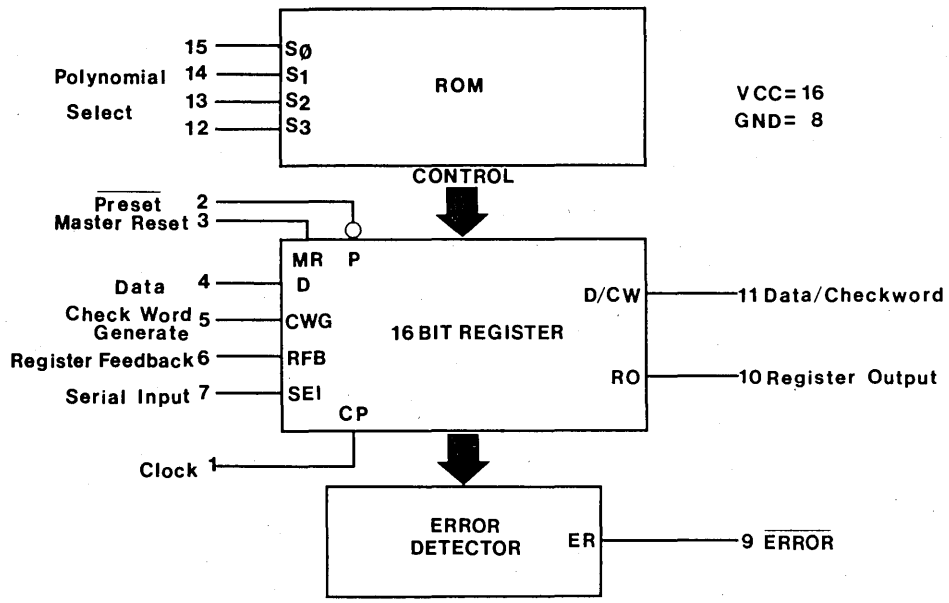
PIN NAMES

PIN NAMES	DESCRIPTION	PIN NAMES	DESCRIPTION
S_0-S_3	Polynomial Select	CWG	Check Word Generate
$\bar{P}$	Preset	D	Data
MR	Master Reset	$\overline{ER}$	Error
SEI	Serial Expansion Input	RD	Register Output
CP	Clock	D/CW	Serial Data/Checkword
RFB	Register Feedback		

© IC MASTER 1983

FUNCTIONAL DESCRIPTION—The '74F402 Expandable Cyclic Redundancy Check (CRC) Generator/Checker is an expandable 16-bit programmable device which operates on serial data streams and provides a means of detecting transmission errors. Cyclic encoding and decoding schemes for error detection are based on polynomial manipulation in modulo arithmetic. For encoding, the data stream (message polynomial) is divided by a selected polynomial. This division results in a remainder (or residue) which is appended to the message as check bits. For error checking, the bit stream containing both data and check bits is divided by the same selected polynomial. If there are no detectable errors, this division results in a zero remainder. Although it is possible to choose many generating polynomials of a given degree, standards exist that specify a small number of useful polynomials. The '74F402 implements the polynomials listed in *Table 1* by applying the appropriate logic levels to the select pins S_0, S_1, S_2, and S_3.

BLOCK DIAGRAM



The '74F402 consists of a 16 bit register, a Read Only Memory (ROM) and associated control circuitry as shown in the Block Diagram. The polynomial control code presented at inputs S_0, S_1, S_2, and S_3 is decoded by the ROM, selecting the desired polynomial or part of a polynomial by establishing shift mode operation on the register with Exclusive OR (XOR) gates at appropriate inputs. To generate the check bits, the data stream is entered via the Data Inputs (D), using the Low-to-High transition of the Clock Input (CP). This data is gated with the most significant Register Output (RO) via the Register Feedback Input (RFB), and controls the XOR gates. The Check Word Generate (CWG) must be held High while the data is being entered. After the last data bit is entered, the CWG is brought Low and the check bits are shifted out of the register(s) and appended to the data bits (no external gating is needed).

© IC MASTER 1983

To check an incoming message for errors, both the data and check bits are entered through the D Input with the CWG Input held High. The Error Output becomes valid after the last check bit has been entered into the '74F402 by a Low-to-High transition of CP, with the exception of the Ethernet polynomial (see applications paragraph). If no detectable errors have occurred during the data transmission, the resultant internal register bits are all Low and the Error Ouput ($\overline{ER}$) is High. If a detectable error has occurred, $\overline{ER}$ is Low. $\overline{ER}$ remains valid until the next Low-to-High transition of CP or until the device has been preset or reset.

A High on the Master Reset Input (MR) asynchronously clears the entire register. A Low on the Preset Input ($\overline{P}$) asynchronously sets the entire register with the exception of:

1) The Ethernet residue selection, in which the registers containing the non-zero residue are cleared;
2) The 56th order polynomial, in which the 8 least significant register bits of the least significant device are cleared; and,
3) S = 0, in which all bits are cleared.

TABLE 1

SELECT CODE HEX S3 S2 S1 S0	POLYNOMIAL	REMARKS
0 L L L L	0	S = 0
C H H L L D H H L H	$X^{32}+X^{26}+X^{23}+X^{22}+X^{16}+$ $X^{12}+X^{11}+X^{10}+X^{8}+X^{7}+X^{5}+X^{4}+X^{2}+X+1$	Ethernet Polynomial
E H H H L F H H H H	$X^{32}+X^{31}+X^{27}+X^{26}+X^{25}+X^{19}+X^{16}+$ $X^{15}+X^{13}+X^{12}+X^{11}+X^{9}+X^{7}+X^{6}+X^{5}+X^{4}+X^{2}+X+1$	Ethernet Residue
7 L H H H	$X^{16}+X^{15}+X^{2}+1$	CRC—16
B H L H H	$X^{16}+X^{12}+X^{5}+1$	CRC—CCITT
3 L L H H 2 L L H L 4 L H L L 8 H L L L	$X^{56}+X^{55}+X^{49}+X^{45}+X^{41}+$ $X^{39}+X^{38}+X^{37}+X^{36}+X^{31}+$ $X^{22}+X^{19}+X^{17}+X^{16}+X^{15}+X^{14}+X^{12}+X^{11}+X^{9}+$ X5+X+1	56th Order
5 L H L H 9 H L L H 1 L L L H	$X^{48}+X^{36}+X^{35}+$ $X^{23}+X^{21}+$ $X^{15}+X^{13}+X^{8}+X^{2}+1$	48th Order
6 L H H L A H L H L	$X^{32}+X^{23}+X^{21}+$ $X^{11}+X^{2}+1$	32nd Order

© IC MASTER 1983

TABLE 2

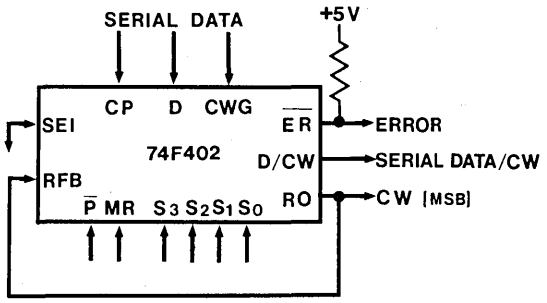
SELECT CODE	P3	P2	P1	PØ	C2	C1	CØ	POLYNOMIAL
Ø	Ø	Ø	Ø	Ø	1	Ø	Ø	S = Ø
C	1	1	1	1	1	Ø	1	Ethernet
D	1	1	1	1	1	Ø	1	Polynomial
E	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ethernet
F	Ø	Ø	Ø	Ø	Ø	1	Ø	Residue
7	1	1	1	1	1	Ø	Ø	CRC—16
B	1	1	1	1	1	Ø	Ø	CRC—CCITT
3	1	1	1	1	1	Ø	Ø	
2	1	1	1	1	1	Ø	Ø	56th
4	1	1	1	1	1	Ø	Ø	Order
8	Ø	Ø	1	1	1	Ø	Ø	
5	1	1	1	1	1	Ø	Ø	48th
9	1	1	1	1	1	Ø	Ø	Order
1	1	1	1	1	1	Ø	Ø	
6	1	1	1	1	1	Ø	Ø	32nd
A	1	1	1	1	1	Ø	Ø	Order

APPLICATIONS—In addition to polynomial selection there are four other capabilities provided for in the ROM. The first is set or clear selectability. The sixteen internal registers have the capability to be either set or cleared when $\overline{P}$ is brought low. This set or clear capability is done in four groups of 4 (see *Table 2*, PØ-P3). The second ROM capability (CØ) is in determining the polarity of the check word. As is the case with the Ethernet polynomial the check word can be inverted when it is appended to the data stream or as is the case with the other polynomials, the residue is appended with no inversion. Thirdly, the ROM contains a bit (C1) which is used to select the RFB input instead of the SEI input to be fed into the LSB. This is used when the polynomial selected is actually a residue (least significant) stored in the ROM. In conjunction with this is another bit (C2) in the ROM which indicates whether the selected location is a polynomial or a residue. If the latter then it inhibits the RFB input.

As mentioned previously, in general, upon a successful data transmission the CRC register has a zero residue. There is an exception to this, however, with respect to the Ethernet polynomial. This polynomial, upon a successful data transmission, has a non-zero residue in the CRC register $(C7\ 04\ DD\ 7B)_{16}$. In order to provide a no-error indication two ROM locations have been preloaded with the residue so that by selecting these locations and clocking the device one additional time, after the last check bit has been entered, will result in zeroing the CRC register. In this manner a no error indication is achieved.

With the present mix of polynomials the largest is 56th order requiring four devices while the smallest is 16th order requiring just one device. In order to accomodate multiplexing between high order polynomials (>16th order) and lower order polynomials, a location of all zero's is provided. This allows the user to choose a lower order polynomial even if the system is configured for a higher order one (see *Figure 3*).

FIG. 1
SINGLE DEVICE USAGE



© IC MASTER 1983

FIG. 2
MULTIPLE DEVICE USAGE

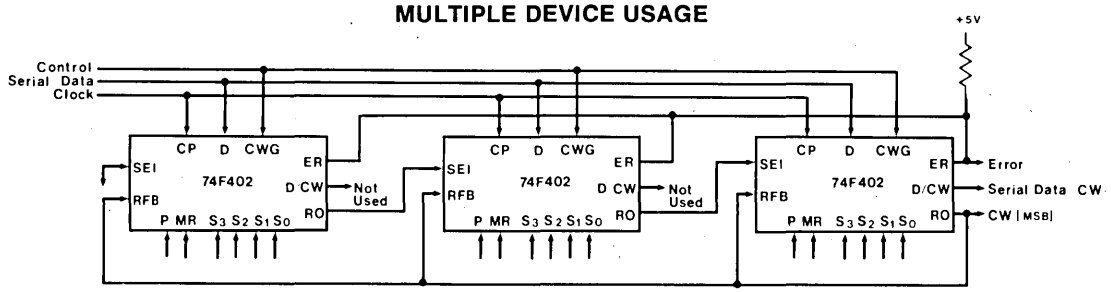
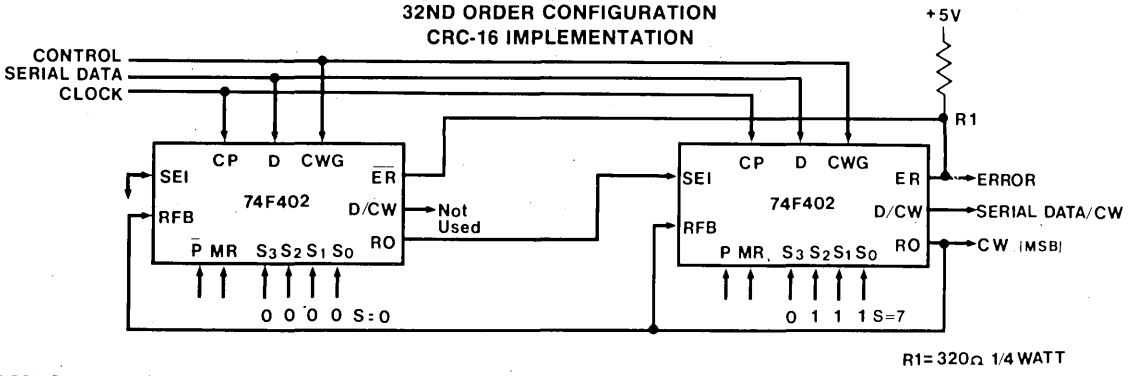


FIG. 3
32ND ORDER CONFIGURATION
CRC-16 IMPLEMENTATION



R1 = 320Ω 1/4 WATT

PIN NAMES

PIN NAMES	DESCRIPTION	COMMENTS
S_0-S_3	Polynomial Select	Used to select one of the six polynomials programmed into the device. See *Table 1* for a breakdown of the entries.
$\overline{P}$	Preset	When LOW asynchronously sets the entire register based on the polynomial selected. In the cases of the ethernet residue selection or the all zero selection the register would be cleared. With respect to the 56 bit polynomial, in the least significant device only, the eight most significant bits of the register are set, the remaining bits are cleared. In all other cases all bits of the register are set (See *Table 2*).
MR	Master Reset	When HIGH asynchronously clears all bits of the register.
SEI	Serial Expansion Input	This input provides the capability for serially expanding the devices to accomodate higher order polynomials. When cascading devices, RO of the preceding device is connected to this input. When a device is used singly or is the least significant device, this input should be wired LOW. See *Figures 1* and *2*.
CP	Clock	Controls all register changes on the LOW to HIGH transition.
RFB	Register Feedback	This input in connected to RO of the most significant device.
CWG	Check Word Generate	This input when held HIGH allows for generation of the check word or for checking a serial data stream for errors. Bringing this input LOW, after the last data bit has been entered, allows the check word bits to be shifted out of the register and be appended to the data bits.
D	Data	The input through which data and/or check bits are entered for check word generation/error detection.
$\overline{ER}$	Error	This open collector ouput, when LOW, indicates that the contents of the register are not zero. When checking for errors, after the data and check bits have been cycled through the device(s), this output should be HIGH to indicate no error in transmission. In multiple device configurations the $\overline{ER}$ outputs are tied together.
RO	Register Output	The output for the most significant bit of the check word register. It is used to supply control to either RFB or SEI.
D/CW	Serial Data/Checkword	This output is controlled by the state of CWG and the polynomial selected. When CWG is HIGH the D input is output; when CWG is LOW the check word register bits are shifted out. (Note: When the Ethernet polynomial is selected and CWG is LOW, the check word bits are inverted.)

© IC MASTER 1983

54F/74F403 • 54F/74F433

FIRST-IN FIRST OUT (FIFO) BUFFER MEMORY
FAIRCHILD TTL MACROLOGIC

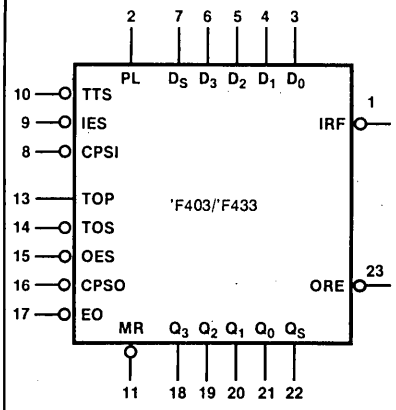
DESCRIPTION—The 'F403/F433 is an expanable fall-through type high-speed First-In First-Out (FIFO) Buffer Memory optimized for high speed disc or tape controllers and communication buffer applications. It is organized as 16 or 64 words by four bits and may be expanded to any number of words or any number of bits (in multiples of four). Data may be entered or extracted asynchronously in serial or parallel, allowing economical implementation of buffer memories.

The 'F403/F433 has 3-state outputs which provide added versatility and is fully compatible with all TTL families.

- **10 MHz SERIAL OR PARALLEL DATA RATE**
- **SERIAL OR PARALLEL INPUT**
- **SERIAL OR PARALLEL OUTPUT**
- **EXPANDABLE WITHOUT EXTERNAL LOGIC**
- **3-STATE OUTPUTS**
- **FULLY COMPATIBLE WITH ALL TTL FAMILIES**
- **SLIM 24-PIN PACKAGE**

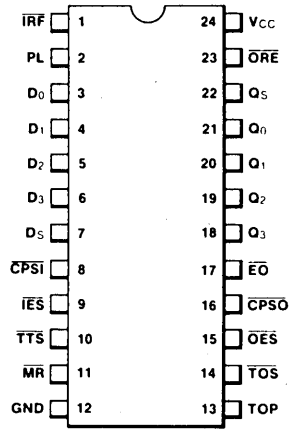
Preliminary

LOGIC SYMBOL



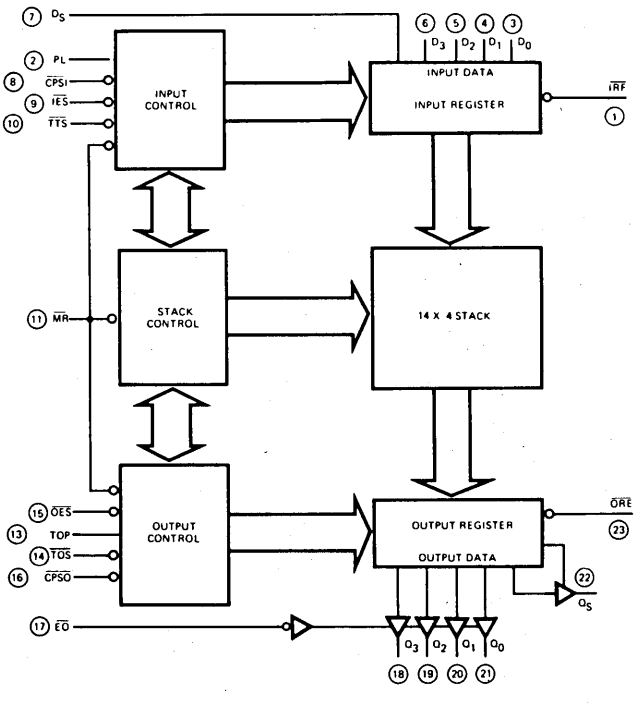
V_{CC} = Pin 24
GND = Pin 12

CONNECTION DIAGRAM



NOTE:
The Flatpak version has the same pinouts (Connection Diagram) as the Dual In-line Package.

BLOCK DIAGRAM



◯ = Pin Numbers

© IC MASTER 1983

PIN NAMES

PIN NAME	DESCRIPTION	COMMENTS
D_0—D_3	Parallel Data Inputs	
D_S	Serial Data Input	
PL	Parallel Load Input	HIGH on PL enables D_0—D_3. Not edge triggered. Ones catching.
$\overline{CPSI}$	Serial Input Clock	Edge triggered. Activates on falling edge.
$\overline{IES}$	Serial Input Enable	Enables serial and parallel input when LOW.
$\overline{TTS}$	Transfer to Stack Input	A LOW on this pin initiates fall through.
$\overline{OES}$	Serial Output Enable Input	Enables serial and parallel output when LOW.
$\overline{TOS}$	Transfer Out Serial Input	A LOW on this pin enables a word to be transferred from the stack to the output register. (TOP must be HIGH also for the transfer to occur). Not edge triggered.
TOP	Transfer Out Parallel Input	A HIGH on this pin enables a word to be transferred from the stack to the output register. ($\overline{TOS}$ must be LOW for the transfer to occur). Not edge triggered.
$\overline{MR}$	Master Reset	Active LOW.
$\overline{EO}$	Output Enable	Active LOW.
$\overline{CPSO}$	Serial Output Clock Input	Edge triggered. Activates on falling edge.
Q_0—Q_3	Parallel Data Outputs	
Q_S	Serial Data Output	
$\overline{IRF}$	Input Register Full Output	LOW when input register is full (Note b).
$\overline{ORE}$	Output Register Empty Output	HIGH when output register contains valid data.

FUNCTIONAL DESCRIPTION—As shown in the block diagram the 'F403/F433 consists of three sections:

1. An Input Register with parallel and serial data inputs as well as control inputs and outputs for input handshaking and expansion.
2. A 4-bit wide, 14 or 62 word deep fall-through stack with self-contained control logic.
3. An Output Register with parallel and serial data outputs as well as control inputs and outputs for output handshaking and expansion.

Since these three sections operate asynchronously and almost independently, they will be described separately below:

Input Register (Data Entry):
The Input Register can receive data in either bit-serial or in 4-bit parallel form. It stores this data until it is sent to the fall-through stack and generates the necessary status and control signals.

Figure 1 is a conceptual logic diagram of the input section. As described later, this 5-bit register is initialized by setting the F3 flip-flop and resetting the other flip-flops. The Q-output of the last flip-flop (FC) is brought out as the "Input Register Full" output ($\overline{IRF}$). After initialization this output is HIGH.

Parallel Entry—A HIGH on the PL input loads the D_0—D_3 inputs into the F_0—F_3 flip-flops and sets the FC flip-flop. This forces the $\overline{IRF}$ output LOW indicating that the input register is full. During parallel entry, the $\overline{CPSI}$ input must be LOW. If parallel expansion is not being implemented, $\overline{IES}$ must be LOW to establish row mastership (see Expansion section).

© IC MASTER 1983

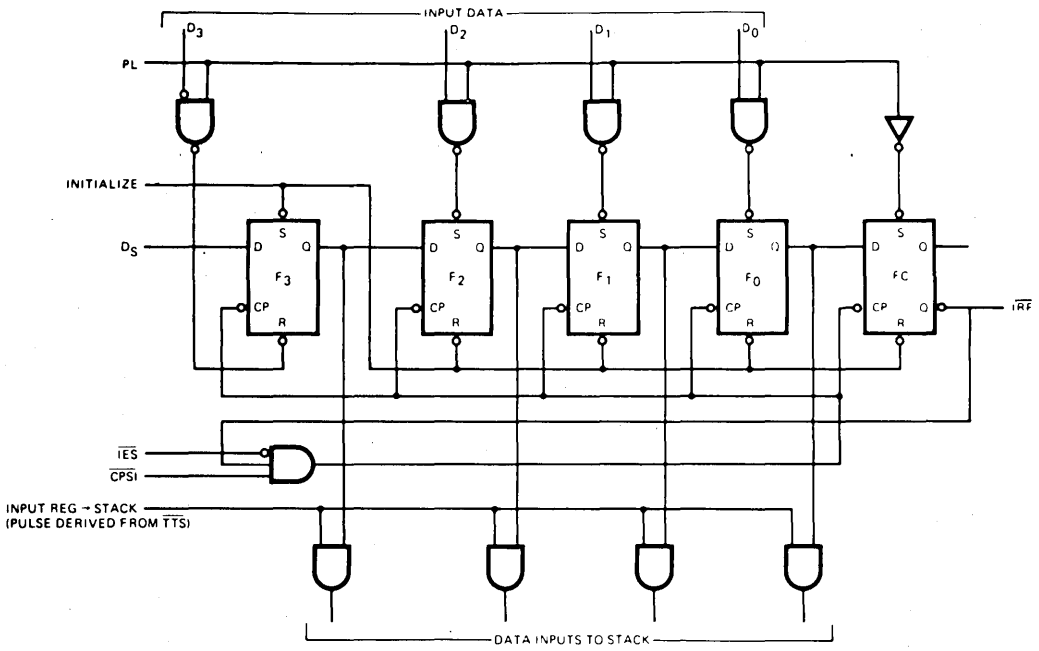


FIG. 1
CONCEPTUAL INPUT SECTION

Serial Entry—Data on the D_S input is serially entered into the F_3, F_2, F_1, F_0, FC shift register on each HIGH-to-LOW transition of the CPSI clock input, provided IES and PL are LOW.

After the fourth clock transition, the four data bits located in the four flip-flops F_0—F_3. The FC flip-flop is set, forcing the $\overline{IRF}$ output LOW and interanlly inhibiting $\overline{CPSI}$ clock pulses from effecting the register. *Figure 2* illustrates the final positions in a 'F403 resulting from a 64-bit serial bit train. B_0 is the first bit, B_{63} the last bit. Similar operation can be developed for 'F433.

Transfer to the Stack—The outputs of Flip-Flops F_0—F_3 feed the stack. A LOW level on the $\overline{TTS}$ input initiates a "fall-through" action. If the top location of the stack is empty, data is loaded into the stack and the input register is re-initialized. Note that this initialization is postponed until PL is LOW again. Thus, automatic FIFO action is achieved by connecting the $\overline{IRF}$ output to the $\overline{TTS}$ input.

An RS Flip-Flop (the Request Initialization Flip-Flop shown in *Figure 10*) in the control section records the fact that data has been transferred to the stack. This prevents multiple entry of the same word into the stack despite the fact the $\overline{IRF}$ and $\overline{TTS}$ may still be LOW. The Request Initialization Flip-Flop is not cleared until PL goes LOW. Once in the stack, data falls through the stack automatically, pausing only when it is necessary to wait for an empty next location. In the 'F403, as in most modern FIFO designs, the $\overline{MR}$ input only initializes the stack control section and does not clear the data.

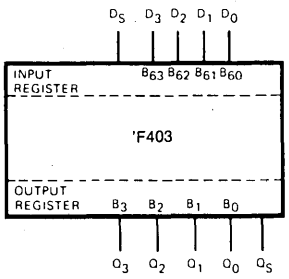


FIG. 2
FINAL POSITIONS IN A 'F403 RESULTING FROM A 64-BIT SERIAL TRAIN

© IC MASTER 1983

Output Register (Data Extraction)—The Output Register receives 4-bit parallel data words from the bottom stack location, stores it and outputs data on a 3-state 4-bit data bus or on a 3-bit serial data bus. The output section generates and receives the necessary status and control signals. *Figure 3* is conceptual logic diagram of the output section.

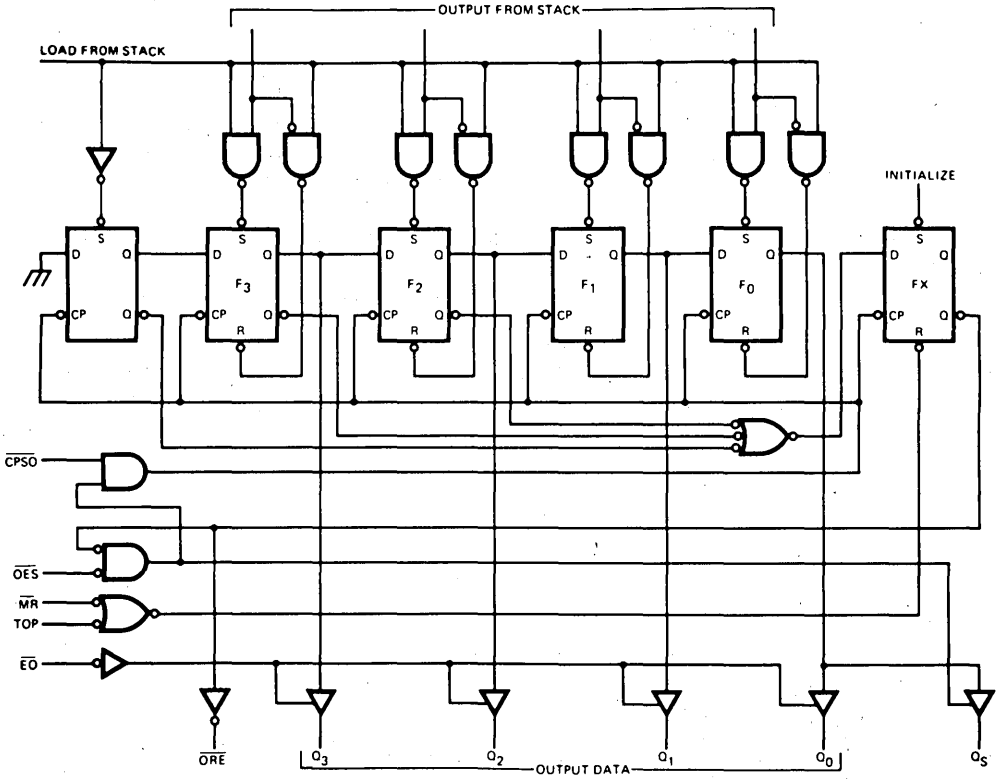


FIG. 3
CONCEPTUAL OUTPUT SECTION

Parallel Data Extraction—When the FIFO is empty after a LOW pulse is applied to $\overline{MR}$, the Output Register Empty ($\overline{ORE}$) output is LOW. After data has been entered into the FIFO and has fallen through to the bottom stack location, it is transferred into the Output Register provided the "Transfer Out Parallel" (TOP) input is HIGH. As a result of the data transfer $\overline{ORE}$ goes HIGH, indicating valid data on the data outputs (provided the 3-state buffer is enabled). TOP can now be used to clock out the next word. When TOP goes LOW, $\overline{ORE}$ will go LOW indicating that the output data has been extracted, but the data itself remains on the output bus until the next HIGH level at TOP permits the transfer of the next word (if available) into the Output Register. During parallel data extraction $\overline{CPSO}$ should be LOW. $\overline{TOS}$ should be grounded for single slice operation or connected to the appropriate $\overline{ORE}$ for expanded operation (see Expansion section).

TOP is not edge triggered. Therefore, if TOP goes HIGH before data is available from the stack, but data does become available before TOP goes LOW again, that data will be transferred into the Output Register. However, internal control circuitry prevents the same data from being transferred twice. If TOP goes HIGH and returns to LOW before data is available from the stack, ORE remains LOW indicating that there is no valid data at the outputs.

Serial Data Extraction—When the FIFO is empty after a LOW pulse is applied to $\overline{MR}$, the Output Register Empty ($\overline{ORE}$) output is LOW. After data has been entered into the FIFO and has fallen through to the bottom stack location, it is transferred into the Output Register provided $\overline{TOS}$ is LOW and TOP is HIGH. As a result of the data transfer $\overline{ORE}$ goes HIGH indicating valid data in the register. The 3-state Serial Data Output, Q_S: is automatically enabled and puts the first data bit on the output bus. Data is serially shifted out on the HIGH-to-LOW transition of $\overline{CPSO}$. To prevent false shifting, $\overline{CPSO}$ should be LOW when the new word is being loaded into the Output Register. The fourth transition empties the shift register, forces $\overline{ORE}$ output LOW and disables the serial output, Q_S (refer to *Figure 3*). For serial operation the $\overline{ORE}$ output may be tied to the $\overline{TOS}$ input, requesting a new word from the stack as soon as the previous one has been shifted out.

© IC MASTER 1983

Horizontal and Vertical Expansion—The 'F403 and 'F433 can be expanded in both the horizontal and vertical directions without any external parts and without sacrificing any of its FIFO's flexibility for serial/parallel input and output. The interconnections necessary to form a 31-word by 16-bit FIFO are shown in *Figure 4*. Using the same technique, any FIFO of (15m + 1) words by (4n) bits can be constructed, where m is the number of devices in a cloumn and n is the number of devices in a row.

Figures 5 and *6* show the timing diagrams for serial data entry and extraction for the 31-word by 16-bit FIFO shown in *Figure 4*. The final position of data after serial insertion of 496 bits into the FIFO array of *Figure 4* is shown in *Figure 7*.

All applications shown for 'F403 can be adapted to the 'F433 with the depth of the stack being 64 locations rather than the 16 locations of 'F403.

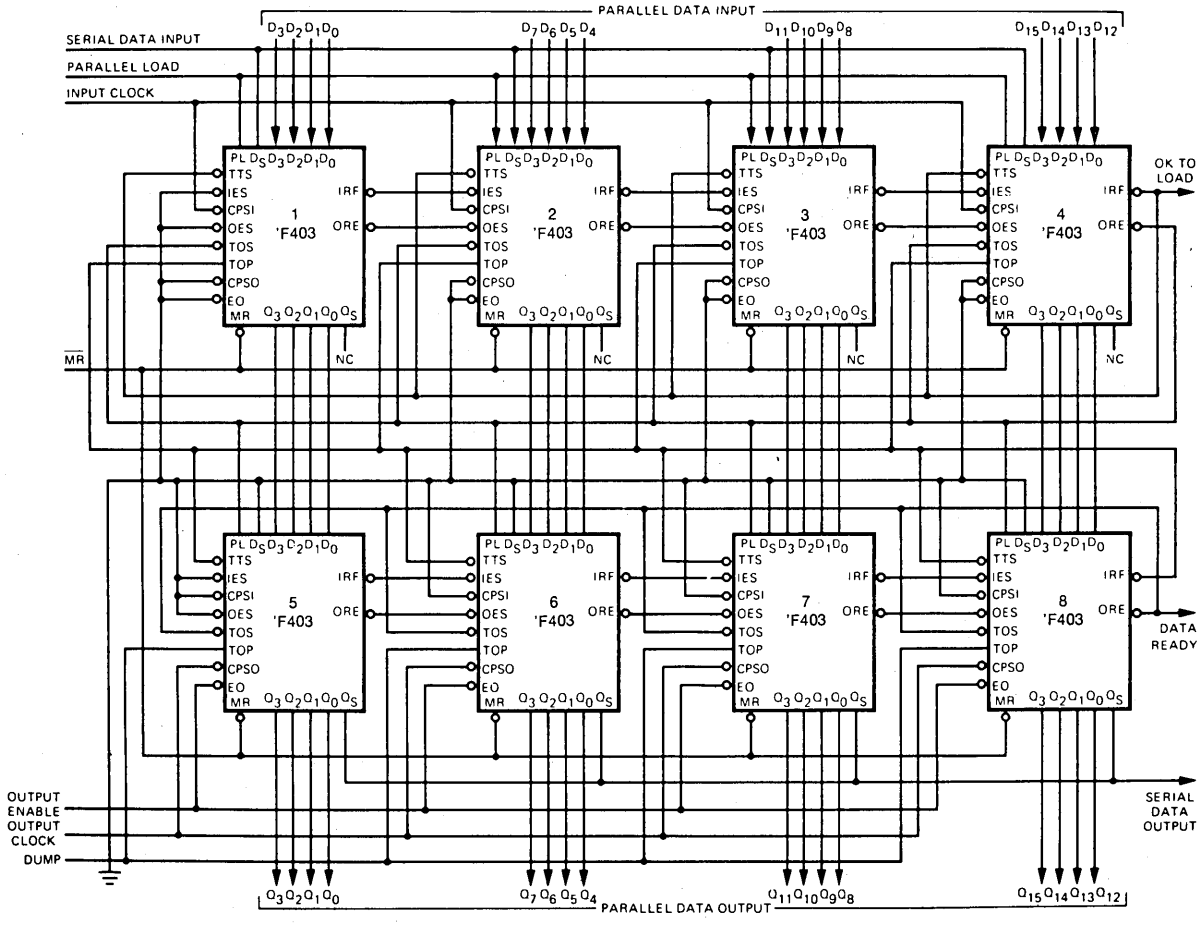


FIG. 4
A 31 X 16 FIFO ARRAY

© IC MASTER 1983

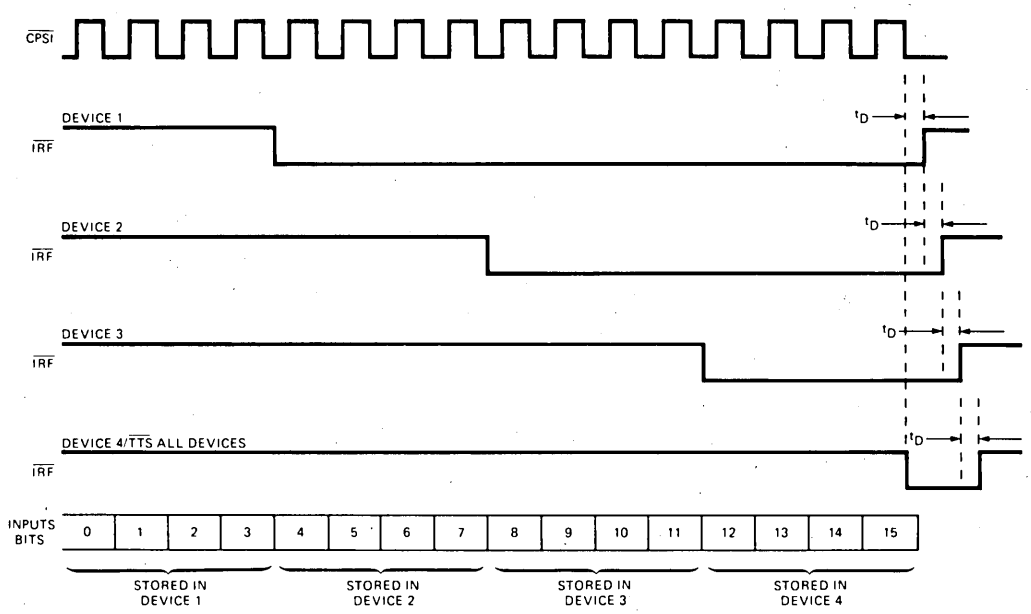


FIG. 5
SERIAL DATA ENTRY FOR ARRAY OF FIG. 6

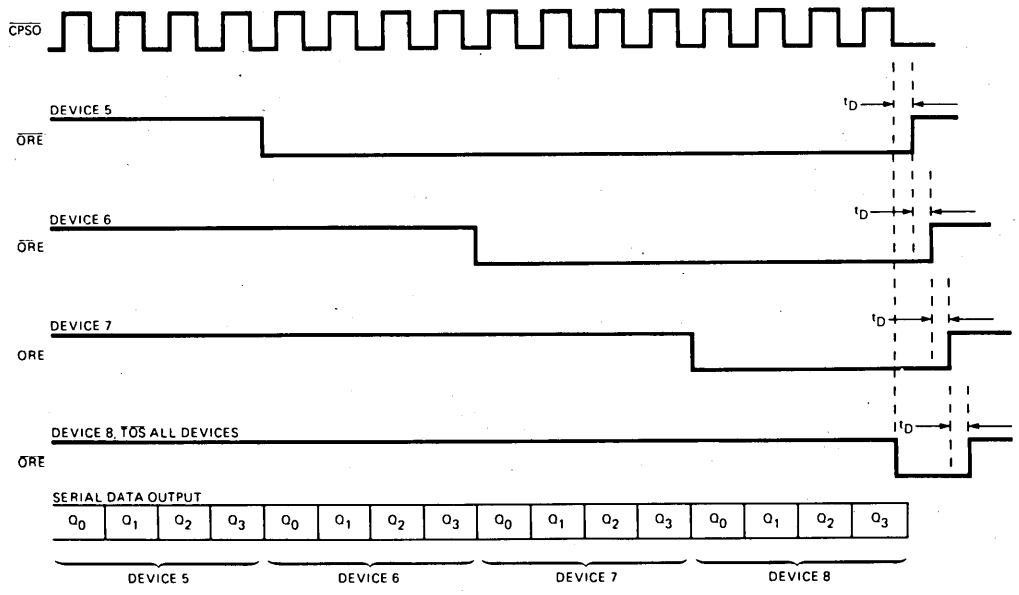


FIG. 6
SERIAL DATA EXTRACTION FOR ARRAY FOR FIG. 6

© IC MASTER 1983

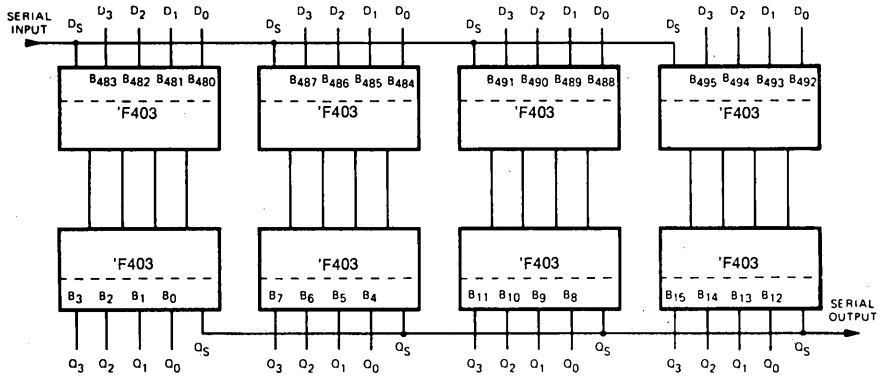


FIG. 7
FINAL POSITION OF A 496-BIT SERIAL INPUT

Interlocking Circuitry—Most convential FIFO designs provide status signals analogous to $\overline{IRF}$ and $\overline{ORE}$. However, when these devices are operated in arrays, variations in unit to unit operating speed require external gating to assure all devices have completed an operation. The 'F403 incorporates simple but effective "master/slave" interlocking circuitry to eliminate the need for external gating.

In the 'F403 array of *Figure 4* devices 1 and 5 are defined as "row masters" and the other devices are slaves to the master in their row. No slave in a given row will intialize its Input Register until it has received LOW on its $\overline{IES}$ input from a row master or a slave of higher priority.

In a similar fashion, the $\overline{ORE}$ outputs of slaves will not go high until their $\overline{OES}$ inputs have gone HIGH. This interlocking scheme ensures that new input data may be accepted by the array when the $\overline{IRF}$ output of the final slave in that row goes LOW and that output data for the array may be extracted when the $\overline{ORE}$ of the final slave in the output row goes HIGH.

The row master master is established by connecting its $\overline{IES}$ input to ground while a slave receives its $\overline{IES}$ input from the $\overline{IRF}$ output of the next higher priority device. When an array of 'F403 FIFOs is intialized with a LOW on the $\overline{MR}$ inputs of all devices, the $\overline{IRF}$ outputs of all devices will be HIGH. Thus, only the row master receives a LOW on the $\overline{IES}$ input during initialization. *Figure 8* is a conceptual logic diagram of the internal circuitry which determines master/slave operation. Whenever $\overline{MR}$ and $\overline{IES}$ are LOW, the Master Latch is set. Whenever $\overline{TTS}$ goes LOW the Request Initialization Flip-Flop will be set. If the Master Latch is HIGH, the Input Register will be immediately initialized and the Request Initialization Flip-Flop reset. If the Master Latch is reset, the Input Register is not initialized until $\overline{IES}$ goes LOW. In array operation, activating the $\overline{TTS}$ initiates a ripple input register initialization from the row master of the last slave.

A similar operation takes place for the output register. Either a $\overline{TOS}$ or TOP input intiates a load-from-stack operation and sets the ORE Request Flip-Flop. If the Master Latch is set, the last Output Register Flip-Flop is set and $\overline{ORE}$ goes HIGH. If the Master Latch is reset, the $\overline{ORE}$ output will be LOW until an $\overline{OES}$ input is received.

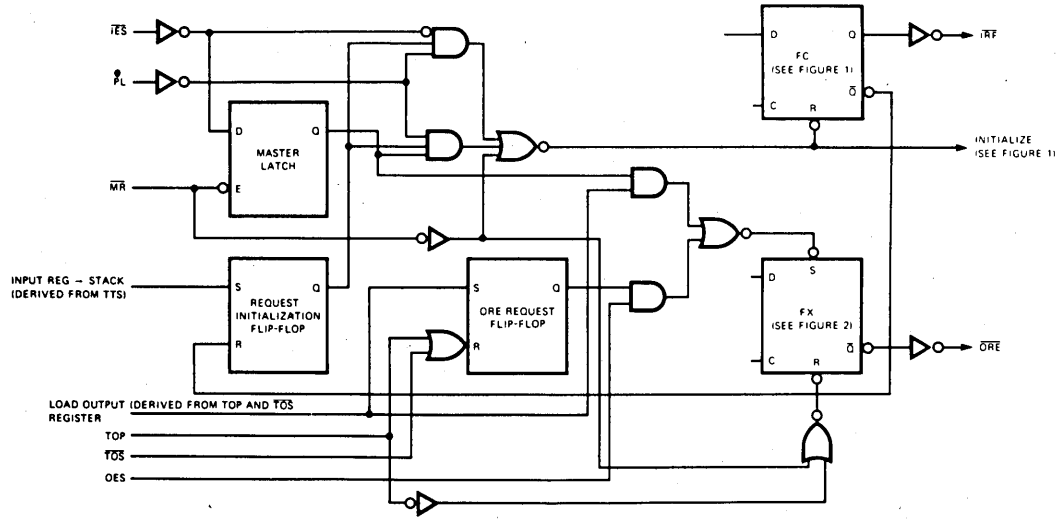


FIG. 8
CONCEPTUAL DIAGRAM, INTERLOCKING CIRCUITRY

© IC MASTER 1983

54F/74F418

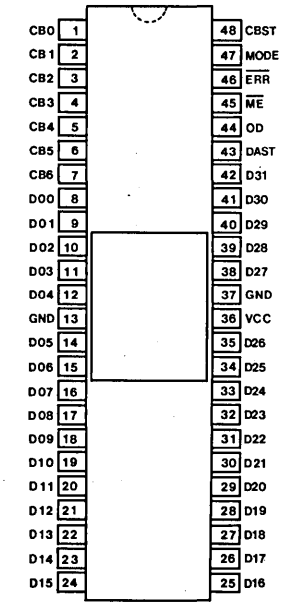
32-BIT MEMORY ERROR DETECTION AND CORRECTION CIRCUIT

DESCRIPTION — The 'F418 memory Error Detection And Correction (EDAC) circuit contains the logic to generate seven check bits on a 32-bit data field, according to a modified Hamming code. The check bits are then stored in memory with the data word. On a subsequent read from memory, the device will detect and correct any single-bit data error, and detect any double-bit error.

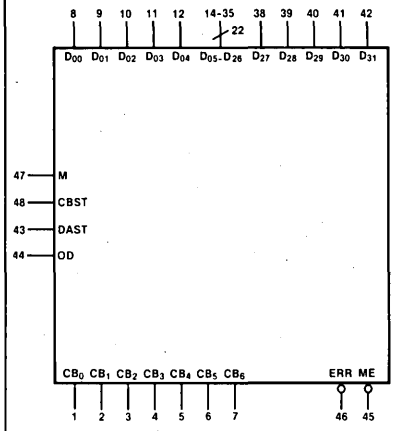
The 'F418 is fully compatible with all TTL families. Data and check-bit signals are bidirectional 3-state lines.

- **INCREASES MEMORY SYSTEM RELIABILITY**
- **CORRECTS SINGLE-BIT ERRORS**
- **DETECTS DOUBLE-BIT ERRORS**

CONNECTION DIAGRAM



LOGIC SYMBOL



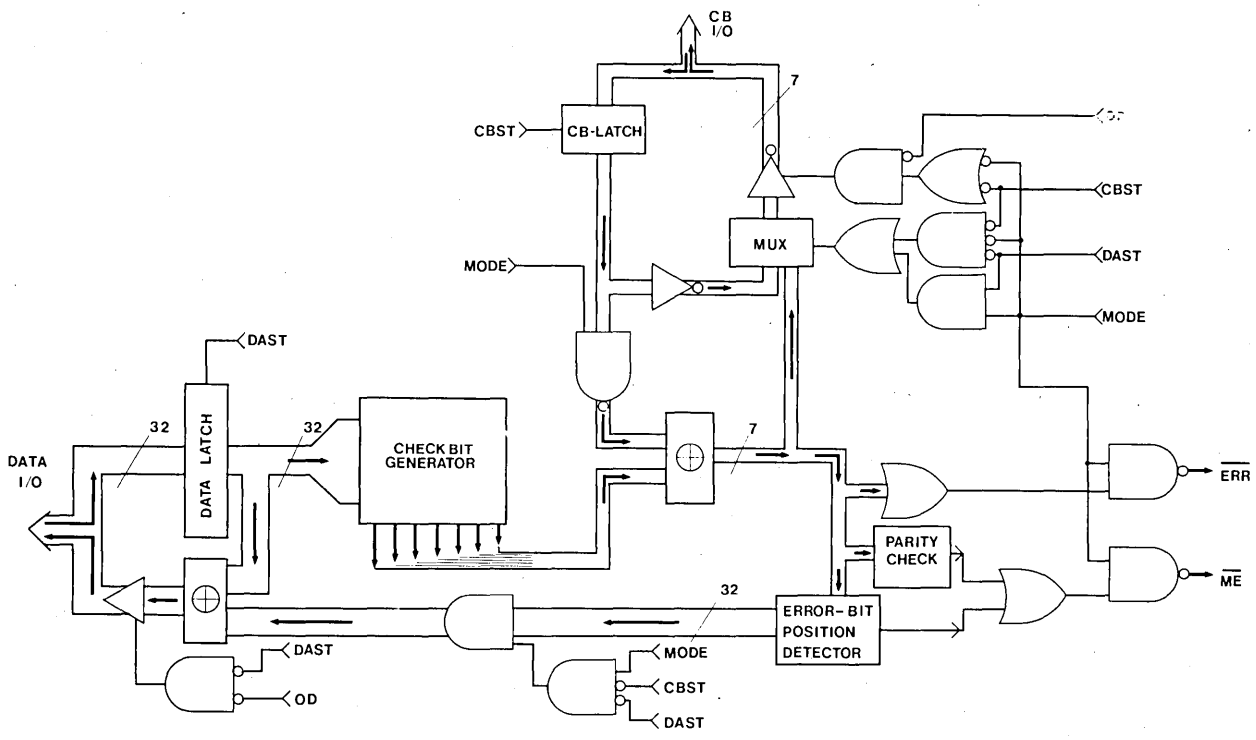
V_{CC} = Pin 36
GND = Pins 13, 37

PIN NAMES

PIN NAME	DESCRIPTION	COMMENTS
D_{00}—D_{31}	Data I/O Lines	
CB_0—CB_6	Check Bit I/O Lines	
DAST	Data Strobe	
OD	Output Disable	
$\overline{ME}$	Multiple Error	
$\overline{ERR}$	Error	
MODE	Mode	
CBST	Check Bit Strobe	

© IC MASTER 1983

LOGIC DIAGRAM



PIN NAMES

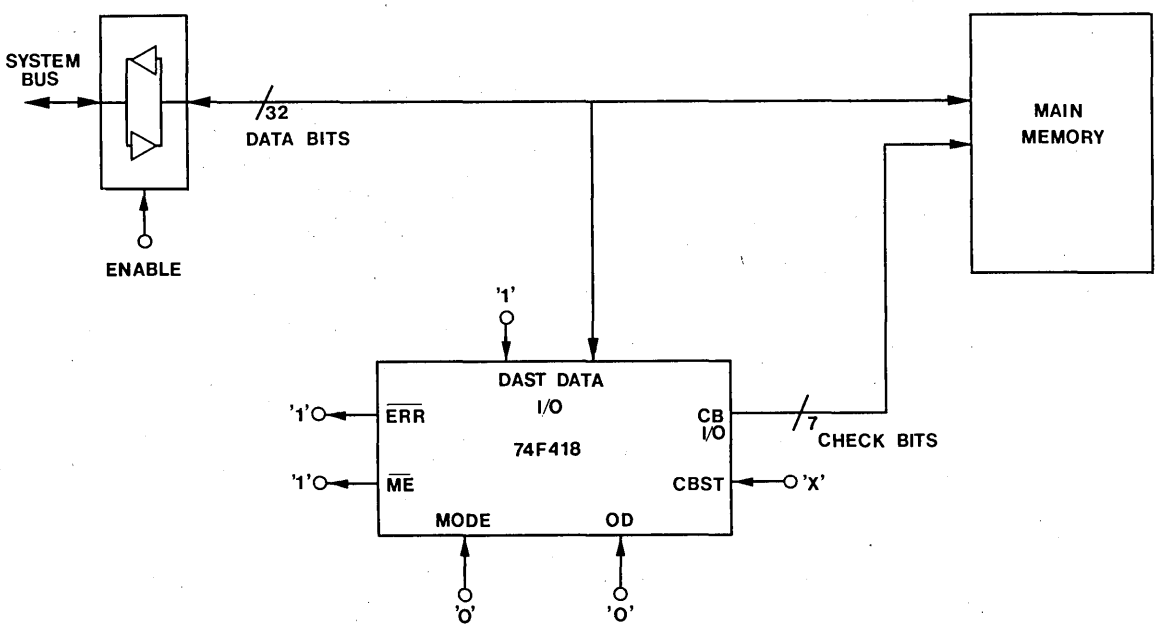
PIN NAME	DESCRIPTION	COMMENTS
D_{00}–D_{31}	Data I/O Lines	32 bidirectional data lines. D_{00} is the least significant bit.
CB_0–CB_6	Check Bit I/O Lines	Seven bidirectional check bit lines used to output the check bits on memory write operations and to put the fail pattern syndromes during correction. CB_0 is the least significant bit.
DAST	Data Strobe	Used to strobe data into the data latches. When DAST is HIGH the outputs of the data latches follow the input data lines (D_{00}–D_{31}). When DAST is LOW the input data lines are latched into the data latches. In addition, when DAST is HIGH the data output drivers on the 32 bidirectional data lines are inhibited. These data output drivers are enabled when DAST is LOW and OD is LOW (see Function Table and Block Diagram).
OD	Output Disable	When OD is HIGH the 39 data/CB line drivers are in the high impedance state regardless of the state of the DAST, CBST and MODE inputs. When OD is LOW, the 32 data I/O lines and 7 check bits I/O lines may be either outputs and/or inputs depending on the states of the DAST, CBST and MODE inputs.
$\overline{ME}$	Multiple Error	With the MODE input HIGH the $\overline{ME}$ output goes LOW whenever 2 or more bit errors have occurred in the memory word (data and check bits). When LOW, indicates a non-correctable error.

© IC MASTER 1983

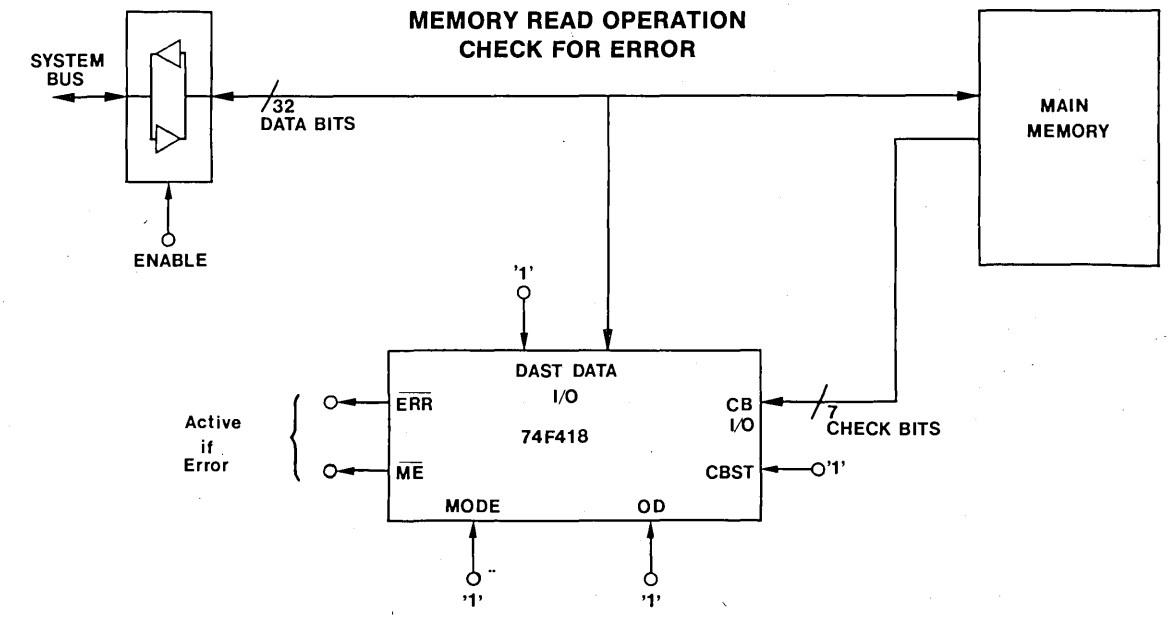
PIN NAMES

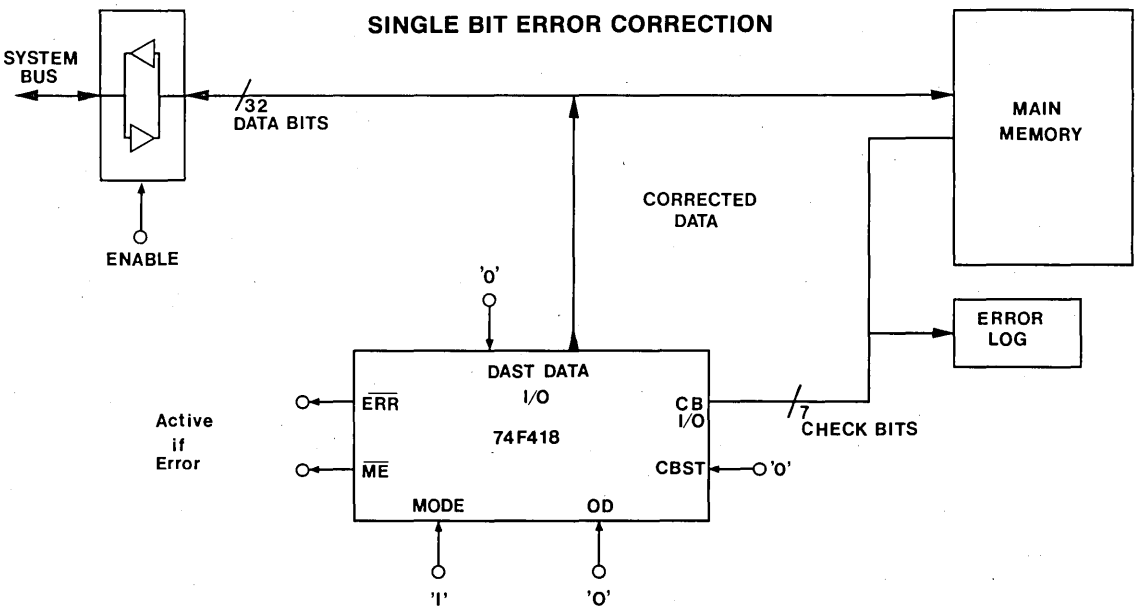
PIN NAME	DESCRIPTION	COMMENTS
$\overline{ERR}$	Error	With the MODE input HIGH the $\overline{ERR}$ output goes LOW whenever a single or double bit error has occurred in the memory word (data and check bits).
MODE	Mode	The MODE input in conjunction with DAST and CBST inputs determines the internal function performed. A HIGH on the MODE input specifies the monitor/correct operation while a LOW specifies the generate/read operation.
CBST	Check Bit Strobe	Used to strobe data into the check bit latches. When CBST is HIGH the outputs of the check bit (CB) latches follow the input check bit lines. When CBST is LOW the input check bit lines are latched into the CB latches. The check bit output drivers are controlled by CBST, MODE and OD inputs as indicated in the Function Table (Block Diagram).

MEMORY WRITE OPERATION



© IC MASTER 1983





'F418 FUNCTION TABLE

CONTROL INPUTS			OUTPUTS			FUNCTION
DAST	MODE	CBST	DATA I/O*	CB I/O*	$\overline{ERR}$, $\overline{ME}$	
0	0	0	O/P Latched Data	O/P Latched CB's	1	Read Latches
0	0	1	O/P	O/P New CB's	1	Latched Generate CB's
0	1	0	O/P Corrected Data	O/P Syndromes	Active	Correct
0	1	1	O/P Uncorrected Data	I/P	Active	Monitor W/Latched Data
1	0	X	I/P	O/P New CB's	1	Unlatched Data, Generate CB's
1	1	0	I/P	O/P Latched CB's	Active	Monitor W/Latched CB's
1	1	1	I/P	I/P	Active	Monitor Inputs

*OD Must be LOW to enable the output drivers.

© IC MASTER 1983

PARITY ENTRIES/FAIL PATTERNS

Bit #	S6	S5	S4	S3	S2	S1	S0	Bit #	S6	S5	S4	S3	S2	S1	S0
D00	X	–	X	X	–	–	–	D20	–	X	X	–	X	–	–
D01	–	–	X	X	–	–	X	D21	X	X	X	–	X	–	X
D02	–	–	X	X	–	X	–	D22	X	X	X	–	X	X	–
D03	X	–	X	X	–	X	X	D23	–	X	X	–	X	X	X
D04	–	–	X	X	X	–	–	D24	–	X	X	X	–	–	–
D05	X	–	X	X	X	–	X	D25	X	X	X	X	–	–	X
D06	X	–	X	X	X	X	–	D26	X	X	X	X	–	X	–
D07	–	–	X	X	X	X	X	D27	–	X	X	X	–	X	X
D08	X	X	–	X	–	–	–	D28	X	X	X	X	X	–	–
D09	–	X	–	X	–	–	X	D29	–	X	X	X	X	–	X
D10	–	X	–	X	–	X	–	D30	–	X	X	X	X	X	–
D11	X	X	–	X	–	X	X	D31	X	X	X	X	X	X	X
D12	–	X	–	X	X	–	–								
D13	X	X	–	X	X	–	X	CB0	–	–	–	–	–	–	X
D14	X	X	–	X	X	X	–	CB1	–	–	–	–	–	X	–
D15	–	X	–	X	X	X	X	CB2	–	–	–	–	X	–	–
D16	X	X	X	–	–	–	–	CB3	–	–	–	X	–	–	–
D17	–	X	X	–	–	–	X	CB4	–	–	X	–	–	–	–
D18	–	X	X	–	–	X	–	CB5	–	X	–	–	–	–	–
D19	X	X	X	–	–	X	X	CB6	X	–	–	–	–	–	–

NOTES:

1.) During generate mode, MODE is LOW, CB2 through CB6 are calculated so that the indicated bits there are an even number of ones (i.e. even parity) while CB0, CB1 and CB6 are calculated for an odd number of ones. This modification of the Hamming code makes the device respond to a memory read of all ones or all zeros (all 39 bits) with a $\overline{ME}$ indication.

2.) During correction mode, with DAST LOW and CBST LOW, the fail pattern will be placed on the CB I/O lines. Each zero in the fail pattern indicates a discrepancy between that particular bit in the input (or latched) checkbit (based on D0 through D31). A fail pattern of all ones indicates no error. A single zero indicates that the corresponding check bit is in error and no correction of the data is required. This situation is still flagged with a LOW $\overline{ERR}$.

© IC MASTER 1983

Preliminary

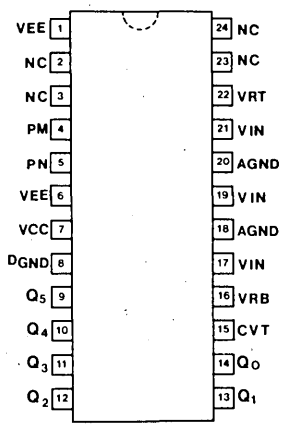
54F/74F500

6-BIT ANALOG-TO-DIGITAL CONVERTER

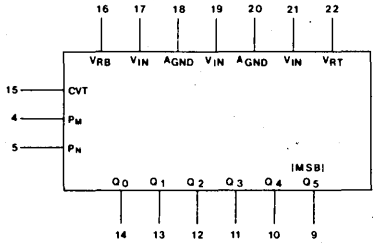
DESCRIPTION—The 'F500 is a 6-bit, fully parallel analog-to-digital converter capable of sampling at rates from 0 to 70 MHz. Conversion is accomplished by 64 comparators spaced one quanta apart on a voltage reference ladder. All comparators measure the analog input against their reference simultaneously. The most significant comparator that finds the analog input to be greater than its reference has its output encoded to a 6-bit, active-HIGH binary number, stored in latches. Two polarity control inputs are provided: P_M complements the most significant output bit and P_N complements the lesser five output bits. The circuit operates from +5.0 V and −6.0 V supplies and has separate digital and analog grounds. Both ends of the reference ladder are brought out, one to V_{RT} (nominally zero volts) and the other to V_{RB} (nominally −1.0 V).

- **NO SAMPLE AND HOLD REQUIRED**
- **SAMPLING RATE 70 MHz TYP**
- **APERTURE TIME 4.0 ns TYP**
- **V_{CC} SUPPLY CURRENT 23mA TYP**
- **V_{EE} SUPPLY CURRENT 93 mA TYP**
- **PIN COMPATIBLE WITH TDC 1014J**

CONNECTION DIAGRAM



LOGIC SYMBOL



V_{CC} = Pin 7
V_{EE} = Pins 1, 6
D_{Gnd} = Pin 8

PIN NAMES

PIN NAMES	DESCRIPTION	COMMENTS
Q_0-Q_5	Data Outputs	
PM	Polarity Control Input -(Q_5)	
PN	Polarity Control Input -(Q_0-Q_4)	
CVT	Convert	
V_{IN}	Analog Input	
V_{RB}	Reference Input Bottom	
V_{RT}	Reference Input Top	

© IC MASTER 1983

54F/74F610 • 54F/74F612

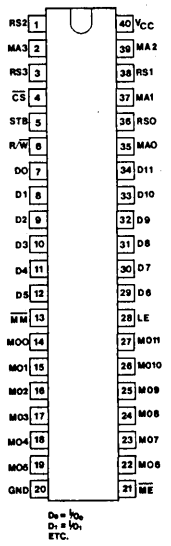
MEMORY MAPPER
(WITH 3-STATE OUTPUTS AND OUTPUT LATCHES)

DESCRIPTION— The 'F610, 'F612 memory mappers are designed to expand the address capability at a Central Processing Unit (CPU) by eight bits. The devices contain 16 map registers, each containing 12 bits, that are loaded by the CPU. Subsequently, the four most significant bits of the memory address select one of the 16 registers. The 12 output bits, plus the four least significant memory address bits, form the expanded address. In this mode the 'F610 output stages may be transparent or latched. The addressable memory space is increased by periodically reloading the map registers.

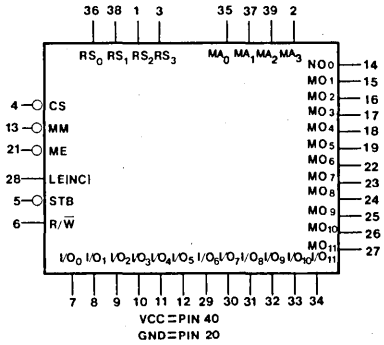
In the pass mode the address bits on the register select inputs appear as the most significant bits at the map outputs, with LOW levels appearing on the other bit positions.

- **INCREASE ADDRESSING CAPABILITY BY EIGHT BITS**
- **DESIGNED FOR PAGED MEMORY MAPPING**
- **OUTPUT LATCHES ON 'F610**
- **3-STATE OUTPUTS**

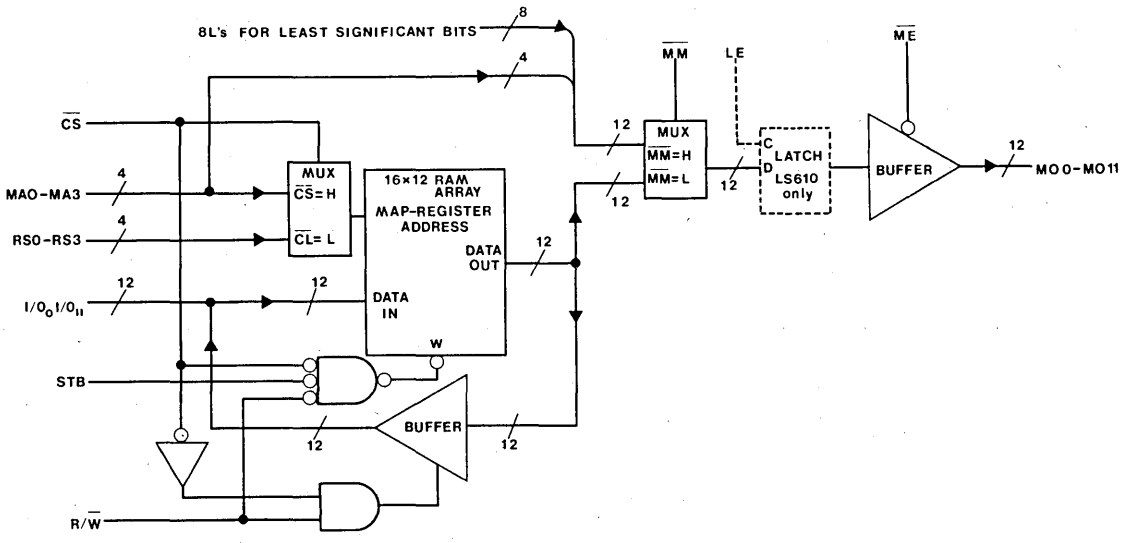
CONNECTION DIAGRAM



LOGIC SYMBOL



LOGIC DIAGRAM



Fairchild

DIGITAL

© IC MASTER 1983

PIN NAMES

PIN NAME	DESCRIPTION	COMMENTS
I/O_0–I/O_{11}	Data I/O Lines	I/O connections to data and control bus used for reading from and writing to the map register selected by RS_0–RS_3 when $\overline{CS}$ is LOW. MODE controlled by R/$\overline{W}$.
RS_0–RS_3	Register Select Inputs	Register select inputs for I/O operations.
R/$\overline{W}$	Read/Write Control Input	Read or write control used in I/O operations to select the condition of the data bus. When HIGH, the data bus outputs are active for reading the map register. When LOW, the data bus is used to write into the register.
STB	Strobe Input	Strobe input used to enter data into the selected map register during I/O operations.
CS	Chip Select	Chip select input. A low input level selects the memory mapper (assuming more than one used) for an I/O operation.
MA_0–MA_3	Map Address Inputs	Map address inputs to select one of 16 map registers when in map MODE ($\overline{MM}$ LOW and $\overline{CS}$ HIGH).
MO_0–MO_{11}	Map Outputs	Map outputs. Present the map register contents to the system memory address bus in the map MODE. In the pass MODE, these outputs provide the map address data on MO_8–MO_{11} and LOW levels on MO_0–MO_7.
$\overline{MM}$	Map Mode Input.	Map MODE Input. When LOW, 12 bits of data are transferred from the selected map register to the map outputs. When HIGH (pass MODE), the 4 bits present on the map address inputs are passed to the map outputs.
$\overline{ME}$	Map Enable	Map enable for the map outputs.A LOW level allows the outputs to be active while a HIGH input level puts the outputs at HIGH impedence.
LE	Latch Enable ('F610 Only)	Latch enable input for the 'F610 (no internal connection for 'F612). A HIGH level will transparently pass data to the map outputs. A LOW level will latch the outputs.

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F100K ECL Logic

Fairchild's entire F100K logic family is in volume production *now*. The family, the industry standard for speed, includes a full complement of gates, flip-flops, latches, counters, shift registers, and arithmetic functions.

F100K utilizes Fairchild's Isoplanar II process along with voltage and temperature compensation networks to bring you the circuits you need when system performance is a must.

See next page for Data Book information.

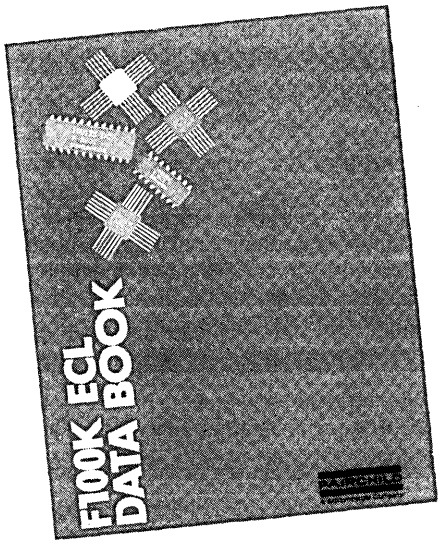
F100K ECL Logic Series

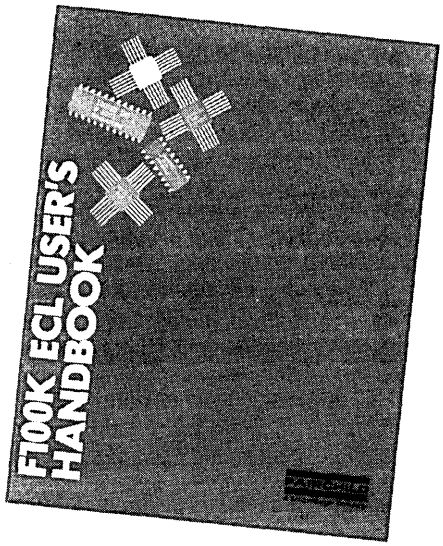
Device	Pkg	Function	Available
100101	DC,FC	Triple 5-Input OR/NOR	NOW
100102	DC,FC	Quint 2-Input OR/NOR	NOW
100107	DC,FC	Quint Exclusive OR/NOR	NOW
100112	DC,FC	Quad Driver	NOW
100113	DC,FC	Line Driver	NOW
100114	DC,FC	Quint Line Receiver	NOW
100117	DC,FC	Triple 2-Wide OA/OAI	NOW
100118	DC,FC	5-Wide 5, 4, 4, 4, 2 OA/OAI	NOW
100122	DC,FC	9-Bit Buffer Gate	NOW
100123	DC,FC	Hex Bus Driver	NOW
100124	DC,FC	TTL-100K ECL Translator	NOW
100125	DC,FC	100K ECL-TTL Translator	NOW
100126	DC,FC	Back Plane Driver	NOW
100130	DC,FC	Triple D Latch	NOW
100131	DC,FC	Triple D Flip-Flop	NOW
100136	DC,FC	Counter/Shift Register	NOW
100141	DC,FC	8-Bit Shift Register	NOW
100142	DC,FC	4 x 4 Content Addressable Memory	NOW
100145	DC,FC	16 x 4 Register File	NOW

Device	Pkg	Function	Available
100150	DC,FC	Hex D Latch	NOW
100151	DC,FC	Hex D Flip-Flop	NOW
100155	DC,FC	Quad Multiplexer/Latch	NOW
100156	DC,FC	Mask-Merge	NOW
100158	DC,FC	Shift Matrix	NOW
100160	DC,FC	Dual 9-Bit Parity	NOW
100163	DC,FC	Dual 8-Input Multiplexer	NOW
100164	DC,FC	16-Input Multiplexer	NOW
100165	DC,FC	Universal Priority Encoder	NOW
100166	DC,FC	9-Bit Comparator	NOW
100170	DC,FC	Universal Decoder	NOW
100171	DC,FC	Triple 4-Input Multiplexer	NOW
100179	DC,FC	Carry Lookahead	NOW
100180	DC,FC	Fast 6-Bit Adder	NOW
100181	DC,FC	4-Bit Binary/BCD ALU	NOW
100182	DC,FC	9-Bit Wallace Tree Adder	NOW
100183	DC,FC	2 x 8-Bit Recode Multiplier	NOW
100194	DC,FC	Quint Transceiver	NOW
100402	DC,FC	High-Speed 16 x 4 Register File	NOW

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company





An *F100K ECL User's Handbook* and *F100K ECL Data Book* are available. The *F100K ECL Data Book* fully specifies the AC and DC characteristics over a power supply voltage of −4.2 V to −4.8 V and 0°C to 85°C case temperature.

The *F100K ECL User's Handbook* is a handy guide for all F100K users. It contains chapters for the logic designer, the system designer, and for those involved in testing F100K. Send the coupon below for your copy.

☐ F100K ECL User's Handbook
☐ F100K ECL Data Book

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____

TO: Fairchild Camera & Instrument Corp.
441 Whisman Road
P.O. Drawer #7283
M/S 23-1250
Mountain View, CA 94039

© IC MASTER 1983

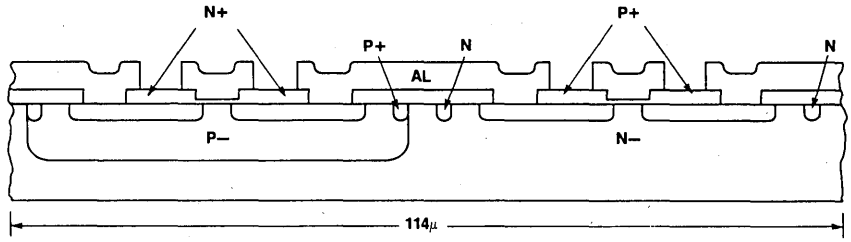
FAIRCHILD
A Schlumberger Company

FACT™ Description and Family Characteristics

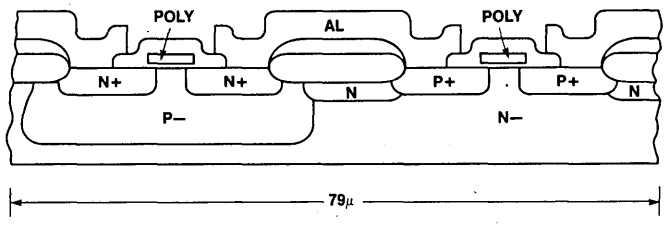
The Fairchild Advanced CMOS Technology, FACT,™ is Fairchild's proprietary, isoplanar, fully ion-implanted, silicon-gate process. FACT™ employs state-of-the-art techniques in projection photolithography, planar plasma etching, low pressure chemical vapor deposited (LPCVD) thin films and sputter metallization. With a nominal effective channel length of 2.5 μm, 500 angstrom gate oxide and 4 μm design rules, the process is ideal for fabricating high speed, high density CMOS logic/memory circuits. *Figure 2-1* shows the progress of CMOS technology since the 6 μm metal gate 4000 Series technology. *Figure 2-1a* shows the cross-section of a single stage inverter, fabricated by the standard 6 μm metal gate technology, which is still commonly used by many manufacturers to produce the 4000B Series CMOS devices. In 1973, Fairchild introduced the F4000 Series CMOS logic, which was fabricated with a 6 μm, silicon gate, oxide-isolation technology. This technology combines local oxide isolation techniques with silicon gate technology to achieve approximately 35% savings in area, as shown in *Figure 2-1b*. Operating speeds were increased due to self-alignment of the silicon gate and reduced sidewall capacitance. This is evident in the high speed performance of the Fairchild 4000B CMOS Series. Over the years, Fairchild has continued to improve the CMOS process. FACT™ is the result of such development effort and is backed-up by nine years of manufacturing experience in silicon-gate CMOS logic devices. As shown in *Figure 2-1c,* it is apparent that devices fabricated with FACT™ are substantially smaller than those made with the other two processes. Much higher density and complexity in circuit designs may be achieved. Another major advantage of FACT™ is that smaller geometry enables the device to operate at a higher speed. Logic gates manufactured with FACT™ can operate in excess of 20 MHz - 30 MHz while driving a 50 pF load with a typical output short circuit current of 55 mA.

Fig. 2-1 Cross Section of a CMOS Inverter

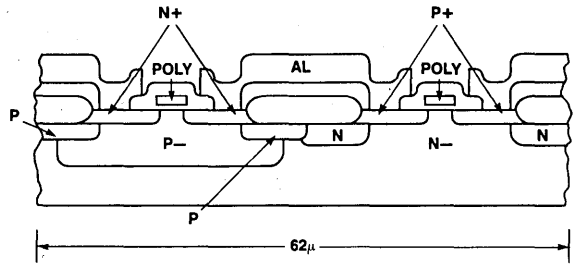
a) 6 μm Metal Gate Technology



b) Fairchild Silicon Gate Technology



c) Fairchild Advanced CMOS Technology, FACT™



DIGITAL

Fairchild

© IC MASTER 1983

Absolute Maximum Ratings
(beyond which useful life may be impaired)

DC Supply Voltage	−0.5 V to 7.0 V
Input or Output Voltage	−0.5 V to V_{CC} + 0.5 V
Input or Output Current (Any One Pin)	
Standard	±25 mA
Bus Driver	±35 mA
DC Current Output	
Standard	±50 mA
Bus Driver	±70 mA
Power Dissipation	500 mW
Storage Temperature	−65°C to 150°C

Recommended Operating Conditions

	Min	Max
DC Supply Voltage (Note 1)	2.0 V	6.0 V
Input or Output Voltage (Any One Pin)	0 V	V_{CC}
Input Rise/Fall Time		500 ns
Operating Temperature		
54HC	−55°C	+125°C
74HC	−40°C	+85°C

Note:
1. Some devices (analog switches, one shots, etc.) may be recommended to operate at V_{CC} = 3 V − 6 V.

DC Characteristics over Operating Temperature Range. V_{CC} = 5 V ± 10%

Symbol	Parameter			25°C Min	25°C Max	85°C Min	85°C Max	125°C Min	125°C Max	Units	Conditions
V_{IH}	Input HIGH Voltage			3.15		3.15		3.15		V	V_{CC} = 4.5 V
				3.85		3.85		3.85			V_{CC} = 5.5 V
V_{IL}	Input LOW Voltage				0.90		0.90		0.90	V	V_{CC} = 4.5 V
					1.10		1.10		1.10		V_{CC} = 5.5 V
V_{OH}	Output HIGH Voltage	All Devices		V_{CC}− 0.1		V_{CC}− 0.1		V_{CC}− 0.1		V	I_{OH} = −20 μA (1)
		Standard Output		3.80		3.70		3.50			I_{OH} = −4 mA (1)
				2.80		2.70		2.50			I_{OH} = −6 mA (1)
		Bus Driver Output		3.80		3.70		3.50			I_{OH} = −6 mA (1)
				2.80		2.70		2.50			I_{OH} = −8.7 mA (1)
V_{OL}	Output LOW Voltage	All Devices			0.10		0.10		0.10	V	I_{OL} = 20 μA (1)
		Standard Output	74HC		0.32		0.40				I_{OL} = 4 mA (1)
			54HC		0.32		0.40		0.40		I_{OL} = 3.4 mA (1)
		Bus Driver Output	74HC		0.32		0.40				I_{OL} = 6 mA (1)
			54HC		0.32		0.40		0.40		I_{OL} = 5.1 mA (1)
I_{IN}	Input Leakage Current	Non-Transceiver			±0.1		±1.0		±1.0	μA	V_{IN} = V_{CC} or GND
		Transceiver			±0.5		±5.0		±10.0		
I_{IN}	Analog Switch Input/Output Leakage Current (Per Channel)				±0.1		±1.0		±1.0	μA	V_{IN} = V_{CC} or GND |V_{CC}| across channel
I_{OZ}	3-State Output Leakage Current				±0.5		±5.0		±10.0	μA	V_{OUT} = V_{CC} or GND
I_{CC}	Quiescent Device Current	SSI			2.0		20		40	μA	V_{IN} = V_{CC} or GND I_{OUT} = 0
		Flip-Flops and Buffers (2)			4.0		40		80		
		MSI and Bus Drivers			8.0		80		160		

Notes:
1. V_{IN} = V_{IH} or V_{IL}
2. Standard outputs

© IC MASTER 1983

AC Characteristics of Simple Gates and D-Type Flip-Flops
(T_A = 25°C, V_{CC} = 5 V, All Inputs are 5 V or ground)

Symbol	Parameter	C_L = 15 pF		C_L = 50 pF		Units	Figure No.
		Min	Max	Min	Max		
t_{PLH} t_{PHL}	Propagation Delay Standard Gates		13		15	ns	2-2 2-4 2-6
f_{MAX}	Maximum Clock Frequency (D Flip-Flop)		30		20	MHz	2-2 2-5
t_{PLH} t_{PHL}	Propagation Delay Clock to Q (D Flip-Flop)		23		25	ns	2-2 2-6
t_{PLH} t_{PHL}	Propagation Delay Clear to Q (D Flip-Flop)		21		23	ns	2-2 2-6
t_{SU}	Setup Time Data to Clock (D Flip-Flop)		10		10	ns	2-6
t_H	Hold Time Clock to Data (D Flip-Flop)	0		0		ns	2-6
t_W	Pulse Width Clock or Clear (D Flip-Flop)	17		17		ns	2-5

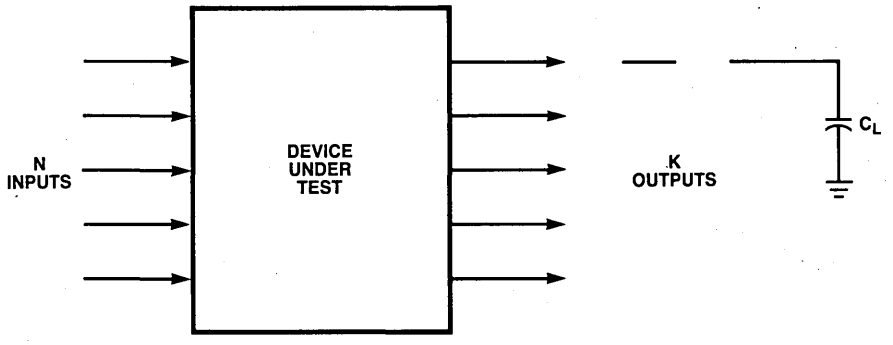
AC Characteristics—Bus Drivers
(T_A = 25°C, V_{CC} = 5 V, All Inputs are 5 V or ground)

Symbol	Parameter	C_L = 50 pF		C_L = 150 pF		Units	Figure No.
		Min	Max	Min	Max		
t_{PLH} t_{PHL}	Propagation Delay Data to Output		16		21	ns	2-2 2-4 2-6

Listing of Standard AC (Dynamic) Test Methods and Definitions

Figure 2-2 shows the standard AC (Dynamic) test configuration and conditions. Dynamic electrical symbols and parametric definitions are listed in *Figure 2-3. Figures 2-4* through *2-6* show standard AC characteristic test waveforms.

Fig. 2-2 Test Configuration and Conditions



Standard Gate: C_L = 50 pF
Bus Driver: C_L = 50 pF
150 pF

V_{CC} = 5 V

$t_s = t_f$ = 6 ns

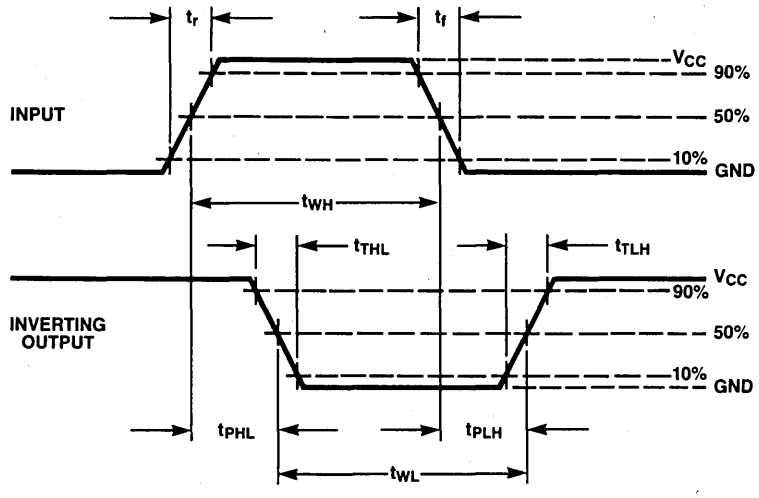
© IC MASTER 1983

Fig. 2-3 Dynamic Electrical Symbols and Definitions

Characteristic	Symbol	Limits		Notes
		Max	Min	
Propagation Delay:				
Outputs going LOW-to-HIGH	t_{PLH}	X		
Outputs going HIGH-to-LOW	t_{PHL}	X		
Output Transition Time:				
Outputs going LOW-to-HIGH	t_{TLH}	X		
Outputs going HIGH-to-LOW	t_{THL}	X		
Pulse Width—Set, Reset, Preset, Enable, Disable, Strobe, Clock	t_{WL} or t_{WH}		X	1
Maximum Clock Input Frequency	F_{CL}		X	1,2
Clock Input Rise and Fall Time	t_r, t_f	X		
Set-up Time	t_{SU}		X	1
Hold time	t_H		X	1
Removal Time—Set, Reset, Preset, Enable	t_{REM}		X	1
Three State Delay Times:				
HIGH level-to-high impedance	t_{PHZ}	X		
LOW level-to-high impedance	t_{PLZ}	X		
High impedance-to-HIGH level	t_{PZH}	X		
High impedance-to-LOW level	t_{PZL}	X		

Notes:
1. By placing a defining min or max in front of definition, the limits can change from min to max, or vice versa.
2. Clock input waveform should have a 50% duty cycle and be such as to cause the outputs to be switching from 10% V_{CC} to 90% V_{CC} in accordance with the device truth table.

Fig. 2-4 Transition Times and Propagation Delay Times, Combinational Logic



© IC MASTER 1983

Fig. 2-5 Clock Pulse Rise and Fall Times and Pulse Width

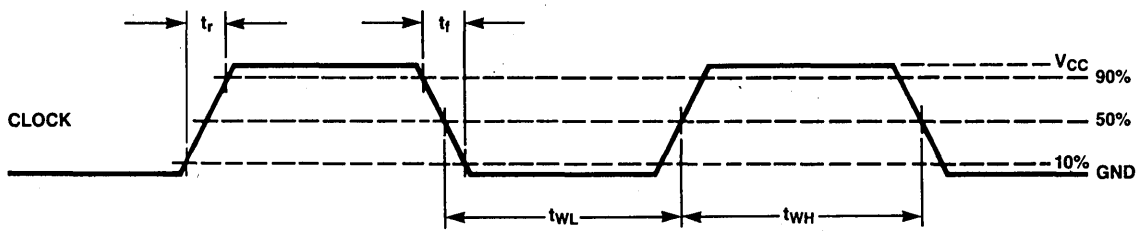
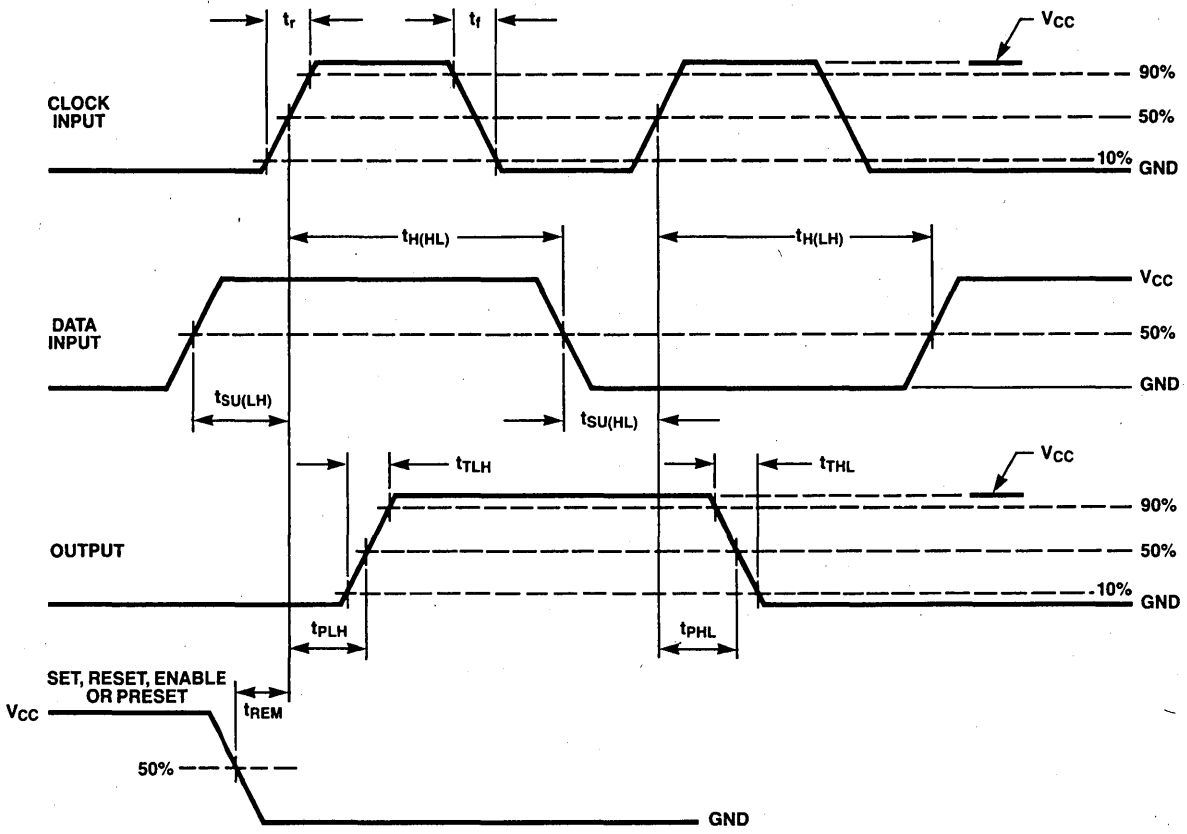


Fig. 2-6 Setup Times, Hold-Times, Removal Time, and Propagation Delay Times for Positive Edge-Triggered Sequential Logic Circuits



© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

Selection Guide

Gates

Function	Device No.	Page No.	Function	Device No.
NAND			*NOR/Exclusive-NOR*	
Quad 2-Input	54/74HC00	4-3	Quad 2-Input NOR	54/74HC02
Triple 3-Input	54/74HC10	4-3	Triple 3-Input NOR	54/74HC27
Dual 4-Input	54/74HC20	4-4	Quad 2-Input Exclusive-NOR	54/74HC266
8-Input	54/74HC30	4-4		
13-Input	54/74HC133	4-11		
Quad 2-Input Schmitt Trigger	54/74HC132	4-10		
AND			*OR/Exclusive-OR*	
Quad 2-Input	54/74HC08	4-3	Quad 2-Input OR	54/74HC32
Triple 3-Input	54/74HC11	4-4	Quad 2-Input Exclusive-OR	54/74HC86

Latches, Registers and FIFOs

Function	Device No.	Enable Input (Level)
4-Bit D-Type Latch	54/74HC75	2 (H)
8-Bit Addressable Latch	54/74HC259	1 (L)
Octal D, 3-State Latch	54/74HC373	1 (H)
Octal D, 3-State Latch	54/74HC573	1 (H)
Octal Inverting, 3-State Latch	54/74HC533	1 (H)
Octal Inverting, 3-State Latch	54/74HC563	1 (H)
8-Bit D-Type Register	54/74HC273	
4-Bit D-Type, 3-State Register	54/74HC173	2 (L)
Serial-In Parallel-Out Shift Register	54/74HC164	1 (H)
Parallel-In Serial Out Shift Register	54/74HC165	1 (L)
Universal Shift Register	54/74HC195	1 (L)
Universal Shift/Storage Register, 3-State	54/74HC299	
Bi-Directional Universal Shift Register	54/74HC194	
Octal Register/Bus Transceiver	54/74HC543	2 (L)
Octal Register/Bus Transceiver	54/74HC544	2 (L)
Octal Register/Bus Transceiver	54/74HC550	2 (L)
Octal Register/Bus Transceiver	54/74HC551	2 (L)
Octal Register/Bus Transceiver	54/74HC646	1 (L)
Octal Inverting Register/Bus Transceiver	54/74HC648	1 (L)
16 x 4 FIFO	54/74HC4703	1 (L) + 1 (H)

© IC MASTER 1983

Flip-Flops

Function	Device No.	Data Inputs	Clock Edge	Set	Clear, Reset
Dual JK	54/74HC73	J,K	Negative	No	Yes
Dual JK	54/74HC76	J,K	Negative	Yes	Yes
Dual JK	54/74HC107	J,$\overline{K}$	Negative	No	Yes
Dual JK	54/74HC109	J,$\overline{K}$	Positive	Yes	Yes
Dual JK	54/74HC112	J,K	Negative	Yes	Yes
Dual D	54/74HC74	D	Positive	Yes	Yes
Quad D	54/74HC175	D	Positive	No	Yes
Hex D	54/74HC174	D	Positive	No	Yes
Octal D, 3-State	54/74HC374	D	Positive	No	No
Octal D. 3-State	54/74HC574	D	Positive	No	No
Octal Inverting D, 3-State	54/74HC534	D	Positive	No	No
Octal Inverting D, 3-State	54/74HC564	D	Positive	No	No

Multiplexers/Encoders

Function	Device No.	Input Enable (Level)	Non-Inverting Output	Inverting Output
8-Input	54/74HC151	1 (L)	Yes	Yes
8-Input, 3-State	54/74HC251	1 (L)	Yes	Yes
8-Input, 3-State	54/74HC4512	2 (L)	Yes	No
Dual 4-Input	54/74HC153	2 (L)	Yes	No
Dual 4-Input, 3-State	54/74HC253	2 (L)	Yes	No
Quad 2-Input, 3-State	54/74HC257	1 (L)	Yes	No
10 to 4 Priority Encoder	54/74HC147		No	Yes

Decoders/Demultiplexers

Function	Device No.	Address Inputs	Input Enable (Level)	Active Low Outputs	Active High Outputs
Dual 1-of-4	54/74HC139	2 + 2	1 (L) + 1 (L)	4 + 4	
1-of-8	54/74HC138	3	2 (L), 1 (H)	8	
1-of-10	54/74HC42	4		10	
1-of-16	54/74HC154	4	2 (L)	16	
1-of-16 w/Input Latch	54/74HC4514	4	1 (L)		16

Analog Multiplexer/Demultiplexer

Function	Device No.	Address Input	Enable (Level)
8-Channel	54/74HC4051	3	1 (L)
Dual 4-Channel	54/74HC4052	2	1 (L)
Triple 2-Channel	54/74HC4053	1 + 1 + 1	1 (L)

© IC MASTER 1983

Inverters, Buffers, Drivers, TTL Interface

Function	Device No.	Output Enable (Level)	Output
Hex Inverter	54/74HC04		Bi-state
Hex Buffer	54/74HC07		Bi-state
Hex Schmitt Trigger Inverter	54/74HC14		Bi-state
Hex Inverting Buffer	54/74HC4049		Bi-state
Hex Non-Inverting Buffer	54/74HC4050		Bi-state
Hex 3-State Inverting Buffer	54/74HC366	1 (L) + 1 (L)	3-state
Hex 3-State Inverting Buffers	54/74HC368	1 (L) + 1 (L)	3-state
Hex 3-State Non-Inverting Buffer	54/74HC365	1 (L) + 1 (L)	3-state
Hex 3-State Non-Inverting Buffers	54/74HC367	1 (L) + 1 (L)	3-state
Quad 3-State Buffer	54/74HC125	1 (L) + 1 (L) + 1 (L) + 1 (L)	3-state
Octal Inverting Buffer/Bus Drivers	54/74HC240	2 (L)	3-state
Octal Buffer/Bus Driver	54/74HC241	1 (L), 1 (H)	3-state
Octal Buffer/Mus Driver	54/74HC244	2 (L)	3-state
TTL Input Hex Inverter	54/74HCT04		Bi-state
TTL Input Hex Buffer	54/74HCT07		Bi-state

Transceivers

Function	Device No.	Output Enable (Level)
Quad Inverting Bus Transceiver	54/74HC242	1 (L), 1 (H)
Quad Bus Transceiver	54/74HC243	1 (L), 1 (H)
Octal Bus Transceiver	54/74HC245	1 (L)
Octal D Register/Bus Transceiver	54/74HC543	2 (L)
Octal D Register/Bus Transceiver	54/74HC544	2 (L)
Octal Registered Transceiver	54/74HC550	2 (L)
Octal Registered Transceiver	54/74HC551	2 (L)
Octal Inverting Transceiver	54/74HC640	1 (L)
Octal Inverting/Non-Inverting Transceiver	54/74HC643	1 (L)
Octal Bus Transceiver	54/74HC645	1 (L)
Octal Register Transceiver	54/74HC646	1 (L)
Octal Inverting Register/Transceiver	54/74HC648	1 (L)

Arithmetic Operators

Function	Device No.	Description
Adder	54/74HC283	Full Binary 4-Bit with Fast Carry
Comparator	54/74HC85	4-Bit Magnitude Comparator
Comparator	54/74HC688	8-Bit Equality Comparator
Parity	54/74HC280	9-Bit Parity Generator/Checker

© IC MASTER 1983

Counters

Function	Device No.	Modulus	No. of Bits	Parallel Entry[1]
Synchronous BCD	54/74HC160	10	4	S
Synchronous BCD	54/74HC162	10	4	S
Dual BCD	54/74HC390		3	
Up/Down BCD	54/74HC192	10	4	A
Up/Down BCD, 3-State	54/74HC568	10	4	S
Programmable Up/Down BCD	54/74HC4510	10	4	A
Synchronous Binary	54/74HC161	16	4	S
Synchronous Binary	54/74HC163	16	4	S
Dual Binary	54/74HC393	16	4	
Up/Down Binary	54/74HC193	16	4	A
Up/Down Binary, 3-State	54/74HC569	16	4	A
Programmable Up/Down Binary	54/74HC4516	16	4	A
14-Stage Binary Ripple	54/74HC4020	14	12	
12-Stage Binary Ripple	54/74HC4040	12	12	
5-Stage Johnson	54/74HC4017	10	10	

Note 1: A–Asynchronous Parallel Entry, S–Synchronous Parallel Entry

Special Functions

Function	Device No.
Dual Monostable Multivibrator	54/74HC221
Dual Monostable Multivibrator	54/74HC4538
Monostable/Astable Multivibrator	54/74HC4047
Phase-Locked Loop	54/74HC4046

CMOS Interface (CMOS 4000B Series)

Function	Device No.
Hex Inverting Buffer	4049B
Hex Buffer	4050B
Quad Low Voltge to High Voltage Translator	4104B

© IC MASTER 1983

HARRIS

HARRIS CMOS MICROPROCESSOR, PERIPHERAL & MEMORY PRODUCTS

CMOS MICROPROCESSOR AND SUPPORT CIRCUITS*

80C86	CMOS 16 BIT MICROPROCESSOR
82C54	CMOS PROGRAMMABLE INTERVAL TIMER
82C55A	CMOS PROGRAMMABLE PERIPHERAL INTERFACE
82C59A	CMOS PRIORITY INTERRUPT CONTROLLER
82C82	CMOS OCTAL LATCH
82C84A	CMOS CLOCK GENERATOR/DRIVER
82C88	CMOS BUS CONTROLLER
HD-6120	CMOS 12 BIT HIGH PERFORMANCE MICROPROCESSOR
HD-6121	CMOS I/O CONTROLLER
HD-64XX	CMOS BUS DRIVER FAMILY

CMOS RANDOM ACCESS MEMORY**

1K	HM-6508	1K X 1 CMOS SYNCHRONOUS RAM
	HM-6518	1K X 1 CMOS SYNCHRONOUS RAM
	HM-6551	256 X 4 CMOS SYNCHRONOUS RAM
	HM-6561	256 X 4 CMOS SYNCHRONOUS RAM
4K	HM-6504	4K X 1 CMOS SYNCHRONOUS RAM
	HM-6514	1K X 4 CMOS SYNCHRONOUS RAM
16K	HM-6516	2K X 8 CMOS SYNCHRONOUS RAM
	HM-65161	2K X 8 CMOS ASYNCHRONOUS RAM
	HM-6116	2K X 8 CMOS ASYNCHRONOUS RAM
	HM-6564	64K CMOS RAM MODULE
	HM-92560	256K CMOS RAM MODULE

CMOS FUSE LINK PROMS**

4K	HM-6641	512 X 8 CMOS PROM
16K	HM-6616	2K X 8 CMOS PROM

CMOS SERIAL INTERFACE***

HD-4702	CMOS PROGRAMMABLE BIT RATE GENERATOR
HD-6402	UART
HD-6408	CMOS ASYNCHRONOUS MANCHESTER ADAPTER
HD-6409	CMOS MANCHESTER ENCODER-DECODER
HD-15530	CMOS MANCHESTER ENCODER-DECODER
HD-15531	CMOS MANCHESTER ENCODER-DECODER

* ADDITIONAL INFORMATION IN THE MICROPROCESSOR SECTION
** ADDITIONAL INFORMATION IN THE MEMORY SECTION
*** ADDITIONAL INFORMATION IN THIS SECTION

© IC MASTER 1983

HD-4702
CMOS PROGRAMMABLE BIT RATE GENERATOR

Features

- HD-4702 – PROVIDES 13 COMMONLY USED BIT RATES
- USES A 2.4576MHz CRYSTAL/INPUT FOR STANDARD FREQUENCY OUTPUT (16 TIMES BIT RATE)
- TTL COMPATIBLE – OUTPUT WILL SINK 1.6mA
- LOW POWER DISSIPATION 4.5mW TYP. @ 2.4576MHz
- CONFORMS TO EIA RS-404
- ONE HD-4702 CONTROLS UP TO EIGHT TRANSMISSION CHANNELS
- INITIALIZATION CIRCUIT FACILITATES DIAGNOSTIC FAULT ISOLATION
- ON-CHIP INPUT PULL-UP CIRCUIT

Description

The HD-4702 Bit Rate Generator provides the necessary clock signals for digital data transmission systems, such as a UART. It generates 13 commonly used bit rates using an on-chip crystal oscillator or an external input. For conventional operation generating 16 output clock pulses per bit period,the input clock frequency must be 2.4576MHz (i.e. 9600 Baud x 16 x 16, since there is an internal÷16 prescaler). A lower input frequency will result in a proportionally lower output frequency.

The HD-4702 can provide multi-channel operation with a minimum of external logic by having the clock frequency CO and the ÷8 prescaler outputs Q_0, Q_1, Q_2 available externally. All signals have a 50% duty cycle except 1800 Baud and 2000 Baud, which has less than 0.39% distortion and 3600 Baud, which has less than 0.78% distortion.

The four rate select inputs (S_0-S_3) select which bit rate is at the output (Z). The table lists select code and output bit rate. Two of the 16 for the HD-4702 do not select an internally generated frequency, but select an input into which the user can feed either a different frequency, or a static level (High or Low) to generate "ZERO BAUD".

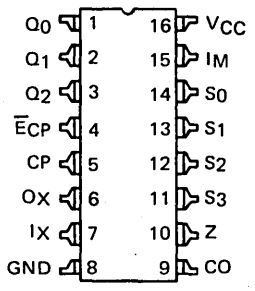
The bit rate most commonly used in modern data terminals (110, 150, 300, 1200, 2400 Baud) require that no more than one input be grounded for the HD-4702, which is easily achieved with a single 5-position switch.

The HD-4702 has an initialization circuit which generates a common master reset for all flip-flops. This signal is derived from a digital differentiator that senses the first high level on the CP input after the $\overline{E}_{CP}$ input goes low. When $\overline{E}_{CP}$ is high, selecting the crystal input, CP must be low. A high level on CP would apply a continuous reset.

For the HD-4702, all inputs except I_X have on-chip pull-up circuits which provide TTL compatibility and eliminate the need to tie a permanently high input to V_{CC}.

Pinout

TOP VIEW



PIN NAMES

$\overline{CP}$	External Clock Input
$\overline{E}_{CP}$	External Clock Enable Input (Active Low)
I_X	Crystal Input
I_M	Multiplexed Input
S_0 - S_3	Rate Select Inputs
CO	Clock Output
O_X	Crystal Drive Output
Q_0 - Q_2	Scan Counter Outputs
Z	Bit Rate Output

Truth Tables

TABLE 1
CLOCK MODES AND INITIALIZATION

I_X	E_{CP}	CP	OPERATION
⊓⊓	H	L	Clocked from I_X
X	L	⊓⊓	Clocked from CP
X	H	H	Continuous Reset
X	L	⊓	Reset During 1st CP = HIGH Time

NOTE: Actual output frequency is 16 times the indicated Output Rate, assuming a clock frequency of 2.4576MHz.

H = HIGH Level
L = LOW Level
X = Don't care
⊓ = 1st HIGH Level Clock Pulse after E_{CP} goes LOW
⊓⊓ = Clock Pulse

TABLE 2
TRUTH TABLE FOR RATE SELECT INPUTS

S_3 S_2 S_1 S_0	OUTPUT RATE (Z)
L L L L	MUX INPUT (I_M) ①
L L L H	MUX INPUT (I_M)
L L H L	50 BAUD
L L H H	75 BAUD
L H L L	134.5 BAUD
L H L H	200 BAUD
L H H L	600 BAUD
L H H H	2400 BAUD
H L L L	9600 BAUD
H L L H	4800 BAUD
H L H L	1800 BAUD
H L H H	1200 BAUD
H H L L	2400 BAUD
H H L H	300 BAUD
H H H L	150 BAUD
H H H H	110 BAUD

NOTE:
① 19200 BAUD by connecting Q_2 to I_M.

CAUTION: These devices are sensitive to electronic discharge. Proper I.C. handling procedures should be followed.

© IC MASTER 1983

ABSOLUTE MAXIMUM RATINGS

Supply Voltage		+8.0V
Input or Output Voltage Applied		(GND -0.3V) to (V_{CC} +0.3V)
Storage Temperature Range		-65°C to +150°C
Operating Temperature Range		
Industrial	HD-4702-9	-40°C to +85°C
Military	HD-4702-2	-55°C to +125°C
Operating Voltage Range		+4 to +7V

ELECTRICAL CHARACTERISTICS

D.C.: V_{CC} = 5V ± 10%; T_A = Industrial or Military.
A.C.: V_{CC} = 5V; T_A = 25°C.

	SYMBOL	PARAMETER	HD-4702-2 MIN	HD-4702-2 TYP	HD-4702-2 MAX	HD-4702-9 MIN	HD-4702-9 TYP	HD-4702-9 MAX	UNITS	TEST CONDITIONS
D.C.	V_{IH}	Input High Voltage	V_{CC} 70%			V_{CC} 70%			V	
	V_{IL}	Input Low Voltage			V_{CC} 30%			V_{CC} 30%	V	
	V_{OH1}	Output High Voltage	V_{CC} -.05			V_{CC} -.05			V	$I_{OH} \leq -1\mu A$
	V_{OL1}	Output Low Voltage			0.05			0.05	V	$I_{OL} \leq +1\mu A$
	I_{IH}	Input High Current	-1		+1	-1		+1	μA	$V_I = V_{CC}$, All other pins = 0V
	I_{IL}	INPUT ① LOW (all other inputs)		-30	-100		-30	-100	μA	
	I_{ILX}	CURRENT (I_X inputs)	-1		+1	-1		+1	μA	V_I = 0, All other pins = V_{CC}
	I_{OHX}	OUTPUT (O_X) HIGH CURRENT	-0.1			-0.1			mA	$V_{OUT} = V_{CC}$ -.5
	I_{OH1}	(all other outputs)	-1.0			-1.0			mA	V_{OUT} = 2.5V
	I_{OH2}	(all other outputs)	-0.3			-0.3			mA	$V_{OUT} = V_{CC}$ -.5
	I_{OLX}	OUTPUT (O_X) LOW CURRENT	0.1			0.1			mA	V_{OUT} = .4V
	I_{OL}	(all other outputs)	1.6			1.6			mA	V_{OUT} = .4V
	I_{CC}	SUPPLY ① CURRENT (STATIC)			500 150			1500 1000	μA μA	$\overline{E}_{CP} = V_{CC}$, CP = 0, All other inputs = GND $\overline{E}_{CP} = V_{CC}$, CP = 0, All other inputs = V_{CC}
A.C.	t_{PLH} t_{PHL}	Propagation Delay, I_X to CO			300 250			300 250	ns ns	$C_L \leq 7pF$ on O_X ②
	t_{PLH} t_{PHL}	Propagation Delay, CP to CO			215 195			215 195	ns ns	C_L = 15pF, Input Transition Times ≤ 20ns
	t_{PLH} t_{PHL}	Propagation Delay, CO to Q_n			⑤			⑤	ns ns	
	t_{PLH} t_{PHL}	Propagation Delay, CO to Z			75 65			75 65	ns ns	
	t_{TLH} t_{THL}	Output Transition Time (except O_X)			80 40			80 40	ns ns	
	t_{PLH} t_{PHL}	Propagation Delay, I_X to CO			350 275			350 275	ns ns	$C_L \leq 7pF$ on O_X ②
	t_{PLH} t_{PHL}	Propagation Delay, CP to CO			260 220			260 220	ns ns	C_L = 50pF, Input Transition Times ≤ 20ns
	t_{PLH} t_{PHL}	Propagation Delay, CO to Q_n			⑤			⑤	ns ns	
	t_{PLH} t_{PHL}	Propagation Delay, CO to Z			85 75			85 75	ns ns	
	t_{TLH} t_{THL}	Output Transition Time (except O_X)			160 75			160 75	ns ns	
	t_s t_h	Set-Up Time, Select to CO Hold Time, Select to CO	350 0			350 0			ns ns	$C_L \leq 7pF$ on O_X ②
	t_s t_h	Set-Up Time, I_M to CO Hold Time, I_M to CO	350 0			350 0			ns ns	C_L = 15pF, Input Transition Times ≤ 20ns
	$t_{WCP(L)}$ $t_{WCP(H)}$	Minimum Clock Pulse-Width Low and High ③ ④	120 120			120 120			ns ns	
	$t_{WCP(L)}$ $t_{WCP(H)}$	Minimum I_X Pulse Width, Low and High ④	160 160			160 160			ns ns	

NOTES:

① Input Current and Quiescent Power Supply Current are relatively higher for this device because of active pull-up circuits on all inputs except I_X. This is done for TTL compatibility.
② Propagation Delays (t_{PLH} and t_{PHL}) and Output Transistion Times (t_{TLH} and t_{THL}) will change with Output Load Capacitance (C_L). Set-Up Times (t_s), Hold Times (t_h), and Mininum Pulse Widths (t_w) do not vary with load capacitance.
③ The first High Level Clock Pulse after $\overline{E}_{CP}$ goes Low and must be at least 350ns long to guarantee reset of all Counters.
④ It is recommended that input rise and fall times to the Clock Inputs (CP, I_X) be less than 15μs.
⑤ For multichannel operation, Propagation Delay (CO to Q_n) plus Set-Up Time, Select to CO, is guaranteed to be ≤ 367ns.

© IC MASTER 1983

HD-6402

CMOS/LSI Universal Asynchronous Receiver Transmitter (UART)

Features

- OPERATION FROM D. C TO 2.0MHz @ 5.0 VOLTS
- LOW POWER-TYP. 10mW @ 2.0MHz AND 5.0 VOLTS
- PROGRAMMABLE WORD LENGTH, STOP BITS AND PARITY
- AUTOMATIC DATA FORMATTING AND STATUS GENERATION
- COMPATIBLE WITH INDUSTRY STANDARD UART'S
- SINGLE POWER SUPPLY

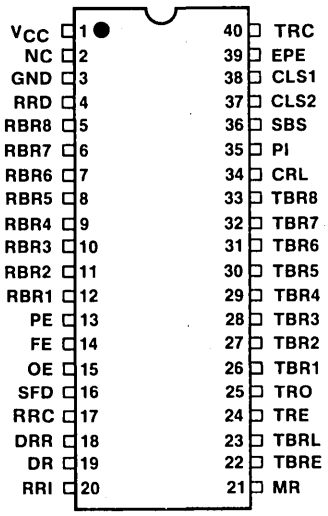
Description

The HD-6402 is a CMOS/LSI subsystem for interfacing computers or microprocessors to an asynchronous serial data channel. The receiver converts serial start, data, parity and stop bits to parallel data verifying proper code transmission, parity, and stop bits. The transmitter converts parallel data into serial form and automatically adds start, parity, and stop bits. The data word length can be 5, 6, 7 or 8 bits. Parity may be odd or even. Parity checking and generation can be inhibited. The stop bits may be one or two or one and one-half when transmitting 5 bit code.

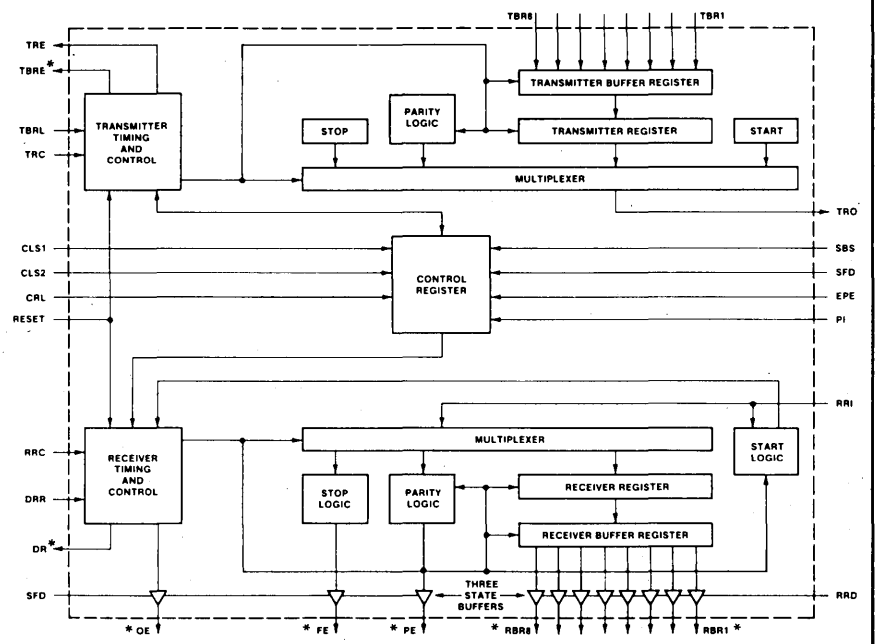
The HD-6402 can be used in a wide range of applications including modems, printers, peripherals and remote data aquisition systems. CMOS/LSI technology permits operation clock frequencies up to 2.0MHz (125K Baud) an improvement of 10 to 1 over previous PMOS UART designs. Power requirements, by comparison, are reduced from 300mW to 10mW. Status logic increases flexibility and simplifies the user interface.

Pinout

TOP VIEW



Functional Diagram



* These outputs are three state

Control Definition

CONTROL WORD					CHARACTER FORMAT			
CCLS2	CCLS1	PI	EPE	SBS	START BIT	DATA BITS	PARITY BIT	STOP BITS
0	0	0	0	0	1	5	ODD	1
0	0	0	0	1	1	5	ODD	1.5
0	0	0	1	0	1	5	EVEN	1
0	0	0	1	1	1	5	EVEN	1.5
0	0	1	X	0	1	5	NONE	1
0	0	1	X	1	1	5	NONE	1.5
0	1	0	0	0	1	6	ODD	1
0	1	0	0	1	1	6	ODD	2
0	1	0	1	0	1	6	EVEN	1
0	1	0	1	1	1	6	EVEN	2
0	1	1	X	0	1	6	NONE	1
0	1	1	X	1	1	6	NONE	2
1	0	0	0	0	1	7	ODD	1
1	0	0	0	1	1	7	ODD	2
1	0	0	1	0	1	7	EVEN	1
1	0	0	1	1	1	7	EVEN	2
1	0	1	X	0	1	7	NONE	1
1	0	1	X	1	1	7	NONE	2
1	1	0	0	0	1	8	ODD	1
1	1	0	0	1	1	8	ODD	2
1	1	0	1	0	1	8	EVEN	1
1	1	0	1	1	1	8	EVEN	2
1	1	1	X	0	1	8	NONE	1
1	1	1	X	1	1	8	NONE	2

CAUTION: These devices are sensitive to electronic discharge. Proper I.C. handling procedures should be followed.

© IC MASTER 1983

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	+8.0V
Input or Output Voltage Applied	GND -0.3V to V_{CC} +0.3V
Storage Temperature Range	-65°C to +150°C
Operating Temperature Range	
Industrial HD-6402-9	-40°C to +85°C
Military HD-6402-2	-55°C to +125°C

ELECTRICAL CHARACTERISTICS

V_{CC} = 5.0V ± 10%. T_A = Industrial or Military

D.C.

SYMBOL	PARAMETER	MINIMUM	TYPICAL	MAXIMUM	UNITS	CONDITIONS
V_{IH}	Logical "1" Input Voltage	70% V_{CC}			V	
V_{IL}	Logical "0" Input Voltage			20% V_{CC}	V	
I_{IL}	Input Leakage	-1.0		1.0	μA	$0V \leq V_{IN} \leq V_{CC}$
V_{OH}	Logical "1" Output Voltage	2.4			V	$I_{OH} = -0.2mA$
V_{OL}	Logical "0" Output Voltage			0.45	V	$I_{OL} = 2.0mA$
I_O	Output Leakage	-1.0		1.0	μA	$0V \leq V_O \leq V_{CC}$
I_{CC}	Supply Current		1.0	100	μA	V_{IN} = GND or V_{CC}; V_{CC} = 5.5V, Output Open
C_{IN}	Input Capacitance*		7.0	8.0	pF	
C_O	Output Capacitance*		8.0	10.0	pF	

*Guaranteed but not 100% tested

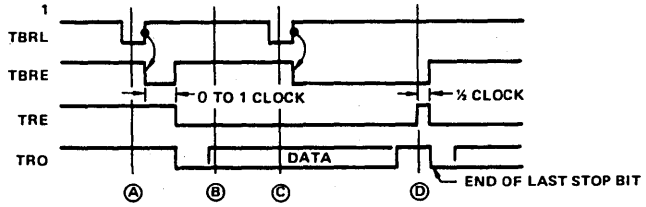
A.C.

		V_{CC} = 5.0V ① T_A = 25°C			V_{CC} = 5.0V ± 10% T_A = Indust. or Mil.				
SYMBOL	PARAMETER	MIN	TYP	MAX	MIN	TYP	MAX	UNITS	CONDITIONS
f_{clock}	Clock Frequency	D.C.		3.0	D.C.		2.0	MHz	
t_{pw}	Pulse Widths CRL, DRR, TBRL	150			150			ns	C_L = 50pF
t_{MR}	Pulse Width MR	350			400			ns	See Switching Time
t_{SET}	Input Data Setup Time	50			50			ns	Waveforms 1, 2, 3
t_{HOLD}	Input Data Hold Time	60			60			ns	
t_{EN}	Output Enable Time			125			160	ns	

NOTE ① All devices guaranteed at worst case limits. Room temperature, 5V data provided for information-not guaranteed.

Transmitter Operation

The transmitter section accepts parallel data, formats it and transmits it in serial form on the TROutput terminal. Ⓐ Data is loaded into the transmitter buffer register from the inputs TR1 through TR8 by a logic low on the TBRLoad input. Valid data must be present at least t_{SET} prior to and t_{HOLD} following the rising edge of TBRL. If words less than 8 bits are used, only the least significant bits are used. The character is right justified into the least significant bit, TR1. Ⓑ The rising edge of TBRL clears TBREmpty. 0 to 1 clock cycles later, data is transferred to the transmitter register, TREmpty is cleared, TBREmpty is set high, and serial data transmission is started. Output data is clocked by TRClock. The clock rate is 16 times the data rate. Ⓒ A second pulse on TBRLoad loads data into the transmitter buffer register. Data transfer to the transmitter register is delayed until transmission of the current character is complete. Ⓓ Data is automatically transferred to the transmitter register and transmission of that character begins one clock cycle later.



TRANSMITTER TIMING (NOT TO SCALE)

© IC MASTER 1983

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	+8.0V
Input or Output Voltage Applied	GND -0.3V to V_{CC} +0.3V
Storage Temperature Range	-65°C to +150°C
Operating Temperature Range (Industrial -9)	-40°C to +85°C

ELECTRICAL CHARACTERISTICS V_{CC} = 5.0V ± 5%. T_A = Industrial

	SYMBOL	PARAMETER	MINIMUM	TYPICAL	MAXIMUM	UNITS	CONDITIONS
D.C.	V_{IH}	Logical "1" Input Voltage	70% V_{CC}			V	
	V_{IL}	Logical "0" Input Voltage			20% V_{CC}	V	
	I_{IL}	Input Leakage	-10.0		+10.0	μA	$0V \leq V_{IN} \leq V_{CC}$
	V_{OH}	Logical "1" Output Voltage	2.4			V	I_{OH} = -0.2mA
	V_{OL}	Logical "0" Output Voltage			0.45	V	I_{OL} = 2.0mA
	I_O	Output Leakage	-10.0		+10.0	μA	$0V \leq V_O \leq V_{CC}$
	I_{CC}	Supply Current		1.0	800	μA	V_{IN} = GND or V_{CC}, V_{CC} = 5.25V, Output Open
	C_{IN}	Input Capacitance*		7.0	8.0	pF	
	C_O	Output Capacitance*		8.0	10.0	pF	

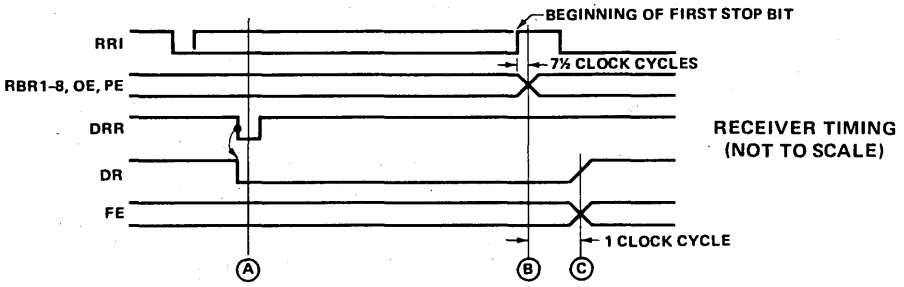
*Guaranteed but not 100% tested.

			V_{CC} = 5.0V ① T_A = 25°C			V_{CC} = 5.0V ± 5% T_A = Industrial				
	SYMBOL	PARAMETER	MIN	TYP	MAX	MIN	TYP	MAX	UNITS	CONDITIONS
A.C.	f_{clock}	Clock Frequency	D.C.		2.0	D.C.		1.0	MHz	
	t_{pw}	Pulse Widths CRL, DRR, TBRL	200			225			ns	C_L = 50pF
	t_{MR}	Pulse Width MR	500			600			ns	See Switching Time
	t_{SET}	Input Data Setup Time	60			75			ns	Waveforms 1, 2, 3
	t_{HOLD}	Input Data Hold Time	75			90			ns	
	t_{EN}	Output Enable Time			150			190	ns	

NOTE ①: All devices guaranteed at worst case limits. Room temperature, 5V data provided for information-not guaranteed.

Receiver Operation

Data is received in serial form at the RInput. When no data is being received, RInput must remain high. The data is clocked through the RRClock. The clock rate is 16 times the data rate. Ⓐ A low level on DRReset clears the DReady line. Ⓑ During the first stop bit data is transferred from the receiver register to the RBRegister. If the word is less than 8 bits, the unused most significant bits will be a logic low. The output character is right justified to the least significant bit RBR1. A logic high on OError indicates overruns. An overrun occurs when DReady has not been cleared before the present character was transferred to the RBRegister. Ⓒ 1 clock cycle later DReady is reset to a logic high, and FError is evaluated. A logic high on FError indicates an invalid stop bit was received, a framing error. A logic high on PError indicates a parity error.



© IC MASTER 1983

HARRIS

SEMICONDUCTOR DIGITAL PRODUCTS DIVISION

HD-6408

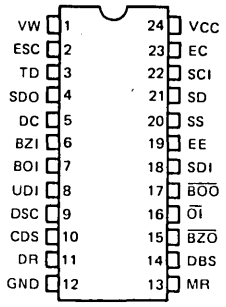
CMOS Asynchronous Serial Manchester Adapter (ASMA)

Features

- LOW BIT ERROR RATE
- ONE MEGABIT/SEC DATA RATE
- SYNC IDENTIFICATION AND LOCK-IN
- CLOCK RECOVERY
- MANCHESTER II ENCODE, DECODE
- SEPARATE ENCODE AND DECODE
- LOW OPERATING POWER: 50mW AT 5 VOLTS
- SINGLE POWER SUPPLY
- 24 PIN PACKAGE

Pinout

TOP VIEW



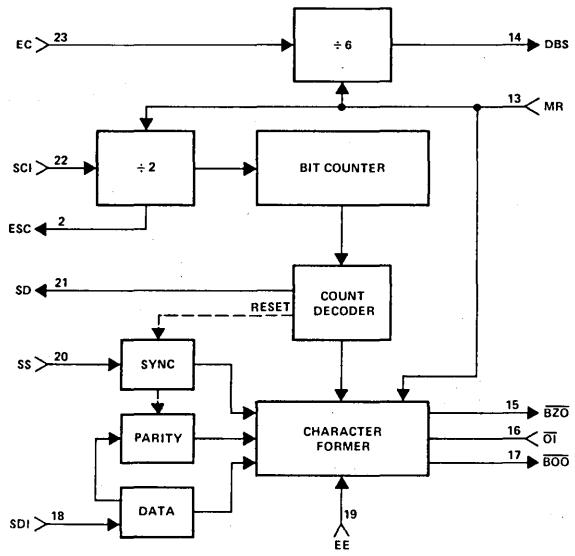
Description

The HD-6408 is a CMOS/LSI Manchester Encoder/Decoder for creating a very high speed asynchronous serial data bus. The Encoder converts serial NRZ data (typically from a shift register) to Manchester II encoded data adding a sync pulse and parity bit. The Decoder recognizes this sync pulse and identifies it as a Command Sync or a Data Sync. The data is then decoded and shifted out in the NRZ code (typically into a shift register). Finally, the parity bit is checked. If there were no Manchester or parity errors the Decoder responds with a valid word signal. This Decoder puts the Manchester code to full use to provide clock recovery and excellent noise immunity at these very high speeds.

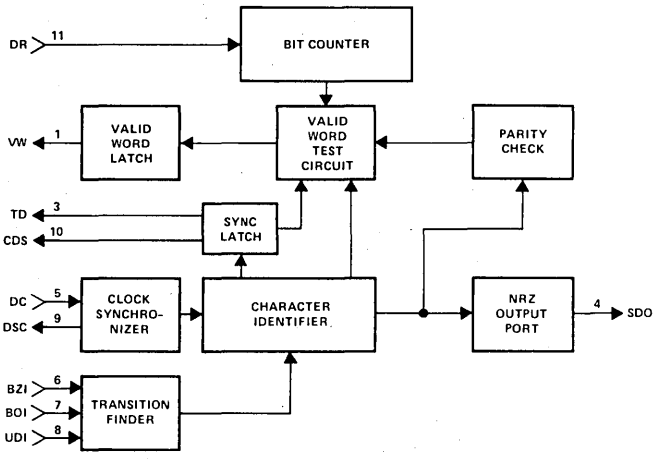
The HD-6408 can be used in many commercial applications such as, security systems, environmental control systems, serial data links and many others. It utilizes a single 12X clock and achieves data rates of up to one million bits per second with a very minimum overhead of only 4 bits out of 20, leaving 16 bits for data.

Block Diagrams

ENCODER



DECODER



CAUTION: These devices are sensitive to electronic discharge. Proper I.C. handling procedures should be followed.

DIGITAL

Harris Semiconductor

© IC MASTER 1983

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	+7.0V
Input or Output Voltage Applied	GND -0.3V to V_{CC} +0.3V
Storage Temperature Range	-65°C to +150°C
Operating Temperature Range	-40°C to +85°C

ELECTRICAL CHARACTERISTICS V_{CC} = 5.0V ±5% T_A = -40°C to +85°C

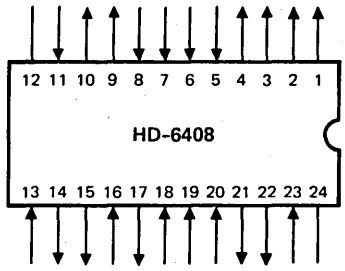
	SYMBOL	PARAMETER	MINIMUM	TYPICAL	MAXIMUM	UNITS	TEST CONDITIONS
D.C.	V_{IH}	Logical "1" Input Voltage	70% V_{CC}			V	
	V_{IL}	Logical "0" Input Voltage			20% V_{CC}	V	
	V_{IHC}	Logical "1" Input Voltage (Clock)	V_{CC} -0.5			V	
	V_{ILC}	Logical "0" Input Voltage (Clock)			GND +0.5	V	
	I_{IL}	Input Leakage	-1.0		+1.0	µA	$0V \leqslant V_{IN} \leqslant V_{CC}$
	V_{OH}	Logical "1" Output Voltage	2.4			V	I_{OH} = -3mA
	V_{OL}	Logical "0" Output Voltage			0.4	V	I_{OL} = 1.8mA
	I_{CCSB}	Supply Current Standby		0.5	2	mA	$V_{IN} = V_{CC}$ = 5.25V Outputs Open
	I_{CCOP}	Supply Current Operating*		8.0	10.0	mA	V_{CC} = 5.25V, f = 1MHz
	C_{IN}	Input Capacitance*		5.0	7.0	pF	
	C_O	Output Capacitance*		8.0	10.0	pF	
		*Guaranteed and sampled but not 100% tested.					
ENCODER TIMING V_{CC} = 5.0V ±5% T_A = -40°C to +85°C							
A.C.	FEC	Encoder Clock Frequency	0		12	MHz	C_L = 50pF
	FESC	Send Clock Frequency	0		2.0	MHz	
	TECR	Encoder Clock Rise Time			8	ns	
	TECF	Encoder Clock Fall Time			8	ns	
	FED	Data Rate	0		1.0	MHz	
	TMR	Master Reset Pulse Width	150			ns	
	TE1	Shift Clock Delay			125	ns	
	TE2	Serial Data Setup	50			ns	
	TE3	Serial Data Hold	50			ns	
	TE4	Enable Setup	90			ns	
	TE5	Enable Pulse Width	100			ns	
	TE6	Sync Setup	55			ns	
	TE7	Sync Pulse Width	150			ns	
	TE8	Send Data Delay	0		50	ns	
	TE9	Bipolar Output Delay			130	ns	
DECODER TIMING V_{CC} = 5.0V ±5% T_A = -40°C to +85°C							
A.C.	FDC	Decoder Clock Frequency	0		12	MHz	C_L = 50pF
	TDCR	Decoder Clock Rise Time			8	ns	
	TDCF	Decoder Clock Fall Time			8	ns	
	FDD	Data Rate	0		1.0	MHz	
	TDR	Decoder Reset Pulse Width	150			ns	
	TDRS	Decoder Reset Setup Time	75			ns	
	TMR	Master Reset Pulse Width	150			ns	
	TD1	Bipolar Data Pulse Width	T_{DC} +10			ns	①
	TD2	Sync Transition Span		18T_{DC}		ns	①
	TD3	One Zero Overlap			T_{DC} -10	ns	①
	TD4	Short Data Transition Span		6T_{DC}		ns	①
	TD5	Long Data Transition Span		12T_{DC}		ns	①
	TD6	Sync Delay (ON)	-20		110	ns	
	TD7	Take Data Delay (ON)	0		110	ns	
	TD8	Serial Data Out Delay			80	ns	
	TD9	Sync Delay (OFF)	0		110	ns	
	TD10	Take Data Delay (OFF)	0		110	ns	
	TD11	Valid Word Delay	0		110	ns	

NOTE ①: T_{DC} = Decoder Clock Period = $\frac{1}{F_{DC}}$

These parameters are guaranteed but not 100% tested.

© IC MASTER 1983

PIN	SYMBOL	SECTION	DESCRIPTION
1	VW	Decoder	Output high indicates receipt of a VALID WORD.
2	ESC	Encoder	ENCODER SHIFT CLOCK is an output for shifting data into the Encoder. This clock shifts data on a low-to-high transition.
3	TD	Decoder	TAKE DATA output is high during receipt of data after identification of a sync pulse.
4	SDO	Decoder	SERIAL DATA OUT delivers received data in correct NRZ format.
5	DC	Decoder	DECODER CLOCK input drives the transition finder, and the synchronizer which in turn supplies the clock to the balance of the Decoder.
6	BZI	Decoder	A high input should be applied to BIPOLAR ZERO IN when the bus is in its negative state. This pin must be held high when the Unipolar input is used.
7	BOI	Decoder	A high input should be applied to BIPOLAR ONE IN when the bus is in its positive state, this pin must be held low when the Unipolar input is used.
8	UDI	Decoder	With pin 6 high and pin 7 low, this pin enters UNIPOLAR DATA IN to the transition finder circuit. If not used this input must be held low.
9	DSC	Decoder	DECODER SHIFT CLOCK output delivers a frequency (DECODER CLOCK ÷ 12), synchronized by the recovered serial data stream.
10	CDS	Decoder	COMMAND/DATA SYNC output high occurs during output of decoded data which was preceded by a Command synchronizing character. A low output indicates a Data synchronizing character.
11	DR	Decoder	A high input to DECODER RESET during a rising edge of DECODER SHIFT CLOCK resets the decoder bit counting logic to a condition ready for a new word.
12	GND	Both	GROUND supply pin.



PIN	SYMBOL	SECTION	DESCRIPTION
13	MR	Both	A high on MASTER RESET clears the 2:1 counters in both the encoder and decoder and the ÷ 12 counter.
14	DBS	Encoder	DIVIDE BY SIX is an output from 6:1 divider which is driven by the ENCODER CLOCK.
15	$\overline{BZO}$	Encoder	$\overline{BIPOLAR\ ZERO\ OUT}$ is an active low output designed to drive the zero or negative sense of a bipolar line driver.
16	$\overline{OI}$	Encoder	A low on $\overline{OUTPUT\ INHIBIT}$ forces pin 15 and 17 high, their inactive states.
17	$\overline{BOO}$	Encoder	$\overline{BIPOLAR\ ONE\ OUT}$ is an active low output designed to drive the one or positive sense of a bipolar line driver.
18	SDI	Encoder	SERIAL DATA IN accepts a serial data stream at a data rate equal to ENCODER SHIFT CLOCK.
19	EE	Encoder	A high on ENCODER ENABLE initiates the encode cycle. (Subject to the preceding cycle being complete.)
20	SS	Encoder	SYNC SELECT actuates a Command sync for an input high and Data sync for an input low.
21	SD	Encoder	SEND DATA is an active high output which enables the external source of serial data.
22	SCI	Encoder	SEND CLOCK IN is 2X the Encoder data rate.
23	EC	Encoder	ENCODER CLOCK is the input to the 6:1 divider.
24	VCC	Both	Positive supply pin.

© IC MASTER 1983

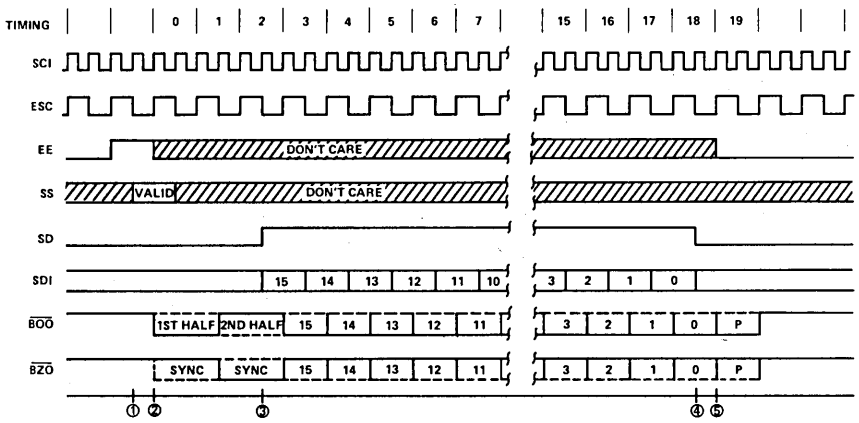
Encoder Operation

The Encoder requires a single clock with a frequency of twice the desired data rate applied at the SClock input. An auxiliary divide by six counter is provided on chip which can be utilized to produce the SClock by dividing the DClock.

The Encoder's cycle begins when EE is high during a falling edge of ESC (1). This cycle lasts for one word length or twenty ESC periods. At the next low-to-high transition of the ESC, a high at SS input actuates a Command sync or a low will produce a Data sync for that word (2). When the Encoder is ready to accept data, the SD output will go high and remain high for sixteen ESC periods (3) – (4).

During these sixteen periods the data should be clocked into the SDInput with every high-to-low transition of the ESC (3) – (4). After the sync and Manchester II encoded data are transmitted through the $\overline{BOO}$ and $\overline{BZO}$ outputs, the Encoder adds on an additional bit which is the (odd) parity for that word (5). At any time a low on $\overline{OI}$ will force both bipolar outputs to a high state but will not affect the Encoder in any other way.

To abort the Encoder transmission a positive pulse must be applied at MR. Any time after or during this pulse, a low-to-high transition on SCI clears the internal counters an initializes the Encoder for a new word.



Decoder Operation

The Decoder requires a single clock with a frequency of 12 times the desired data rate applied at the DClock input. The Manchester II coded data can be presented to the Decoder in one of two ways. The BOI and BZI inputs will accept data from a differential output comparator. The UDI input can only accept noninverted Manchester II coded data (e.g. from $\overline{BZO}$ of an Encoder).

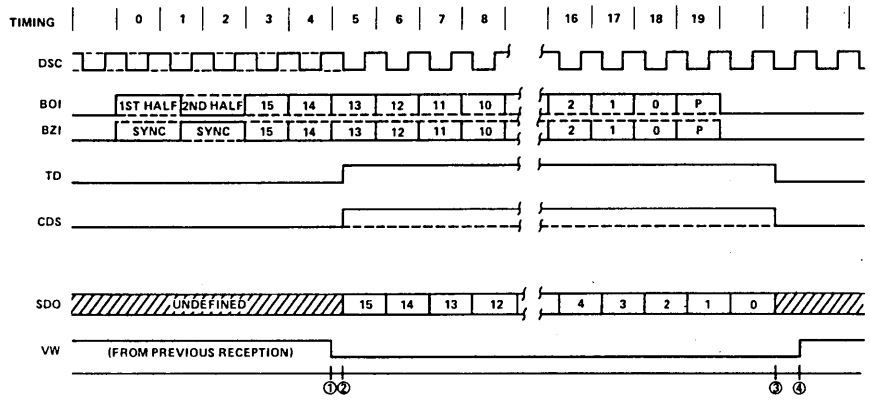
The Decoder is free running and continuously monitors its data input lines for a valid sync character and two valid Manchester data bits to start an output cycle. When a valid sync is recognized (1), the type of sync is indicated by the CDS output. If the sync character was a command, this output will go high (2) and remain high for sixteen DSC periods (3), otherwise it will remain low. The TD output will go high and remain high (2) – (3) while the Decoder is transmitting the decoded data through SDO

The decoded data available at SDO is in a NRZ format. The DSC is provided so that the decoded bits can get shifted into an external register on every low-to-high transition for this clock (2) – (3).

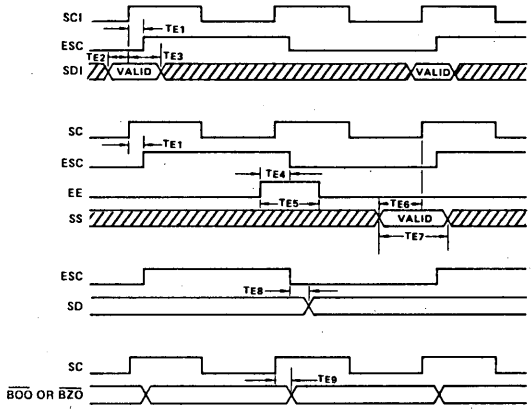
After all sixteen decoded bits have been transmitted (3) the data is checked for odd parity. A high on VW output (4) indicates a successful reception of a word without any Manchester or parity errors. At this time the Decoder is looking for a new sync character to start another output sequence.

At any time in the above sequence a high input on DR during a low-to-high transition of DSC will abort transmission and initialize the Decoder to start looking for a new sync character.

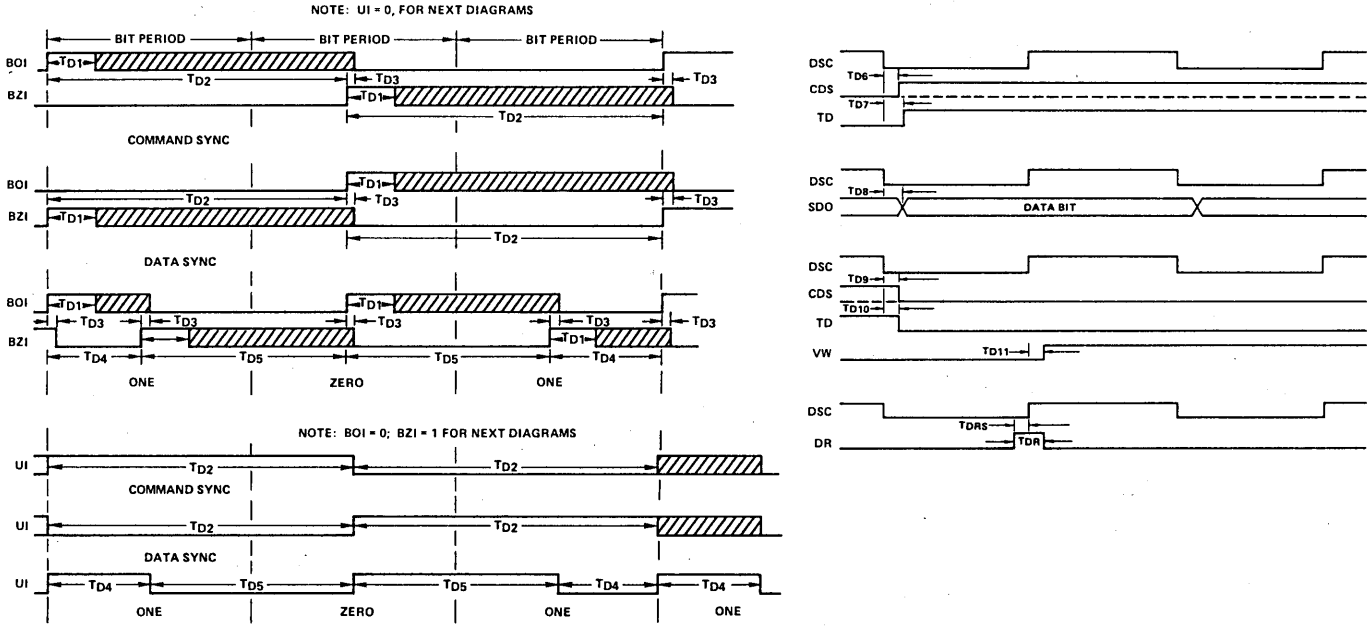
© IC MASTER 1983



Encoder Timing



Decoder Timing



© IC MASTER 1983

HARRIS

SEMICONDUCTOR DIGITAL PRODUCTS DIVISION

HD-6409

CMOS Manchester Encoder-Decoder (MED)

Features

- CONVERTER OR REPEATER MODE
- INDEPENDENT MANCHESTER ENCODER AND DECODER OPERATION
- STATIC TO ONE MEGABIT/SEC DATA RATE GUARANTEED
- LOW BIT ERROR RATE
- DIGITAL PLL CLOCK RECOVERY
- ON CHIP OSCILLATOR
- SINGLE POWER SUPPLY
- LOW OPERATING POWER: 50mW AT 5 VOLTS
- INDUSTRIAL OR MILITARY TEMPERATURE RANGE
- 20 PIN PACKAGE

Description

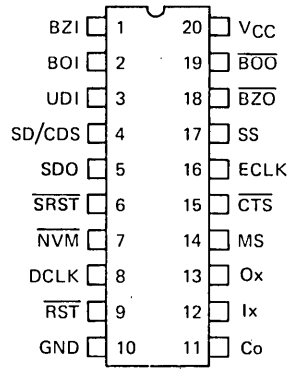
The HD-6409 Manchester Encoder-Decoder (MED) is a high speed, low power device manufactured using self-aligned silicon gate technology. The device is intended for use in serial data communication, and can be operated in either of two modes. In the converter mode, the MED converts Nonreturn-to-Zero code (NRZ) into Manchester code and decodes Manchester code into Nonreturn-to-Zero code. For serial data communication, Manchester code does not have some of the deficiencies inherent in Nonreturn-to-Zero code. For instance, use of the MED on a serial line eliminates DC components, provides clock recovery, and gives a relatively high degree of noise immunity. Because the MED converts the most commonly used code (NRZ) to Manchester code, the advantages of using Manchester code are easily realized in a serial data link.

In the Repeater mode, the MED accepts Manchester code input and reconstructs it with a recovered clock. This minimizes the effects of noise on a serial data link. A digital phase lock loop generates the recovered clock. A maximum data rate of 1MHz requires only 50mW of power.

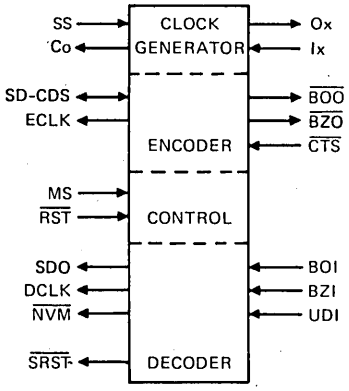
Manchester code is used in magnetic tape recording and in fiber optic communication, and generally is used where data accuracy is imperative. Because it frames blocks of data, the HD-6409 easily interfaces to protocol controllers.

Pinout

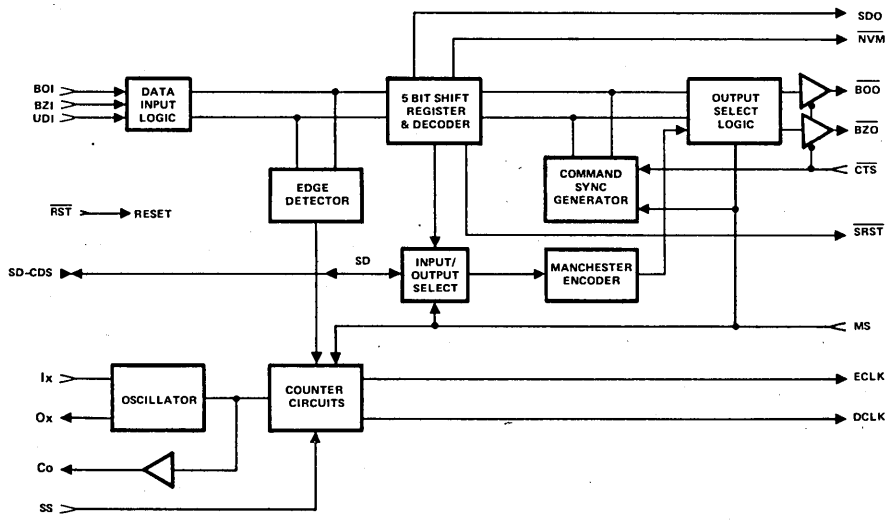
TOP VIEW



Logic Symbol



Functional Diagram



CAUTION: These devices are sensitive to electronic discharge. Proper I.C. handling procedures should be followed.

© IC MASTER 1983

PIN	MNEMONIC NAME		DESCRIPTION
1 (I)	BZI	Bipolar Zero Input	Used in conjunction with pin 2, Bipolar One Input (BOI), to input Manchester II encoded data to the decoder. BZI and BOI are logical complements. When using pin 3, Unipolar Data Input (UDI) for data input, BZI must be held high.
2 (I)	BOI	Bipolar One Input	Used in conjunction with pin 1, Bipolar Zero Input (BZI), to input Manchester II encoded data to the decoder. BOI and BZI are logical complements. When using pin 3, Unipolar Data Input (UDI) for data input, BOI must be held low.
3 (I)	UDI	Unipolar Data Input	An alternate to bipolar input (BZI, BOI), Unipolar Data Input (UDI) is used to input Manchester II encoded data to the decoder. When using pin 1 (BZI) and pin 2 (BOI) for data input, UDI must be held low.
4 (I/O)	SD/CDS	Serial Data/Command Data Sync	In the converter mode, SD/CDS is an input used to receive serial NRZ data. NRZ data is accepted synchronously on the falling edge of encoder clock output (ECLK). In the repeater mode, SD/CDS is an output indicating the status of last valid sync pattern received. A high indicates a command sync and a low indicates a data sync pattern.
5 (O)	SDO	Serial Data Out	The decoded serial NRZ data is transmitted out synchronously with the decoder clock (DCLK). SDO is forced low when $\overline{RST}$ is low.
6 (O)	$\overline{SRST}$	$\overline{\text{Serial Reset}}$	In the converter mode, $\overline{SRST}$ follows $\overline{RST}$. In the repeater mode, when $\overline{RST}$ goes low, $\overline{SRST}$ goes low and remains low after $\overline{RST}$ goes high. $\overline{SRST}$ goes high only when $\overline{RST}$ is high, the reset bit is zero, and a valid synchronization sequence is received.
7 (O)	$\overline{NVM}$	$\overline{\text{Nonvalid Manchester}}$	A low on $\overline{NVM}$ indicates that the decoder has received invalid Manchester data and present data on Serial Data Out (SDO) is invalid. A high indicates that the sync pulse and data were valid and SDO is valid. $\overline{NVM}$ is set low by a low on $\overline{RST}$, and remains low after $\overline{RST}$ goes high until valid sync pulse followed by two valid Manchester bits is received.
8 (O)	DCLK	Decoder Clock	The decoder clock is a 1X clock recovered from BZI and BOI to synchronously output received NRZ data (SDO).
9 (I)	$\overline{RST}$	$\overline{\text{Reset}}$	In the converter mode, a low on $\overline{RST}$ forces SDO, DCLK, $\overline{NVM}$, and $\overline{SRST}$ low. A high on $\overline{RST}$ enables SDO and DCLK, and forces $\overline{SRST}$ high. $\overline{NVM}$ remains low after $\overline{RST}$ goes high until a valid sync pulse followed by two Manchester bits is received, after which it goes high. In the repeater mode, $\overline{RST}$ has the same effect on SDO, DCLK and $\overline{NVM}$ as in the converter mode. When $\overline{RST}$ goes low, $\overline{SRST}$ goes low and remains low after $\overline{RST}$ goes high. $\overline{SRST}$ goes high only when $\overline{RST}$ is high, the reset bit is zero and a valid synchronization sequence is received.

(I) - Input

(O) - Output

© IC MASTER 1983

PIN	MNEMONIC NAME		DESCRIPTION
10 (I)	GND	Ground	Ground
11 (O)	Co	Clock Output	Buffered output of clock input Ix. May be used as clock signal for other peripherals.
12 (I)	Ix	Clock Input	Ix is the input for an external clock or, if the internal oscillator is used, Ix and Ox are used for the connection of the crystal.
13 (I)	Ox	Clock Drive	If the internal oscillator is used, Ox and Ix are used for the connection of the crystal.
14 (I)	MS	Mode Select	MS must be held low for operation in the converter mode, and high for operation in the repeater mode.
15 (I)	$\overline{CTS}$	Clear to Send	In the converter mode, a high disables the encoder, forcing outputs $\overline{BOO}$, $\overline{BZO}$ high and ECLK low. A high to low transition of $\overline{CTS}$ initiates transmission of a Command sync pulse. A low on $\overline{CTS}$ enables $\overline{BOO}$, $\overline{BZO}$, and ECLK. In the repeater mode, the function of $\overline{CTS}$ is identical to that of the converter mode with the exception that a transition of $\overline{CTS}$ does not initiate a synchronization sequence.
16 (O)	ECLK	Encoder Clock	In the converter mode, ECLK is a 1X clock output used to receive serial NRZ data to SD/CDS. In the repeater mode, ECLK is a 2X clock which is recovered from BZI and BOI data by the digital phase locked loop.
17 (I)	SS	Speed Select	A logic high on SS sets the data rate at 1/32 times the clock frequency while a low sets the data rate at 1/16 times the clock frequency.
18 (O)	$\overline{BZO}$	$\overline{\text{Bipolar Zero Output}}$	$\overline{BZO}$ and its logical complement $\overline{BOO}$ are the Manchester data outputs of the encoder. The inactive state for these outputs is in the high state.
19 (0)	$\overline{BOO}$	$\overline{\text{Bipolar One Out}}$	see pin 18
20 (I)	V_{CC}	V_{CC}	Positive Power Supply

(I) - Input
(O) - Output

© IC MASTER 1983

ABSOLUTE MAXIMUM RATINGS *	
Supply Voltage	+7.0V
Input or Output Voltage Applied	GND -0.3V to VCC +0.3V
Storage Temperature	-65°C to +150°C

OPERATING RANGE		
Operating Temperature Range		
Industrial	HD-6409-9	-40°C to +85°C
Military	HD-6409-2	-55°C to +125°C
Operating Voltage Range		
Industrial	HD-6409-9	4.5V to 5.5V
Military	HD-6409-2	4.5V to 5.5V

** CAUTION: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and functional operation of the device at these or at any other conditions above those indicated in the operational sections of this specification is not implied.*

ELECTRICAL CHARACTERISTICS

	SYMBOL	PARAMETER	MIN	TYPICAL	MAX	UNITS	TEST CONDITIONS
DC	VIH	Logic-1 Input Voltage	70% VCC	–		V	
	VIL	Logic-0 Input Voltage			20% VCC	V	
	VIHR	Logic-1 Input Voltage ($\overline{\text{Reset}}$)	60% VCC			V	
	VILR	Logic-0 Input Voltage ($\overline{\text{Reset}}$)			40% VCC	V	
	VIHC	Logic-1 Input Voltage (Clock)	VCC -0.5			V	
	VILC	Logic-0 Input Voltage (Clock)			GND +0.5	V	
	IIL	Input Leakage	-1.0		+1.0	μA	$0V \leqslant V_{IN} \leqslant V_{CC}$
	VOH	Logic-1 Output Voltage	VCC -0.4			V	IOH = -2.0mA
	VOL	Logic-0 Output Voltage			0.4	V	IOL = 2.0mA
	ICCQ	Supply Current Quiescent		1.0	100	μA	VIN = VCC = 5.5V,
	ICCOP	Supply Current Operating*		7.0	12.0	mA	VCC = 5.5V, f_{CO} = 16MHz
	CIN	Input Capacitance*		6.0	8.0	pF	
	COUT	Output Capacitance*		8.0	15.0	pF	
AC	fc	Clock Frequency		16		MHz	Ix or Xtal
	tc	Clock Period		1/fc		s	
	t1	Bipolar Pulse Width	tc -10			ns	
	t2	Sync Transition Span		1.5 x CR x tc ①②		ns	
	t3	One-Zero Overlap			tc -10	ns	
	t4	Short Data Transition Span		0.5 x CR x tc ①②		ns	
	t5	Long Data Transition Span		CR x tc		ns	
	t6	Output Rise & Fall Time			50	ns	CL = 20pF for Co,
		Clock Out Co Rise & Fall Time			1/(5 x fc)	s	50pF Otherwise
	t7	Input Rise & Fall Time			1/(5 x fc)	s	
	t8	Clock High Duty Cycle	20			ns	TCYCLE = 62ns
	t9	Clock Low Duty Cycle	20			ns	TCYCLE = 62ns

CONVERTER MODE

	ENCODER SECTION						
AC	tCE1	SD Setup Time	70			ns	
	tCE2	SD Hold Time	0			ns	
	tCE3	SD to $\overline{\text{BZO}}$, $\overline{\text{BOO}}$ Prop Delay		1	1.5	DBP	
	tCE4	$\overline{\text{CTS}}$ Low to $\overline{\text{BZO}}$, $\overline{\text{BOO}}$ Enabled		1	1.5	DBP	
	tCE5	$\overline{\text{CTS}}$ Low to ECLK Enabled		10.5		DBP	
	tCE6	$\overline{\text{CTS}}$ High to ECLK Disabled		1.0	1.5	DBP	
	tCE7	$\overline{\text{CTS}}$ High to $\overline{\text{BZO}}$, $\overline{\text{BOO}}$ Disabled		2.0	2.5	DBP	
	DECODER SECTION						
	tCD1	UDI to SDO, $\overline{\text{NVM}}$	2.5		3	DBP ③	
	tCD2	DCLK to SDO, $\overline{\text{NVM}}$			40	ns	
	tCD3	$\overline{\text{RST}}$ Low to DCLK, SDO, $\overline{\text{NVM}}$ Low		0.5	1.5	DBP ③	CL = 50pF
	tCD4	$\overline{\text{RST}}$ High to DCLK Enabled		0.5	1.5	DBP ③	CL = 50pF

REPEATER MODE

tR1	UDI to $\overline{\text{BOO}}$, $\overline{\text{BZO}}$		1		DBP ③	
tR2	ECLK to $\overline{\text{BZO}}$			40	ns	
tR3	UDI to SDO, $\overline{\text{NVM}}$	2.5		3	DBP ③	

NOTES: ① CR – Clock Rate, either 16X or 32X
② $t_c = 1/f_c$
③ DBP – Data Bit Period, CR = 16X, one DBP = 16 Clock cycles; CR = 32X, one DBP = 32 clock cycles
* Guaranteed and sampled but not 100% tested.

© IC MASTER 1983

ENCODER OPERATION

The encoder uses free running clocks at 1X and 2X the data rate derived from the system clock I_X for internal timing. $\overline{CTS}$ is used to control the encoder outputs, ECLK, $\overline{BOO}$ and $\overline{BZO}$. A free running 1X ECLK is transmitted out of the encoder to drive the external circuits which supply the NRZ data to the MED at pin SD/CDS.

A low on $\overline{CTS}$ enables encoder outputs ECLK, $\overline{BOO}$ and $\overline{BZO}$, while a high on $\overline{CTS}$ forces $\overline{BZO}$, $\overline{BOO}$ high and holds ECLK low. When $\overline{CTS}$ goes from high to low ①, a synchronization sequence is transmitted out on $\overline{BOO}$ and $\overline{BZO}$. A synchronization sequence consists of eight Manchester "0" bits followed by a command sync pulse. ② A command sync pulse is a three bit wide pulse with the first 1½ bits high followed by 1½ bits low. ③ Serial NRZ data is clocked into the encoder at SD/CDS on the high to low transition of ECLK during the command sync pulse. The NRZ data received is encoded into Manchester II data and transmitted out on $\overline{BOO}$ and $\overline{BZO}$ following the command sync pulse. ④ Following the synchronization sequence, input data is encoded and transmitted out continuously without parity check or word framing. The length of the data block encoded is defined by $\overline{CTS}$. Manchester data out is inverted.

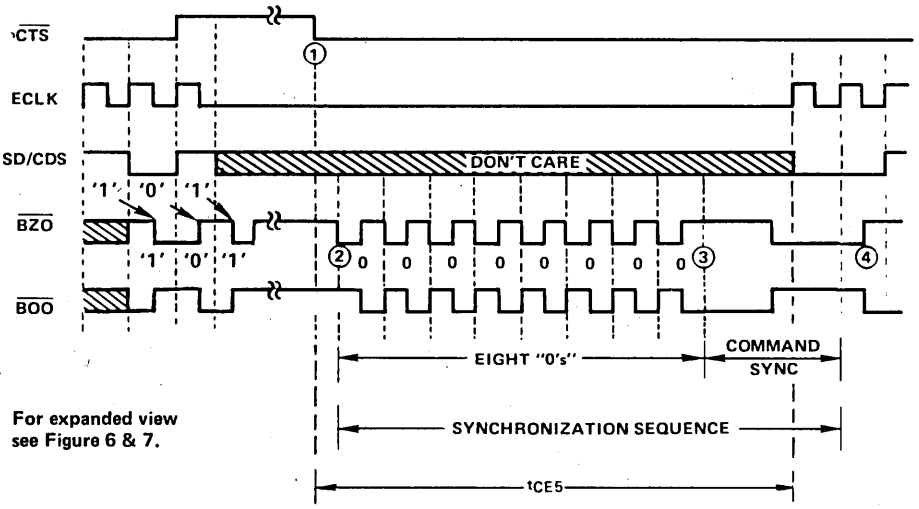


FIGURE 1

DECODER OPERATION

The decoder requires a single clock with a frequency 16X or 32X the desired data rate. The rate is selected on the speed select with SS low producing a 16X clock and high a 32X clock. For long data links the 32X mode should be used as this permits a wider timing jitter margin. The internal operation of the decoder utilizes a free running clock synchronized with incoming data for its clocking.

The Manchester II encoded data can be presented to the decoder in either of two ways. The Bipolar One and Bipolar Zero inputs will accept data from differential inputs such as a comparator sensed transformer coupled bus. The Unipolar Data input can only accept noninverted Manchester II encoded data, i.e. Bipolar Zero Out of an encoder. The decoder continuously monitors this data input for a valid sync pattern. Note that while the MED encoder section can generate only a command sync pattern, the decoder can recognize either a command or data sync pattern. A data sync is a logically inverted command sync.

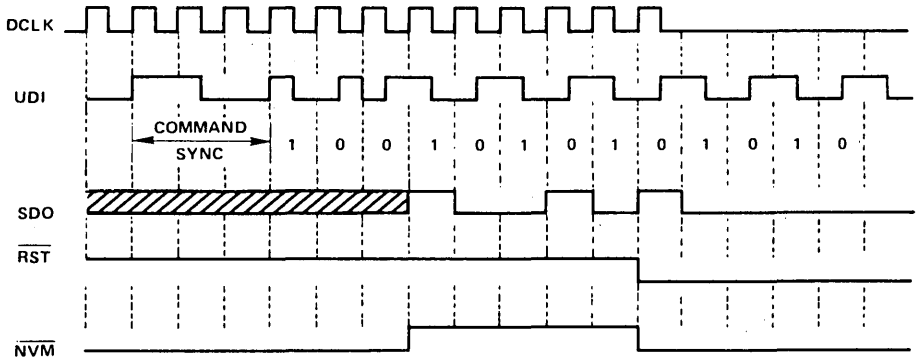
There is a three bit delay between UDI, BOI or BZI input and the decoded NRZ data transmitted out of SDO.

Control of the decoder outputs is provided by the $\overline{RST}$ pin. When $\overline{RST}$ is low, SDO, DCLK and $\overline{NVM}$ are forced low. When $\overline{RST}$ is high, SDO is transmitted out synchronously with the recovered clock DCLK. The $\overline{NVM}$ output remains low after a low to high transition on $\overline{RST}$ until a valid sync pattern is received.

The decoded data at SDO is in NRZ format. DCLK is provided so that the decoded bits can be shifted into an external register on every high to low transition of this clock.

Three bit periods after an invalid Manchester bit is received on UDI, or BOI and BZI, $\overline{NVM}$ goes low synchronously with the questionable data output on SDO. Further, the decoder does not reestablish proper data decoding until another sync pattern is recognized.

© IC MASTER 1983



For expanded view see Figure 8.

FIGURE 2

Repeater Mode

Manchester II data can be presented to the repeater in either of two ways. The inputs Bipolar One In and Bipolar Zero In will accept data from differential inputs such as a comparator or sensed transformer coupled bus. The input Unipolar Data In accepts only non-inverted Manchester II coded data. The decoder requires a single clock with a frequency 16X or 32X the desired data rate. This clock is selected to 16X with Speed Select low and 32X with Speed Select high. For long data links the 32X mode should be used as this permits a wider timing jitter margin.

The inputs UDI, or BOI, BZI are delayed approximately 1/2 bit period and repeated as outputs $\overline{BOO}$ and $\overline{BZO}$. The 2X ECLK is transmitted out of the repeater synchronously with $\overline{BOO}$ and $\overline{BZO}$.

A low on $\overline{CTS}$ enables ECLK, $\overline{BOO}$, and $\overline{BZO}$. In contrast to the converter mode, a transition on $\overline{CTS}$ does not initiate a synchronization sequence of eight 0's and a command sync. The repeater mode does recognize a command or data sync pulse. SD/CDS is an output which reflects the state of the most recent sync pulse received, with high indicating a command sync and low indicating a data sync.

When $\overline{RST}$ is low, the outputs SDO, DCLK, and $\overline{NVM}$ are low, and $\overline{SRST}$ is set low. $\overline{SRST}$ remains low after $\overline{RST}$ goes high and is not reset until a sync pulse and two valid manchester bits are received with the reset bit low. With $\overline{RST}$ high, NRZ Data is transmitted out of Serial Data Out synchronously with the 1X DCLK.

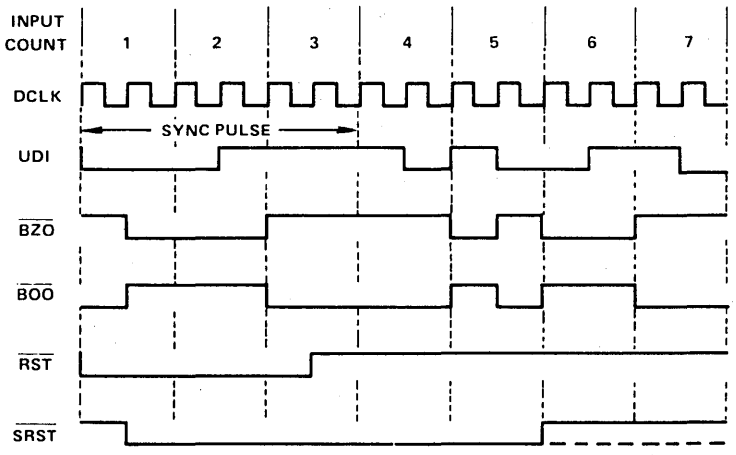


FIGURE 3

© IC MASTER 1983

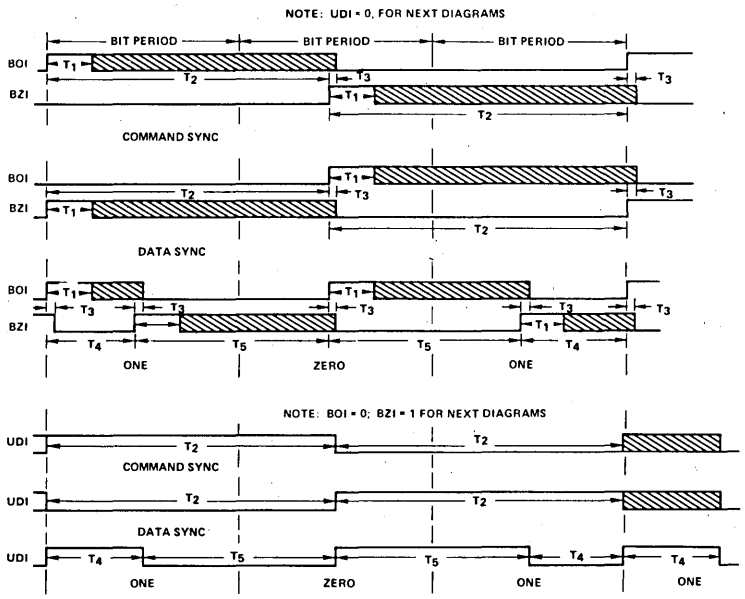


FIGURE 4

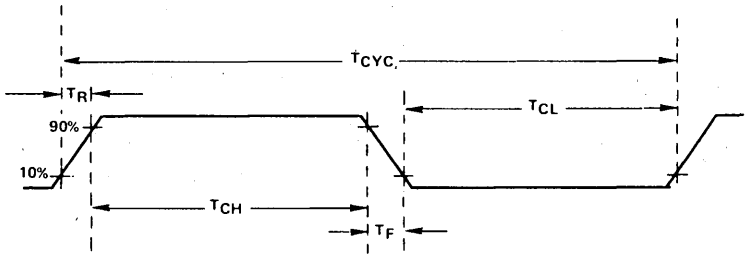


FIGURE 5

NOTE: Reference parameters t6, t7, t8, t9

Encoder Timing

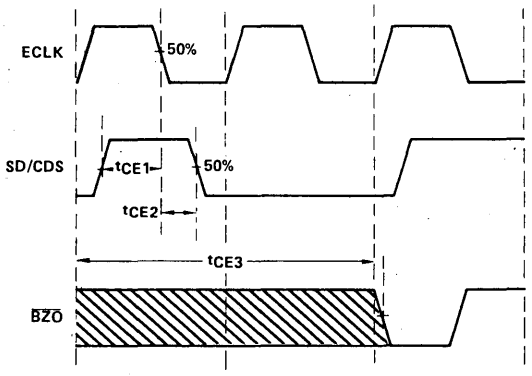


FIGURE 6

© IC MASTER 1983

MANCHESTER CODE

Nonreturn to Zero (NRZ) code represents the binary values logic-0 and logic-1 with a static level maintained throughout the data cell. In contrast, Manchester code represents data with a level transition in the middle of the data cell. Manchester has bandwidth, error detection, and synchronization advantages over NRZ code.

The Manchester II code Bipolar One and Bipolar Zero shown below are logical complements. The direction of the transition indicates the binary value of data. A logic-0 in Bipolar One is defined as a low to high transition in the middle of the data cell, and a logic-1 as a high to low mid bit transition. Manchester I code is not properly decoded by the HD-6409. Manchester II is also known as Biphase-L code.

The bandwidth of NRZ is from DC to the clock frequency fc/2, while that of Manchester is from fc/2 to fc. Thus, Manchester can be AC or transformer coupled, which has considerable advantages over DC coupling. Also, the ratio of maximum to minimum frequency of Manchester extends one octave, while the ratio for NRZ is the range of 5-10 octaves. It is much easier to design a narrow band than a wideband amp.

Secondly, the mid bit transition in each data cell provides the code with an effective error detection scheme. If noise produces a logic inversion in the data cell such that there is no transition, an error indiction is given, and synchronization must be re-established. This places relatively stringent requirements on the incoming data.

The synchronization advantages of using the HD-6409 and Manchester code are several fold. One is that Manchester is a self clocking code. The clock in serial data communication defines the position of each data cell. Non self clocking codes, as NRZ, often require and extra clock wire or clock track (in magnetic recording). Further, there can be a phase variation between the clock and data track. Crosstalk between the two may be a problem. In Manchester, the serial data stream contains both the clock and the data, with the position of the mid bit transition representing the clock, and the direction of the transition representing data. There is thus no phase variation between the clock and the data.

A second synchronization advantage is a result of the number of transitions in the data. The decoder resynchronizes on each transition, or at least once every data cell. In contrast, receivers using NRZ, which does not necessarily have transitions, must resynchronize on frame bit transitions, which occur far less often, usually on a character basis. This more frequent resynchronization eliminates the cumulative effect of errors over sucessive data cells. A final synchronization advantage concerns the HD-6409's sync pulse used to initiate synchronization. This three bit wide pattern is sufficiently distinct from Manchester data that a false start by the receiver is unlikely.

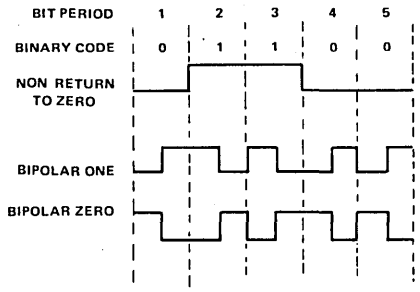
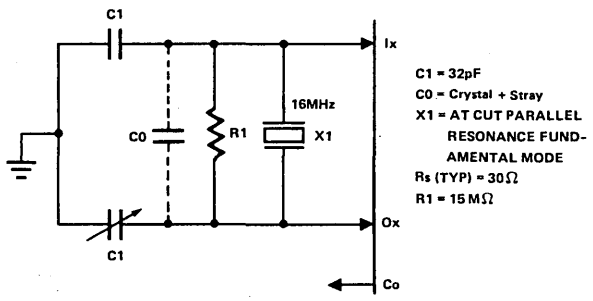


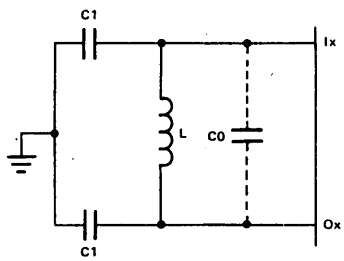
FIGURE 11

Crystal Oscillator Mode



C1 = 32pF
C0 = Crystal + Stray
X1 = AT CUT PARALLEL RESONANCE FUNDAMENTAL MODE
Rs (TYP) = 30Ω
R1 = 15MΩ

LC Oscillator Mode



C1 = 20pF
C0 = 5pF

$$Ce \approx \frac{C1 - 2C0}{2}$$

$$f_o \approx \frac{1}{2\pi\sqrt{LC_e}}$$

© IC MASTER 1983

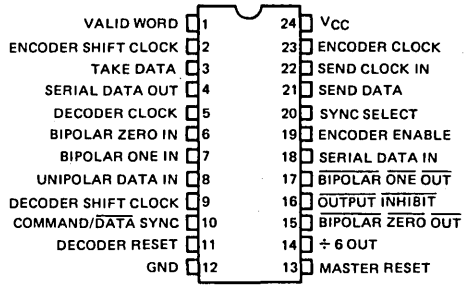
HD-15530

CMOS Manchester Encoder-Decoder

Features

- SUPPORT OF MIL-STD-1553
- 1.25 MEGABIT/SEC DATA RATE
- SYNC IDENTIFICATION AND LOCK-IN
- CLOCK RECOVERY
- MANCHESTER II ENCODE, DECODE
- SEPARATE ENCODE AND DECODE
- LOW OPERATING POWER: 50mW AT 5 VOLTS
- FULL MILITARY TEMPERATURE RANGE

Pinout



Description

The Harris HD-15530 is a high performance CMOS device intended to service the requirements of MIL-STD-1553 and similar Manchester II encoded, time division multiplexed serial data protocals. This LSI chip is divided into two sections, an Encoder and a Decoder. These sections operate completely independent of each other, except for the Master Reset function.

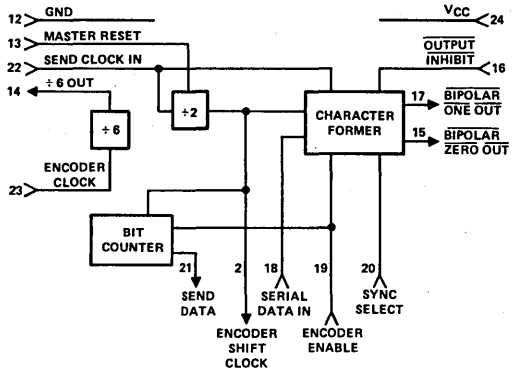
This circuit meets many of the requirements of MIL-STD-1553. The Encoder produces the sync pulse and the parity bit as well as the encoding of the data bits. The Decoder recognizes the sync pulse and identifies it as well as decoding the data bits and checking parity.

This integrated circuit is fully guaranteed to support the 1MHz data rate of MIL-STD-1553 over both temperature and voltage. It interfaces with CMOS, TTL or N channel support circuitry, and uses a standard 5 volt supply.

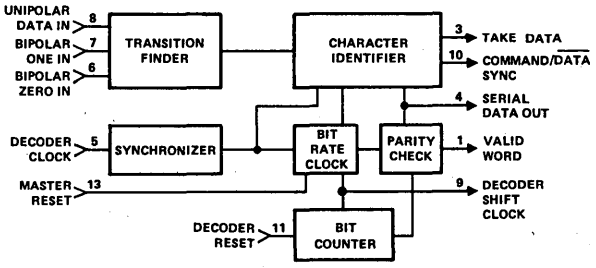
The HD-15530 can also be used in many party line digital data communications applications, such as an environmental control system driven from a single twisted pair cable or fiber optic cable throughout the building.

Block Diagrams

ENCODER



DECODER



CAUTION: These devices are sensitive to electronic discharge. Proper I.C. handling procedures should be followed.

© IC MASTER 1983

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	+7.0V
Input or Output Voltage Applied	GND -0.3V to V_{CC} + 0.3V
Storage Temperature Range	-65°C to +150°C
Operating Temperature Range	
Industrial HD-15530-9	-40°C to +85°C
Military HD-15530-2	-55°C to +125°C

ELECTRICAL CHARACTERISTICS V_{CC} = 5.0V ±5% T_A = Industrial or Military

	SYMBOL	PARAMETER	MINIMUM	TYPICAL	MAXIMUM	UNITS	TEST CONDITIONS
D.C.	V_{IH}	Logical "1" Input Voltage	70% V_{CC}			V	
	V_{IL}	Logical "0" Input Voltage			20% V_{CC}	V	
	V_{IHC}	Logical "1" Input Voltage (Clock)	V_{CC} -0.5			V	
	V_{ILC}	Logical "0" Input Voltage (Clock)			GND +0.5	V	
	I_{IL}	Input Leakage	-1.0		+1.0	µA	$0V \leqslant V_{IN} \leqslant V_{CC}$
	V_{OH}	Logical "1" Output Voltage	2.4			V	I_{OH} = -3mA
	V_{OL}	Logical "0" Output Voltage			0.4	V	I_{OL} = 1.8mA
	I_{CCSB}	Supply Current Standby		0.5	2	mA	$V_{IN} = V_{CC} = 5.25V$ Outputs Open
	I_{CCOP}	Supply Current Operating*		8.0	10.0	mA	V_{CC} = 5.25V, f = 1MHz
	C_{IN}	Input Capacitance*		5.0	7.0	pF	
	C_O	Output Capacitance*		8.0	10.0	pF	
		*Guaranteed and sampled but not 100% tested.					
	ENCODER TIMING V_{CC} = 5.0V ±5% T_A = Industrial or Military						
A.C.	FEC	Encoder Clock Frequency	0		15	MHz	C_L = 50pF
	FESC	Send Clock Frequency	0		2.5	MHz	
	TECR	Encoder Clock Rise Time			8	ns	
	TECF	Encoder Clock Fall Time			8	ns	
	FED	Data Rate	0		1.25	MHz	
	TMR	Master Reset Pulse Width	150			ns	
	TE1	Shift Clock Delay			80	ns	
	TE2	Serial Data Setup	50			ns	
	TE3	Serial Data Hold	50			ns	
	TE4	Enable Setup	90			ns	
	TE5	Enable Pulse Width	100			ns	
	TE6	Sync Setup	55			ns	
	TE7	Sync Pulse Width	150			ns	
	TE8	Send Data Delay	0		50	ns	
	TE9	Bipolar Output Delay			130	ns	
	DECODER TIMING V_{CC} = 5.0V ±5% T_A = Industrial or Military						
A.C.	FDC	Decoder Clock Frequency	0		15	MHz	C_L = 50pF
	TDCR	Decoder Clock Rise Time			8	ns	
	TDCF	Decoder Clock Fall Time			8	ns	
	FDD	Data Rate	0		1.25	MHz	
	TDR	Decoder Reset Pulse Width	150			ns	
	TDRS	Decoder Reset Setup Time	75			ns	
	TMR	Master Reset Pulse Width	150			ns	
	TD1	Bipolar Data Pulse Width	T_{DC} +10			ns	①
	TD2	Sync Transition Span		18T_{DC}		ns	①
	TD3	One Zero Overlap			T_{DC} -10	ns	①
	TD4	Short Data Transition Span		6T_{DC}		ns	①
	TD5	Long Data Transition Span		12T_{DC}		ns	①
	TD6	Sync Delay (ON)	-20		110	ns	
	TD7	Take Data Delay (ON)	0		110	ns	
	TD8	Serial Data Out Delay			80	ns	
	TD9	Sync Delay (OFF)	0		110	ns	
	TD10	Take Data Delay (OFF)	0		110	ns	
	TD11	Valid Word Delay	0		110	ns	

NOTE ①: T_{DC} = Decoder Clock Period = $\frac{1}{F_{DC}}$

These parameters are guaranteed but not 100% tested.

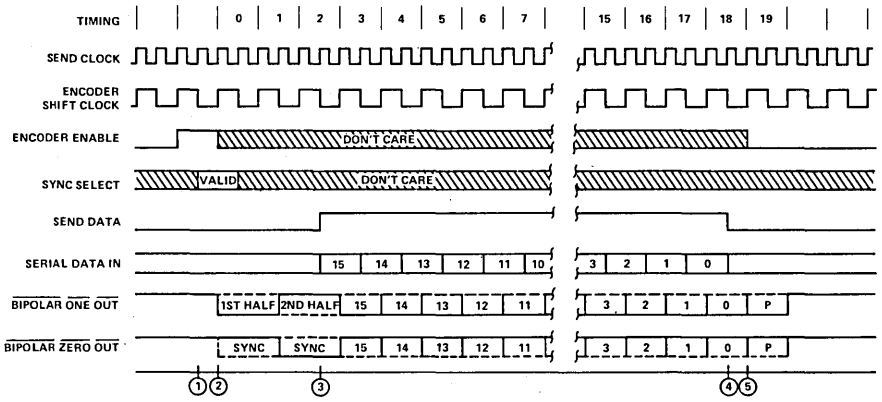
© IC MASTER 1983

Encoder Operation

The Encoder requires a single clock with a frequency of twice the desired data rate applied at the SEND CLOCK input. An auxillary divide by six counter is provided on chip which can be utilized to produce the SEND CLOCK by dividing the DECODER CLOCK.

The Encoder's cycle begins when ENCODER ENABLE is high during a falling edge of ENCODER SHIFT CLOCK ①. This cycle lasts for one word length or twenty ENCODER SHIFT CLOCK periods. At the next low-to-high transition of the ENCODER SHIFT CLOCK, a high at SYNC SELECT input actuates a command sync or a low will produce a data sync for that word ② . When the Encoder is ready to accept data, the SEND DATA output will go high and remain high for sixteen ENCODER SHIFT CLOCK periods ③ . During these sixteen periods the data should be clocked into the SERIAL DATA input with every low-to-high transition of the ENCODER SHIFT CLOCK ③ – ④ . After the sync and the Manchester II coded data are transmitted through the $\overline{\text{BIPOLAR ONE}}$ and $\overline{\text{BIPOLAR ZERO}}$ outputs, the Encoder adds on an additional bit which is the parity for that word ⑤ . At any time a low on $\overline{\text{OUTPUT INHIBIT}}$ input will force both bipolar outputs to a high state but will not affect the Encoder in any other way.

To abort the Encoder transmission a positive pulse must be applied at MASTER RESET. Anytime after or during this pulse, a low to high transition on SEND CLOCK clears the internal counters and initializes the Encoder for a new word.



Decoder Operation

The Decoder requires a single clock with a frequency of 12 times the desired data rate applied at the DECODER CLOCK input. The Manchester II coded data can be presented to the Decoder in one of two ways. The BIPOLAR ONE and BIPOLAR ZERO inputs will accept data from a comparator sensed transformer coupled bus as specified in Military Spec 1553. The UNIPOLAR DATA input can only accept non-inverted Manchester II coded data. (e.g. from $\overline{\text{BIPOLAR ZERO OUT}}$ of an Encoder.)

The Decoder is free running and continuously monitors its data input lines for a valid sync character and two valid Manchester data bits to start an output cycle. When a valid sync is recognized ①, the type of sync is indicated on COMMAND/$\overline{\text{DATA}}$ SYNC output. If the sync character was a command sync, this output will go high ② and remain high for sixteen DECODER SHIFT CLOCK periods ③ , otherwise it will remain low. The TAKE DATA output will go high and remain high ② – ③ while the Decoder is transmitting the decoded data through SERIAL DATA OUT. The decoded data available at SERIAL DATA OUT is in a NRZ format. The DECODER SHIFT CLOCK is provided so that the decoded bits can get shifted into an external register on every low-to-high transition of this clock ② – ③ .

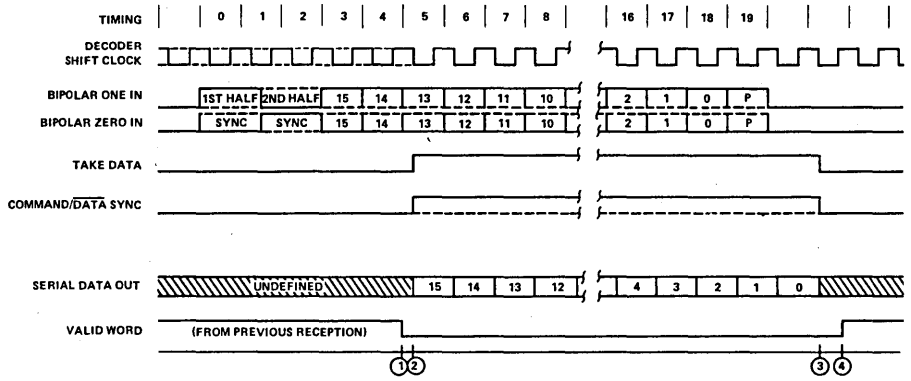
After all sixteen decoded bits have been transmitted ③ the data is checked for odd parity. A high on VALID WORD output ④ indicates a successful reception of a word without any Manchester or parity errors. At this time the Decoder is looking for a new sync character to start another output sequence.

At any time in the above sequence a high input on DECODER RESET during a low-to-high transition of DECODER SHIFT CLOCK will abort transmission and initialize the Decoder to start looking for a new sync character.

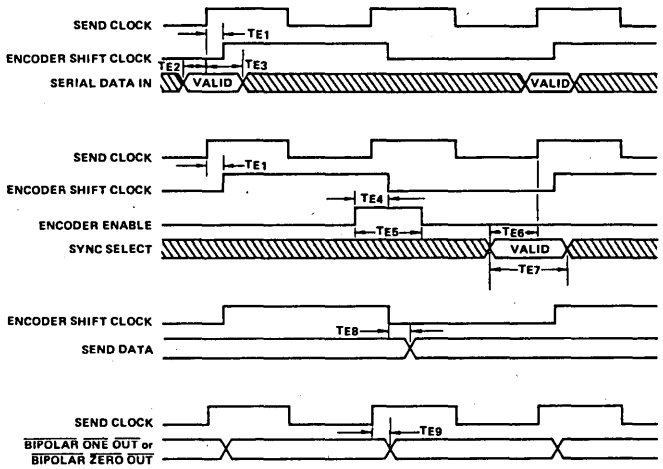
© IC MASTER 1983

PIN	SECTION	NAME	DESCRIPTION
1	Decoder	VALID WORD	Output high indicates receipt of a valid word.
2	Encoder	ENCODER SHIFT CLOCK	Output for shifting data into the Encoder. This clock shifts data on a low-to-high transition.
3	Decoder	TAKE DATA	Output is high during receipt of data after identification fo a sync pulse.
4	Decoder	SERIAL DATA OUT	Delivers received data in correct NRZ format.
5	Decoder	DECODER CLOCK	Input drives the transition finder, and the synchronizer which in turn supplies the clock to the balance of the Decoder.
6	Decoder	BIPOLAR ZERO IN	A high input should be applied when the bus is in its negative state. This pin must be held high when the Unipolar input is used.
7	Decoder	BIPOLAR ONE IN	A high input should be applied when the bus is in its positive state, this pin must be held low when the Unipolar input is used.
8	Decoder	UNIPOLAR DATA IN	With pin 6 high and pin 7 low, this pin enters unipolar data into the transition finder circuit. If not used this input must be held low.
9	Decoder	DECODER SHIFT CLOCK	Output which delivers a frequency (Decoder Clock ÷ 12), synchronized by the recovered serial data stream.
10	Decoder	COMMAND SYNC	Output of a high from this pin occurs during output of decoded data which was preceded by a Command (or Status) synchronizing character. A low output indicates a Data synchronizing character.
11	Decoder	DECODER RESET	A high input to this pin during a rising edge of DECODER SHIFT CLOCK resets the decoder bit counting logic to a condition ready for a new word.
12	Both	GROUND	Ground supply pin.
13	Both	MASTER RESET	A high on this pin clears 2:1 counters in both the Encoder and Decoder.
14	Encoder	÷ 6 OUT	Output from 6:1 divider which is driven by the ENCODER CLOCK.
15	Encoder	$\overline{\text{BIPOLAR ZERO OUT}}$	An active low output designed to drive the zero or negative sense of a bipolar line driver.
16	Encoder	$\overline{\text{OUTPUT INHIBIT}}$	A low on this input forces pin 15 and pin 17 high, the inactive states.
17	Encoder	$\overline{\text{BIPOLAR ONE OUT}}$	An active low output designed to drive the one or positive sense of a bipolar line driver.
18	Encoder	SERIAL DATA IN	Accepts a serial data stream at a data rate equal to ENCODER SHIFT CLOCK.
19	Encoder	ENCODER ENABLE	A high on this input initiates the encode cycle. (Subject to the preceding cycle being complete.)
20	Encoder	SYNC SELECT	Actuates command sync for an input high and data sync for an input low.
21	Encoder	SEND DATA	Is an active high output which enables the external source of serial data.
22	Encoder	SEND CLOCK IN	Clock input at a frequency equal to the data rate X2.
23	Encoder	ENCODER	Input to the 6:1 divider.
24	Both	V_{CC}	Positive supply pin.

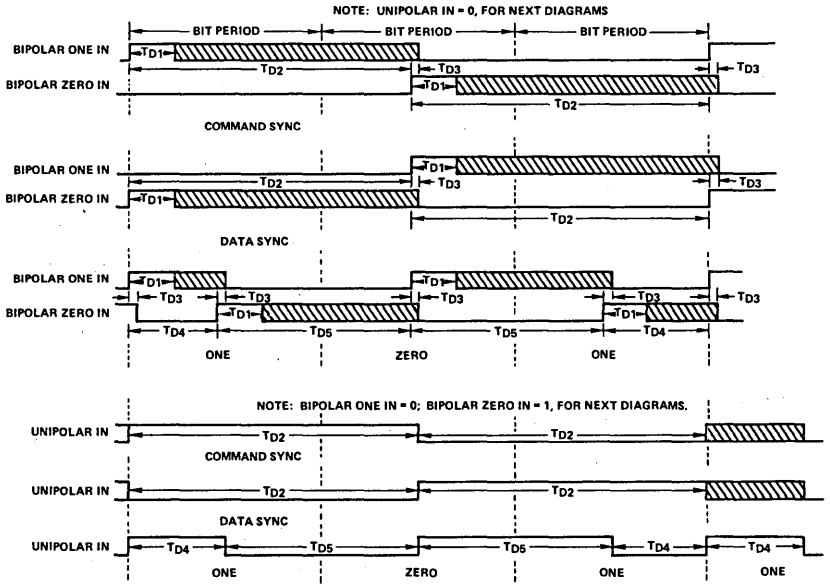
© IC MASTER 1983



Encoder Timing



Decoder Timing



© IC MASTER 1983

HARRIS

SEMICONDUCTOR DIGITAL PRODUCTS DIVISION

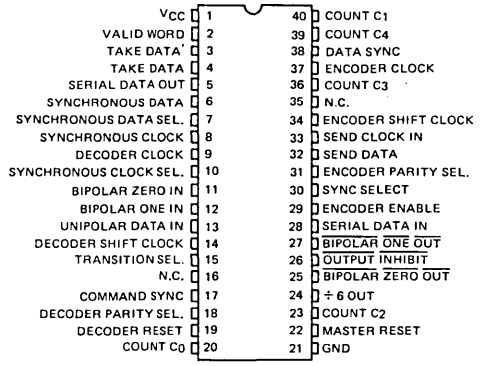
HD-15531

CMOS Manchester Encoder-Decoder

Features

- SUPPORT OF MIL-STD-1553
- 1.25 MEGABIT/SEC DATA RATE
- SYNC IDENTIFICATION AND LOCK-IN
- CLOCK RECOVERY
- VARIABLE FRAME LENGTH TO 32 BITS
- MANCHESTER II ENCODE, DECODE
- SEPARATE ENCODE AND DECODE
- LOW OPERATING POWER: 50mW @ 5 VOLTS
- FULL MILITARY TEMPERATURE RANGE

Pinout



Description

The Harris HD-15531 is a high performance CMOS device intended to service the requirements of MIL-STD-1553 and similar Manchester II encoded, time division multiplexed serial data protocals. This LSI chip is divided into two sections, an Encoder and a Decoder. These sections operate independently of each other, except for the Master Reset and frame length functions.

This circuit provides many of the requirements of MIL-STD-1553. The Encoder produces the sync pulse and the parity bit as well as the encoding of the data bits. The Decoder recognizes the sync pulse and identifies it as well as decoding the data bits and checking parity.

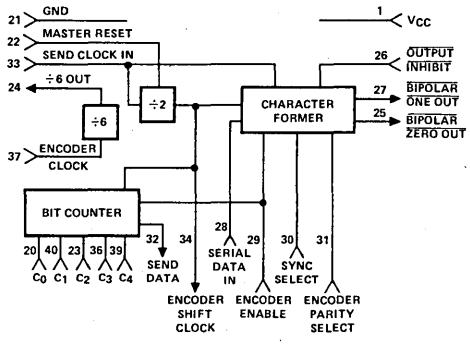
The HD-15531 also surpasses the requirements of MIL-STD-1553 by allowing the frame length to be programmable. The frame length may be programmed from 2 to 28 data bits plus sync and parity. This chip also allows selection of either even or odd parity for the Encoder and Decoder separately.

This integrated circuit is fully guaranteed to support the 1MHz data rate of MIL-STD-1553 over both temperature and voltage. It interfaces with CMOS, TTL or N channel support circuitry, and uses a standard 5 volt supply.

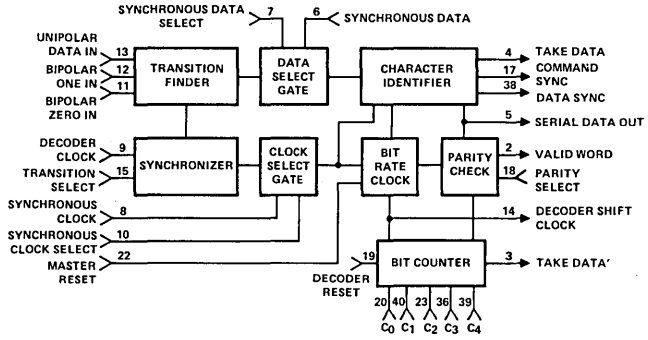
The HD-15531 can also be used in many party line digital data communications applications, such as an environmental control system driven from a single twisted pair of fiber optic cable throughout a building.

Block Diagrams

ENCODER



DECODER



CAUTION: These devices are sensitive to electronic discharge. Proper I.C. handling procedures should be followed.

© IC MASTER 1983

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	+7.0V
Input or Output Voltage Applied	GND -0.3V to VCC +0.3V
Storage Temperature Range	-65°C to +150°C
Operating Temperature Range	
Industrial HD-15531-9	-40°C to +85°C
Military HD-15531-2	-55°C to +125°C

ELECTRICAL CHARACTERISTICS V_{CC} = 5.0V ±5% T_A = Industrial or Military

	SYMBOL	PARAMETER	MINIMUM	TYPICAL	MAXIMUM	UNITS	TEST CONDITIONS
D.C.	VIH	Logical "1" Input Voltage	70% VCC			V	
	VIL	Logical "0" Input Voltage			20% VCC	V	
	VIHC	Logical "1" Input Voltage (Clock)	VCC -0.5			V	
	VILC	Logical "0" Input Voltage (Clock)			GND +0.5	V	
	IIL	Input Leakage	-1.0		+1.0	µA	0V ≤ VIN ≤ VCC
	VOH	Logical "1" Output Voltage	2.4			V	IOH = -3mA
	VOL	Logical "0" Output Voltage			0.4	V	IOL = 1.8mA
	ICCSB	Supply Current Standby		0.5	2.0	mA	VIN = VCC = 5.25V Outputs Open
	ICCOP	Supply Current Operating*		8.0	10.0	mA	VCC = 5.25V, f = 15MHz
	CIN	Input Capacitance*		5.0	7.0	pF	
	CO	Output Capacitance*		8.0	10.0	pF	
	*Guaranteed and sampled but not 100% tested.						
	ENCODER TIMING						
A.C.	FEC	Encoder Clock Frequency	0		15	MHz	CL = 50pF
	FESC	Send Clock Frequency	0		2.5	MHz	
	TECR	Encoder Clock Rise Time			8	ns	
	TECF	Encoder Clock Fall Time			8	ns	
	FED	Data Rate	0		1.25	MHz	
	TMR	Master Reset Pulse Width	150			ns	
	TE1	Shift Clock Delay			80	ns	
	TE2	Serial Data Setup	50			ns	
	TE3	Serial Data Hold	50			ns	
	TE4	Enable Setup	90			ns	
	TE5	Enable Pulse Width	100			ns	
	TE6	Sync Setup	55			ns	
	TE7	Sync Pulse Width	150			ns	
	TE8	Send Data Delay	0		50	ns	
	TE9	Bipolar Output Delay			130	ns	
	DECODER TIMING						
A.C.	FDC	Decoder Clock Frequency	0		15	MHz	CL = 50pF
	FDS	Decoder Synchronous Clock	0		2.5	MHz	
	TDCR	Decoder Clock Rise Time			8	ns	
	TDCF	Decoder Clock Fall Time			8	ns	
	FDD	Data Rate	0		1.25	MHz	
	TDR	Decoder Reset Pulse Width	150			ns	
	TDRS	Decoder Reset Setup Time	75			ns	
	TMR	Master Reset Pulse Width	150			ns	
	TD1	Bipolar Data Pulse Width	TDC +10			ns	①
	TD2	Sync Transition Span		18TDC		ns	①
	TD3	One Zero Overlap			TDC -10	ns	①
	TD4	Short Data Transition Span		6TDC		ns	①
	TD5	Long Data Transition Span		12TDC		ns	①
	TD6	Sync Delay (ON)	-20		110	ns	
	TD7	Take Data Delay (ON)	0		110	ns	
	TD8	Serial Data Out Delay			80	ns	
	TD9	Sync Delay (OFF)			110	ns	
	TD10	Take Data Delay (OFF)	0		110	ns	
	TD11	Valid Word Delay	0		110	ns	
	TD12	Synchronous Clock To Shift Clock Delay	0		75	ns	
	TD13	Synchronous Data Setup	75			ns	

NOTE ①: T_{DC} = Decoder Clock Period = $\frac{1}{F_{DC}}$

These parameters are guaranteed but not 100% tested.

© IC MASTER 1983

HARRIS

SEMICONDUCTOR CMOS DIGITAL PRODUCTS DIVISION

HD-15531B

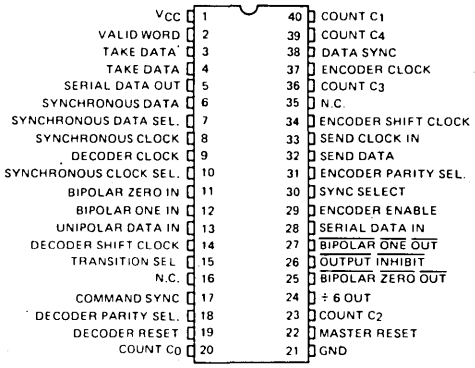
CMOS Programmable Manchester Encoder-Decoder

Preliminary

Features

- 2.5 MEGABIT/SEC DATA RATE
- SYNC IDENTIFICATION AND LOCK-IN
- CLOCK RECOVERY
- VARIABLE FRAME LENGTH TO 32 BITS
- MANCHESTER II ENCODE AND DECODE
- HALF OR FULL DUPLEX OPERATION
- FULL MILITARY OR INDUSTRIAL TEMPERATURE RANGES
- WORD TYPE SELECT AND RECOGNITION
- DETECTS ALL SINGLE, DOUBLE, OR TRIPLE SAMPLING ERRORS

Pinout



Description

The Harris HD-15531B Programmable Manchester Encoder-Decoder (MED) is intended to be used as a high speed, low power, serial data link controller in applications where data integrity combined with low overhead is important. It is manufactured using Harris' Self Aligned Junction Isolated (SAJI) CMOS process.

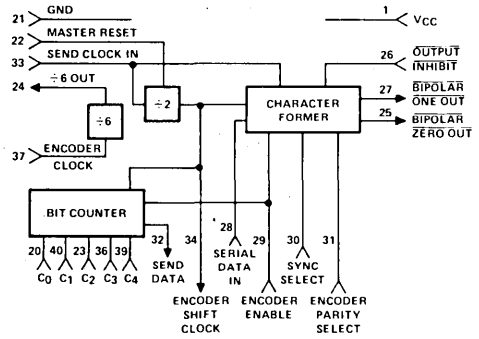
This LSI chip is divided into two sections, an encoder and a decoder. These sections operate independently of each other except for the Master Reset and frame length select function. In addition to encoding/decoding of NRZ data the HD-15531B frames variable length data (2-28 bits) with one of two types of synchronization characters and a parity bit. Independent selection of even or odd parity for the encoder and decoder is included.

An internal error detection algorithm will detect all single, double or triple sampling errors. In addition, this algorithm will typically detect better than 99% of four or more errors in any one word.

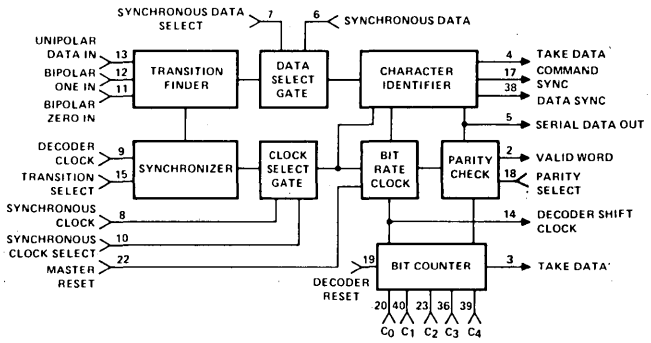
Ideal applications include party line Local Area Networks as well as data acquisition systems where 8, 12 or 16 bit A/D converters are typically used for the digital transmission of data.

Block Diagrams

ENCODER



DECODER



CAUTION: These devices are sensitive to electrostatic discharge. Users should follow standard IC Handling Procedures.

Copyright © Harris Corporation 1982

HERE ARE 9 COMPELLING REASONS FOR HAVING US PRODUCE A CUSTOM LSI CIRCUIT FOR YOU:

1. The money you'll save. Production cost will be lower since you'll only be wiring in one chip instead of many. And you'll save money on quality control, inventory, and in-plant handling.

2. The improved reliability of your product.

3. Proprietary protection: a custom circuit is almost impossible to copy.

4. Enhanced marketability: extra functions not included in original chip concept can be loaded on the chip—usually at no extra cost—enabling product to do things it never could before.

5. At LSI Computer Systems, Inc., your chip receives full-time attention by experts, whatever the size of your order.

6. It is produced on the finest most advanced processing equipment, with the MOS technique best suited to your requirements.

7. Each chip receives 100% functional testing.

8. The "prototypes" you receive for your verification are random samples from an actual production run, not products of a special prototype line.

9. LSI Computer Systems, Inc., has been helping companies large and small realize the full benefits of MOS/LSI circuits for over ten years. All of its engineers have been involved with MOS since its infancy.

AND HERE ARE 23 HOTSHOT STANDARD CIRCUITS FOR YOU TO USE RIGHT NOW:

INTEGRATED CONTROLLER-SEQUENCER (ICS)

The first microprocessor designed specifically for logical sequencing, timing, and controlling functions; where simple decision-making, as opposed to computation is of prime importance. It is far more easily programmable than any other μP, and program can be stored in any standard ROM, PROM, EEPROM, EAROM, or RAM. Low-cost, reliable replacement for hard-wired controls and relay networks.

PROGRAMMABLE DIGITAL DELAY TIMER

For delaying the starting or stopping of an operation.

LS7210: Can generate delay, flashing, ms to infinity, or add auto reset to μP system, programmed by 5 binary weighted input bits plus on chip oscillator or external clock. Operable in 4 modes: delayed operate or release, dual delay, or one-shot. Ion-planted PMOS; all inputs CMOS, PMOS, & TTL compatible. 14-pin DIP.

CMOS DIVIDERS

For generating time bases from 50/60 Hz input. All feature: input shaping network; resettable; division select input 50/60 Hz; clock enable input; 8-pin mini-DIP — inputs arranged so that circuit cannot be damaged if plugged in backwards.
RED 5/6: 10 pulses/sec. RED 50/60: 1 pulse/sec. RED 3000/3600: 1 pulse/minute. RED 100/120: 1 pulse/2 seconds. RED 300/360: 1 pulse/0.1 minute.

For generating decade-related time bases.

RDD104XTL: 8-pin mini-DIP addressable divider divides by 10^1, 10^2, 10^3, 10^4. Input may be controlled by crystal or external frequency source.
RDD104RC: RC oscillator version of above.

DIGITAL LOCK CIRCUITS

For automotive/marine anti-theft.

LS7220: 14-pin DIP; 5,040 4-digit combinations; out-of-sequence detection logic; 25μA standby; "Save" mode for valet parking, settable in "Unlock"; built-in convenience delay.

For area access and machine access.

LS7225: 14-pin DIP; 5,040 4-digit combinations; toggle output (set and reset with application of code); momentary output; tamper output.

For serial address decoding or 2-pushbutton keyless locks.

LS7229: Address decoder/digital lock. 16-pin DIP. Code programmable through 9 parallel pins. Serial decoding input can be applied through dual pulse train or two pushbuttons. Pulse output. Duration between entries capacitor programmable. Cascadable.

MOTOR SPEED CONTROLLERS

LS7263: Crystal controlled 3-phase motor speed controller. For motor speed of 3600 rpm, accuracy of .01% achieved within 20 seconds.
LS7262: Same as LS7263, but for 2-phase motor.

DISPLAY DRIVERS

For liquid crystal displays requiring up to 60V.

LS7100: BCD to 7 segment latch/decoder/driver.
LS7110: Binary addressable latched 8-channel demultiplexer/driver. Both are ion-implanted P Channel MOS circuits, compatible with CMOS and TTL systems. 16-pin DIPS.

LSI COMPUTER SYSTEMS INC. Since 1969
Manufacturers of Custom and Standard LSI circuits.
1235 Walt Whitman Rd., Melville, NY 11747
(516) 271-0400. TWX: 510 226-7833.

COUNTERS

DC to 5 MHz: LS7030: DC to 5 MHz eight decade MOS up counter with 8 decade latch and multiplexer. Multiplexed BCD and 7 segment outputs. Single power supply +4.75 to +15 VDC (full frequency range over full voltage range). Compatible with CMOS logic. Counter output latches. Leading zero blanking. 40-pin DIP.

5 MHz to 500 MHz: LS7031: DC to 5 MHz six decade MOS up counter with 8 decade latch and multiplexer. Multiplexed BCD outputs. Access to LSD latches allows attachment of prescalers for counting to 500 MHz. Leading zero blanking. Single power supply operation +4.75 to +15 VDC (full frequency range over full voltage range). Compatible with CMOS logic. 40-pin DIP.

For multi-comparison applications where parallel outputs are required.

LS7040: Dual 3 decade up/down counter with parallel BCD outputs. DC to 350 KHz count frequency at +5 volts. Fully synchronous operation. Inputs CMOS, TTL, and DTL compatible at +5V operation. Reset. Count enable. Power-on-reset. 40-pin DIP.
LS7240: 7-level comparator/multiplexer with parallel BCD inputs, for use with LS7040.

For counting applications requiring presignalling and recycling.

LS7055: DC to 250 KHz six decade up/down counter with integral preset, presignal, and main signal store. Automatic or manual preset/reset control. Three comparators with output flags. Multiplexed BCD and 7 segment outputs. Internal oscillator. Single power supply operation +5 to +15 volts. High noise immunity. All inputs CMOS compatible over entire power range. 40-pin DIP. (Successor to LS7050).

DC to 10 MHz: LS7060: DC to 10 MHz 32-bit MOS binary counter with 32-bit latch and multiplexer. 8-bit tri-state multiplexed outputs. Single power supply +4.75 to +5.25 VDC. **Bus compatible.** 18-pin DIP.
LS7062: Identical, except that it is a **dual 16-bit counter,** with two inputs.

DC to 2.56 GHz: LS7061: DC to 10 MHz 32-bit MOS up counter with 40-bit latch and multiplexer. 8-bit tri-state multiplexed outputs. Access to 8 LSB latches allows attachment of prescalers for counting to 2.56 GHz. Single power supply operation +4.75 to +5.25 VDC. **Bus compatible.** 24-pin DIP.

WORLD REPS:
ARGENTINA 46-2211, AUSTRALIA (03)598 5622, DENMARK 03-172417-172420, FRANCE 6085275, GERMANY & AUSTRIA 49-89 134093, HONG KONG 0-444241-6, ISRAEL 738701, ITALY 313364, JAPAN 264-3301, NORWAY (02)247285, SOUTH AFRICA 45-1421, SPAIN & PORTUGAL 449 59 00, SWEDEN & FINLAND 81 01 00, SWITZERLAND & LIECHTENSTEIN 01 730 2165-69, UK & NORTH IRELAND 01-207 1957.

EXPORT DEPT: Martin Essenburg, Mavex Technology Corp., 4667 Nesconset Hwy., Port Jefferson Station, NY 11776, USA Tel.: 516/473-2673. Cable: NOVEC

© IC MASTER 1983

MITEL
Technical Data

ISO-CMOS
Octal Decoders/Demultiplexers

MD54SC137, MD54SC138, MD54SC139
MD54SC237, MD54SC238, MD54SC239
MD74SC137, MD74SC138, MD74SC139
MD74SC237, MD74SC238, MD74SC239

OCT '82

Features

- Equivalent to 54/74LS' series
- Low power ISO-CMOS technology
- Short propagation delay
- Improved noise margins
- High current, sink/source capability

Ordering Information	
MD54SCXXXAC	16 Pin, Cerdip
MD74SCXXXAC	16 Pin, Cerdip
MD74SCXXXAE	16 Pin, Plastic DIP

Description

This family of ISO-CMOS, MSI circuits is designed for use in high speed memory and peripheral, address decoding systems. MD54/74SC138 and MD54/74SC238, decode 3 binary inputs (A_0, A_1, A_2) to select one of eight mutually exclusive outputs (0_0 - 0_7). Three enable inputs, two active LOW ($\overline{E}_1$, $\overline{E}_2$) and one active HIGH (E_3), reduce the need for external gates in an expanded system. MD54/74SC137 and MD54/74SC237 feature additional latches on A_0, A_1 and A_2 for use in glitch free applications. When Latch Enable (LE) is LOW the device acts as MD54/74SC138. When LE is HIGH the address present at A_0 to A_2 is stored. A 1 to 32 decoder requires only four of these devices and one inverter. MD54/74SC139 and MD54/74SC239 feature two individual, two line (A_O-A_1) to four line (0_O-0_3) decoders.

Device Selection

Product	Format	Output
MD54/74SC137	1 of 8, latched address	inverted
MD54/74SC138	1 of 8	inverted
MD54/74SC139	Dual 1 of 4	inverted
MD54/74SC237	1 of 8, latched address	non-inverted
MD54/74SC238	1 of 8	non-inverted
MD54/74SC239	Dual 1 of 4	non-inverted

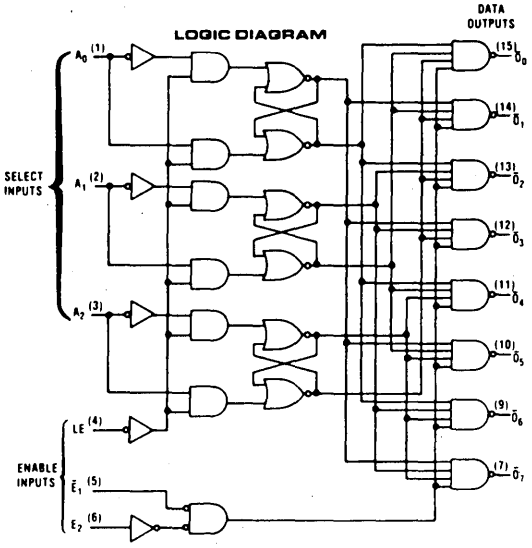
© IC MASTER 1983

See Page 714 for Package Information.

Functional Block Diagrams and Logic

Fig. 1 MD54/74SC137

LOGIC DIAGRAM



FUNCTION TABLE

INPUTS						OUTPUTS							
ENABLE			SELECT										
LE	E_2	$\bar{E}_1$	A_2	A_1	A_0	$\bar{O}_0$	$\bar{O}_1$	$\bar{O}_2$	$\bar{O}_3$	$\bar{O}_4$	$\bar{O}_5$	$\bar{O}_6$	$\bar{O}_7$
X	X	H	X	X	X	H	H	H	H	H	H	H	H
X	L	X	X	X	X	H	H	H	H	H	H	H	H
L	H	L	L	L	L	L	H	H	H	H	H	H	H
L	H	L	L	L	H	H	L	H	H	H	H	H	H
L	H	L	L	H	L	H	H	L	H	H	H	H	H
L	H	L	L	H	H	H	H	H	L	H	H	H	H
L	H	L	H	L	L	H	H	H	H	L	H	H	H
L	H	L	H	L	H	H	H	H	H	H	L	H	H
L	H	L	H	H	L	H	H	H	H	H	H	L	H
L	H	L	H	H	H	H	H	H	H	H	H	H	L
H	H	L	X	X	X	Output corresponding to stored address L all others H							

H = high level, L = low level, X = irrelevent

CONNECTION DIAGRAM DIP (TOP VIEW)

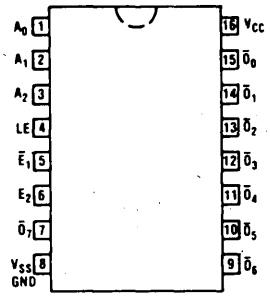
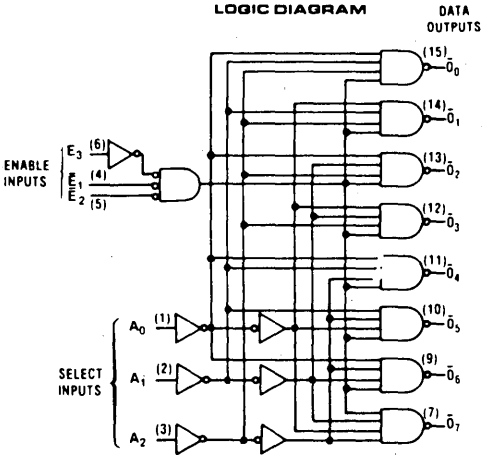


Fig. 2 MD54/74SC138

LOGIC DIAGRAM



FUNCTION TABLE

INPUTS				OUTPUTS							
ENABLE		SELECT									
E_3	$\bar{E}_{1,2}$	A_2	A_1	A_0	$\bar{O}_0$	$\bar{O}_1$	$\bar{O}_2$	$\bar{O}_3$	$\bar{O}_4$	$\bar{O}_5$	$\bar{O}_6$	$\bar{O}_7$
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

H = high level, L = low level, X = irrelevent

CONNECTION DIAGRAM DIP (TOP VIEW)

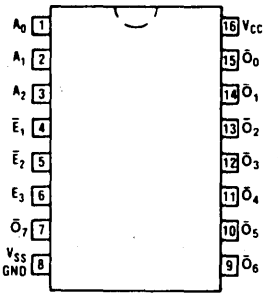
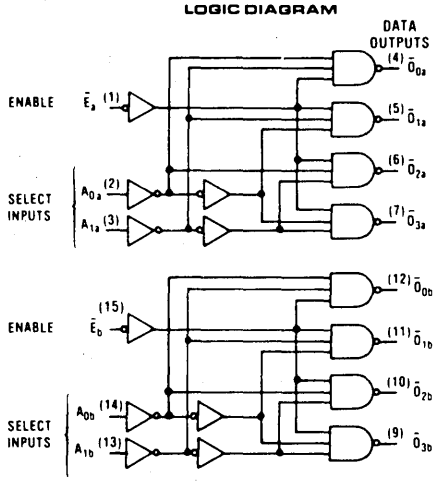


Fig. 3 MD54/74SC139

LOGIC DIAGRAM

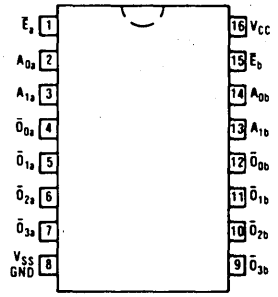


(EACH DECODER/DEMULTIPLEXER) FUNCTION TABLE

INPUTS		OUTPUTS				
ENABLE	SELECT					
$\bar{E}$	A_1	A_0	$\bar{O}_0$	$\bar{O}_1$	$\bar{O}_2$	$\bar{O}_3$
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

H = high level, L = low level, X = irrelevent

CONNECTION DIAGRAM DIP (TOP VIEW)



MITEL

DIGITAL

Mitel Semiconductor

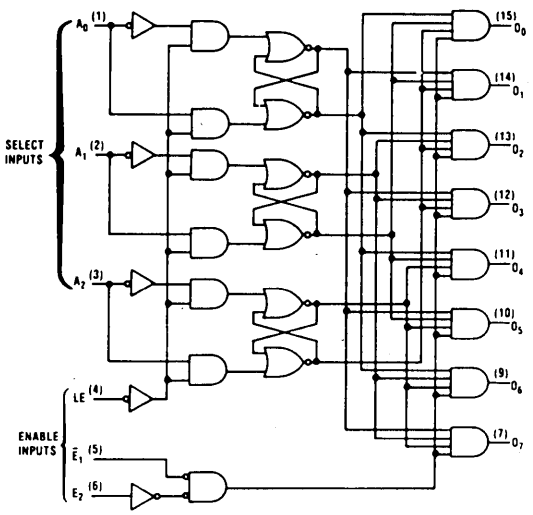
See Page 714 for Package Information.

© IC MASTER 1983

Functional Block Diagrams and Logic

Fig. 4 MD54/74HC237

LOGIC DIAGRAM



FUNCTION TABLE

INPUTS						OUTPUTS							
ENABLE			SELECT										
LE	E_2	$\bar{E}_1$	A_2	A_1	A_0	O_0	O_1	O_2	O_3	O_4	O_5	O_6	O_7
X	X	H	X	X	X	L	L	L	L	L	L	L	L
X	L	X	X	X	X	L	L	L	L	L	L	L	L
L	H	L	L	L	L	H	L	L	L	L	L	L	L
L	H	L	L	L	H	L	H	L	L	L	L	L	L
L	H	L	L	H	L	L	L	H	L	L	L	L	L
L	H	L	L	H	H	L	L	L	H	L	L	L	L
L	H	L	H	L	L	L	L	L	L	H	L	L	L
L	H	L	H	L	H	L	L	L	L	L	H	L	L
L	H	L	H	H	L	L	L	L	L	L	L	H	L
L	H	L	H	H	H	L	L	L	L	L	L	L	H
H	H	L	X	X	X	Output corresponding to stored address H all others L							

H = high level, L = low level, X = irrelevent

CONNECTION DIAGRAM DIP (TOP VIEW)

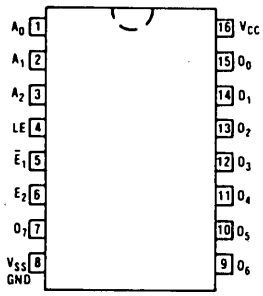
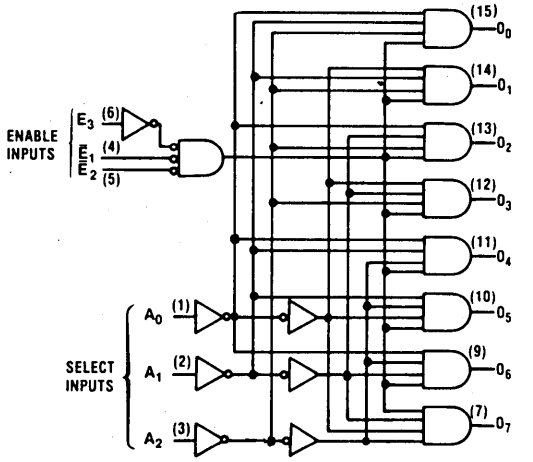


Fig. 5 MD54/74HC238

LOGIC DIAGRAM



FUNCTION TABLE

INPUTS						OUTPUTS							
ENABLE			SELECT										
E_3	$\bar{E}_1$	$\bar{E}_2$	A_2	A_1	A_0	O_0	O_1	O_2	O_3	O_4	O_5	O_6	O_7
X	H	X	X	X	X	L	L	L	L	L	L	L	L
L	X	X	X	X	X	L	L	L	L	L	L	L	L
H	L	L	L	L	L	H	L	L	L	L	L	L	L
H	L	L	L	L	H	L	H	L	L	L	L	L	L
H	L	L	L	H	L	L	L	H	L	L	L	L	L
H	L	L	L	H	H	L	L	L	H	L	L	L	L
H	L	L	H	L	L	L	L	L	L	H	L	L	L
H	L	L	H	L	H	L	L	L	L	L	H	L	L
H	L	L	H	H	L	L	L	L	L	L	L	H	L
H	L	L	H	H	H	L	L	L	L	L	L	L	H

H = high level, L = low level, X = irrelevent

CONNECTION DIAGRAM DIP (TOP VIEW)

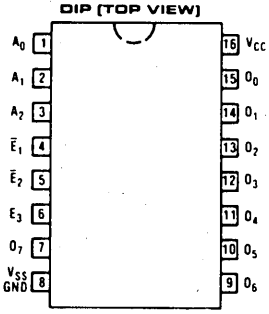
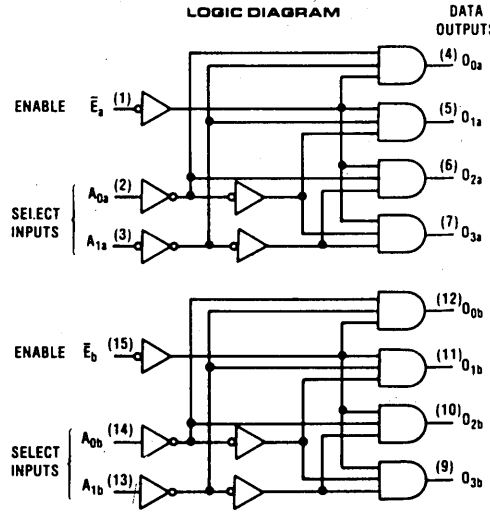


Fig. 6 MD54/74HC239

LOGIC DIAGRAM

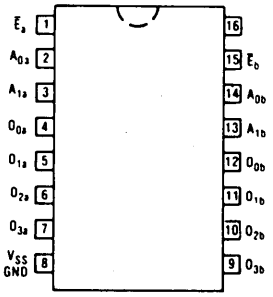


(EACH DECODER/DEMULTIPLEXER) FUNCTION TABLE

INPUTS			OUTPUTS			
ENABLE	SELECT					
$\bar{E}$	A_1	A_0	O_0	O_1	O_2	O_3
H	X	X	L	L	L	L
L	L	L	H	L	L	L
L	L	H	L	H	L	L
L	H	L	L	L	H	L
L	H	H	L	L	L	H

H = high level, L = low level, X = irrelevent

CONNECTION DIAGRAM DIP (TOP VIEW)



MITEL

DIGITAL

Mitel Semiconductor

© IC MASTER 1983

See Page 714 for Package Information.

Absolute Maximum Ratings

PARAMETER	SYMBOL	VALUE	
		MD74'	MD54'
Supply voltage	V_{CC}	−0.5V to 7.0V	−0.5V to 7.0V
Input voltage	V_I	−0.3V to Vcc + 0.3V	−0.3V to V_{CC} + 0.3V
Output current, per output	I_O	±75mA	± 75 mA
Operating temperature	T_A	−40°C to +85°C	−55°C to + 125°C
Storage temperature	T_S	−65°C to +150°C	−65°C to + 150°C
Package Power dissipation	P	450mW	450 mW

Note: 1. Exceeding these ratings may cause permanent damage. Functional operation under these conditions is not implied.

Recommended Operating Conditions

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Supply voltage		V_{CC}	2	5	6.5	V
Input voltage		V_I	0		V_{CC}	V
Operating free-air temperature	MD74'	T_A	0		70	°C
	MD54'	T_A	−55		125	°C

1. Voltage values are with respect to V_{SS} GND

Electrical Characteristics Over Recommended Operating Free-Air Temperature Range

PARAMETER	SYMBOL		MIN	TYP	MAX	UNIT	TEST CONDITIONS
High level input voltage	V_{IH}	MD54'	2			V	V_{CC} = 5.5V
		MD74'	2			V	V_{CC} = 5.25V
Low level input voltage	V_{IL}	MD54'			0.8	V	V_{CC} = 4.5V
		MD74'			0.8	V	V_{CC} = 4.75V
High level output voltage	V_{OH}	MD54'	2.4 3.5			V	V_{CC} = 4.5V, I_{OH} = −5mA, I_{OH} = −3mA
		MD74'	2.4 4.0			V	V_{CC} = 4.75V, I_{OH} = −14mA I_{OH} = −3mA
Low level output voltage	V_{OL}	MD54'			0.4	V	V_{CC} = 4.5V, I_{OL} = 6.5mA
		MD74'			0.4	V	V_{CC} = 4.75V, I_{OL} = 8 mA
Input current at maximum input voltage	I_I	MD54'			15	µA	V_{CC} = 5.5V, V_I = 5.85V
		MD74'			15	µA	V_{CC} = 5.25V, V_I = 5.55V
High level input current	I_{IH}	MD54'			10	µA	V_{CC} = 5.5V, V_I = 2.7V
		MD74'			10	µA	V_{CC} = 5.25V, V_I = 2.7V
Low level input current	I_{IL}	MD54'			−10	µA	V_{CC} = 5.5V, V_I = 0.4V
		MD74'			−10	µA	V_{CC} = 5.25V, V_I = 0.4V
Short circuit output current	I_{OS}	MD54'		−40		mA	NOTE 2, V_{CC} = 5.5V
		MD74'		−40		mA	NOTE 2, V_{CC} = 5.25V
Quiescent supply current	I_{CC}	MD54'			0.5	mA	V_{CC} = 5.5V, outputs disabled
		MD74'			0.1	mA	V_{CC} = 5.25V, outputs disabled

2. Max. dissipation or 1 ms duration should not be exceeded.
3. All TYP. values at T_A = 25°C V_{CC} = 5V.

See Page 714 for Package Information.

© IC MASTER 1983

Switching Characteristics, V_{CC} = 5V, T_A = 25° C

PARAMETER	SYMBOL	DEVICE	MIN	TYP	MAX	UNIT	TEST CONDITION (Figure 7)
Propagation delay time Address to output	t_{PLH}	MD54/74SC137		25	38	ns	C_L = 15pF R_L = 2K Ω
		MD54/74SC138		22	35		
		MD54/74SC139		29	48		
		MD54/74SC237		30	50		
		MD54/74SC238		24	40		
		MD54/74SC239		25	45		
Propagation delay time Address to output	t_{PHL}	MD54/74SC137		31	52	ns	C_L = 15pF R_L = 2K Ω
		MD54/74SC138		24	42		
		MD54/74SC139		30	50		
		MD54/74SC237		30	44		
		MD54/74SC238		26	42		
		MD54/74SC239		27	45		
Propagation delay time E to output	t_{PLH}	MD54/74SC137		31	44	ns	C_L = 15pF R_L = 2K Ω
		MD54/74SC138		31	44		
		MD54/74SC139		22	35		
		MD54/74SC237		33	45		
		MD54/74SC238		33	45		
		MD54/74SC239		25	45		
Propagation delay time E to output	t_{PHL}	MD54/74SC137		31	48	ns	C_L = 15pF R_L = 2K Ω
		MD54/74SC138		33	48		
		MD54/74SC139		30	53		
		MD54/74SC237		34	52		
		MD54/74SC238		34	52		
		MD54/74SC239		26	35		
Set up time, address to Latch Enable Hold	t_{su}	MD54/74SC137	15			ns	C_L = 15pF R_L = 2K Ω
		MD54/74SC237	15				
Hold time output, from latch Disable	t_h	MD54/74SC137	10			ns	C_L = 15pF R_L = 2K Ω
		MD54/74SC237	10				
Input Capacitance	C_I	MD54/74SC137		3	8	pF	
		MD54/74SC138		3	8		
		MD54/74SC139		3	8		
		MD54/74SC237		3	8		
		MD54/74SC238		3	8		
		MD54/74SC239		3	8		

Voltage Waveforms - Propagation Delay Times

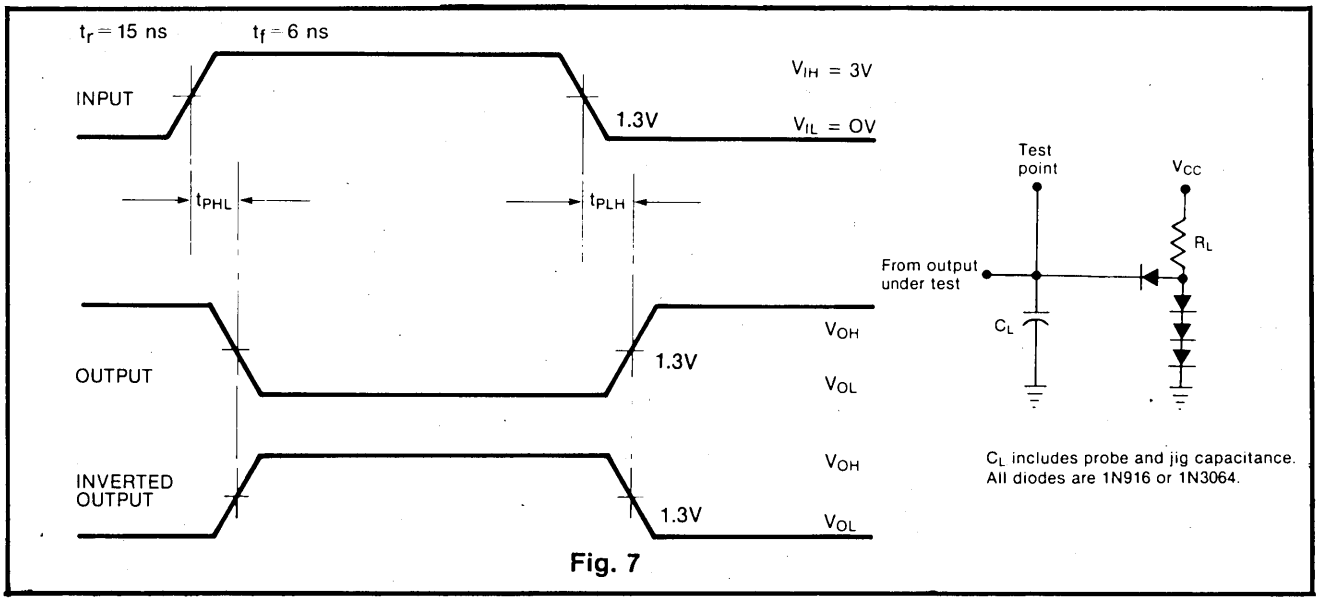


Fig. 7

Pin Function

PIN	DESCRIPTION
A_0, A_1, A_2 or A_{0a}, A_{0b} A_{1a}, A_{1b}	Address Inputs, to be decoded
$\overline{E}_1$, $\overline{E}_2$, E_3 or $\overline{E}_a$, $\overline{E}_b$ or $\overline{E}_1$, E_2	Chip Enable Inputs

PIN	DESCRIPTION
LE	Latch Enable Input
O_0 - O_7 or $\overline{O}_0$ - $\overline{O}_7$	Outputs, to peripherals Inverted Outputs, to peripherals
V_{CC}	Positive Supply Voltage
V_{SS}/GND	System Ground

© IC MASTER 1983

See Page 714 for Package Information.

MITEL
Technical Data

ISO-CMOS, 3-State Octal Buffers/Line Drivers

MD54SC240, MD54SC241, MD54SC244
MD54SC540, MD54SC541
MD74SC240, MD74SC241, MD74SC244
MD74SC540, MD74SC541

OCT '82

Features

- Equivalent to 54/74LS' series
- Low power ISO-CMOS technology
- Short propagation delay
- Improved noise margins
- Bus oriented 3-state outputs
- High current sink/source capability

Ordering Information	
MD54SCXXXAC	20 Pin, Cerdip
MD74SCXXXAC	20 Pin, Cerdip
MD74SCXXXAE	20 Pin, Plastic DIP

DIGITAL

Mitel Semiconductor

Description

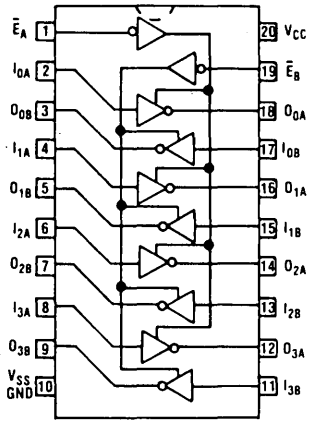
This family of ISO-CMOS Octal Buffers and Line Drivers are designed to improve P.C. board density and performance in three-state memory address drivers, clock drivers and bus oriented receivers and transmitters. A comprehensive range of devices, cover a selection of differing input/output pin layouts, inverting and non-inverting buffers and a choice of similar or complementary, output controls ($\bar{E}_A$, $\bar{E}_B$).

Device Selection

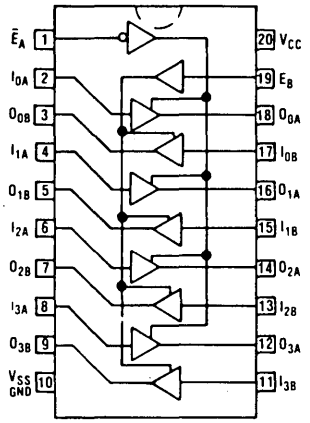
PRODUCT	3-STATE CONTROL	DATA OUTPUTS
MD54/74SC240	$\bar{E}_A$, $\bar{E}_B$	inverting
MD54/74SC241	$\bar{E}_A$, E_B	non-inverting
MD54/74SC244	$\bar{E}_A$, $\bar{E}_B$	non-inverting
MD54/74SC540	$\bar{E}_1$ AND $\bar{E}_2$	inverting
MD54/74SC541	$\bar{E}_1$ AND $\bar{E}_2$	non-inverting

See Page 714 for Package Information.
© IC MASTER 1983

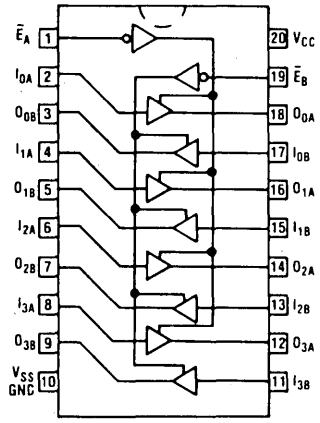
Connection and Logic Diagrams, DIP (TOP VIEW)



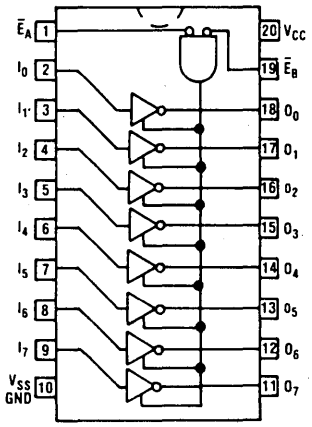
MD54/74SC240



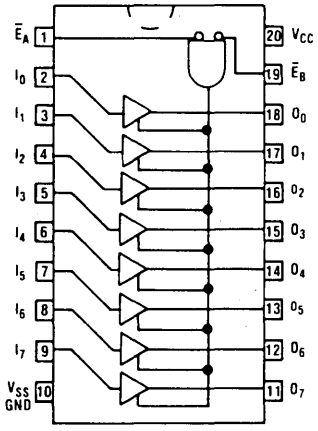
MD54/74SC241



MD54/74SC244



MD54/74SC540



MD54/74SC541

PIN	DESCRIPTION
$\bar{E}_A$, $\bar{E}_B$ or $\bar{E}_A$, E_B	Data Output Enable
I_{0A} - I_{3A} I_{0B} - I_{3B} or I_{0-7}	Data Inputs
O_{0A} - O_{3A} O_{0B} - O_{3B} or O_0 - O_7	Data Outputs
V_{CC}	Positive Supply Voltage
V_{SS}/GND	System Ground

Fig. 1

Truth Tables

INPUTS		OUTPUT	
$\bar{E}$	I_{0-3}	MD54/74SC240A O_{0-3}	MD54/74SC244A O_{0-3}
L	L	H	L
L	H	L	H
H	X	Z	Z

A or B Buffers

MD54/74SC241A					
A BUFFERS			B BUFFERS		
INPUTS		OUTPUT	INPUTS		OUTPUT
$\bar{E}_A$	I_{0-3}	O_{0-3}	E_B	I_{0-3}	O_{0-3}
L	L	L	H	L	L
L	H	H	H	H	H
H	X	Z	L	X	Z

INPUTS			OUTPUT	
$\bar{E}_A$	$\bar{E}_B$	I_{0-7}	MD54/74SC540A O_{0-7}	MD54/74SC541A O_{0-7}
L	L	L	H	L
L	L	H	L	H
H	X	X	Z	Z
X	H	X	Z	Z

L Logic Low
H Logic High
X Don't Care
Z High Impedance

Fig. 2

© IC MASTER 1983

See Page 714 for Package Information.

Absolute Maximum Ratings

PARAMETER	SYMBOL	VALUE	
		MD74'	MD54'
Supply voltage	V_{CC}	−0.5V to 7.0V	−0.5V to 7.0V
Input voltage	V_I	−0.3V to Vcc + 0.3V	−0.3V to V_{CC} + 0.3V
Output current, per output	I_O	±75mA	±,75 mA
Operating temperature	T_A	−40°C to +85°C	−55°C to +125°C
Storage temperature	T_S	−65°C to +150°C	−65°C to +150°C
Package Power dissipation	P	450mW	450 mW

Note:1. Exceeding these ratings may cause permanent damage. Functional operation under these conditions is not implied.

Recommended Operating Conditions

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Supply voltage		V_{CC}	2	5	6.5	V
Input voltage		V_I	0		V_{CC}	V
Operating free-air temperature	MD74'	T_A	0		70	°C
	MD54'	T_A	−55		125	°C

1 Voltage values are with respect to V_{SS}/GND

Electrical Characteristics Over Recommended Operating Free-Air Temperature Range

PARAMETER	SYMBOL		MIN	TYP	MAX	UNIT	TEST CONDITIONS
High level input voltage	V_{IH}	MD54'	2			V	V_{CC} = 5.5V
		MD74'	2			V	V_{CC} = 5.25V
Low level input voltage	V_{IL}	MD54'			0.8	V	V_{CC} = 4.5V
		MD74'			0.8	V	V_{CC} = 4.75V
High level output voltage	V_{OH}	MD54'	2.4 3.5			V	V_{CC} = 4.5V, I_{OH} = −5mA, I_{OH} = −3mA
		MD74'	2.4 4.0			V	V_{CC} = 4.75V, I_{OH} = −14mA I_{OH} = −3mA
Low level output voltage	V_{OL}	MD54'			0.4	V	V_{CC} = 4.5V, I_{OL} = 6.5mA
		MD74'			0.4	V	V_{CC} = 4.75V, I_{OL} = 10mA
Input current at maximum input voltage	I_I	MD54'			15	µA	V_{CC} = 5.5V, V_I = 5.85V
		MD74'			15	µA	V_{CC} = 5.25V, V_I = 5.55V
High level input current	I_{IH}	MD54'			10	µA	V_{CC} = 5.5V, V_I = 2.7V
		MD74'			10	µA	V_{CC} = 5.25V, V_I = 2.7V
Low level input current	I_{IL}	MD54'			−10	µA	V_{CC} = 5.5V, V_I = 0.4V
		MD74'			−10	µA	V_{CC} = 5.25V, V_I = 0.4V
Off-state output current high-level voltage applied	I_{OZH}	MD54'			20	µA	V_{CC} = 5.5V, V_O = 2.7V
		MD74'			20	µA	V_{CC} = 5.25V, V_O = 2.7V
Off-state output current low-level voltage applied	I_{OZL}	MD54'			−20	µA	V_{CC} = 5.5V, V_O = 0.4V
		MD74'			-20	µA	V_{CC} = 5.25V, V_O = 0.4V
Short circuit output current	I_{OS}	MD54'		−40		mA	NOTE 2 V_{CC} = 5.5V
		MD74'		−40		mA	NOTE 2, V_{CC} = 5.25V
Quiescent supply current	I_{CC}	MD54'			0.5	mA	V_{CC} = 5.5V, outputs disabled
		MD74'			0.1	mA	V_{CC} = 5.25V, outputs disabled

2. Max. dissipation or1ms duration should not be exceeded.
3. All TYP. values at T_A = 25°C V_{CC} = 5V.

See Page 714 for Package Information.

© IC MASTER 1983

Switching Characteristics, V_{CC} = 5V, T_A = 25° C

PARAMETER	SYMBOL	DEVICE	MIN	TYP	MAX	UNIT	TEST CONDITION (Figure 3)
Propagation delay time Low to high output	t_{PLH}	MD54/74SC240		19	35	ns	R_L = 667Ω, R_C = ∞, C_L = 45pF
		MD54/74SC241/4		21	38		
		MD54/74SC540		22	40		
		MD54/74SC541		26	45		
Propagation delay time high to low input	t_{PHL}	MD54/74SC240		20	35	ns	
		MD54/74SC241/4		23	40		
		MD54/74SC540		24	40		
		MD54/74SC541		27	45		
Output enable time to low level	t_{PZL}	MD54/74SC240		21	40	ns	R_L = 667Ω, R_C = 5KΩ, C_L = 5pF
		MD54/74SC241/4		22	42		
		MD54/74SC540		35	52		
		MD54/74SC541		39	58		
Output enable time to high level	t_{PZH}	MD54/74SC240		20	35	ns	
		MD54/74SC241/4		21	38		
		MD54/74SC540		26	45		
		MD54/74SC541		28	45		
Output disable time from low level	t_{PLZ}	MD54/74SC240		22	35	ns	
		MD54/74SC241/4		24	38		
		MD54/74SC540		25	38		
		MD54/74SC541		30	45		
Output disable time from high level	t_{PHZ}	MD54/74SC240		42	55	ns	
		MD54/74SC241/4		48	60		
		MD54/74SC540		35	48		
		MD54/74SC541		37	48		
Output disable time from low level	t_{PLZ}	MD54/74SC240		22	35	ns	R_L = 667Ω, R_C = 1KΩ, C_L = 5pF
		MD54/74SC241/4		24	38		
		MD54/74SC540		25	38		
		MD54/74SC541		30	45		
Output disable time from high level	t_{PHZ}	MD54/74SC240		30	40	ns	
		MD54/74SC241/4		33	45		
		MD54/74SC540		25	36		
		MD54/74SC541		27	36		
Input Capacitance	C_I	MD54/74SC240		3	8	pF	
		MD54/74SC241/4		3	8		
		MD54/74SC540		3	8		
		MD54/74SC541		3	8		

Voltage Waveforms

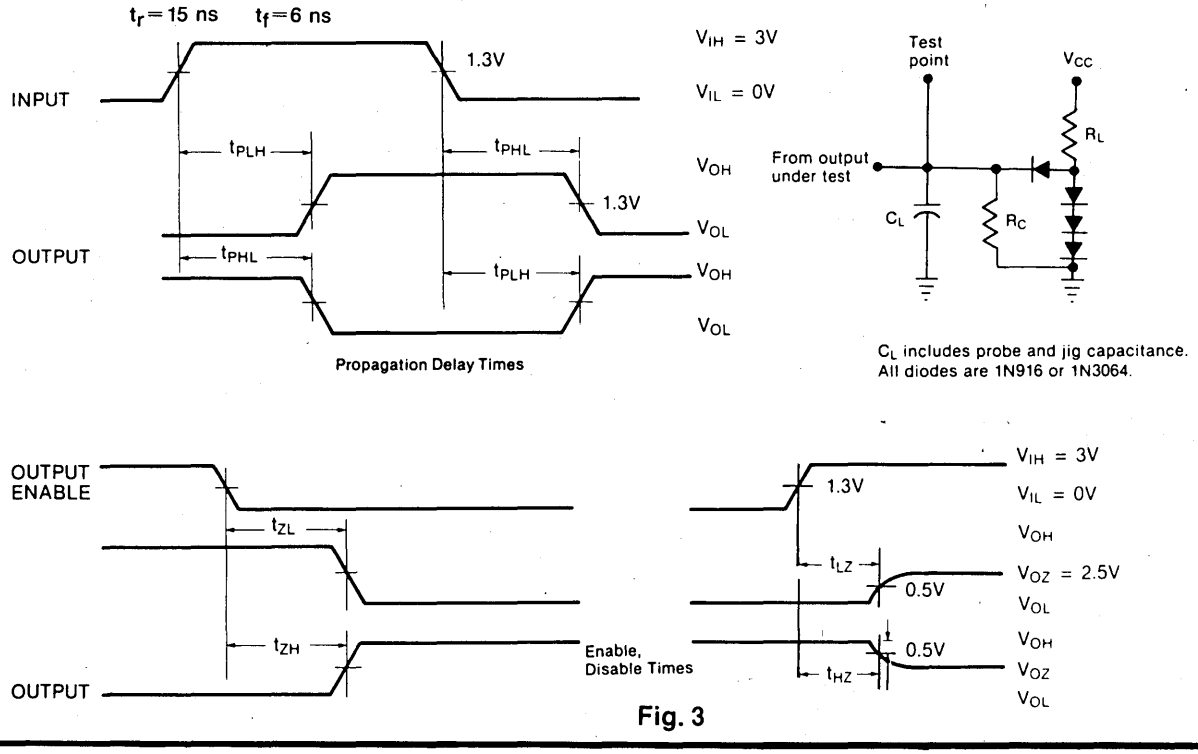


Fig. 3

© IC MASTER 1983

See Page 714 for Package Information.

MITEL
Technical Data

ISO-CMOS Octal Bus Transceivers with 3-State Buffered Outputs

MD54SC245, MD54SC545
MD74SC245, MD74SC545

OCT '82

Features

- Pin compatible with 54/74LS245 types
- Low power ISO-CMOS technology
- Short propagation delay
- Bus oriented 3-state outputs
- CMOS inputs reduce DC loading
- Fully TTL compatible, inputs and outputs

Ordering Information

MD54SCXXXAC	20 Pin, Cerdip
MD74SCXXXAC	20 Pin, Cerdip
MD74SCXXXAE	20 Pin, Plastic DIP

Description

These octal bus transceiver circuits are designed for high-speed asynchronous two-way communication between data buses. The control function inputs minimize external timing requirements.

The devices provide data transmission from the A bus to the B bus or from the B bus to the A bus depending upon the logic level at the direction control input (DIR) pin. The enable input ($\overline{G}$) pin can be used to disable the device outputs so that the buses are effectively isolated from each other. The MD54/74SC545 differs from the MD54/74SC245 by use of inverting buffers.

Device Selection

Product	Format	Output
MD54/74SC245	Bi-directional Buffer	non-inverted
MD54/74SC545	Bi-directional Buffer	inverted

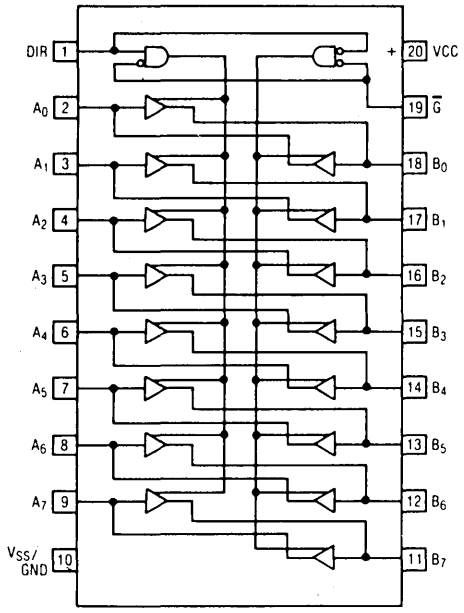
See Page 714 for Package Information.

© IC MASTER 1983

Connection and Logic Diagram

DIP (TOP VIEW)

MD54/74SC245



MD54/74SC545

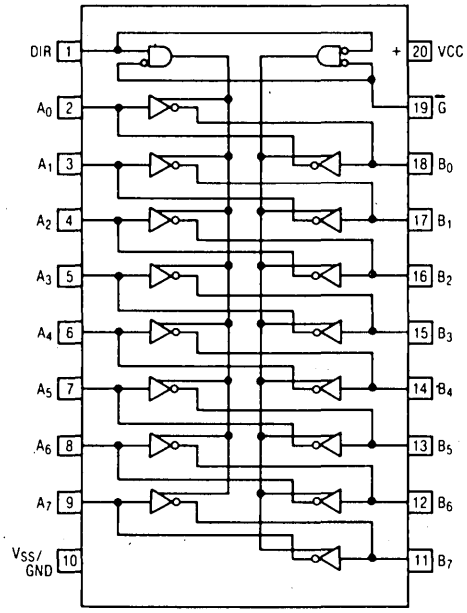


Fig. 1

Function Table

INPUT	OUTPUT	
ENABLE (G)	Control(DIR)	OPERATION
L	L	B - A
L	H	A - B
H	X	ISOLATION

Pin Function

Pin	Description
A_0 - A_7	Bus A, Data Inputs/Outputs
B_0 - B_7	Bus B, Data Inputs/Outputs
DIR	Direction Control Input
$\overline{G}$	Enable Input, Active LOW
V_{CC}	Positive Supply Voltage
V_{SS}/GND	System Ground

© IC MASTER 1983

See Page 714 for Package Information.

Absolute Maximum Ratings

PARAMETER	SYMBOL	VALUE	
		MD74SC'	MD54SC'
Supply voltage	V_{CC}	-0.5V to 7.0V	-0.5V to 7.0V
Input voltage	V_I	-0.3V to Vcc + 0.3V	-0.3V to V_{CC} + 0.3V
Output current, per output	I_O	± 75mA	± 75 mA
Operating temperature	T_A	-40°C to +85°C	-55°C to +125°C
Storage temperature	T_S	-65°C to +150°C	-65°C to +150°C
Package Power dissipation	P	450mW	450 mW

Note:1. Exceeding these ratings may cause permanent damage. Functional operation under these conditions is not implied.

Recommended Operating Conditions

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Supply voltage		V_{CC}	2	5	6.5	V
Input voltage		V_I	0		V_{CC}	V
Operating free-air temperature	MD74'	T_A	0		70	°C
	MD54'	T_A	-55		125	°C

1 Voltage values are with respect to V_{SS}/GND

Electrical Characteristics Over Recommended Operating Free-Air Temperature Range

PARAMETER	SYMBOL		MIN	TYP	MAX	UNIT	TEST CONDITIONS
High level input voltage	V_{IH}	MD54'	2			V	V_{CC} = 5.5V
		MD74'	2			V	V_{CC} = 5.25V
Low level input voltage	V_{IL}	MD54'			0.8	V	V_{CC} = 4.5V
		MD74'			0.8	V	V_{CC} = 4.75V
High level output voltage	V_{OH}	MD54'	2.4 3.5			V	V_{CC} = 4.5V, I_{OH} = -5mA, I_{OH} = -3mA
		MD74'	2.4 4.0			V	V_{CC} = 4.75V, I_{OH} = -14mA I_{OH} = -3mA
Low level output voltage	V_{OL}	MD54'			0.4	V	V_{CC} = 4.5V, I_{OL} = 6.5mA
		MD74'			0.4	V	V_{CC} = 4.75V, I_{OL} = 10mA
Input current at maximum input voltage	I_I	MD54'			15	µA	V_{CC} = 5.5V, V_I = 5.85V
		MD74'			15	µA	V_{CC} = 5.25V, V_I = 5.55V
High level input current	I_{IH}	MD54'			10	µA	V_{CC} = 5.5V, V_I = 2.7V
		MD74'			10	µA	V_{CC} = 5.25V, V_I = 2.7V
Low level input current	I_{IL}	MD54'			-10	µA	V_{CC} = 5.5V, V_I = 0.4V
		MD74'			-10	µA	V_{CC} = 5.25V, V_I = 0.4V
Off-state output current high-level voltage applied	I_{OZH}	MD54'			20	µA	V_{CC} = 5.5V, V_O = 2.7V
		MD74'			20	µA	V_{CC} = 5.25V, V_O = 2.7V
Off-state output current low-level voltage applied	I_{OZL}	MD54'			-20	µA	V_{CC} = 5.5V, V_O = 0.4V
		MD74'			-20	µA	V_{CC} = 5.25V, V_O = 0.4V
Short circuit output current	I_{OS}	MD54'		-40		mA	NOTE 2 V_{CC} = 5.5V
		MD74'		-40		mA	NOTE 2, V_{CC} = 5.25V
Quiescent supply current	I_{CC}	MD54'			0.5	mA	V_{CC} = 5.5V, outputs disabled
		MD74'			0.1	mA	V_{CC} = 5.25V, outputs disabled

2. Max. dissipation or 1ms duration should not be exceeded.
3. All TYP. values at T_A = 25°C V_{CC} = 5V.

See Page 714 for Package Information.

© IC MASTER 1983

Switching Characteristics, V_{CC} = 5V, T_A = 25° C

PARAMETER	SYMBOL	DEVICE	MIN	TYP	MAX	UNIT	TEST CONDITION (Figure 2)
Propagation delay time Low to high output	t_{PLH}	MD54/74SC245 MD54/74SC545		22 18	33 29	ns	R_L = 667Ω C_L = 45pF R_C = ∞
Propagation delay time High to low input	t_{PHL}	MD54/74SC245 MD54/74SC545		25 20	40 35	ns	
Output enable time to low level	t_{PZL}	MD54/74SC245 MD54/74SC545		31 27	46 41	ns	R_L = 667Ω C_L = 5pF R_C = 5KΩ
Output enable time to high level	t_{PZH}	MD54/74SC245 MD54/74SC545		30 24	40 35	ns	
Output disable time from low level	t_{PLZ}	MD54/74SC245 MD54/74SC545		31 26	42 38	ns	
Output disable time from high level	t_{PHZ}	MD54/74SC245 MD54/74SC545		40 35	57 53	ns	
Output disable time from low level	t_{PLZ}	MD54/74SC245 MD54/74SC545		31 26	42 38	ns	R_L = 667Ω C_L = 5pF R_C = 1KΩ
Output disable time from high level	t_{PHZ}	MD54/74SC245 MD54/74SC545		21 17	30 26	ns	
Input Capacitance	C_L	MD54/74SC245 MD54/74SC545		3 3	8 8	pF	

Voltage Waveforms

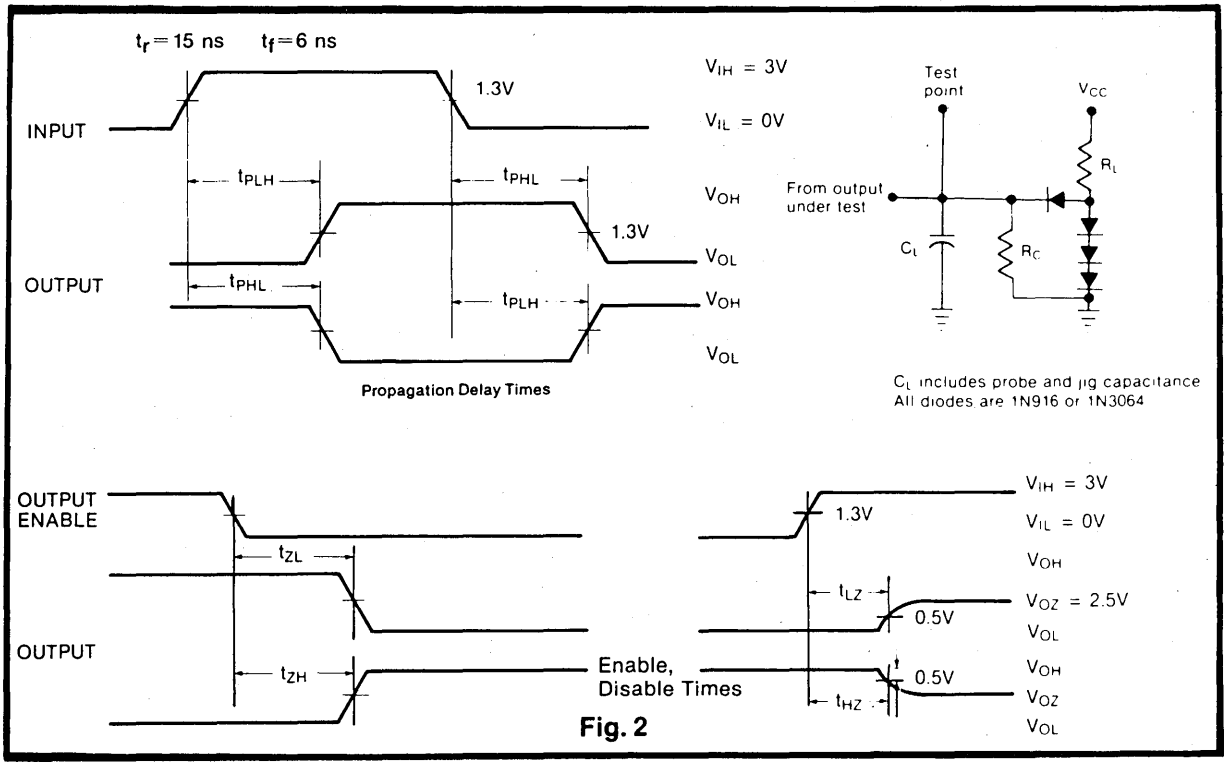


Fig. 2

DIGITAL

Mitel Semiconductor

MITEL
Technical Data

ISO-CMOS, 3-State Octal D-Type Transparent Latches and Edge Triggered Flip Flops

MD54SC373, MD54SC374, MD54SC533
MD54SC534, MD54SC563, MD54SC564
MD54SC573, MD54SC574
MD74SC373, MD74SC374, MD74SC533
MD74SC534, MD74SC563, MD74SC564
MD74SC573, MD74SC574

OCT '82

Features

- Equivalent to 54/74LS' series
- Low power ISO-CMOS technology
- Short propagation delay
- Improved noise margins
- Bus oriented 3-state outputs
- High current, sink/source capability

Ordering Information	
MD54SCXXXAC	20 Pin, Cerdip
MD74SCXXXAC	20 Pin, Cerdip
MD74SCXXXAE	20 Pin, Plastic DIP

Description

This family of 8 bit latches feature 3-state operation and are designed for use in high speed, bus oriented, systems. The '373 appears transparent to data (outputs change asynchronously) when Latch Enable, LE, is HIGH. When LE is LOW, data meeting the set up times becomes latched. The '374 latches hold their individual data when meeting set up times with the clock, CK, LOW-to-HIGH transition. With both devices $\overline{OE}$ does not affect the state of the latches, but when $\overline{OE}$ is HIGH the output is put into high impedence. Data may thus be latched even when the device is deselected. A selection of packages offers a choice of inverted or non-inverted outputs.

Device Selection

Product	Format	Output
MD54/74SC373	transparent latch	non-inverted
MD54/74SC374	D type flip-flop	non-inverted
MD54/74SC533	transparent latch	inverted
MD54/74SC534	D type flip-flop	inverted
MD54/74SC563	transparent latch	inverted
MD54/74SC564	D type flip-flop	inverted
MD54/74SC573	transparent latch	non-inverted
MD54/74SC574	D type flip-flop	non-inverted

See Page 714 for Package Information.
© IC MASTER 1983

LOGIC DIAGRAMS

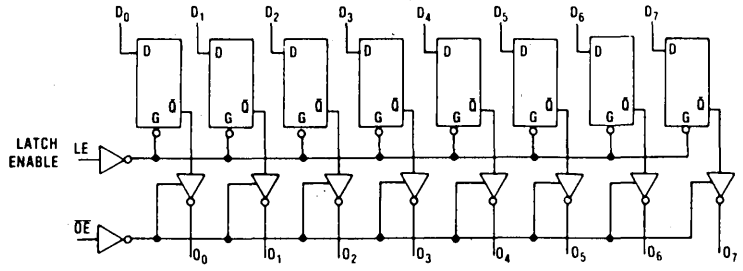


Fig. 1

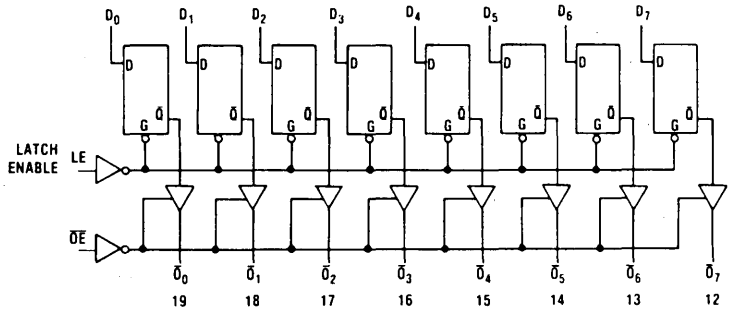


Fig. 2

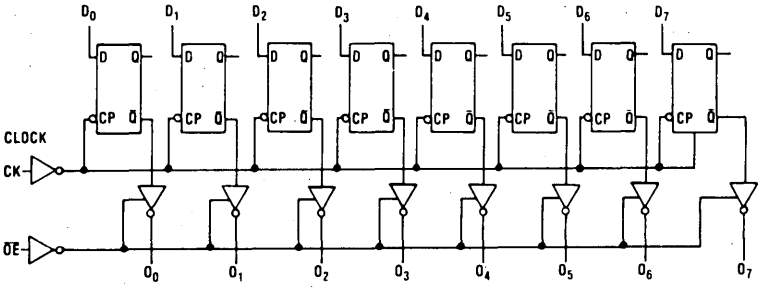


Fig. 3

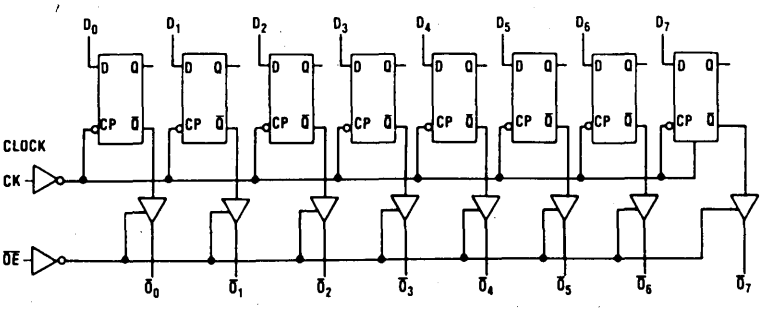
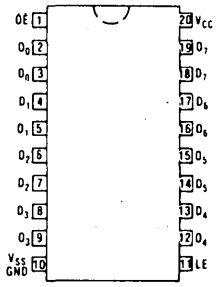
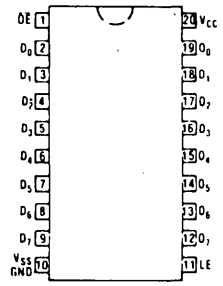


Fig. 4

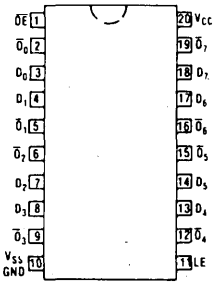
CONNECTION DIAGRAMS DIP (TOP VIEW)



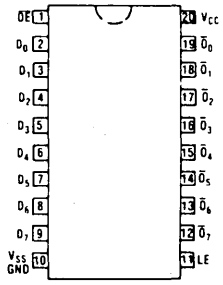
MD54/74HC373



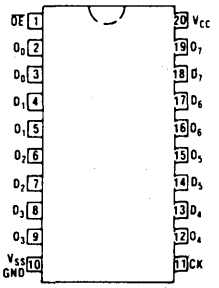
MD54/74HC573



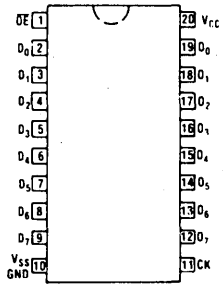
MD54/74HC533



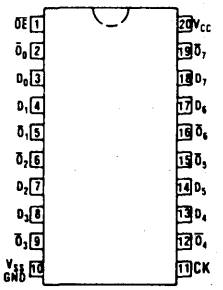
MD54/74HC563



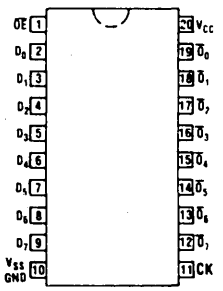
MD54/74HC374



MD54/74HC574



MD54/74HC534



MD54/74HC564

1678

MITEL

© IC MASTER 1983

See Page 714 for Package Information.

Absolute Maximum Ratings

PARAMETER	SYMBOL	VALUE	
		MD74'	MD54'
Supply voltage	V_{CC}	-0.5V to 7.0V	-0.5V to 7.0V
Input voltage	V_I	-0.3V to Vcc + 0.3V	-0.3V to V_{CC} + 0.3V
Output current, per output	I_O	±75mA	± 75 mA
Operating temperature	T_A	-40°C to +85°C	-55°C to +125°C
Storage temperature	T_S	-65°C to +150°C	-65°C to +150°C
Package Power dissipation	P	450mW	450 mW

Note:1. Exceeding these ratings may cause permanent damage. Functional operation under these conditions is not implied.

Recommended Operating Conditions

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Supply voltage		V_{CC}	2	5	6.5	V
Input voltage		V_I	0		V_{CC}	V
Operating free-air temperature	MD74'	T_A	0		70	°C
	MD54'	T_A	-55		125	°C
Width of clock/enable pulse,		t_w	20			ns
Data set up time	MD54/74 SCXX3	t_{su}	5↓			ns
	MD54/74 SCXX4		20↑			ns
Data hold time	MD54/74 SCXX3	t_h	25↓			ns
	MD54/74 SCXX4		15↑			ns

1. The arrow indicates clock/enable transition: ↑ LOW to HIGH, ↓ HIGH to LOW
2. Voltage values are with respect to V_{SS}/GND

Electrical Characteristics Over Recommended Operating Free-Air Temperature Range

PARAMETER	SYMBOL		MIN	TYP	MAX	UNIT	TEST CONDITIONS
High level input voltage	V_{IH}	MD54'	2			V	V_{CC} = 5.5V
		MD74'	2			V	V_{CC} = 5.25V
Low level input voltage	V_{IL}	MD54'			0.8	V	V_{CC} = 4.5V
		MD74'			0.8	V	V_{CC} = 4.75V
High level output voltage	V_{OH}	MD54'	2.4 3.5			V	V_{CC} = 4.5V, I_{OH} = -5mA, I_{OH} = -3mA
		MD74'	2.4 4.0			V	V_{CC} = 4.75V, I_{OH} = -14mA I_{OH} = -3mA
Low level output voltage	V_{OL}	MD54'			0.4	V	V_{CC} = 4.5V, I_{OL} = 6.5mA
		MD74'			0.4	V	V_{CC} = 4.75V, I_{OL} = 10mA
Input current at maximum input voltage	I_I	MD54'			15	µA	V_{CC} = 5.5V, V_I = 5.85V
		MD74'			15	µA	V_{CC} = 5.25V, V_I = 5.55V
High level input current	I_{IH}	MD54'			10	µA	V_{CC} = 5.5V, V_I = 2.7V
		MD74'			10	µA	V_{CC} = 5.25V, V_I = 2.7V
Low level input current	I_{IL}	MD54'			-10	µA	V_{CC} = 5.5V, V_I = 0.4V
		MD74'			-10	µA	V_{CC} = 5.25V, V_I = 0.4V
Off-state output current high-level voltage applied	I_{OZH}	MD54'			20	µA	V_{CC} = 5.5V, V_O = 2.7V
		MD74'			20	µA	V_{CC} = 5.25V, V_O = 2.7V
Off-state output current low-level voltage applied	I_{OZL}	MD54'			-20	µA	V_{CC} = 5.5V, V_O = 0.4V
		MD74'			-20	µA	V_{CC} = 5.25V, V_O = 0.4V
Short circuit output current	I_{OS}	MD54'		-40		mA	NOTE 2 V_{CC} = 5.5V
		MD74'		-40		mA	NOTE 2, V_{CC} = 5.25V
Quiescent supply current	I_{CC}	MD54'			0.5	mA	V_{CC} = 5.5V, outputs disabled
		MD74'			0.1	mA	V_{CC} = 5.25V, outputs disabled

3. Max. dissipation or 1ms duration should not be exceeded.
4. All TYP. values at T_A = 25°C V_{CC} = 5V.

See Page 714 for Package Information.

© IC MASTER 1983

Switching Characteristics, V_{CC} = 5V, T_A = 25° C

PARAMETER	SYMBOL	DEVICE	MIN	TYP	MAX	UNIT	TEST CONDITION (Figure 5)
Propagation delay time Address to output	t_{PLH}	MD54/74SC373 MD54/74SC533 MD54/74SC563 MD54/74SC573		30	50	ns	C_L = 45pF R_L = 667 Ω R_C = ∞
		MD54/74SC374 MD54/74SC534 MD54/74SC564 MD54/74SC574		33	55	ns	
Propagation delay time Address to output	t_{PHL}	MD54/74SC373 MD54/74SC533 MD54/74SC563 MD54/74SC573		30	50	ns	C_L = 45pF R_L = 667 Ω R_C = ∞
		MD54/74SC374 MD54/74SC534 MD54/74SC564 MD54/74SC574		33	55	ns	
Output enable time to low level	t_{PZL}	All		27	49	ns	R_L = 667 C_L = 5pF R_C = 5K Ω
Output enable time to high level	t_{PZH}	All		27	49	ns	
Output disable time from low level	t_{PLZ}	All		27	49	ns	
Output disable time from high level	t_{PHZ}	All		40	69	ns	
Input Capacitance	C_I	All		3	8	pF	

Voltage Waveforms

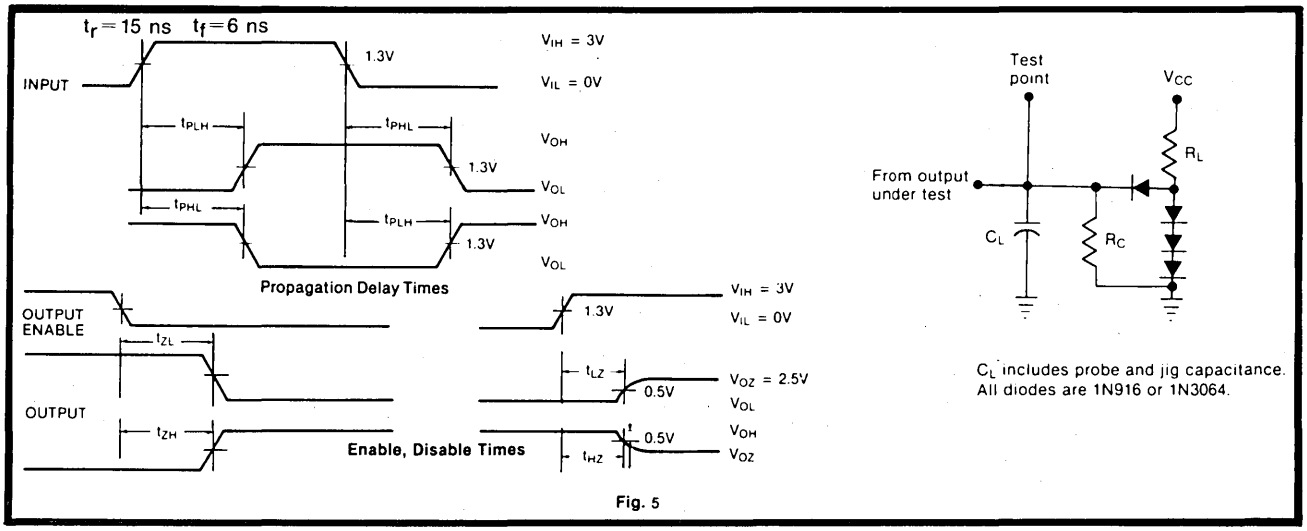


Fig. 5

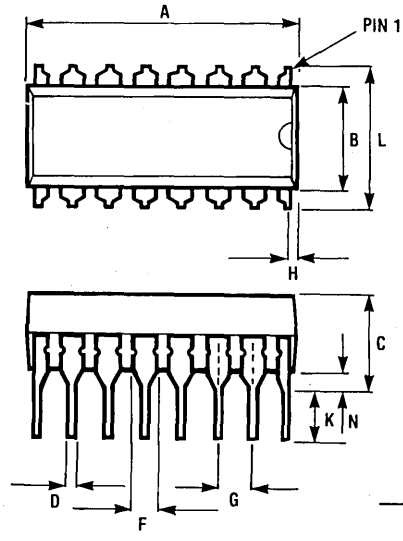
Pin Function

Pin	Description
D_{0-7}	Data Inputs
O_{0-7}	Non Inverted Data Outputs
$\overline{O}_{0-7}$	Inverted Data Outputs
$\overline{OE}$	Output Enable

Pin	Description
CK	Clock Input
LE	Latch Enable
V_{CC}	Positive Supply Voltage
V_{SS}/GND	System Ground

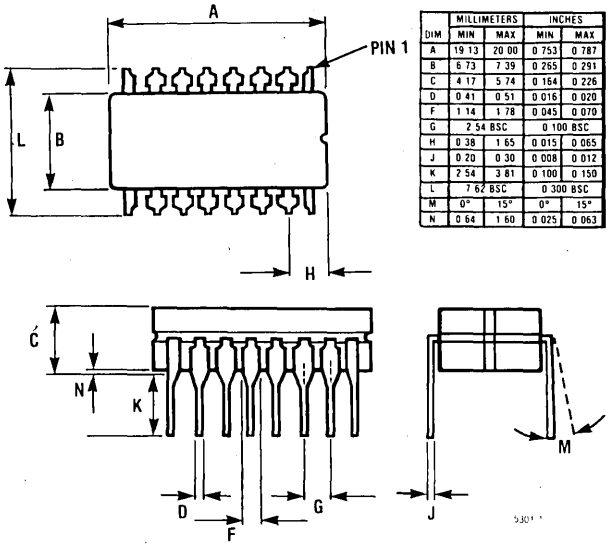
© IC MASTER 1983

See Page 714 for Package Information.



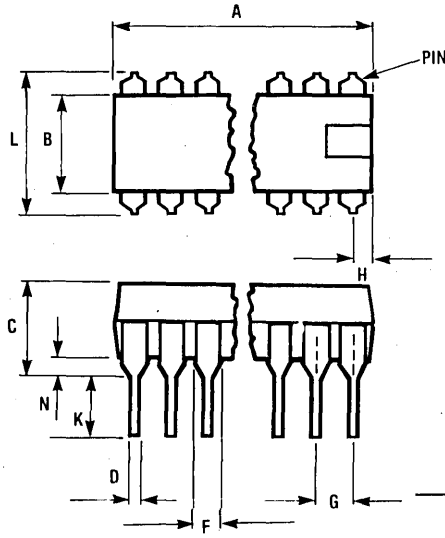
DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	21.34	22.10	0.840	0.870
B	6.10	6.60	0.240	0.260
C	4.19	5.21	0.165	0.205
D	0.38	0.53	0.015	0.021
F	1.27	1.78	0.050	0.070
G	2.54 BSC		0.100 BSC	
H	0.25	2.29	0.010	0.090
J	0.20	0.38	0.008	0.015
K	2.92	3.43	0.115	0.135
L	7.62 BSC		0.300 BSC	
M	0°	15°	0°	15°
N	0.51	1.02	0.020	0.040

16-Lead Dual-In-Line Plastic (E Suffix)



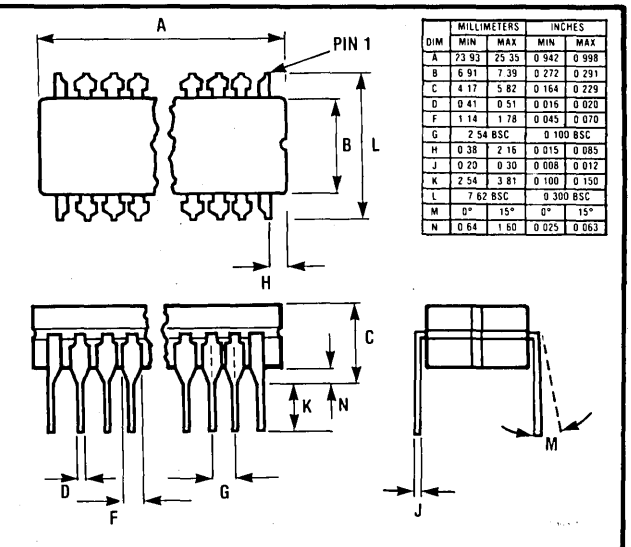
DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	19.13	20.00	0.753	0.787
B	6.73	7.39	0.265	0.291
C	4.17	5.74	0.164	0.226
D	0.41	0.51	0.016	0.020
F	1.14	1.78	0.045	0.070
G	2.54 BSC		0.100 BSC	
H	0.38	1.65	0.015	0.065
J	0.20	0.30	0.008	0.012
K	2.54	3.81	0.100	0.150
L	7.62 BSC		0.300 BSC	
M	0°	15°	0°	15°
N	0.64	1.60	0.025	0.063

16-Lead CERDIP (C Suffix)



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	26.42	26.92	1.040	1.060
B	6.10	6.60	0.240	0.260
C	4.19	5.21	0.165	0.205
D	0.38	0.53	0.015	0.021
F	1.27	1.78	0.050	0.070
G	2.54 BSC		0.100 BSC	
H	0.25	2.29	0.010	0.090
J	0.20	0.38	0.008	0.015
K	2.92	3.43	0.115	0.139
L	7.62 TYP		0.300 TYP	
M	0°	15°	0°	15°
N	0.51	1.02	0.020	0.040

20-Lead Dual-In-Line Plastic (E Suffix)



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	23.93	25.35	0.942	0.998
B	6.91	7.39	0.272	0.291
C	4.17	5.82	0.164	0.229
D	0.41	0.51	0.016	0.020
F	1.14	1.78	0.045	0.070
G	2.54 BSC		0.100 BSC	
H	0.38	2.16	0.015	0.085
J	0.20	0.30	0.008	0.012
K	2.54	3.81	0.100	0.150
L	7.62 BSC		0.300 BSC	
M	0°	15°	0°	15°
N	0.64	1.60	0.025	0.063

20-Lead CERDIP (C Suffix)

Information furnished by MITEL Semiconductor is believed to be accurate and reliable. However, no responsibility is assumed by MITEL Semiconductor for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent rights of MITEL Semiconductor. Specifications are subject to change without notice.

For more information write or phone the leaders in CMOS technology, MITEL Semiconductor:

UNITED STATES:
2321 Morena Blvd., San Diego, **California, U.S.A.** 92110. Telephone: (714) 276-3421
TWX: 910-335-1242
5400 Broken Sound Blvd., Boca Raton, **Florida, U.S.A.** 33431. Telephone: (305) 994-8500
TWX: 510-953-7521
14330 Midway Rd., Dallas, **Texas, U.S.A.** 75234. Telephone: (214) 387-5581
TWX: 910-860-9263
1223 Westchester Pike, Havertown, **Pennsylvania, U.S.A.** 19083. Telephone: (215) 449-5556
TWX: 510-662-6653

CANADA:
360 Legget Drive, P.O. Box 13320, Kanata, **Ontario, Canada** K2K 1X5. Telephone: (613) 592-5630
Telex: 053-3221; TWX: 610-562-1678

EUROPE:
Unit 12, Severnbridge Industrial Estate, Portskewett, Gwent, **South Wales.** Telephone: 291-423355
Telex: 497-360
Bredgade 65A, Second Floor, 1260 Copenhagen K, **Denmark.** Telephone: (01) 134712
Telex: 19502 Mitel DK

ASIA:
Young Ya Industrial Bldg., Block A & C, 16th Floor, 381-389 Sha Tsui Road, Tsuen Wan, **Hong Kong.**
Telephone: 4-636416
Telex: 34235

© IC MASTER 1983

Octal Interface Selection Guide

FUNCTION	POWER	POLARITY	FEATURE	PART NUMBER	
				COMMERCIAL	MILITARY
Buffer	LS	Non-invert	—	SN74LS244	SN54LS244
			—	SN74LS241	SN54LS241
			Schmitt Trigger	SN74LS344	SN54LS344
			Schmitt Trigger	SN74LS341	SN54LS341
		Invert	—	SN74LS210	SN54LS210
			—	SN74LS240	SN54LS240
			Schmitt Trigger	SN74LS310	SN54LS310
			Schmitt Trigger	SN74LS340	SN54LS340
	S	Non-invert	—	SN74S244	SN54S244
			—	SN74S241	SN54S241
		Invert	—	SN74S210	SN54S210
			—	SN74S240	SN54S240
Transceiver	LS	Non-invert	—	SN74LS245	SN54LS245
			—	SN74LS645	SN54LS645
			48mA I_{OL}	SN74LS645-1	—
Latch	LS	Non-invert	—	SN74LS373	SN54LS373
		Invert	—	SN74LS533	SN54LS533
	S	Non-invert	—	SN74S373	SN54S373
			32mA I_{OL}	SN74S531	—
		Invert	—	SN74S533	SN54S533
			32mA I_{OL}	SN74S535	—
Register	LS	Non-invert	Master Reset	SN74LS273	SN54LS273
			—	SN74LS374	SN54LS374
			Clock Enable	SN74LS377	SN54LS377
		Invert	—	SN74LS534	SN54LS534
	S	Non-invert	—	SN74S374	SN54S374
			32mA I_{OL}	SN74S532	—
		Invert	—	SN74S534	SN54S534
			32mA I_{OL}	SN74S536	—

1165 East Arques Avenue, Sunnyvale, CA 94086 Tel: (408) 739-3535 TWX: 910-339-9229

© IC MASTER 1983

16x16 Multiplier/Divider
SN54/74S516

Features/Benefits

- **Co-processor for enhancing the arithmetic speed of all present 16-bit and 8-bit microprocessors**
- **Bus-oriented organization**
- **24-pin package**
- **16/16 or 32/16 division in less than 3.5 μsec**
- **16x16 multiplication in less than 1.5 μsec**
- **28 different multiplication instructions such as "fractional multiply and accumulate"**
- **13 different divide instructions**
- **Self-contained and microprogrammable**

Description

The SN54/74S516 ('S516) is a bus-organized 16x16 Multiplier/Divider. The device provides both multiplication and division of 2s-complement 16-bit numbers at high speed. There are 28 different multiply options, including: positive and negative multiply, positive and negative accumulation, multiplication by a constant, and both single-length and double-length addition in conjunction with multiplication. 13 different divide options allow single-length or double-length division, division of a previously-generated result, division by a constant, and continued division of a remainder or quotient.

The 'S516 is a time-sequenced device requiring a single clock. It loads operands from, and presents results to, a bidirectional 16-bit bus. Loading of the operands, reading of the results, and sequential control of the device is performed by a 3-bit instruction field.

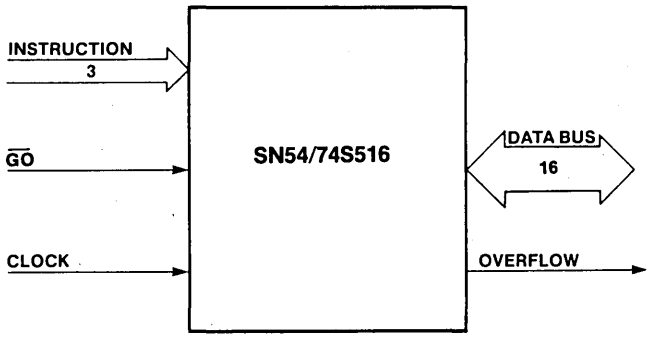
The 'S516 has the additional feature that operands and results can be either integers or fractions; when it deals with fractions, automatic scaling occurs. Results can be rounded if required, and an Overflow output indicates whenever a result is outside the normally-accepted number range.

For a simple multiplication of two operands the device takes nine clock periods — one for initialization, and eight for the actual multiplication. A realistic clock period is 167 ns, which gives a multiplication time of 1333 ns typical for 16x16 multiplication, plus 167 ns additionally for initialization, or 1500 ns in all. More complex multiplications will take additional clock periods for loading the additional operands. A simple division operation requires 16 + 4 = 20 clock periods for a typical time of 3.333 ns (16 bits/8 bits), also plus 167 ns for initialization, or 3500 ns in all.

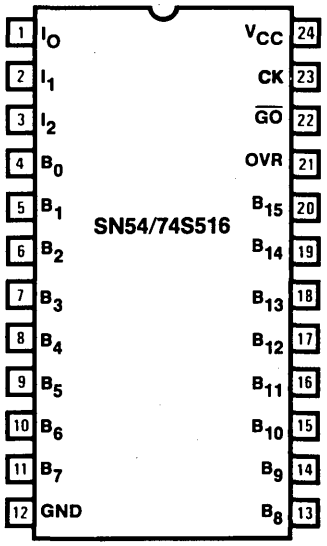
Ordering Information

PART NUMBER	PACKAGE	TEMPERATURE
SN54S516	T24	Military
SN74S516	T24	Commercial

Logic Symbol



Pin Configuration



© IC MASTER 1983

INSTRUCTION SEQUENCE			OPERATION	CLOCK CYCLES
ARITHMETIC OPERATIONS				
		0	X1 · Y	9
		1	-X1 · Y	9
		2	X1 · Y + K_Z, K_W	9
		3	-X1 · Y + K_Z, K_W	9
		4	K_Z, K_W/X1	21
	5/6	0	X · Y	10
	5/6	1	-X · Y	10
	5/6	2	X · Y + K_Z, K_W	10
	5/6	3	-X · Y + K_Z, K_W	10
	5/6	4	K_W/X	22
	5/6	5	K_Z/X	22
5/6	6	0	X · Y + Z	11
5/6	6	1	-X · Y + Z	11
5/6	6	2	X · Y + $K_Z \cdot 2^{-15}$	11
5/6	6	3	-X · Y + $K_Z \cdot 2^{-15}$	11
5/6	6	4	Z, W/X	23
5/6	6	5	Z/X	23
5/6	6	6	0	X · Y + Z, W	12
5/6	6	6	1	-X · Y + Z, W	12
5/6	6	6	2	X · Y + W_{sign}	12
5/6	6	6	3	-X · Y + W_{sign}	12
5/6	6	6	4	W/X	24
5/6	6	6	5	W_{sign}/X	24
5/6	6	6	6	(See Note 10 below.)	—
5/6	6	6	7	Load X, Load Z, Load W, Clear Z	4
	5/6	6	7	Load X, Load Z, Read Z	3
READING OPERATIONS				
			7	Read Z	1
		7	7	Read Z, W	2
	7	7	7	Read Z, W, Z	3
7	7	7	7	Read Z, W, Z, W	4
		5	7	Round, then Read Z	2
	5	7	7	Round, then Read Z, W	3

NOTES:
1. X,Y are input multiplier and multiplicand.
2. X1 is the previous contents of the first rank of the X register (either the old X or a new X).
3. Fractional or integer arithmetic is specified by having the next-to-the-last operand loaded using a 5 or 6 instruction respectively. All rows beginning with "5/6" in effect represent *two* instructions. 5 does fractional arithmetic and 6 does integer arithmetic.
4. Z, W is a double-precision number. Z is the most significant half, Z, W represents addend upon input, and product (or accumulated sum) after multiplication.
5. K_Z, K_W represents previous accumulator contents. K_Z is the most-significant half.
6. W_{sign} is a single-length signed number, with sign extension.
7. Maximum clock cycle = 125 ns for an 8-MHz clock.
8. If n instruction codes are shown at the left under "instruction sequences," the number of clock cycles at the right is n+8 for multiplication and n+20 for division.
9. By presenting code 7 on the instruction lines at least one clock cycle before the last clock pulse of the operation cycles, the result (register Z) is available on the bus one clock earlier (see Figure 9).
10. The code "5/6 6 6 6" represents an incomplete operation since it leaves the 'S516 in state 1 rather than in state 0, 8, or 10.

Figure 1 'S516 Instruction Set (Partial List)

SUMMARY OF SIGNALS/PINS	
B_{15}-B_0	Bidirectional data bus inputs/outputs
I_2-I_0	Instruction (sequential control) input
CK	Clock pulse input
$\overline{GO}$	Chip activation input
OVR	Arithmetic overflow output

Description (continued)

The 'S516 device uses standard low-power Schottky technology, requires a single +5V power supply, and is fully TTL compatible. Bus inputs require at most 250 μA input current, and control and clock inputs require at most 1 mA input current. Bus outputs are three-state, and are capable of sinking 8 mA at the low logic level. The 'S516 is available in both commercial-temperature and military-temperature ranges, in a 600-mil 24-pin dual-in-line ceramic package.

Device Operation

The 'S516 contains four 16-bit working registers. Y is the multiplier register; X is the multiplicand and divisor register; W is the least-significant half of a double-length accumulator, and holds the least-significant half of the product after a multiplication operation, or the remainder after a division operation; and Z is the most-significant half of this same accumulator. In addition to these registers, there is a high-speed arithmetic unit which performs addition, subtraction, and shifting steps in order to accomplish the various arithmetic operations; a loading sequencer; and a PLA control network.

Operands are loaded into the working registers in time sequence at each clock period, under the control of this sequencer. The chip-activation signal $\overline{GO}$ must be LOW in order to begin the loading process and continue to the next step in the loading operation. If $\overline{GO}$ is continually held HIGH, the 'S516 remains in a wait state with its outputs held in their high-impedance states, so that the other devices attached to the bus may drive it. In this condition, the 'S516 does not respond to any codes on its instruction inputs; in effect, it does not "wake up" until $\overline{GO}$ goes LOW. Also, $\overline{GO}$ may change only when the clock input CK is HIGH. After all of the operands are loaded, the 'S516 jumps to the multiply routine, or to the divide routine, and performs the required operations as indicated in Figure 1. After 9 clock periods for a simple multiply or 21 clock periods for a simple divide, for example, the result is placed on the bus in time sequence.

© IC MASTER 1983

Absolute Maximum Ratings

Supply Voltage, V_{CC} 7V
Input Voltage 7V
Off-state output voltage 5.5V
Storage temperature ..... –65° to +150°C

Operating Conditions

SYMBOL	PARAMETER	FIGURE	MILITARY MIN	MILITARY TYP	MILITARY MAX	COMMERCIAL MIN	COMMERCIAL TYP	COMMERCIAL MAX	UNIT
V_{CC}	Supply voltage		4.5	5	5.5	4.75	5	5.25	V
f_{MAX}	Clock frequency	8	5	8		6	8		MHz
t_{CWP}	Positive clock pulse width	8	90	45		70	45		ns
t_{CWN}	Negative clock pulse width	8	60	35		50	35		ns
t_{BS}	Bus setup time for inputting data *	8	60	40		50	40		ns
t_{BH}	Bus hold time for inputting data *	8	45	15		35	15		ns
t_{INSS}	Instruction setup time	8	10	0		10	0		ns
t_{INSH}	Instruction hold time	8	30	20		30	20		ns
T_A	Operating free-air temperature		–55		125†	0		75	°C

* During operations when the bus is being used to input data. † Case temperature.

Electrical Characteristics Over Operating Conditions

SYMBOL	PARAMETER	TEST CONDITIONS		MIN	TYP	MAX	UNIT
V_{IL}	Low-level input voltage					0.8	V
V_{IH}	High-level input voltage			2			V
V_{IC}	Input clamp voltage	V_{CC} = MIN I_I = –18mA				–1.5	V
I_{IL}	Low-level input current	V_{CC} = MAX V_I = 0.5V	B_{15}-B_0			–250	μA
			All other inputs			–1	mA
I_{IH}	High-level input current	V_{CC} = MAX V_I = 2.4V				250	μA
I_I	Maximum input current	V_{CC} = MAX V_I = 5.5V				1	mA
V_{OL}	Low-level output voltage	V_{CC} = MIN I_{OL} = 8mA			0.3	0.5	V
V_{OH}	High-level output voltage	V_{CC} = MIN I_{OH} = –2mA		2.4			V
I_{OS}	Output short-circuit current*	V_{CC} = MAX V_O = 0V		–10		–90	mA
I_{CC}	Supply current	V_{CC} = MAX	SN54S516		370	500†	mA
			SN74S516		370	450†	

* Not more than one output should be shorted at a time, and the duration of the short-circuit should not exceed one second.
† At code temperatures see the "I_{CC} vs Temperature" curves on the next page for more complete information. The typical values shown here are at 5.0V.

Switching Characteristics Over Operating Conditions

SYMBOL	PARAMETER		FIGURE	MILITARY MIN	MILITARY TYP	MILITARY MAX	COMMERCIAL MIN	COMMERCIAL TYP	COMMERCIAL MAX	UNIT
t_{BO}	Bus output delay from CK for outputting data; C_L = 30pF		8		70	120		70	95	ns
t_{PXZ}	Output disable delay	From I_2-I_0 to bus			30	70		30	65	ns
		From $\overline{GO}$ to bus			20	50		20	40	
t_{PZX}	Output enable delay; C_L = 30pF	From I_2-I_0 to bus			55	90		55	80	ns
		From $\overline{GO}$ to bus			25	55		25	45	
t_{OVR}	Overflow output delay from CK; C_L = 30pF		8		60	120		60	95	ns

* During operations when the bus is being used to output data.

© IC MASTER 1983

8x8 High Speed Schottky Multipliers
SN54/74S557 SN54/74S558

Features/Benefits

- **Industry-standard 8x8 multiplier**
- **Multiplies two 8-bit numbers; gives 16-bit result**
- **Cascadable; 56x56 fully-parallel multiplication uses only 34 multipliers for the most-significant half of the product**
- **Full 8x8 multiply in 60ns worst case**
- **Three-state outputs for bus operation**
- **Transparent 16-bit latch in 'S557**
- **Plug-in compatible with original Monolithic Memories' 67558**

Description

The 'S557/'S558 is a high-speed 8x8 combinatorial multiplier which can multiply two eight-bit unsigned or signed twos-complement numbers and generate the sixteen-bit unsigned or signed product. Each input operand X and Y has an associated Mode control line, X_M and Y_M respectively. When a Mode control line is at a Low logic level the operand is treated as an unsigned eight-bit number, while if the Mode control is at a High logic level the operand is treated as an eight-bit signed twos-complement number. Additional inputs, R_S and R_U, (R, S557) allow the addition of a bit into the multiplier array at the appropriate bit positions for rounding signed or unsigned fractional numbers.

The 'S557 internally develops proper rounding for either signed or unsigned numbers by combining the rounding input R with X_M, Y_M, $\overline{X_M}$, and $\overline{Y_M}$ as follows:

$R_U = \overline{X_M} \cdot \overline{Y_M} \cdot R$ = Unsigned rounding input to 2^7 adder.

$R_S = (X_M + Y_M)\ R$ = Signed rounding input to 2^6 adder.

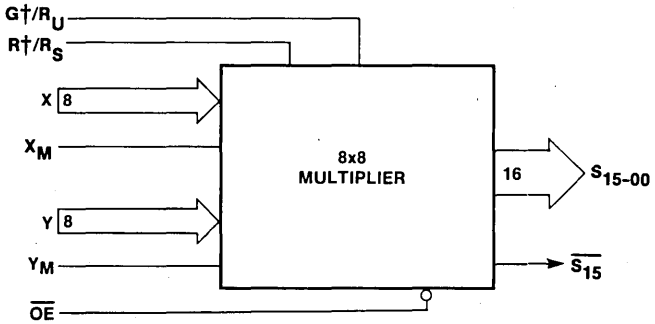
Since the 'S558 does not require the use of pin 11 for the latch enable input G, R_S and R_U are brought out separately.

The most-significant product bit is available in both true and complemented form to assist in expansion to larger signed multipliers. The product outputs are three-state, controlled by an assertive-low Output Enable which allows several multipliers to be connected to a parallel bus or be used in a pipelined system. The device uses a single +5V power supply and is packaged in a standard 40-pin DIP.

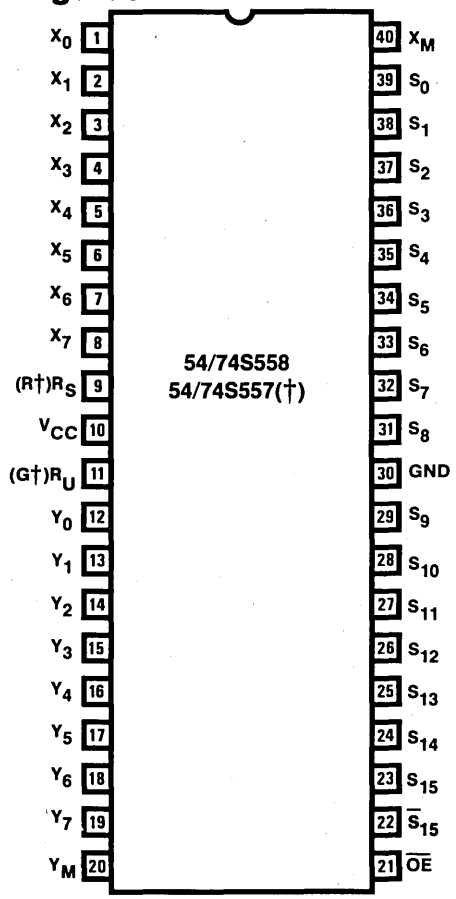
Ordering Information

PART NUMBER	PACKAGE	TEMPERATURE
54S557, 54S558	J40, F42	Military
74S557, 74S558	J40	Commercial

Logic Symbol



Pin Configuration



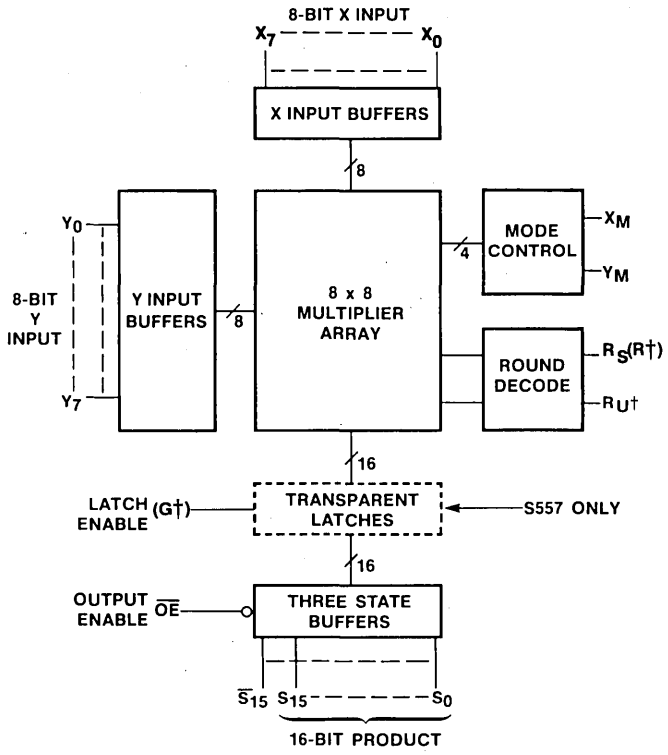
†For 54/74S557 Pin 9 is R and Pin 11 is G.

DIGITAL

Monolithic Memories

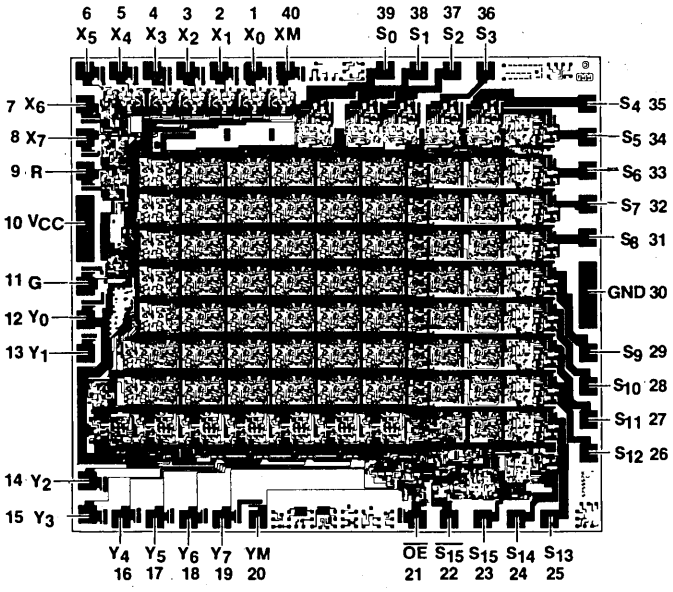
© IC MASTER 1983

Logic Diagram



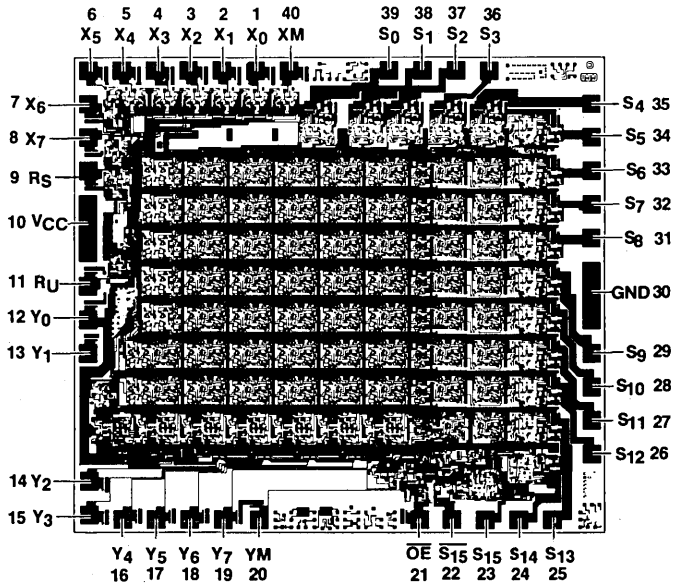
†For 54/74S557 Pin 9 is R and Pin 11 is G.

'S557



DIE SIZE: 144x130 mil

'S558



DIE SIZE: 144x130 mil

© IC MASTER 1983

Absolute Maximum Ratings

Supply Voltage, V_{CC} 7V
Input Voltage 7V
Off-state output voltage 5.5V
Storage temperature ..... –65° to +150°C

Operating Conditions

SYMBOL	PARAMETER	DEVICE	MILITARY MIN	MILITARY TYP	MILITARY MAX	COMMERCIAL MIN	COMMERCIAL TYP	COMMERCIAL MAX	UNITS
V_{CC}	Supply voltage	all	4.5	5	5.5	4.75	5	5.25	V
t_{su}	X_i, Y_i to G setup time	'S557	50			40			ns
t_h	X_i, Y_i to G hold time	'S557	0			0			ns
t_w	Latch enable pulse width	'S557	20			15			ns
T_A	Operating free-air temperature	all	–55		125*	0		75	°C

* Case temperature

Electrical Characteristics Over Operating Conditions

SYMBOL	PARAMETER	TEST CONDITIONS		MIN	TYP†	MAX	UNIT
V_{IL}	Low-level input voltage					0.8	V
V_{IH}	High-level input voltage			2			V
V_{IC}	Input clamp voltage	V_{CC} = MIN	I_I = –18mA			–1.5	V
I_{IL}	Low-level input current	V_{CC} = MAX	V_I = 0.5V			–1	mA
I_{IH}	High-level input current	V_{CC} = MAX	V_I = 2.4V			100	μA
I_I	Maximum input current	V_{CC} = MAX	V_I = 5.5V			1	mA
V_{OL}	Low-level output voltage	V_{CC} = MIN	I_{OL} = 8mA			0.5	V
V_{OH}	High-level output voltage	V_{CC} = MIN	I_{OH} = –2mA	2.4			V
I_{OZL}	Off-state output current	V_{CC} = MAX	V_O = 0.5V			–100	μA
I_{OZH}			V_O = 2.4V			100	μA
I_{OS}	Output short-circuit current*	V_{CC} = MAX	V_O = 0V	–20		–90	mA
I_{CC}	Supply current	V_{CC} = MAX			200	280	mA

* Not more than one output should be shorted at a time and duration of the short-circuit should not exceed one second.

† Typicals at 5.0V V_{CC} and 25°C T_A.

Switching Characteristics Over Operating Conditions

SYMBOL	PARAMETER	DEVICE	TEST CONDITIONS	MILITARY MIN	MILITARY TYP†	MILITARY MAX	COMMERCIAL MIN	COMMERCIAL TYP†	COMMERCIAL MAX	UNIT
t_{PD1}	X_i, Y_i to S_{7-0}	All	C_L = 30pF, R_L = 560Ω, see test figures		40	60		40	50	ns
t_{PD2}	X_i, Y_i to S_{15-8}	All			45	70		45	60	ns
t_{PD3}	X_i, Y_i to $\overline{S}_{15}$	All			50	75		50	65	ns
t_{PD4}	G to S_i	'S557			20	40		20	35	ns
t_{PXZ}	$\overline{OE}$ to S_i	All			20	40		20	30	ns
t_{PZX}	$\overline{OE}$ to S_i	All			15	40		15	30	ns

© IC MASTER 1983

First-In First-Out (FIFO) 64x4 64x5 Serial Cascadable Memory

C67401/B C67402B
C5/C67401/A C5/C67402A
C5/C67401 C5/C67402

Features/Benefits

- Choice of 16.7, 15, and 10 MHz shift out guaranteed rates
- Choice of 4 bit or 5 bit data width
- TTL inputs and outputs
- Readily expandable in the word and bit dimensions
- Output pins directly opposite corresponding input pins
- Asynchronous or synchronous operation
- Pin compatible with Fairchild's F3341 MOS FIFO and many times as fast

Description

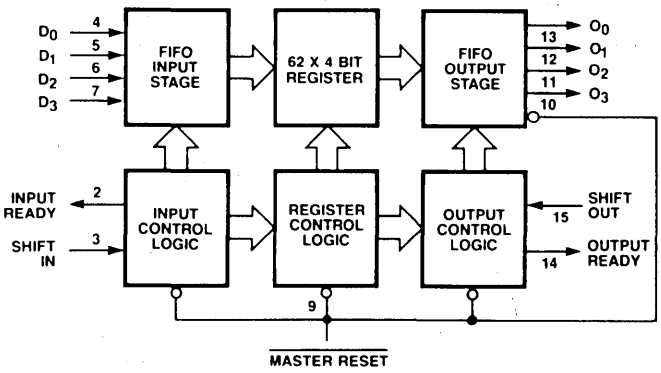
The C5/C67401B/2B/1A/2A/1/2 are "fall-through" high speed First-In First-Out (FIFO) memory organized 64 words by 4-bits and 64 words by 5-bits respectively. A 16.7 MHz data rate allows usage in digital video systems; a 15 MHz data rate allows usage in high speed tape or disc controllers and communication buffer applications. Both word length and FIFO depth are expandable.

Ordering Information

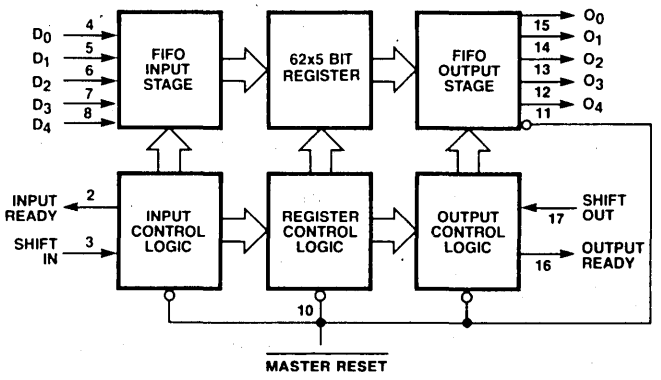
PART NUMBER	PKG	TEMP	DESCRIPTION
C57401	J,F	MIL	7 MHz 64x4 FIFO
C67401	J	COM	10 MHz 64x4 FIFO
C57402	J,F	MIL	7 MHz 64x5 FIFO
C67402	J	COM	10 MHz 64x5 FIFO
C57401A	J,F	MIL	10 MHz 64x4 FIFO
C67401A	J	COM	15 MHz 64x4 FIFO
C57402A	J,F	MIL	10 MHz 64x5 FIFO
C67402A	J	COM	15 MHz 64x5 FIFO
C67401B	J	COM	16.7 MHz 64x4 FIFO
C67402B	J	COM	16.7 MHz 64x5 FIFO

Block Diagrams

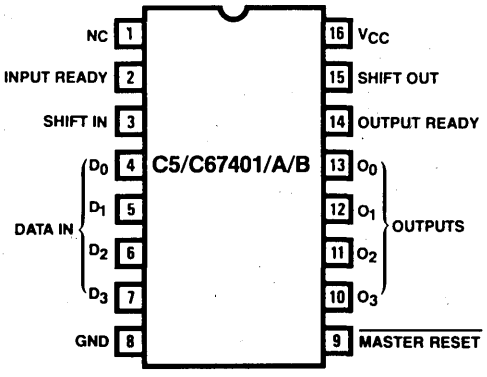
C5/C67401/A/B 64x4

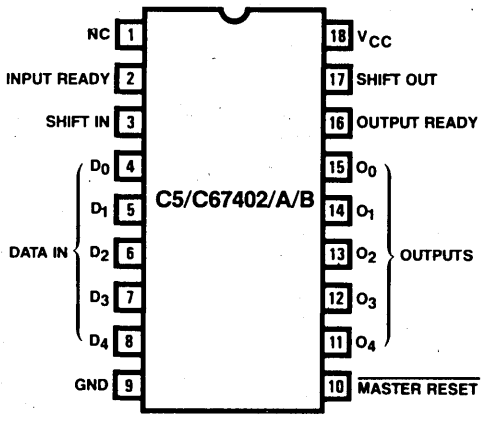


C5/C67402/A/B 64x5



Pin Configurations





DIGITAL

Monolithic Memories

1165 East Arques Avenue, Sunnyvale, CA 94086 Tel: (408) 739-3535 TWX: 910-339-9229

Monolithic Memories

© IC MASTER 1983

Absolute Maximum Ratings

Supply voltage V_{CC} 7V
Input voltage 7V
Off-state output voltage 5.5V
Storage temperature ..... −65° to +150°C

Operating Conditions C67401B/2B

SYMBOL	PARAMETER	FIGURE	MILITARY MIN	MILITARY NOM	MILITARY MAX	COMMERCIAL MIN	COMMERCIAL NOM	COMMERCIAL MAX	UNIT
V_{CC}	Supply voltage					4.75	5	5.25	V
T_A	Operating free-air temperature					0		75	°C
t_{SIH}†	Shift in HIGH time	1				18		20†	ns
t_{SIL}	Shift in LOW time	1				18			ns
t_{IDS}	Input data set up	1				0			ns
t_{IDH}	Input data hold time	1				45			ns
t_{SOH}†	Shift Out HIGH time	6				18		20†	ns
t_{SOL}	Shift Out LOW time	6				18			ns
t_{MRW}	Master Reset pulse††	11				35			ns
t_{MRS}	Master Reset to SI	11				35			ns

* Case temperature.

†The values listed in this table are for interfacing to a FIFO input or a FIFO/string output. To guarantee the cascadability, Monolithic Memories tests t_{SIH} and t_{SOH} at 18 ns.

††Master reset clears all the cells to the empty state, and the data outputs to a LOW state.

Switching Characteristics C67401B/2B

Over Operating Conditions

SYMBOL	PARAMETER	FIGURE	MILITARY MIN	MILITARY MAX	COMMERCIAL MIN	COMMERCIAL MAX	UNIT
f_{IN}	Shift in rate	1			16.7		MHz
t_{IRL}	Shift In to Input Ready LOW	1				35	ns
t_{IRH}	Shift In to Input Ready HIGH	1				37	ns
f_{OUT}	Shift Out rate	6			16.7		MHz
t_{ORL}†	Shift Out to Output Ready LOW	6				38	ns
t_{ORH}†	Shift Out to Output Ready HIGH	6				44	ns
t_{ODH}	Output Data Hold (previous word)	6			5		ns
t_{ODS}	Output Data Shift (next word)	6				44	
t_{PT}	Data throughput or "fall through"	4, 9				1.3	μs
t_{MRORL}	Master Reset to OR LOW	11				55	ns
t_{MRIRH}	Master Reset to IR HIGH	11				55	ns
t_{IPH}	Input Ready pulse HIGH	4			20		ns
t_{OPH}	Output Ready pulse HIGH	9			20		ns

†During testing t_{SOL} has to be a minimum of 55 ns.

© IC MASTER 1983

Multi-Mode Dynamic RAM Controller/Driver
SN74S409/DP8409

Features/Benefits

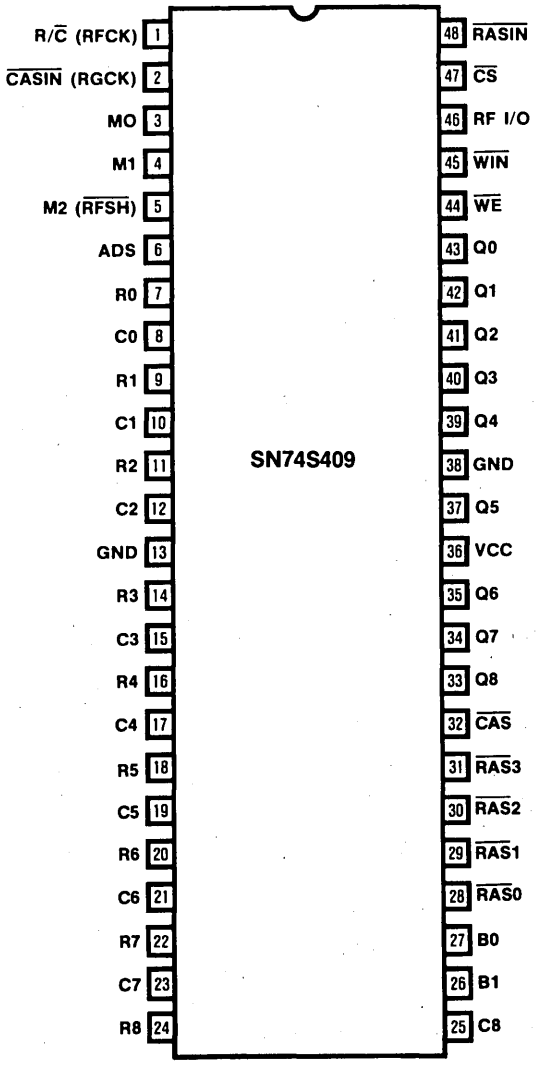
- All DRAM drive functions on one chip — minimizes skew on outputs, maximizes AC performance
- On-chip capacitive-load drives (specified to drive up to 88 DRAMs)
- Drives directly all 16k, 64k, and 256k DRAMs
- Capable of addressing 64k, 256k, or 1M words
- Propagation delays of 25ns typical at 500pF load
- $\overline{CAS}$ goes low automatically after column addresses are valid if desired
- Auto Access mode provides $\overline{RAS}$, row to column select, then $\overline{CAS}$ automatically and fast
- $\overline{WE}$ follows $\overline{WIN}$ unconditionally—offering READ, WRITE or READ-MODIFY-WRITE cycles
- On-chip 9-bit refresh counter with selectable End-of-Count (127, 255, or 511)
- End-of-Count indicated by RF I/O pin going low at 127, 255, or 511
- Low input on RF I/O resets 9-bit refresh counter
- $\overline{CAS}$ inhibited during refresh cycle
- Fall-through latches on address inputs controlled by ADS
- Three-state outputs allow multi-controller addressing of memory
- Control output signals go high-impedance logic "1" when disabled for memory sharing
- Power-up: counter reset, control signals high, address outputs three-state and End-of-Count set to 127
- Interchangable with National DP8409
- 8 modes of operation: 3 access, 3 refresh, and 2 set-up
- 2 externally controlled modes: 1 access and 1 refresh (Modes 0, 4)
- 2 auto-access modes $\overline{RAS} \rightarrow R/\overline{C} \rightarrow \overline{CAS}$ automatic, with $t_{RAH} = 20$ or 30ns minimum (Modes 5, 6)
- Auto-access mode allows Hidden Refreshing (Mode 5)
- Forced Refresh requested on RF I/O if no Hidden Refresh (Mode 5)
- Forced Refresh performed after system acknowledge of request (Mode 1)
- Automatic Burst Refresh mode stops at End-of-Count of 127, 255, or 511 (Mode 2)
- 2 All-$\overline{RAS}$ Access modes externally or automatically controlled for memory initialization (Modes 3a, 3b)
- Automatic All-$\overline{RAS}$ mode with external 8-bit counter frees system for other set-up routines (Mode 3a)
- End-of-Count value of Refresh Counter set by B1 and B0 (Mode 7)

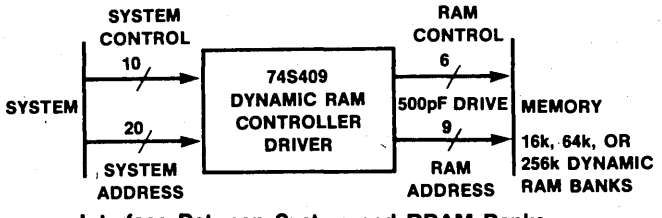
Parts reprinted courtesy of National Semiconductor

Ordering Information

PART NUMBER	PACKAGE	TEMPERATURE
SN74S409/DP8409	N48, D48	COM
SN74S409-3	N48, D48	COM, AC OPTION

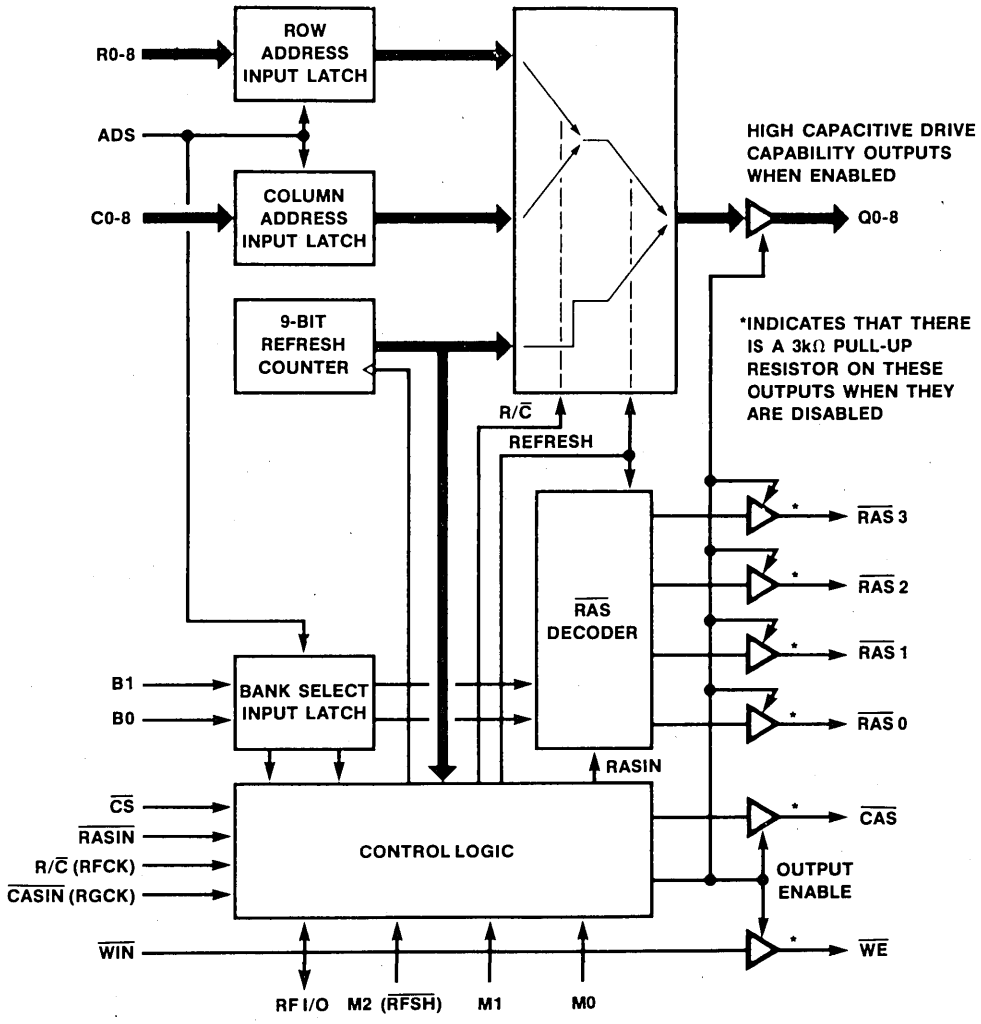
Pin Configuration





Interface Between System and DRAM Banks

© IC MASTER 1983



74S409 Functional Block Diagram

MODE	(RFSH) M2	M1	M0	MODE OF OPERATION	CONDITIONS
0	0	0	0	Externally controlled refresh	RF I/O = EOC
1	0	0	1	Auto refresh — forced	RF I/O = Refresh request (RFRQ)
2	0	1	0	Internal auto burst refresh	RF I/O = EOC
3a	0	1	1	All-RAS auto write	RF I/O = EOC; all RAS active
3b	0	1	1	Externally controlled All-RAS access	All-RAS active
4	1	0	0	Externally controlled access	Active RAS defined by Table 2
5	1	0	1	Auto access, slow t_{RAH}, hidden refresh	Active RAS defined by Table 2
6	1	1	0	Auto access, fast t_{RAH}	Active RAS defined by Table 2
7	1	1	1	Set end of count	See Table 3 for Mode 7

Table 1. 74S409 Mode Select Options

© IC MASTER 1983

Description

Dynamic memory system designs, which formerly required several support chips to drive the memory array, can now be implemented with a single IC . . . the 74S409 Multi-Mode Dynamic RAM Controller/Driver. The 74S409 is capable of driving all 16k and 64k Dynamic RAMs (DRAMs) as well as 256k DRAMs. Since the 74S409 is a one-chip solution (including capacitive-load drivers), it minimizes propagation delay skews, the major performance disadvantage of multiple-chip memory drive and control.

The 74S409's 8 modes of operation offer a wide selection of DRAM control capabilities. Memory access may be controlled externally or on-chip automatically; an on-chip refresh counter makes refreshing (either externally or automatically controlled) less complicated; and automatic memory initialization is both simple and fast.

The 74S409 is a 48-pin DRAM Controller/Driver with 9 multiplexed address outputs and 6 control signals. It consists of two 9-bit address latches, a 9-bit refresh counter, and control logic. All output drivers are capable of driving 500 pF loads with propagation delays of 25 ns. The 74S409 timing parameters are specified driving the typical load capacitance of 88 DRAMs, including trace capacitance.

The 74S409 has 3 mode-control pins: M2, M1, and M0, where M2 is in general REFRESH. These 3 pins select 8 modes of operation. Inputs B1 and B0 in the memory access modes (M2 = 1), are select inputs which select one of four $\overline{RAS}$ outputs. During normal access, the 9 address outputs can be selected from the Row Address Latch or the Column Address Latch. During refresh, the 9-bit on-chip refresh counter is enabled onto the address bus and in this mode all $\overline{RAS}$ outputs are selected, while $\overline{CAS}$ is inhibited.

The 74S409 can drive up to 4 banks of DRAMs, with each bank comprised of 16k's, 64k's, or 256k's. Control signal outputs $\overline{RAS}$, $\overline{CAS}$, and $\overline{WE}$ are provided with the same drive capability. Each $\overline{RAS}$ output drives one bank of DRAMs so that the four $\overline{RAS}$ outputs are used to select the banks, while $\overline{CAS}$, $\overline{WE}$, and the multiplexed addresses can be connected to all of the banks of DRAMs. This leaves the non-selected banks in the standby mode (less than one tenth of the operating power) with the data outputs in three-state. Only the bank with its associated $\overline{RAS}$ low will be written to or read from.

Pin Definitions

V_{CC}, GND, GND — $V_{CC} = 5V \pm 5\%$. The three supply pins have been assigned to the center of the package to reduce voltage drops, both DC and AC. There are also two ground pins to reduce the low level noise. The second ground pin is located two pins from V_{CC}, so that decoupling capacitors can be inserted directly next to these pins. It is important to adequately decouple this device, due to the high switching currents that will occur when all 9 address bits change in the same direction simultaneously. A recommended solution would be a 1 μF multilayer ceramic capacitor in parallel with a low-voltage tantalum capacitor, both connected close to pins 36 and 38 to reduce lead inductance.

R0-R8: Row Address Inputs.

C0-C8: Column Address Inputs.

Q0-Q8: Multiplexed Address Outputs — Selected from the Row Address Input Latch, the Column Address Input Latch, or the Refresh Counter.

$\overline{RASIN}$: Row Address Strobe Input — Enables selected $\overline{RAS}_n$ output when M2 ($\overline{RFSH}$) is high, or all $\overline{RAS}_n$ outputs when $\overline{RFSH}$ is low.

R/$\overline{C}$ (RFCK) — In Auto-Refresh Mode this pin is the external Refresh Clock Input: one refresh cycle has to be performed each clock period. In all other modes it is Row/Column Select Input: selects either the row or column address input latch onto the output bus.

$\overline{CASIN}$ (RGCK) — In Auto-Refresh Mode, Auto Burst Mode, and All-$\overline{RAS}$ Auto-Write Mode, this pin is the $\overline{RAS}$ Generator Clock input. In all other modes it is $\overline{CASIN}$ (Column Address Strobe Input), which inhibits $\overline{CAS}$ output when high in Modes 4 and 3b. In Mode 6 it can be used to prolong $\overline{CAS}$ output.

ADS: Address (Latch) Strobe Input — Strobes Input Row Address, Column Address, and Bank Select Inputs into respective latches when high; Latches on high-to-low transition.

CS: Chip Select Input — Three-state's the Address Outputs and puts the control signal into a high-impedance logic "1" state when high (unless refreshing in one of the Refresh Modes). Enables all outputs when low.

M0, M1, M2: Mode Control Inputs — These 3 control pins determine the 8 major modes of operation of the 74S409 as depicted in Table 1.

RF I/O — The I/O pin functions as a Reset Counter Input when set low from an external open-collector gate, or as a flag output. The flag goes active-low in Modes 0 and 2 when the End-of-Count output is at 127, 255, or 511 (see Table 3). in Auto-Refresh Mode it is the Refresh Request output.

$\overline{WIN}$: Write Enable Input.

$\overline{WE}$: Write Enable Output — Buffered output from $\overline{WIN}$.

$\overline{CAS}$: Column Address Strobe Output — In Modes 3a, 5, and 6, $\overline{CAS}$ transitions low following valid column address. In Modes 3b and 4, it goes low after R/$\overline{C}$ goes low, or follows $\overline{CASIN}$ going low if R/$\overline{C}$ is already low. $\overline{CAS}$ is high during refresh.

$\overline{RAS}$ 0-3: Row Address Strobe Outputs — Selects a memory bank decoded from B1 and B0 (see Table 2), if $\overline{RFSH}$ is high. If $\overline{RFSH}$ is low, all banks are selected.

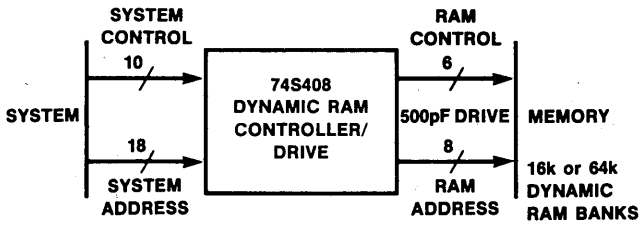
B0, B1: Bank Select Inputs — Strobed by ADS. Decoded to enable one of the $\overline{RAS}$ outputs when $\overline{RASIN}$ goes low. Also used to define End-of-Count in Mode 7.

© IC MASTER 1983

Dynamic RAM Controller/Driver
SN74S408/DP8408

Features/Benefits

- All DRAM drive functions on one chip — minimizes skew on outputs, maximizes AC performance
- On-chip capacitive-load drives (specified to drive up to 88 DRAMs)
- Drives directly all 16k and 64k DRAMs
- Capable of addressing 64k and 256k words
- Propagation delays of 25ns typical at 500pF load
- $\overline{CAS}$ goes low automatically after column addresses are valid if desired
- Auto Access mode provides $\overline{RAS}$, Row to Column, select, then $\overline{CAS}$ automatically and fast
- $\overline{WE}$ follows $\overline{WIN}$ unconditionally—offering READ, WRITE or READ-MODIFY-WRITE cycles
- On-chip 8-bit refresh counter with selectable End-of-Count (127 or 255)
- End-of-Count indicated by RF I/O pin going low at 127 or 255
- Low input on RF I/O resets 8-bit refresh counter
- $\overline{CAS}$ inhibited during refresh cycle
- Fall-through latches on address inputs controlled by ADS
- Three-state outputs allow multi-controller addressing of memory
- Control output signals go high-impedance logic "1" when disabled for memory sharing
- Power-up; counter reset, control signals high, address outputs three-state, and End-of-Count set to 127
- Interchangeable with National DP8408
- 6 modes of operation: 3 access, 1 refresh, and 2 set-up
- 2 externally controlled modes: 1 access (Mode 4) and 1 refresh (Modes 0, 1, 2)
- 2 auto-access modes $\overline{RAS} \rightarrow R/\overline{C} \rightarrow \overline{CAS}$ automatic, with $t_{RAH} = 20$ or 30ns minimum (Modes 5, 6)
- Externally controlled All-$\overline{RAS}$ Access modes for memory initialization (Mode 3)
- End-of-Count value of Refresh Counter set by B1 and B0 (Mode 7)

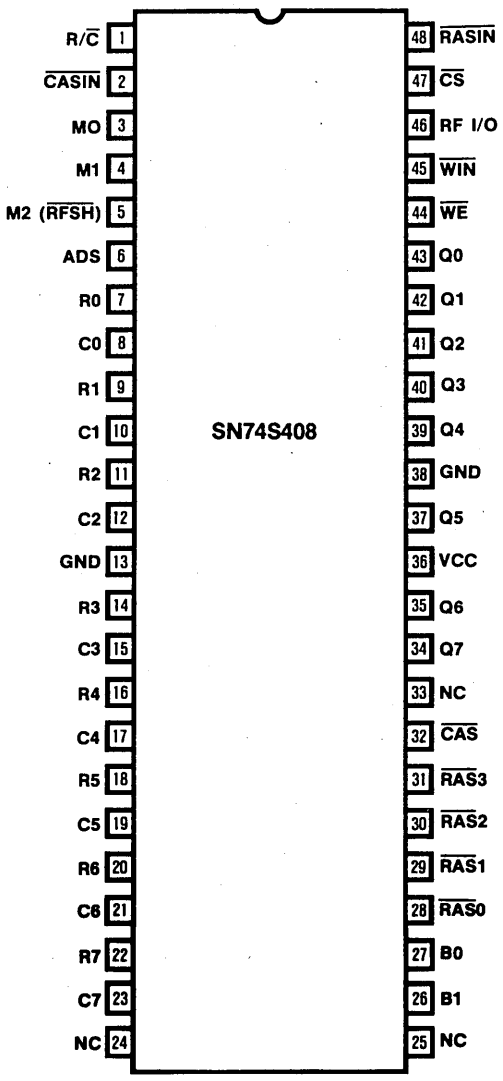


74S408 Interface Between System and DRAM Banks

Ordering Information

PART NUMBER	PACKAGE	TEMPERATURE
SN74S408/DP8408	N48, D48	COM
SN74S408-3	N48, D48	COM, AC OPTION

Pin Configuration



NC = NO CONNECTION

Parts reprinted courtesy of National Semiconductor

DIGITAL

Monolithic Memories

© IC MASTER 1983

Octal Dynamic-RAM Driver with 3-state Outputs

SN54/74S700, SN54/74S730, SN54/74S731, SN54/74S734

Features/Benefits:

- Provides MOS voltage levels for 16K and 64K D-RAMs.
- Undershoot of low-going output is less than -0.5V.
- Large capacitive drive capability.
- Symmetric rise and fall times by balanced output impedence.
- Glitch-free outputs at power-up and power-down.
- 20-pin SKINNYDIP® saves spaces.
- 'S730/734 are exact replacements for the Am2965/66.
- 'S700/730/731/744 are pin-compatible with 'S210/240/241/244, and can replace them in many applications.
- Commercial devices are specified at V_{CC} ±10%.

Ordering Information

PART NUMBER	PKG	TEMP	ENABLE	POLARITY	POWER
SN54S700	J,F	Mil	High-Low	Invert	S
SN74S700	N,J	Com			
SN54S730	J,F	Mil	Low		
SN74S730	N,J	Com			
SN54S731	J,F	Mil	High-Low	Non-Invert	
SN74S731	N,J	Com			
SN54S734	J,F	Mil	Low		
SN74S734	N,J	Com			

Description:

The 'S700, 'S730, 'S731, and 'S734 are buffers that can drive multiple address and control lines of MOS dynamic RAMs. The 'S700 and 'S730 are inverting drivers and the 'S731 and 'S734 are non-inverting drivers. The 'S700/731 are pin compatible with the 'S210/241 and have complementary enables. The 'S730 is pin compatible with the 'S240 and an exact replacement for the Am2965. The 'S734 is pin compatible with the 'S244 and an exact replacement for the Am2966.

These devices have been designed with an additional internal resistor in the lower output driver transistor circuit, unlike regular octal buffers. This resistor serves two purposes: it causes a slower fall time for a high-to-low transition, and it limits the undershoot without the use of an external series resistor.

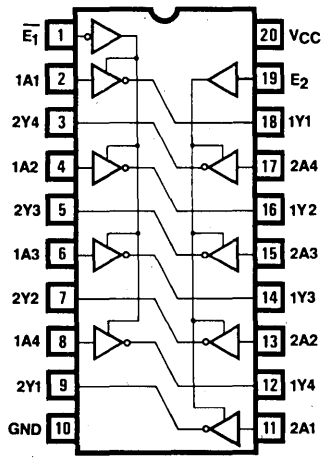
The 'S700, 'S730, 'S731, and 'S734 have been designed to drive the highly capacitive input lines of dynamic RAMs. The drivers provide a guaranteed V_{OH} of V_{CC}-1.15 volts, a limit on the undershoot to 0.5V and a rise time symmetrical to the fall time by having balanced outputs. These features enhance dynamic RAM performance.

A typical fully-loaded board dynamic-RAM array consists of 4 banks of dynamic-RAM memory. Each bank has its own $\overline{RAS}$ and $\overline{CAS}$, but has identical address lines. The $\overline{RAS}$ and $\overline{CAS}$ inputs to the array can come from one driver, reducing the skew between the $\overline{RAS}$ and $\overline{CAS}$ signals. Also, only one driver is needed to drive eight address lines of a dynamic RAM. The propagation delays are specified for 50pf and 500pf load capacitances, and the commercial-range specifications are extended to V_{CC} ± 10%.

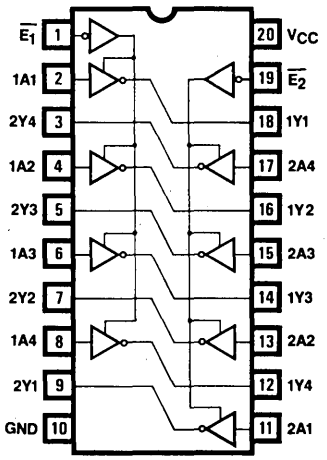
All of the octal devices are packaged in the popular 20-pin SKINNYDIP.

Logic Symbols

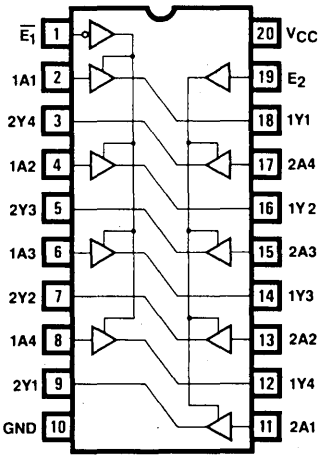
S700 (S210)*



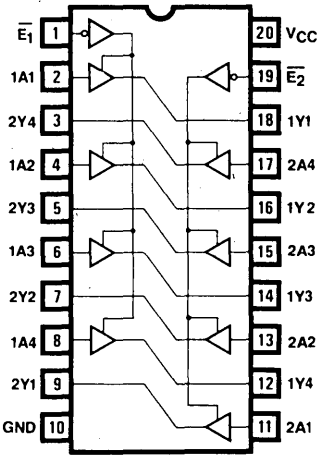
S730 (S240/Am2965)*



S731 (S241)*



S734 (S244/Am2966)*



* Indicates pin compatibility with available devices.

SKINNYDIP is a registered trademark of Monolithic Memories

DIGITAL

Monolithic Memories

1165 East Arques Avenue, Sunnyvale, CA 94086 Tel: (408) 739-3535 TWX: 910-339-9229

Monolithic Memories

© IC MASTER 1983

MOTOROLA

SEMICONDUCTORS

P.O. BOX 20912 • PHOENIX, ARIZONA 85036

DIGITAL LOGIC FAMILIES

CMOS • ECL • TTL
MDTL • MHTL

A "Supermarket" For Standard Logic

Motorola carries a comprehensive inventory of standard components encompassing almost all major digital logic families and technologies.

Complementary (very low power) MOS (CMOS)

Series MC14000/MC14500 — These standard lines of *MSI/SSI circuits* contain a complement of nearly 200 device types with which to implement complete system designs. They feature the new JEDEC B-Series specifications with low-power-Schottky compatible outputs. A faster non-buffered line of devices is compatible with the B-Series, as well as with standard Schottky TTL, for mix-and-match versatility.

Series MC14400 — This series of highly complex LSI devices consists of single-chip "subsystems" tailored for specific application. Included are such major functions as smoke detectors, automotive speed-control processors, communications/telephone subsystems, and a variety of other function-dedicated components.

MECL (very high-speed) Logic Circuit

Motorola manufactures two basic lines of emitter-coupled logic (ECL) circuit: The pervasive MECL 10,000 family and more function-limited but higher speed MECL III family. The basic performance differences between these two lines are as follows:

MECL FAMILY COMPARISONS

Feature	MECL 10,000		MECL III
	10,100 Series 10,500 Series	10,200 Series 10,600 Series	
1. Gate Propagation Delay	2 ns	1.5 ns	1 ns
2. Output Edge Speed	2.2 ns	2.0 ns	1 ns
3. Flip-Flop Toggle Speed	160 MHz	250 MHz	300–500 MHz
4. Gate Power	25 mW	25 mW	60 mW
5. Speed Power Product	50 pJ	37 pJ	60 pJ

*Average for Equivalent LSI Gate.

MECL 10,000 Series — A complement of more than 80 circuits, ranging from simple gates to complex functions, such as arithmetic units and memories, populates this family of high-speed logic circuits. Devices are available in two temperature ranges −30 to 85°C and −55 to 125°C to meet the highest standards of performance.

MECL III series — Basic logic circuits designed for highest speed requirements, as in test and communications equipment, and in high-speed sections of larger systems. MECL III circuits are compatible with MECL 10,000 devices to provide the best speed-power combination for system designs.

TTL Circuits

Motorola manufactures several different families of TTL circuits:

The **MC54LS/74LS** Schottky series
The MC3000/3100 series
The MC4000/4300 Series

Of these, the **54LS/74LS** low-power Schottky family is the most pervasive, with a wide selection of MSI components to simplify system designs.

An impressive line of standard TTL complex functions in the MC4000/4300 series, provides significant reduction in package count over systems implemented with simpler families. Phase Locked Loop functions are also available in this series.

Other Logic Families

MHTL Series MC660 — for use in equipment designed for high-noise environments.

MDTL Series MC830/930 — An early logic family manufactured primarily for replacement purposes.

MC12000/12500 — Phase Locked Loop Series.

MECL, MHTL, and MDTL are trademarks of Motorola Inc.

© IC MASTER 1983

MOTOROLA
SEMICONDUCTORS
P.O. BOX 20912 • PHOENIX, ARIZONA 85036

DIGITAL LOGIC FAMILIES

MECL 10KH

New High-Speed Logic Family

Much of the MECL10KH Family of high-speed logic circuits will be pin-compatible with the existing MECL10K Family, but double the performance standards. System clock rates are increased as much as 40%, parasitic capacitance drops by 50%, and propagation delay is reduced by 50% with no corresponding increase in power dissipation. Pin compatibility permits upgrading of existing designs without major modifications. More complex logic functions will be available in the 10KH family than were possible in MECL10K. The MECL10KH Family is performance compatible with the MECL Macrocell Array.

Typical family characteristics for 10K and 10KH circuits

	10K	10KH
Speed (ns)	2.0	1.0
Power (mW)	25	22/25*
Power-speed product (pJ)	50	22/25
Rise/fall times (ns) (20–80%)	2.0	1.2
Temperature range (°C)	−30 to +85	0 to +75
Voltage regulated	No	Yes
Technology	Junction isolated	Oxide isolated

*V_{EE} = 4.5 V/5.2 V

MECL 10KH DC Specifications
V_{EE} = −5.2V + −5%
R Load = 50 Ω to −2.0 Vdc

Parameter	0°C Min	0°C Max	25°C Min	25°C Max	75°C Min	75°C Max
V_{OH}	—	−0.840	—	−0.810	—	−0.735
V_{OHA}	−1.020	—	−0.980	—	−0.920	—
V_{OL}	−1.950	—	−1.950	—	−1.950	—
V_{OLA}	—	−1.630	—	−1.630	—	−1.600
V_{IHA}	—	−1.170	—	−1.130	—	−1.070
V_{ILA}	−1.480	—	−1.480	—	−1.450	—

MECL 10KH AC Specifications and Tracking

Parameter	0°C Min	0°C Typ	0°C Max	25°C Min	25°C Typ	25°C Max	75°C Min	75°C Typ	75°C Max	Units
t_{PD}	0.7	1.1	1.6	0.7	1.0	1.5	0.7	1.1	1.7	ns
	Min		Max	Min		Max	Min		Max	
t_r (20–80%)	0.8		2.2	0.7		2.0	0.8		2.2	ns
t_f (20–80%)	0.8		2.2	0.7		2.0	0.8		2.2	ns

V_{EE} = −5.2V ±5%

Parameter	Propagation delay (ns)* Typ	Propagation delay (ns)* Max	Delay variation vs temp (ps/°C) Typ	Delay variation vs temp (ps/°C) Max	Delay variation vs supply (ps/V) Typ	Delay variation vs supply (ps/V) Max
t_{PD} 10KH	1.0	1.5	0.5	4.0	0	0

*V_{EE} = 5.2V, Temp = 25°C

MECL and Macrocell are trademarks of Motorola Inc.

Initial 10KH products

Device	Function	Available
MC10H016	Binary Counter	Now
MC10H100	Quad 2-Input NOR Gate W/Strobe	4Q82
MC10H101	Quad OR/NOR Gate	Now
MC10H102	Quad 2-Input NOR Gate	Now
MC10H103	Quad 2-Input OR Gate	Now
MC10H104	Quad AND Gate	Now
MC10H105	Triple 2-3-2 Input OR/NOR Gate	Now
MC10H106	Triple 4-3-3 Input NOR Gate	4Q82
MC10H107	Triple Exclusive OR/NOR Gate	Now
MC10H109	Dual 4-5 Input OR/NOR Gate	Now
MC10H113	Quad Exclusive OR Gate	1Q83
MC10H115	Quad Line Receiver	2Q83
MC10H116	Triple Line Receiver	Now
MC10H117	Dual 2-Wide OR-AND/OR-AND Invert Gate	Now
MC10H118	Dual 2-Wide 3-Input OR-AND Gate	Now
MC10H119	4-Wide 4-3-3-3 Input OR-AND Gate	Now
MC10H121	4-Wide OR-AND/OR-AND-Invert Gate	Now
MC10H123	Triple 4-3-3 Input Bus Driver (25 Ω)	2Q83
MC10H124	Quad TTL-To-MECL Translator	4Q82
MC10H125	Quad MECL-To-TTL Translator	4Q82
MC10H130	Dual D Latch	Now
MC10H131	Dual D Master-Slave Flip-Flop	Now
MC10H135	Dual J-K Master-Slave Flip-Flop	2Q83
MC10H136	Universal Hexadecimal Counter	Now
MC10H141	4-Bit Universal Shift Register	Now
MC10H145	16 X 4-Bit Register File	Now
MC10H155	8 X 2-Bit Content Addressable Memory	2H83
MC10H158	Quad 2-Input Multiplexer (Non-Inverting Output)	Now
MC10H159	Quad 2-Input Multiplexer (Inverting Output)	Now
MC10H160	12-Bit Parity Generator/Checker	Now
MC10H161	Binary TO 1-8 Line Decoder (Low)	Now
MC10H162	Binary To 1-8 Line Decoder (High)	Now
MC10H164	8 Line Multiplexer	Now
MC10H165	8-Input Priority Encoder	4Q82
MC10H166	5-Bit Magnitude Comparator	4Q82
MC10H173	Quad 2-Input MUX W/Latch	Now
MC10H174	Dual 4 to 1 Multiplexer	Now
MC10H175	Quint Latch	Now
MC10H176	Hex D Flip-Flop	Now
MC10H179	Look Ahead Carry Block	Now
MC10H180	Dual High-Speed Adder/Subtracter	Now
MC10H181	4-Bit ALU	4Q82
MC10H186A	Hex D Flip-Flop W/Common Reset	4Q82
MC10H188	Hex Buffer W/Enable	1Q83
MC10H189	Hex Inverter W/Enable	1Q83
MC10H209	Dual 4-5-Input OR/NOR Gate	Now
MC10H210	Dual 3-Input, 3-Output OR Gate	A
MC10H211	Dual 3-Input, 3-Output NOR Gate	A
MC10H330	Quad Bus Transceiver W/2-1 Output MUX (25 Ω)	1Q83
MC10H332	Quad Bus Transceiver W/4-1 Output MUX (25 Ω)	2Q83
MC10H334	Quad Bus Transceiver W/Transmit/ Receiver Latches (25 Ω)	2Q83
MC10H350	Quad MECLto TTL Translator (Single Power Supply +5.0V or −5.2V)	2Q83
MC10H423	Triple 3-Input Bus Driver W/Enable (25 Ω)	2Q83
MC10H424	Quad TTL-To-MECL Translator (ECL Strobe)	1Q83

© IC MASTER 1983

FAST TTL 54F00/74F00

Integrated Circuits

The FAST Schottky TTL family provides a 75–80% power reduction compared to standard Schottky (54/74S) TTL and yet offers a 20–40% improvement in circuit performance over the standard Schottky due to Motorola's state-of-the-art oxide isolated process (MOSAIC). This is a new product line; contact your Motorola representative for complete details and current introduction status.

MC54F00 Series (−55 to +125°C)
MC74F00 Series (0 to +70°C)

Suffix: N . . . Plastic (only 74-series)
J . . . Ceramic (54/74 series)

FAST TTL INTRODUCTION LIST

Device	Function	Available	Pins
F00	Quad 2-Input NAND Gate	Now	14
F02	Quad 2-Input NOR Gate	Now	14
F04	Hex Inverter	Now	14
F08	Quad 2-Input AND Gate	Now	14
F10	Triple 3-Input NAND Gate	Now	14
F11	Triple 3-Input AND Gate	Now	14
F20	Dual 4-Input NAND Gate	Now	14
F32	Quad 2-Input OR Gate	4Q82	14
F64	4-2-2-3 Input AND/OR/INVERT/ Gate	Now	14
F74	Dual D Flip Flop	4Q82	14
F86	Quad EX/OR Gate	2Q83	14
F109	Dual J-K Flip Flop W/Preset	4Q82	16
F112	Dual J-K Flip Flop	2Q83	16
F113	Dual J-K Flip Flop	2Q83	14
F114	Dual J-K Flip Flop	2Q83	14
F138	1-Of-8 Decoder/Demultiplexer	1Q83	16
F139	Dual 1-Of-4 Decoder/ Demultiplexer	1Q83	16
F151	8-Input Multiplexer	1Q83	16
F153	Dual 4-Input Multiplexer	1Q83	16
F157	Quad 2-Input Multiplexer	1Q83	16
F158	Quad 2-Input Multiplexer	1Q83	16
F160	BCD Decade Counter, Asynchronous Reset	2H83	16
F161	4-Bit Binary Counter, Asynchronous Reset	2H83	16
F162	BCD Decade Counter, Synchronous Reset	2H83	16
F163	4-Bit Binary Counter, Synchronous Reset	2H83	16
F168	Up/Down Decade Counter	2H83	16
F169	Up/Down Binary Counter	2H83	16
F174	Hex D Flip Flop	2Q83	16
F175	Quad D Flip Flop	2Q83	16
F181	4-Bit ALU	2Q83	24
F182	Look Ahead Carry Generator	2Q83	16
F190	Up/Down Decade Counter	2Q83	16
F191	Up/Down Binary Counter	2Q83	16
F192	Up/Down Decade Counter With Clear	2Q83	16
F193	Up/Down Binary Counter With Clear	2Q83	16
F194	Universal Shift Register	2H83	16
F195	4-Bit Shift Register	2H83	16
F240	Octal Bus/Line Driver/Inverting/ 3-State	4Q82	20
F241	Octal Bus/Line Driver/3-State	4Q82	20
F242	Quad Bus Transceiver/Inverting/ 3-State	4Q82	14
F243	Quad Bus Transceiver/ Non-Inverting/3-State	4Q82	14
F244	Octal Bus Driver/ Non-Inverting/3-State	4Q82	20
F245	Octal Bus Transceiver	1Q83	20
F251	8-Input Multiplexer/3-State	1Q83	16
F253	Dual 4-Input Multiplexer/3-State	4Q82	16
F257	Quad 2-Input Multiplexer/ 3-State	1Q83	16
F258	Quad 2-Input Multiplexer/ Inverting/3-State	1Q83	16
F280	9-Bit Odd/Even Parity Gen/Checker	2H83	14
F283	4-Bit Full Adder	2H83	16
F299	8-Bit Shift/Store Register	2H83	20
F350	4-Bit Shifter/3-State	2H83	16
F352	Dual 4-Input Multiplexer	4Q82	16
F353	Dual 4-Input Multiplexer/ 3-State	4Q82	16
F373	Octal Transparent Latch/ 3-State	1Q83	20
F374	Octal D Flip Flop/3-State	1Q83	20
F378	Parallel D Register W/Enable	2Q83	16
F379	Quad Parallel Register W/Enable	2H83	16
F381	4-Bit ALU	2Q83	20
F382	4-Bit ALU	2Q83	20
F521	Octal Comparitor	2Q83	20
F533	Octal Transparent Latch/ 3-State	1Q83	20
F534	Octal D Flip Flop/3-State	1Q83	20
F537	1-Of-10 Decoder/3-State	1Q83	20
F538	1-Of-8 Decoder/3-State	1Q83	20
F539	1-Of-4 Decoder/3-State	1Q83	20
F620	Octal Bus Transceiver/Inverting/ 3-State	1Q83	20
F623	Octal Bus Transceiver/3-State	1Q83	20
F640	Octal Bus Transceiver/Inverting/ 3-State	1Q83	20
F643	Octal Bus Transceiver/Inverting/ True/3-State	1Q83	20
F645	Octal Bus Transceiver/3-State	1Q83	20
F2960	Error Detection and Correction Unit	1Q83	48
F2968	Dynamic Memory Controller	2H83	48
F2969	Memory Timing Controller W/EDAC	2H83	48
F2970	Memory Timing Controller W/O EDAC	2H83	24

© IC MASTER 1983

ALS TTL 54ALS00/74ALS00

Integrated Circuits

The Advanced Low Power Schottky TTL family (ALS TTL) provides a 50% power reduction compared to standard 54/74LS TTL and yet offers improved circuit performance over the standard LS due to Motorola's state-of-the-art oxide isolated process (MOSAIC). This is a new product line; contact your Motorola representative for complete details and current introduction status.

SN54ALS00 Series (−55 to +125°C)
SN74ALS00 Series (0 to +70°C)

Suffix: J . . . Ceramic (54/74 series)

ALS TTL INTRODUCTION LIST

Device	Function	Available	Pins
ALS00	Quad 2-Input NAND Gate	Now	14
ALS01	Quad 2-Input NAND Gate, Open-Collector	4Q82	14
ALS02	Quad 2-Input NOR Gate	1Q83	14
ALS03	Quad 2-Input NAND Gate, Open-Collector	4Q82	14
ALS04	Hex Inverter	Now	14
ALS05	Hex Inverter, Open-Collector	Now	14
ALS08	Quad 2-Input AND Gate	Now	14
ALS09	Quad 2-Input AND Gate, Open-Collector	1Q83	14
ALS10	Triple 3-Input NAND Gate	1Q83	14
ALS11	Triple 3-Input AND Gate	1Q83	14
ALS12	Triple 3-Input NAND Gate, Open-Collector	1Q83	14
ALS13	Dual 4-Input Schmitt Trigger	2Q83	14
ALS14	Hex Schmitt Trigger	2Q83	14
ALS15	Triple 3-Input Schmitt Trigger	1Q83	14
ALS20	Dual 4-Input NAND Gate	4Q82	14
ALS22	Dual 4-Input NAND Gate, Open-Collector	4Q82	14
ALS27	Triple 3-Input NOR Gate	1Q83	14
ALS28	Quad 2-Input NOR Buffer	4Q82	14
ALS32	Quad 2-Input OR Gate	4Q82	14
ALS33	Quad 2-Input NOR Buffer, Open-Collector	4Q82	14
ALS37	Quad 2-Input NAND Buffer	4Q82	14
ALS38	Dual 4-Input NAND Buffer	4Q82	14
ALS40	Dual 4-Input NAND Buffer	4Q82	14
ALS74	Dual D Flip Flop	Now	14
ALS109	Dual J-K Flip Flop W/Preset	4Q82	16
ALS132	Quad 2-Input Schmitt Trigger	2Q83	14
ALS138	1-Of-8 Decoder/Demultiplexer	4Q82	16
ALS139	Dual 1-Of-4 Decoder/ Demultiplexer	4Q82	16
ALS151	8-Input Multiplexer	1Q83	16
ALS153	Dual 4-Input Multiplexer	4Q82	16
ALS157	Quad 2-Input Multiplexer/ Non-Inverting	4Q82	16
ALS158	Quad 2-Input Multiplexer/ Inverting	4Q82	16
ALS160	BCD Decade Counter/ Asynchronous Reset (9910 Type)	4Q82	16
ALS161	4-Bit Binary Counter, Asynchronous Reset (9316 Type)	4Q82	16
ALS162	BCD Decade Counter/ Synchronous Reset	4Q82	16
ALS163	4-Bit Binary Counter/ Synchronous Reset	4Q82	16
ALS164	8-Bit Serial-In/Parallel-Out Shift Register	1Q83	14
ALS168	4-Bit Up/Down Decade Counter/ Synchronous Reset	1Q83	16
ALS169	4-Bit Up/Down Binary Counter/ Synchronous Reset	1Q83	16
ALS190	Up/Down Decade Counter	4Q82	16
ALS191	Up/Down Binary Counter	4Q82	16
ALS192	Up/Down Decade Counter W/Clear	4Q82	16
ALS193	Up/Down Binary Counter W/Clear	4Q82	16
ALS238	1-Of-8 Decoder/Demultiplexer/ (Active High Outputs)	4Q82	16
ALS239	Dual 1-Of-4 Decoder/ Demultiplexer/(Active High Outputs)	4Q82	16
ALS240	Octal Bus/Line Driver/Inverting/ 3-State	Now	20
ALS241	Octal Bus/Line Driver/3-State	Now	20
ALS242	Quad Bus Transceiver/ Inverting/3-State	Now	14
ALS243	Quad Bus Transceiver/ Non-Inverting/3-State	Now	14
ALS244	Octal Driver/Non-Inverting/ 3-State	Now	20
ALS245	Octal Bus Transceiver/ Non-Inverting/3-State	Now	20
ALS251	8-Input Multiplexer/3-State	1Q83	16
ALS253	Dual 4-Input Multiplexer/ 3-State	4Q82	16
ALS257	Quad 2-Input Multiplexer/ Non-Inverting/3-State	1Q83	16
ALS258	Quad 2-Input Multiplexer/ Inverting/3-State	1Q83	16
ALS273	Octal D Flip Flop W/Clear	Now	20
ALS352	Dual 4-Multiplexer/Inverting ALS 153	4Q82	16
ALS353	Dual 4-Multiplexer/3-State ALS 352	4Q82	16
ALS373	Octal Transparent Latch/ 3-State	1Q83	20
ALS374	Octal D Flip Flop/3-State	1Q83	20
ALS377	Octal D Flip Flop W/Enable	Now	20
ALS533	Octal Transparent Latch/ Inverting	1Q83	20
ALS534	Octal D-Type Flip Flop/Inverting	1Q83	20
ALS537	1-Of-10 Decoder/3-State	1Q83	20
ALS538	1-Of-8 Decoder/3-State	1Q83	20
ALS539	Dual 1-Of-4 Decoder/3-State	1Q83	20
ALS540	Octal Buffer/3-State	2Q83	20
ALS541	Octal Buffer/3-State	2Q83	20
ALS560	4-Bit Decade Counter/3-State	1Q83	20
ALS561	4-Bi Binary Counter/3-State	1Q83	20
ALS563	8-Bit Latch/3 State	2H83	20
ALS564	Octal D Flip Flop/3-State	2H83	20
ALS568	Decade Up/Down Counter/ 3-State	4Q82	20
ALS569	Binary Up/Down Counter/ 3-State	4Q82	20
ALS573	Octal Transparent Latch/ 3-State	2H83	20
ALS574	Octal D Flip Flop/3-State	2H83	20
ALS576	Octal D Flip Flop/Inverting/ 3-State	2H83	20
ALS580	Octal Transparent Latch/ Inverting/3-State	2H83	20
ALS620	Octal Transceiver W/Storage/ 3-State	Now	20
ALS621	Octal Transceiver W/Storage/ Open Collector	Now	20
ALS622	Octal Transceiver W/Storage/ Open Collector	Now	20
ALS623	Octal Transceiver W/Storage/ 3-State	Now	20
ALS638	Octal Bus Transceiver/Inverting/ 3-State	Now	20
ALS639	Octal Bus Transceiver/3-State	Now	20
ALS640	Octal Bus Transceiver/Inverting/ 3-State	Now	20
ALS641	Octal Bus Transceiver/ Non-Inverting/Open Collector	Now	20
ALS642	Octal Bus Transceiver/Inverting/ Open Collector	Now	20
ALS643	Octal Bus Transceiver/True/ Inverting/3-State	Now	20
ALS644	Octal Bus Transceiver/True/ Inverting/Open Collector	Now	20
ALS646	Octal Transceiver/Latch/ Multiplexer/Non-Inverting/ 3-State	1Q83	24
ALS647	Octal Transceiver/Latch/ Multiplexer/Non-Inverting/Open Collector	1Q83	24
ALS648	Octal Transceiver/Latch/ Multiplexer/Inverting/3-State	1Q83	24
ALS649	Octal Transceiver/Latch/ Multiplexer/Inverting/Open Collector	1Q83	24
ALS671	Binary Bidirectional Shift Register/Latch/Multiplexer/ 3-State	4Q82	20
ALS672	BCD Bidirectional Shift Register/Latch/Multiplexer/ 3-State	4Q82	20
ALS690	Decade Counter/Latch/ Multiplexer/Asynchronous Reset/3-State	4Q82	20
ALS691	Binary Counter/Latch/ Multiplexer/Asynchronous Reset/3-State	4Q82	20
ALS692	Decade Counter/Latch/ Multiplexer/Synchronous Reset/3-State	4Q82	20
ALS693	Binary Counter/Latch/ Multiplexer/Synchronous Reset/3-State	4Q82	20
ALS694	Decade Counter/Latch/ Multiplexer/Synchronous/ Asynchronous Reset/3-State	4Q82	20
ALS695	Binary Counter/Latch/ Multiplexer/Synchronous/ Asynchronous Reset/3-State	4Q82	20
ALS696	Decade Counter/Register/ Multiplexer/3-State	4Q82	20
ALS697	Binary Counter/Register/ Multiplexer/3-State	4Q82	20
ALS698	Decade Counter/Register/ Multiplexer/3-State	4Q82	20
ALS699	Binary Counter/Register/ Multiplexer/3-State	4Q82	20
ALS790	Error Detection and Correction Circuit	See F2960	
ALS873	Octal Transparent Latch	2H83	24
ALS874	Octal D Flip Flop	2H83	24
ALS876	Octal D Flip Flop/Inverting	2H83	24
ALS880	Octal Transparent Latch/ Inverting	2H83	24

MOSAIC is a trademark of Motorola Inc.

© IC MASTER 1983

MOTOROLA
SEMICONDUCTORS
3501 ED BLUESTEIN BLVD., AUSTIN, TEXAS 78721

High-Speed CMOS Logic Family

MC54/74HCXXX

For the first time, a higher-performance standard digital logic family is available that combines the popular features of CMOS and the traditional characteristics of LSTTL. Previously, designers were forced to choose between CMOS low power dissipation and good noise immunity and LSTTL high operating frequencies, short propagation delays, and good fanout or drive capability. The best of both technologies is now available in Motorola's newest digital logic family – High-Speed CMOS Logic (MC54/74HC). Higher performance is available for most applications – yielding speed improvements as well as significant cost savings.

The family is composed of gates, flip-flops, buffers, octal devices and various MSI functions such as counters, shift registers, and decoders. Many of the popular CMOS and LS functions have been incorporated into the new logic family with full pinout capability for each function. In addition, the family has temperature ratings of −40 to +85°C (74 series) and −55 to 125°C (54 series) for both commercial and high-reliability requirements. The base LS supply voltage of 5 V ±10% has been increased to a full rating of 2-6 V with the absolute maximum limited at −0.5 and 7 V. Because of its extra speed and performance, the High-Speed CMOS Logic Family provides an ideal interface for CMOS memory and microprocessor system applications. Examples of the increased operating parameters are shown in the charts below.

Family Comparisons in Key Specifications (Typical Gate)

Specification	CMOS	LS	HC
Propagation Delay (t_{PHL}/t_{PLH})	300 ns	15 ns	15 ns
Quiescent Power Dissipation	40 μW	22 mW	100 μW
Input Current	±1.0 μA	0.1 mA	±1.0 μA
Maximum Operating Frequency (f_{max})	>1 MHz	30 MHz	30 MHz
Fanout Capability (LS Drive)	1 Load	10 Loads	10 Loads
Worst Case Noise Margins V_{NL} V_{NH}	 29% V_{CC} 29% V_{CC}	 8% V_{CC} 14% V_{CC}	 19% V_{CC} 29% V_{CC}
Quiescent Current (Per Package)	7.5 μA	4.4 mA	20 μA
Operating Temperature	−40 to +85°C −55 to +125°C	0 to +70°C −55 to +125°C	−40 to +85°C −55 to +125°C

Forty-three (43) devices are available through September 1982, with specific device introductions continuing through 1983. Contact your Motorola representative for pricing and sample availability.

SWITCHING CHARACTERISTICS (Tentative Maximum Values)

Symbol	Parameters	74HC244 Bus Driver	74HC74 D Flip-Flop	74HC194 Register	74HC00 Gate
f_{max}	Maximum Clock Frequency	–	30 MHz	30 MHz	–
t_{PHL}/t_{PLH}	Prop. Delay, Clock to Q	18 ns	30 ns	26 ns	15 ns
t_{su}	Setup Time, Data to Clock	–	20 ns	20 ns	–
t_h	Hold Time, Clock to Data	–	0 ns	0 ns	–
t_w	Pulse Width, Clock and Clear	–	16 ns	16 ns	–
t_r	Input Clock Rise Time	500 ns	500 ns	500 ns	–
C_{PD}*	Power Dissipation	100 pF	100 pF	100 pF	100 pF
t_{PZL}/t_{PZH}	Three-State Enable Time	30 ns	–	–	–
t_{PLZ}/t_{PHZ}	Three-State Disable Time	25 ns	–	–	–

*C_{PD} is an equivalent device capacitance for calculating power dissipation using $P_D = C_{PD} V_{CC}^2 f$

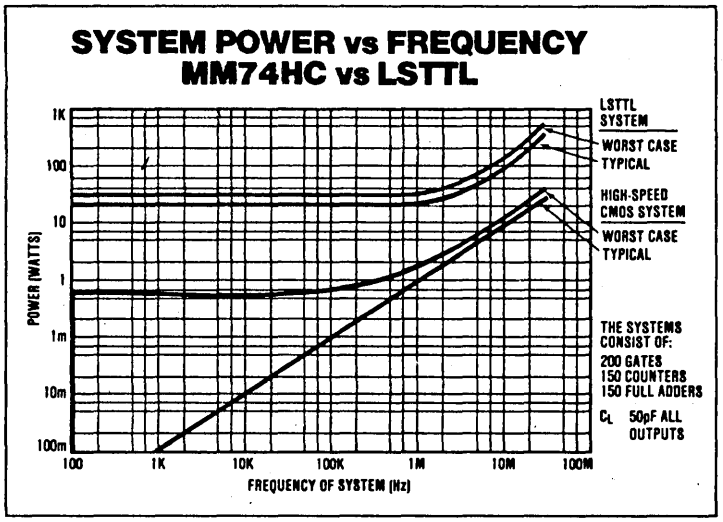
INITIAL PRODUCT LINE BY FUNCTION

Function	Number of Devices
Gates	24
NAND/NOR	11
AND/OR	3
Exclusive-OR/Exclusive-NOR	2
Inverters/Buffers	8
Flip Flops/Latches	18
Registers	6
Shift Register	5
Storage	1
Counters	12
Binary	7
Decade	5
Decoders/Encoders	17
Transceivers/Line Drivers	11
Octal Bus Transceiver	6
Quad Bus Transceiver	2
Octal Buffer/Line Driver	3
Others	11
Multivibrators	2
Comparators	2
Parity Generator	1
TTL-to-CMOS Level Translator	6
TOTAL DEVICES	99

© IC MASTER 1983

MM74HCXXXX High Speed CMOS Logic Family

Combines:
CMOS μW Power Dissipation
CMOS High Noise Immunity
With
LS Equivalent Speeds
LS Output Drive
LS Pinout



HIGH SPEED CMOS PRODUCT GUIDE

NAND / NOR Gates

MM54HC00 / MM74HC00 Quad 2-Input NAND Gate
MM54HC02 / MM74HC02 Quad 2-Input NOR Gate
MM54HC10 / MM74HC10 Triple 3-Input NAND Gate
MM54HC20 / MM74HC20 Dual 4-Input NAND Gate
MM54HC27 / MM74HC27 Triple 3-Input NOR Gate
MM54HC30 / MM74HC30 8-Input NAND Gate
MM54HC133 / MM74HC133 13-Input NAND Gate
MM54HC4002 / MM74HC4002 Dual 4-Input NOR Gate
MM54HC4078 / MM74HC4078 8-Input NOR Gate

AND / OR / XOR / XNOR Gates

MM54HC08 / MM74HC08 Quad 2-Input AND Gates
MM54HC11 / MM74HC11 Triple 3-Input AND Gate
MM54HC32 / MM74HC32 Quad 2-Input OR Gate
MM54HC86 / MM 74HC86 Quad 2-Input Exclusive-OR (XOR) Gate
MM54HC266 / MM74HC266 Quad 2-Input Exclusive NOR (XNOR) Gate
MM54HC4075 / MM74HC4075 Triple 3-Input OR Gate

Inverters / Non-Inverting Buffers / Bus Drivers

MM54HC04 / MM74HC04 Hex Inverter
MM54HC240 / MM74HC240 Inverting Octal TRI-STATE® Buffer
MM54HC241 / MM74HC241 Octal TRI-STATE Buffer
MM54HC244 / MM74HC244 Octal TRI-STATE Buffer
MM54HC365 / MM74HC365 Hex TRI-STATE Buffer
MM54HC366 / MM74HC366 Inverting Hex TRI-STATE Buffer
MM54HC367 / MM74HC367 Hex TRI-STATE Buffer
MM54HC368 / MM74HC368 Inverting Hex TRI-STATE Buffer
MM54HC4049 / MM74HC4049 Hex Inverting Logic Level Down Converter
MM54HC4050 / MM74HC4050 Hex Logic Level Down Converter
MM54HC4305 / MM74HC4305 TTL Input Octal TRI-STATE Inverting Buffer
MM54HC4306 / MM74HC4306 TTL Input Octal TRI-STATE Buffer

Bus Transceivers

MM54HC242 / MM74HC242 Inverting Quad TRI-STATE Transceiver
MM54HC243 / MM74HC243 Quad TRI-STATE Transceiver
MM54HC245 / MM74HC245 Octal TRI-STATE Transceiver
MM54HC640 / MM74HC640 Inverting Octal TRI-STATE Transceiver
MM54HC643 / MM74HC643 Octal TRI-STATE Transceiver
MM54HC646 / MM74HC646 Octal Bus Transceivers / Registers
MM54HC648 / MM74HC648 Inverting Octal Bus Transceivers / Registers

Schmitt Triggers

MM54HC14 / MM74HC14 Hex Inverting Schmitt Trigger
MM54HC132 / MM74HC132 Quad 2-Input NAND Schmitt Trigger

One Shots

MM54HC123 / MM74HC123 Dual Monostable Multivibrator
MM54HC221 / MM74HC221 Dual Monostable Multivibrator
MM54HC4538 / MM74HC4538 Retriggerable Monostable Multivibrator

Arithmetic Circuits

MM54HC85 / MM74HC85 4-Bit Magnitude Comparator
MM54HC688 / MM74HC688 8-Bit Magnitude Comparator

Flip-Flops / Latches / Registers

MM54HC73 / MM74HC73 Dual J-K Flip-Flop with Clear
MM54HC74 / MM74HC74 Dual D Flip-Flop with Preset and Clear
MM54HC75 / MM74HC75 4-Bit Bistable Latch with Q and $\overline{Q}$ Output
MM54HC76 / MM74HC76 Dual J-K Flip-Flop with Preset and Clear
MM54HC77 / MM74HC77 4-Bit Bistable Latch
MM54HC107 / MM74HC107 Dual J-K Flip-Flop with Clear
MM54HC109 / MM74HC109 Dual J-$\overline{K}$ Flip-Flop with Preset and Clear
MM54HC112 / MM74HC112 Dual J-K Flip-Flop with Preset and Clear
MM54HC173 / MM74HC173 TRI-STATE® Quad D Flip-Flop

Flip-Flops / Latches / Registers

MM54HC174 / MM74HC174 Hex D Flip-Flop with Clear
MM54HC175 / MM74HC175 Quad D-Type Flip-Flop with Clear
MM54HC259 / MM74HC259 8-Bit Addressable Latch / 3-to-8 Line Decoder
MM54HC373 / MM74HC373 TRI-STATE Octal D-Type Latch
MM54HC374 / MM74HC374 TRI-STATE Octal D-Type Flip-Flop
MM54HC533 / MM74HC533 TRI-STATE Octal D-Type with Inverting Outputs
MM54HC534 / MM74HC534 TRI-STATE Octal D-Type Flip-Flop with Inverting Outputs
MM54HC563 / MM74HC563 TRI-STATE Octal D-Type Latch with Inverting Outputs
MM54HC564 / MM74HC564 TRI-STATE Octal D-Type Flip-Flop with Inverting Outputs
MM54HC573 / MM74HC573 TRI-STATE Octal D-Type Latch
MM54HC574 / MM74HC574 TRI-STATE Octal D-Type Flip-Flop
MM54HC646 / MM74HC646 Non-Inverting Octal Bus Transceivers / Registers
MM54HC648 / MM74HC648 Inverting Octal Bus Transceivers / Registers
MM54HC4301 / MM74HC4301 TTL Input Octal TRI-STATE Latch (Inverting)
MM54HC4302 / MM74HC4302 TTL Input Octal TRI-STATE Latch
MM54HC4303 / MM74HC4303 TTL Input Octal TRI-STATE Flip-Flop (Inverting)
MM54HC4304 / MM74HC4304 TTL Input Octal TRI-STATE Flip-Flop

Shift Registers

MM54HC164 / MM74HC164 8-Bit Serial-In Parallel-Out Shift Register
MM54HC165 / MM74HC165 8-Bit Parallel-In Serial Out Shift Register
MM54HC194 / MM74HC194 4-Bit Bidirectional Universal Shift Register
MM54HC195 / MM74HC195 4-Bit Parallel-Shift Register
MM54HC299 / MM74HC299 8-Bit TRI-STATE Universal Shift Register

Counters

MM54HC160 / MM74HC160 Synchronous Decade Counter
MM54HC161 / MM74HC161 Synchronous Binary Counter
MM54HC162 / MM74HC162 Synchronous Decade Counter
MM54HC163 / MM74HC163 Synchronous Binary Counter
MM54HC192 / MM74HC192 Synchronous Decade Up / Down Counter
MM54HC193 / MM74HC193 Synchronous Binary Up / Down Counter
MM54HC390 / MM74HC390 Dual 4-Bit Decade Counter
MM54HC393 / MM74HC393 Dual 4-Bit Binary Counter
MM54HC4017 / MM74HC4017 Decade Counter / Divider with 10 Decoded Outputs
MM54HC4020 / MM74HC4020 14 Stage Binary Counter
MM54HC4040 / MM74HC4040 12 Stage Binary Counter
MM54HC4060 / MM74HC4060 14 Stage Binary Counter

Decoders / Encoders

MM54HC42 / MM74HC42 BCD-to-Decimal Decoder
MM54HC138 / MM74HC138 3-to-8 Line Decoder
MM54HC139 / MM74HC139 Dual 2-to-4 Line Decoder
MM54HC147 / MM74HC147 10-Line to 4-Line Priority Encoder
MM54HC154 / MM74HC154 4-to-16 Line Decoder
MM54HC259 / MM74HC259 8-Bit Addressable Latch / 3-to-8 Line Decoder
MM54HC280 / MM74HC280 Odd / Even Parity Generator / Checker
MM54HC4511 / MM74HC4511 BCD-to-7 Segment Latch / Decoder / Driver
MM54HC4514 / MM74HC4514 4-Line to 16- Line Decoder with Latch
MM54HC4543 / MM74HC4543 BDC-to-7 Segment Latch / Decoder / Driver for Liquid Crystal Displays

Multiplexers

MM54HC151 / MM74HC151 8-Channel Digital Multiplexer
MM54HC153 / MM74HC153 Dual 4-Input Multiplexer
MM54HC157 / MM74HC157 Quad 2-Input Multiplexer
MM54HC158 / MM74HC158 Quad 2-Input Multiplexer (Inverted Output)
MM54HC251 / MM74HC251 8-Channel TRI-STATE® Multiplexer
MM54HC253 / MM74HC253 Dual 4-Channel TRI-STATE Multiplexer
MM54HC257 / MM74HC257 Quad 2-Channel TRI-STATE Multiplexer
MM54HC354 / MM74HC354 8-Channel TRI-STATE Multiplexers with Latches
MM54HC356 / MM74HC356 8-Channel TRI-STATE Multiplexers with Latches

Contact your local National Semiconductor Sales Office or Distributor for more information.

© IC MASTER 1983

NATIONAL SEMICONDUCTOR MOS/LSI

PART TYPE	DESCRIPTION	FEATURES
MM74CXXX-SERIES DISPLAY DRIVERS		
MM74C945/7	4-digit up/down counter w/latch/decoder driver	• 4-decade U/D counter • Schmitt trigger clock input • Direct 4-digit drive • Store and reset inputs
MM74C946N	4½-digit counter/decoder driver for LCD displays	• Direct 4½-digit 7-segment display drive • Carry output for cascading 4-digit blocks • Store and reset inputs
MM74C911	4-digit display controller	• TTL-compatible inputs • Internal oscillator • Segment expandability
MM74C912	6-digit BCD display/driver	• TTL-compatible inputs • Internal-segment decoder • Direct-base drive-to-digit transistors
MM74C917	6-digit hex display/driver	• TTL-compatible inputs • Internal-segment decoder • Direct-base drive-to-digit transistors
MM54XX-SERIES DISPLAY DRIVERS		
MM5450/51	34/35 segment LED	• Serial data in • Brightness control • Data enable, cascadeable
MM5452/53	32/33 segment LCD	• Serial data in • Oscillator on-board • Data enable, cascadeable
MM5445/6/7/8	33-35 segment VF	• Serial data in • Brightness control • Data enable, cascadeable
MICROPROCESSOR-COMPATIBLE CLOCKS — LOW-POWER CMOS		
MM58167A	8-bit bus clock	• Time: 1/100 sec ~ months • RAM: 56 bits • Interrupts: 1 sec ~ 1 month and RAM compare
MM58174A	4-bit bus clock	• Package: 24-pin • Time: 1/10 sec ~ years • Interrupts: 0.5-, 5-, 60-sec • Package: 16-pin
DIGITAL CLOCK/RADIO		
MM5458/59	Alarm clock/radio	• LED duplex • 12/24-hour, 50/60 Hz • Sleep/snooze • Battery back-up
MM5466	Dual alarm clock/radio	• LED duplex • 12/24-hour, 50/60 Hz • Sleep/snooze • Battery back-up

© IC MASTER 1983

National Semiconductor

PRELIMINARY
October 1982

MM74HC942 300 Baud P²CMOS™ Modem

General Description

The MM74HC942 is a full duplex low speed modem. It provides a 300 baud bidirectional serial interface for data communication over telephone lines and other narrow bandwidth channels. It is Bell 103 compatible.

The device is manufactured on National's P² CMOS™ process. Switched capacitor techniques are used to perform analog signal processing.

MODULATOR SECTION

The modulator contains a frequency synthesizer and a sine wave synthesizer. It produces a phase coherent frequency shift keyed (FSK) output.

LINE DRIVER AND HYBRID SECTION

The line driver and hybrid are designed to facilitate connection to a 600 Ω phone line. They can perform two to four wire conversion and drive the line at 0 dBm.

DEMODULATOR SECTION

The demodulator incorporates anti-aliasing filters, a receive filter, limiter, discriminator, and carrier detect circuit. The nine pole receive filter provides 60 dB of transmitted tone rejection. The discriminator is fully balanced for stable operation.

P² CMOS™ is a trademark of National Semiconductor Corp.

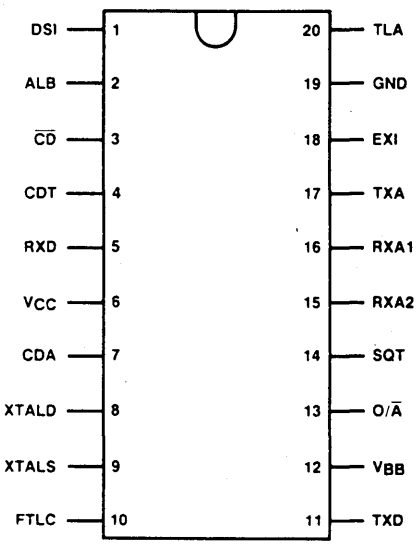
Features

- All filtering, modulator, demodulator, line driver, and hybrid on single IC
- Full duplex answer or originate modes — Bell 103 compatible
- Low operating power *plus* "stand-by" power-down mode
- Analog loopback for self test
- ±5V supplies
- Adjustable "carrier detect" and "transmit" levels

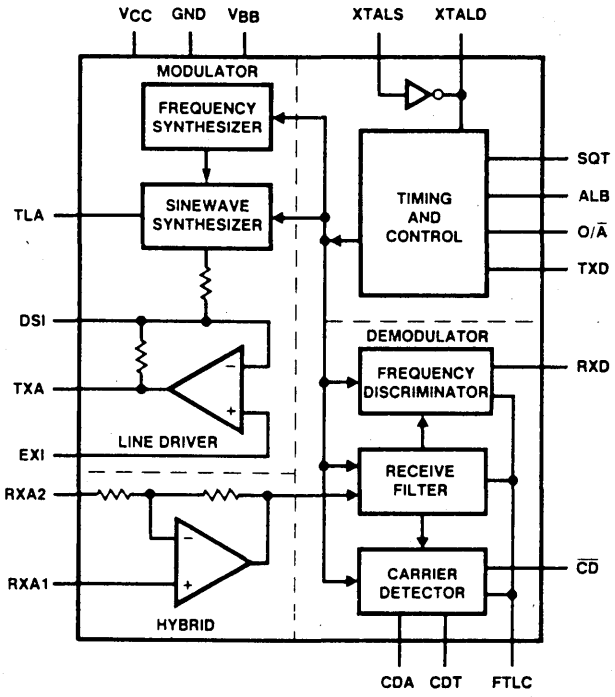
Applications

- Built-in low speed-modems — personal computers
- Remote data collection
- Radio telemetry
- Credit verification
- Stand-alone modems
- Remote process control
- Portable terminals

Connection Diagram Dual-in-Line Package



Block Diagram



© IC MASTER 1983

National Semiconductor

October 1982

Programmable Array Logic (PAL®) High-Speed PAL Series 20A

General Description

The PAL® family utilizes National Semiconductor's Schottky TTL process and bipolar PROM fusible-link technology to provide user-programmable logic to replace conventional SSI/MSI gates and flip-flops. Typical chip count reduction gained by using PALs is greater than 4:1.

The family lets the systems engineer customize his chip by opening fusible links to configure AND and OR gates to perform his desired logic functions. Complex interconnections that previously required time-consuming layout are thus transferred from PC board to silicon where they can be easily modified during prototype checkout or production.

The PAL transfer function is the familiar sum of products with a single array of fusible links. Unlike the PROM, the PAL is a programmable AND array driving a fixed OR array. (The PROM is a fixed AND array driving a programmable OR array.) In addition, the PAL family offers these options:

- Variable input/output in ratio
- Programmable TRI-STATE® outputs
- Registers and feedback

Unused inputs are tied directly to V_{CC} or GND. Product terms with all fuses blown assume the logical high state, and product terms connected to both true and complement of any single input assume the logical low state. Registers consist of D type flip-flops that are loaded on the low-to-high transition of the clock. PAL logic diagrams are shown with all fuses blown, enabling the designer use of the diagrams as coding sheets.

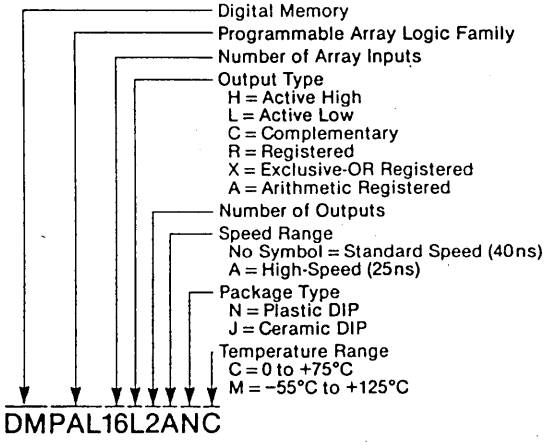
The entire PAL family is programmed on inexpensive conventional PROM programmers with appropriate personality and socket adapter cards. Once the PAL is programmed and verified, two additional fuses may be blown to defeat verification. This feature gives the user a proprietary circuit which is very difficult to copy.

Features

- Programmable replacement for TTL logic
- Simplifies prototyping and board layout
- Skinny DIP packages
- Reliable titanium-tungsten fuses
- 25ns max. propagation delay

Ordering Information

Part Number	Description	
PAL10H8A	OCTAL	10 Input AND-OR Gate Array
PAL12H6A	HEX	12 Input AND-OR Gate Array
PAL14H4A	QUAD	14 Input AND-OR Gate Array
PAL16H2A	DUAL	16 Input AND-OR Gate Array
PAL16C1A		16 Input AND-OR/AND-OR-INVERT Gate Array
PAL10L8A	OCTAL	10 Input AND-OR-INVERT Gate Array
PAL12L6A	HEX	12 Input AND-OR-INVERT Gate Array
PAL14L4A	QUAD	14 Input AND-OR-INVERT Gate Array
PAL16L2A	DUAL	16 Input AND-OR-INVERT Gate Array
PAL16L8A	OCTAL	16 Input AND-OR-INVERT Gate Array
PAL16R8A	OCTAL	16 Input Registered AND-OR Gate Array
PAL16R6A	HEX	16 Input Registered AND-OR Gate Array
PAL16R4A	QUAD	16 Input Registered AND-OR Gate Array



PAL Part Numbers

The PAL part number reveals the logic operation the part performs. The example shown, the DMPAL16L2ANC, is a device that accommodates 16 input terms and generates 2 active-low output terms. It is contained in a 20-pin plastic dual-in-line package and meets commercial temperature range specifications.

TRI-STATE® is a registered trademark of National Semiconductor Corp.
PAL® is a registered trademark of Monolithic Memories, Inc.

© IC MASTER 1983

National Semiconductor

ADVANCED LOW POWER SCHOTTKY

Absolute Maximum Ratings (Note 1)

Supply Voltage, V_{CC} (1)	7V
Input Voltage, V_I: All Inputs	7V
I/O Ports	5.5V
Off State (High Level) Voltage Applied to Open-Collector Outputs	7V
High Level Voltage Applied to 3-State Outputs	5.5V
Operating Free-Air Temperature Range:	
SN54ALS	−55°C to 125°C
SN74ALS	0°C to 70°C
Storage Temperature Range	−65°C to 150°C

Recommended Operating Conditions

Parameter		Standard Output			Buffer Output			Bus Driver Output			Unit
		Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	
Supply Voltage	54/74ALS	4.5	5.0	5.5	4.5	5.0	5.5	4.5	5.0	5.5	V
High Level Input Voltage, V_{IH}	54/74ALS	2.0			2.0			2.0			V
Low Level Input Voltage, V_{IL}	54/74ALS			0.8			0.8			0.8	V
High Level Output Current, I_{OH} (2)	54ALS			−0.4			−1			−12	mA
	74ALS			−0.4			−2.6			−15	mA
High Level Output Voltage, V_{OH} (3)	54/74ALS			5.5			5.5			5.5	V
Low Level Output Current, I_{OL}	54/74ALS			4			12			12	mA
	74ALS			8			24			24/48	mA
Operating Free-Air Temperature, T_A	54ALS	−55		125	−55		125	−55		125	°C
	74ALS	0		70	0		70	0		70	°C

© IC MASTER 1983

QMOS Product Selection Guide

Function					Page
Arithmetic Circuits					
CD74HC85E	CD54HC85F	CD74HCT85E	CD54HCT85F	4-Bit Magnitude Comparator	■
CD74HC384E	CD54HC384F	CD74HCT384E	CD54HCT384F	8-Bit Serial Multiplier	77
CD74HC688E	CD54HC688F	CD74HCT688E	CD54HCT688F	8-Bit Equality Comparator	86
Bus Transceivers					
CD74HC242E	CD54HC242F	CD74HCT242E	CD54HCT242F	Quad-Bus Transceiver, 3-State, Inverting	56
CD74HC243E	CD54HC243F	CD74HCT243E	CD54HCT243F	Quad-Bus Transceiver, 3-State	56
CD74HC245E	CD54HC245F	CD74HCT245E	CD54HCT245F	Octal-Bus Transceiver, 3-State	58
CD74HC640E	CD54HC640F	CD74HCT640E	CD54HCT640F	Octal Bus Transceiver, 3-State, Inverting	81
CD74HC643E	CD54HC643F	CD74HCT643E	CD54HCT643F	Octal Bus Transceiver, 3-State	81
CD74HC645E	CD54HC645F	CD74HCT645E	CD54HCT645F	Octal Bus Transceiver, 3-State	■
CD74HC646E	CD54HC646F	CD74HCT646E	CD54HCT646F	Octal Bus Transceiver, 3-State	83
CD74HC648E	CD54HC648F	CD74HCT648E	CD54HCT648F	Octal Bus Transceiver, 3-State, Inverting	83
Counters					
CD74HC160E	CD54HC160F	CD74HCT160E	CD54HCT160F	BCD Decade Counter, Asynchronous Reset	37
CD74HC161E	CD54HC161F	CD74HCT161E	CD54HCT161F	4-Bit Binary Counter, Asynchronous Reset	37
CD74HC162E	CD54HC162F	CD74HCT162E	CD54HCT162F	BCD Decade Counter, Synchronous Reset	37
CD74HC163E	CD54HC163F	CD74HCT163E	CD54HCT163F	4-Bit Binary Counter, Synchronous Reset	37
CD74HC191E	CD54HC191F	CD74HCT191E	CD54HCT191F	Presettable 4-Bit Up/Down Counter	47
CD74HC192E	CD54HC192F	CD74HCT192E	CD54HCT192F	Synchronous Decade Up/Down Counter	48
CD74HC193E	CD54HC193F	CD74HCT193E	CD54HCT193F	Synchronous Binary Up/Down Counter	49
CD74HC390E	CD54HC390F	CD74HCT390E	CD54HCT390F	Dual Decade Counter	78
CD74HC393E	CD54HC393F	CD74HCT393E	CD54HCT393F	Dual 4-Bit Binary Counter	79
CD74HC4017E	CD54HC4017F	CD74HCT4017E	CD54HCT4017F	Decade Counter/Divider	87
CD74HC4020E	CD54HC4020F	CD74HCT4020E	CD54HCT4020F	14-Bit Binary Counter	89
CD74HC4024E	CD54HC4024F	CD74HCT4024E	CD54HCT4024F	7-Stage Ripple Counter	■
CD74HC4040E	CD54HC4040F	CD74HCT4040E	CD54HCT4040F	12-Bit Binary Counter	90
CD74HC4060E	CD54HC4060F	CD74HCT4060E	CD54HCT4060F	14-Bit Binary Counter w/Oscillator	92
CD74HC4520E	CD54HC4520F	CD74HCT4520E	CD54HCT4520F	Dual Binary Counter	■
Decoders/Encoders					
CD74HC42E	CD54HC42F	CD74HCT42E	CD54HCT42F	BCD-to-Decimal Decoder	■
CD74HC138E	CD54HC138F	CD74HCT138E	CD54HCT138F	3-to-8 Line Decoder	28
CD74HC139E	CD54HC139F	CD74HCT139E	CD54HCT139F	Dual 2-of-4 Line Decoder	30
CD74HC147E	CD54HC147F	CD74HCT147E	CD54HCT147F	10-to-4 Line-Priority Encoder	31
CD74HC154E	CD54HC154F	CD74HCT154E	CD54HCT154F	4-to-16-Line Decoder	34
CD74HC238E	CD54HC238F	CD74HCT238E	CD54HCT238F	3-of-8 Decoder	28
CD74HC259E	CD54HC259F	CD74HCT259E	CD54HCT259F	8-Bit Addressable Latch	■
CD74HC280E	CD54HC280F	CD74HCT280E	CD54HCT280F	8-Bit Odd/Even Parity Generator/Checker	64
CD74HC4511E	CD54HC4511F	CD74HCT4511E	CD54HCT4511F	BCD-to-7-Segment Latch/Decoder/Driver	■
CD74HC4514E	CD54HC4514F	CD74HCT4514E	CD54HCT4514F	4-to-16-Line Decoder w/Latch	■
Flip-Flops/Latches/Registers					
CD74HC73E	CD54HC73F	CD74HCT73E	CD54HCT73F	Dual J-K Flip-Flop w/CLEAR	22
CD74HC74E	CD54HC74F	CD74HCT74E	CD54HCT74F	Dual D Flip-Flop w/PRESET and CLEAR	23
CD74HC75E	CD54HC75F	CD74HCT75E	CD54HCT75F	4-Bit Bistable Latch	■
CD74HC76E	CD54HC76F	CD74HCT76E	CD54HCT76F	Dual J-K Flip-Flop w/PRESET and CLEAR	■
CD74HC107E	CD54HC107F	CD74HCT107E	CD54HCT107F	Dual J-K Flip-Flop w/CLEAR	25
CD74HC109E	CD54HC109F	CD74HCT109E	CD54HCT109F	Dual J-K Flip-Flop w/PRESET and CLEAR	■
CD74HC112E	CD54HC112F	CD74HCT112E	CD54HCT112F	Dual J-K Flip-Flop w/PRESET and CLEAR	■
CD74HC713E	CD54HC173F	CD74HCT173E	CD54HCT173F	Quad D Flip-Flop, 3-State	44
CD74HC174E	CD54HC174F	CD74HCT174E	CD54HCT174F	Hex D Flip-Flop w/CLEAR	45
CD74HC175E	CD54HC175F	CD74HCT175E	CD54HCT175F	Quad D Flip-Flop w/CLEAR	46
CD74HC259E	CD54HC259F	CD74HCT259E	CD54HCT259F	8-Bit Addressable Latch	■
CD74HC723E	CD54HC273F	CD74HCT273E	CD54HCT273F	Octal D Flip-Flop w/CLEAR	63
CD74HC373E	CD54HC373F	CD74HCT373E	CD54HCT373F	Octal Transparent Latch 3-State	72
CD74HC374E	CD54HC374F	CD74HCT374E	CD54HCT374F	Octal D Flip-Flop, 3-State	74
CD74HC377E	CD54HC377F	CD74HCT377E	CD54HCT377F	Octal D Flip-Flop with Clock Enable	76
CD74HC533E	CD54HC533F	CD74HCT533E	CD54HCT533F	Octal Transparent Latch, 3-State, Inverting	72
CD74HC534E	CD54HC534F	CD74HCT534E	CD54HCT534F	Octal D Flip-Flop, 3-State, Inverting	74
CD74HC563E	CD54HC563F	CD74HCT563E	CD54HCT563F	Octal Transparent Latch, 3-State, Inverting	72
CD74HC564E	CD54HC564F	CD74HCT564E	CD54HCT564F	Octal D Flip-Flop, 3-State, Inverting	74
CD74HC573E	CD54HC573F	CD74HCT573E	CD54HCT573F	Octal Transparent Latch, 3-State	72
CD74HC574E	CD54HC574F	CD74HCT574E	CD54HCT574F	Octal D Flip-Flop, 3-State	74
CD74HC646E	CD54HC646F	CD74HCT646E	CD54HCT646F	Octal Bus Transceiver, 3-State	83
CD74HC648E	CD54HC648F	CD74HCT648E	CD54HCT648F	Octal Bus Transceiver, 3-State, Inverting	83
CD74HC670E	CD54HC670F	CD74HCT670E	CD54HCT670F	4 x 4 Register File, 3-State	85

Note: Add package suffix code to part number on all orders.
E = Dual-in-Line Plastic Package—Temp. Range = −40°C to +85°C.
F = Dual-in-Line Frit-Seal Ceramic Package (CERDIP)—Temp. Range = −55°C to +125°C.

*CD54/74HCU04E, F unbuffered version also available.
•CD54/74HCU4049E, F unbuffered version only available.
▲CD54/74HC4050E, F version only available.
■Available at a later date.

© IC MASTER 1983

QMOS Product Selection Guide (Cont'd)

Function					Page
Gates					
CD74HC00E	CD54HC00F	CD74HCT00E	CD54HCT00F	Quad 2-Input NAND Gate	18
CD74HC02E	CD54HC02F	CD74HCT02E	CD54HCT02F	Quad 2-Input NOR Gate	19
CD74HC08E	CD54HC08F	CD74HCT08E	CD54HCT08F	Quad 2-Input AND Gate	■
CD74HC10E	CD54HC10F	CD74HCT10E	CD54HCT10F	Triple 3-Input NAND Gate	■
CD74HC11E	CD54HC11F	CD74HCT11E	CD54HCT11F	Triple 3-Input AND Gate	■
CD74HC20E	CD54HC20F	CD74HCT20E	CD54HCT20F	Dual 4-Input NAND Gate	21
CD74HC27E	CD54HC27F	CD74HCT27E	CD54HCT27F	Triple 3-Input NOR Gate	■
CD74HC30E	CD54HC30F	CD74HCT30E	CD54HCT30F	8-Input NAND Gate	■
CD74HC32E	CD54HC32F	CD74HCT32E	CD54HCT32F	Quad 2-Input OR Gate	■
CD74HC86E	CD54HC86F	CD74HCT86E	CD54HCT86F	Quad 2-Input Excl. OR Gate	24
CD74HC133E	CD54HC133F	CD74HCT133E	CD54HCT133F	13-Input NAND Gate	■
CD74HC266E	CD54HC266F	CD74HCT266E	CD54HCT266F	Quad 2-Input Excl. NOR	■
CD74HC4002E	CD54HC4002F	CD74HCT4002E	CD54HCT4002F	Dual 4-Input NOR Gate	■
Inverters/Non-Inverting Buffers/Bus Drivers					
*CD74HC04E	*CD54HC04F	CD74HCT04E	CD54HCT04F	Hex Inverter/Buffer	20
CD74HC240E	CD54HC240F	CD74HCT240E	CD54HCT240F	Octal Buffer Line Driver, 3-State, Inverting	54
CD74HC241E	CD54HC241F	CD74HCT241E	CD54HCT241F	Octal Buffer Line Driver, 3-State	54
CD74HC244E	CD54HC244F	CD74HCT244E	CD54HCT244F	Octal Buffer Line Driver, 3-State	54
CD74HC365E	CD54HC365F	CD74HCT365E	CD54HCT365F	Hex 3-State Buffer	■
CD74HC366E	CD54HC366F	CD74HCT366E	CD54HCT366F	Hex 3-State Buffer, Inverting	71
CD74HC367E	CD54HC367F	CD74HCT367E	CD54HCT367F	Hex 3-State Buffer	71
CD74HC368E	CD54HC368F	CD74HCT368E	CD54HCT368F	Hex 3-State Buffer, Inverting	71
CD74HC540E	CD54HC540F	CD74HCT540E	CD54HCT540F	Octal Buffer Line Driver, 3-State, Inverting	80
CD74HC541E	CD54HC541F	CD74HCT541E	CD54HCT541F	Octal Buffer Line Driver, 3-State	80
•CD74HCU4049E	•CD54HCU4049F	—	—	Hex Buffer, Inverting	91
▲CD74HC4050E	▲CD54HC4050F	—	—	Hex Buffer	91
Multiplexers					
CD74HC151E	CD54HC151F	CD74HCT151E	CD54HCT151f	8-Chanel Digital Multiplexer	32
CD74HC153E	CD54HC153F	CD74HCT153e	CD754HCT153F	Dual 4-Input Multiplexer	33
CD74HC157E	CD54HC157F	CD74HCT157E	CD54HCT157F	Quad 2-Input Multiplexer	36
CD74HC158E	CD54HC158F	CD74HCT158E	CD54HCT158F	Quad 2-Input Multiplexer, Inverting	36
CD74HC251E	CD54HC251F	CD74HCT251E	CD54HCT251F	8-Channel Multiplexer, 3-State	59
CD74HC253E	CD54HC253F	CD54HCT253E	CD54HCT253F	Dual 4-Input Multiplexer, 3-State	61
CD74HC257E	CD54HC257F	CD74HCT257E	CD54HCT257F	Quad 2-Input Multiplexer, 3-State	62
CD74HC354E	CD54HC354F	CD74HCT354E	CD54HCT354F	8-Input Multiplexer, Latched-Data 3-State	68
CD74HC356E	CD54HC356F	CD74HCT356E	CD54HCT356F	8-Input Multiplexer, Clocked-Latched-Data, 3-State	68
CD74HC4051E	CD54HC4051F	CD74HCT4051E	CD54HCT4051F	8-Channel Analog Multiplexer/Demultiplexer	■
CD74HC4052E	CD54HC4052F	CD74HCT4052E	CD54HCT4052F	Dual 4-Channel Analog Multiplexer/Demultiplexer	■
CD74HC4053E	CD54HC4053F	CD74HCT4053E	CD54HCT4053F	Triple 2-Channel Analog Multiplexer/Demultiplexer	■
One-Shots					
CD74HC123E	CD54HC123F	CD74HCT123E	CD54HCT123F	Dual Retriggerable Monostable Multivibrator	26
CD74HC221E	CD54HC221F	CD74HCT221E	CD54HCT221F	Dual Monostable Multivibrator	■
CD74HC4538E	CD54HC4538F	CD74HCT4538E	CD54HCT4538F	Dual Precision Monostable Multivibrator	93
Schmitt Triggers					
CD74HC14E	CD54HC14F	CD74HCT14E	CD54HCT14F	Hex Schmitt Trigger Inverter	■
CD74HC132E	CD54HC132F	CD74HCT132E	CD74HCT132F	Quad 2-Input NAND Schmitt Trigger	27
Shift Registers					
CD74HC164E	CD54HC164F	CD74HCT164E	CD54HCT164F	8-Bit Serial-to-Parallel Shift Register	39
CD74HC165E	CD54HC185F	CD74HCT165E	CD74HCT165F	8-Bit Parallel-to-Serial Shift Register	40
CD74HC166E	CD54HC166F	CD74HCT166E	CD54HCT166F	8-Bit Parallel In/Serial Out Shift Register	42
CD74HC194E	CD54HC194F	CD74HCT194E	CD54HCT194F	4-Bit Bidirectional Universal Shift Register	50
CD74HC195E	CD54HC195F	CD74HCT195E	CD54HCT195F	4-Bit Parallel Shift Register	52
CD74HC299E	CD54HC299F	CD74HCT299E	CD54HCT299F	8-Bit Universal Shift Register	66
CD74HC40104E	CD54HC40104F	CD74HCT40104E	CD54HCT40104F	4-Bit Bidirectional Universal Shift Register, 3-State	94
CD74HC40105E	CD74HC40105F	CD74HCT40105E	CD54HCT40105F	FIFO Shift Register	96
Miscellaneous					
CD74HC297E	CD54HC297F	CD74HCT297E	CD54HCT297F	Digital Phase-Locked Loop Filter	65

Note: Add package suffix code to part number on all orders.
E = Dual-in-Line Plastic Package—Temp. Range = −40°C to +85°C.
F = Dual-in-Line Frit-Seal Ceramic Package (CERDIP)—Temp. Range = −55°C to +125°C.

*CD54/74HCU04E, F unbuffered version also available.
•CD54/74HCU4049E, F unbuffered version only available.
▲CD54/74HC4050E, F version only available.
■Available at a later date.

© IC MASTER 1983

The QMOS Product Line

The RCA QMOS series of high-speed CMOS logic integrated circuits include an extensive line of products that are pin compatible with many existing bipolar 54/74LSTTL and CMOS 4000 series of digital logic types. The new QMOS IC's provide high-speed CMOS replacements for the most popular LSTTL devices in existing designs and also offer low-power all-CMOS designs for new digital systems. Key family features of the RCA QMOS types include:

- Speeds equivalent to LSTTL types with typical gate delays of 10 ns.
- Fanout to 10 74 LSTTL loads; 15 loads using Bus Driver 54/74 types.
- Operating frequencies equivalent to LSTTL types, typically 30 MHz.
- The high voltage noise immunity characteristic of CMOS, typically 45 percent of V_{CC}, a two to three times improvement over LSTTL.
- Wide range of power supply operating voltages, 2 to 6 volts.
- CMOS low static power consumption, typically less than 1 microwatt.

With the broad line of CMOS MSI function types currently available, together with performance offered by the RCA QMOS series of high-speed CMOS integrated circuits, the designer need not sacrifice speed for power consumption. Add the other classical advantages of CMOS, including high noise immunity and wide power supply and temperature ranges, and the decision to use high-speed CMOS logic (QMOS) is the choice for the 80's. This new family provides for the design of more cost-effective systems to serve high-speed market applications.

The RCA QMOS product line consists primarily of CD54/74HC-series types, which feature CMOS input voltage level compatibility, and CD54/74HCT-series types, which are input voltage level compatible with LSTTL devices. The QMOS line also includes a limited number of single-stage, unbuffered inverter types (CD54/74HCU-series) for added versatility in oscillator and amplifier applications. The following paragraphs outline some key advantages that QMOS IC's offer over standard CMOS and LSTTL types:

Power Consumption

CMOS is well established in the marketplace as the leading technology for applications in which low power consumption is a prime requisite. Relative to LSTTL, CMOS IC's feature low static power dissipation or heat generation. In comparison to 54/74-series LSTTL types, RCA QMOS devices enhance system reliability and reduce costs by reducing, or eliminating, the number and size of parts such as heat sinks, fans, tightly regulated high current power supplies, and copper busses. A typical system in which LSTTL types have been replaced by equivalent QMOS types can be expected to operate with only 1% of the power, assuming that all logic nodes are switched at an average rate of 10 KHz. Although some QMOS logic nodes may switch at speeds greater than 10 MHz, it's the over-all duty cycle and average switching rate that counts. This average switching is the key to the advantage of CMOS low power. For LSTTL, the high dc current dominates.

Noise Immunity Consideration

The noise immunity of a logic family is also an important equipment cost factor in terms of decoupling components, power supply dynamic resistance and regulation, and layout rules for PC boards and signal cables. A true system assessment of noise immunity is the noise margin provided by a logic family. The table shown below illustrates the superior (2:1) system noise margin of the QMOS CD74HC series over the 74LSTTL series. The system noise margin of CD74HCT series is similar to that of 74LSTTL series.

TABLE 1—74LSTTL AND CD74HC FAMILY INPUT, OUTPUT, AND NOISE MARGIN VOLTAGES (V_{CC} = 5 V)

Parameter	74LSTTL Series	CD74HC Series
V_{IL}	0.8 V	1 V
V_{IH}	2 V	3.5 V
V_{OH}	2.7 V	4.9 V
V_{OL}	0.4 V	0.1 V
$V_{NML} = V_{IL} - V_{OL}$ (Noise Margin LOW)	0.4 V	0.9 V
$V_{NMH} = V_{OH} - V_{IH}$ (Noise Margin High)	0.7 V	1.4 V

AC Performance

In comparison to standard CD4000 Series CMOS, LSTTL types provide higher operating frequencies as well as considerably shorter propagation delays, The RCA QMOS high-speed logic series is designed to meet the dynamic switching speeds and operating frequency of LSTTL. This new series, therefore, offers a high-performance family of low power logic products that should be widely accepted in computer and communication applications and for other uses that require fast switching speed.

Output Drives

A prominent characteristic of LSTTL is its restrictive output drive capacity, or fanout rules. Each basic logic type in the RCA QMOS High-Speed CMOS series is capable of driving a full complement of 10 LSTTL loads (4mA at 0.4 V). An additional factor of 50% was applied to parts in the octal grouping for a total bus driving capability of 6 mA or a fanout of 15 LSTTL loads. These improved drive capabilities are achieved without sacrifice of the power, speed, and noise immunity benefits of the CMOS family. For driving QMOS loads, a fanout of 20 at high noise margin is specified. This fanout capability is twice that of standard 74LSTTL Much higher fanout capability exists for QMOS types, but speed and noise margin are reduced.

© IC MASTER 1983

RECOMMENDED OPERATING CONDITIONS:

For maximum reliability, nominal operating conditions should be selected so that operation is always within the following ranges:

CHARACTERISTIC	LIMITS		UNITS
	MIN.	MAX.	
Supply-Voltage Range (For T_A = Full Package Temperature Range) V_{CC}:*			
CD54/74HC, CD54/74HCU Types	2	6	V
CD54/74HCT Types▲	4.5	5.5	V
DC Input or Output Voltage V_{in}, V_{out}	0	V_{CC}	V
Operating Temperature T_A:			
CD74 Types	−40	+85	°C
CD54 Types	−55	+125	°C
Input Rise and Fall Times t_r, t_f (except for Schmitt Inputs)	0	500	ns

*Unless otherwise specified, all voltages are referenced to Ground.

▲DC and AC parameters are specified at 4.5 to 5.5 V. The truth table, as applicable, is specified over a voltage range of 2 to 6 volts.

STATIC ELECTRICAL CHARACTERISTICS for CD74HC/CD54HC Types

CHARACTERISTIC	TEST CONDITIONS			CD74HC/CD54HC Series			CD74HC Series		CD54HC Series		UNITS
	V_{IN} V		V_{CC} V	+25°C			−40/+85°C		-55/+125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
High-Level Input Voltage V_{IH}	-		4.5	3.15	-	-	3.15	-	3.15	-	V
			5.5	3.85	-	-	3.85	-	3.85		
Low-Level Input Voltage V_{IL}	-		4.5	-	-	0.9	-	0.9	-	0.9	V
			5.5	-	-	1.1	-	1.1	-	1.1	
High-Level Output Voltage V_{OH}*			-								
CMOS Loads	V_{IL}	$\lvert I_{OUT}\rvert \leq 20\ \mu A$	4.5	4.4	-	-	4.4	-	4.4	-	V
Standard Output	or	$I_{OUT} = -4$ mA	4.5	3.8	-	-	3.7	-	3.5	-	
Bus Driver Output	V_{IH}	$I_{OUT} = -6$ mA	4.5	3.8	-	-	3.7	-	3.5	-	
Low-Level Output Voltage V_{OL}*											
CMOS Loads	V_{IL}	$\lvert I_{OUT}\rvert \leq 20\ \mu A$	4.5	-	-	0.1	-	0.1	-	0.1	V
Standard (74 Series) Output (54 Series)	or	$I_{OUT} = 4$ mA	4.5	-	-	0.32	-	0.4	-	0.4	
	V_{IH}	$I_{OUT} = 3.4$ mA	4.5	-	-	0.32	-	0.4	-	0.4	
Bus (74 Series) Driver (54 Series)		$I_{OUT} = 6$ mA	4.5	-	-	0.32	-	0.4	-	0.4	
		$I_{OUT} = 5.1$ mA	4.5	-	-	0.32	-	0.4	-	0.4	
Input Leakage Current I_{IN}°	V_{CC} or Gnd.		6	-	$\pm 10^{-5}$	±0.1	-	±1	-	±1	μA
3-State Leakage Current I_Z*	V_{IL} or V_{IH}	V_{OUT} = V_{CC} or Gnd.	6	-	-	±0.5	-	±5	-	±10	μA
Quiescent Device Current I_{CC}*											
SSI	V_{CC}	$I_{OUT} = 0$	7	-	-	2	-	20	-	40	μA
FF/Latches	or	$I_{OUT} = 0$	7	-	-	4	-	40	-	80	
MSI	Gnd.	$I_{OUT} = 0$	7	-	-	8	-	80	-	160	

* As applicable to device type.

° $I_{IN} = I_Z$ for bidirectional devices.

© IC MASTER 1983

STATIC ELECTRICAL CHARACTERISTICS for CD74HCT/CD54HCT Types

CHARACTERISTIC	TEST CONDITIONS V_{IN} V		V_{CC} V	CD74HCT/CD54HCT Series +25°C Min.	Typ.	Max.	CD74HCT Series −40/+85°C Min.	Max.	CD54HCT Series -55/+125°C Min.	Max.	UNITS
High-Level Input Voltage V_{IH}	-		4.5 to 5.5	2	-	-	2	-	2	-	V
Low-Level Input Voltage V_{IL}	-		4.5 to 5.5	-	-	0.8	-	0.8	-	0.8	V
High-Level Output Voltage V_{OH}*											
CMOS Loads	V_{IL}	$\lvert I_{OUT}\rvert \leq 20\ \mu A$	4.5	4.4	-	-	4.4	-	4.4	-	V
Standard Output	or	$I_{OUT} = -4$ mA	4.5	3.8	-	-	3.7	-	3.5	-	
Bus Driver Output	V_{IH}	$I_{OUT} = -6$ mA	4.5	3.8	-	-	3.7	-	3.5	-	
Low-Level Output Voltage V_{OL}*											
CMOS Loads	V_{IL}	$\lvert I_{OUT}\rvert \leq 20\ \mu A$	4.5	-	-	0.1	-	0.1	-	0.1	V
Standard (74 Series)	or	$I_{OUT} = 4$ mA	4.5	-	-	0.32	-	0.4	-	0.4	
Output (54 Series)	V_{IH}	$I_{OUT} = 3.4$ mA	4.5	-	-	0.32	-	0.4	-	0.4	
Bus (74 Series)		$I_{OUT} = 6$ mA	4.5	-	-	0.32	-	0.4	-	0.4	
Driver (54 Series)		$I_{OUT} = 5.1$ mA	4.5	-	-	0.32	-	0.4	-	0.4	
Input Leakage Current I_{IN}°	V_{CC} or Gnd.		6	-	$\pm 10^{-5}$	± 0.1	-	± 1	-	± 1	μA
3-State Leakage Current I_Z*	V_{IL} or V_{IH}	$V_{OUT} = V_{CC}$ or Gnd.	6	-	-	± 0.5	-	± 5	-	± 10	μA
Quiescent Device Current I_{CC}*											
SSI	V_{CC}	$I_{OUT} = 0$	7	-	-	2	-	20	-	40	μA
FF/Latches	or	$I_{OUT} = 0$	7	-	-	4	-	40	-	80	
MSI	Gnd.	$I_{OUT} = 0$	7	-	-	8	-	80	-	160	

* As applicable to device type.

° $I_{IN} = I_Z$ for bidirectional devices.

© IC MASTER 1983

STATIC ELECTRICAL CHARACTERISTICS for CD74HCU/CD54HCU Types

CHARACTERISTIC	TEST CONDITIONS V_{IN} V		V_{CC} V	CD74HCU/CD54HCU Series +25°C Min.	Typ.	Max.	CD74HCU Series −40/+85°C Min.	Max.	CD54HCU Series -55/+125°C Min.	Max.	UNITS
High-Level Input Voltage V_{IH}	-		4.5	3.6	-	-	3.6	-	3.6	-	V
			5.5	4.4	-	-	4.4	-	4.4		
Low-Level Input Voltage V_{IL}	-		4.5	-	-	0.9	-	0.9	-	0.9	V
			5.5	-	-	1.1	-	1.1	-	1.1	
High-Level Output Voltage V_{OH}*	V_{IL}										
CMOS Loads	or	$\lvert I_{OUT}\rvert \leq 20\ \mu A$	4.5	4	-	-	4	-	4	-	V
Standard Output	V_{IH}	$I_{OUT} = -4$ mA	4.5	3.8	-	-	3.7	-	3.5	-	
Low-Level Output Voltage V_{OL}*	V_{IL}										
CMOS Loads	or	$\lvert I_{OUT}\rvert \leq 20\ \mu A$	4.5	-	-	0.5	-	0.5	-	0.5	V
Standard (74 Series)	V_{IH}	$I_{OUT} = 4$ mA	4.5	-	-	0.32	-	0.4	-	0.4	
Output (54 Series)		$I_{OUT} = 3.4$ mA	4.5	-	-	0.32	-	0.4	-	0.4	
Input Leakage Current I_{IN}°	V_{CC} or Gnd.		6	-	$\pm 10^{-5}$	± 0.1	-	± 1	-	± 1	μA
Quiescent Device Current I_{CC}*											
SSI	V_{CC}	$I_{OUT} = 0$	7	-	-	2	-	20	-	40	μA
FF/Latches	or	$I_{OUT} = 0$	7	-	-	4	-	40	-	80	
MSI	Gnd.	$I_{OUT} = 0$	7	-	-	8	-	80	-	160	

* As applicable to device type.

° $I_{IN} = I_Z$ for bidirectional devices.

© IC MASTER 1983

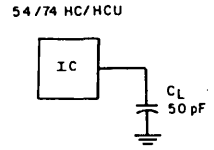
Dynamic Electrical Characteristics

Definitions

Characteristic	Symbol	Limits		Notes
		Max.	Min.	
Propagation Delay:				
Outputs going high to low	t_{PHL}	X		
Outputs going low to high	t_{PLH}	X		
Output Transition Time:				
Outputs going high to low	t_{THL}	X		
Outputs going low to high	t_{TLH}	X		
Pulse Width-Set, Reset, Preset Enable, Disable, Strobe, Clock	t_{WL} or t_{WH}		X	1
Clock Input Frequency	f_{CL}	X		1,2
Clock Input Rise and Fall Time	t_{rCL}, t_{fCL}	X		
Set-Up Time	t_{SU}		X	1
Hold Time	t_H		X	1
Removal Time - Set, Reset, Preset-Enable	t_{REM}		X	1
Three State Disable Delay Times:				
High level to high impedance	t_{PHZ}	X		
High impedance to low level	t_{PZL}	X		
Low level to high impedance	t_{PLZ}	X		
High impedance to high level	t_{PZH}	X		

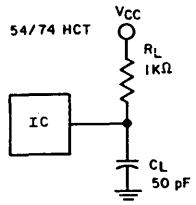
NOTE: (1) By placing a defining min. or max. in front of definition, the limits can change from min. to max., or vice versa.

(2) Clock input waveform should have a 50% duty cycle and be such as to cause the outputs to be switching from 10% V_{CC} to 90% V_{CC} in accordance with the device truth table.



92CS-35124

Test load for associated waveforms for 54/74 HC/HCU types.

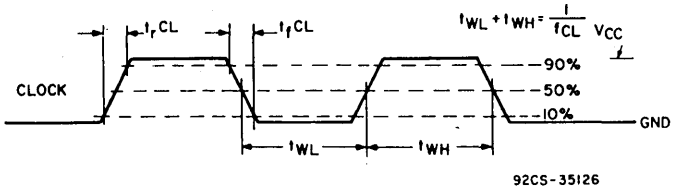


92CS-35125

Test load for associated waveforms for 54/74 HCT types.

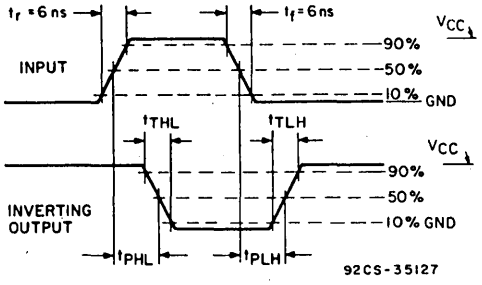
© IC MASTER 1983

Switching Waveforms for CD54/74HC and CD54/74HCU QMOS Integrated Circuits

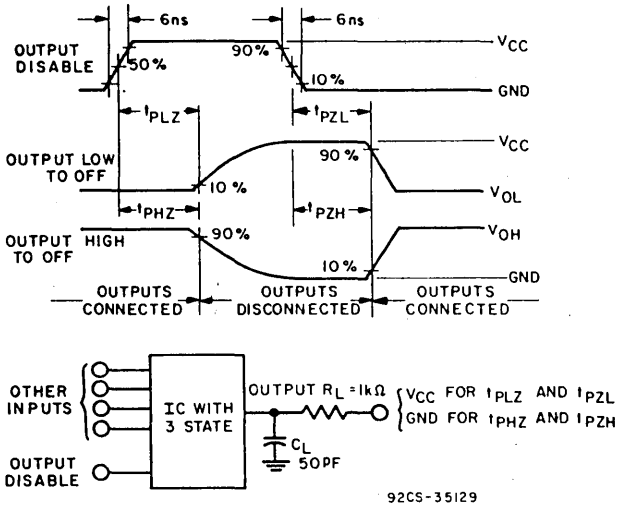


Outputs should be switching from 10% V_{CC} to 90% V_{CC} in accordance with device truth table.

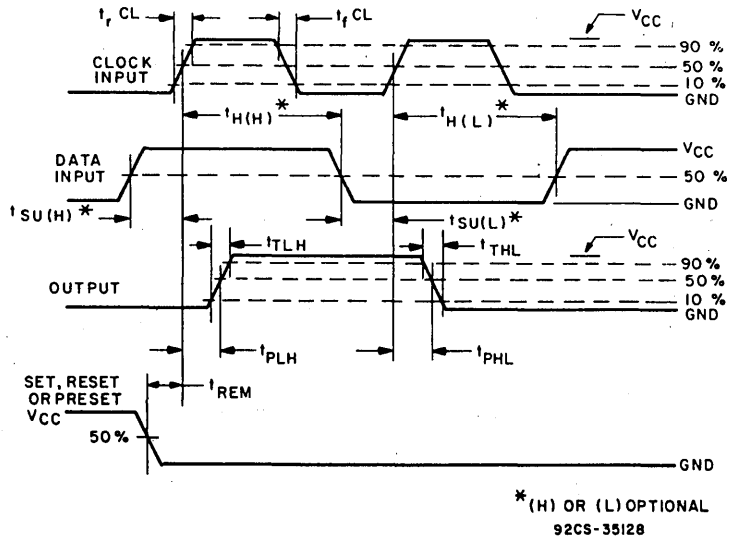
Clock-pulse rise and fall times and pulse width.



Transition times and propagation delay times, combination logic.



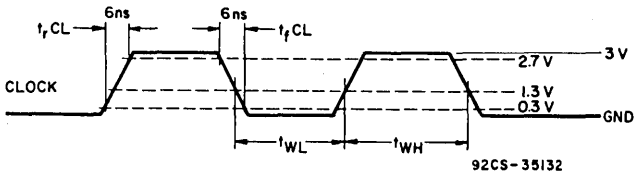
Three-state propagation delay wave shapes and test circuit.



Setup times, hold times, removal time, and propagation delay times for positive-edge triggered sequential logic circuits.

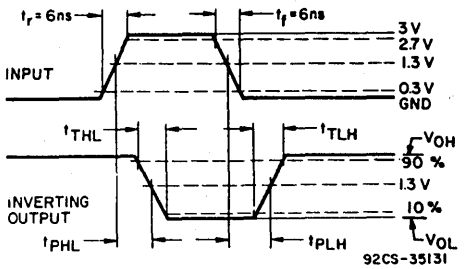
© IC MASTER 1983

Switching Waveforms for CD54/74HCT QMOS Integrated Circuits

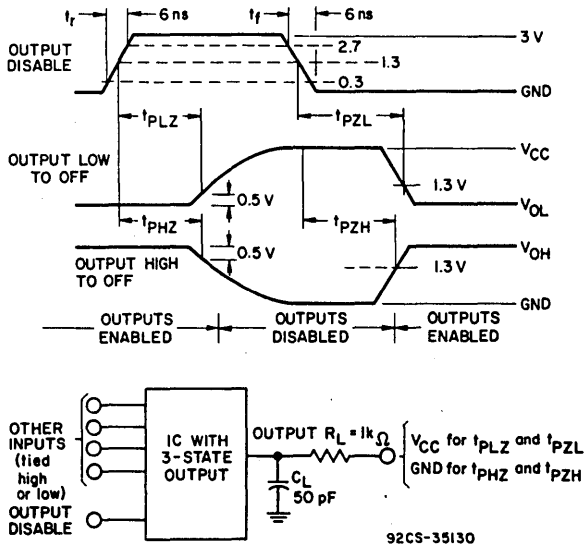


Outputs should be switching from 10% V_{CC} to 90% V_{CC} in accordance with device truth table.

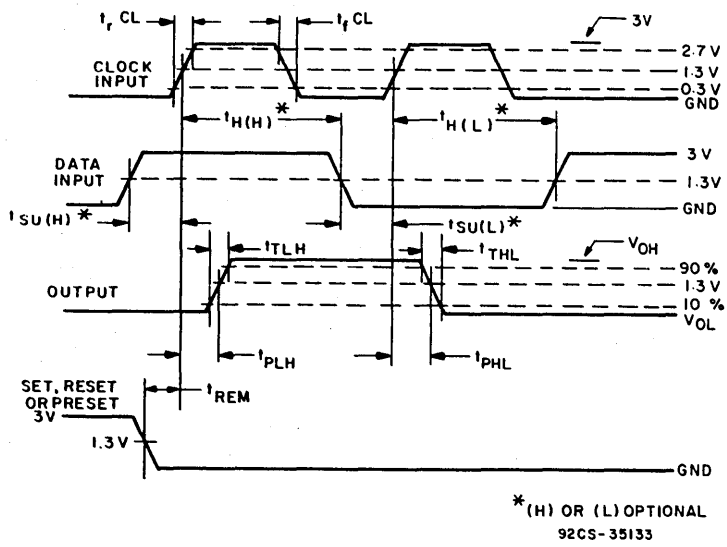
Clock-pulse rise and fall times and pulse width.



Transition times and propagation delay times, combination logic.



Three-state propagation delay wave shapes and test circuit.



Setup times, hold times, removal time, and propagation delay times for positive-edge triggered sequential logic circuits.

© IC MASTER 1983

RCA CD4000-Series CMOS ICs

Part No.	Function	Leads
CD4000A CD4000UB CD4000B	Dual 3-Input NOR Gate plus Inverter	14 14 14
CD4001A CD4001UB CD4001B	Quad 2-Input NOR Gate	14 14 14
CD4002A CD4002UB CD4002B	Dual 4-Input NOR Gate	14 14 14
CD4006A CD4006B	18-Bit Static Shift Register	14 14
CD4007A CD4007UB	Dual Complementary Pair plus Inverter	14 14
CD4008A CD4008B	4-Bit Full Adder	16 16
CD4009A CD4009UB	Hex Buffer/Converter (Inverting)	16 16
CD4010A CD4010B	Hex Buffer/Converter (Non-Inverting)	16 16
CD4011A CD4011UB CD4011B	Quad 2-Input NAND Gate	14 14 14
CD4012A CD4012UB CD4012B	Dual 4-Input NAND Gate	14 14 14
CD4013A CD4013B	Dual D Flip-Flop	14 14
CD4014A CD4014B	8-Bit Static Shift Register	16 16
CD4015A CD4015B	Dual 4-Bit Static Shift Register	16 16
CD4016A CD4016B	Quad Analog Switch/Quad Multiplexer	14 14
CD4017A CD4017B	Decade Counter Divider	16 16
CD4018A CD4018B	Presettable Divide-by-N-Counter	16 16
CD4019A CD4019B	Quad AND/OR Select Gate	16 16
CD4020A CD4020B	14-Bit Binary Counter	16 16
CD4021A CD4021B	8-Bit Static Shift Register	16 16
CD4022A CD4022B	Octal Counter Divider	16 16
CD4023A CD4023UB CD4023B	Triple 3-Input NAND Gate	14 14 14
CD4024A CD4024B	7-Stage Binary Counter	14 14
CD4025A CD4025UB CD4025B	Triple 3-Input NOR Gate	14 14 14
CD4026A CD4026B	7-Segment Decade Counter, Display Enable	16 16
CD4027A CD4027B	Dual J-K Flip-Flop	16 16
CD4028A CD4028B	BCD-to-Decimal Decoder	16 16
CD4029A CD4029B	4-Bit Presettable Up/Down Counter	16 16
CD4030A CD4030B	Quad Exclusive-OR Gate	14 14
CD4031A CD4031B	64-Stage Shift Register	16 16
CD4032A CD4032B	Triple Serial Adder Positive Logic	16 16
CD4033A CD4033B	7-Segment Decaded Counter/Blanking Ripple	16 16
CD4034A CD4034B	8-Bit Universal Register (3-State)	24 24

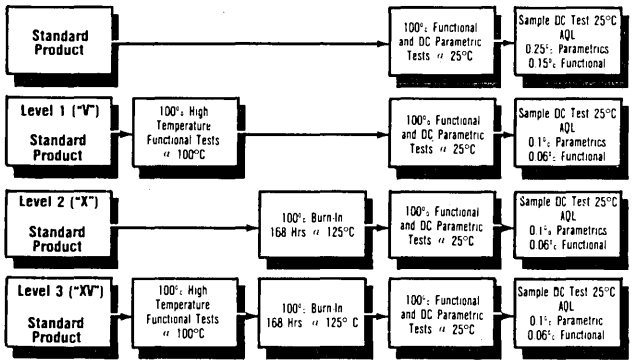
Part No.	Function	Leads
CD4035A CD4035B	4-Bit Universal Shift Register	16 16
CD4037A	Triple AND/OR Bi-Phase Pairs	14
CD4038A CD4038B	Triple Serial Adder Negative Logic	16 16
CD4040A CD4040B	12-Bit Binary Counter	16 16
CD4041A CD4041UB	Quad True/Complement Buffer	14 14
CD4042A CD4042B	Quad Clocked "D" Latch	16 16
CD4043A CD4043B	Quad NOR R-S Latch (3-State—	16 16
CD4044A CD4044B	Quad NAND R-S Latch (3-State)	16 16
CD4045A CD4045B	21-Stage Counter	14 14
CD4046A CD4046B	Phase-Locked Loop	16 16
CD4047A CD4047B	Monostable/Astable Multivibrator	14 14
CD4048A CD4048B	8-Input Multifunctional Gate (3-Stage)	16 16
CD4049A CD4049UB	Hex Inverter Buffer/Counter	16 16
CD4050A CD4050B	Hex Buffer/Converter	16 16
CD4051B	8-Channel Analog Multiplexer/Demult.	16
CD4052B	Dual 4-Channel Analog Multiplexer/Demult.	16
CD4053B	Triple 2-Channel Analog Multiplexer/Demult.	16
CD4054B	4-Segment Display Decoder/Driver	16
CD4055B	BCD to 7-Segment Decoder/Driver	16
CD4056B	BCD to 7-Segment Driver/Strobe/Latch	16
CD4059A	Programmable Divide-by-N Counter	24
CD4060A CD4060B	14-Stage Binary Counter/Divider/Oscillator	16 16
CD4063B	4-Bit Magnitude Comparator	16
CD4066A CD4066B	Quad Analog Switch	14 14
CD4067B	16-Channel Analog Multiplexer/Demult.	24
CD4068B	8-Input NAND/AND Gate	14
CD4069UB	Hex Inverter (Symmetrical Outputs)	14
CD4070B	Quad Exclusive OR Gate	14
CD4071B	Quad 2-Input OR Gate	14
CD4072B	Dual 4-Input OR Gate	14
CD4073B	Triple 3-Input AND Gate	14
CD4075B	Triple 3-Input OR Gate	14
CD4076B	Quad D-Type Register (3-State)	16
CD4077B	Quad Exclusive NOR Gate	14
CD4078B	8-Input NOR/OR Gate	14
CD4081B	Quad 2-Input AND Gate	14
CD4082B	Dual 4-Input AND Gate	14
CD4085B	Dual 2-Wide 2-Input AND/OR Invert Gate	14
CD4086B	Expandable 4-Wide 2-Input AND/OR Invert Gate	14
CD4089B	Binary Rate Multiplier	16
CD4093B	Quad 2-Input NAND Schmitt Trigger	14
CD4094B	8-Stage Shift & Store Bus Register	16
CD4095B	Gated Non-Inverting J-K Flip-Flop	14
CD4096B	Gated J-K Flip-Flop	14
CD4097B	Differential 8-Channel Analog Multiplexer/Demult.	24

© IC MASTER 1983

Part No.	Function	Leads
CD4098B	Dual Monostable Multivibrator	16
CD4099B	8-Bit Addressable Latch	16
CD40100B	32-Bit Left/Right 8-Stage Shift/Register	16
CD40101B	9-Bit Parity Generator/Checker	14
CD40102B	Presettable 2-Decade BCD Down Counter	16
CD40103B	Presettable 8-Bit Binary Down Counter	16
CD40104B	4-Bit Bidirectional Shift Register (3-State)	40
CD40105B	4x16 FIFO (3-State)	40
CD40106B	Hex Schmitt Trigger	14
CD40107B	Dual 2-Input NAND Buffer/Driver	8-14
CD40108B	4x4 Multiport Storage Registers (3-State)	24
CD40109B	Quad Low-to-High Voltage Interface (3-State)	16
CD40110B	Decade Up/Down Counter/Latch/Decoder/ Driver	16
CD40116B	8-Bit Bidirectional CMOS to TTL Level/ Converter	22
CD40117B	4-Bit Terminator	14
CD40147B	BCD Priority Encoder 10 to 4 Line	16
CD40174B	Hex "D" Flip-Flop	16
CD40175B	Quad "D" Flip-Flop	16
CD40160B	Decade Counter (Asynchronous Clear)	16
CD40161B	Binary Counter (Asynchronous Clear)	16
CD40162B	Decade Counter (Synchronous Clear)	16
CD40163B	Binary Counter (Synchronous Clear)	16
CD40181B	4-Bit Arithmetic Logic Unit	24
CD40182B	Lock-Ahead-Carry Generator	16
CD40192B	Presettable 4-Bit BCD Up/Down Counter	16
CD40193B	Presettable 4-Bit Binary Up/Down Counter	16
CD40194B	4-Bit Universal Bidirectional Shift Register	16
CD40208B	4x4 Multiport Storage Register (3-State)	24
CD40257B	Quad 2-Line-to-1-Line Multiplexer (3-State)	16
CD4502B	Strobed Hex Inverted/Buffer (3-State)	16
CD4503B	Hex 3-State Buffer (3-State)	16
CD4508B	Dual 4-Bit Latch	24
CD4510B	BCD Up/Down Counter	16
CD4511B	BCD-to-7-Segment Latch/Decoder/Driver	16
CD4512B	8-Channel Data Selector (3-State)	16

Part No.	Function	Leads
CD4514B	4-Bit Latch/4-to-16 Line Decoder (High)	24
CD4515B	4-Bit Latch/4-to-16 Line Decoder (Low)	24
CD4516B	Binary Up/Down Counter	16
CD4517B	Dual 64-Bit Static Shift Register	16
CD4518B	Dual BCD Up Counter	16
CD4520B	Dual Binary Up Counter	16
CD4527B	BCD Rate Multiplier	16
CD4532B	8-Bit Priority Encoder	16
CD4536B	Programmable Timer	16
CD4541B	Programmable Oscillator-Timer	14
CD4543B	BCD-to-7-Segment Latch/Decoder/Driver	16
CD4555B	Dual Binary to 1-of-4 Decoder/Demux	16
CD4556B	Dual Binary to 1-of-4 Decoder (Inverting)	16
CD4585B	4-Bit Magnitude Comparator	16
CD4724B	8-Bit Addressable Latch	16
CD22100	4x4 Crosspoint Switch with Control Memory	16
CD22101	4x4x2 Crosspoint Switch with Control Memory	24
CD22103	HDB-3 Ditital Transcoder	16
CD22104	28-Segment LCD Decoder/Driver Hexadecimal Display	40
CD22104A	28-Segment LCD Decoder/Driver Decimal Display	40
CD22105	28-Segment LCD Decoder/Driver Hexadecimal Display	40
CD22105A	28-Segment LCD Decoder/Driver Decimal	40
CD22301	T-1 Repeater	16
***CD22404**	CODEC A-Law	24
***CD22406**	CODEC Full Feature	28
***CD22407**	CODEC μ-Law	24
***CD22413**	Filter Bandpass Low Pass Transmit Receive	16
***CD22414**	Filter Low Pass Transmit Receive	16
***CD22416**	TSAC	16
***CD22417**	TSAC	18
***CD22418**	TSAC	22
***CD22419**	SLIC	18
CD22859	DTMF Touch-Tone Encoder	16

3-Level Extra Value Program



© IC MASTER 1983

CD40116

Preliminary Data

COS/MOS High-Speed 8-Bit Bidirectional CMOS/TTL Interface Level Converter

The RCA-CD40116 is a high-speed 8-bit integrated circuit designed to interface CMOS logic levels with TTL logic levels on the data bus of microprocessor-based systems. CMOS/TTL interface is provided by eight parallel bidirectional buffer/level converters. Buffer INPUT/OUTPUT terminals are either inputs or outputs depending on the desired direction of data flow.

A low level on the DISABLE input with the ENABLE input either high or low, permits conversion of CMOS inputs to TTL outputs. A high level on both the DISABLE and ENABLE inputs permits data flow from TTL inputs to CMOS outputs. A low level on the ENABLE input and a high level on the DISABLE input sets both inputs/outputs to the high-impedance state.

The TTL Input/Output terminals and the ENABLE and DISABLE control inputs are TTL-compatible without the use of external pull-up resistors. The TTL input logic 0 to logic 1 transition occurs at a level of approximately 1.5 volts. The ENABLE and DISABLE inputs may be driven to the V_{DD} rail; therefore, either TTL or CMOS logic drivers, capable of sinking one TTL load, may be used to determine the direction of data flow. The large CMOS and TTL output buffers in this device have high output sink and source current capability and can drive the data bus capacitance with a transition time of approximately 0.25 ns/pF. This fast output transition time, together with the small propagation delay time of the device, allow high-speed operation.

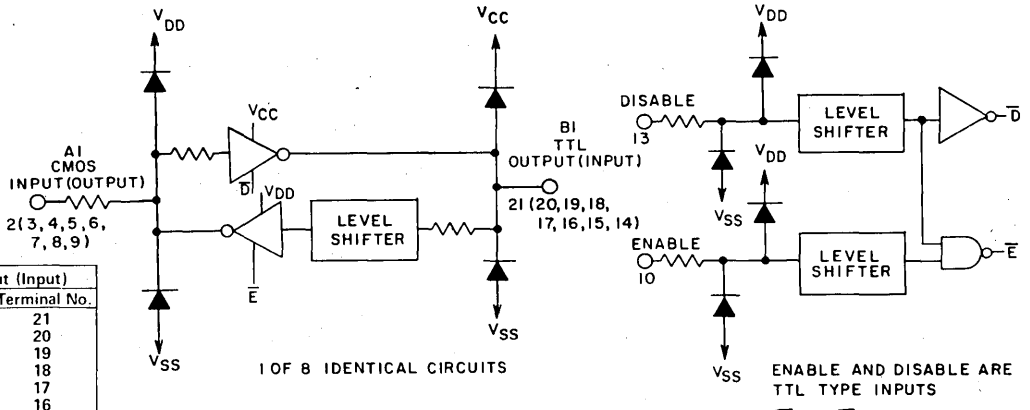
The CD40116 is supplied in a 22-lead hermetic dual-in-line ceramic package (D suffix) and a 22-lead dual-in-line plastic package (E suffix).

Features:

- **Eight inverting channels with conversion from V_{DD} to V_{CC} or V_{CC} to V_{DD} ($4\ V \leq V_{DD} \leq 12\ V$ and $4\ V \leq V_{CC} \leq V_{DD}$)**
- **Three operating modes:**
  CMOS-to-TTL level conversion
  TTL-to-CMOS level conversion
  Interface off; high-impedance on both sides
- **Low propagation delay time:**
  CMOS-to-TTL conversion — 15 ns typ.
  TTL-to-CMOS conversion — 30 ns typ.
  (V_{DD} = 12 V, V_{CC} = 5 V)
- **High TTL sink current — 11 mA typ.**
- **No external TTL input pull-up resistors required**
- **High speed drive of large data bus capacitances**
- **Input/output and power supply terminals located for ease of PC board layout**

Applications:

- **Interface CMOS microprocessor with TTL memories and peripheral devices**
- **Interface between and within logic systems which combine CMOS and TTL devices**



Input (Output)		Output (Input)	
Data	Terminal No.	Data	Terminal No.
A1	2	B1	21
A2	3	B2	20
A3	4	B3	19
A4	5	B4	18
A5	6	B5	17
A6	7	B6	16
A7	8	B7	15
A8	9	B8	14

Fig. 1—Functional block diagram.

© IC MASTER 1983

CD40116

STATIC CHARACTERISTICS at T_A = 25°C, V_{DD} = 12 V, V_{CC} = 5 V

CHARACTERISTIC		TEST CONDITIONS	TYPICAL VALUES	UNITS
Quiescent Device Current,		ENABLE = 1	1	mA
From V_{DD} Supply,	I_{DD}	ENABLE = 0	200	μA
From V_{CC} Supply,	I_{CC}		5	μA
Data Flow — CMOS Inputs to TTL Outputs				
Input Current,	I_{IN}	V_{IN} = 0,12 V; Any CMOS input	±5	μA
Output Current,	I_{OH}	V_{OH} = 3 V, V_{IL} = 2 V	−12	mA
	I_{OL}	V_{OL} = 0.4 V, V_{IH} = 10 V	11	
TTL 3-State Output Leakage		ENABLE = 1	−250	
Current	I_{OUT}	ENABLE = 0	±5	μA
Data Flow — TTL Inputs to CMOS Outputs				
Input Current,	I_{IL}	V_{IL} = 0 to 0.7 V; Any TTL input	−250	μA
	I_{IH}	V_{IH} = 2.3 V; Any TTL input	−150	
Output Current,	I_{OH}	V_{OH} = 11.5 V, V_{IL} = 0.7 V	−6.5	mA
	I_{OL}	V_{OL} = 0.5 V, V_{IH} = 2.3 V	6.5	
CMOS 3-State Output Leakage Current,	I_{OUT}	V_O = 0,12 V, V_{IN} = 0,5 V	±5	μA
Enable and Disable Inputs				
Input Current,	I_{IL}	V_{IL} = 0 to 0.7 V	−250	μA
	I_{IH}	V_{IH} = 2.3 V (TTL)	−150	
	I_{IH}	V_{IH} = 12 V (CMOS)	5	

DYNAMIC ELECTRICAL CHARACTERISTICS At T_A = 25°C, V_{DD} = 12 V, V_{CC} = 5 V

CHARACTERISTIC	TEST CONDITIONS		TYPICAL VALUES		UNITS
	INPUT	OUTPUT	C_L = 50 pF	C_L = 200 pF	
Propagation Delay Times, Data-In to Data-Out,	CMOS	TTL	15	35	ns
t_{PHL}, t_{PLH}	TTL	CMOS	30	50	
Enable or Disable to Data-Out, t_{PHZ}, t_{PZH}, t_{PLZ}, t_{PZL}			30		ns
Transistion Time,	CMOS	TTL	20	55	ns
t_{THL}, t_{TLH}	TTL	CMOS	20	55	

TRUTH TABLE

ENABLE	DISABLE	FUNCTION
X	0	Convert CMOS Level to TTL Level
1	1	Convert TTL Level to CMOS Level
0	1	High Impedance (Z)

0 = Low Level 1 = High Level X = Don't Care

Z = High Impedance on both CMOS and TTL sides.

See Operating and Handling Considerations — Bypassing and Unused Inputs.

© IC MASTER 1983

CD40117B Types Programmable Dual 4-Bit Terminator

Preliminary Data

High-Voltage Types (20-Volt Rating)

The RCA-CD40117B Programmable Terminator consists of two 4-bit Terminators that are capable of terminating a data bus to a high or low logic state. They can also terminate any open or unused CMOS logic input to the last driven logic state when used with a 3-state logic, or during a power down condition. The Terminator reduces power consumption by eliminating pull-up or pull-down resistors and may be beneficial in improving board density. It also performs SET or RESET functions for CMOS logic inputs when the STROBE input is high and the DATA input is high or low respectively. When the STROBE input is held low, the terminated input/output lathes the last DATA input until the terminated input/output changes state. This device functions as an 8-bit terminator when the DATA inputs are connected together and the STROBE inputs are connected togther. The CD40117B types are supplied in 14-lead hermetic dual-in-line ceramic packages (D and F suffixes), and 14 lead dual-in-line plastic packages (E suffix).

Features:

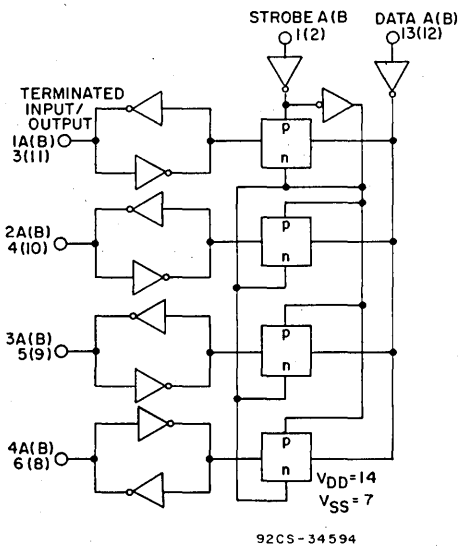
- *One standard "B" output will drive eight terminator circuits.*
- *Will terminate a CMOS data bus with up to 40 B-series inputs or 3-state outputs connected at V_{DD} of 5V.*
- *Input terminals protected by standard "B" series ESD protection network.*
- *Preserves final logic state.*
- *Does not consistently go to logic 1 or 0.*
- *Output after switching is closer to V_{DD} or V_{SS} rail than with a resistor.*
- *Requires only one solder connection.*
- *Open circuited terminators not used will not affect performance.*
- *Can be connected to any CMOS I/O line.*
- *Draws only quiescent current when logic state is changing.*
- *Can be preset.*

TRUTH TABLE

Strobe	Data	1A (B)	2A (B)	3A (B)	4A (B)
1	0	0	0	0	0
1	1	1	1	1	1
0	X	*	*	*	*

1 = high, 0 = low, X = Don't Care

*Terminator retains last data state during strobe if its inputs are in high Z state. If inputs are not in high Z state, then terminator follows the last driver state, (1 or 0) on its input/output.



FUNCTIONAL DIAGRAM

© IC MASTER 1983

CD22100 Types

CMOS 4 x 4 Crosspoint Switch with Control Memory

The RCA-CD22100 combines a 4 x 4 array of crosspoints (transmission gates) with a 4-line-to-16-line decoder and 16 latch circuits. Any one of the sixteen transmission gates (crosspoints) can be selected by applying the appropriate four line address. The selected transmission gate can be turned on or off by applying a logical one or zero, respectively, to the data input and strobing the strobe input to a logical one. Any number of the transmission gates can be ON simultaneously. When the device is "powered up", the states of the 16 switches are indeterminate. Therefore, all switches must be turned off by putting the strobe high and data-in low, then addressing all switches in succession.

The CD22100 is supplied in 16-lead hermetic dual-in-line ceramic packages (D and F suffixes), 16-lead dual-in-line plastic packages (E suffix), and in chip form (H suffix).

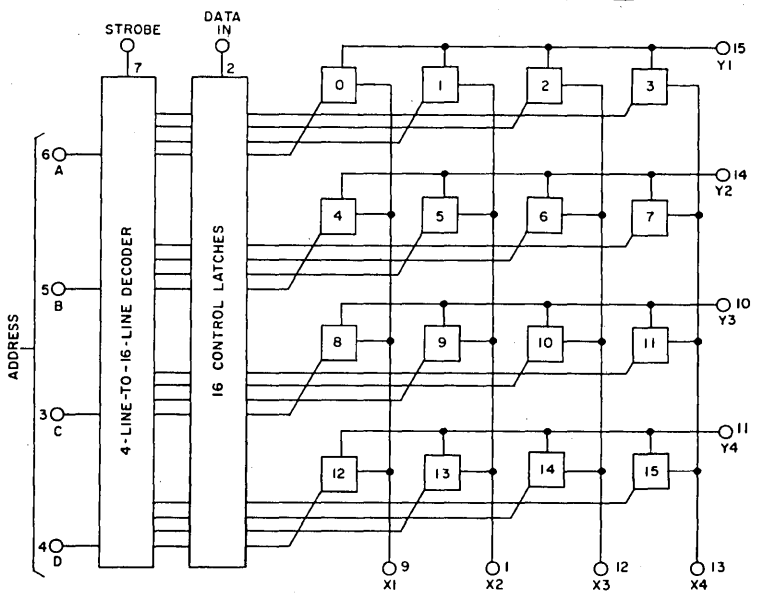


Fig. 1 – Functional diagram.

92CM-27346R1

Features:

- Low ON resistance – 75 Ω typ. at V_{DD} = 12 V
- "Built-in" control latches
- Large analog signal capability – ± $V_{DD}/2$
- 10-MHz switch bandwidth
- Matched switch characteristics ΔR_{ON} = 18Ω typ. at V_{DD} = 12 V
- High linearity – 0.5% distortion (typ.) at f = 1 kHz, V_{IN} = 5 V_{p-p}, V_{DD} = 10 V, and R_L = 1 kΩ
- Standard COS/MOS noise immunity
- 100% tested for maximum quiescent current at 20 V

STATIC ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	CONDITIONS			LIMITS at Indicated Temperature (°C) Values at –55,+25,+125,apply to D,F,H pkg Values at –40,+25,+85,apply to E pkg							Units
		V_{IN} (V)	V_{DD} (V)	–55	–40	+85	+125	+25 Min.	+25 Typ.	+25 Max.	
CROSSPOINTS											
Quiescent Device Current, I_{DD} Max.		–	5	5	5	150	150	–	0.04	5	μA
		–	10	10	10	300	300	–	0.04	10	
		–	15	20	20	600	600	–	0.04	20	
		–	20	100	100	3000	3000	–	0.08	100	
ON Resistance R_{ON} Max.	Any Switch V_{IS} = 0 to V_{DD}	–	5	450	1000	1440	1625	–	225	1250	Ω
		–	10	135	145	205	230	–	85	180	
		–	12	100	110	155	175	–	75	135	
		–	15	70	75	110	125	–	65	95	
ΔON Resistance, ΔR_{ON}	Between any two switches	–	5	–	–	–	–	–	35	–	Ω
		–	10	–	–	–	–	–	20	–	
		–	12	–	–	–	–	–	18	–	
		–	15	–	–	–	–	–	15	–	
OFF Switch Leakage Current I_L Max.	All switches OFF	0,18	18	±100		±1000		–	±1	±100*	nA

* Determined by minimum feasible leakage measurement for automatic testing.

© IC MASTER 1983

CD22101, CD22102 Types

CMOS 4 x 4 x 2 Crosspoint Switches With Control Memory

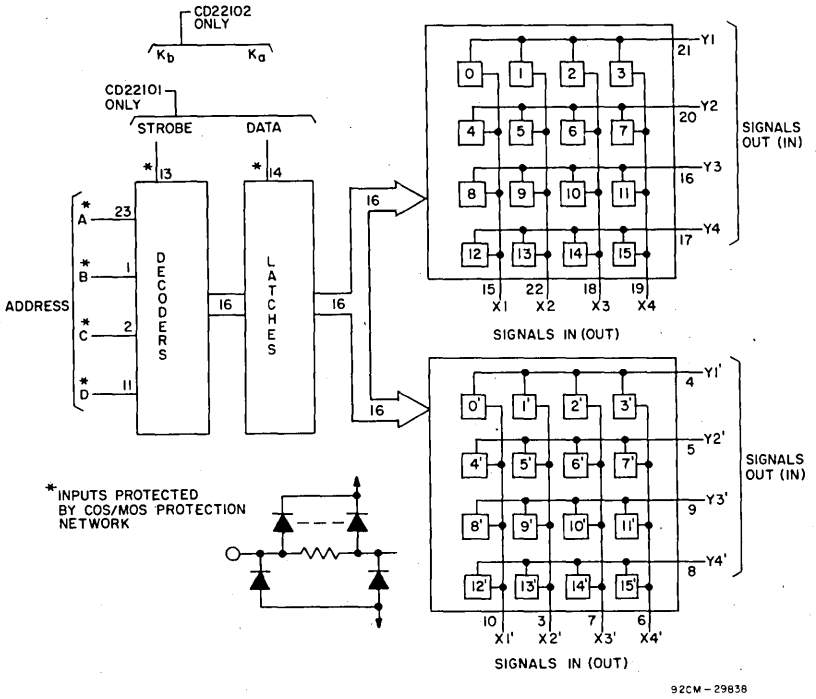


Fig. 1 — Functional block diagram.

Features:

- **Low ON resistance — 75 Ω typ. at V_{DD} + 12 V**
- **"Built-in" latched inputs**
- **Large analog signal capability — ± $V_{DD}/2$**
- **10 MHz switch bandwidth**
- **Matched switch characteristics ΔR_{ON} = 8 Ω typ. at V_{DD} = 12 V**
- **High linearity — 0.25% distortion (typ.) at f = 1 kHz, $V_{IN} = 5V_{p-p}$, $V_{DD} - V_{SS}$ = 10 V, and R_l = 1 kΩ**
- **Standard COS/MOS noise immunity**

Applications:

- **Telephone systems**
- **PBX**
- **Studio audio switching**
- **Multisystem bus interconnect**

The RCA-CD22101 and CD22102 crosspoint switches consist of 4 x 4 x 2 arrays of crosspoints (transmission gates), 4-line to 16-line decoders, and 16 latch circuits. Any one of the sixteen crosspoint pairs can be selected by applying the appropriate four-line address, and any number of crosspoints can be ON simultaneously. Corresponding crosspoints in each array are turned on and off simultaneously, also.

In the CD22101, the selected crosspoint pair can be turned on or off by applying a logical ONE or ZERO, respectively, to the data input, and applying a ONE to the strobe input. When the device is "powered up", the states of the 16 switches are indeterminate. Therefore, all switches must be turned off by putting the strobe high, data-in low, and then addressing all switches in succession.

The selected pair of crosspoints in the CD22102 is turned on by applying a logical ONE to the K_a (set) input while a logical ZERO is on the K_b input, and turned off by applying a logical ONE to the K_b (reset) input while a logical ZERO is on the K_a input. In this respect, the control latches of the CD22102 are similar to SET/RESET flip-flops. They differ, however, in that the simultaneous application of ONEs to the K_a and K_b inputs turns off (resets) all crosspoints. All crosspoints in both devices must be turned off as V_{DD} is applied.

The CD22101 and CD22102 types are supplied in 24-lead hermetic dual-in-line ceramic packages (D and F suffixes), 24-lead dual-in-line plastic packages (E suffix), and in chip form (H suffix).

RECOMMENDED OPERATING CONDITIONS

For maximum reliability, nominal operating conditions should be selected so that operation is always within the following ranges:

CHARACTERISTIC	LIMITS		UNITS
	Min.	Max.	
Supply-Voltage Range (For T_A = Full Package-Temperature Range)	3	18	V

© IC MASTER 1983

STATIC ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	CONDITIONS			LIMITS at Indicated Temperature (°C) Values at −55,+25,+125,apply to D,F,H pkg Values at −40,+25,+85,apply to E pkg							Units
		V_{IS} (V)	V_{DD} (V)	−55	−40	+85	+125	+25 Min.	+25 Typ.	+25 Max.	
CROSSPOINTS											
Quiescent Device Current, I_{DD} Max.		–	5	5	5	150	150	–	0.04	5	μA
		–	10	10	10	300	300	–	0.04	10	
		–	15	20	20	600	600	–	0.04	20	
		–	20	100	100	3000	3000	–	0.08	100	
ON Resistance R_{ON} Max.	Any Switch V_{IS} = 0 to V_{DD}	–	5	475	500	725	800	–	225	600	Ω
		–	10	135	145	205	230	–	85	180	
		–	12	100	110	155	175	–	75	135	
		–	15	70	75	110	125	–	65	95	
ΔON Resistance, ΔR_{ON}	Between any two switches	–	5	–	–	–	–	–	25	–	Ω
		–	10	–	–	–	–	–	10	–	
		–	12	–	–	–	–	–	8	–	
		–	15	–	–	–	–	–	5	–	
OFF Leakage Current I_L Max.	All switches OFF	0,18	18	±1000				–	±1	±100*	nA
CONTROLS											
Input Low Voltage V_{IL} Max.	OFF switch I_L <0.2 μA; ON switch see R_{ON} characteristic	–	5	1.5				–	–	1.5	V
		–	10	3				–	–	3	
		–	15	4				–	–	4	
Input High Voltage, V_{IH} Min.		–	5	3.5				3.5	–	–	
		–	10	7				7	–	–	
		–	15	11				11	–	–	
Input Current, I_{IN} Max.	Any control	0,18	18	±0.1	±0.1	±1	±1	–	$\pm 10^{-5}$	±0.1	μA

* Determined by minimum feasible leakage measurement for automatic testing.

DECODER TRUTH TABLE

Address				Select	Address				Select
A	B	C	D		A	B	C	D	
0	0	0	0	X1Y1 & X1′Y1′	0	0	0	1	X1Y3 & X1′Y3′
1	0	0	0	X2Y1 & X2′Y1′	1	0	0	1	X2Y3 & X2′Y3′
0	1	0	0	X3Y1 & X3′Y1′	0	1	0	1	X3Y3 & X3′Y3′
1	1	0	0	X4Y1 & X4′Y1′	1	1	0	1	X4Y3 & X4′Y3′
0	0	1	0	X1Y2 & X1′Y2′	0	0	1	1	X1Y4 & X1′Y4′
1	0	1	0	X2Y2 & X2′Y2′	1	0	1	1	X2Y4 & X2′Y4′
0	1	1	0	X3Y2 & X3′Y2′	0	1	1	1	X3Y4 & X3′Y4′
1	1	1	0	X4Y2 & X4′Y2′	1	1	1	1	X4Y4 & X4′Y4′

© IC MASTER 1983

CD22103

Preliminary Data

COS/MOS HDB3 (High Density Bipolar 3) Transcoder for 2.048 Mb/s Transmission Applications

Features:

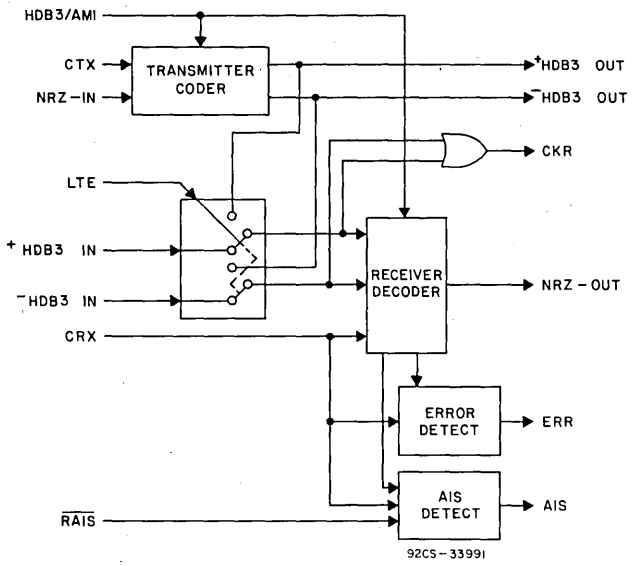
- *HDB3 coding and decoding for data rates from 10 Kb/s to 2.1 Mb/s in a manner consistent with CCITT 6703 recommendations.*
- *HDB3/AMI transmission coding/reception decoding with code error detection is performed in independent coder and decoder sections.*
- *All transmitter and receiver inputs/outputs are TTL compatible.*
- *Internal Loop Test capability.*

The RCA CD22103 is an LSI SOS integrated circuit which performs the HDB3 transmission coding and reception decoding functions with error detection. It is used in 2.048 Mb/s transmission applications. The CD-22103 performs HDB3 coding and decoding for data rates from 10 Kb/s to 2.1 Mb/s in a manner consistent with CCITT G703 recommendations.

HDB3 transmission coding/reception decoding with code error detection is performed in independent code and decoder sections. All transmitter and receiver inputs/outputs are TTL compatible.

The HDB3 transmitter coder codes are NRZ binary unipolar input signal (NRZ-In) and a synchronous transmission clock (CTX) into two HDB3 binary unipolar RZ output signals ($^{+}$HDB3 OUT, $^{-}$HDB3 OUT). The TTL compatible output signals $^{+}$HDB3 OUT, $^{-}$HDB3 OUT are externally mixed to generate ternary bipolar HDB3 signals for driving transmission lines.

HDB3 reception decoding is performed on ternary bipolar HBD3 signals which have been externally split to provide binary unipolar receiver input signals, ($^{+}$HDB3 IN, $^{-}$HDB3 IN), and a synchronous receiver clock signal, (CRX) into binary unipolar NRZ signals (NRZ - Out).



Block diagram of the CD22103.

STATIC ELECTRICAL CHARACTERISTICS

CHARACTERISTIC		LIMITS Min.	LIMITS Typ.	LIMITS Max.	UNITS
Quiescent Device Current	I_{DD}	—	—	10	μA
Operating Device Current f_{CL} = 2.1 MHz		—	—	8	mA
HDB3 Output Low (Sink) Current (V_{OL} = 0.5 V)	I_{OL1}	1.6	—	—	
HDB3 Output High (Source) Current (V_{OH} = 2.8 V)	I_{OH1}	-10	—	—	
All Other Outputs Low (Sink) Current (V_{OL} = 0.5 V)	I_{OL2}	1.6	—	—	
All Other Outputs High (Source) Current (V_{OL} = 2.8 V)	I_{OH2}	-1.6	—	—	
Input Low Current	I_{IL}	—	—	-100	nA
Input High Current	I_{IH}	—	—	100	
Input Low Voltage (Max.)	V_{IL}	—	—	0.8	V
Input High Voltage (Min.)	V_{IH}	2	—	—	
Input Capacitance	C_{IN}	5	—	—	pF

© IC MASTER 1983

CD22301

PCM Line Repeater

Preliminary Data

Features:

- *Automatic line buildout*
- *5.1 V supply voltage*
- *Buffered output*

Applications:

- *T1 1.544 Mbits/s bipolar carrier system*
- *T148 2.37 Mbits/s ternary carrier system*

The RCA-CD22301 monolithic PCM repeater circuit is designed for T1 carrier systems operating with a bipolar pulse train of 1.544 Mbits/s. It can also be used in the T148 carrier system operating with a ternary pulse train of 2.37 Mbits/s. The circuit operates from a 5.1 V ± 5 % externally regulated supply.

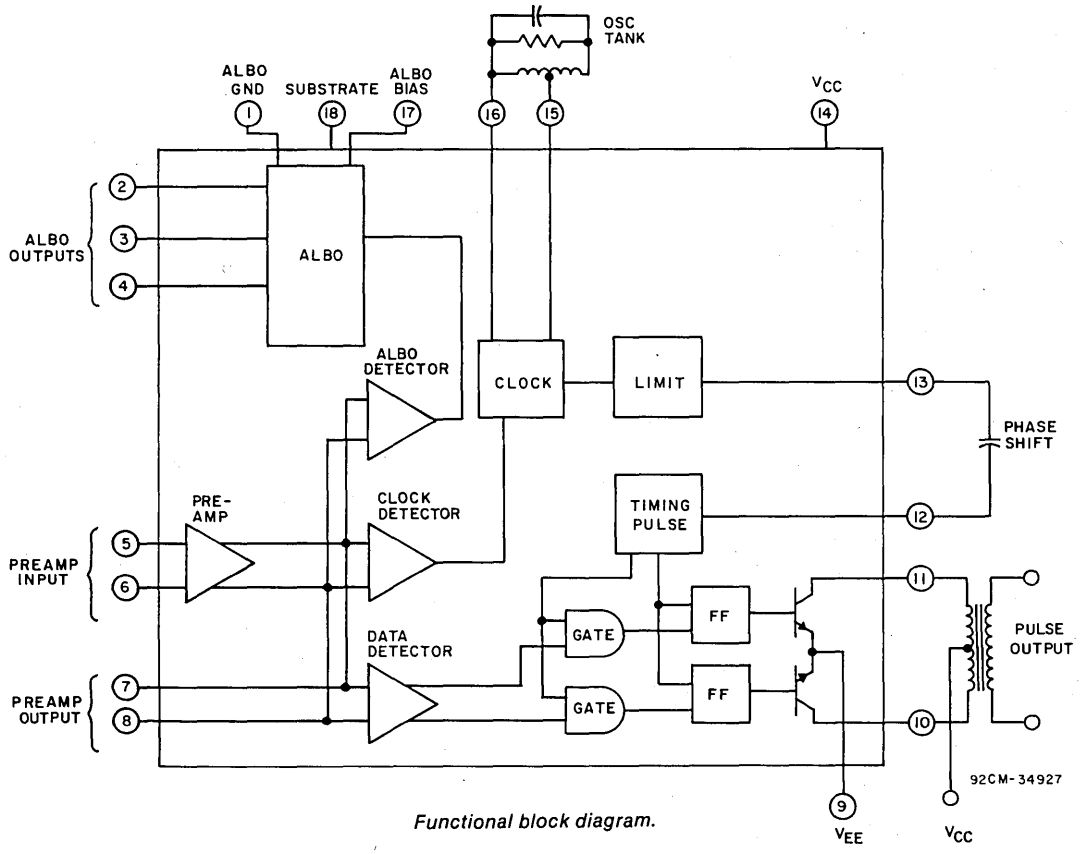
The CD22301 provides active circuitry to perform all functions of signal equalization and amplification, automatic line buildout (ALBO), threshold detection, clock extraction, pulse timing, and buffered output formation.

The CD22301 is supplied in an 18-lead dual-in-line plastic package (E suffix).

STATIC ELECTRICAL CHARACTERISTICS

T_A = 25°C, V_{CC} = 5.1 V ± 5%

CHARACTERISTIC	LIMITS			UNITS
	Min.	Typ.	Max.	
DC VOLTAGES				
Pins 2, 3, 4 and 17	—	0	0.1	V
Pins 5, 6, 7 and 8	2.4	2.9	3.4	V
Pins 10 and 11	—	5.1	—	V
Pins 12, 13, 15 and 16	3.1	3.6	4.1	V
DC CURRENTS				
Pin 14	—	22	30	mA
Pins 10 and 11	—	0	100	μA



Functional block diagram.

© IC MASTER 1983

CD22859 Types

Preliminary

CMOS Dual-Tone Multifrequency Tone Generator

For Use in Dual-Tone Telephone Dialing Systems

Features

- *Mute drivers on chip*
- *Device power can either be regulated dc or telephone loop current*
- *Use of an inexpensive 3.579545-MHz TV crystal provides high accuracy and stability for all frequencies*

General Description

The RCA-CD22859 is a CMOS dual-tone multifrequency (DTMF) tone generator for use in dual-tone telephone dialing systems. The device can easily be interfaced to a standard pushbutton telephone keyboard, to provide enabling operation directly with the telephone lines.

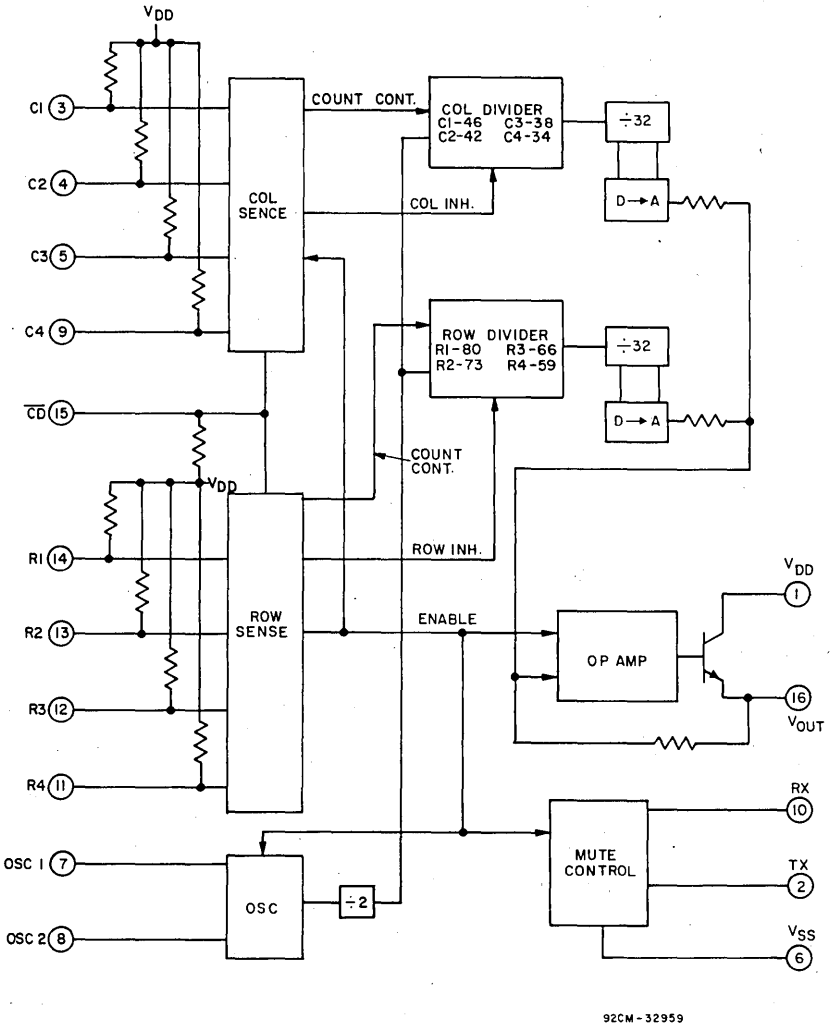
The CD22859 generates standard DTMF sinusoidal dialing tones from an on-chip reference crystal oscillator. The reference oscillator uses an inexpensive 3.579545-MHz color TV crystal to create highly stable and accurate tones. The sinusoidal tones are digitally synthesized by a stair-step approximation.

One of four low-frequency band row tones and one of four high-frequency band column tones are selected by driving one of the four row inputs and one of the four column inputs low. Simultaneous selection of more than one row input and/or more than one column input will inhibit tone generation, or generate a single-tone sinusoid. These operating modes are described in the functional truth table.

Control logic is included to allow easy interface to standard K500-type telephones. Two CMOS outputs Tx, Rx, capable of driving external p-n-p receiver and transmitter muting transistors are provided. A low input to the CD pin, inhibits tone generation, turns off the reference oscillator, and causes Tx and Rx outputs to logic '0'. During tone generation mode, $\overline{CD} = 1$ and Tx, Rx = logic 1.

All row, column, and $\overline{CD}$ inputs are provided with pull-up resistors to allow the use of SPST switch matrixes.

The CD22859 types are supplied in a 16-lead hermetic dual-in-line side-brazed ceramic package (D suffix), and a 16-lead dual-in-line plastic package (E suffix), and in chip form (H suffix).



TOUCH-TONE GENERATOR

© IC MASTER 1983

CD22859 Types

STATIC ELECTRICAL CHARACTERISTICS at $T_A = -25°C$ to $+60°C$

CHARACTERISTIC	V_{DD} (V)	V_O (V)	LIMITS		UNITS
			Min.	Max.	
Tone Outputs ($R_L = 82$)					
V_O; Dual-Tone Output	3.7-9.3		350	700	mV rms
$V_O(C_L)$; Single-Tone Output, Column*	3.7-9.3		300	—	mV rms
$V_O(R_L)$; Single-Tone Output, Row**	3.7-9.3		260	—	mV rms
Distortion (Note 1)	3.9-9.3		—	10	%
Rise and Fall Time (Dual-Tone Out) (Note 2)	3.9-9.3		—	5	ms
Pre-Emphasis (Note 3)	3.9-9.3		1	3	dB
Output Frequency (Note 4)	3.9-9.3		(Nom. − 1%)	(Nom. + 1%)	Hz
Mute Output Current					
Transmitter					
I_{OH} (Source)	1.7	1.2	−0.5	—	mA
	10	9.5	−3.4	—	
I_{OL} (Sink)	10	2.5	—	10	μA
Receiver					
I_{OH} (Source)	1.7	1.2	−0.5	—	mA
	10	9.5	−3.4	—	
I_{OL} (Sink)	10	2.5	—	10	μA

*Two or more row inputs low, and one column input low.

**Two or more column inputs low, and one row input low.

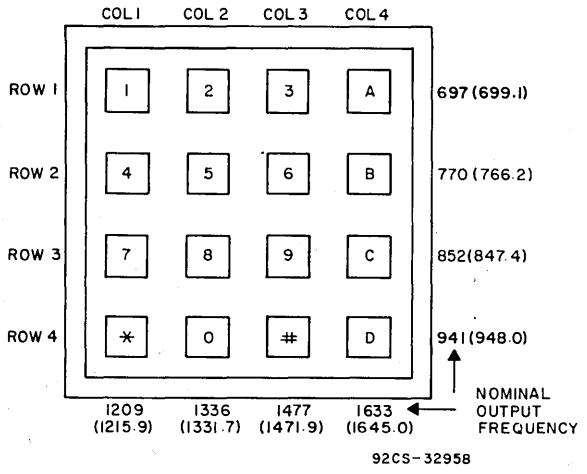
Notes:

1. Distortion is defined as: The ratio of all extraneous frequency components generated in the voiceband 0.5 kHz to 3 kHz, to the power of the dual-tone signal, measure across R_L.

$$= \frac{(V_1^2 + V_2^2 = \ldots + V_n^2)}{V_L^2 + V_H^2}$$

where $V_1, V_2, \ldots V_n$ are extraneous frequency components in the voiceband 0.5 kHz to 3 kHz, V_L is the low-band frequency tone, and V_H is the high-band frequency tone.

2. Tone rise time is defined as the time for each of the 2 DTMF frequencies to attain 90% of full amplitude, measured from the time when a row and column signal are driven low.
3. Pre-emphasis is the ratio of the high-group level to the low-group level.
4. Refer to Fig. 1 for standard DTMF frequencies.



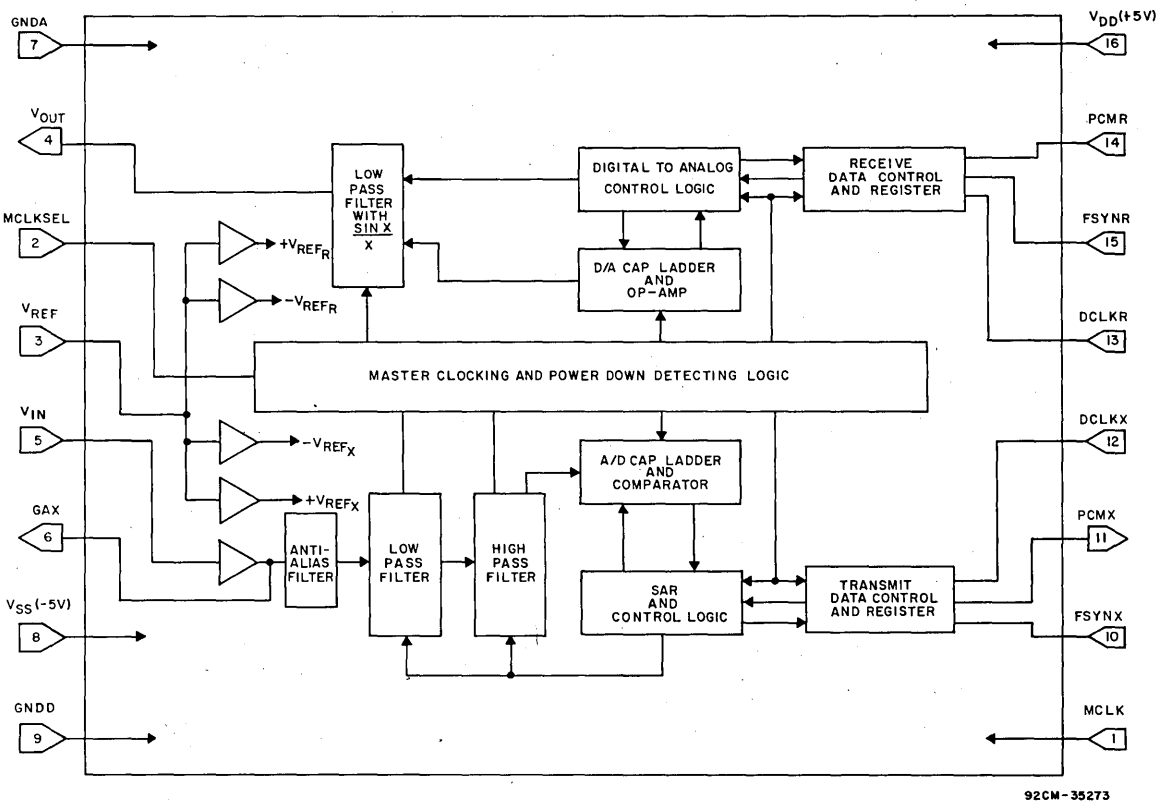
Bell and nominal output frequencies (in parenthesis) for 3.579545-MHz crystal.

© IC MASTER 1983

CD22302 Objective Data
Combined PCM CODEC/Filter Chip

Features:

- 16-pin device
- COder and DECoder with PCM receive and transmit filters in one package
- ±5V DC operation
- Anti-aliasing filter
- Sin x/x correction for the receive low pass filter
- On-chip auto-zero circuitry
- TTL compatibility
- Synchronous or Asynchronous operation
- Master clock select control
  1.536 MHz
  1.544 MHz
  2.048 MHz
- Variable data rates: 64 kHz to 3.56 MHz
- Meets or exceeds D3/D4 channel bank and CCITT specifications
- A-law or μ-law metal option
- Separate analog and digital grounds
- Variable external single voltage reference 2.5V-3.16V
- Low power dissipation:
  Operating - 60 mW typical
  Power-down mode ≤2mW



Functional Block Diagram

© IC MASTER 1983

SP74SC CMOS LOGIC PRODUCTS

FEATURES

- **Pin-Out and Function compatible to Low Power Schottky Logic.**
- **TTL compatible, interface directly with standard TTL logic levels.**
- **Low quiescent power dissipation.**
- **High Noise Immunity.**
- **All devices have input protective diodes connected to V_{CC} and GND.**

ORDERING INFORMATION

Plastic DIP Package	SP74SCxxxN

ABSOLUTE MAXIMUM RATINGS

Parameter		Min	Max	Units
V_{CC}	DC Supply Voltage	−0.3	7.0	V
V_I, V_O	Input or Output Voltage	−0.3	V_{CC} +0.3	V
T_S	Storage Temperature	−65	+150	°C
P_D	Power Dissipation (Note 1)		500	mW
T_L	Lead Temperature (1/16" from mounting surface for 10 Sec)		+300	°C

Note 1: Derate at 12mW/°C from +45 to +85 C.

CURRENT PRODUCTS

137	Decoder/Demultiplexer 3-to-8 Line Decoders, 3 Enable Inputs and Inverted Outputs with Latches
138	Decoder/Demultiplexer 3-to-8 Line Decoders, 3 Enable Inputs and Inverted Outputs
139	Decoder/Demultiplexer Two independent 2-to-4 Line Decoders with Inverted Outputs
238	Decoder/Demultiplexer 3-to-8 Line Decoders, 3 Enable Inputs with Non-Inverted Outputs
239	Decoder/Demultiplexer Two independent 2-to-4 Line Decoders with Non-Inverted Outputs
240	Octal Buffer/Line Driver Inverting 3-State Outputs
241	Octal Buffer/Line Driver Non-Inverting 3-State Outputs
244	Octal Buffer/Line Driver Non-Inverting 3-State Outputs
245	Octal Bus Transceivers Non-Inverting 3-State Outputs
373	Octal Transparent Latches Non-Inverting 3-State Outputs
374	Octal D-Type Flip-Flops Non-Inverting 3-State Outputs

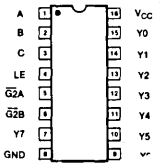
All devices contain diodes to protect inputs against damage due to high static voltages or electric fields; however, it is advised that precautions be taken not to exceed the max. recommended input voltages. All unused inputs must be connected to an appropriate logic voltage level (either V_{CC} or GND).

540	Octal Buffer/Line Driver Inverting 3-State Outputs
541	Octal Buffer/Line Driver Non-Inverting 3-State Outputs
573	Octal Transparent Latches Non-Inverting 3-State Outputs Functionally identical to 373, but 573 Inputs and Outputs are on opposite sides of package
574	Octal D-Type Flip-Flops Non-Inverting 3-State Outputs Functionally identical to 374, but 574 Inputs and Outputs are on opposite sides of package

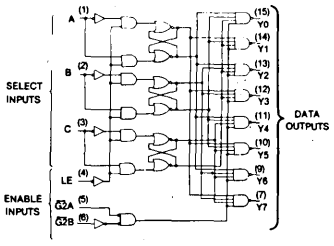
© IC MASTER 1983

SP74SC137

PIN CONFIGURATION

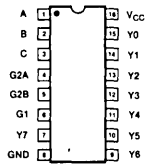


LOGIC DIAGRAM

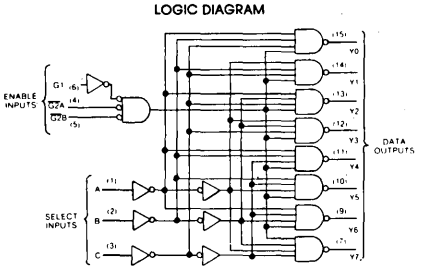


SP74SC138

PIN CONFIGURATION

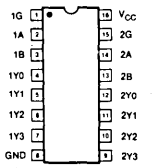


LOGIC DIAGRAM

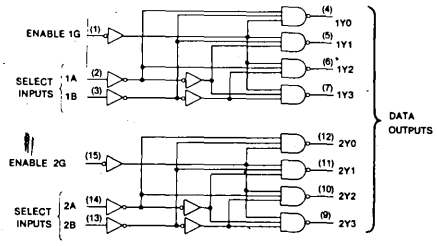


SP74SC139

PIN CONFIGURATION

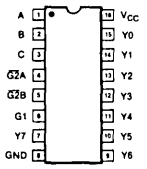


LOGIC DIAGRAM

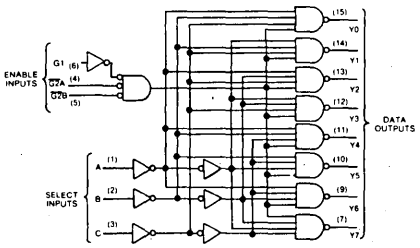


SP74SC238

PIN CONFIGURATION

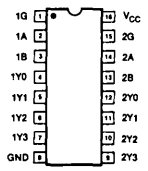


LOGIC DIAGRAM

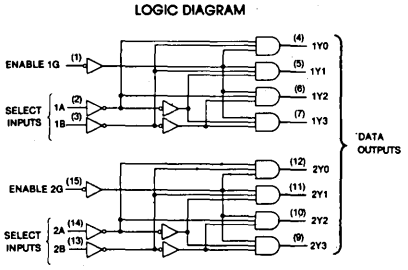


SP74SC239

PIN CONFIGURATION



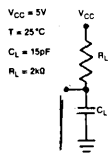
LOGIC DIAGRAM



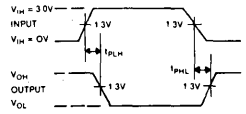
SWITCHING CHARACTERISTICS

Parameter Propagation Time	Min.	Typ.	Max.	Unit
t_{PLH} Address to Output		20		ns
t_{PHL} Address to Output		30		ns
t_{PLH} Enable to Output		28		ns
t_{PHL} Enable to Output		36		ns

TEST CONDTIONS

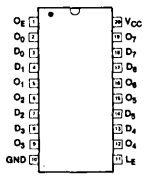


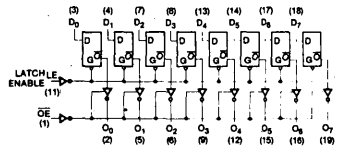
VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES



SP74SC373

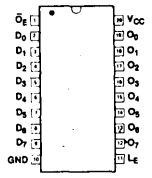
PIN CONFIGURATION

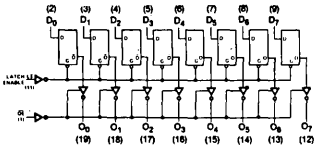




SP74SC573

PIN CONFIGURATION



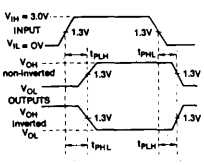


SWITCHING CHARACTERISTICS

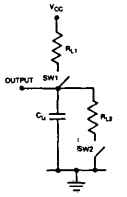
Parameter Propagation Time	Min.	Typ.	Max.	Unit
t_{PLH} Data to Output		17		ns
t_{PHL} Data to Output		25		ns
t_{PLH} Latch Enable to Output		32		ns
t_{PHL} Latch Enable to Output		36		ns
t_{PZH} Output Enable to High-Level		25		ns
t_{PZL} Output Enable to Low-Level		32		ns
t_{PHZ} Output Disable from High-Level		25		ns
t_{PLZ} Output Disable from Low-Level		32		ns
Data Set-Up Time Note 1	0↓			ns
Data Hold Time Note 1	10↓			ns

Note 1 ↓ indicates the Enable Transition from High to Low

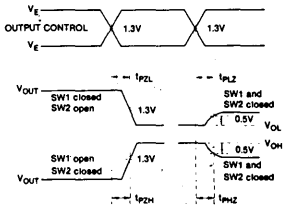
VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES



EQUIVALENT TEST CIRCUIT



VOLTAGE WAVEFORMS
ENABLE & DISABLE TIMES, 3-STATE OUTPUTS



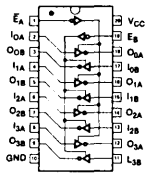
TEST CONDITIONS

V_{CC} = 5.0V
T_A = +25°C
C_L = 15pF
R_{L1} = 2KΩ
R_{L2} = 5KΩ

© IC MASTER 1983

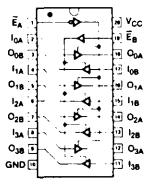
SP74SC240

PIN CONFIGURATION



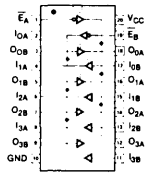
SP74SC241

PIN CONFIGURATION



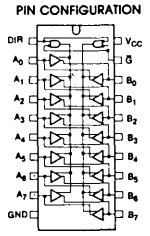
SP74SC244

PIN CONFIGURATION



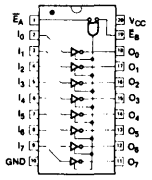
SP74SC245

PIN CONFIGURATION



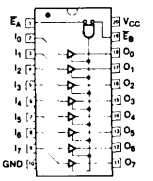
SP74SC540

PIN CONFIGURATION



SP74SC541

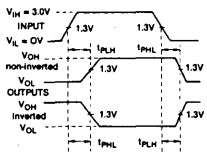
PIN CONFIGURATION



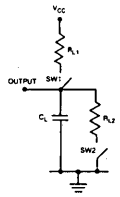
SWITCHING CHARACTERISTICS

Parameter Propagation Time	Min.	Typ.	Max.	Unit
t_{PLH} Address to Output		17		ns
t_{PHL} Address to Output		25		ns
t_{PZH} Enable to Output		25		ns
t_{PZL} Enable to Output		32		ns
t_{PLZ} Disable to Output		32		ns
t_{PHZ} Disable to Output		25		ns

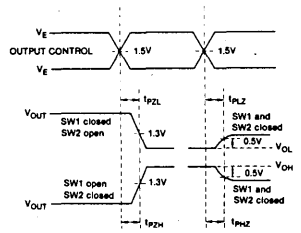
VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES



EQUIVALENT TEST CIRCUIT



VOLTAGE WAVEFORMS
ENABLE & DISABLE TIMES, 3-STATE OUTPUTS

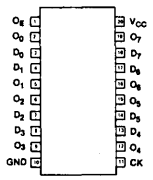


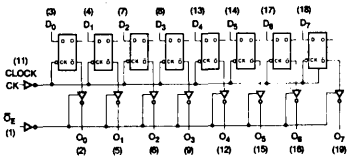
TEST CONDITIONS

V_{CC} = 5.0V
T_A = +25°C
C_L = 15pF
R_{L1} = 2KΩ
R_{L2} = 5KΩ

SP74SC374

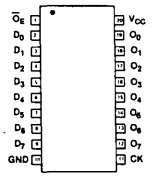
PIN CONFIGURATION

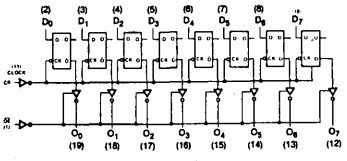




SP74SC574

PIN CONFIGURATION



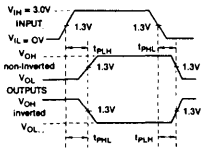


SWITCHING CHARACTERISTICS

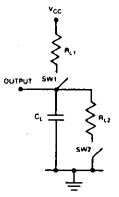
Parameter Propagation Time	Min.	Typ.	Max.	Unit
t_{PLH} Data to Output		17		ns
t_{PHL} Data to Output		25		ns
t_{PLH} Clock to Output		32		ns
t_{PHL} Clock to Output		36		ns
t_{PZH} Output Enable to High-Level		25		ns
t_{PZL} Output Enable to Low-Level		32		ns
t_{PHZ} Output Disable from High-Level		25		ns
t_{PLZ} Output Disable from Low-Level		32		ns
Data Set-Up Time, Note 1		20↑		ns
Data Hold Time, Note 1	0↑			ns

Note 1: ↑ indicates positive clock transition

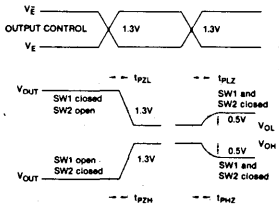
VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES



EQUIVALENT TEST CIRCUIT



VOLTAGE WAVEFORMS
ENABLE & DISABLE TIMES, 3-STATE OUTPUTS



TEST CONDITIONS

V_{CC} = 5.0V
T_A = +25°C
C_L = 15pF
R_{L1} = 2KΩ
R_{L2} = 5KΩ

DC ELECTRICAL CHARACTERISTICS

Over operating temperature range unless otherwise specified.

Parameter	Conditions	Min.	Typ.	Max.
V_{IH} High Level Input Voltage	V_{CC} = 5.25V	2.0		
V_{IL} Low Level Input Voltage	V_{CC} = 4.75V			0.8
V_{OH} High Level Output Voltage	V_{CC} = 5.0V, V_{IH} = 2.0V V_{IL} = 0.8V, I_{OH} = -400μA	4.35	4.8	
	V_{CC} = 5.0V, V_{IH} = 2.0V V_{IL} = 0.8V, I_{OH} = -4mA	3.5	4.0	
V_{OL} Low Level Output Voltage	V_{CC} = 5.0V, V_{IH} = 2.0V V_{IL} = 0.8V, I_{OL} = 8mA		0.3	0.4
I_I Input Current	V_I = V_{CC} or Gnd		0.1	1.0
I_{CC} Supply Current	V_I = V_{CC} or Gnd. V_{CC} = 5.0V		1.0	

© IC MASTER 1983

SP74HC SERIES

CMOS LOGIC PRODUCTS

FEATURES

- Utilizes SPI's Selective Oxidation, Silicon-Gate CMOS Process.
- Speed, function and pin-out compatible to 74LS series Logic.
- High Noise Immunity
- Low quiescent power consumption
- Wide power supply range.
- Operates over V_{CC} range of 2.0 to 6.0 Volts.
- Standardized set of Input and Output electrical characteristics.

INPUT

- All devices have Input Protection diodes to V_{CC} and ground.
- All devices have Logic input voltage levels consistent with CMOS

OUTPUT

- The standard output of 74HC devices can source and sink 4mA while devices designed to interface with a Bus system can drive 6mA. Sink and drive capability is guaranteed over −40 to +85°C.
- Symmetric current drive.
- All Outputs are fully buffered.

ORDERING INFORMATION

Plastic DIP Package	SP74HCxxxN

ABSOLUTE MAXIMUM RATINGS

	Parameter	Min	Max	Units
V_{CC}	DC Supply Voltage	−0.5	+7.0	V
V_I, V_O	Input or Output Voltage	−0.5	V_{CC} +0.5	V
I_L	DC Current Per Pin Any Input or Output		25	mA
I_{CC}	DC Current Drain, V_{CC} GND		50	mA
T_S	Storage Temperature	−65	+150	°C
P_D	Power Dissipation (Note 1)		500	mW
T_L	Lead Temperature (1/16" from mounting surface for 10 sec)		+300	°C

Note 1: Derate at 12mW/°C over +45 to +85°C for Plastic "N" Package

All devices contain diodes to protect inputs against damage due to high static voltages or electric fields; however, it is advised that precautions be taken not to exceed the max. recommended input voltages. All unused inputs must be connected to an appropriate logic voltage level (either V_{CC} or GND).

RECOMMENDED OPERATING CONDITIONS

	Parameter	Min	Max	Units
V_{CC}	DC Supply Voltage Range	2.0	6.0	V
V_{in}, V_{out}	Input Voltage, Output Voltage	0	V_{CC}	V
T_A	Operating Temperature Range	−40	+85	°C

© IC MASTER 1983

DC ELECTRICAL CHARACTERISTICS

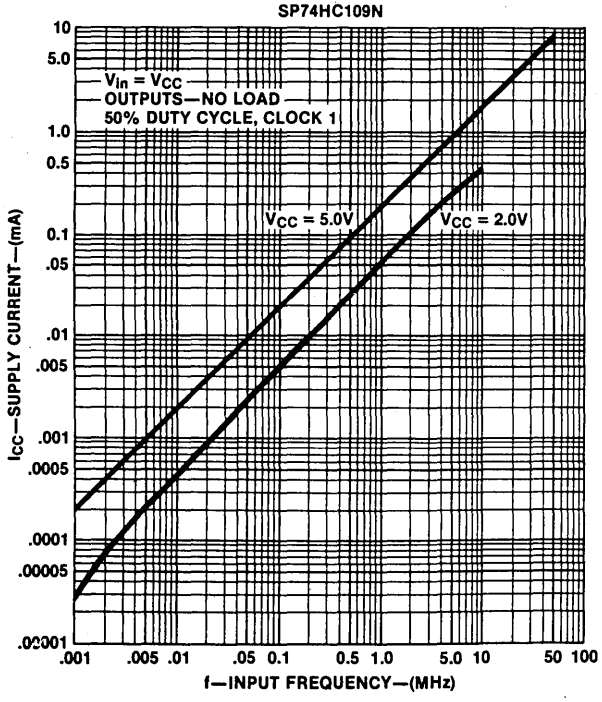
V_{CC} = 5.0V ± 10% unless otherwise specified.
Limits are guaranteed over T_A range of −40 to +85°C

Parameter		Conditions	Min	Typ	Max	Units
V_{IH}	High Level Input Voltage	V_O = 0.5V or V_{CC} −1.0V	V_{CC} −1.4			V
V_{IL}	Low Level Input Voltage	I_O = 10.μA			0.9	
V_{OH}	High Level Output Voltage	V_{IL} = 0.9V, I_{OH} = 1.0μA V_{IH} = V_{CC} −1.4V	V_{CC} −0.05			V
		V_{IL} = 0.9V, I_{OH} = (Note 2) V_{IH} = 3.6V, V_{CC} = 5.0V	4.2			V
V_{OL}	Low Level Output Voltage	V_{IL} = 0.9V, I_{OL} = 1.0μA V_{IH} = V_{CC} −1.4V			0.05	V
		V_{IL} = 0.9V, I_{OL} = (Note 2) V_{IH} = V_{CC} −1.4V			0.4	V
I_I	Input Current	V_I = V_{CC} or GND			1.0	μA
I_{CC}	Supply Current	V_I = V_{CC} or GND V_{CC} = 5.0V, T_A = 25°C			2.0	μA

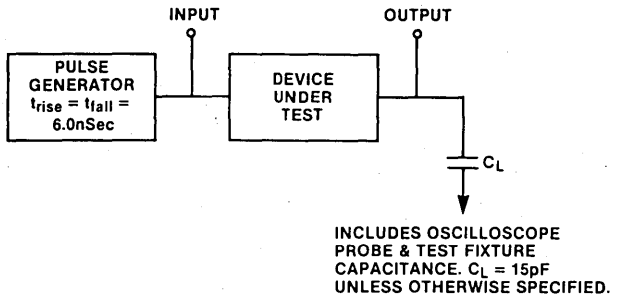
Note 2: I_{OH}/I_{OL} = 4.0mA for Standard Ouputs
I_{OH}/I_{OL} = 6.0mA for Enhanced Outputs

SWITCHING CHARACTERISTICS (V_{CC} = 5.0V, C_L = 15pF, T_A = +25°C, Input t_{rise} = t_{fall} = 6.0nSec)

SUPPLY CURRENT—vs—INPUT FREQUENCY
SP74HC109N

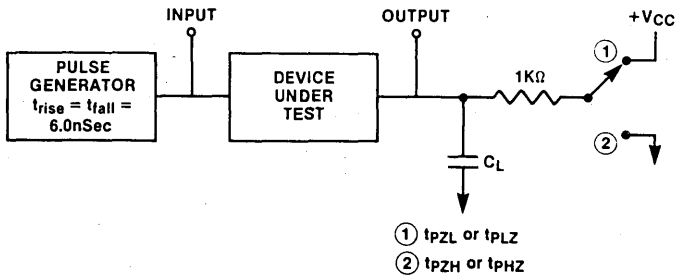


PROPAGATION TIMES TEST CKT.
NORMAL OUTPUT DEVICES



INCLUDES OSCILLOSCOPE PROBE & TEST FIXTURE CAPACITANCE. C_L = 15pF UNLESS OTHERWISE SPECIFIED.

PROPAGATION TIMES TEST CKT.
3-STATE OUTPUT DEVICES



① t_{PZL} or t_{PLZ}
② t_{PZH} or t_{PHZ}

© IC MASTER 1983

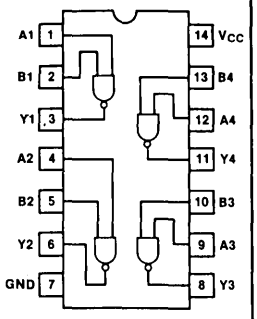
SP74HC00N

Quad 2-Input NAND Gate

t_{pHL}/t_{pLH} 10/10nSec typ.

$Y = \overline{AB}$

TOP VIEW



14 PIN DIP

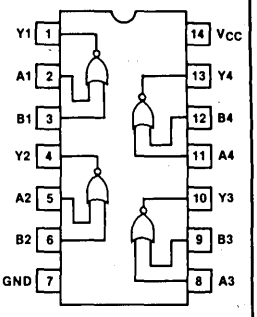
SP74HC02N

Quad 2-Input NOR Gate

t_{pHL}/t_{pLH} 10/10nSec typ.

$Y = \overline{A + B}$

TOP VIEW



14 PIN DIP

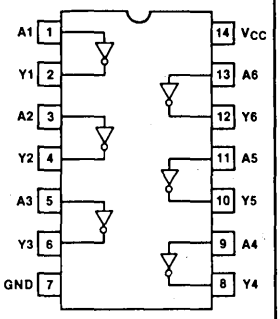
SP74HC04N

Hex Inverter

t_{pHL}/t_{pLH} 8/10nSec typ.

$Y = \overline{A}$

TOP VIEW



14 PIN DIP

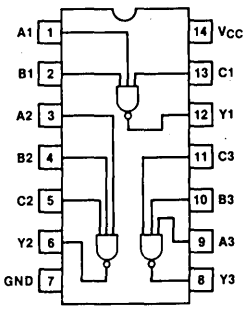
SP74HC10N

Triple 3-Input NAND Gate

t_{pHL}/t_{pLH} 14/16nSec typ.

$Y = \overline{ABC}$

TOP VIEW



14 PIN DIP

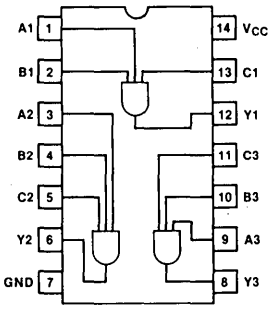
SP74HC11N

Triple 3-Input AND Gate

t_{pHL}/t_{pLH} 14/14nSec typ.

$Y = ABC$

TOP VIEW



14 PIN DIP

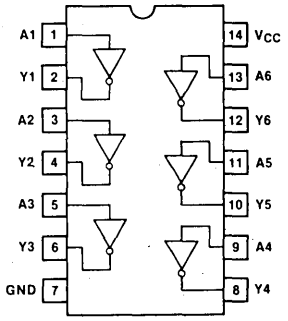
SP74HC14N

Hex Schmitt Trigger Inverter

t_{pHL}/t_{pLH} 10/10nSec typ.

$Y = \overline{A}$

TOP VIEW



14 PIN DIP

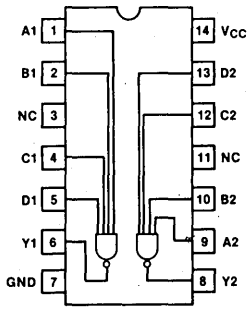
SP74HC20N

Dual 4-Input NAND Gate

t_{pHL}/t_{pLH} 16/18nSec typ.

$Y = \overline{ABCD}$

TOP VIEW



14 PIN DIP

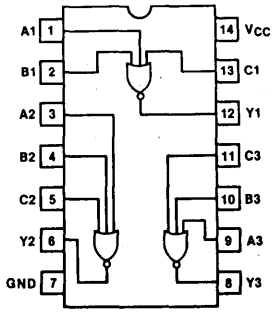
SP74HC27N

Triple 3-Input NOR Gate

t_{pHL}/t_{pLH} 14/20nSec typ.

$Y = \overline{A + B + C}$

TOP VIEW



14 PIN DIP

© IC MASTER 1983

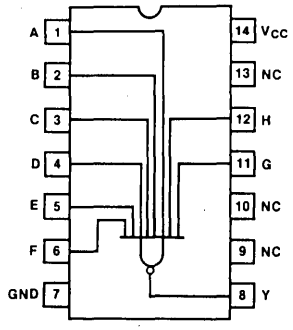
SP74HC30N

8-Input NAND Gate

t_{pHL}/t_{pLH} 18/18nSec typ.

$Y = \overline{ABCDEFGH}$

TOP VIEW



14 PIN DIP

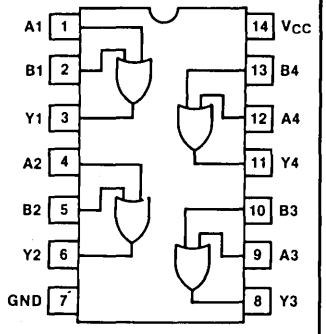
SP74HC32N

Quad 2-Input OR Gate

t_{pHL}/t_{pLH} 15/15nSec typ.

$Y = A + B$

TOP VIEW



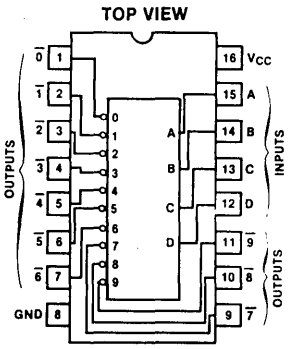
14 PIN DIP

SP74HC42N

1-of-10 BCD-to-Decimal Decoder

Propagation Times
Non-Inverting, 2 level
t_{pHL}/t_{pLH} 18/18nSec typ.
Inverting, 3 level
t_{pHL}/t_{pLH} 20/20nSec typ.

TOP VIEW



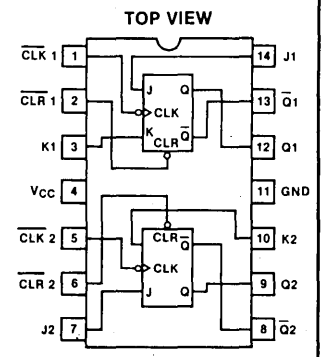
16 PIN DIP

SP74HC73N

Dual J K Flip-Flops with Clear

f_{MAX} 50MHz typ.
t_p Clock to Output 20nSec typ.
t_p Clear to Output 20nSec typ.

TOP VIEW



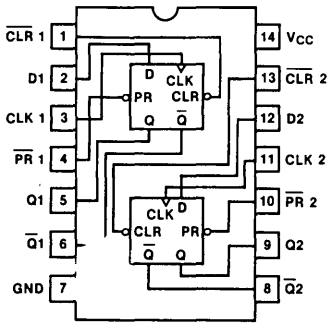
14 PIN DIP

SP74HC74N

Dual D Flip-Flops with Set and Clear, Positive Edge Triggered

f_{MAX} 50MHz typ
t_p Clock to Output 22nSec typ.
t_p Reset to Output 22nSec typ.

TOP VIEW



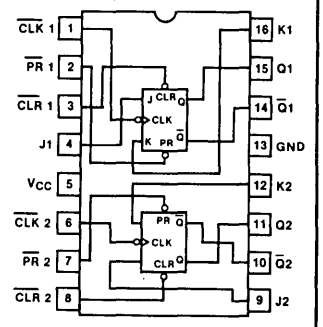
14 PIN DIP

SP74HC76N

Dual J K Flip-Flops with Preset and Clear

f_{MAX} 50MHz typ.
t_p Clock to Output 20nSec typ.
t_p Set to Output 20nSec typ.
t_p Clear to Output 20nSec typ.

TOP VIEW



16 PIN DIP

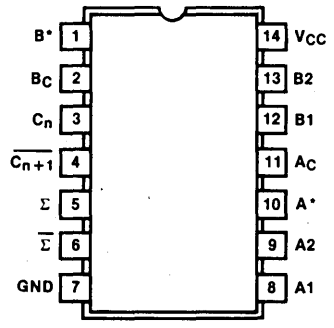
SP74HC80N

Gated Full Adder

t_p C_n to $\overline{C_{n+1}}$ 18nSec typ.
t_p A_c to $\overline{C_{n+1}}$ 20nSec typ.
t_p B_c to $\overline{C_{n+1}}$ 20nSec typ.
t_p A_c to Σ 20nSec typ.
t_p B_c to Σ 30nSec typ.

Note: A* Input only

TOP VIEW



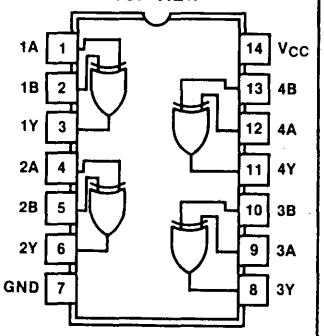
14 PIN DIP

SP74HC86N

Quad 2-Input Exclusive OR Gate

t_{pHL}/t_{pLH} 20/20nSec typ.

TOP VIEW



14 PIN DIP

DIGITAL

Semi Processes

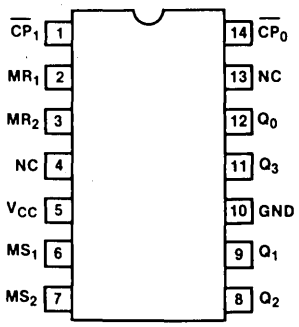
© IC MASTER 1983

SP74HC90N

Decade Counters, Divide-by-2/ Synchronous Divide-by-5

C_{p1} f_{MAX} 30MHz typ.
C_{p0} f_{MAX} 50MHz typ.
t_p C_{p0} to Q_0 18nSec typ.
t_p C_{p1} to Q_1 or Q_2 or Q_3 20nSec typ.
t_p M_R to Output 25nSec typ.

TOP VIEW



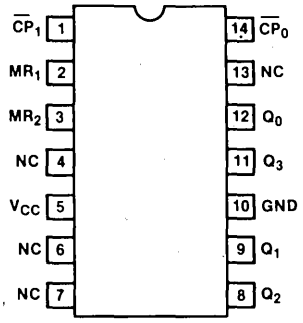
14 PIN DIP

SP74HC93N

4-Bit Binary Counter, Divide-by-2/ Synchronous Divide-by-8

C_{p1} f_{MAX} 30MHz typ.
C_{p0} f_{MAX} 50MHz typ.
t_p C_{p0} to Q_0 18nSec typ.
t_p C_{p1} to Q_1 or Q_2 or Q_3 20nSec typ.
t_p M_R to Output 25nSec typ.

TOP VIEW



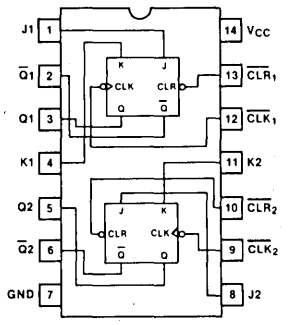
14 PIN DIP

SP74HC107N

Dual J K Flip-Flops with Clear

f_{MAX} 50MHz typ.
t_p Clock to Q 20nSec typ.
t_p Clear to Output 20nSec typ.

TOP VIEW



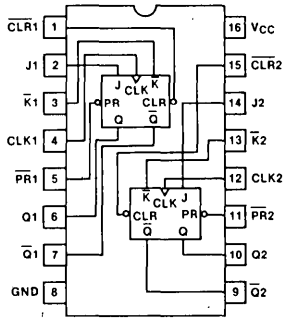
14 PIN DIP

SP74HC109N

Dual J K Flip-Flops with Preset and Clear, Positive Edge Triggered

f_{MAX} 50MHz typ.
t_p Clock to Q 20nSec typ.
t_p Set to Output 20nSec typ.
t_p Clear to Output 20nSec typ.

TOP VIEW



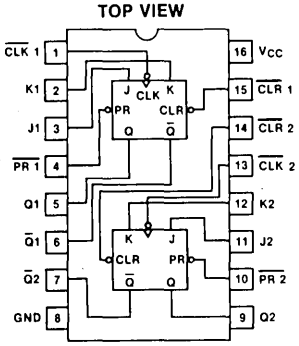
16 PIN DIP

SP74HC112N

Dual J K Flip-Flops with Preset and Clear, Negative Edge Triggered

f_{MAX} 50MHz typ.
t_p Clock to Q 20nSec typ.
t_p Set to Output 20nSec typ.
t_p Clear to Output 20nSec typ.

TOP VIEW



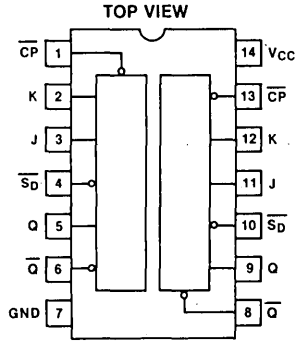
16 PIN DIP

SP74HC113N

Dual J K Flip-Flop with Preset, Negative-Edge Triggered

f_{MAX} 50MHz typ.
t_p Clock to Q 20nSec typ.

TOP VIEW



14 PIN DIP

SP74HC125N

Quad 3-State Buffers with Active Low Enables

C_L = 50pF

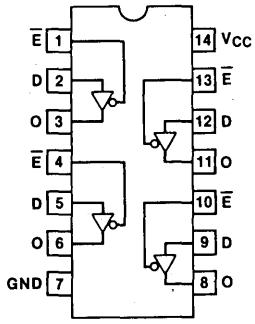
t_p Data to Output 16nSec typ.
t_{pZH} 15nSec typ.
t_{pZL} 15nSec typ.

C_L = 15pF

t_{pHZ} 18nSec typ.
t_{pLZ} 18nSec typ.

Output is disabled when C is high
Y = A

TOP VIEW



14 PIN DIP

SP74HC126N

Quad 3-State Buffers with Active High Enables

C_L = 50pF

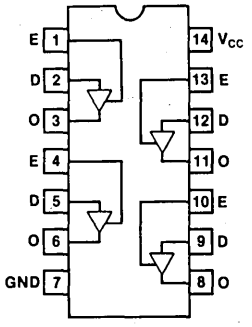
t_p Data to Output 16nSec typ.
t_{pZH} 15nSec typ.
t_{pZL} 15nSec typ.

C_L = 15pF

t_{pHZ} 18nSec typ.
t_{pLZ} 18nSec typ.

Output is disabled when C is low.
Y = A

TOP VIEW

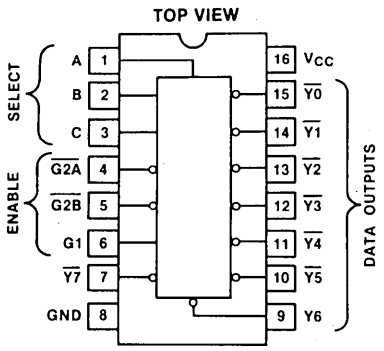


14 PIN DIP

© IC MASTER 1983

SP74HC138N

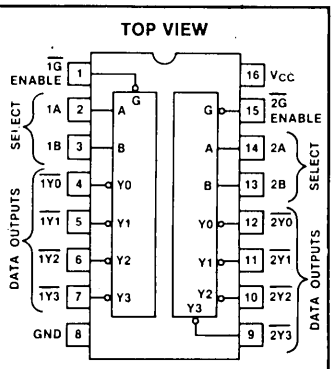
1-of-8 Decoder/Demultiplexer



16 PIN DIP

SP74HC139N

Dual 1-of-4 Decoder/ Demultiplexer

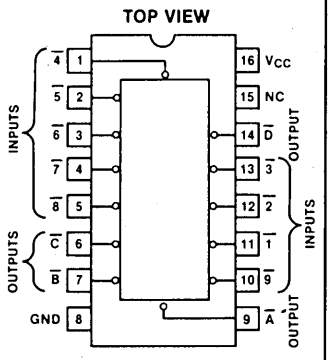


16 PIN DIP

SP74HC147N

10-to-4 Line Priority Encoder

t_p Non-Inverting Output 25nSec typ.
t_p Inverting Output 28nSec typ.

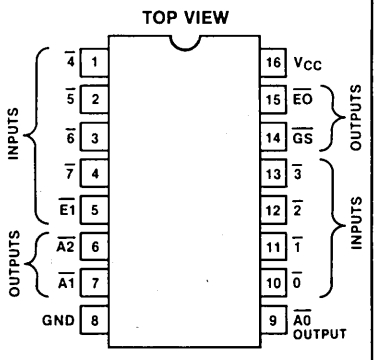


16 PIN DIP

SP74HC148N

8-to-3 Line Priority Encoder

t_p Non-Inverting Output 25nSec typ.
t_p Inverting Output 28nSec typ.

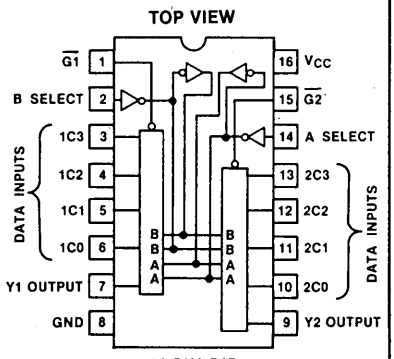


16 PIN DIP

SP74HC153N

Dual 4-Input Multiplexer

t_p Data to Output 16nSec typ.
t_p Select to Output 20nSec typ.



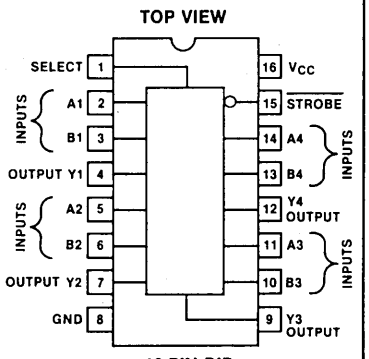
16 PIN DIP

SP74HC157N

Quad 2-Input Multiplexer Non-Inverting Outputs

C_L = 50pF

t_{pHL}/t_{pLH} Data to Output 18/20nSec typ.
t_{pHL}/t_{pLH} Select to Output 22/26nSec typ.



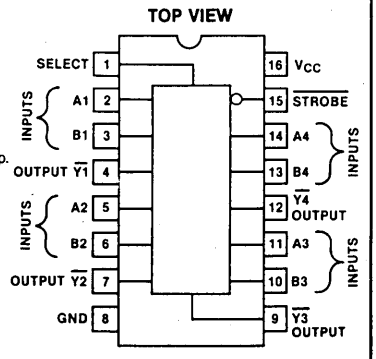
16 PIN DIP

SP74HC158N

Quad 2-Input Multiplexer, Inverting Outputs

C_L = 50pF

t_{pHL}/t_{pLH} Data to Output 18/20nSec typ.
t_{pHL}/t_{pLH} Select to Output 22/26nSec typ.

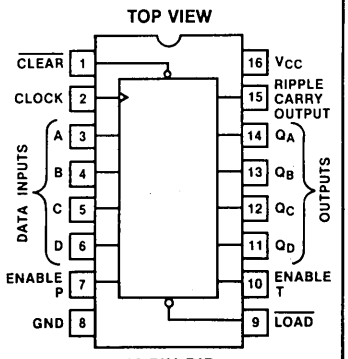


16 PIN DIP

SP74HC160N

BCD Decade Counter Asynchronous Reset

f_{max} 40MHz typ.
t_p Delay Clock to R_c 20nSec typ.
t_p Delay Clear to Q 20nSec typ.
t_p Clock to Q 20nSec typ.



16 PIN DIP

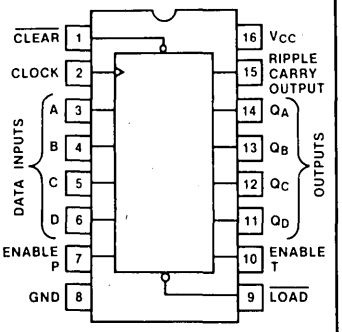
© IC MASTER 1983

SP74HC161N

4-Bit Binary Counter
Asynchronous Reset

f_{max} 40MHz typ.
t_p Delay Clock to R_c 20nSec typ.
t_p Delay Clear to Q 20nSec typ.
t_p Clock to Q 20nSec typ.

TOP VIEW



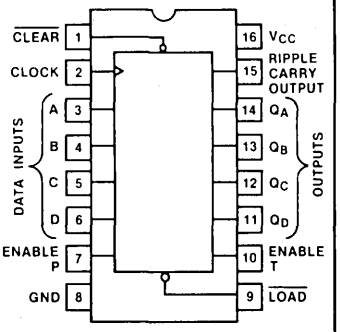
16 PIN DIP

SP74HC162N

BCD Decade Counter
Synchronous Reset

f_{max} 40MHz typ.
t_p Delay Clock to R_c 20nSec typ.
t_p Delay Clear to Q 20nSec typ.
t_p Clock to Q 20nSec typ.

TOP VIEW



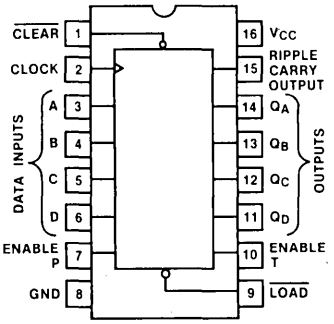
16 PIN DIP

SP74HC163N

4-Bit Binary Counter
Synchronous Reset

f_{max} 40MHz typ.
t_p Delay Clock to R_c 20nSec typ.
t_p Delay Clear to Q 20nSec typ.
t_p Clock to Q 20nSec typ.

TOP VIEW



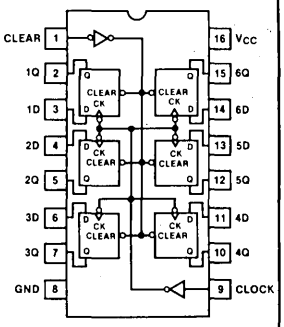
16 PIN DIP

SP74HC174N

Hex D-Type Flip-Flops with
Common Direct Clear

f_{MAX} 50MHz typ.
t_p Clock to Output 22nSec typ.
t_p Reset to Output 22nSec typ.

TOP VIEW



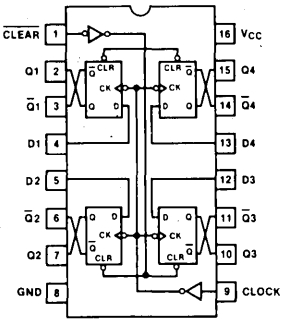
16 PIN DIP

SP74HC175N

Quad D-Type Flip-Flops with
Common Direct Clear

f_{MAX} 50MHz typ.
t_p Clock to Output 18nSec typ.
t_p Reset to Output 18nSec typ.

TOP VIEW

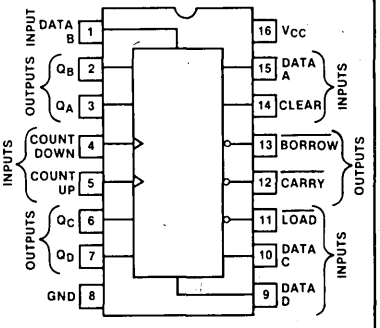


16 PIN DIP

SP74HC192N

BCD Decade Up/Down Counter

TOP VIEW

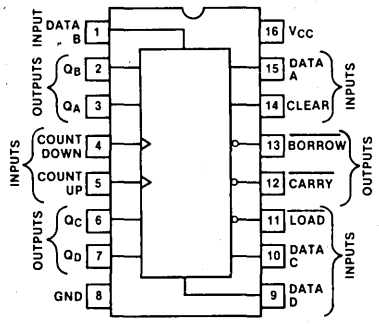


16 PIN DIP

SP74HC193N

4-Bit Binary Up/Down Counter

TOP VIEW



16 PIN DIP

SP74HC240N

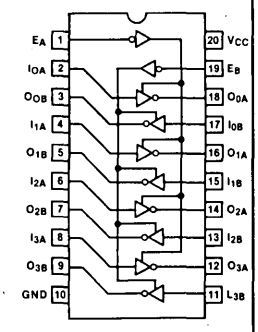
Octal Buffer/Line Driver, 3-State,
Inverting Outputs

FUNCTION TABLE

Inputs		Outputs
EA, EB	Data	
L	L	H
L	H	L
H	X	Z

H = High level, L = Low level, X = Irrelevant,
Z = High impedance

TOP VIEW



20 PIN DIP

© IC MASTER 1983

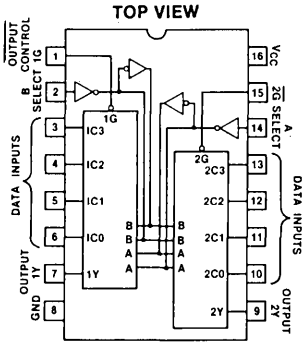
SP74HC253N

Dual 4-Input Multiplexer, 3-State Output

t_p Data to Output 16nSec typ.
t_p Select to Output 20nSec typ.

t_{pZH} 15nSec typ.
t_{pZL} 15nSec typ.
t_{pLZ} 15nSec typ.
t_{pHZ} 15nSec typ.

TOP VIEW



16 PIN DIP

SP74HC257N

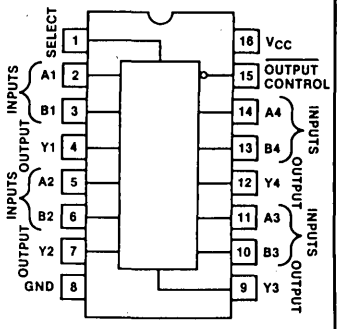
Quad 2-Input Multiplexer Non-Inverting 3-State Outputs

C_L = 50pF

t_{PHL}/t_{PLH} Data to Output 18/20nSec typ.
t_{PHL}/t_{PLH} Select to Output 22/26nSec typ.

t_{pZH} 20nSec typ.
t_{pZL} 20nSec typ.
C_L = 15pF
t_{pLZ} 16nSec typ.
t_{pHZ} 16nSec typ.

TOP VIEW

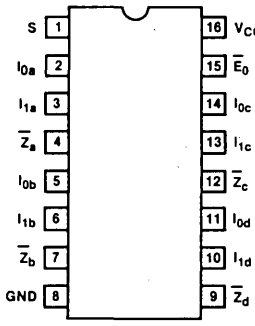


16 PIN DIP

SP74HC258N

Quad 2-Input Multiplexer 3-State Outputs

TOP VIEW



16 PIN DIP

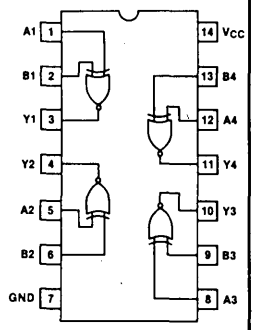
SP74HC266N

Quad 2-Input Exclusive NOR (XNOR) Gates, Active Pull-Up

t_{pHL}/t_{pLH} 20/20nSec typ.

$Y = \overline{A \oplus B} = AB + \overline{A}\,\overline{B}$

TOP VIEW



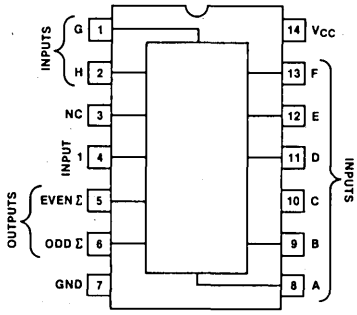
14 PIN DIP

SP74HC280N

9-Bit Odd/Even Parity Generator/Checker

t_p Data to Output 30nSec typ.

TOP VIEW



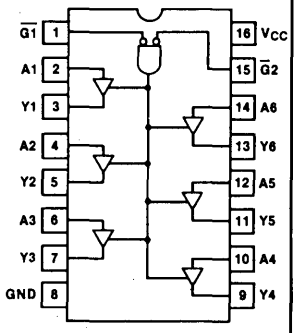
14 PIN DIP

SP74HC365N

Hex 3-State Bus Driver with Common 2-Input NOR Enable

C_L = 50pF
t_p Data to Output 14nSec typ.
t_{pZH} 26nSec typ.
t_{pZL} 20nSec typ.
C_L = 15pF
t_{pHZ} 20nSec typ.
t_{pLZ} 16nSec typ.

TOP VIEW



16 PIN DIP

SPI reserves the right to change specifications at any time without notification.

ABBREVIATIONS OF COMPANY NAMES

Action Ins	Action Instruments
AD	Analog Devices
ADT	Advanced Digital Technology
Adapt Sci	Adaptive Science Corp.
Advent	Advent Products, Inc.
Alphatron	Alphatron
AMA	American Automation
AMD	Advanced Micro Devices
AMI	American Microsystems, Inc.
Amperex	Amperex Electronic Corp.
Analogic	Analogic
Analog Sys	Analog Systems
APC	Applied Micro Circuits
Apex	Apex Microtechnology
APM	Applied Microsystems Corp.
Appl Sys	Applied Systems Corp.
APT	Applied Microtechnology
Aptek	Aptek Microsystems
Array Tech	Array Technology
AWI	Analog West
Bedford	Bedford Computer Systems Inc.
Burr-Brown	Burr-Brown Research
CAE	Computer Aided Engineering
Cal Devices	California Devices
Cent Data	Central Data Corp.
Cermetek	Cermetek
CGRS	CGRS Microtech Inc.
Cherry	Cherry Semiconductor
CIC	Custom Integrated Circuits
Citel	Citel, Inc.
Comlinear	Comlinear Corporation
CMA	Custom MOS Arrays
Comark	Comark Corp.
Comdial	Comdial Semiconductor
Comp Auto	Computer Automation
Compas	Compas Microsystems
Cont Logic	Control Logic Inc.
Control Sys	Control Systems Microsystems Div.
CreMicro	Creative Micro Systems
Cromemco	Cromemco, Inc.
CSG	Commodore Semiconductor Group
Cubit	Cubit Inc.
Curtis	Curtis Electro Devices, Inc.
Cybernetic	Cybernetic Micro Systems
Cybersys	Cybersystems
Cybertek	Cybertek Inc.
Data General	Data General
Data I/O	Data I/O
Data Trans	Data Translation
Datel	Datel-Intersil
Datricon	Datricon Corporation
DDC	Data Devices Corporation
DEC	Digital Equipment Corporation
Delco	Delco Electronics
DGM	Digital Microsystems
Digelec	Digelec Corp.
Digitek	Digitek, Inc.
Dionics	Dionics Inc.
Dist Comp	Distributed Computer Systems
Divers Tech	Diversified Technology
E-HI	E-H International, Inc.
Elind	Elind Elettronica Industriale
EL Instr	E & L Instruments
EMM	EMM
Emulogic	Emulogic Inc.
Epson	Epson America, Inc.
ETI Micro	ETI Micro
Exar	Exar Integrated Systems
Fairchild	Fairchild
Ferranti	Ferranti Electric
Fujitsu A	Fujitsu America
Fujitsu	Fujitsu Microelectronics, Inc.
GI	General Instrument
GMS	General Microsystems
GTE Micro	GTE Microcircuits
Harris	Harris Semiconductor
Heurikon	Heurikon Corp.
Hilevel	Hilevel Technology, Inc.
Hitachi	Hitachi America, Ltd.
Holt	Holt Inc.
HP	Hewlett-Packard
Hughes	Hughes Aircraft, Solid State Products
Hybrid Sys	Hybrid Systems
Hycom	Hycom Incorporated
IDT	Integrated Device Technology
IMI	International Microcircuits, Inc.
IMP	International Microelectronic Products
IMS	Industrial Micro-systems Inc.
Inconix	Inconix Corporation
Ind Tech	Inductive Technology
Inmos	Inmos
IntCirEng	Integrated Circuit Engineering
IntCirSys	Integrated Circuit Systems
IntCompSys	Integrated Computer Systems
IntCyber	International Cybernetics
Int Micro	International Microsystems
Int Tech	Integrated Technology Corp.
Intech/FMI	Intech/Function Modules Inc.
Intel	Intel
Interdesign	Interdesign
Intersil	Intersil
Intronics	Intronics
IPI	Integrated Photomatrix Inc.
ITT	ITT Semiconductors
Kinetic Sys	Kinetic Systems
Kontron	Kontron Electronics
Lambda	Lambda Semiconductor
Laserdyne	Laserdyne
LSI Comp	LSI Computer Systems
LSI Logic	LSI Logic Corporation
Master Logic	Master Logic Corporation
Matrix	Matrix Corp.
Matrox	Matrox Electronic Systems
MCC	Microcomputer Control
Micrel	Micrel
Micro Eng	Micro Circuit Engineering
Micro Innov	Micro Innovators
Micropac	Micropac Industries
Micro Net	Micro Networks
Micro Pwr	Micro Power Systems
Micro Sci	Micro Sciences Corp.
Micro Tech	Microcircuits Technology
Micro-Link	Micro-Link Corporation
Micron	Micron Technology
MilerTron	MilerTronics
Miller	Miller Technology
Mitel	Mitel Semiconductor
Mitsubishi	Mitsubishi Electronics
MMI	Monolithic Memories, Inc.
Monosil	Monosil
MonSys	Monolithic Systems Corp.
Mostek	Mostek
Motorola	Motorola Semiconductor
MRC	MRC Systems
Murray	Murray Consulting
National	National Semiconductor
NCR	NCR Corp., Microelectronics Division
NEC-EA	NEC/Electronic Arrays Division
NEC Electron	NEC/Electron Division
NEC Micro	NEC/Microcomputer Division
Nitron	Nitron
Nortek	Nortek
OAE	Oliver Advanced Engineering
Octagon	Octagon Systems Corp.
OEI	Optical Electronics Inc.
Ohio Sci	Ohio Scientific
OKI	OKI Semiconductor
Omnibyte	Omnibyte Corp.
Oscar	I. S. Oscar Assoc.
Panasonic	Panasonic
PC/M	Pacific/Cyber Metrix
Percom	Percom Data Co.
Phoenix	Phoenix Digital Corp.
Pico Design	Pico Design
Polycore	Polycore Electronics
Plessey	Plessy Semiconductors
PMI	Precision Monolithics, Inc.
PragDes	Pragmatic Design Inc.
PREMA	PREMA GmbH
Pro-Log	Pro-Log Corp.
Quay	Quay Corp.
Raytheon	Raytheon Semiconductor
RCA	RCA Solid State Division
RCI Data	RCI Data
RELMS	Relational Memory Systems
Reticon	Reticon
RIFA	RFIA
Rockwell	Rockwell, Microelectronic Devices
RTC	Riehl Time Corporation
Sanken	Sanken Electric
Sanyo	Sanyo
SEEQ	SEEQ Technology, Inc.
Semi Proc	Semi Processes
Siemens	Siemens
Signetics	Signetics
SGS	SGS-ATES Semiconductor
Sharp	Sharp
Silicon G	Silicon General
Siliconix	Siliconix
Silicon Sys	Silicon Systems Inc.
Siltronics	Siltronics
SMC	Standard Microsystems Corp.
Solarise	Solarise Enterprises
Solitron	Solitron Devices
Sprague	Sprague Electric Company
SSM	Solid State Micro Technology for Music
SSS	Solid State Scientific
Stag	Stag Microsystems
Struc. Des.	Structured Design Inc.
Stynetic	Stynetic Systems
Sunrise	Sunrise Electronics
Sunshine	Sunshine Semiconductor
Supertex	Supertex Inc.
Symtek	Symtek Corp.
Synapse	Synapse Corp.
Synertek	Synertek
Sys Innov	Systems Innovations
Tau Zero	Tau Zero Inc.
Tektronix	Tektronix
Telaris	(See Laserdyne)
Teledyne C	Teledyne Crystalonics
Teledyne P	Teledyne Philbrick
Teledyne S	Teledyne Semiconductor
Telefunken	Telefunken
Telephonics	Telephonics LSI
Telmos	Telmos
Teltone	Teltone Corporation
TI	Texas Instruments
Thomson-CSF	Thompson-CSF Components Corp.
TMX	TMX
Topanga	Topanga Data Systems
Toshiba	Toshiba America
Trans-Data	Trans-Data
TRW	TRW-LSI Products
Unitrode	Unitrode
Universal	Universal Semiconductor, Inc.
Vantage	Vantage Data Products
VTI	VLSI Technology, Inc.
Votrax	Votrax
Weitek	Weitek Corporation
Western	Western Digital
Wintek	Wintek Corp.
Xicor	Xicor, Inc.
Xycom	Xycom
Zendex	Zendex Corp.
Zilog	Zilog
Zymos	Zymos Corporation

© IC MASTER 1983

ECL LOGIC SELECTION GUIDE 10K/100K

Signetics is big in ECL. Big in product breadth and superb in quality and reliability. We're also big in ECL inventory — which means most of the parts listed below are readily available from your local Signetics sales office or authorized distributor.

If you're already using ECL, you know full well that its high operating speed is the most direct way to improve system performance. The 10K series has established itself as "the logical choice" for designing high-speed CPUs and digital communications systems. Its 200 MHz operating speed and 2.0 nsec gate delay have also made 10K ECL increasingly popular for designing computers, peripherals, and instrumentation. Signetics' 10K offering represents more than 90% of the devices currently recognized as industry standards.

We're not only committed to being your best source for 10K. We also aim to be the leading supplier of the faster 100K series. Our 100K parts — with a 750 picosecond gate delay and an operating speed in the 400-500 MHz range — will let you boost your system performance even further.

Our 10K ICs automatically go through the rigors of our SUPR IIA program (Signetics Upgraded Product Reliability) — at no extra charge. For further testing which has proved to minimize board reworks and cut field repairs, you'll be interested in our SUPR IIB burn-in. This optional screening is available at a nominal cost adder per device.

10K ECL PERFORMANCE REVIEW

The high-speed performance attributes of the 10K series are being demonstrated today in a host of data processing applications. The 10K parts provide an ideal speed-power solution for enhancing the performance of systems previously designed with standard TTL. Compared to standard TTL, the 10K ECL series offers these benefits:

- Smaller logic swings: 600 mV vs. 4V
- Reduced parts count from complementary outputs
- Significantly faster operating speed
- Versatile drive output with high DC/AC fanout
- Maximum device utilization with Wired-OR outputs
- Reduced noise due to constant supply current
- Low power dissipation

When high speed is essential to your design, 10K ECL may be the answer. Signetics has more than 60 answers in its 10K ECL family.

10K AVAILABLE IN PLASTIC DIP AND CERDIP PACKAGES

Type	Function
	Gates
10100	quadruple 3-input NOR gate (1 input common)
10101	quadruple 2-input OR/NOR gate (1 input common)
10102	quadruple 2-input, 3 NOR and 1 OR/NOR gate
10103	quadruple 2-input, 3 OR and 1 OR/NOR gate
10104	quadruple 2-input, 3 AND and 1 AND/NAND gate
10105	triple 2-3-2 input OR/NOR gate
10106	triple 4-3-3 input NOR gate
10107	triple 2-input EXCLUSIVE-OR/EXCLUSIVE-NOR gate
10108	dual 3-input AND/NAND gate
10109	dual 4-5 input OR/NOR gate
10110	dual 3-input/3-output OR gate (line driver)
10111	dual 3-input/3-output NOR gate (line driver)
10113	quadruple EXCLUSIVE-OR gate (with enable)
10117	dual 2-wide 2-3 input OR-AND/OR-AND-INVERT gate
10118	dual 2-wide 3-input OR-AND gate
10119	4-wide 4-3-3-3 input OR-AND gate
10121	4-wide OR-AND/OR-AND-INVERT gate
10210	high speed dual 3-input/3-output OR gate
10211	high speed dual 3-input/3-output NOR gate
10216	triple differential OR/NOR line receiver (high speed)
	Interfaces
10112	dual 3-input/3-output (1 OR and 2 NOR) line driver
10114	triple line receiver
10115	quadruple line receiver
10116	triple line receiver
10123	triple 4-3-3 input bus driver
10124	quadruple TTL to ECL translator
10125	quadruple ECL to TTL translator
10129	quadruple TTL/IBM bus receiver/latch
10188	hex buffer (non-inverting)
10189	hex inverter
10192	quad differential line driver
	Flip-Flops
10130	dual D-type latch
10131	dual D-type master-slave flip-flop
10133	quadruple latch with D-type inputs and enable outputs
10135	dual JK master-slave flip-flop
10175	quint D-latch common reset and two wired-OR common clock inputs
10176	hex D-type master-slave flip-flop
10231	high speed dual D-type master-slave flip-flop

Type	Function
	Counters & Registers
10136	universal hexadecimal counter
10137	universal decade counter
10141	4-bit universal shift register
	Complex
10132	dual 2-input multiplexer with clocked D-type latches and common reset
10134	dual 2-input multiplexer with clocked D-type latches
10158	quadruple 2-to-1 multiplexer (non-inverting)
10159	quadruple 2-to-1 multiplexer (inverting)
10160	12-bit parity checker/generator
10161	3-bit decoder with two enable inputs (1 of 8 lines LOW)
10162	3-bit decoder with two enable inputs (1 of 8 lines HIGH)
10164	8-input multiplexer with enable input
10165	8-input priority encoder
10171	dual 2-bit decoder (1 of 4 lines LOW)
10172	dual 2-bit decoder (1 of 4 lines HIGH)
10173	quadruple 2-input multiplexer with latched outputs
10174	dual 4-to-1 multiplexer (with enable)
10179	look-ahead carry block
10180	dual 2-bit adder/subtractor
10181	4-bit arithmetic logic unit
10191	hex ECL-MST translator
	Memories
10149	1024-bit, 4-bits per word PROM
10155	16-bit, 2-bits per word CAM (content addressable memory)
10415	1024-bit, 1-bit per word RAM

© IC MASTER 1983

See Page 809 for Ordering Information.

ECL LOGIC SELECTION GUIDE 10K/100K

SPECIFY 100K FOR INDUSTRY'S FASTEST LOGIC

With sub-nanosecond propagation gate delay, our growing family of 100K deserves serious consideration for the design of your next high-speed system.

Signetics' 100K devices are specified to operate from a single −4.5V supply. However, they can be internally compensated to operate over a wider voltage range.

Specify our 100K — and you can rest assured that the performance characteristics on the lab bench will also prevail in different application environments. That means you'll spend less time estimating all possible extremes of temperature and supply voltage that your system will endure — and the ultimate effects of these variables on component performance.

Signetics' 100K ECL. Your logical choice for the fastest standard logic. Put 100K switching rates to work in your design — and realize superior system performance.

100K AVAILABLE IN SLIMDIP AND FLATPAK PACKAGES

Type	Function	Availability
100101	triple 5-input OR/NOR	production
100102	quint 2-input OR/NOR	production
100107	quint EXCLUSIVE-OR/NOR	production
100112	quad high fan-out driver	production
100113	line driver	4Q '82
100114	quint line receiver	production
100117	triple 2-2-1 input OR/AND	production
100118	quint 5-4-4-4-2 input OR/AND	production
100122	9 buffer gates	production
100123	hex bus driver	4Q '82
100131	triple D flip-flop	productin
100136	4-stage counter/shift register	1Q '83
100141	8-bit shift register	4Q '82
100145	16 x 4-bit register file	1Q '83
100150	hex latch	4Q '82
100151	hex flip-flop	production
100155	quad multiplexer with latch	production
100158	8-bit shift matrix	production
100160	9-bit parity/8-bit compare	production
100163	dual 8-line multiplexer	production
100164	16-line multiplexer	production
100165	universal priority encoder	4Q '82
100166	9-bit magnitude comparator	production
100170	universal decoder	production
100171	triple 4-line multiplexer	production
100175	ECL 10K-ECL 100K translator	production
100180	high speed adder	4Q '82
100181	4-bit ALU	4Q '82
100255	TTL-100K ECL translator (bidirectional)	production

See Page 809 for Ordering Information.
© IC MASTER 1983

THE HIGH-SPEED LOGIC OF THE 80'S — 54/74F FAST TTL

PRODUCT DESCRIPTION

Signetics has combined advanced oxide-isolated fabrication techniques with standard TTL functions to create a new family designed for the 80's. The high operating speeds of FAST can push system operating speeds into areas previously reserved for 10K ECL, but with simple TTL design rules and single 5V power supplies. Low input loading allows the user to mix LS, ALS,and HCMOS in the same system without the need for translators and restrictive fanout requirements.

FAST circuits are pin-for-pin replacements for 74S types, but offer power dissipation 3-4 times lower and higher operating speeds. Existing systems can achieve much lower power by replacing the 74S types with the corresponding FAST devices, with no changes other than reducing the size of the power supply.

The input structure provides better noise immunity because of higher thresholds, while the oxide-isolation and new circuit techniques create devices that have less variation with temperature or supply voltage than existing TTL logic families. Signetics guarantees all ac parameters under realistic system conditions—across the supply voltage spread and the temperature range, and with heavy 50pF output loads.

The use of high-capacitance PNP inputs has been avoided, and clamping diodes have been added to both the inputs and outputs to prevent negative overshoots. High input breakdown voltages allow unused inputs to be tied directly to V_{CC} without pullup resistors.

Multiple sources and a complete family of powerful circuits combine to make Signetics FAST the logic choice of the 80's!

FEATURES

- **3ns propagation delays**
- **4mW/gate power dissipation**
- **Guaranteed AC performance over temperature and supply voltage spreads**
- **Improved input and output structures**
- **Standard TTL functions and pinouts**
- **Replacement for "S" types . . . 1/4 the power**
- **Designer's choice for new system designs**

THE SPEED/POWER SPECTRUM

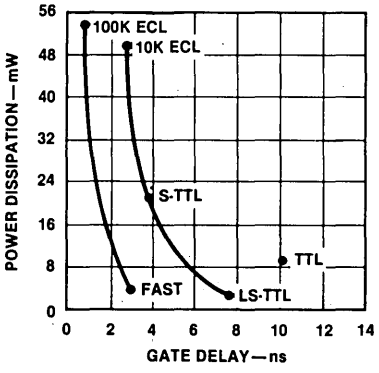


Figure 1

BASIC FAST GATE

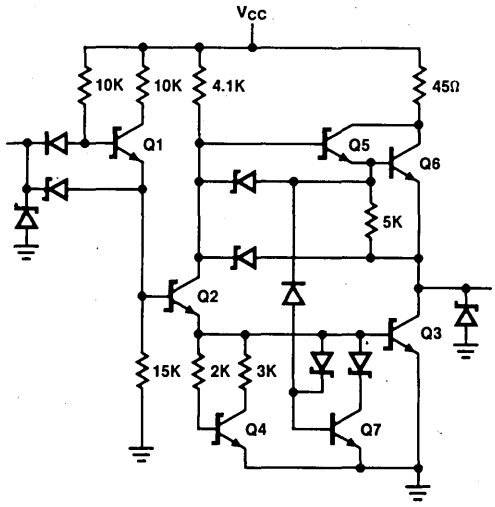


Figure 2

TRANSFER FUNCTIONS AT ROOM TEMPERATURE

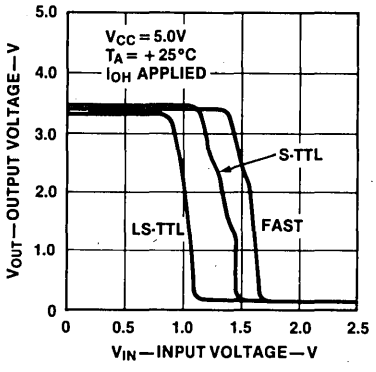


Figure 3

DIGITAL

Signetics

© IC MASTER 1983

See Page 809 for Ordering Information.

PROPAGATION DELAY
VS LOAD CAPACITANCE

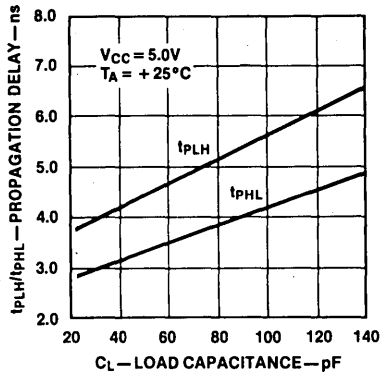


Figure 4

OUTPUT LOW CHARACTERISTIC

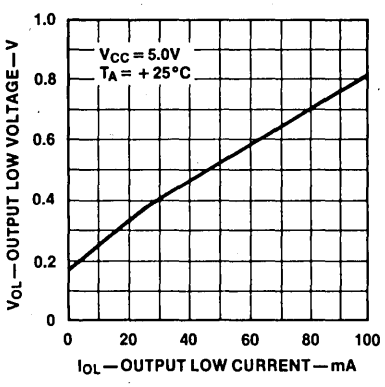


Figure 5

TRANSITION TIME
VS LOAD CAPACITANCE

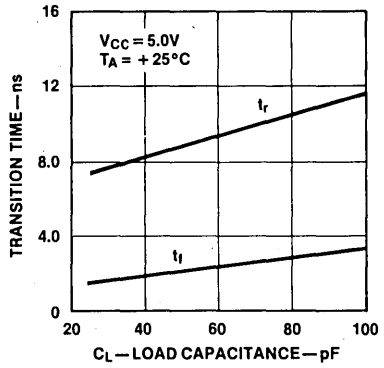


Figure 6

OUTPUT HIGH CHARACTERISTIC

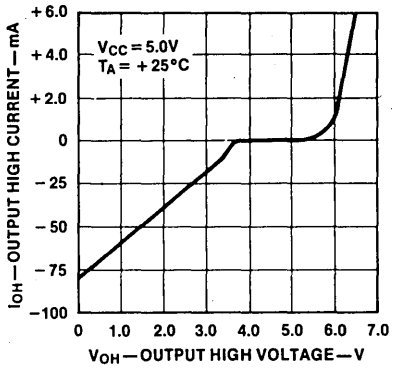


Figure 7

© IC MASTER 1983

ABSOLUTE MAXIMUM RATINGS (Over operating free-air temperature range unless otherwise noted.)

PARAMETER		54F	74F	UNIT
V_{CC}	Supply voltage	7.0	7.0	V
V_{IN}	Input voltage	−0.5 to +7.0	−0.5 to +7.0	V
I_{IN}	Input current	−30 to +5	−30 to +5	mA
V_{OUT}	Voltage applied to output in HIGH output state	−0.5 to +V_{CC}	−0.5 to +V_{CC}	V
T_A	Operating free-air temperature range	−55 to +125	0 to 70	°C

RECOMMENDED OPERATING CONDITIONS

PARAMETER			54/74F			UNIT
			Min	Nom	Max	
V_{CC}	Supply voltage	Mil	4.5	5.0	5.5	V
		Com'l	4.75	5.0	5.25	V
V_{IH}	HIGH-level input voltage		2.0			V
V_{IL}	LOW-level input voltage				+0.8	V
I_{IK}	Input clamp current				−18	mA
I_{OH}	HIGH-level output current	Std.			−1.0	mA
		Buffer			−3.0	mA
I_{OL}	LOW-level output current	Std.			20	mA
		Buffer (Com'l)			64	mA
T_A	Operating free-air temperature	Mil	−55		+125	°C
		Com'l	0		70	°C

DC ELECTRICAL CHARACTERISTICS (Over recommended operating free-air temperature range unless otherwise noted.)

PARAMETER		TEST CONDITIONS[1]		54/74F			UNIT
				Min	Typ[2]	Max	
V_{OH}	HIGH-level output voltage	V_{CC} = MIN, V_{IH} = MIN, V_{IL} = 0.5V, I_{OH} = MAX		2.0			V
		V_{CC} = MIN, V_{IH} = MIN, V_{IL} = MAX, I_{OH} = −1mA	Mil	2.5	3.4		V
			Com'l	2.7	3.4		V
V_{OL}	LOW-level output voltage	V_{CC} = MIN, V_{IH} = MIN, V_{IL} = MAX, I_{OL} = MAX	Std.		0.35	0.5	V
			Buffer			0.55	V
V_{IK}	Input clamp voltage	V_{CC} = MIN, I_I = I_{IK}				−1.2	V
I_I	Input current at maximum input voltage	V_{CC} = MAX, V_I = 7.0V				0.1	mA
I_{IH}	HIGH-level input current	V_{CC} = MAX, V_I = 2.7V				20	μA
I_{IL}	LOW-level input current	V_{CC} = MAX, V_I = 0.5V				−0.6	mA
I_{OS}	Short-circuit output current[3]	V_{CC} = MAX	Std.	−60		−150	mA
			Buffer	−100		−225	mA

NOTES:
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
2. All typical values are at V_{CC} = 5V, T_A = 25°C.
3. I_{OS} is tested with V_{OUT} = +0.5V and V_{CC} = V_{CC} MAX + 0.5V. Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.

© IC MASTER 1983

See Page 809 for Ordering Information.

FAST ADVANCED SCHOTTKY TTL STATUS GUIDE

DEVICE	PIN #	DESCRIPTION	AVAILABILITY
74F00	14	Quad 2-Input NAND Gate	Avail.
74F02	14	Quad 2-Input NOR Gate	Planned
74F04	14	Hex Inverter	Avail.
74F08	14	Quad 2-Input AND Gate	1H '83
74F10	14	Triple 3-Input NAND Gate	1H '83
74F11	14	Triple 3-Input AND Gate	1H '83
74F14	14	Hex Schmitt Trigger	2H '83
74F20	14	Dual 4-Input NAND Gate	Avail.
74F32	14	Quad 2-Input OR Gate	1H '83
74F37	14	Quad 2-Input NAND Buffer	2H '83
74F38	14	Quad 2-Input NAND Buffer, O/C	2H '83
74F40	14	Quad 4-Input NAND Buffer	2H '83
74F64	14	AND/OR Invert Gate	Avail.
74F74	14	Dual D-Type Flip-Flop	1H '83
74F85	16	4-Bit Magnitude Comparator	2H '83
74F86	14	Quad 2-Input Exclusive-OR Gate	Avail.
74F109	16	Dual JK Flip-Flop	1H '83
74F112	16	Dual JK Flip-Flop	Planned
74F113	16	Dual JK Flip-Flop	Planned
74F114	16	Dual JK Flip-Flop	Planned
74F138	16	One-of-Eight Decoder/Demultiplexer	1H '83
74F139	16	Dual One-of-Four Decoder/Demultiplexer	Avail.
74F148	16	8-Bit Priority Encoder	Planned
74F151	16	8-Input Multiplexer	2H '83
74F153	16	Dual 4-Input Multiplexer	1H '83
74F157	16	Quad 2-Input Multiplexer	Avail.
74F158	16	Quad 2-Input Multiplexer	1H '83
74F160	16	BCD Decade Counter, Asynchronous Reset	Planned
74F161	16	4-Bit Binary Counter, Asynchronous Reset	Planned
74F162	16	BCD Decade Counter, Synchronous Reset	Planned
74F163	16	4-Bit Binary Counter, Synchronous Reset	Planned
74F164	14	8-Bit PISO Shift Register	Planned
74F168	16	Up/Down Decade Counter	Planned
74F169	16	Up/Down Binary Counter	Planned
74F174	16	Hex D Flip-Flop w/Common Master Reset	Planned
74F175	16	Quad D Flip-Flop w/Common Master Reset	Planned
74F181	24	Arithmetic Logic Unit	1H '83
74F182	16	Carry Look-Ahead Generator	Planned
74F190	16	Up/Down Decade Counter	1H '83
74F191	16	Up/Down Binary Counter	1H '83
74F192	16	Up/Down Decade Counter	Planned
74F193	16	Up/Down Binary Counter	Planned
74F194	16	4-Bit Bidirectional Universal Shift Register	2H '83
74F195	16	4-Bit Parallel Access Shift Register	1H '83
74F198	24	8-Bit Bidirectional Universal Shift Register	Planned
74F240	20	Octal Inverting Bus/Line Driver	1H '83
74F241	20	Octal Bus/Line Driver	1H '83
74F242	14	Quad Bus Transceiver	2H '83
74F243	14	Quad Bus Transceiver	2H '83
74F244	20	Octal Bus/Line Driver	1H '83
74F245	20	Octal Bus Transceiver	1H '83
74F251	16	8-Input Multiplexer, 3-State	2H '83
74F253	16	Dual 4-Input Multiplexer, 3-State	4Q '82
74F256	16	Dual 4-Bit Addressable Latch	2H '83
74F257	16	Quad 2-Input Multiplexer, 3-State	Avail.
74F258	16	Quad 2-Input Multiplexer, 3-State	Avail.
74F259	16	8-Bit Addressable Latch	2H '83
74F269	24	8-Bit Up/Down Counter	2H '83
74F273	20	Octal "D" Flip-Flop	2H '83
74F280	14	9-Bit Parity Generator/Checker	1H '83
74F299	20	Octal Shift/Storage Register, 3-State	Planned
74F322	20	Octal Shift/Storage Register, 3-State	Planned
74F323	20	Octal Shift/Storage Register, 3-State	Planned

DEVICE	PIN #	DESCRIPTION	AVAILABILITY
74F350	16	4-Bit Shifter, 3-State	1H '83
74F352	14	Dual 4-Input Multiplexer (inverted '153)	1H '83
74F353	16	Dual 4-Input Multiplexer (Inverted '253)	1H '83
74F365	16	Hex Buffer with Common Enable, 3-State	2H '83
74F366	16	Hex Inverter with Common Enable, 3-State	2H' 83
74F367	16	Hex Buffer, 4-Bit and 2-Bit, 3-State	2H '83
74F368	16	Hex Inverter, 4-Bit and 2-Bit, 3-State	2H '83
74F373	20	Octal D Latch, 3-State	Avail.
74F374	20	Octal D Flip-Flop, 3-State	Avail.
74F377	20	Octal D-Type Flip-Flop with Enable	2H '83
74F378	16	Hex D Flip-Flop with Enable	Planned
74F379	16	Quad Flip-Flop with Enable	Planned
74F395	16	4-Bit Cascadable S/R, 3-State	2H '83
74F398	20	4-Bit Flip-Flop, True and Comp. Outputs	Planned
74F399	16	4-Bit Flip-Flop, True and Comp. Outputs	Planned
74F431	24	8-Bit Output Port	2H '83
74F521	20	Octal Comparator	Avail.
74F524	20	8-Bit Register Comparator	Planned
74F533	20	Inverting Octal D Latch, 3-State	Avail.
74F534	20	Inverting Octal D Flip-Flop, 3-State	Avail.
74F545	20	Octal Bus Transceiver	1H '83
74F568	20	4-Bit Binary Up/Down Counter, 3-State	Planned
74F569	20	4-Bit Decade Up/Down Counter, 3-State	Planned
74F579	20	8-Bit Up/Down Counter, Common I/O	2H '83
74F581	24	Octal Inverting Buffer w/Parity Generator-Checker	1H '83
74F582	24	Octal Buffer w/Parity Generator-Checker	1H '83
74F585	24	Octal Bus Transceiver w/Parity Generator-Checker	1H '83
74F588	20	GPIB Compatible Octal Transceiver	1H '83
74F590	16	8-Bit Binary Counter w/Output Latch, 3-State	2H '83
74F591	16	8-Bit Binary Counter w/Output Latch, O.C.	2H '83
74F592	16	8-Bit Binary Counter w/Input Register	2H '83
74F593	20	8-Bit Binary Counter w/Input Register	2H '83
74F595	16	8-Bit Shift Register w/Output Latch	2H '83
74F596	16	8-Bit Shift Register w/Output Latch	2H '83
74F597	16	8-Bit Shift Register w/Input Latch	2H '83
74F598	16	8-Bit Shift Register w/Input Latch	2H '83
74F604	28	Dual 8-Bit Latch	2H '83
74F605	28	Dual 8-Bit Latch	2H '83
74F606	28	Dual 8-Bit Latch	2H '83
74F607	28	Dual 8-Bit Latch	2H '83
74F620	20	Octal Bus Transceivers	2H '83
74F621	20	Octal Bus Transceivers	2H '83
74F622	20	Octal Bus Transceivers	2H '83
74F623	20	Octal Bus Transceivers	2H '83
74F630	28	Memory Error Detector/Corrector, 3-State	2H '83
74F631	28	Memory Error Detector/Corrector, Open Collector	2H '83
74F646	24	Octal Bus Transceivers and Registers	1H '83
74F647	24	Octal Bus Transceivers and Registers	1H '83
74F648	24	Octal Bus Transceivers and Registers	1H '83
74F649	24	Octal Bus Transceivers and Registers	1H '83
74F673	24	16-Bit Serial-In/Parallel-Out Shift Register	Planned
74F674	24	16-Bit Parallel-In/Serial-Out Shift Register	Planned
74F675	24	16-Bit SI/PO Shift Register w/S.O. Capability	Planned
74F676	24	16-Bit PI/SO Shift Register w/S.O. Capability	Planned
74F764	40	Dual-Port RAM Controller w/Dynamic Memory Refresh	2H '83
74F779	16	8-Bit Counter	2H '83

FAST is a trademark of Fairchild Camera and Instrument Corporation.

See Page 809 for Ordering Information.

© IC MASTER 1983

TRANSCEIVER 54/74LS245

Octal Transceiver (3-State)

- **Octal bidirectional bus interface**
- **3-State buffer outputs**
- **PNP inputs for reduced loading**
- **Hysteresis on all inputs**

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (Total)
74LS245	8ns	58mA

DESCRIPTION

The 'LS245 is an octal transceiver featuring non-inverting 3-State bus compatible outputs in both send and receive directions. The outputs are all capable of sinking 24mA and sourcing up to 15mA, producing very good capacitive drive characteristics. The device features a Chip Enable (CE) input for easy cascading and a Send/Receive (S/R) input for direction control. All inputs have hysteresis built in to minimize ac noise effects.

ORDERING CODE

PACKAGES	COMMERCIAL RANGES V_{CC} = 5V ±5%; T_A = 0°C to +70°C	MILITARY RANGES V_{CC} = 5V ±10%; T_A = −55°C to +125°C
Plastic DIP	N74LS245N	
Ceramic DIP	N74LS245F	S54LS245F
Flatpack		

FUNCTION TABLE

INPUTS		INPUTS/OUTPUTS	
$\overline{CE}$	S/$\overline{R}$	A_n	B_n
L	L	A = B	INPUTS
L	H	INPUT	B = A
H	X	(Z)	(Z)

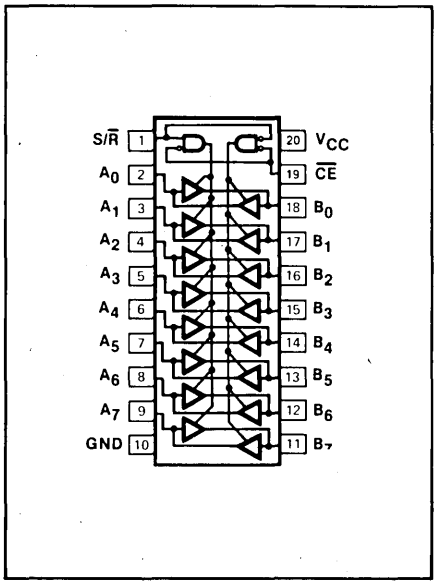
H = HIGH voltage level
L = LOW voltage level
X = Don't care
(Z) = HIGH impedance "off" state

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

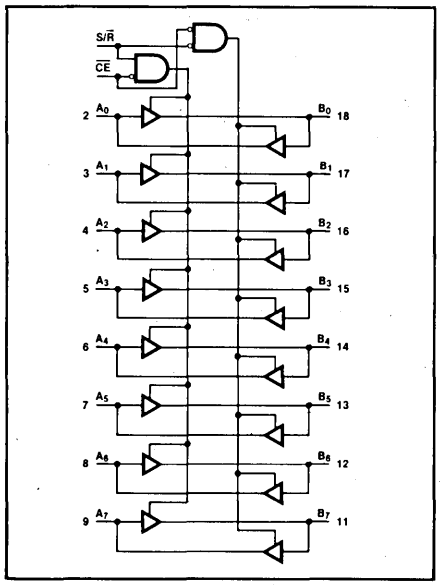
PINS	DESCRIPTION	54/74LS
All	Inputs	1LSul
All	Outputs	30LSul

NOTE
A 54/74LS unit load (LSul) is 20μA I_{IH} and −0.4mA I_{IL}.

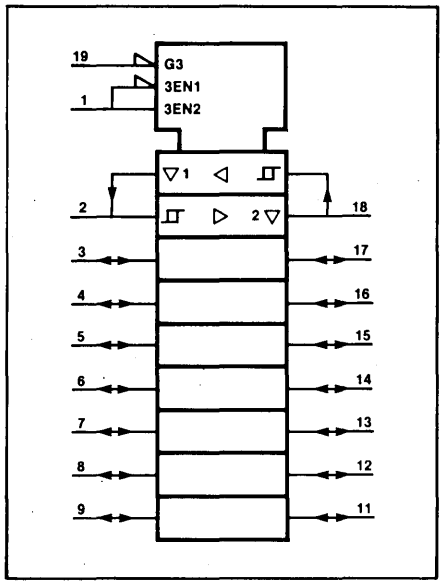
PIN CONFIGURATION



LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



© IC MASTER 1983

See Page 809 for Ordering Information.

TRANSCEIVER 54/74LS245

ABSOLUTE MAXIMUM RATINGS (Over operating free-air temperature range unless otherwise noted.)

PARAMETER		54LS	74LS	UNIT
V_{CC}	Supply voltage	7.0	7.0	V
V_{IN}	Input voltage	−0.5 to +7.0	−0.5 to +7.0	V
I_{IN}	Input current	−30 to +1	−30 to +1	mA
V_{OUT}	Voltage applied to output in HIGH output state	−0.5 to +V_{CC}	−0.5 to +V_{CC}	V
T_A	Operating free-air temperature range	−55 to +125	0 to 70	°C

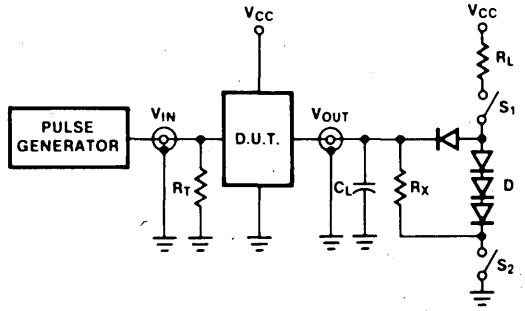
NOTE
V_{IN} limited to 5.5V on A and B inputs only.

RECOMMENDED OPERATING CONDITIONS

PARAMETER			54/74LS			UNIT
			Min	Nom	Max	
V_{CC}	Supply voltage	Mil	4.5	5.0	5.5	V
		Com'l	4.75	5.0	5.25	V
V_{IH}	HIGH-level input voltage		2.0			V
V_{IL}	LOW-level input voltage	Mil			+0.7	V
		Com'l			+0.8	V
I_{IH}	Input clamp current				−18	mA
I_{OH}	HIGH-level output current	Mil			−12	mA
		Com'l			−15	mA
I_{OL}	LOW-level output current	Mil			12	mA
		Com'l			24	mA
T_A	Operating free-air temperature	Mil	−55		+125	°C
		Com'l	0		70	°C

TEST CIRCUITS AND WAVEFORMS

TEST CIRCUIT FOR 3-STATE OUTPUTS

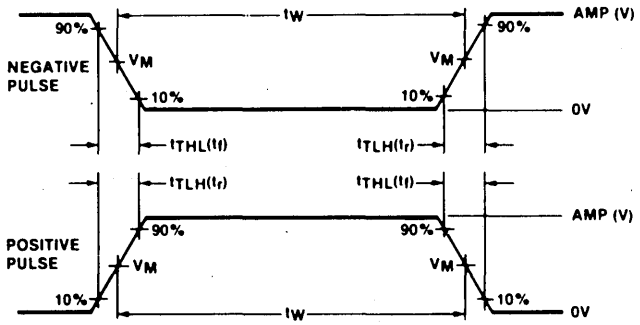


SWITCH POSITION

Test	Switch 1	Switch 2
t_{PZH}	Open	Closed
t_{PZL}	Closed	Open
t_{PHZ}	Closed	Closed
t_{PLZ}	Closed	Closed

DEFINITIONS
R_L = Load resistor to V_{CC}; see AC CHARACTERISTICS for value.
C_L = Load capacitance includes jig and probe capacitance; see AC CHARACTERISTICS for value.
R_T = Termination resistance should be equal to Z_{OUT} of Pulse Generators.
D = Diodes are 1N916, 1N3064, or equivalent.
R_X = 1kΩ for 54/74, 54S/74S. R_X = 5kΩ for 54LS/74LS.
t_{TLH}, t_{THL} Values should be less than or equal to the table entries.

INPUT PULSE DEFINITIONS



V_M = 1.3V for 54LS/74LS; V_M = 1.5V for all other TTL families

FAMILY	INPUT PULSE REQUIREMENTS				
	Amplitude	Rep. Rate	Pulse Width	t_{TLH}	t_{THL}
54/74	3.0V	1MHz	500ns	7ns	7ns
54LS/74LS	3.0V	1MHz	500ns	15ns	6ns
54S/74S	3.0V	1MHz	500ns	2.5ns	2.5ns

© IC MASTER 1983

TRANSCEIVER 54/74LS245

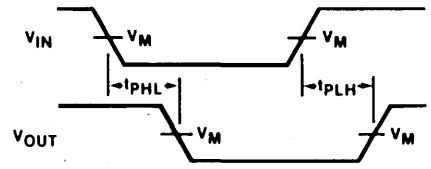
DC ELECTRICAL CHARACTERISTICS (Over recommended operating free-air temperature range unless otherwise noted.)

PARAMETER		TEST CONDITIONS[1]			54/74LS245 Min	54/74LS245 Typ[2]	54/74LS245 Max	UNIT
ΔV_T	Hysteresis ($V_{T+}-V_{T-}$)	V_{CC} = MIN			0.2	0.4		V
V_{OH}	HIGH-level output voltage	V_{CC} = MIN, V_{IH} = MIN, V_{IL} = MAX	I_{OH} = MAX		2.0			V
			I_{OH} = −3mA		2.4	3.4		V
V_{OL}	LOW-level output voltage	V_{CC} = MIN, V_{IH} = MIN, V_{IL} = MAX	I_{OL} = MAX	Mil			0.4	V
				Com'l			0.5	V
			I_{OL} = 12mA	74LS			0.4	V
V_{IK}	Input clamp voltage	V_{CC} = MIN, $I_I = I_{IK}$					−1.5	V
I_{OZH}	Off-state output current, HIGH-level voltage applied	V_{CC} = MAX, V_O = 2.7V, $\overline{CE}$ = 2.0V					20	μA
I_{OZL}	Off-state output current, LOW-level voltage applied	V_{CC} = MAX, V_O = 0.4V, $\overline{CE}$ = 2.0V					−200	μA
I_I	Input current at maximum input voltage	V_{CC} = MAX	V_I = 5.5V	A, B inputs			0.1	mA
			V_I = 7.0V	S/$\overline{R}$, $\overline{CE}$ inputs			0.1	mA
I_{IH}	HIGH-level input current	V_{CC} = MAX, V_I = 2.7V					20	μA
I_{IL}	LOW-level input current	V_{CC} = MAX, V_I = 0.4V					−0.2	mA
I_{OS}	Short-circuit output current[3]	V_{CC} = MAX			−40		−130	mA
I_{CC}	Supply current[4] (total)	V_{CC} = MAX	I_{CCH}	Outputs HIGH		48	70	mA
			I_{CCL}	Outputs LOW		62	90	mA
			I_{CCZ}	Outputs OFF		64	95	mA

NOTES
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
2. All typical values are at V_{CC} = 5V, T_A = 25°C.
3. I_{OS} is tested with V_{OUT} = +0.5V and $V_{CC} = V_{CC}$ MAX + 0.5V. Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.
4. Measure I_{CC} with outputs open.

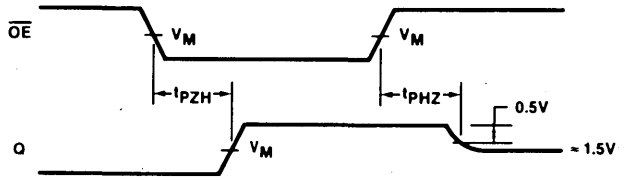
AC WAVEFORMS

WAVEFORM FOR NON-INVERTING OUTPUTS



Waveform 1

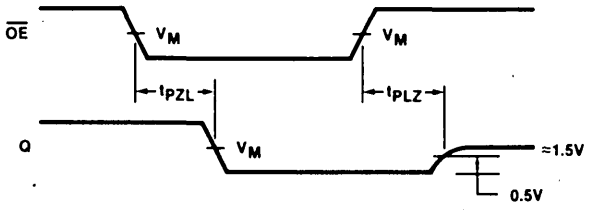
3-STATE ENABLE TIME TO HIGH LEVEL AND DISABLE TIME FROM HIGH LEVEL



Waveform 2

V_M = 1.3V for 54LS/74LS, V_M = 1.5V for all other TTL families

3-STATE ENABLE TIME TO LOW LEVEL AND DISABLE TIME FROM LOW LEVEL



Waveform 3

© IC MASTER 1983

See Page 809 for Ordering Information.

TRANSCEIVER 54/74LS245

AC CHARACTERISTICS $T_A = 25°C$, $V_{CC} = 5.0V$

PARAMETER		TEST CONDITIONS	54LS/74LS $C_L = 45pF$, $R_L = 667\Omega$		UNIT
			Min	Max	
t_{PLH}	Propagation delay	Waveform 1		12	ns
t_{PHL}	Propagation delay	Waveform 1		12	ns
t_{PZH}	Enable to HIGH	Waveform 2		40	ns
t_{PZL}	Enable to LOW	Waveform 3		40	ns
t_{PHZ}	Disable from HIGH	Waveform 2, $C_L = 5pF$		25	ns
t_{PLZ}	Disable from LOW	Waveform 3, $C_L = 5pF$		25	ns

See Page 809 for Ordering Information.
© IC MASTER 1983

'373 Octal Transparent Latch With 3-State Outputs
'374 Octal D Flip-Flop With 3-State Outputs

- 8-bit transparent latch — '373
- 8-bit positive, edge-triggered register — '374
- 3-State output buffers
- Common 3-State Output Enable
- Independent register and 3-State buffer operation

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (Total)
74LS373	19ns	24mA
74S373	10ns	105mA
74LS374	19ns	27mA
74S374	8ns	116mA

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION	54/74S	54/74LS
All	Inputs	1Sul	1LSul
All	Outputs	10Sul	30LSul

NOTE
Where a 54/74S unit load (Sul) is 50μA I_{IH} and -2.0mA I_{IL}, and a 54/74LS unit load (LSul) is 20μA I_{IH} and -0.4mA I_{IL}.

ORDERING CODE

PACKAGES	COMMERCIAL RANGES $V_{CC}=5V \pm 5\%; T_A=0°C$ to $+70°C$	MILITARY RANGES $V_{CC}=5V \pm 10\%; T_A=-55°C$ to $+125°C$
Plastic	N74LS373N • N74S373N N74LS374N • N74S374N	
Ceramic DIP	N74LS373F • N74S373F N74LS374F • N74S374F	S54LS373F • S54S373F S54LS374F • S54S374F

DESCRIPTION

The '373 is an octal transparent latch coupled to eight 3-State output buffers. The two sections of the device are controlled independently by Latch Enable (E) and Output Enable ($\overline{OE}$) control gates.

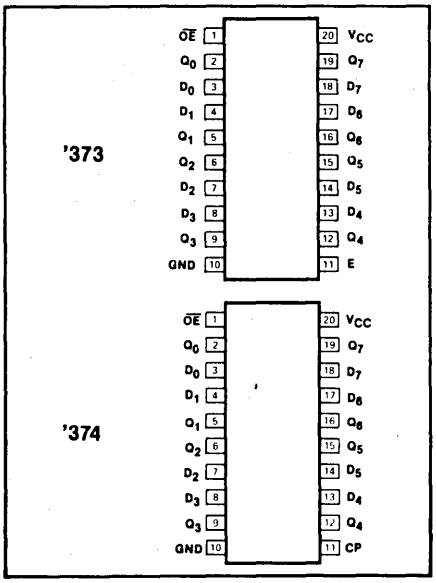
The data on the D inputs are transferred to the latch outputs when the Latch Enable (E) input is HIGH. The latch remains transparent to the data inputs while E is HIGH, and stores the data present one setup time before the HIGH-to-LOW enable transition. The enable gate has about 400mV of hysteresis built in to help minimize problems that signal and ground noise can cause on the latching operation.

The 3-State output buffers are designed to drive heavily loaded 3-State buses, MOS memories, or MOS microprocessors. The active LOW Output Enable ($\overline{OE}$) controls all eight 3-State buffers independent of the latch operation. When $\overline{OE}$ is LOW, the latched or transparent data appears at the outputs. When $\overline{OE}$ is HIGH, the outputs are in the HIGH impedance "off" state, which means they will neither drive nor load the bus.

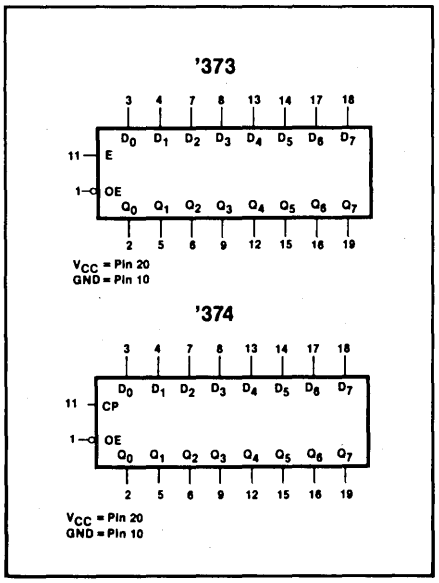
The '374 is an 8-bit, edge-triggered register coupled to eight 3-State output buffers. The two sections of the device are controlled independently by the Clock (CP) and Output Enable ($\overline{OE}$) control gates.

The register is fully edge triggered. The state of each D input, one setup time before the LOW-to-HIGH clock transition, is transferred to the corresponding flip-flop's Q output. The clock buffer has about 400mV of hysteresis built in to help minimize problems that signal and ground noise can cause on the clocking operation.

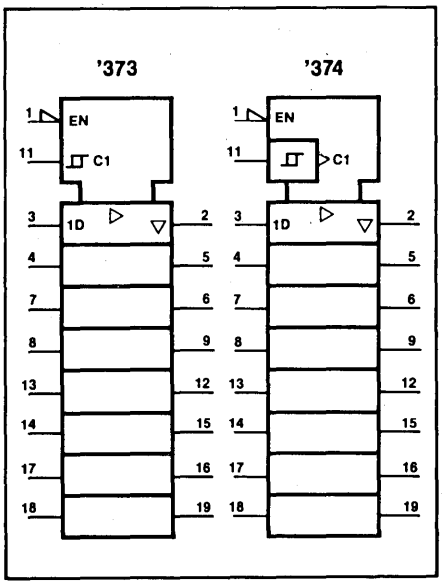
PIN CONFIGURATION



LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)

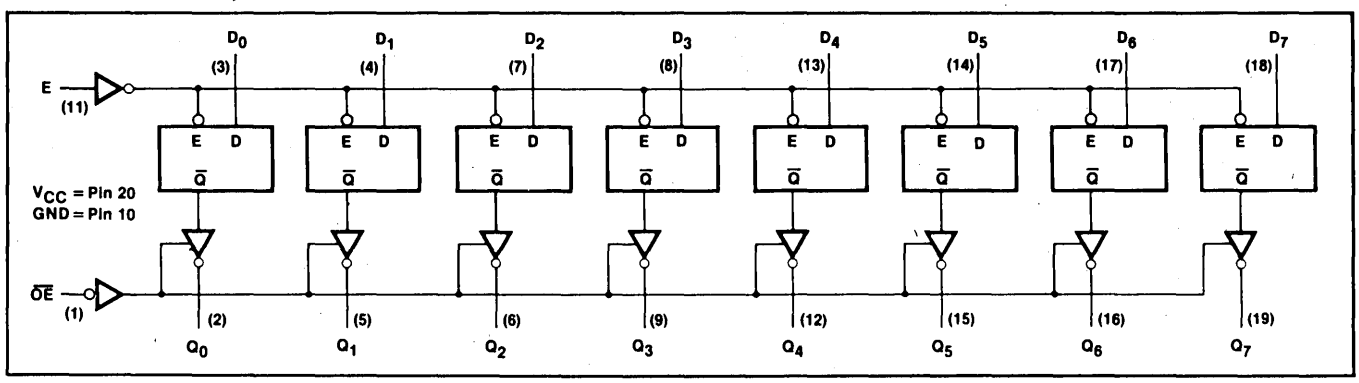


© IC MASTER 1983

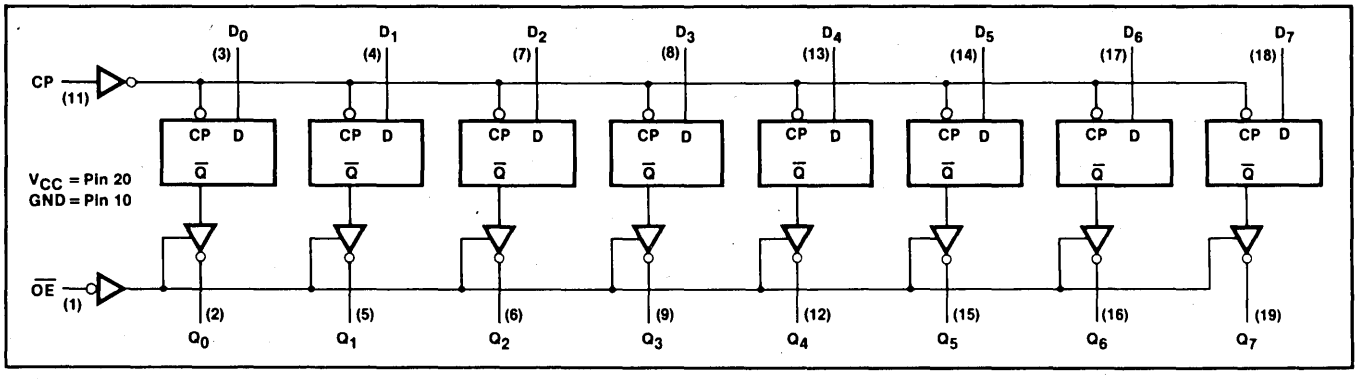
See Page 809 for Ordering Information.

The 3-State output buffers are designed to drive heavily loaded 3-State buses, MOS memories, or MOS microprocessors. The active LOW Output Enable ($\overline{OE}$) controls all eight 3-State buffers independent of the register operation. When $\overline{OE}$ is LOW, the data in the register appears at the outputs. When $\overline{OE}$ is HIGH, the outputs are in the HIGH impedance "off" state, which means they will neither drive nor load the bus.

LOGIC DIAGRAM, '373



LOGIC DIAGRAM, '374



MODE SELECT—FUNCTION TABLE, '373

OPERATING MODES	INPUTS			INTERNAL REGISTER	OUTPUTS
	$\overline{OE}$	E	D_n		Q_0-Q_7
Enable and read register	L	H	L	L	L
	L	H	H	H	H
Latch and read register	L	L	l	L	L
	L	L	h	H	H
Latch register and disable outputs	H	L	l	L	(Z)
	H	L	h	H	(Z)

MODE SELECT—FUNCTION TABLE, '374

OPERATING MODES	INPUTS			INTERNAL REGISTER	OUTPUTS
	$\overline{OE}$	CP	D_n		Q_0-Q_7
Load and read register	L	↑	l	L	L
	L	↑	h	H	H
Load register and disable outputs	H	↑	l	L	(Z)
	H	↑	h	H	(Z)

H = HIGH voltage level
h = HIGH voltage level one setup time prior to the LOW-to-HIGH clock transition or HIGH-to-LOW $\overline{OE}$ transition
L = LOW voltage level
l = LOW voltage level one setup time prior to the LOW-to-HIGH clock transition or HIGH-to-LOW $\overline{OE}$ transition
(Z) = HIGH impedance "off" state
↑ = LOW-to-HIGH clock transition

See Page 809 for Ordering Information.

© IC MASTER 1983

ABSOLUTE MAXIMUM RATINGS (Over operating free-air temperature range unless otherwise noted.)

PARAMETER		54LS	54S	74LS	74S	UNIT
V_{CC}	Supply voltage	7.0	7.0	7.0	7.0	V
V_{IN}	Input voltage	−0.5 to +7.0	−0.5 to +5.5	−0.5 to +7.0	−0.5 to +5.5	V
I_{IN}	Input current	−30 to +1	−30 to +5	−30 to +1	−30 to +5	mA
V_{OUT}	Voltage applied to output in HIGH output state.	−0.5 to +V_{CC}	−0.5 to +V_{CC}	−0.5 to +V_{CC}	−0.5 to +V_{CC}	V
T_A	Operating free-air temperature range	−55 to +125		0 to 70		°C

RECOMMENDED OPERATING CONDITIONS

PARAMETER			54/74LS			54/74S			UNIT
			Min	Nom	Max	Min	Nom	Max	
V_{CC}	Supply voltage	Mil	4.5	5.0	5.5	4.5	5.0	5.5	V
		Com'l	4.75	5.0	5.25	4.75	5.0	5.25	V
V_{IH}	HIGH-level input voltage		2.0			2.0			V
V_{IL}	LOW-level input voltage	Mil			+0.7			+0.8	V
		Com'l			+0.8			+0.8	V
I_{IK}	Input clamp current				−18			−18	mA
I_{OH}	HIGH-level output current	Mil			−1.0			−2.0	mA
		Com'l			−2.6			−6.5	mA
I_{OL}	LOW-level output current	Mil			12			20	mA
		Com'l			24			20	mA
T_A	Operating free-air temperature	Mil	−55		+125	−55		+125	°C
		Com'l	0		70	0		70	°C

NOTE
V_{IL} = +0.7V MAX for 54S at T_A = +125°C only.

© IC MASTER 1983

See Page 809 for Ordering Information.

LATCHES/FLIP-FLOPS 54/74LS373, 54/74LS374, S373, S374

DC ELECTRICAL CHARACTERISTICS (Over recommended operating free-air temperature range unless otherwise noted.)

PARAMETER		TEST CONDITIONS[1]			54/74LS373, 374			54/74S373, 374			UNIT
					Min	Typ[2]	Max	Min	Typ[2]	Max	
V_{OH}	HIGH-level output voltage	V_{CC} = MIN, V_{IH} = MIN, V_{IL} = MAX, I_{OH} = MAX		Mil	2.4	3.4		2.4	3.0		V
				Com'l	2.4	3.1		2.4	3.1		V
V_{OL}	LOW-level output voltage	V_{CC} = MIN, V_{IH} = MIN, V_{IL} = MAX	I_{OL} = MAX	Mil		0.25	0.4			0.5[4]	V
				Com'l		0.35	0.5			0.5	V
			I_{OL} = 12mA	74LS		0.25	0.4				V
V_{IK}	Input clamp voltage	V_{CC} = MIN, I_I = I_{IK}					– 1.5			– 1.2	V
I_{OZH}	Off-state output current, HIGH-level voltage applied	V_{CC} = MAX, V_{IH} = MIN	V_O = 2.7V				20				μA
			V_O = 2.4V							50	μA
I_{OZL}	Off-state output current, LOW-level voltage applied	V_{CC} = MAX, V_{IH} = MIN	V_O = 0.4V				– 20				μA
			V_O = 0.5V							– 50	μA
I_I	Input current at maximum input voltage	V_{CC} = MAX	V_I = 7.0V				0.1				mA
			V_I = 5.5V							1.0	mA
I_{IH}	HIGH-level input current	V_{CC} = MAX, V_I = 2.7V					20			50	μA
I_{IL}	LOW-level input current	V_{CC} = MAX	V_I = 0.4V				– 0.4				mA
			V_I = 0.5V							– 0.25	mA
I_{OS}	Short-circuit output current[3]	V_{CC} = MAX			– 30		– 130	– 40		– 100	mA
I_{CC}	Supply current (total)	V_{CC} = MAX	I_{CCZ}	$\overline{OE}$ = 4.5V 'LS373		24	40				mA
			I_{CCL}	$\overline{OE}$ = 0V 'S373					105	160	mA
			I_{CCZ}	$\overline{OE}$ = 4.5V 'LS374		27	40				mA
			I_{CCL}	All inputs grounded 'S374					102	140	mA
			I_{CCZ}	CP, $\overline{OE}$ = 4.0V, D inputs = GND 'S374					131	180	mA

NOTES
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
2. All typical values are at V_{CC} = 5V, T_A = 25°C.
3. I_{OS} is tested with V_{OUT} = + 0.5V and V_{CC} = V_{CC} MAX + 0.5V. Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.
4. V_{OL} = + 0.45V MAX for 54S at T_A = + 125°C only.

AC CHARACTERISTICS T_A = 25°C, V_{CC} = 5.0V

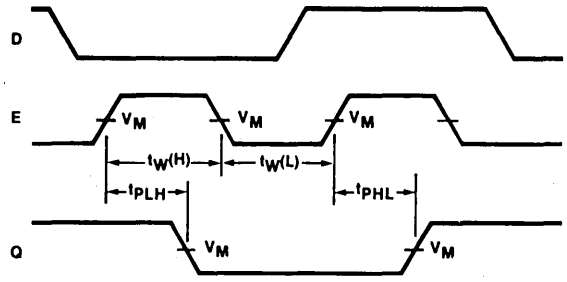
PARAMETER		TEST CONDITIONS	54/74LS C_L = 45pF, R_L = 667Ω		54/74S C_L = 15pF, R_L = 280Ω		UNIT
			Min	Max	Min	Max	
f_{MAX}	Maximum clock frequency	Waveform 6, '374	35		75		MHz
t_{PLH} t_{PHL}	Propagation delay Latch Enable to output	Waveform 1, '373		30 30		14 18	ns
t_{PLH} t_{PHL}	Propagation delay Data to output	Waveform 4, '373		18 18		9 13	ns
t_{PLH} t_{PHL}	Propagation delay Clock to output	Waveform 6, '374		28 28		15 17	ns
t_{PZH}	Enable time to HIGH level	Waveform 2		28		15	ns
t_{PZL}	Enable time to LOW level	Waveform 3, '373 '374		36 28		18 18	ns
t_{PHZ}	Disable time from HIGH level	Waveform 2, C_L = 5pF		20		9	ns
t_{PLZ}	Disable time from LOW level	Waveform 3, C_L = 5pF		25		12	ns

NOTE Per industry convention, f_{MAX} is the worst case value of the maximum device operating frequency with no constraints on t_r, t_f, pulse width or duty cycle.

© IC MASTER 1983

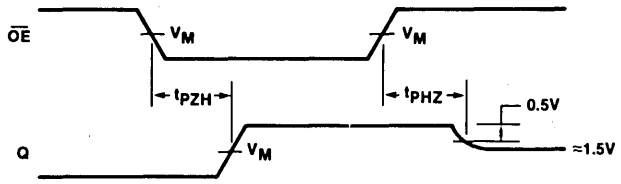
AC WAVEFORMS

LATCH ENABLE TO OUTPUT DELAYS AND LATCH ENABLE PULSE WIDTH



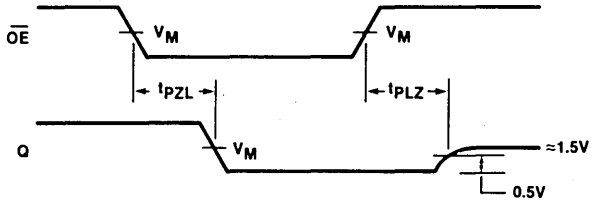
Waveform 1

3-STATE ENABLE TIME TO HIGH LEVEL AND DISABLE TIME FROM HIGH LEVEL



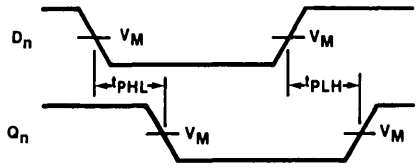
Waveform 2

3-STATE ENABLE TIME TO LOW LEVEL AND DISABLE TIME FROM LOW LEVEL



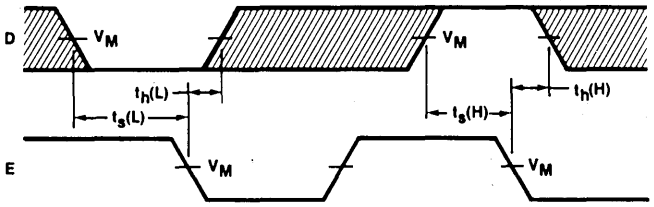
Waveform 3

PROPAGATION DELAY DATA TO Q OUTPUTS



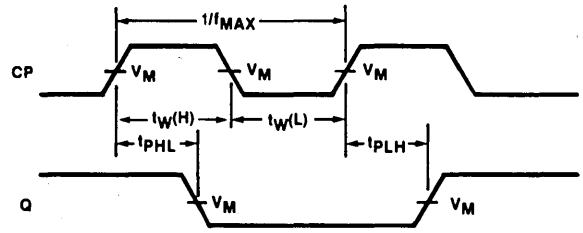
Waveform 4

DATA SETUP AND HOLD TIMES



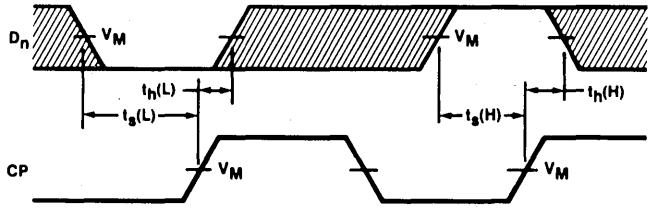
Waveform 5

CLOCK TO OUTPUT DELAYS AND CLOCK PULSE WIDTH



Waveform 6

DATA SETUP AND HOLD TIMES



Waveform 7

V_M = 1.5V for 54/74 and 54S/74S, V_M = 1.3V for 54LS/74LS.
The shaded areas indicate when the input is permitted to change for predictable output performance.

DIGITAL

Signetics

© IC MASTER 1983

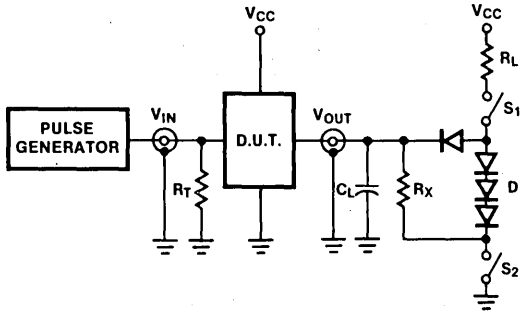
See Page 809 for Ordering Information.

AC SETUP REQUIREMENTS $T_A = 25°C$, $V_{CC} = 5.0V$

PARAMETER		TEST CONDITIONS	54/74LS		54/74S		UNIT
			Min	Max	Min	Max	
$t_{W(H)}$ $t_{W(L)}$	Latch Enable pulse width	Waveform 1, '373	15 15		6 7.3		ns
t_s	Setup time, Data to Latch Enable	Waveform 5, '373	5		0		ns
t_h	Hold time, Data to Latch Enable	Waveform 5, '373	20		10		ns
$t_{W(H)}$ $t_{W(L)}$	Clock pulse width	Waveform 6, '374	15 15		6 7.3		ns
t_s	Setup time, Data to Clock	Waveform 7, '374	20		5		ns
t_h	Hold time, Data to Clock	Waveform 7, '374	0		2		ns

TEST CIRCUITS AND WAVEFORMS

TEST CIRCUIT FOR 3-STATE OUTPUTS



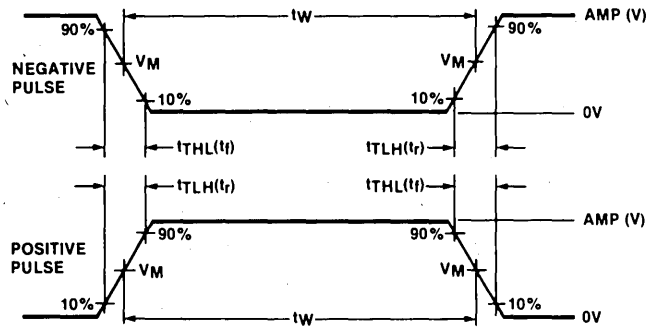
SWITCH POSITION

Test	Switch 1	Switch 2
t_{PZH}	Open	Closed
t_{PZL}	Closed	Open
t_{PHZ}	Closed	Closed
t_{PLZ}	Closed	Closed

DEFINITIONS

R_L = Load resistor to V_{CC}; see AC CHARACTERISTICS for value.
C_L = Load capacitance includes jig and probe capacitance; see AC CHARACTERISTICS for value.
R_T = Termination resistance should be equal to Z_{OUT} of Pulse Generators.
D = Diodes are 1N916, 1N3064, or equivalent.
R_X = 1kΩ for 54/74, 54S/74S, R_X = 5kΩ for 54LS/74LS.
t_{TLH}, t_{THL} Values should be less than or equal to the table entries.

INPUT PULSE DEFINITIONS



V_M = 1.3V for 54LS/74LS; V_M = 1.5V for all other TTL families.

FAMILY	INPUT PULSE REQUIREMENTS				
	Amplitude	Rep. Rate	Pulse Width	t_{TLH}	t_{THL}
54/74	3.0V	1MHz	500ns	7ns	7ns
54LS/74LS	3.0V	1MHz	500ns	15ns	6ns
54S/74S	3.0V	1MHz	500ns	2.5ns	2.5ns

© IC MASTER 1983

FLIP-FLOP 54/74S534

Octal D Flip-Flop With 3-State Outputs

- 8-bit positive, edge-triggered register
- Inverting outputs
- 3-State output buffers
- Common 3-State Output Enable
- Independent register and 3-State buffer operation

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (Total)
74S534	8ns	116mA

ORDERING CODE

PACKAGES	COMMERCIAL RANGES V_{CC} = 5V ±5%; T_A = 0°C to +70°C	MILITARY RANGES V_{CC} = 5V ±10%; T_A = −55°C to +125°C
Plastic DIP	N74S534N	
Ceramic DIP	N74S534F	S54S534F

DESCRIPTION

The '534 is an 8-bit, edge-triggered register coupled to eight 3-State inverting output buffers. The two sections of the device are controlled independently by the Clock (CP) and Output Enable ($\overline{OE}$) control gates.

The register is fully edge triggered. The state of each D input, one setup time before the LOW-to-HIGH clock transition, is transferred to the corresponding flip-flop's $\overline{Q}$ output. The clock buffer has about 400mV of hysteresis built in to help minimize problems that signal and ground noise can cause on the clocking operation.

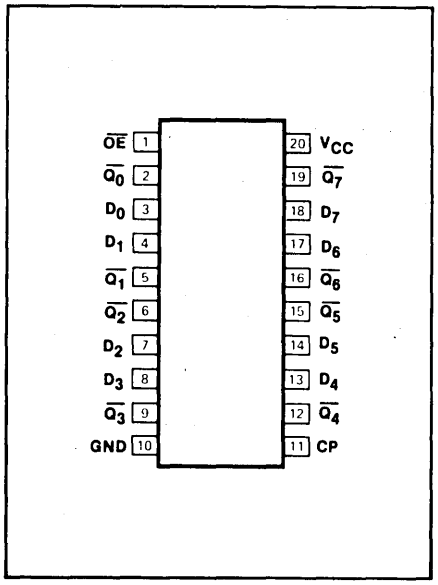
The 3-State inverting output buffers are designed to drive heavily loaded 3-State buses, MOS memories, or MOS microprocessors. The active LOW Output Enable ($\overline{OE}$) controls all eight 3-State buffers independent of the register operation. When $\overline{OE}$ is LOW, the data in the register appears at the outputs. When $\overline{OE}$ is HIGH, the outputs are in the HIGH impedance "off" state, which means they will neither drive nor load the bus.

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

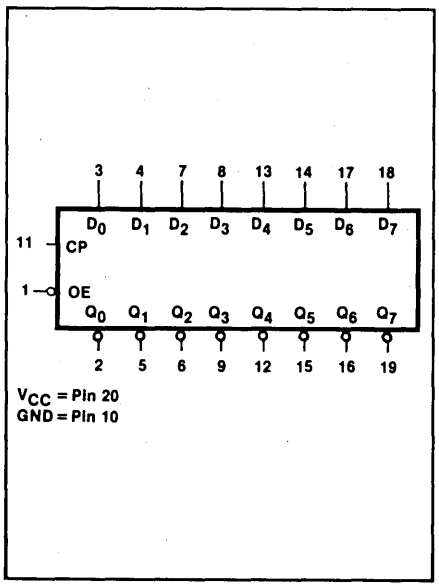
PINS	DESCRIPTION	54/74S
All	Inputs	1Sul
All	Outputs	10Sul

NOTE
Where a 54/74S unit load (Sul) is 50μA I_{IH} and −2.0mA I_{IL}.

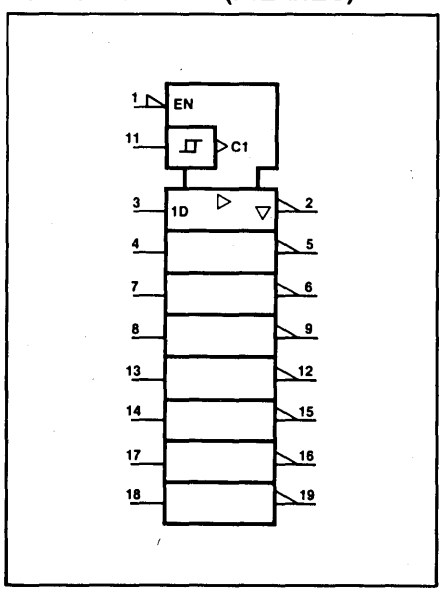
PIN CONFIGURATION



LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



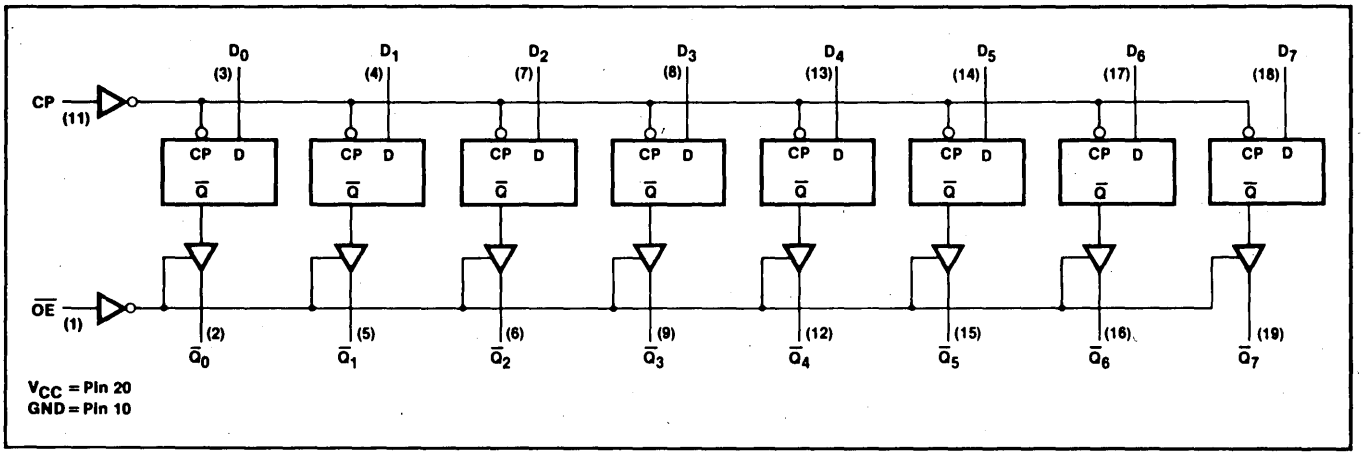
DIGITAL

Signetics

© IC MASTER 1983
See Page 809 for Ordering Information.

FLIP-FLOP 54/74S534

LOGIC DIAGRAM



MODE SELECT—FUNCTION TABLE

OPERATING MODES	INPUTS			INTERNAL REGISTER	OUTPUTS
	$\overline{OE}$	CP	D_n		Q_0-Q_7
Load and read register	L	↑	l	L	H
	L	↑	h	H	L
Load register and disable outputs	H	↑	l	L	(Z)
	H	↑	h	H	(Z)

H = HIGH voltage level
h = HIGH voltage level one setup time prior to the LOW-to-HIGH clock transition
L = LOW voltage level
l = LOW voltage level one setup time prior to the LOW-to-HIGH clock transition
(Z) = HIGH impedance "off" state
↑ = LOW-to-HIGH clock transition

ABSOLUTE MAXIMUM RATINGS (Over operating free-air temperature range unless otherwise noted.)

PARAMETER		54S	74S	UNIT
V_{CC}	Supply voltage	7.0	7.0	V
V_{IN}	Input voltage	−0.5 to +5.5	−0.5 to +5.5	V
I_{IN}	Input current	−30 to +5	−30 to +5	mA
V_{OUT}	Voltage applied to output in HIGH output state.	−0.5 to +V_{CC}	−0.5 to +V_{CC}	V
T_A	Operating free-air temperature range	−55 to +125	0 to 70	°C

RECOMMENDED OPERATING CONDITIONS

PARAMETER			54/74S			UNIT
			Min	Nom	Max	
V_{CC}	Supply voltage	Mil	4.5	5.0	5.5	V
		Com'l	4.75	5.0	5.25	V
V_{IH}	HIGH-level input voltage		2.0			V
V_{IL}	LOW-level input voltage	Mil			+0.8	V
		Com'l			+0.8	V
I_{IK}	Input clamp current				−18	mA
I_{OH}	HIGH-level output current	Mil			−2.0	mA
		Com'l			−6.5	mA
I_{OL}	LOW-level output current	Mil			20	mA
		Com'l			20	mA
T_A	Operating free-air temperature	Mil	−55		+125	°C
		Com'l	0		70	°C

NOTE
V_{IL} = +0.7V MAX for 54S at T_A = +125°C only.

See Page 809 for Ordering Information.
© IC MASTER 1983

FLIP-FLOP 54/74S534

DC ELECTRICAL CHARACTERISTICS (Over recommended operating free-air temperature range unless otherwise noted.)

PARAMETER		TEST CONDITIONS[1]			54/74S534 Min	54/74S534 Typ[2]	54/74S534 Max	UNIT
V_{OH}	HIGH-level output voltage	V_{CC} = MIN, V_{IH} = MIN, V_{IL} = MAX, I_{OH} = MAX		Mil	2.4	3.0		V
				Com'l	2.4	3.1		V
V_{OL}	LOW-level output voltage	V_{CC} = MIN, V_{IH} = MIN, V_{IL} = MAX	I_{OL} = MAX	Mil			0.5[4]	V
				Com'l			0.5	V
			I_{OL} = 12mA	74LS				V
V_{IK}	Input clamp voltage	V_{CC} = MIN, I_I = I_{IK}					-1.2	V
I_{OZH}	Off-state output current, HIGH-level voltage applied	V_{CC} = MAX, V_{IH} = MIN	V_O = 2.7V					μA
			V_O = 2.4V				50	μA
I_{OZL}	Off-state output current, LOW-level voltage applied	V_{CC} = MAX, V_{IH} = MIN	V_O = 0.4V					μA
			V_O = 0.5V				-50	μA
I_I	Input current at maximum input voltage	V_{CC} = MAX	V_I = 7.0V					mA
			V_I = 5.5V				1.0	mA
I_{IH}	HIGH-level input current	V_{CC} = MAX, V_I = 2.7V					50	μA
I_{IL}	LOW-level input current	V_{CC} = MAX	V_I = 0.4V					mA
			V_I = 0.5V				-0.25	mA
I_{OS}	Short-circuit output current[3]	V_{CC} = MAX			-40		-100	mA
I_{CC}	Supply Current (total)	V_{CC} = MAX	I_{CCL}	All inputs grounded		102	140	mA
			I_{CCZ}	CP, $\overline{OE}$ = 4.0V, D inputs = GND		131	180	mA

NOTES
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
2. All typical values are at V_{CC} = 5V, T_A = 25°C.
3. I_{OS} is tested with V_{OUT} = +0.5V and V_{CC} = V_{CC} MAX + 0.5V. Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.
4. V_{OL} = +0.45V MAX for 54S at T_A = +125°C only.

AC CHARACTERISTICS T_A = 25°C, V_{CC} = 5.0V

PARAMETER		TEST CONDITIONS	54S/74S C_L = 15pF, R_L = 280Ω Min	54S/74S C_L = 15pF, R_L = 280Ω Max	UNIT
f_{MAX}	Maximum clock frequency	Waveform 3	75		MHz
t_{PLH} t_{PHL}	Propagation delay Clock to output	Waveform 3		15 17	ns
t_{PZH}	Enable time to HIGH level	Waveform 1		15	ns
t_{PZL}	Enable time to LOW level	Waveform 2		18	ns
t_{PHZ}	Disable time from HIGH level	Waveform 1, C_L = 5pF		9	ns
t_{PLZ}	Disable time from LOW level	Waveform 2, C_L = 5pF		12	ns

AC SETUP REQUIREMENTS T_A = 25°C, V_{CC} = 5.0V

PARAMETER		TEST CONDITIONS	54S/74S Min	54S/74S Max	UNIT
$t_{W(H)}$ $t_{W(L)}$	Clock pulse width	Waveform 3	6 7.3		ns
t_s	Setup time, Data to Clock	Waveform 4	5		ns
t_h	Hold time, Data to Clock	Waveform 4	2		ns

NOTE
Per industry convention, f_{MAX} is the worst case value of the maximum device operating frequency with no constraints on t_r, t_f, pulse width or duty cycle.

DIGITAL

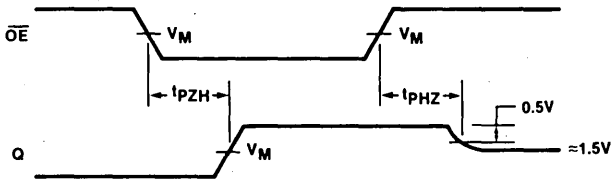
Signetics

© IC MASTER 1983

See Page 809 for Ordering Information.

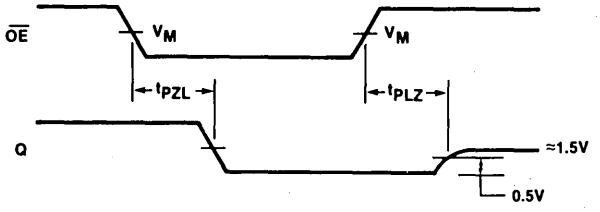
AC WAVEFORMS

3-STATE ENABLE TIME TO HIGH LEVEL AND DISABLE TIME FROM HIGH LEVEL



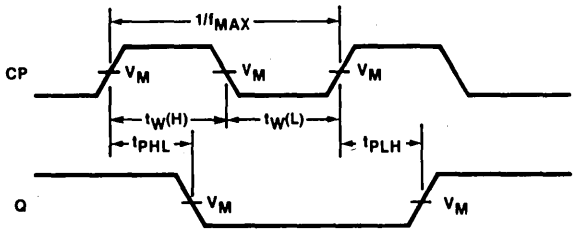
Waveform 1

3-STATE ENABLE TIME TO LOW LEVEL AND DISABLE TIME FROM LOW LEVEL



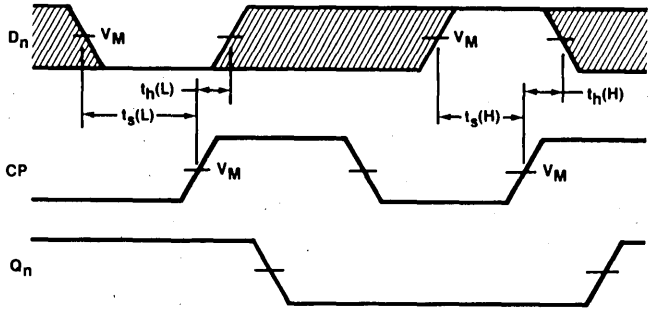
Waveform 2

CLOCK TO OUTPUT DELAYS AND CLOCK PULSE WIDTH



Waveform 3

DATA SETUP AND HOLD TIMES

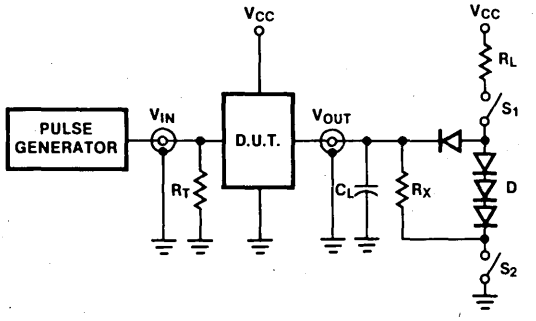


Waveform 4

V_M = 1.5V for 54/74 and 54S/74S, V_M = 1.3V for 54LS/74LS.
The shaded areas indicate when the input is permitted to change for predictable output performance.

TEST CIRCUITS AND WAVEFORMS

TEST CIRCUIT FOR 3-STATE OUTPUTS



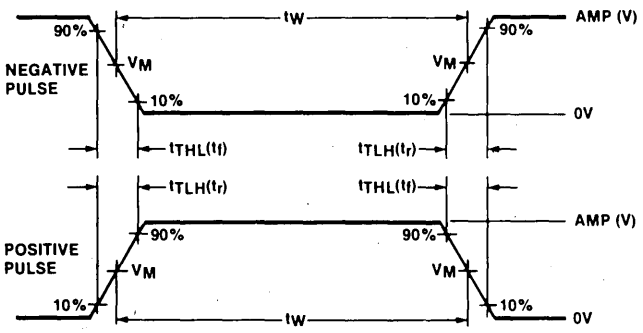
SWITCH POSITION

Test	Switch 1	Switch 2
t_{PZH}	Open	Closed
t_{PZL}	Closed	Open
t_{PHZ}	Closed	Closed
t_{PLZ}	Closed	Closed

DEFINITIONS

R_L = Load resistor to V_{CC}; see AC CHARACTERISTICS for value.
C_L = Load capacitance includes jig and probe capacitance; see AC CHARACTERISTICS for value.
R_T = Termination resistance should be equal to Z_{OUT} of Pulse Generators.
D = Diodes are 1N916, 1N3064, or equivalent.
R_X = 1kΩ for 54/74, 54S/74S, R_X = 5kΩ for 54LS/74LS.
t_{TLH}, t_{THL} Values should be less than or equal to the table entries.

INPUT PULSE DEFINITIONS



V_M = 1.3V for 54LS/74LS; V_M = 1.5V for all other TTL families.

FAMILY	INPUT PULSE REQUIREMENTS				
	Amplitude	Rep. Rate	Pulse Width	t_{TLH}	t_{THL}
54/74	3.0V	1MHz	500ns	7ns	7ns
54LS/74LS	3.0V	1MHz	500ns	15ns	6ns
54S/74S	3.0V	1MHz	500ns	2.5ns	2.5ns

© IC MASTER 1983

8TS805 Octal Transparent Latch With 3-State Outputs
8TS806 Octal D Flip-Flop With 3-State Outputs

- 8-bit transparent latch — 8TS805
- 8-bit positive, edge-triggered register — 8TS806
- 3-State output buffers
- Common 3-State Output Enable
- Independent register and 3-State buffer operation

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (Total)
8TS805	10ns	105mA
8TS806	8ns	116mA

ORDERING CODE

PACKAGES	COMMERCIAL RANGES V_{CC} = 5V ±5%; T_A = 0°C to +70°C	MILITARY RANGES V_{CC} = 5V ±10%; T_A = −55°C to +125°C
Plastic DIP	N8TS805N • N8TS806N	
Ceramic DIP	N8TS805F • N8TS806F	S8TS805F • S8TS806F

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION	8TS
All	Inputs	1Sul
All	Outputs	10Sul

NOTE
An 8TS unit load (Sul) is 50μA I_{IH} and −2.0mA I_{IL}.

DESCRIPTION

The 8TS805 is an octal, transparent latch coupled to eight 3-State output buffers. The two sections of the device are controlled independently by Latch Enable (E) and Output Enable ($\overline{OE}$) control gates.

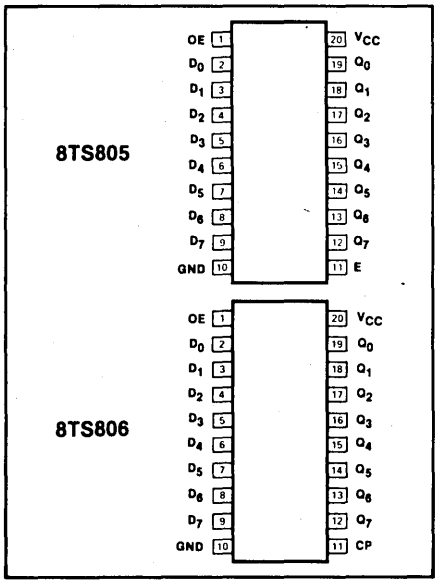
The data on the D inputs are transferred to the latch outputs when the Latch Enable (E) input is HIGH. The latch remains transparent to the data inputs while E is HIGH, and stores the data present one setup time before the HIGH-to-LOW enable transition. The enable gate has about 400mV of hysteresis built in to help minimize problems that signal and ground noise can cause on the latching operation.

The 3-State output buffers are designed to drive heavily loaded 3-State buses, MOS memories, or MOS microprocessors. The active LOW Output Enable ($\overline{OE}$) controls all eight 3-State buffers independent of the latch operation. When $\overline{OE}$ is LOW, the latched or transparent data appears at the outputs. When $\overline{OE}$ is HIGH, the outputs are in the HIGH impedance "off" state, which means they will neither drive nor load the bus.

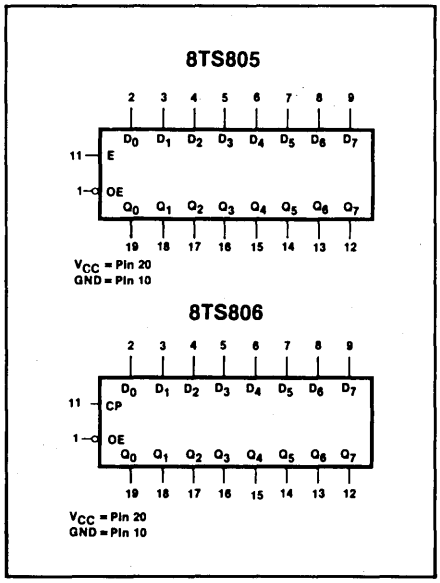
The 8TS806 is an 8-bit, edge-triggered register coupled to eight 3-State output buffers. The two sections of the device are controlled independently by the Clock (CP) and Output Enable ($\overline{OE}$) control gates.

The register is fully edge triggered. The state of each D input, one setup time before the LOW-to-HIGH clock transition, is transferred to the corresponding flip-flop's Q output. The clock buffer has about 400mV of hysteresis built in to help minimize problems that signal and ground noise can cause on the clocking operation.

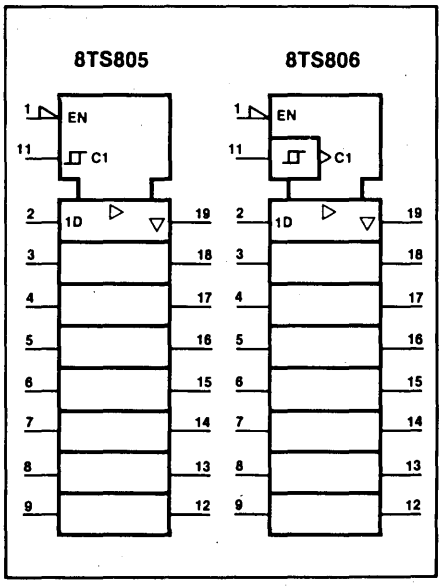
PIN CONFIGURATION



LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



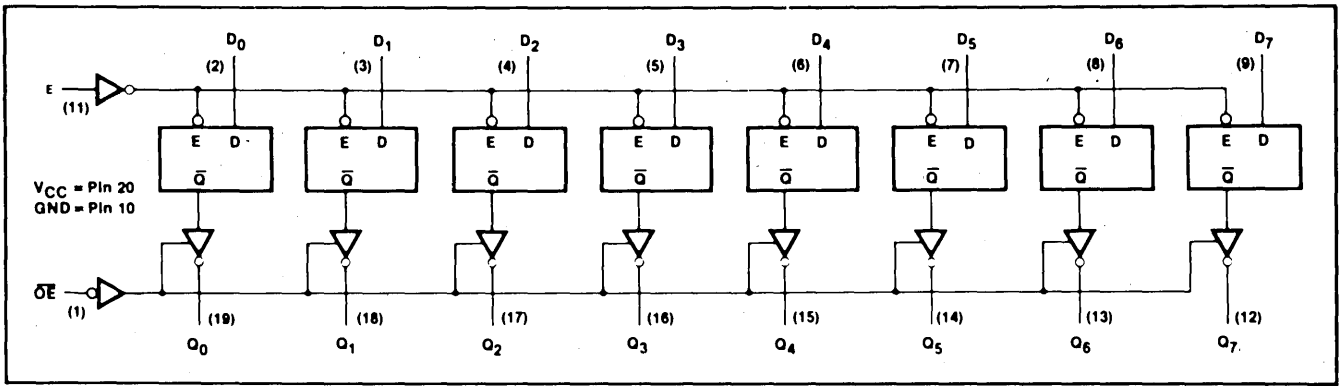
© IC MASTER 1983

See Page 809 for Ordering Information.

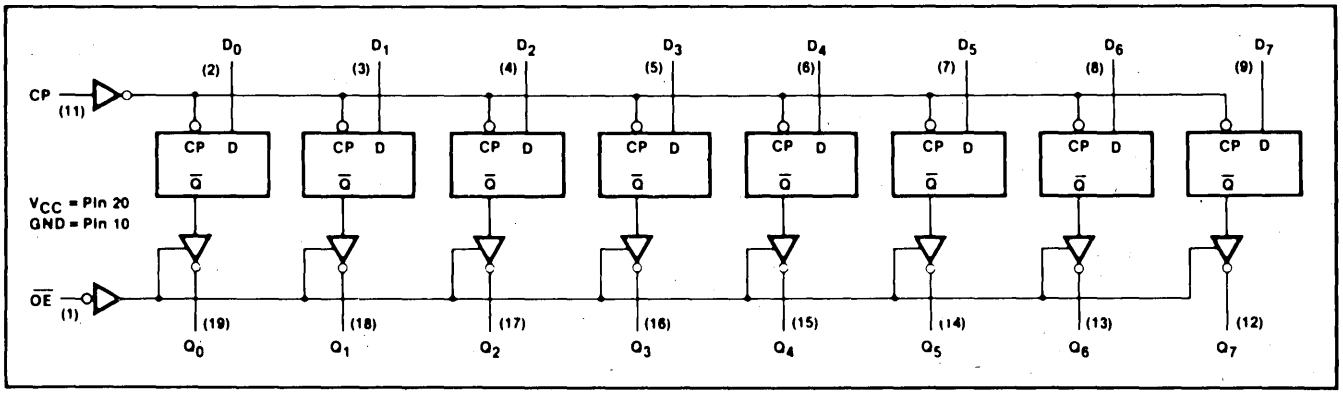
LATCHES/FLIP-FLOPS 8TS805, 806

The 3-State output buffers are designed to drive heavily loaded 3-State buses, MOS memories, or MOS microprocessors. The active LOW Output Enable ($\overline{OE}$) controls all eight 3-State buffers independent of the register operation. When $\overline{OE}$ is LOW, the data in the register appears at the outputs. When $\overline{OE}$ is HIGH, the outputs are in the HIGH impedance "off" state, which means they will neither drive nor load the bus.

LOGIC DIAGRAM, 8TS805



LOGIC DIAGRAM, 8TS806



MODE SELECT—FUNCTION TABLE, 8TS805

OPERATING MODES	INPUTS			INTERNAL REGISTER	OUTPUTS
	$\overline{OE}$	E	D_n		Q_0-Q_7
Enable and read register	L	H	L	L	L
	L	H	H	H	H
Latch and read register	L	L	l	L	L
	L	L	h	H	H
Latch register and disable outputs	H	L	l	L	(Z)
	H	L	h	H	(Z)

MODE SELECT—FUNCTION TABLE, 8TS806

OPERATING MODES	INPUTS			INTERNAL REGISTER	OUTPUTS
	$\overline{OE}$	CP	D_n		Q_0-Q_7
Load and read register	L	↑	l	L	L
	L	↑	h	H	H
Load register and disable outputs	H	↑	l	L	(Z)
	H	↑	h	H	(Z)

H = HIGH voltage level
h = HIGH voltage level one setup time prior to the LOW-to-HIGH clock transition or HIGH-to-LOW OE transition
L = LOW voltage level
l = LOW voltage level one setup time prior to the LOW-to-HIGH clock transition or HIGH-to-LOW OE transition
(Z) = HIGH impedance "off" state
↑ = LOW-to-HIGH clock transition

See Page 809 for Ordering Information.
© IC MASTER 1983

ABSOLUTE MAXIMUM RATINGS (Over operating free-air temperature range unless otherwise noted.)

PARAMETER		S8TS	N8TS	UNIT
V_{CC}	Supply voltage	7.0	7.0	V
V_{IN}	Input voltage	−0.5 to +5.5	−0.5 to +5.5	V
I_{IN}	Input current	−30 to +5	−30 to +5	mA
V_{OUT}	Voltage applied to output in HIGH output state.	−0.5 to +V_{CC}	−0.5 to +V_{CC}	V
T_A	Operating free-air temperature range	−55 to +125	0 to 70	°C

RECOMMENDED OPERATING CONDITIONS

PARAMETER			8TS			UNIT
			Min	Nom	Max	
V_{CC}	Supply voltage	Mil	4.5	5.0	5.5	V
		Com'l	4.75	5.0	5.25	V
V_{IH}	HIGH-level input voltage		2.0			V
V_{IL}	LOW-level input voltage	Mil			+0.8	V
		Com'l			+0.8	V
I_{IK}	Input clamp current				−18	mA
I_{OH}	HIGH-level output current	Mil			−2.0	mA
		Com'l			−6.5	mA
I_{OL}	LOW-level output current	Mil			20	mA
		Com'l			20	mA
T_A	Operating free-air temperature	Mil	−55		+125	°C
		Com'l	0		70	°C

NOTE
V_{IL} = +0.7V MAX for S8TS at T_A = +125°C only.

© IC MASTER 1983

See Page 809 for Ordering Information.

DC ELECTRICAL CHARACTERISTICS (Over recommended operating free-air temperature range unless otherwise noted.)

PARAMETER		TEST CONDITIONS[1]			8TS805, 806 Min	8TS805, 806 Typ[2]	8TS805, 806 Max	UNIT
V_{OH}	HIGH-level output voltage	V_{CC} = MIN, V_{IH} = MIN, V_{IL} = MAX, I_{OH} = MAX		Mil	2.4	3.0		V
				Com'l	2.4	3.1		V
V_{OL}	LOW-level output voltage	V_{CC} = MIN, V_{IH} = MIN, V_{IL} = MAX	I_{OL} = MAX	Mil			0.5[4]	V
				Com'l			0.5	V
V_{IK}	Input clamp voltage	V_{CC} = MIN, I_I = I_{IK}					-1.2	V
I_{OZH}	Off-state output current, HIGH-level voltage applied	V_{CC} = MAX, V_{IH} = MIN, V_O = 2.4V					50	μA
I_{OZL}	Off-state output current, LOW-level voltage applied	V_{CC} = MAX, V_{IH} = MIN, V_O = 0.5V					-50	μA
I_I	Input current at maximum input voltage	V_{CC} = MAX, V_I = 5.5V					1.0	mA
I_{IH}	HIGH-level input current	V_{CC} = MAX, V_I = 2.7V					50	μA
I_{IL}	LOW-level input current	V_{CC} = MAX, V_I = 0.5V					-0.25	mA
I_{OS}	Short-circuit output current[3]	V_{CC} = MAX			-40		-100	mA
I_{CC}	Supply current (total)	V_{CC} = MAX	I_{CCL}	8TS805		105	160	mA
			I_{CCL}	All inputs grounded, 8TS806		102	140	mA
			I_{CCZ}	CP, $\overline{OE}$ = 4.0V, D inputs = GND, 8TS806		131	180	mA

NOTES
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
2. All typical values are at V_{CC} = 5V, T_A = 25°C.
3. I_{OS} is tested with V_{OUT} = +0.5V and V_{CC} = V_{CC} MAX + 0.5V. Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.
4. V_{OL} = +0.45V MAX for S8TS at T_A = +125°C only.

AC CHARACTERISTICS T_A = 25°C, V_{CC} = 5.0V

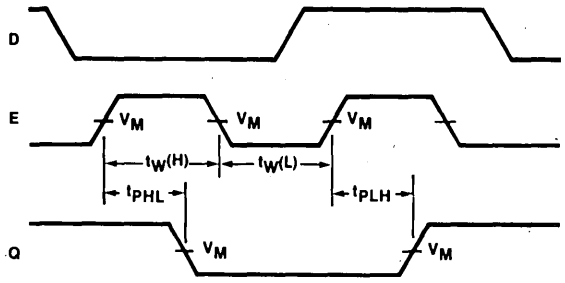
PARAMETER		TEST CONDITIONS	8TS C_L = 15pF, R_L = 280Ω Min	8TS C_L = 15pF, R_L = 280Ω Max	UNIT
f_{MAX}	Maximum clock frequency	Waveform 6, 8TS806	75		MHz
t_{PLH} t_{PHL}	Propagation delay Latch Enable to output	Waveform 1, 8TS805		14 18	ns
t_{PLH} t_{PHL}	Propagation delay Data to output	Waveform 4, 8TS805		9 13	ns
t_{PLH} t_{PHL}	Propagation delay Clock to output	Waveform 6, 8TS806		15 17	ns
t_{PZH}	Enable time to HIGH level	Waveform 2		15	ns
t_{PZL}	Enable time to LOW level	Waveform 3 8TS805 8TS806		18 18	ns
t_{PHZ}	Disable time from HIGH level	Waveform 2, C_L = 5pF		9	ns
t_{PLZ}	Disable time from LOW level	Waveform 3, C_L = 5pF		12	ns

NOTE
Per industry convention, f_{MAX} is the worst case value of the maximum device operating frequency with no constraints on t_r, t_f, pulse width or duty cycle.

© IC MASTER 1983

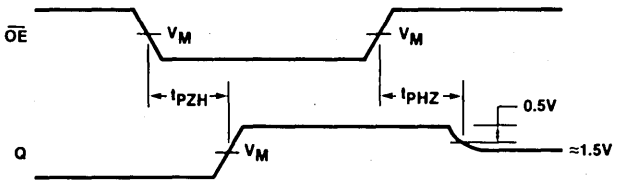
AC WAVEFORMS

LATCH ENABLE TO OUTPUT DELAYS AND LATCH ENABLE PULSE WIDTH



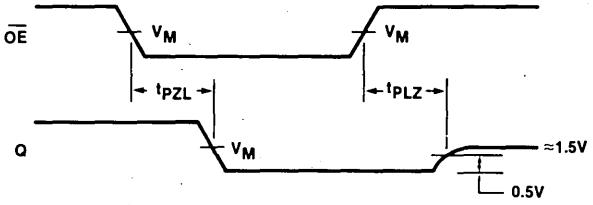
Waveform 1

3-STATE ENABLE TIME TO HIGH LEVEL AND DISABLE TIME FROM HIGH LEVEL



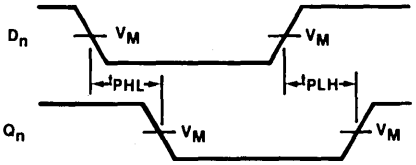
Waveform 2

3-STATE ENABLE TIME TO LOW LEVEL AND DISABLE TIME FROM LOW LEVEL



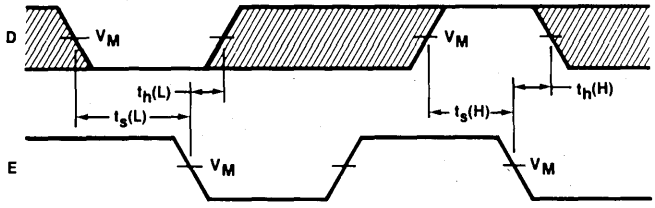
Waveform 3

PROPAGATION DELAY DATA TO Q OUTPUTS



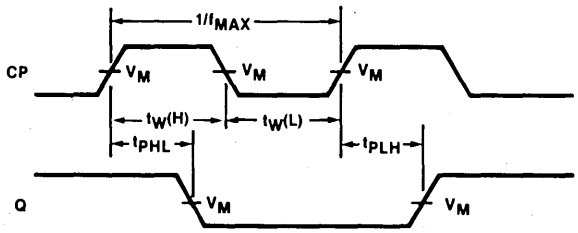
Waveform 4

DATA SETUP AND HOLD TIMES



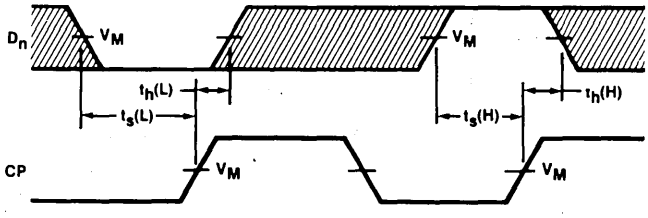
Waveform 5

CLOCK TO OUTPUT DELAYS AND CLOCK PULSE WIDTH



Waveform 6

DATA SETUP AND HOLD TIMES



Waveform 7

V_M = 1.5V for 54/74 and 54S/74S, V_M = 1.3V for 54LS/74LS.
The shaded areas indicate when the input is permitted to change for predictable output performance.

DIGITAL

Signetics

© IC MASTER 1983

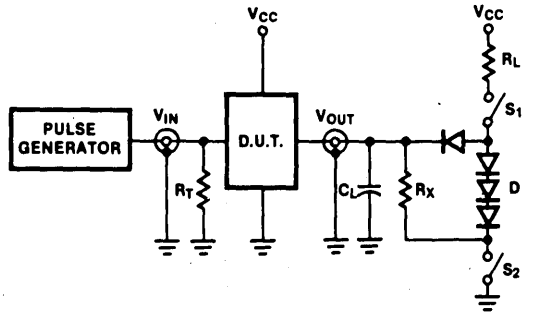
See Page 809 for Ordering Information.

AC SETUP REQUIREMENTS $T_A = 25°C$, $V_{CC} = 5.0V$

PARAMETER		TEST CONDITIONS	8TS		UNIT
			Min	Max	
$t_{W(H)}$ $t_{W(L)}$	Latch Enable pulse width	Waveform 1, 8TS805	6 7.3		ns
t_s	Setup time, Data to Latch Enable	Waveform 5, 8TS805	0		ns
t_h	Hold time, Data to Latch Enable	Waveform 5, 8TS805	10		ns
$t_{W(H)}$ $t_{W(L)}$	Clock pulse width	Waveform 6, 8TS806	6 7.3		ns
t_s	Setup time, Data to Clock	Waveform 7, 8TS806	5		ns
t_h	Hold time, Data to Clock	Waveform 7, 8TS806	2		ns

TEST CIRCUITS AND WAVEFORMS

TEST CIRCUIT FOR 3-STATE OUTPUTS



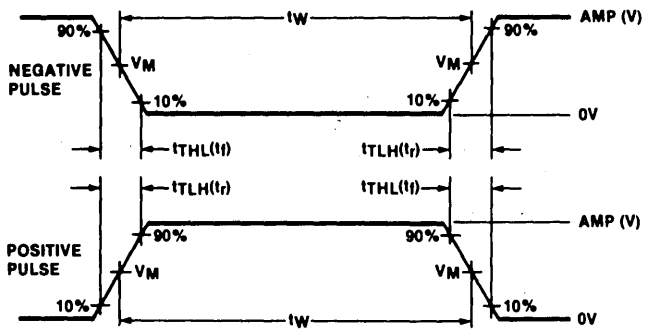
SWITCH POSITION

Test	Switch 1	Switch 2
t_{PZH}	Open	Closed
t_{PZL}	Closed	Open
t_{PHZ}	Closed	Closed
t_{PLZ}	Closed	Closed

DEFINITIONS

R_L = Load resistor to V_{CC}; see AC CHARACTERISTICS for value.
C_L = Load capacitance includes jig and probe capacitance; see AC CHARACTERISTICS for value.
R_T = Termination resistance should be equal to Z_{OUT} of Pulse Generators.
D = Diodes are 1N916, 1N3064, or equivalent.
R_X = 1kΩ for 54/74, 54S/74S, R_X = 5kΩ for 54LS/74LS.
t_{TLH}, t_{THL} Values should be less than or equal to the table entries.

INPUT PULSE DEFINITIONS



V_M = 1.3V for 54LS/74LS; V_M = 1.5V for all other TTL families.

FAMILY	INPUT PULSE REQUIREMENTS				
	Amplitude	Rep. Rate	Pulse Width	t_{TLH}	t_{THL}
8TS	3.0V	1MHz	500ns	2.5ns	2.5ns

© IC MASTER 1983

'807 Octal Transparent Latch With 3-State Outputs
'808 Octal D Flip-Flop With 3-State Outputs

- 8-bit transparent latch — 8TS807
- 8-bit positive, edge-triggered register — 8TS808
- 3-State inverting output buffers
- Common 3-State Output Enable
- Independent register and 3-State buffer operation

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (Total)
8TS807	10ns	105mA
8TS808	8ns	116mA

ORDERING CODE

PACKAGES	COMMERCIAL RANGES V_{CC} = 5V ±5%; T_A = 0°C to +70°C	MILITARY RANGES V_{CC} = 5V ±10%; T_A = −55°C to +125°C
Plastic DIP	N8TS807N • N8TS808N	
Ceramic DIP	N8TS807F • N8TS808F	S8TS807F • S8TS808F

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION	8TS
All	Inputs	1Sul
All	Outputs	10Sul

NOTE
An 8TS unit load (Sul) is 50μA I_{IH} and −2.0mA I_{IL}.

DESCRIPTION

The 8TS807 is an octal transparent latch coupled to eight 3-State output buffers. The two sections of the device are controlled independently by Latch Enable (E) and Output Enable ($\overline{OE}$) control gates.

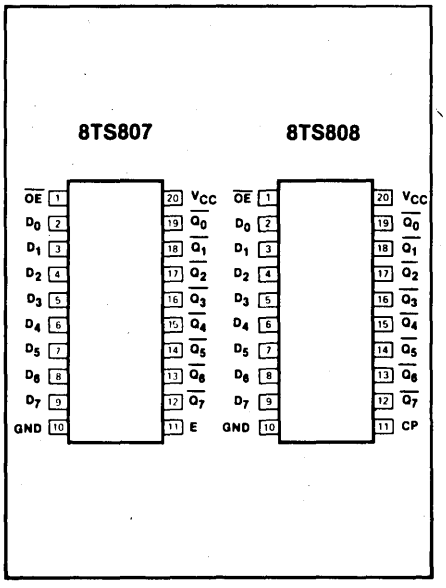
The data on the D inputs are transferred to the latch outputs when the Latch Enable (E) input is HIGH. The latch remains transparent to the data inputs while E is HIGH, and stores the data present one setup time before the HIGH-to-LOW enable transition. The enable gate has about 400mV of hysteresis built in to help minimize problems that signal and ground noise can cause on the latching operation.

The 3-State output buffers are designed to drive heavily loaded 3-State buses, MOS memories, or MOS microprocessors. The active LOW Output Enable ($\overline{OE}$) controls all eight 3-State buffers independent of the latch operation. When $\overline{OE}$ is LOW, the latched or transparent data appears at the outputs. When $\overline{OE}$ is HIGH, the outputs are in the HIGH impedance "off" state, which means they will neither drive nor load the bus.

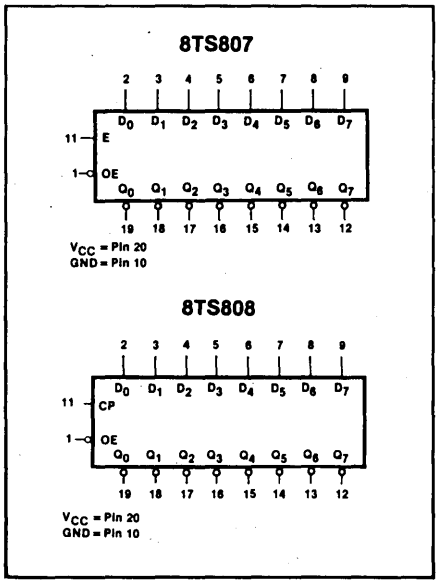
The 8TS808 is an 8-bit, edge-triggered register coupled to eight 3-State output buffers. The two sections of the device are controlled independently by the Clock (CP) and Output Enable ($\overline{OE}$) control gates. The register is fully edge triggered. The state of each D input, one setup time before the LOW-to-HIGH clock transition, is transferred to the corresponding flip-flop's Q output. The clock buffer has about 400mV of hysteresis built in to help minimize problems that signal and ground noise can cause on the clocking operation.

The 3-State output buffers are designed to drive heavily loaded 3-State buses, MOS memories, or MOS microprocessors. The

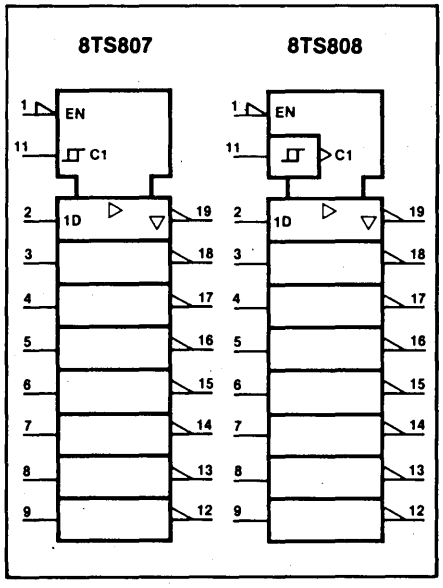
PIN CONFIGURATION



LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



DIGITAL

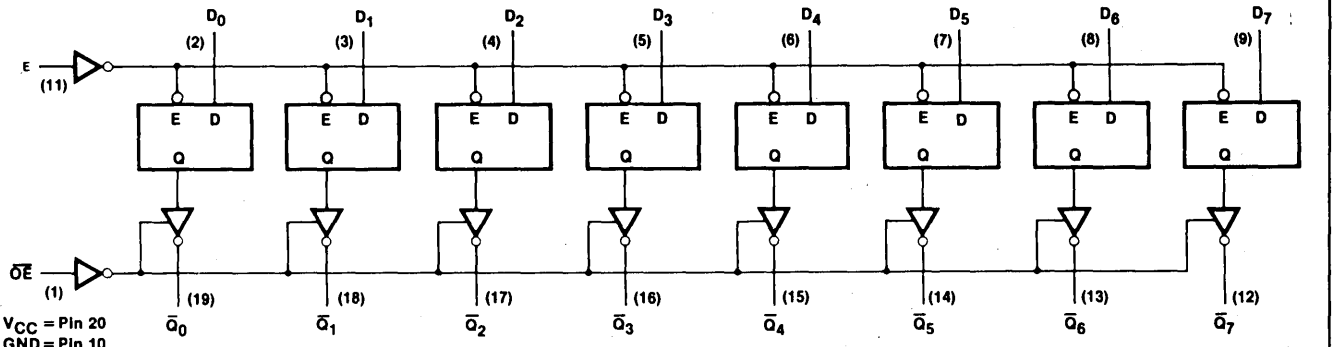
Signetics

© IC MASTER 1983

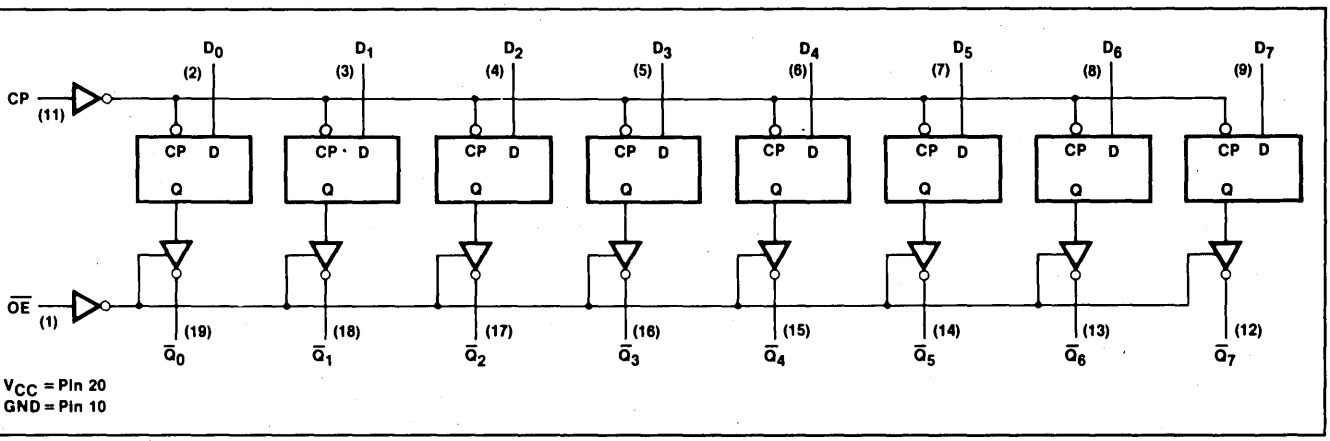
See Page 809 for Ordering Information.

active LOW Output Enable ($\overline{OE}$) controls all eight 3-State buffers independent of the register operation. When $\overline{OE}$ is LOW, the data in the register appears at the outputs. When $\overline{OE}$ is HIGH, the outputs are in the HIGH impedance "off" state, which means they will neither drive nor load the bus.

LOGIC DIAGRAM, 8TS807



LOGIC DIAGRAM, 8TS808



MODE SELECT—FUNCTION TABLE, 8TS807

OPERATING MODES	INPUTS			INTERNAL REGISTER	OUTPUTS
	$\overline{OE}$	E	D_n		Q_0-Q_7
Enable and read register	L L	H H	L H	L H	H L
Latch and read register	L L	L L	l h	L H	H L
Latch register and disable outputs	H H	L L	l h	L H	(Z) (Z)

MODE SELECT—FUNCTION TABLE, 8TS808

OPERATING MODES	INPUTS			INTERNAL REGISTER	OUTPUTS
	$\overline{OE}$	CP	D_n		Q_0-Q_7
Load and read register	L L	↑ ↑	l h	L H	H L
Load register and disable outputs	H H	↑ ↑	l h	L H	(Z) (Z)

H = HIGH voltage level
h = HIGH voltage level one setup time prior to the LOW-to-HIGH clock transition
L = LOW voltage level
l = LOW voltage level one setup time prior to the LOW-to-HIGH clock transition
(Z) = HIGH impedance "off" state
↑ = LOW-to-HIGH clock transition

See Page 809 for Ordering Information.

© IC MASTER 1983

ABSOLUTE MAXIMUM RATINGS (Over operating free-air temperature range unless otherwise noted.)

PARAMETER		S8TS	N8TS	UNIT
V_{CC}	Supply voltage	7.0	7.0	V
V_{IN}	Input voltage	−0.5 to +5.5	−0.5 to +5.5	V
I_{IN}	Input current	−30 to +5	−30 to +5	mA
V_{OUT}	Voltage applied to output in HIGH output state	−0.5 to +V_{CC}	−0.5 to +V_{CC}	V
T_A	Operating free-air temperature range	−55 to +125	0 to 70	°C

RECOMMENDED OPERATING CONDITIONS

PARAMETER			8TS			UNIT
			Min	Nom	Max	
V_{CC}	Supply voltage	Mil	4.5	5.0	5.5	V
		Com'l	4.75	5.0	5.25	V
V_{IH}	HIGH-level input voltage		2.0			V
V_{IL}	LOW-level input voltage	Mil			+0.8	V
		Com'l			+0.8	V
I_{IK}	Input clamp current				−18	mA
I_{OH}	HIGH-level output current	Mil			−2.0	mA
		Com'l			−6.5	mA
I_{OL}	LOW-level output current	Mil			20	mA
		Com'l			20	mA
T_A	Operating free-air temperature	Mil	−55		+125	°C
		Com'l	0		70	°C

NOTE
V_{IL} = +0.7V MAX for S8TS at T_A = +125°C only.

DC ELECTRICAL CHARACTERISTICS (Over recommended operating free-air temperature range unless otherwise noted.)

PARAMETER		TEST CONDITIONS[1]			8TS807, 808			UNIT
					Min	Typ[2]	Max	
V_{OH}	HIGH-level output voltage	V_{CC} = MIN, V_{IH} = MIN, V_{IL} = MAX, I_{OH} = MAX		Mil	2.4	3.0		V
				Com'l	2.4	3.1		V
V_{OL}	LOW-level output voltage	V_{CC} = MIN, V_{IH} = MIN, V_{IL} = MAX	I_{OL} = MAX	Mil			0.5[4]	V
				Com'l			0.5	V
V_{IK}	Input clamp voltage	V_{CC} = MIN, I_I = I_{IK}					−1.2	V
I_{OZH}	Off-state output current, HIGH-level voltage applied	V_{CC} = MAX, V_{IH} = MIN, V_O = 2.4V					50	μA
I_{OZL}	Off-state output current, LOW-level voltage applied	V_{CC} = MAX, V_{IH} = MIN, V_O = 0.5V					−50	μA
I_I	Input current at maximum input voltage	V_{CC} = MAX, V_I = 5.5V					1.0	mA
I_{IH}	HIGH-level input current	V_{CC} = MAX, V_I = 2.7V					50	μA
I_{IL}	LOW-level input current	V_{CC} = MAX, V_I = 0.5V					−0.25	mA
I_{OS}	Short-circuit output current[3]	V_{CC} = MAX			−40		−100	mA
I_{CC}	Supply current (total)	V_{CC} = MAX	I_{CCL}	8TS807		105	160	mA
			I_{CCL}	All inputs grounded, 8TS808		102	140	mA
			I_{CCZ}	CP, $\overline{OE}$ = 4.0V, D inputs = GND, 8TS807		131	180	mA

NOTES
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
2. All typical values are at V_{CC} = 5V, T_A = 25°C.
3. I_{OS} is tested with V_{OUT} = +0.5V and V_{CC} = V_{CC} MAX + 0.5V. Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.
4. V_{OL} = +0.45V MAX for S8TS at T_A = +125°C only.

© IC MASTER 1983

AC CHARACTERISTICS $T_A = 25°C$, $V_{CC} = 5.0V$

PARAMETER		TEST CONDITIONS	8TS $C_L = 15pF$, $R_L = 280\Omega$ Min	8TS $C_L = 15pF$, $R_L = 280\Omega$ Max	UNIT
f_{MAX}	Maximum clock frequency	Waveform 6, 8TS808	75		MHz
t_{PLH} t_{PHL}	Propagation delay Latch Enable to output	Waveform 1, 8TS807		14 18	ns
t_{PLH} t_{PHL}	Propagation delay Data to output	Waveform 4, 8TS807		9 13	ns
t_{PLH} t_{PHL}	Propagation delay Clock to output	Waveform 6, 8TS808		15 17	ns
t_{PZH}	Enable time to HIGH level	Waveform 2		15	ns
t_{PZL}	Enable time to LOW level	Waveform 3 8TS807 8TS808		18 18	ns
t_{PHZ}	Disable time from HIGH level	Waveform 2, $C_L = 5pF$		9	ns
t_{PLZ}	Disable time from LOW level	Waveform 3, $C_L = 5pF$		12	ns

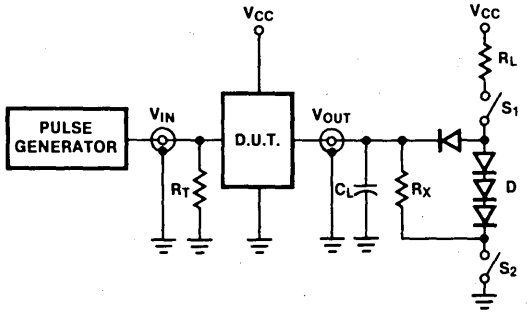
NOTE Per industry convention, f_{MAX} is the worst case value of the maximum device operating frequency with no constraints on t_r, t_f, pulse width or duty cycle.

AC SETUP REQUIREMENTS $T_A = 25°C$, $V_{CC} = 5.0V$

PARAMETER		TEST CONDITIONS	8TS Min	8TS Max	UNIT
$t_{W(H)}$ $t_{W(L)}$	Latch Enable pulse width	Waveform 1, 8TS807	6 7.3		ns
t_s	Setup time, Data to Latch Enable	Waveform 5, 8TS807	0		ns
t_h	Hold time, Data to Latch Enable	Waveform 5, 8TS807	10		ns
$t_{W(H)}$ $t_{W(L)}$	Clock pulse width	Waveform 6, 8TS808	6 7.3		ns
t_s	Setup time, Data to Clock	Waveform 7, 8TS808	5		ns
t_h	Hold time, Data to Clock	Waveform 7, 8TS808	2		ns

TEST CIRCUITS AND WAVEFORMS

TEST CIRCUIT FOR 3-STATE OUTPUTS



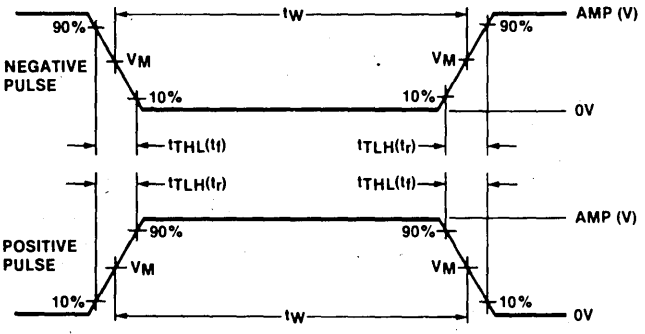
SWITCH POSITION

Test	Switch 1	Switch 2
t_{PZH}	Open	Closed
t_{PZL}	Closed	Open
t_{PHZ}	Closed	Closed
t_{PLZ}	Closed	Closed

DEFINITIONS

R_L = Load resistor to V_{CC}; see AC CHARACTERISTICS for value.
C_L = Load capacitance includes jig and probe capacitance; see AC CHARACTERISTICS for value.
R_T = Termination resistance should be equal to Z_{OUT} of Pulse Generators.
D = Diodes are 1N916, 1N3064, or equivalent.
R_X = 1kΩ for 54/74, 54S/74S, R_X = 5kΩ for 54LS/74LS.
t_{TLH}, t_{THL} Values should be less than or equal to the table entries.

INPUT PULSE DEFINITIONS



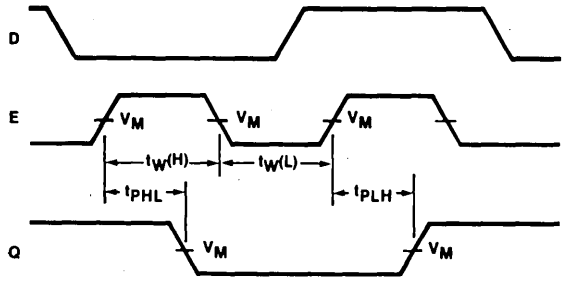
V_M = 1.3V for 54LS/74LS; V_M = 1.5V for all other TTL families.

FAMILY	INPUT PULSE REQUIREMENTS Amplitude	Rep. Rate	Pulse Width	t_{TLH}	t_{THL}
8TS	3.0V	1MHz	500ns	2.5ns	2.5ns

© IC MASTER 1983

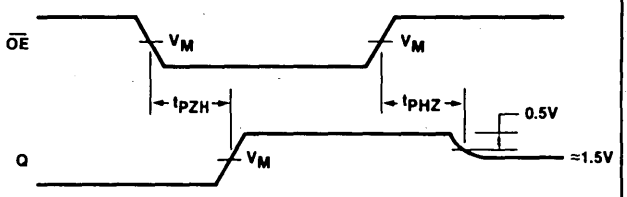
AC WAVEFORMS

LATCH ENABLE TO OUTPUT DELAYS AND LATCH ENABLE PULSE WIDTH



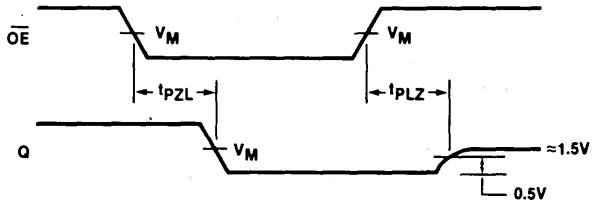
Waveform 1

3-STATE ENABLE TIME TO HIGH LEVEL AND DISABLE TIME FROM HIGH LEVEL



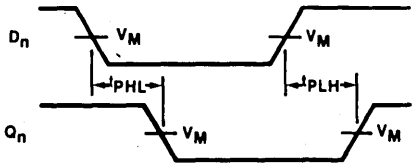
Waveform 2

3-STATE ENABLE TIME TO LOW LEVEL AND DISABLE TIME FROM LOW LEVEL



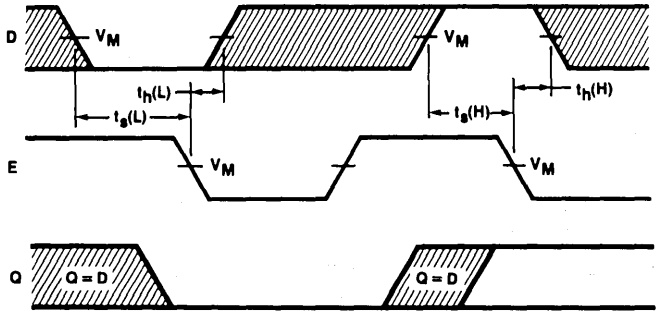
Waveform 3

PROPAGATION DELAY DATA TO Q OUTPUTS



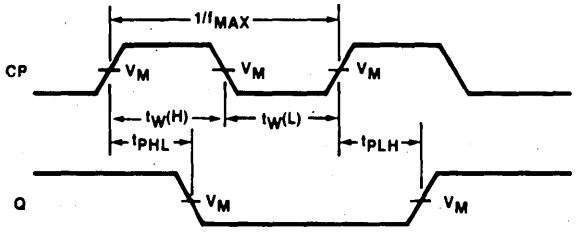
Waveform 4

DATA SETUP AND HOLD TIMES



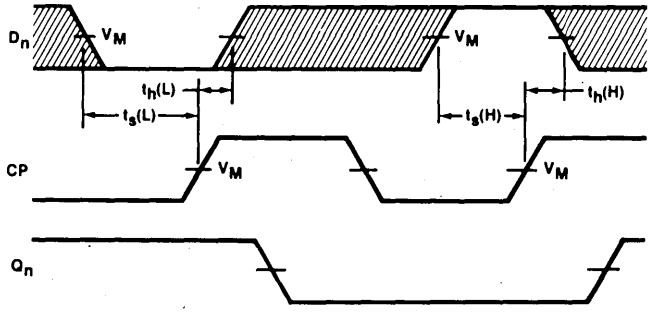
Waveform 5

CLOCK TO OUTPUT DELAYS AND CLOCK PULSE WIDTH



Waveform 6

DATA SETUP AND HOLD TIMES



Waveform 7

V_M = 1.5V for 54/74 and 54S/74S, V_M = 1.3V for 54LS/74LS.
The shaded areas indicate when the input is permitted to change for predictable output performance.

DIGITAL

Signetics

© IC MASTER 1983

See Page 809 for Ordering Information.

LOCMOS

Signetics Now Offers the Entire Philips IC Product Line.

HE4000B Family

The LOCMOS HE4000B range is a fully buffered digital integrated circuit family which meets the JEDEC-B specification. The members of this family are plug-in replacements for the well-known C-MOS 4000 and 14500 ranges. The HE family has the same advantages as conventional C-MOS circuits, plus the additional LOCMOS advantages. Recommended supply voltage range 3 to 15V.

LOCMOS means Local Oxidation Complementary MOS.

Inputs and outputs are protected against electrostatic effects in a wide variety of device-handling situations. However, to be totally safe, it is desirable to take handling precautions into account.

The HE family is designed with standardized output drive characteristics which, combined with relative intensity to output capacitance loading, simplify system design.

Advantages of LOCMOS

- Low power dissipation — typically 10nW per gate (static)
- Wide operating supply voltage range
- Wide operating temperature range from −40 to +85°C
- High d.c. fan-out
- Inputs and outputs are protected against electrostatic voltages

In addition to these, the LOCMOS HE4000B range has:

- Buffered outputs on **all** circuits
- Higher speed
- Higher packing density—essential for MSI/LSI
- Excellent noise immunity

We currently offer 121 types (most 14 and 16 pin devices) in S.O. package with additional types planned for the future (20, 24, 28 pin devices).

DIGITAL

Signetics

Family Ratings

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Supply voltage	V_{DD}		−0.5 to +18V
Voltage on any input	V_I		−0.5 to (V_{DD} + 0.5)V
d.c. current into any input or output	±1	max.	10mA
Power dissipation per package for plastic and ceramic DIL			
for T_{amb} = −40 to +60°C	P_{tot}	max.	400mW
for T_{amb} = +60 to +85°C			derate linearly with 8mW/°C to 200 mW
Power dissipation per package for plastic S.O. package			
for T_{amb} = −40 to +70°C	P_{tot}	max.	200mW
for T_{amb} = +70 to +85°C			derate linearly with 5mW/°C to 125mW
Power dissipation per output	P	max.	100mW
Operating ambient temperature	T_{amp}		−40 to +85°C
Storage temperature	T_{stg}		−65 to +150°C

See Page 809 for Ordering Information.

© IC MASTER 1983

LOCMOS

LOCMOS HE4000B

Digital Integrated Circuits

Product Range

NAND Gates

HEF4011B	Quadruple 2-Input NAND Gate
HEF4011UB	Quadruple 2-Input NAND Gate
HEF4012B	Dual 4-Input NAND Gate
HEF4023B	Triple 3-Input NAND Gate
HEF4068B	8-Input NAND Gate

AND Gates

HEF4073B	Triple 3-Input AND Gate
HEF4081B	Quadruple 2-Input AND Gate
HEF4082B	Dual 4-Input AND Gate

NOR Gates

HEF4000B	Dual 3-Input NOR Gate and Inverter
HEF4001B	Quadruple 2-Input NOR Gate
HEF4001UB	Quadruple 2-Input NOR Gate
HEF4002B	Dual 4-Input NOR Gate
HEF4025B	Triple 3-Input NOR Gate
HEF4078B	8-Input NOR Gate

OR Gates

HEF4071B	Quadruple 2-Input OR Gate
HEF4072B	Dual 4-Input OR Gate
HEF4075B	Triple 3-Input OR Gate

Inverters and Buffers

HEF4007UB	Dual Complementary Pair and Inverter
HEF4041B	Quadruple True/Complement Buffer
HEF4049B	Hex Inverting Buffers
HEF4050B	Hex Non-Inverting Buffers
HEF4069UB	Hex Inverter
HEF4502B	Strobed Hex Inverter/Buffer
HEF40097B	3-State Hex Non-Inverting Buffer
HEF40098B	3-State Hex Inverting Buffer
HEF40240B	Octal Inverting Buffers with 3-State Outputs
HEF40244B	Octal Buffer with 3-State Outputs

Complex Gates

HEF4030B	Quadruple EXCLUSIVE-OR Gate
HEF4070B	Quadruple EXCLUSIVE-OR Gate
HEF4077B	Quadruple EXCLUSIVE-OR Gate
HEF4085B	Dual 2-Wide 2-Input AND-OR-Invert Gate
HEF4086B	4-Wide 2-Input AND-OR-Invert Gate

Flip-Flops

HEF4013B	Dual D-Type Flip-Flop
HEF4027B	Dual JK Flip-Flop
HEF4076B	Quadruple D-Type Flip-Flop with 3-State Outputs
HEF40174B	Hex D-Type Flip-Flop
HEF40175B	Quadruple D-Type Flip-Flop
HEF40374B	Octal D-Type Flip-Flop with 3-State Outputs

Schmitt Triggers

HEF4093B	Quadruple 2-Input NAND Schmitt Trigger
HEF40106B	Hex Schmitt Trigger

Special Functions

HEF4046B	Phase-Locked Loop
HEF4104B	Quadruple Low-to-High Voltage Translator with 3-State Outputs
HEF4527B	BCD Rate Multiplier
HEF4738V	IEC/IEEE Bus Interface
HEF4739V	Digital Voltmeter Circuit
HEF4750V	Frequency Divider
HEF4752V	a.c. Motor Control Circuit
HEF4755V	Transceiver for Serial Data Communication
HEF40245B	Octal Bus Transceiver with 3-State Outputs

Counters

HEF4017B	5-State Johnson Counter
HEF4018B	Presettable Divide-by-n Counter
HEF4020B	14-Stage Binary Counter
HEF4022B	4-Stage Divide-by-8 Johnson Counter
HEF4024B	7-Stage Binary Counter
HEF4029B	Synchronous Up/Down Counter, Binary/ Decade Counter
HEF4040B	12-Stage Binary Counter
HEF4059B	Programmable Divide-by-n Counter
HEF4060B	14-Stage Ripple-Carry Binary Counter/ Divider and Oscillator
HEF4510B	BCD Up/Down Counter
HEF4516B	Binary Up/Down Counter
HEF4518B	Dual BCD Up Counter
HEF4520B	Dual Binary Counter
HEF4521B	24-Stage Frequency Divider
HEF4522B	Programmable 4-Bit BCD Down Counter
HEF4526B	Programmable 4-Bit Binary Down Counter
HEF4534B	Real Time 5-Decade Counter
HEF4737B/V	Quadruple Static Decade Counters
HEF4751V	Universal Divider
HEF40160B	4-Bit Synchronous Decade Counter with Asynchronous Reset
HEF40161B	4-Bit Synchronous Binary Counter with Asynchronous Reset
HEF40162B	4-Bit Synchronous Decade Counter with Synchronous Reset
HEF40163B	4-Bit Synchronous Binary Counter with Synchronous REset
HEF40192B	4-Bit Up/Down Decade Counter
HEF40193B	4-Bit Up/Down Binary Counter

Registers

HEF4006B	18-Stage Static Shift Register
HEF4014B	8-Bit Static Shift Register

© IC MASTER 1983

See Page 809 for Ordering Information.

LOCMOS

Product Range (Continued)

HEF4015B Dual 4-Bit Static Shift Register
HEF4021B 8-Bit Static Shift Register
HEF4031B 64-Stage Static Shift Register
HEF4035B 4-Bit Universal Shift Register
HEF4094B 8-Stage Shift-and-Store Bus Register
HEF4517B Dual 64-Bit Static Shift Register
HEF4557B 1-to-64-Bit Variable Length Shift Register
HEF4731B/V Quadruple 64-Bit Static Shift Registers
HEF40194B 4-Bit Bidirectional Universal Shift Register
HEF40195B 4-Bit Universal Shift Register

Digital Multiplexers

HEF4019B Quadruple 2-Input Multiplexer
HEF4512B 8-Input Multiplexer with 3-State Output
HEF4519B Quadruple 2-Input Multiplexer
HEF4539B Dual 4-Input Multiplexer

Decoders and Demultiplexers

HEF4028B 1-of-10 Decoder
HEF4511B BCD to 7-Segment Latch/Decoder/Driver
HEF4514B 1-of-16 Decoder/Demultiplexer with Input Latches
HEF4515B 1-of-16 Decoder/Demultiplexer with Input Latches
HEF4543B BCD to 7-Segment Latch/Decoder Driver for Liquid Crystal and LED Displays
HEF4555B Dual 1-of-4 Decoder/Demultiplexer
HEF4556B Dual 1-of-4 Decoder/Demultiplexer

Analog Switches and Multiplexers/Demultiplexers

HEF4016B Quadruple Bilateral Switches
HEF4051B 8-Channel Analog Multiplexer/ Demultiplexer
HEF4052B Dual 4-Channel Analog Multiplexer/ Demultiplexer
HEF4053B Triple 2-Channel Analog Multiplexer/ Demultiplexer
HEF4066B Quadruple Bilateral Switches
HEF4067B 16-Channel Analog Multiplexer/ Demultiplexer

Latches

HEF4042B Quadruple D-Latch
HEF4043B Quadruple R/S Latch with 3-State Outputs
HEF4044B Quadruple R/S Latch with 3-State Outputs
HEF4508B Dual 4-Bit Latch
HEF4724B 8-Bit Addressable Latch
HEF40373B Octal Transparent Latch with 3-State Outputs

Multivibrators and Timers

HEF4047B Monostable/Astable Multivibrator
HEF4528B Dual Monostable Multivibrator
HEF4538B Dual Precision Monostable Multivibrator
HEF4541B Programmable Timer
HEF4753B Universal Timer Module

Arithmetic Units

HEF4008B 4-Bit Binary Full Adder
HEF4531B 13-Input Parity Checker/Generator
HEf4532B 8-Input Priority Encoder
HEF4585B 4-Bit Magnitude Comparator

Memories

HEF4505B 64-Bit, 1-Bit per Word Random Access Read/Write Memory
HEF4720B/V 256-Bit, 1-Bit per Word Random Access Memories

See Page 809 for Ordering Information.
© IC MASTER 1983

LOCMOS

HE4000B Family Specifications

Family Characteristics (d.c.) at $V_{SS} = 0$

Parameter	Symbol	$T_{amb} = -40°C$		$T_{amb} = +25°C$		$T_{amb} = +85°C$		V_{DD} V	Conditions
		Min	Max	Min	Max	Min	Max		
Quiescent device current for gates	I_{DD} (μA)	—	1.0	—	1.0	—	7.5	5	
		—	2.0	—	2.0	—	15.0	10	
		—	4.0	—	4.0	—	30.0	15	
Quiescent device current for buffers, and flip-flops	I_{DD} (μA)	—	4.0	—	4.0	—	30	5	
		—	8.0	—	8.0	—	60	10	
		—	16.0	—	16.0	—	120	15	All valid input combinations; $V_I = V_{SS}$ or V_{DD}
Quiescent device current for MSI	I_{DD} (μA)	—	20	—	20	—	150	5	
		—	40	—	40	—	300	10	
		—	80	—	80	—	600	15	
Quiescent device current for LSI	I_{DD} (μA)	—	50	—	50	—	375	5	
		—	100	—	100	—	750	10	
		—	200	—	200	—	1500	15	
Output voltage LOW $\lvert I_O \rvert + 1\mu A$	V_{OL} (V)	—	0.05	—	0.05	—	0.05	5	
		—	0.05	—	0.05	—	0.05	10	$V_I = V_{SS}$ or V_{DD}
		—	0.05	—	0.05	—	0.05	15	
Output voltage HIGH $\lvert I_O \rvert + 1\mu A$	V_{OH} (V)	4.95	—	4.95	—	4.95	—	5	
		9.95	—	9.95	—	9.95	—	10	$V_I = V_{SS}$ or V_{DD}
		14.95	—	14.95	—	14.95	—	15	
Input voltage LOW $\lvert I_O \rvert + 1\mu A$ (buffered stages only)	V_{IL} (V)	—	1.5	—	1.5	—	1.5	5	$V_O = 0.5$ or 4.5V
		—	3.0	—	3.0	—	3.0	10	$V_O = 1.0$ or 9.0V
		—	4.0	—	4.0	—	4.0	15	$V_O = 1.5$ or 13.5V
Input voltage HIGH $\lvert I_O \rvert + 1\mu A$ (buffered stages only)	V_{IH} (V)	3.5	—	3.5	—	3.5	—	5	$V_O = 0.5$ or 4.5V
		7.0	—	7.0	—	7.0	—	10	$V_O = 1.0$ or 9.0V
		11.0	—	11.0	—	11.0	—	15	$V_O = 1.5$ or 13.5V
Input voltage LOW $\lvert I_O \rvert + 1\mu A$ (unbuffered stages only)	V_{IL} (V)	—	1	—	1	—	1	5	$V_O = 0.5$ or 4.5V
		—	2	—	2	—	2	10	$V_O = 1.0$ or 9.0V
		—	2.5	—	2.5	—	2.5	15	$V_O = 1.5$ or 13.5V
Input voltage HIGH $\lvert I_O \rvert + 1\mu A$ (unbuffered stages only)	V_{IH} (V)	4	—	4	—	4	—	5	$V_O = 0.5$ or 4.5V
		8	—	8	—	8	—	10	$V_O = 1.0$ or 9.0V
		12.5	—	12.5	—	12.5	—	15	$V_O = 1.5$ or 13.5V
Output (sink) current LOW	I_{OL} (mA)	0.52	—	0.44	—	0.36	—	5	$V_O = 0.4$; $V_I = 0$ or 5V
		1.3	—	1.1	—	0.9	—	10	$V_O = 0.5$; $V_I = 0$ or 10V
		3.6	—	3.0	—	2.4	—	15	$V_O = 1.5$; $V_I = 0$ or 15V
Output (source) current HIGH	$-I_{OH}$ (mA)	0.52	—	0.44	—	0.36	—	5	$V_O = 4.6$; $V_O = 0$ or 5V
		1.3	—	1.1	—	0.9	—	10	$V_O = 9.5$; $V_I = 0$ or 10V
		3.6	—	3.0	—	2.4	—	15	$V_O = 13.5$; $V_I = 0$ or 15V
Output (source) current HIGH	$-I_{OH}$ (mA)	1.7	—	1.4	—	1.1	—	5	$V_O = 2.5$V; $V_I = 0$ or 5V
Input leakage current	$\pm I_{IN}$ (μA)	—	0.3	—	0.3	—	1.0	15	$V_I = 0$ or 15V
Three-state output leakage current; HIGH	I_{OZH} (μA)	—	1.6	—	1.6	—	12.0	15	Output returned to V_{DD}
Three-state output leakage current; LOW	$-I_{OZL}$ (μA)	—	1.6	—	1.6	—	12.0	15	Output returned to V_{DD}
Input capacitance per unit load	C_{IN} (pF)	—	—	—	7.5	—	—	—	Digital inputs

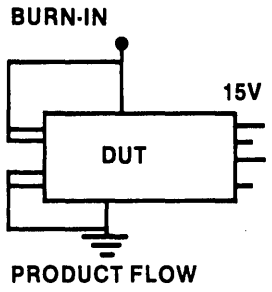
© IC MASTER 1983

See Page 809 for Ordering Information.

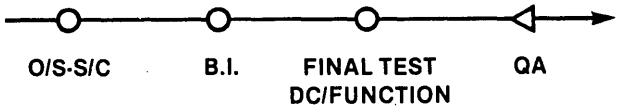
LOCMOS

Burn-In

Optional



MIL-STD-883B: 168 Hrs/125°C
Philips Actual: 44 Hrs/155°C
For Plastic HEF ..... (U)BPB
For Cerdip HEF ..... (U)BDB



100%

	Plastic	Cerdip
Die Visual	X	X
Stab. Bake	X	X
Temp. Cycling		X
Leak Test		X
Hot Open (110°C)	X	
DC/Functional	X	X

Screen/Test Methods Acc. MIL-STD-883B.

Product Identification

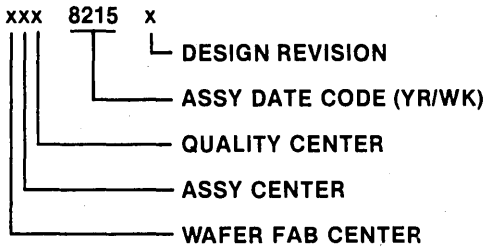
HEF 4000 Bxy
- HE: Serial Letters
- F: −40°C/+85°C Operating
- C: −55°C/+125°C Operating (Available End of Q2 '83)
- B: Buffered Output Stage
- UB: Unbuffered Output Stage

Package (x): P: Plastic (Epoxy 410B)
D: Cerdip/Frit Seal
T: SO (Miniature)

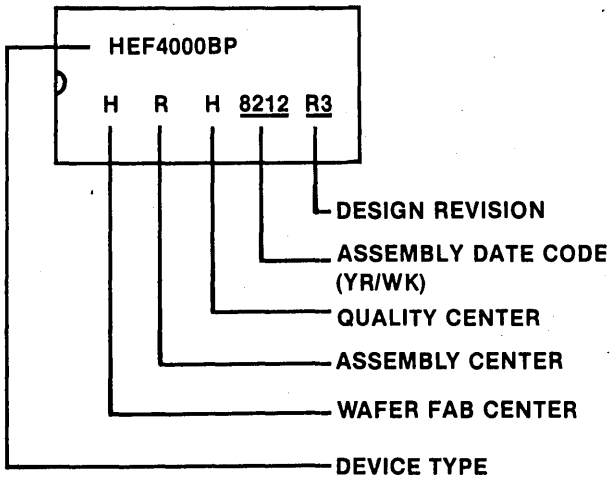
Screen (y): B: Burn-In

Data Code:

H = Nijmegen—Netherlands
S = Philips Taiwan
M = Faselec—Switzerland
N = Subcontract Manila
R = Subcontract Manila
H = Signetics—Bangkok



Sample:



See Page 809 for Ordering Information.
© IC MASTER 1983

ORDERING INFORMATION

KEY TO CODE

In the parts selection tables, the following definitions apply:

Prefix Mil/Com Select Military or Commercial part

Base Number Select specific device number

Package Mil/Com Select on Mil/Com package code for device number

JAN Qual
Q1 = Device selected in JAN qualified level 1
M = Device selected is in accordance with MIL-STD-883
F (Q1, M = Q1 and M apply to F package only

Prefix
JB, S, D = −55°C to +125°C (Military)

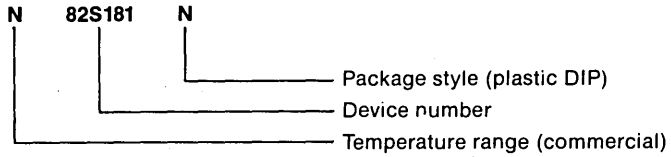
Package Styles
D = Microminiature SO molded (epoxy)
W = Hermetic flat pack
Y = Flat pack leads extended 4 sides

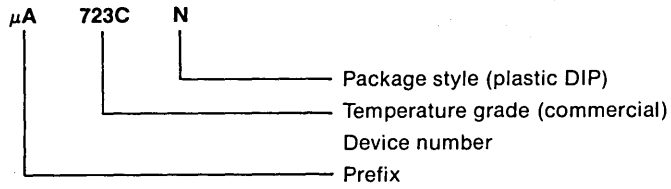
HOW TO ORDER

Signetics products are available in different packages and temperature ranges. The correct ordering code or part number for the devices is an alphanumeric sequence. All devices are not obtainable in all temperature ranges or all package styles.

Ordering Code Examples

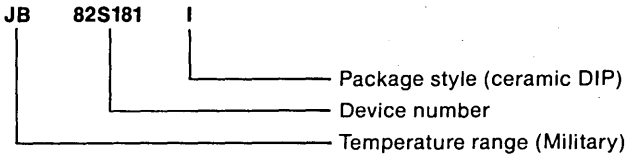
Commercial parts:



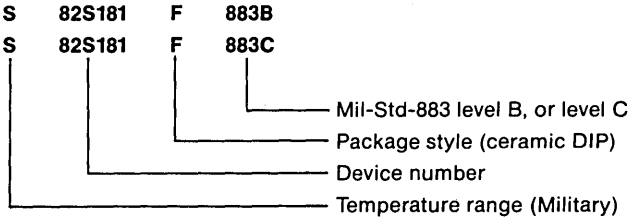


Military specification parts:

For JAN qualified parts specify:



For Mil-Std-883 level B or level C parts specify:



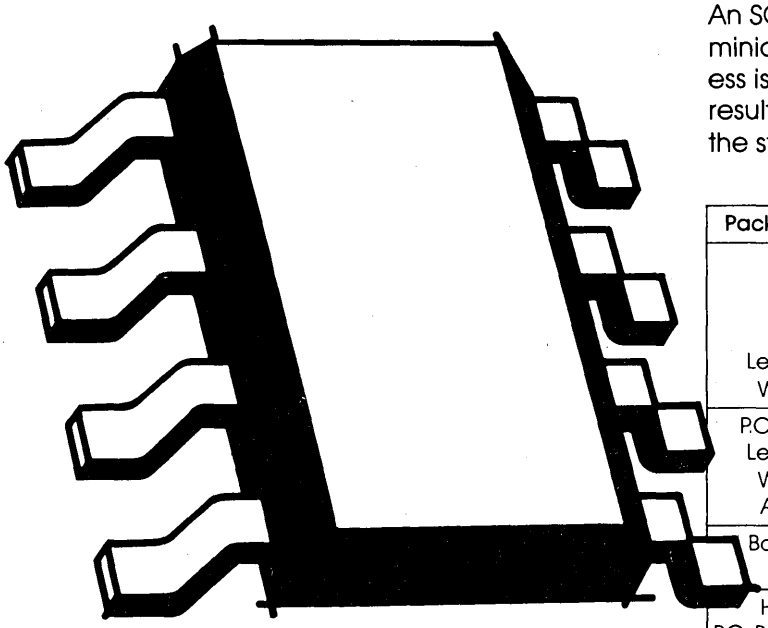
DIGITAL

Signetics

© IC MASTER 1983

SMALL OUTLINE (SO) PACKAGES

Take a good look at these SO (small outline) packages. They're the smallest plastic DIPs in the world and they could reduce the cost of your system by more than 50%.



SO versus DIP — No Contest!

An SO package is just like a standard DIP, except a miniature lead frame is used. The assembly process is the same as for the standard DIP, but the result is a microminiature package that outshines the standard DIP in every way.

Package Feature	Package Size (Mils)*					
	8 Pin		14 Pin		20 Pin	
	SO	DIP	SO	DIP	SO	DIP
Body Size						
Length (Inches)	.197	.375	.344	.755	.512	1.060
Width (Inches)	.158	.252	.158	.252	.299	.252
P.C. Board Area						
Length (Inches)	.197	.375	.344	.755	.512	1.066
Width (Inches)	.244	.300	.244	.300	.419	.300
Area (Inches^2)	.048	.113	.084	.226	.214	.318
Body Thickness (Inches)	.057	.125	.057	.125	.096	.145
Height Above P.C. Board (Inches)	.069	.160	.069	.160	.104	.180
Weight (Mgs)	60	600	114	1050	500	1500
*16-pin and wide frame 16L-pin versions also available.						

SO Packages Are Surface-Mounted Devices.

The advantages of surface mounting are almost as numerous as those of reduced package size. Because it can be surface mounted, the SO package . . .

- Requires no through hole in the PC board
- Can be wave or reflow soldered using your present equipment
- Can be mounted with traces running underneath it
- Has a low profile allowing boards to be positioned closer together

Our Most Popular Circuits Come In SO Packages.

Over 200 of the more popular logic, linear and CMOS products are available now in SO packages – in 8, 14, 16 and 20-pin packages.

Signetics

© IC MASTER 1983

Authorized IC Master International Distributors

ARGENTINA, COLOMBIA, ECUADOR, VENEZUELA, MEXICO, PERU
Intectra
2629 Terminal Blvd.
Mt. View, CA 94043
Tel. (415) 967-8818

AUSTRALIA
A J Distributors Pty Ltd.
P.O. Box 71
Prospect, S. Australia 5082
Tel. 269-1244
Telex (790) 82635

AUSTRIA
LBG GmbH
Tichtelgasse 10/2/12
A-1120 Vienna, Austria
Tel. (0222) 83 41 01
Telex (847) 134106

BELGIUM
J. P. Le Maire
Rampe Gaulouise Ia
1020 Bruxelles, Belgium
Tel. 02 478 4847
Telex (846) 24610

BRAZIL
Filcres Importacao
Rua Auroraigs
CEP 01209
Caixa Postal 18767
Sao Paulo, Brazil
Tel. (011) 223 7388
Telex 113298

CYPRUS
MOR Electronics Ltd.
P.O. Box 4155
Ramat Gan 52141, Israel

DENMARK
Advanced Electronik
55, Mariendalsvej
DK2000, Copenhagen F, Denmark
Tel. 01 194433
Telex (855) 22431

ENGLAND
Paterson/Steadman & Partner
4 Gold Street
Saffron Walden, Essex CB10 IEP
England
Tel. 27067
Telex 81653

J. B. Tratsart Ltd.
Dogmersfield Nr. Baskingstoke
Hampshire RG27 8SU, England
Tel. 02514 3334
Telex (851) 8814136

FRANCE
Conseilet Promotion
1 Rue Damiens
92100 Boulogne, France
Tel. 621-30-77
Telex 250030F

OFFILIB
48 Rue Gay-Lussac
75240 Paris, Cedex 05, France
Tel. 329-2132
Telex: None

HOLLAND
Manudax-Nederland B. V.
54732G Heeswijk (N.B.)
Meerstraat 7, Holland PB25
Tel. 04139 2901
Telex (844) 50175

HONG KONG
Conmos Products, Ltd.
Haynein Bldg., 11th Floor
1 Tai Yip Street
Keun Tong, Kowloon
Tel. 3-684572
Telex 85448

INDIA, MALAYSIA, SINGAPORE, THAILAND
Radio & Craft Publications
4794/23 Bharat Ram Road
Daryanganj, New Delhi 2, India
Tel. 277147
Telex: None

ISRAEL
STG International Ltd.
10 Huberman Street
P.O. Box 1276
61012 Tel-Aviv, Israel
Tel. 248231
Telex 342229

ITALY
Gruppo Editoriale Jackson
Technoclub
Direzione Redacione e
Amministrazione
Via Rosellini 12
20124 Milano, Italy
Tel. 688-0951

JAPAN
Asahi Glass Company, Ltd.
Electronic Components Group
1-2 Marunouchi 2-chome
Chiyoda-ku, Tokyo 100, Japan
Tel. (03) 218-5813
Telex TK4616

JAPAN (Continued)
Overseas Data Service Co., Ltd.
Shugetsu Building, No. 12-7
Kita-Aoyama 3-chome
Minato-ku, Tokyo 107, Japan
Tel. (03) 400-7090
Telex (781) J26487

Tokyo International
Communications, Inc.
Miyajima Blvd.
28 Yoyogi 1-chome, Shibuya-ku
Tokyo 151, Japan
Tel. 379-2561
Telex: 33106

NORWAY, FINLAND, SWEDEN
Ingenioerforlaget A/S
Kronprinsens Gate 17
Boxs 2476 Solli
Oslo 2, Norway
Tel. (02) 11-51-70
Telex 72400Y

SOUTH AFRICA
Suntronika PTY Ltd.
P.O. Box 46268 Orange Grove
Johannesburg 2119, South Africa
Tel. 725-1210

SPAIN
Sagitron
Castello 25, 2, °
Madrid 1, Spain
Tel. 402 6085
Telex (831) 43819

SWITZERLAND
W. Stolz AG
Taefernstrasse 15
CH-5404 Baden-Daettwil
Switzerland
Tel. 056 840151
Telex (845) 54070Z

TAIWAN
Alfred M. L. Pien
IBS Publications Ltd.
P.O. Box 55-879
Taipei, Taiwan

TURKEY
EEMPA Elektronik
Tersane Cad. Kuthan 38/408
TR/Kara Koy, Istanbul
Turkey
Tel. (11) 49-6249
Telex 24429

WEST GERMANY
Astronic GmbH
Winzererstrasse 47d
8000 Munich 40
West Germany
Tel. (089) 309031
Telex (841) 5216187

Multipliers

TRW parallel multipliers offer a wide range of word sizes (8 to 24 bits) and speeds to meet requirements in a wide variety of signal processing and computer applications. All devices are TTL compatible. Except as noted, they perform two's complement and unsigned magnitude arithmetic. The MPY112K has been optimized for minimum package size and operation at video processing rates (20 MHz). The MPY1024 will perform the significand multiplication in 32 bit floating point arithmetic, as well as standard fixed point operations.

Product	Size	Multiplication Time* (nsec)	Power Dissipation* (watts)	Package	Extended Temperature Range Available	Available	Notes
MPY008H	8×8	90	1.3	J5, C2	−55°C to 125°C	6/78	Two's complement arithmetic
	8×8	65	1.3	J5, C2	no	6/78	Two's complement arithmetic
MPY08HU	8×8	90	1.3	J5, C2	−55°C to 125°C	11/78	Unsigned magnitude arithmetic
	8×8	65	1.3	J5, C2	no	11/78	Unsigned magnitude arithmetic
MPY012H	12×12	115	3.0	J1, C1, L1	−55°C to 125°C	3/78	
MPY012K	12×12	50	2.5	J1, C1, L1	1Q83	3Q82	
MPY112K	12×12	50	2.2	J4	3Q82	2/82	16 bit product
MPY016H	16×16	145	4.4	J1, C1, L1	−55°C to 125°C	11/77	
MPY16HD	16×16	80	4.0	J1, C1, L1	4Q82	3Q82	
MPY016K	16×16	50	4.0	J1, C1, L1	2Q83	1Q83	
MPY1024	24×24	250	4.0	J1, C1, L1	4Q82	3Q82	
MPY008A**	8×8	170	1.5	J5	−55°C to 125°C	11/76	Two's complement arithmetic
MPY012A**	12×12	200	3.8	J2	−55°C to 125°C	10/76	
MPY016A**	16×16	230	5.0	J2	−55°C to 125°C	10/76	

* Guaranteed, Worst Case, T_A=0°C to 70°C.

**The older "A" series multipliers are available to support ongoing production, but offer no advantage over the "H" and "K" series and are not recommended for new designs.

Multiplier-Accumulators

Multiplier-accumulators perform the sum-of-products operation found in most signal processing algorithms. By imbedding the accumulator adder in the multiplier array, the product and sum are computed in only slightly more time than is required to develop the product alone. The devices will add or subtract the accumulated sum to the new product. Accumulator clearing is accomplished simultaneously with the computation of the first product. The accumulator may be disabled for operation as a multiplier. All devices are TTL compatible.

Product	Size	Multiply-Accumulate Time* (nsec)	Power Dissipation* (watts)	Package	Extended Temperature Range Available	Available	Notes
TDC1008	8×8	100	1.8	J4, C1, L1	−55°C to 125°C	2/78	
TDC1009	12×12	135	3.2	J1, C1, L1	−55°C to 125°C	6/78	
TDC1010	16×16	165	4.7	J1, C1, L1	−55°C to 125°C	3/78	
TDC1003**	12×12	225	4.0	J2	no	8/77	

* Guaranteed, Worst Case, T_A=0°C to 70°C.

**The older TDC1003 is available to support ongoing production, but offers no advantage over the TDC1009 and is not recommended for new designs.

TRW reserves the right to change product and specifications without notice. This information does not convey any license under patent rights of TRW Inc. or others.

LSI Products Division
TRW Electronic Components Group
P.O. Box 2472
La Jolla, Ca. 92038

Phone: (619) 457-1000
Telex: 697-957
TWX: 910-335-1571

©TRW Inc. 1982
40G00838 REV. A-7/82
Printed in the U.S.A.

© IC MASTER 1983

Special Functions

Digital correlators provide a measure of the similarity between two signals. The TDC1004 produces an analog output which is readily summed with other outputs to yield a moderate precision output over a large single- or multi-dimension correlation. The TDC1023 offers a precise digital output with an internal threshold comparison register.

The TDC1022 is the first chip devoted to floating point signal processing. The 16-bit significand and 6-bit exponent provide a dynamic range that is more than sufficient for a majority of DSP applications. This part performs the most difficult floating point operations: add, subtract, normalize, denormalize, limit round, scale, and accumulate. Other floating point circuits are in development.

The TDC1028 is an 8-tap finite impulse response filter that handles 4-bit coefficients, and processes at a 20 MHz data word rate. It is easily expandable in coefficient size, and filter length.

Product	Description	Size	Speed*	Power Dissipation* (watts)	Package	Extended Temperature Range Available	Available	Notes
TDC1022	Floating Point Arithmetic Unit	22 Bit	100 nsec Cycle	2.4	J1, C1, L1	4Q82	3Q82	
TDC1028	FIR Filter	4×4×8	20 MHz	2.0	J4, C1, L1	2Q83	1Q83	
TDC1004	Correlator	64×1	15 MHz	0.7	J9	−55°C to 125°C	8/77	Analog output
TDC1023	Correlator	64×1	15 MHz	1.0	J7, C3	4Q82	8/80	Digital output

* Guaranteed, Worst Case, T_A=0°C to 70°C.

Storage Products

The TDC1005 and TDC1006 are the longest fast (or fastest long) shift registers available. Fully TTL compatible, they are ideal as buffer stores for video rate data. The TDC1030 FIFO is ideal for interconnecting two asynchronous systems.

Product	Description	Size	Clock Rate* (MHz)	Power Dissipation* (watts)	Package	Extended Temperature Range Available	Available	Notes
TDC1005	Shift Register	64×2	25	0.5	J9	−55°C to 125°C	10/77	
TDC1006	Shift Register	256×1	25	0.7	J9	−55°C to 125°C	10/77	
TDC1030	FIFO	64×9	15	1.5	J6	1Q83	3Q82	

* Guaranteed, Worst Case, T_A=0°C to 70°C.

TRW reserves the right to change product and specifications without notice. This information does not convey any license under patent rights of TRW Inc. or others.

LSI Products Division
TRW Electronic Components Group
P.O. Box 2472
La Jolla, Ca. 92038

Phone: (619) 457-1000
Telex: 697-957
TWX: 910-335-1571

©TRW Inc. 1982
40G00838 REV. A-7/82
Printed in the U.S.A.

© IC MASTER 1983

MPY112K
Preliminary Information

VLSI Multiplier
12 × 12 Bits

The MPY112K is a 12 x 12 bit parallel multiplier designed to operate at a 20 MHz video rate. Fabrication of this device using TRW's latest fine-geometry bipolar process offers a three to one improvement in delay-power product over the previously available technology. Multiplication may be performed on two's complement 12 bit operands or on unsigned magnitude 12 bit operands yielding a 16 bit product.

One output and two input registers are provided along with three-state outputs. These registers are positive edge triggered type D flip-flops. The X input is latched by CLK X and the Y input along with the product output is latched by CLK M.

The MPY112K is packaged in a 48 pin DIP for compact size. Applications for the device include real time digital signal processing, use in array processors, and geometric transformations.

Features

- 50 nsec Multiply time Over Commercial Temperature Range
- 12 x 12 Bit Parallel Multiplication With 16 Bit Product Output
- All Inputs And Outputs Are Latched TTL Compatible
- Three-State TTL Output
- Two's Complement Or Unsigned Magnitude Multiplication
- Radiation Hard Bipolar Process
- Single +5V Power Supply
- Ceramic 48 Pin DIP

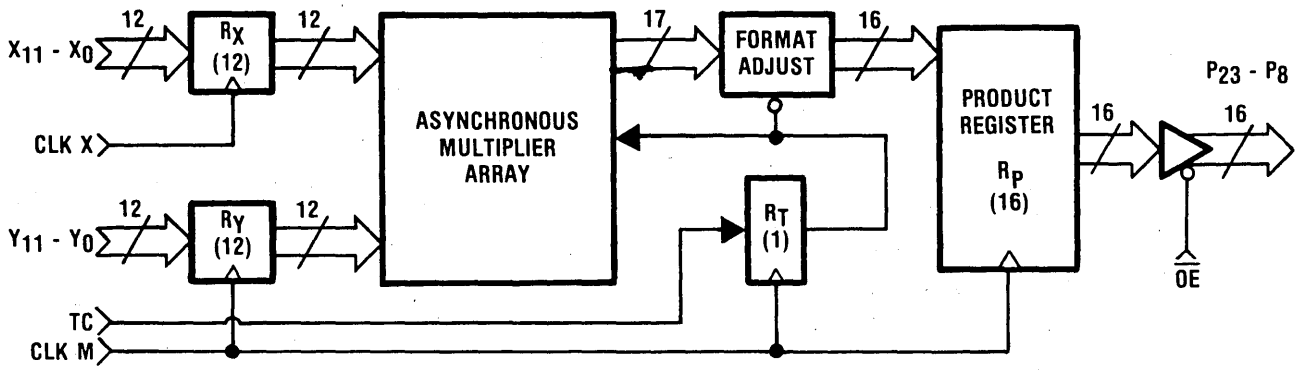
Applications

- Digital Video Filtering And Real Time Signal Processing
- Image Processing
- Elements In Array Processors
- FFT Calculations
- Geometric Transformations For Graphics Processing

DIGITAL

TRW LSI Products

Functional Block Diagram



TRW reserves the right to change product and specifications without notice. This information does not convey any license under patent rights of TRW Inc. or others.

LSI Products Division
TRW Electronic Components Group
P.O. Box 2472
La Jolla, Ca. 92038

Phone: (619) 457-1000
Telex: 697-957
TWX: 910-335-1571

© TRW Inc. 1982
40G00817 Rev. A–6/82
Printed in the U.S.A.

© IC MASTER 1983

MPY016K
Advance Information

VLSI Multiplier
16 × 16 Bit, 50 nsec

The TRW MPY016K is a 16 × 16 bit VLSI multiplier that operates on a 50-nsec cycle (20 MHz multiplication rate). Individually clocked input and output registers are provided to maximize system throughput and simplify bus interfacing. The Most Significant Product (MSP) and Least Significant Product (LSP) are multiplexed through a dedicated output port, or the LSP can share a bidirectional port with the Y input. Three-state outputs are employed throughout.

Built in TRW's OMICRON-B™ 1-micron bipolar process, the MPY016K is pin-compatible with the industry standard MPY016H and operates with three times the speed at no increase in power dissipation. The MPY016K is the industry's first true video-speed 16-bit multiplier.

Features

- True Video-Speed Performance (20 MHz)
- Double Precision Product
- Includes Input And Output Registers
- Two's Complement, Unsigned Magnitude, Or Mixed Mode Operation
- Output Registers Can Be Made Transparent
- Three-State Outputs
- Pin-Compatible With MPY016H
- Proven Hi-Rel, Rad-Hard Bipolar Process
- Single +5V Power Supply

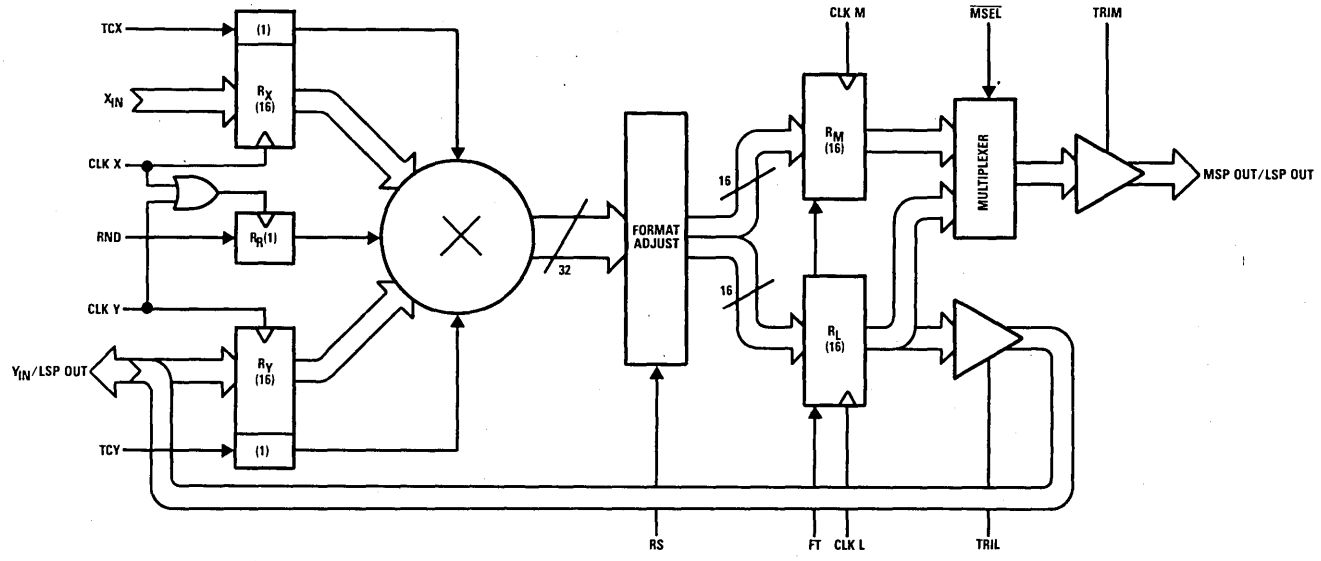
Applications

- Array Processors
- Video Processors
- Radar Signal Processors
- FFT Processors
- General Digital Signal Processors
- Microcomputer/Minicomputer Accelerators

DIGITAL

TRW LSI Products

Functional Block Diagram



TRW reserves the right to change product and specifications without notice. This information does not convey any license under patent rights of TRW Inc. or others.

LSI Products Division
TRW Electronic Components Group
P.O. Box 2472
La Jolla, Ca. 92038

Phone: (619) 457-1000
Telex: 697-957
TWX: 910-335-1571

© TRW Inc. 1982
40G00817 Rev. A–6/82
Printed in the U.S.A.

© IC MASTER 1983

TDC 1030
Advance Information

First-In First-Out Memory
64 Words by 9 Bits

The TDC1030 is an expandable high speed First-In First-Out (FIFO) memory organized as 64 words by 9 bits. A 20 MHz data rate makes it ideal in applications such as video time base correction, A/D input buffers, input/output formatter for digital filters and FFT's, disk controllers and voice synthesizers.

The Shift In (SI) and Shift Out (SO) controls allow asynchronous data transfers. The Input Ready (IR) flag indicates that the FIFO input stage is empty and available to receive new data. When IR is valid, SI may be asserted, thus loading the data present at D0 through D8 into the FIFO. From this stage, data "falls-through" in an asynchronous manner. The data will stack up at the end of the device while empty locations will "ripple" to the front. Output Ready (OR) indicates that the FIFO output stage contains valid data which may be transferred out via the Shift Out control. Additional control inputs include; Master Reset ($\overline{MR}$) to clear all data within the device and a three-state control signal, Output Enable, ($\overline{OE}$).

Devices can be interconnected to expand in word and bit dimensions. This operation is simplified by the resistive pullups provided at the OR and IR outputs which allow the use of a wired-AND configuration. The device has all output pins directly opposite the corresponding input pins, facilitating board layouts in expanded configurations.

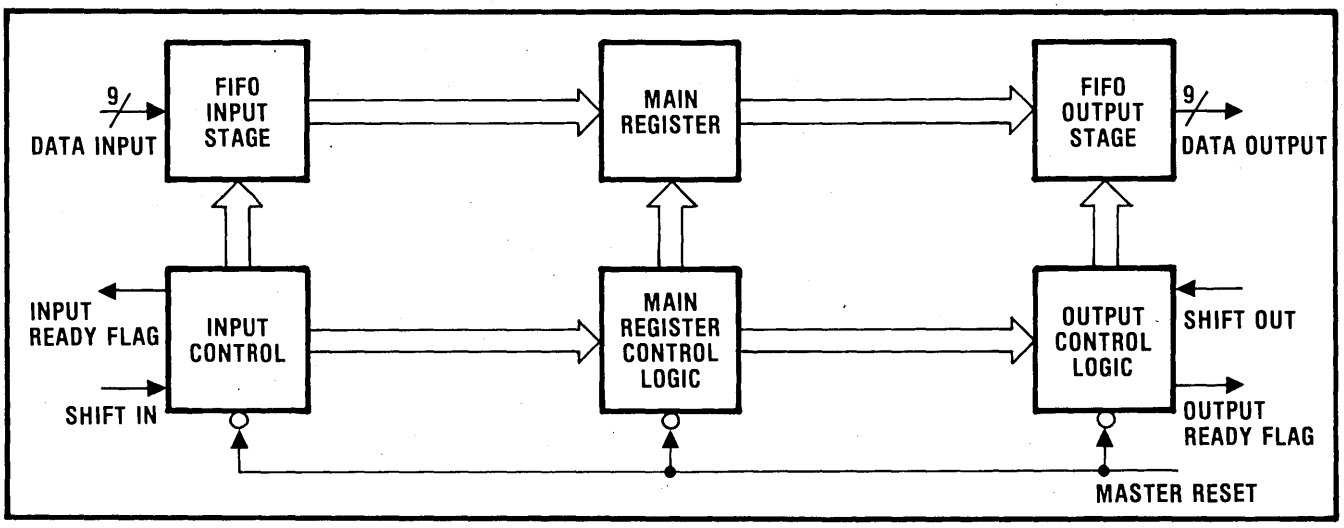
Features

- 64 words by 9-bit organization
- 20 MHz typical shift-in, shift-out rates
- Readily expandable in word and bit dimension
- Asynchronous or synchronous
- TTL inputs and outputs
- Three state outputs
- Master reset input to clear data and control
- Output pins directly opposite corresponding input pins
- OR, IR have resistive pull-ups to allow wired-AND Configuration
- Ceramic 28-pin dual-in-line package

DIGITAL

TRW LSI Products

Functional Block Diagram



TRW reserves the right to change product and specifications without notice. This information does not convey any license under patent rights of TRW Inc. or others.

LSI Products Division
TRW Electronic Components Group
P.O. Box 2472
La Jolla, Ca. 92038

Phone: (619) 457-1000
Telex: 697-957
TWX: 910-335-1571

© TRW Inc. 1982
40G00817 Rev. A–6/82
Printed in the U.S.A.

© IC MASTER 1983

TDC1022

Floating Point Arithmetic Unit
22 Bit

The TDC1022 is a high speed, TTL compatible, 22-bit VLSI floating point arithmetic unit. It operates on two binary numbers, each with a 16-bit two's complement significand and a 6-bit two's complement exponent. Its high performance results from a proven method developed and patented by TRW (U.S. Patent No. 3,900,724). The main internal adders and shifters achieve a speed power product of less than 1.0 picojoule per equivalent gate.

One output and two input data registers are provided along with three-state outputs. These registers are positive-edge triggered type D flip-flops with a common clock. An input latch is provided to demultiplex the two input operands from a single input bus.

The TDC1022 allows parallel loading and outputting of data and several external command and flag options. An internal pipeline register may be enabled to ensure a full arithmetic throughput rate of 10MHz, (100 nsec, Typ.).

Features

- Floating Point, Two's Complement
- Dynamic Range Equivalent to 64 Bits Fixed Point
- Selectable Pipelining, 100 nsec stage time
- Three-State TTL Output
- Selectable Add/Accumulate Function
- 12 Function Data/Arithmetic Control
- ÷2 Scaling Function for FFT's
- Selectable Saturating Arithmetic
- Parallel Data I/O
- Single 5V Supply
- 64 Pin DIP or 68 Contact Ceramic Leadless Chip Carrier

Applications

- Image Processing
- ALU in Array Processor
- Conversion between Fixed and Floating Point Numbers
- Digital Filters
- FFT's
- Secure Communications

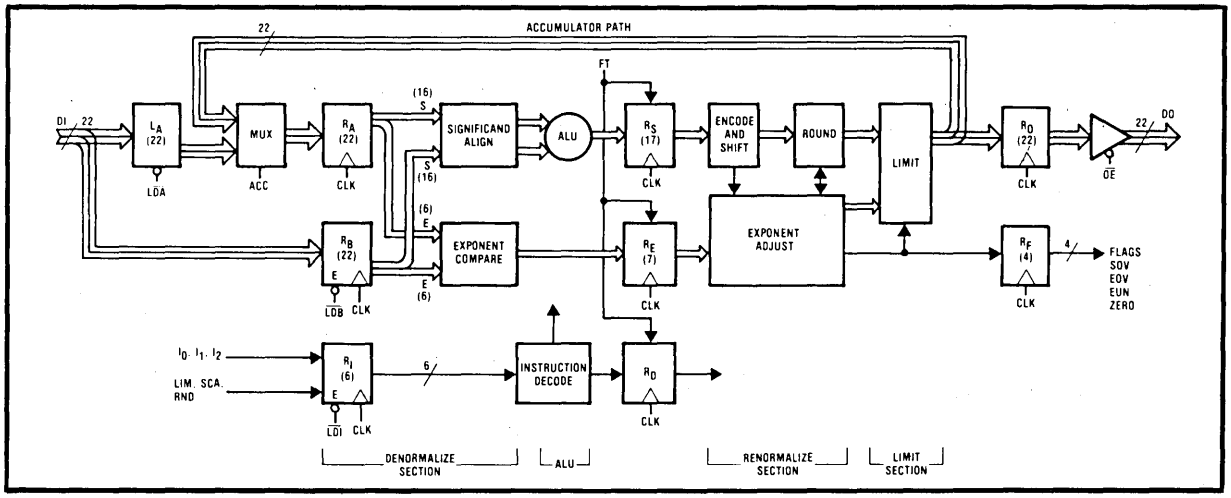
Instructions

Zero	A Denormalize
A + B	− A Denormalize
A − B	Limit (LMT)
B − A	Round (RND)
B Normalize	÷2, Scale (SCA)
− B Normalize	Accumulate (ACC)

Flags

Exponent Overflow	Zero
Significand Overflow	Exponent Underflow

Functional Block Diagram



TRW reserves the right to change product and specifications without notice. This information does not convey any license under patent rights of TRW Inc. or others.

LSI Products Division
TRW Electronic Components Group
P.O. Box 2472
La Jolla, Ca. 92038

Phone: (619) 457-1000
Telex: 697-957
TWX: 910-335-1571

© TRW Inc. 1982
40G00817 Rev. A–6/82
Printed in the U.S.A.

© IC MASTER 1983

TDC1028
Advance Information

FIR Digital Filter
Building Block

The TRW TDC1028 is a video-speed, TTL compatible bit-slice "building block" for Finite Impulse Response (FIR) digital filters and for multi-bit digital correlators. It is implemented as a bit-slice processor independently in the coefficient and signal data word dimensions. Word lengths can be multiples of four bits. Two's complement or unsigned magnitude operation is independently selectable for both coefficients and signal data words.

The TDC1028 provides eight delay stages, eight multipliers, and eight adders in a single integrated circuit. Eight coefficient storage registers are also provided for ease in programming filter characteristics. One coefficient may be changed every clock cycle. The delay registers and the adder pipeline registers have been merged for efficiency.

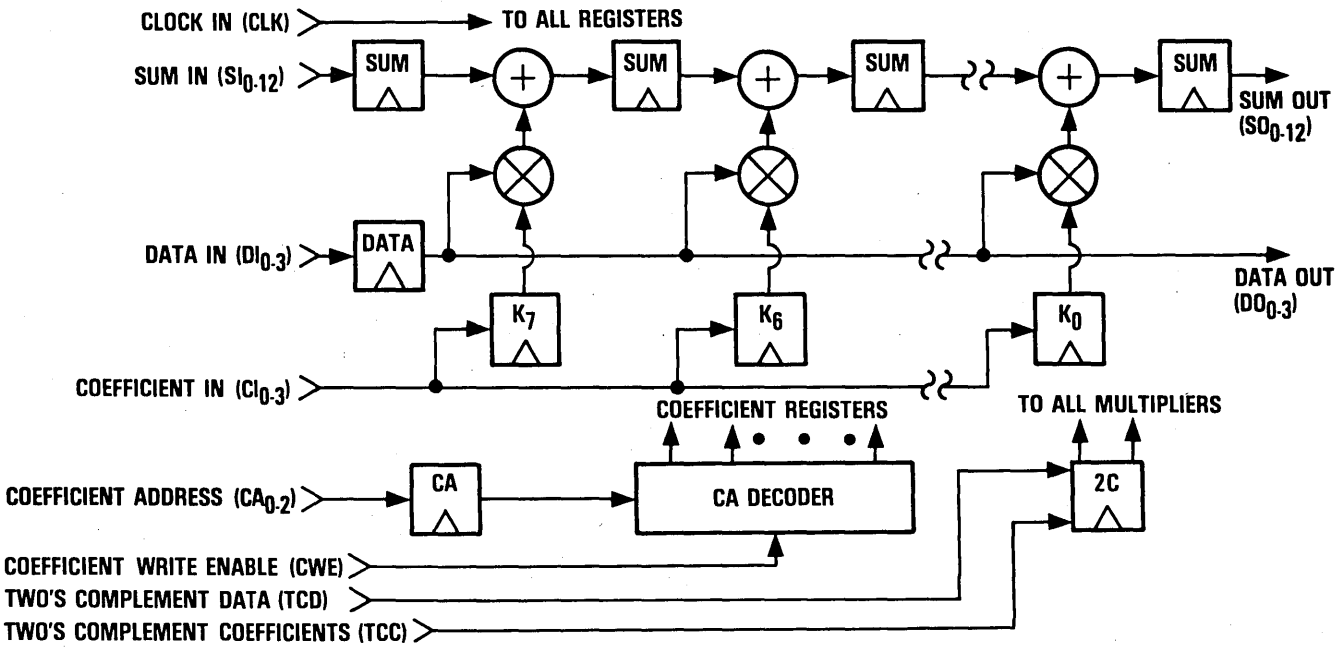
Features

- 20 MegaSamples Per Second (MSPS) Throughput Rate
- Eight Coefficients
- Cascadable (To>36 Taps) Without External Components
- 4 Bit Coefficient And Signal Data Words
- Independently Expandable Coefficient And Signal Word Length
- Independently Selectable Format For Coefficients And Signal Data Words (Two's Complement Or Unsigned Magnitude)
- 48-Pin DIP Or 68-Contact Leaded Or Leadless Chip Carrier
- Single +5V Power Supply
- TTL Compatible

Applications

- Digital Video Filters
- Matched Filters
- Pulse Compression
- Multi-Bit Correlation
- Waveform Synthesis
- Adaptive Filters

Functional Block Diagram



TRW reserves the right to change product and specifications without notice. This information does not convey any license under patent rights of TRW Inc. or others.

LSI Products Division
TRW Electronic Components Group
P.O. Box 2472
La Jolla, Ca. 92038

Phone: (619) 457-1000
Telex: 697-957
TWX: 910-335-1571

© TRW Inc. 1982
40G00817 Rev. A–6/82
Printed in the U.S.A.

© IC MASTER 1983

TDC1023
Preliminary Information

Digital Output Correlator
64 Bit

The TRW TDC1023 is a 64-bit monolithic, all digital correlator with a 7-bit three-state buffered digital output. This device consists of three 64-bit independently clocked shift registers, one 64-bit reference holding latch (exclusive ORed with the A data register), and a 64-bit independently clocked digital summing network. The device is capable of a 20 MHz (typical) parallel correlation rate.

The 7-bit threshold register allows the user to pre-load a binary number from 0 to 64. Whenever the correlation score is equal to or greater than the number in the threshold register, the threshold flag goes active.

The 64-bit mask register (M register) allows the user to mask or selectively choose "no compare" bit positions, enabling total word length flexibility.

The correlation process begins when the reference word is serially shifted into the B register. Then by clocking LDR, the data is parallel loaded into the R reference latch. This allows the user to serially load a new reference word into the B register while correlation is taking place between the A register and R latch. The two words are continually compared bit-for-bit by exclusive OR circuits. Each exclusive OR provides one bit to the digital summer. The output is a 7-bit word representing the sum of positions which agree at any one time between the A register and R latch.

A control provides either true or inverted binary output formats.

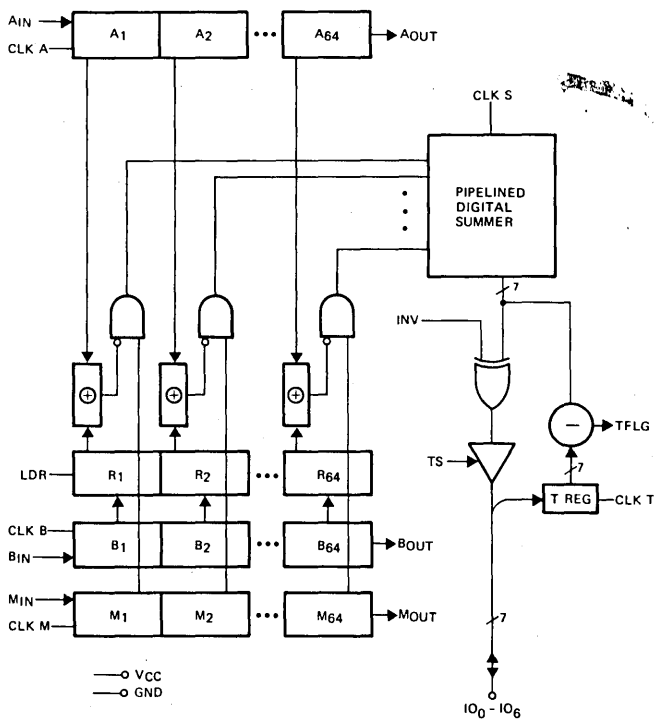
Features

- 20-MHz (Typical) Correlation Rate
- Bipolar, TTL Compatible
- All Digital
- Single 5V Power Supply
- Serial Data Input, Parallel Correlation Output
- Programmable Word Length
- Independently Clocked Registers
- Power Dissipation: 900 mW (Typical)
- Available In 24-Pin DIP And 28-Contact Leadless Chip Carrier
- Output Format Flexibility
- Three State Outputs

Applications

- Check Sorting Equipment
- High-Density Recording
- Bar Code Identification
- Radar Signature Recognition
- Video Frame Synchronization
- Electro-Optical Navigation
- Pattern And Character Recognition
- Cross-Correlation Control Systems
- Error Correction Coding

Functional Block Diagram



TRW reserves the right to change product and specifications without notice. This information does not convey any license under patent rights of TRW Inc. or others.

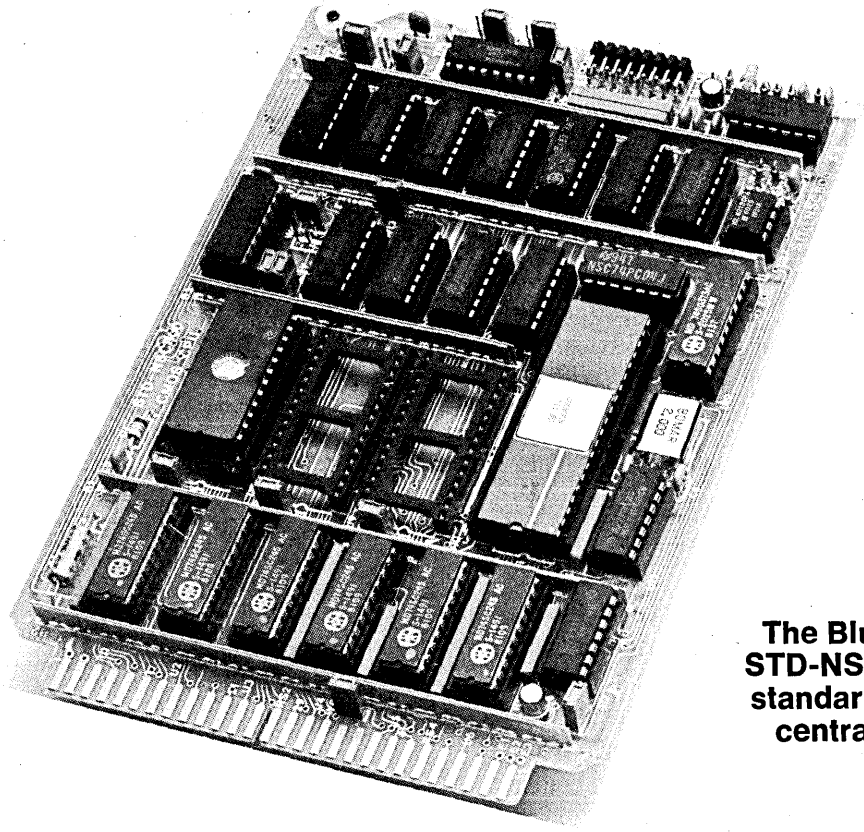
LSI Products Division
TRW Electronic Components Group
P.O. Box 2472
La Jolla, Ca. 92038

Phone: (619) 457-1000
Telex: 697-957
TWX: 910-335-1571

© TRW Inc. 1982
40G00817 Rev. A–6/82
Printed in the U.S.A.

© IC MASTER 1983

For Key Data On Every IC On This Board, The Place To Look Is...



The Blue Chip Computer STD-NSC800 is a CMOS standard bus compatible central processor card.

Equipment and system design often require the use of a wide variety of integrated circuits in order to obtain optimum performance. One way for an engineer to be certain that he hasn't overlooked the best device for his application is to refer to the pages of IC MASTER.

Surveys conducted by IC MASTER, integrated circuit manufacturers, and independent research agencies confirm that four out of five IC MASTER users have specified one or more products as the result of using IC MASTER.

Device No.	Description
NMC27C16	Erasable CMOS PROM
NSC800	8-bit Microprocessor
74SC245	3-State Octal Bus Driver
MD74SC373	Noninverted D-Type Transparent Latch
ICL8212C	Micropower Voltage Detector
MM74PC00	Quad 2-Input NAND Gate
MM74PC32	Quad 2-Input OR Gate
MM74PC08	Quad 2-Input AND Gate
MD74SC139	Octal Decoder/Demultiplexer
MM74PC74	Dual Type-D Flip-Flop
MSC74PC07	Hex Inverter
MM74C30	8-Input NAND Gate

Representative list of ICs on the Blue Chip Computer STD-NSC800 card. Key specifications for all of these ICs can be found in IC MASTER.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

TEXAS INSTRUMENTS
INCORPORATED

Bipolar Digital Logic Circuits

Functional Index and Product Guide

- SSI, MSI, and LSI Circuits
- Microprocessors and Support Circuits
- Field-Programmable Logic Arrays

in

Advanced Low-Power Schottky,
Advanced Schottky, Low-Power Schottky,
Schottky, and Original TTL Families

© IC MASTER 1983

	Page
Gates and Inverters	823, 824
Expanders and Expandable Gates	824
Buffers	824, 825
Drivers	824, 825
Transceivers	824, 825
Clock Generators	825
Flip-Flops	826
Latches	826
Monostable Multivibrators	826
Registers	827
Programmable Logic Arrays	827
Counters	828
Decoders/Demultiplexers	829
Code Converters	829
Priority Encoders	829
Display Decoders/Drivers	830
Controllers, Memory and Microprocessor	830
Voltage-Controlled Oscillators	830
Arithmetic Circuits (Adders, Accumulators, Multipliers)	831
Comparators	831
Error Detection and Correction Circuits	831
Bit-Slice Processors	831
Programmable Read-Only Memories (PROMs)	832
Read-Only Memories (ROMs)	832
Random-Access Memories (RAMs)	832
First-In, First-Out Memories (FIFOs)	832

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

GATES AND INVERTERS

POSITIVE-NAND GATES AND INVERTERS

DESCRIPTION	TYPE	TECHNOLOGY							BOOK†	PAGE NO.
		STD TTL	ALS	AS	H	L	LS	S		
Hex 2-Input Gates	'804		▲	A					ADV	
Hex Inverters	'04	●			●	●	●	●	TTL	5-7
			●						ADV	
	'1004		▲						ADV	
				▲					CF	
Quadruple 2-Input Gates	'00	●			●	●	●	●	TTL	5-6
			A						ADV	
				▲					CF	
	'1000		●						ADV	
				▲					CF	
Triple 3-Input Gates	'10	●			●	●	●	●	TTL	5-8
			●						ADV	
				▲					CF	
	'1010		●						ADV	
Dual 4-Input Gates	'20	●			●	●	●	●	TTL	5-10
			A						ADV	
				▲					CF	
	'1020		●						ADV	
8-Input Gates	'30	●			●	●	●	●	TTL	5-12
			●						ADV	
				▲					CF	
13-Input Gates	'133							●	TTL	5-38
			●						ADV	

POSITIVE-NAND GATES AND INVERTERS WITH OPEN-COLLECTOR OUTPUTS

DESCRIPTION	TYPE	TECHNOLOGY							BOOK†	PAGE NO.
		STD TTL	ALS	AS	H	L	LS	S		
Hex Inverters	'05	●			●		●	●	TTL	5-7
			●						ADV	
	'1005		▲						ADV	
Quadruple 2-Input Gates	'01	●			●		●		TTL	5-7
			●						ADV	
	'03	●				●	●	●	TTL	5-7
			A						ADV	
	'1003		●						ADV	
Triple 3-Input Gates	'12	●					●		TTL	5-9
			●						ADV	
Dual 4-Input Gates	'22	●			●		●	●	TTL	5-11
			A						ADV	

POSITIVE-AND GATES

DESCRIPTION	TYPE	TECHNOLOGY						BOOK†	PAGE NO.
		STD TTL	ALS	AS	H	LS	S		
Hex 2-Input Gates	'808		▲	A				ADV	
Quadruple 2-Input Gates	'08	●				●	●	TTL	5-8
			●					ADV	
				▲				CF	
	'1008		●	▲				ADV	
Triple 3-Input Gates	'11				●	●	●	TTL	5-9
			●					ADV	
				▲				CF	
	'1011		●					ADV	
Dual 4-Input Gates	'21					●		TTL	5-11
			●					ADV	
				▲				CF	
Triple 4-Input AND/NAND	'800			▲				ADV	

POSITIVE-AND GATES WITH OPEN-COLLECTOR OUTPUTS

DESCRIPTION	TYPE	TECHNOLOGY						BOOK†	PAGE NO.
		STD TTL	ALS	AS	H	LS	S		
Quadruple 2-Input Gates	'09	●				●	●	TTL	5-8
			●					ADV	
Triple 3-Input Gates	'15				●	●	●	TTL	5-10
			●					ADV	

POSITIVE-OR GATES

DESCRIPTION	TYPE	TECHNOLOGY					BOOK†	PAGE NO
		STD TTL	ALS	AS	LS	S		
Hex 2-Input Gates	'832		▲	A			ADV	
Quadruple 2-Input Gates	'32	●			●	●	TTL	5-13
			●				ADV	
				▲			CF	
	'1032		●	▲			ADV	
Triple 4-Input OR/NOR	'802			▲				

POSITIVE-NOR GATES

DESCRIPTION	TYPE	TECHNOLOGY						BOOK†	PAGE NO.
		STD TTL	ALS	AS	L	LS	S		
Hex 2-Input Gates	'805		▲	A				ADV	
Quadruple 2-Input Gates	'02	●			●	●	●	TTL	5-6
			●					ADV	
				▲				CF	
	'1002		●	▲				ADV	
Triple 3-Input Gates	'27	●				●		TTL	5-12
			●					ADV	
				▲				CF	
Dual 4-Input Gates with Strobe	'25	●						TTL	5-11
Dual 5-Input Gates	'260						●	TTL	5-57

SCHMITT-TRIGGER POSITIVE-NAND GATES AND INVERTERS

DESCRIPTION	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
		STD TTL	ALS	AS	LS	S		
Hex Inverters	'14	●			●		TTL	5-9
	'19				●		SUP	17
Dual 4-Input Positive-NAND	'13	●			●		TTL	5-9
	'18				●		SUP	17
Quadruple 2-Input Positive-NAND	'24				●		SUP	17
	'132				●	●	TTL	5-37

CURRENT-SENSING GATES

DESCRIPTION	TYPE	TECHNOLOGY			BOOK†	PAGE NO.
		ALS	AS	LS		
Hex	'63			●	TTL	5-20

DELAY ELEMENTS

DESCRIPTION	TYPE	TECHNOLOGY			BOOK†	PAGE NO.
		ALS	AS	LS		
Inverting & Non-inverting Elements, 2-Input NAND buffers	'31			●	CF	

†The books are identified as follows:
- ADV = The ALS/AS Data Book
- BMC = The Bipolar Microcomputer Components Data Book for Design Engineers, third edition
- SUP = 1981 Supplement to the TTL Data Book for Design Engineers, second edition
- TTL = The TTL Data Book for Design Engineers, second edition
- CF = Data sheet is not presently available in a book. Contact the factory.

● Denotes available technology.

▲ Denotes planned new products.

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

GATES, EXPANDERS, BUFFERS, DRIVERS, AND TRANSCEIVERS

AND-OR-INVERT GATES

DESCRIPTION	TYPE	TECHNOLOGY							BOOK†	PAGE NO.
		STD TTL	ALS	AS	H	L	LS	S		
2-Wide 4-Input	'55				●	●	●		TTL	5-19
4-Wide 4-2-3-2-Input	'64							●	TTL	5-20
4-Wide 2-2-3-2-Input	'54				●				TTL	5-18
4-Wide 2-Input	'54	●							TTL	5-18
4-Wide 2-3-3-2 Input	'54					●	●		TTL	5-18
Dual 2-Wide 2-Input	'51	●			●	●	●	●	TTL	5-16

AND-OR-INVERT GATES WITH OPEN-COLLECTOR OUTPUTS

DESCRIPTION	TYPE	TECHNOLOGY				BOOK†	PAGE NO.
		STD TTL	ALS	AS	S		
4-Wide 4-2-3-2-Input	'65				●	TTL	5-20

EXPANDABLE GATES

DESCRIPTION	TYPE	TECHNOLOGY						BOOK†	PAGE NO.
		STD TTL	ALS	AS	H	L	LS		
Dual 4-Input Positive-NOR With Strobe	'23	●						TTL	5-11
4-Wide AND-OR	'[illegible]				●			TTL	5-17
4-Wide AND-OR-INVERT	'53	●			●			TTL	5-17
2-Wide AND-OR-INVERT	'55				●	●	●	TTL	5-19
Dual 2-Wide AND-OR-INVERT	'50	●			●			TTL	5-16

EXPANDERS

DESCRIPTION	TYPE	TECHNOLOGY				BOOK†	PAGE NO.
		STD TTL	ALS	AS	H		
Dual 4-Input	'60	●			●	TTL	5-19
Triple 3-Input	'61				●	TTL	5-19
3-2-2-3-Input AND-OR	'62				●	TTL	5-20

BUFFER AND INTERFACE GATES WITH OPEN-COLLECTOR OUTPUTS

DESCRIPTION	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
		STD TTL	ALS	AS	LS	S		
Hex	'07	●					TTL	5-8
	'17	●					TTL	5-10
	'1035		▲				ADV	
Hex Inverter	'06	●					TTL	5-7
	'16	●					TTL	5-10
	'1005		▲				ADV	
Quad 2-Input Positive-NAND	'26	●			●		TTL	5-12
	'38	●			●	●	TTL	5-13
			●				ADV	
	'39	●					CF	
	'1003		●				ADV	
Quad 2-Input Positive-NOR	'33	●			●		TTL	5-13
			●				ADV	

GATES, BUFFERS, DRIVERS, AND BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

DESCRIPTION	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
		STD TTL	ALS	AS	LS	S		
Non-Inverting Octal Buffers/Drivers	'241				●	●	TTL	5-5
			●	●			ADV	
	'244				●	●	TTL	5-54
			●	●			ADV	
	'465				●		SUP	95
			▲				ADV	
	'467				●		SUP	95
			▲				ADV	
	'541				●		SUP	98
			▲				ADV	
	'1241*		▲				ADV	
	'1244*		●				ADV	
Inverting Octal Buffers/Drivers	'231			▲			ADV	
	'240				●	●	TTL	5-53
			●	●			ADV	
	'466				●		SUP	95
			▲				ADV	
	'468				●		SUP	95
			▲				ADV	
	'540				●		SUP	98
			▲				ADV	
	'1240*		●				ADV	
Inverting and Non-Inverting Octal Buffers/Drivers	'230			▲			ADV	
Octal Transceivers	'245				●		TTL	7-349
			●	▲			ADV	
	'1245		●				ADV	
Non-Inverting Hex Buffers/Drivers	'365	A			A		TTL	5-66
			▲				ADV	
	'367	A			A		TTL	5-66
			▲				ADV	
Inverting Hex Buffers/Drivers	'366	A			A		TTL	5-66
			▲				ADV	
	'368	A			A		TTL	5-66
			▲				ADV	
Quad Buffers/Drivers with Independent Output Controls	'125	●			A		TTL	5-37
	'126	●			A		TTL	5-37
	'425	●					TTL	5-71
	'426	●					TTL	5-72
Non-Inverting Quad Transceivers	'243				●		TTL	5-54
			●	●			ADV	
	'1243*		●				ADV	
Inverting Quad Transceivers	'242				●		TTL	5-54
			●	●			ADV	
	1242*		●				ADV	
Quad Transceivers with Storage	'226					●	TTL	7-345
12-Input NAND Gate	'134					●	TTL	5-38
Controller and Bus Driver for 8080A System	'428					●	TTL	7-514
	'438					●	TTL	7-514

50-OHM/75-OHM LINE DRIVERS

DESCRIPTION	TYPE	TECHNOLOGY				BOOK†	PAGE NO.
		STD TTL	ALS	AS	S		
Hex 2-Input Positive-NAND	'804		▲	A		ADV	
Hex 2-Input Positive-NOR	'805		▲	A		ADV	
Hex 2-Input Positive-AND	'808		▲	A		ADV	
Hex 2-Input Positive-OR	'832		▲	A		ADV	
Quad 2-Input Positive-NOR	'128	●				TTI	537
Dual 4-Input Positive-NAND	'140				●	TTL	5-39

† The books are identified as follows:
ADV = The ALS/AS Data Book
BMC = The Bipolar Microcomputer Components Data Book for Design Engineers, third edition
SUP = 1981 Supplement to the TTL Data Book for Design Engineers, second edition
TTL = The TTL Data Book for Design Engineers, second edition
CF = Data sheet is not presently available in a book. Contact the factory.

● Denotes available technology.

▲ Denotes planned new products.

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

BUFFERS, DRIVERS, TRANSCEIVERS, AND CLOCK GENERATORS

BUFFERS, CLOCK/MEMORY DRIVERS

DESCRIPTION	TYPE	TECHNOLOGY						BOOK†	PAGE NO.
		STD TTL	ALS	AS	H	LS	S		
Hex 2-Input Positive-NAND	'804		▲	A				ADV	
Hex 2-Input Positive-NOR	'805		▲	A				ADV	
Hex 2-Input Positive-AND	'808		▲	A				ADV	
Hex 2-Input Positive-OR	'832		▲	A				ADV	
Hex Inverter	'1004		▲					ADV	
				▲				CF	
Hex Buffer	'1034		▲	▲				ADV	
Quad 2-Input Positive-NAND	'37	●				●	●	TTL	5-13
			●					ADV	
	'1000		●					ADV	
				▲				CF	
Quad 2-Input Positive-NOR	'28	●				●		TTL	5-12
			●					ADV	
	'1002		●	▲				ADV	
Quad 2-Input Positive-AND	'1008		●	▲				ADV	
Quad 2-Input Positive-OR	'1032		●	▲				ADV	
Triple 3-Input Positive-NAND	'1010		●					ADV	
Triple 3-Input Positive-AND	'1011		●						
Triple 4-Input AND-NAND	'800			▲				ADV	
Triple 4-Input OR-NOR	'802			▲				ADV	
Dual 4-Input Positive-NAND	'40	●			●	●	●	TTL	5-14
			●					ADV	
	'1020		●					ADV	
Line Driver/Memory Driver with Series Damping Resistor	'436						●	SUP	77
Line Driver/Memory Driver	'437						●	SUP	77

BI-/TRI-DIRECTIONAL BUS TRANSCEIVERS AND DRIVERS

DESCRIPTION	TYPE OF OUTPUT	TYPE	TECHNOLOGY				BOOK†	PAGE NO.
			ALS	AS	LS	S		
Quad with Bit Direction Controls	3-State	'446			●		SUP	89
	3-State	'449			●		SUP	89
Quad Tridirection	OC	'440			●		SUP	81
	OC	'441			●		SUP	81
	3-State	'442			●		SUP	81
	3-State	'443			●		SUP	81
	3-State	'444			●		SUP	81
	OC	'448			●		SUP	81
4-Bit with Storage	3-State	'226				●	TTL	7-345
Controller and Bus Driver for 8080A Systems		'428				●	TTL	7-514
		'438				●	TTL	7-514

OCTAL BI-/TRI-DIRECTIONAL BUS TRANSCEIVERS

DESCRIPTION		TYPE OF OUTPUT	TYPE	TECHNOLOGY			BOOK†	PAGE NO.
				ALS	AS	LS		
12 mA/24 mA Sink, True Outputs	Low Power	3-State	'245	●	▲		ADV	
						●	TTL	7-349
		OC	'621	●			ADV	
						●	SUP	141
		3-State	'623	●			ADV	
						●	SUP	141
					▲		CF	
		OC, 3-State	'639	●			ADV	
						●	SUP	157
		3-State	'652	▲			ADV	
						●	SUP	175
					▲		CF	
		OC, 3-State	'654				ADV	
						●	CF	
	Very Low Power	OC	'1621	▲			ADV	
		3-State	'1623	▲			ADV	
		OC, 3-State	'1639	▲			ADV	
12 mA/24 mA Sink, Inverting Outputs	Low Power	3-State	'620	●			ADV	
						●	SUP	141
					▲		CF	
		OC	'622	●			ADV	
						●	SUP	141
		OC, 3-State	'638	●			ADV	
						●	SUP	157
		3-State	'651	▲			ADV	
						●	SUP	175
					▲		CF	
		OC, 3-State	'653				ADV	
						●	CF	
	Very Low Power	3-State	'1620	▲			ADV	
		OC	'1622	▲			ADV	
		OC 3-State	'1638	▲			ADV	
12 mA/24 mA/48 mA Sink, True Outputs	Low Power	OC	'641	●			ADV	
						●	SUP	161
		3-State	'645	●	▲		ADV	
						●	SUP	161
	Very Low Power	OC	'1641	▲			ADV	
		3-State	'1645	●			ADV	
12 mA/24 mA/48 mA Sink, Inverting Outputs	Low Power	3-State	'640	●			ADV	
						●	SUP	161
					▲		CF	
		OC	'642	●			ADV	
						●	SUP	161
	Very Low Power	3-State	'1640	●			ADV	
		OC	'1642	●			ADV	
12 mA/24 mA/48 mA Sink, True and Inverting Outputs	Low Power	3-State	'643	●			ADV	
						●	SUP	161
					▲		CF	
		OC	'644	●			ADV	
						●	SUP	161
	Very Low Power	3-State	'1643	▲			ADV	
		OC	'1644	▲			ADV	
Registered with Multiplexed 12 mA/24 mA True Outputs		3-State	'646	▲			ADV	
						●	SUP	168
					▲		CF	
		OC	'647	▲			ADV	
						●	SUP	168
Registered with Multiplexed 12 mA/24 mA Inverting Outputs		3-State	'648	▲			ADV	
						●	SUP	168
					▲		CF	
		OC	'649	▲			ADV	
						●	SUP	168
Universal Transceiver/ Port Controllers		3-State	'877		▲		ADV	

†The books are identified as follows:

ADV = The ALS/AS Data Book
BMC = The Bipolar Microcomputer Components Data Book for Design Engineers, third edition
SUP = 1981 Supplement to the TTL Data Book for Design Engineers, second edition
TTL = The TTL Data Book for Design Engineers, second edition
CF = Data sheet is not presently available in a book. Contact the factory.

● Denotes available technology.

▲ Denotes planned new products.

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

FLIP-FLOPS, LATCHES, AND MULTIVIBRATORS

DUAL AND SINGLE FLIP-FLOPS

DESCRIPTION	TYPE	TECHNOLOGY							BOOK†	PAGE NO.
		STD TTL	ALS	AS	H	L	LS	S		
Dual J-K Edge-Triggered	'73						A		TTL	5-22
	'76						A		TTL	5-23
	'78						A		TTL	5-24
	'103				●				TTL	5-31
	'106				●				TTL	5-32
	'107						A		TTL	5-32
	'108				●				TTL	5-32
	'109	●					A		TTL	5-33
			●	▲					ADV	
	'112						A	●	TTL	5-34
			A	▲					ADV	
	'113						A	●	TTL	5-34
			A	▲					ADV	
	'114						A	●	TTL	5-34
			A	▲					ADV	
Single J-K Edge-Triggered	'70	●							TTL	5-21
	'101				●				TTL	5-31
	'102				●				TTL	5-31
Dual Pulse-Triggered	'73	●			●	●			TTL	5-22
	'76	●			●				TTL	5-23
	'78				●	●			TTL	5-24
	'107	●							TTL	5-33
Single Pulse-Triggered	'71				●	●			TTL	5-21
	'72	●			●	●			TTL	5-22
Dual J-K With Data Lockout	'111	●							TTL	5-33
Single J-K With Data Lockout	'110	●							TTL	5-33
Dual D-Type	'74	●			●	●	A	●	TTL	5-33
			●	▲					ADV	

QUAD LATCHES

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
			STD TTL	ALS	AS	L	LS		
Dual 2-Bit Transparent	2-State	'75	●			●	●	TTL	7-35
	2-State	'77	●			●	●	TTL	7-35
	2-State	'375					●	TTL	7-478
S-R	2-State	'279	●				●	TTL	5-59

RETRIGGERABLE MONOSTABLE MULTIVIBRATORS

DESCRIPTION	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
		STD TTL	ALS	AS	LS	L		
Single	'122	●			●	●	TTL	5-36
	'422				●		SUP	73
Dual	'123	●			●	●	TTL	5-36
	'423				●		SUP	73

QUAD AND HEX FLIP-FLOPS

DESCRIPTION	NO. FFs	OUTPUTS	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
				STD TTL	ALS	AS	LS	S		
D Type	6	Q	'174	●			●	●	TTL	7-253
					▲	▲			ADV	
			'378				●		TTL	7-481
	4	Q,Q	'171				●		CF	
			'175	●			●	●	TTL	7-253
					▲	▲			ADV	
			'379				●		TTL	7-481
J-K	4	Q	'276	●					TTL	7-401
			'376	●					TTL	7-479

OCTAL D-TYPE FLIP-FLOPS

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
			STD TTL	ALS	AS	LS	S		
True Data	3-State	'374		▲	●			ADV	
						●	●	TTL	7-471
	3-State	'574		●	▲			ADV	
True Data with Clear	2-State	'273		▲				ADV	
			●			●		TTL	7-338
	3-State	'575		●	▲			ADV	
	3-State	'874		●	▲			ADV	
	3-State	'878		●	▲			ADV	
True with Enable	2-State	'377				●		TTL	7-481
Inverting	3-State	'534		▲	▲			ADV	
	3-State	'564		●				ADV	
	3-State	'576		●	▲			ADV	
Inverting with Clear	3-State	'577		●	▲			ADV	
	3-State	'879		●	▲			ADV	
Inverting with Preset	3-State	'876		●	▲			ADV	

OCTAL LATCHES

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY						BOOK†	PAGE NO.
			STD TTL	ALS	AS	L	LS	S		
Transparent	3-State	'373					●	●	TTL	7-471
				▲	●				ADV	
	3-State	'573		●	▲				ADV	
Dual 4-Bit Transparent	2-State	'100	●						TTL	7-113
	2-State	'116	●						TTL	7-115
	3-State	'873		●	▲				ADV	
Inverting Transparent	3-State	'533		▲	▲				ADV	
	3-State	'563		●					ADV	
	3-State	'580		●	▲				ADV	
Dual 4-Bit Inverting Transparent	3-State	'880		●	▲				ADV	
2-Input Multiplexed	3-State	'604					●		SUP	124
	OC	'605					●		SUP	124
	3-State	'606					●		SUP	124
	OC	'607					●		SUP	124
Addressable	2-State	'259	●				●		TTL	7-376
				▲					ADV	
Multi-Mode Buffered	3-State	'412						●	TTL	7-502

MONOSTABLE MULTIVIBRATORS WITH SCHMITT-TRIGGER INPUTS

DESCRIPTION	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
		STD TTL	ALS	AS	LS	S		
Single	'121	●					TTL	5-35
Dual	'221	●			●		TTL	5-33

† The books are identified as follows:
- ADV = The ALS/AS Data Book
- BMC = The Bipolar Microcomputer Components Data Book for Design Engineers, third edition
- SUP = 1981 Supplement to the TTL Data Book for Design Engineers, second edition
- TTL = The TTL Data Book for Design Engineers, second edition
- CF = Data sheet is not presently available in a book. Contact the factory.

● Denotes available technology.

▲ Denotes planned new products.

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

REGISTERS AND PROGRAMMABLE LOGIC ARRAYS

SHIFT REGISTERS

DESCRIPTION	NO. OF BITS	MODES S-R	MODES S-L	MODES LOAD	MODES HOLD	TYPE	TECHNOLOGY STD TTL	TECHNOLOGY ALS	TECHNOLOGY AS	TECHNOLOGY L	TECHNOLOGY LS	TECHNOLOGY S	BOOK†	PAGE NO.
Sign-Protected		X		X	X	'322					A		SUP	47
Parallel-In, Parallel-Out, Bidirectional	8	X	X	X	X	'198	●						TTL	7-338
		X	X	X	X	'299					●	●	TTL	7-437
								●					ADV	
		X	X	X	X	'323					●		TTL	7-443
								●					ADV	
	4	X	X	X	X	'194	●				A	●	TTL	7-316
Parallel-In, Parallel-Out, Registered Outputs	4	X	X	X	X	'671					●		SUP	187
		X	X	X	X	'672					●		SUP	187
Parallel-In, Parallel-Out	8	X		X	X	'199	●						TTL	7-338
	5	X		X		'96	●			●	●		TTL	7-95
	4	X		X		'95	A			●	B		TTL	7-89
		X		X		'99				●			TTL	7-109
		X		X	X	'178	●						TTL	7-265
		X		X	X	'179	●						TTL	7-265
		X		X		'195	●				A	●	TTL	7-324
		X		X		'295					B		TTL	7-429
		X		X		'395					A		TTL	7-496
Serial-In, Parallel-Out	16	X		X	X	'673					●		SUP	193
	8	X				'164	●			●	●		TTL	7-206
								▲					ADV	
Parallel-In, Serial-Out	16	X		X	X	'674					●		SUP	193
	8	X		X	X	'165	●				A		TTL	7-212
								▲					ADV	
		X		X	X	'166	●				A		TTL	7-217
								▲					ADV	
Serial-In, Serial-Out	8	X				'91	A			●	●		TTL	7-81
	4	X		X		'94	●						TTL	7-86

SHIFT REGISTERS WITH LATCHES

DESCRIPTION	NO. OF BITS	OUTPUTS	TYPE	TECHNOLOGY ALS	TECHNOLOGY AS	TECHNOLOGY LS	BOOK†	PAGE NO.
Parallel-In, Parallel-Out with Output Latches	4	3-State	'671			●	SUP	187
		3-State	'672			●	SUP	187
Serial-In, Parallel-Out with Output Latches	16	2-State	'673			●	SUP	193
	8	Buffered	'594			▲	CF	
		3-State	'595			▲	SUP	110
		OC	'596			▲	SUP	110
		OC	'599			▲	CF	
Parallel-In, Serial-Out, with Input Latches	8	2-State	'597			▲	SUP	114
Parallel I/O Ports with Input Latches, Multiplexed Serial Inputs	8	3-State	'598			▲	SUP	114

SIGN-PROTECTED REGISTERS

DESCRIPTION	NO. OF BITS	MODES S-R	MODES S-L	MODES LOAD	MODES HOLD	TYPE	TECHNOLOGY ALS	TECHNOLOGY AS	TECHNOLOGY LS	BOOK†	PAGE NO.
Sign-Protected Register	8	X		X	X	'322			A	SUP	47

REGISTER FILES

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY STD TTL	TECHNOLOGY ALS	TECHNOLOGY AS	TECHNOLOGY LS	BOOK†	PAGE NO.
8 Words X 2 Bits	3-State	'172	●				TTL	7-245
4 Words X 4 Bits	OC	'170	●			●	TTL	7-237
	3-State	'670				●	TTL	7-526
Dual 16 Words X 4 Bits	3-State	'870			▲		ADV	
	3-State	'871			▲		ADV	

OTHER REGISTERS

DESCRIPTION	TYPE	TECHNOLOGY STD TTL	TECHNOLOGY ALS	TECHNOLOGY AS	TECHNOLOGY L	TECHNOLOGY LS	TECHNOLOGY S	BOOK†	PAGE NO.
Quadruple Multiplexers With Storage	'98				●			TTL	7-107
	'298	●				●		TTL	7-432
	'3098					●		TTL	7-499
	'399					●		TTL	7-499
8-Bit Universal Shift Registers	'299					●	●	TTL	7-437
			●					ADV	
Quadruple Bus-Buffer Registers	'173	●				A		TTL	7-249
Octal Storage Register	'396					●		SUP	71

PROGRAMMABLE LOGIC ARRAYS

DESCRIPTION	INPUTS	OUTPUTS NO.	OUTPUTS TYPE	TYPE NO.	NO. OF PINS	BOOK†	PAGE NO.
Fixed-OR Arrays	16	8	Active-Low	'PL16L8	20	ADV	
		8	Registered	'PL16R8			
		6		'PL16R6			
		4		'PL16R4			
	19 Registered ▲	8	Active-Low	'PLR19L8	24	ADV	
		8	Registered	'PLR19R8			
		6		'PLR19R6			
		4		'PLR19R4			
	19 Latched ▲	8	Active-Low	'PLT19L8	24	ADV	
		8	Registered	'PLT19R8			
		6		'PLT19R6			
		4		'PLT19R4			
	20 ▲	8	Active-Low	'PL20L8	24	ADV	
		8	Registered	'PL20R8			
		6		'PL20R6			
		4		'PL20R4			
Field-Programmable 14 × 32 × 6 Logic Arrays	14	6	3-State	'PL839	24	ADV	
			OC	'PL840			
Field-Programmable Logic Sequencers	11 or 12	6	3-State	'PL333		ADV	
			OC	'PL335			

†The books are identified as follows:

ADV = The ALS/AS Data Book
BMC = The Bipolar Microcomputer Components Data Book for Design Engineers, third edition
SUP = 1981 Supplement to the TTL Data Book for Design Engineers, second edition
TTL = The TTL Data Book for Design Engineers, second edition
CF = Data sheet is not presently available in a book. Contact the factory.

● Denotes available technology.

▲ Denotes planned new products.

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

COUNTERS

SYNCHRONOUS COUNTERS – POSITIVE-EDGE TRIGGERED

DESCRIPTION	PARALLEL LOAD	TYPE	TECHNOLOGY						BOOK†	PAGE NO.
			STD TTL	ALS	AS	L	LS	S		
Decade	Sync	'160	●				A		TTL	7-190
				●	▲				ADV	
	Sync	'162	●				A	●	TTL	7-190
				●	▲				ADV	
	Sync	'560		●					ADV	
	Sync	'668					●		SUP	179
	Sync	'690					●		SUP	211
	Sync	'692					●		SUP	211
Decade Up/Down	Sync	'168					B	●	TTL	7-226
				●	▲				ADV	
	Async	'190	●				●		TTL	7-296
				●					ADV	
	Async	'192	●			●	●		TTL	7-306
				●					ADV	
	Sync	'568		●					ADV	
	Sync	'696					●		SUP	217
	Sync	'698					●		SUP	217
Decade Rate Multiplier, $\frac{1}{N10}$	Async Set-to-9	'167	●						TTL	7-222
4-Bit Binary	Sync	'161	●				A		TTL	7-190
				●	▲				ADV	
	Sync	'163	●				A	●	TTL	7-190
				●	▲				ADV	
	Sync	'561		●					ADV	
	Sync	'669					●		SUP	179
	Sync	'691					●		SUP	211
	Sync	'693					●		SUP	211
4-Bit Binary Up/Down	Sync	'169					B	●	TTL	7-226
				●	▲				ADV	
	Async	'191	●				●		TTL	7-296
				●					ADV	
	Async	193	●			●	●		TTL	7-306
				●					ADV	
	Sync	'569		●					ADV	
	Sync	'697					●		SUP	217
	Sync	'699					●		SUP	217
6-Bit Binary Rate Multiplier, $\frac{1}{N2}$		'97	●						TTL	7-102
8-Bit Up/Down	Async CLR	'867			●				ADV	
	Sync CLR	'869			●				ADV	

ASYNCHRONOUS COUNTERS (RIPPLE CLOCK) – NEGATIVE-EDGE TRIGGERED

DESCRIPTION	PARALLEL LOAD	TYPE	TECHNOLOGY						BOOK†	PAGE NO.
			STD TTL	ALS	AS	L	LS	S		
Decade	Set-To-9	'90	A			●	●		TTL	7-72
		'68					●		CE	
	Yes	'176	●						TTL	7-259
	Yes	'196	●				●	●	TTL	7-331
	Set-To-9	'290	●				●		TTL	7-423
4-Bit Binary	None	'93	A			●	●		TTL	7-72
		'69					●		CF	
	Yes	'177	●						TTL	7-259
	Yes	'197	●				●	●	TTL	7-331
	None	'293	●				●		TTL	7-423
Divide-By-12	None	'92	A				●		TTL	7-72
Dual Decade	None	'390	●				●		TTL	7-489
	Set-To-9	'490	●				●		TTL	7-520
Dual 4-Bit Binary	None	'393	●				●		TTL	7-489

8-BIT BINARY COUNTERS WITH REGISTERS

DESCRIPTION	TYPE OF OUTPUT	TYPE	TECHNOLOGY			BOOK†	PAGE NO.
			ALS	AS	LS		
Parallel Register	3-State	'590			●	SUP	101
Outputs	OC	'591			●	SUP	101
Parallel Register Inputs	2-State	'592			●	SUP	105
Parallel I/O	3-State	'593			●	SUP	105

FREQUENCY DIVIDERS, RATE MULTIPLIERS

DESCRIPTION	TYPE	TECHNOLOGY				BOOK†	PAGE NO.
		STD TTL	ALS	AS	LS		
50-to-1 Frequency Divider	'56				●	CF	
60-to-1 Frequency Divider	'57				●	CF	
6-Bit Binary Rate Multiplier,	'97	●				TTL	7-102
Decade Rate Multiplier,	'167	●				TTL	7-222

†The books are identified as follows:
ADV = The ALS/AS Data Book
BMC = The Bipolar Microcomputer Components Data Book for Design Engineers, third edition
SUP = 1981 Supplement to the TTL Data Book for Design Engineers, second edition
TTL = The TTL Data Book for Design Engineers, second edition
CF = Data sheet is not presently available in a book. Contact the factory.
● Denotes available technology.
▲ Denotes planned new products.

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

DECODERS, ENCODERS, AND DATA SELECTORS/MULTIPLEXERS

DATA SELECTORS/MULTIPLEXERS

DESCRIPTION	TYPE OF OUTPUT	TYPE	TECHNOLOGY						BOOK†	PAGE NO.
			STD TTL	ALS	AS	L	LS	S		
16-to-1	2-State	'150	●						TTL	7-157
					▲				CF	
		'850			▲				ADV	
Dual 8-to-1	3-State	'351	●						TTL	7-451
8-to-1	2-State	'151	A				●	●	TTL	7-157
				▲	▲				ADV	
	2-State	'152	A				●		TTL	7-157
	3-State	'251	●				●	●	TTL	7-362
				▲	▲				ADV	
	3-State	'354					●		SUP	53
	2-State	'355					●		SUP	53
	3-State	'356					●		SUP	53
	2-State	'357					●		SUP	53
Dual 4-to-1	2-State	'153	●			●	●	●	TTL	7-165
				▲	▲				ADV	
	3-State	'253					●	●	TTL	7-369
				▲	▲				ADV	
	2-State	'352					●		TTL	7-454
				▲	▲				ADV	
	3-State	'353					●		TTL	7-457
				▲	▲				ADV	
Octal 2-To-1 with Storage	3-State	'604					●		SUP	124
	OC	'605					●		SUP	124
	3-State	'606					●		SUP	124
	OC	'607					●		SUP	124
Quad 2-To-1 with Storage	2-State	'98				●			TTL	7-107
	2-State	'298	●				●		TTL	7-432
	2-State	'398					●		TTL	7-499
	2-State	'399					●		TTL	7-499
Quad 2-to-1	2-State	'157	●			●	●	●	TTL	7-181
				▲	▲				ADV	
	2-State	'158					●	●	TTL	7-181
				▲	▲				ADV	
	3-State	'257					A	●	TTL	7-372
				▲	▲				ADV	
	3-State	'258					A	●	TTL	7-372
				▲	▲				ADV	
6-to-1 Universal Multiplexer	3-State	'857		●	▲				ADV	

DECODERS/DEMULTIPLEXERS

DESCRIPTION	TYPE OF OUTPUT	TYPE	TECHNOLOGY						BOOK†	PAGE NO.
			STD TTL	ALS	AS	L	LS	S		
4-To-16	2-State	'154	●			●			TTL	7-171
	OC	'159	●						TTL	7-188
4-To-10 BCD-to-Decimal	2-State	'42	A			●	●		TTL	7-15
4-To-10 Excess-3-To-Decimal	2-State	'43	A			●			TTL	7-15
4-To-10 Excess-3-Gray-To-Decimal	2-State	'44	A			●			TTL	7-15
3-To-8 with Address Latches		'131		▲					ADV	
	2-State	'137		▲					ADV	
							●		SUP	19
3-To-8	2-State	'138		▲					ADV	
							●	●	TTL	7-134
	3-State	'538		▲					ADV	
Dual 2-To-4	2-State	'139		▲					ADV	
							●	●	TTL	7-134
	2-State	'155	●				●		TTL	7-175
	OC	'156	●				●		TTL	7-175
Dual 1-To-4 Decoders	3-State	'539		▲					ADV	

CODE CONVERTERS

DESCRIPTION	TYPE	TECHNOLOGY		BOOK†	PAGE NO.
		STD TTL	S		
6-Line-BCD To 6-Line Binary, Or 4-Line To 4-Line BCD 9's/BCD 10's Converters	'184	●		TTL	7-290
6-Bit-Binary To 6-Bit-BCD Converters	'185	A		TTL	7-290
BCD-To-Binary Converters	'484		●	BMC	2-71
Binary-To-BCD Converters	'485		●	BMC	2-71

PRIORITY ENCODERS/REGISTERS

DESCRIPTION	TYPE	TECHNOLOGY				BOOK†	PAGE NO.
		STD TTL	ALS	AS	LS		
Full BCD	'147	●			●	TTL	7-151
Cascadable Octal	'148	●			●	TTL	7-151
Cascadable Octal With 3-State Outputs	'348				●	TTL	7-448
4-Bit Cascadable With Registers	'278	●				TTL	7-403

†The books are identified as follows:
- ADV = The ALS/AS Data Book
- BMC = The Bipolar Microcomputer Components Data Book for Design Engineers, third edition
- SUP = 1981 Supplement to the TTL Data Book for Design Engineers, second edition
- TTL = The TTL Data Book for Design Engineers, second edition
- CF = Data sheet is not presently available in a book. Contact the factory.

● Denotes available technology.

▲ Denotes planned new products.

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

DISPLAY DECODERS/DRIVERS, MEMORY/MICROPROCESSOR CONTROLLERS, AND VOLTAGE-CONTROLLED OSCILLATORS

OPEN-COLLECTOR DISPLAY DECODERS/DRIVERS

DESCRIPTION	OFF-STATE OUTPUT VOLTAGE	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
			STD TTL	ALS	AS	L	LS		
BCD-To-Decimal	30 V	'45	●					TTL	7-20
	60 V	'141	●					TTL	7-138
	15 V	'145	●				●	TTL	7-148
	7 V	'445					●	SUP	87
BCD-To-Seven-Segment	30 V	'46	A			●		TTL	7-22
	15 V	'47	A			●	●	TTL	7-22
	5.5 V	'48	●				●	TTL	7-22
	5.5 V	'49	●				●	TTL	7-22
	30 V	'246	●					TTL	7-351
	15 V	'247	●				●	TTL	7-351
	7 V	'347					●	SUP	51
	7 V	'447					●	SUP	93
	5.5 V	'248	●				●	TTL	7-351
	5.5 V	'249	●				●	TTL	7-351

OPEN COLLECTOR DISPOAY DECODERS/DRIVERS WITH COUNTERS/LATCHES

DESCRIPTION	TYPE	TECHNOLOGY			BOOK†	PAGE NO.
		STD TTL	ALS	AS		
BCD Counter/4-Bit Latch/BCD-To-Decimal Decoder/Driver	'142	●			TTL	7-143
BCD Counter/4-Bit Latch/BCD-To-Seven-Segment Decoder/Led Driver	'143	●			TTL	7-143
BCD Counter/4-Bit Latch/BCD-To-Seven-Segment Decoder/Lamp Driver	'144	●			TTL	7-143

VOLTAGE-CONTROLLED OSCILLATORS

DESCRIPTION						TYPE	TECHNOLOGY		BOOK†	PAGE NO.
No. VCO'S	COMP'L Z_{OUT}	ENABLE	RANGE INPUT	R_{ext}	f_{max} MHz		LS	S		
Single	Yes	Yes	Yes	No	20	'624	●		SUP	145
Single	Yes	Yes	Yes	Yes	20	'628	●		SUP	145
Dual	No	Yes	Yes	No	60	'124		●	TTL	7-123
Dual	Yes	No	No	No	20	'625	●		SUP	145
Dual	Yes	Yes	No	No	20	'626	●		SUP	145
Dual	No	No	No	No	20	'627	●		SUP	145
Dual	No	Yes	Yes	No	20	'629	●		SUP	145

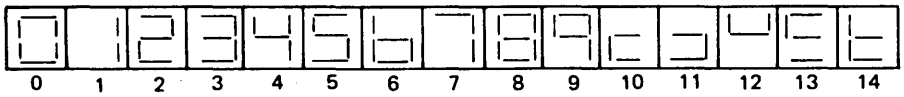
MEMORY/MICROPROCESSOR CONTROLLERS

DESCRIPTION			TYPE	TECHNOLOGY				BOOK†	PAGE NO.
				ALS	AS	LS	S		
System Controllers For 8080A			'428				●	TTL	7-514
			'438				●	TTL	7-514
System Controller, Universal			'482				●		7
System Controllers, Universal			'890		▲			ADV	
(or For '888, '889)			'891		▲			ADV	
Memory Refresh Controllers	Transparent, Burst Modes	4K, 16K	'600			A		SUP	119
		64K	'601			A		SUP	119
	Cycle Steal, Burst Modes	4K, 16K	'602			A		SUP	119
		64K	'603			A		SUP	119
Memory Cycle Controller			'608			●		SUP	128
Memory Mappers		3-State‡	'612			●		SUP	133
		OC‡	'613			●		SUP	133
Memory Mappers With Output Latches		3-State‡	'610			●		SUP	133
		OC‡	'611			●		SUP	133
Multi-Mode Latches (8080A Applications)			'412				●	TTL	7-502
Clock Elements (8080A Applications)			'424			●		CF	

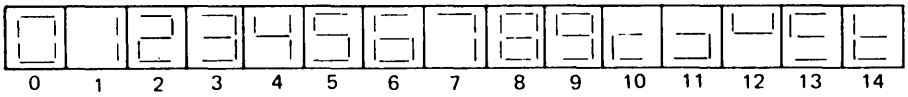
CLOCK GENERATOR CIRCUITS

DESCRIPTION	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
		STD TTL	ALS	AS	LS	S		
Quadruple Complementary-Output Logic Elements	'265	●					TTL	5-57
Dual Pulse Synchronizers/Drivers	'120	●					TTL	7-118
Crystal-Controlled Oscillators	'320				●		SUP	44
	'321				●		SUP	44
Digital Phase-Lock Loop	'297				●		SUP	38
Programmable Frequency Dividers/Digital Timers	'292				●		SUP	31
	'294				●		SUP	31
Triple 4-Input AND/NAND Drivers	'800			▲			ADV	
Triple 4-Input OR/NOR Drivers	'802			▲			ADV	
Dual VCO	'124					●		
Clock Element for 8080A Systems	'424				●		CF	

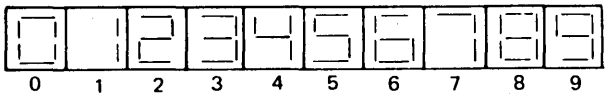
RESULTANT DISPLAYS USING '46A, '47A, '48, '49, 'L46, 'L47, 'LS47, 'LS48, 'LS49, 'LS347



RESULTANT DISPLAYS USING '246, '247, '248, '249, 'LS247, 'LS248, 'LS249, 'LS447



RESULTANT DISPLAYS USING '143, '144



† The books are identified as follows:
- ADV = The ALS/AS Data Book
- BMC = The Bipolar Microcomputer Components Data Book for Design Engineers, third edition
- SUP = 1981 Supplement to the TTL Data Book for Design Engineers, second edition
- TTL = The TTL Data Book for Design Engineers, second edition
- CF = Data sheet is not presently available in a book. Contact the factory.

● Denotes available technology.

▲ Denotes planned new products.

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

ARITHMETIC CIRCUITS, ERROR DETECTION CIRCUITS, AND PROCESSOR ELEMENTS

PARALLEL BINARY ADDERS

DESCRIPTION	TYPE	TECHNOLOGY						BOOK†	PAGE NO.
		STD TTL	ALS	AS	H	LS	S		
1-Bit Gated	'80	●						TTL	7-41
2-Bit	'82	●						TTL	7-49
4-Bit	'83	A				A		TTL	7-53
	'283	●				●	●	TTL	7-415
Dual 1-Bit Carry-Save	'183				●	●		TTL	7-287

ACCUMULATORS, ARITHMETIC LOGIC UNITS, LOOK-AHEAD CARRY GENERATORS

DESCRIPTION		TYPE	TECHNOLOGY					BOOK†	PAGE NO.
			STD TTL	ALS	AS	LS	S		
4-Bit Parallel Binary Accumulators		'281					●	TTL	7-410
		'681				●		SUP	197
4-Bit Arithmetic Logic Units/ Function Generators		'181	●			●	●	TTL	7-271
					A			ADV	
		'381				A		CF	
							●	TTL	7-484
		'881			A			ADV	
4-Bit Arithmetic Logic Unit with Ripple Carry		'382				●		SUP	60
Look-Ahead Carry Generators	16-Bit	'182	●				●	TTL	7-282
	32-Bit	'882			●			ADV	
Quad Serial Adder/Subtractor		'385				●		SUP	69
4-Bit-Slice Elements		'481				●	●	BMC	3-3
8-Bit-Slice Elements		'888			▲			ADV	
		'889			▲			ADV	

MULTIPLIERS

DESCRIPTION	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
		STD TTL	ALS	AS	LS	S		
2-Bit-By-4-Bit Parallel Binary Multipliers	'261				●		TTL	7-380
4-Bit-By-4-Bit Parallel Binary Multipliers	'274					●	TTL	7-391
	'284	●					TTL	7-420
	'285	●					TTL	7-420
7-Bit-Slice Wallace Trees	'275				●	●	TTL	7-391
25-MHz 6-Bit-Binary Rate Multipliers	'97	●					TTL	7-102
25-MHz Decade Rate Multipliers	'167	●					TTL	7-222
8-Bit X 1-Bit 2's Complement Multipliers	'384				●		SUP	65
16-Bit Parallel Multiplier	'1616		▲				ADV	

OTHER ARITHMETIC OPERATORS

DESCRIPTION	TYPE	TECHNOLOGY							BOOK†	PAGE NO.
		STD TTL	ALS	AS	H	L	LS	S		
Quad 2-Input Exclusive-OR Gates With Totem-Pole Outputs	'86	●				●	●	●	TTL	7-65
			▲						ADV	
	'386						●		TTL	7-487
Quad 2-Input Exclusive-OR Gates With Open-Collector Outputs	'136	●					●		TTL	7-131
Quad 2-Input Exclusive-NOR Gates	'266						●		TTL	7-386
Quad Exclusive OR/NOR Gates	'135							●	TTL	7-129
4-Bit True/Complement, Element	'87				●				TTL	7-70

4-BIT COMPARATORS

DESCRIPTION					TYPE	TECHNOLOGY						BOOK†	PAGE NO.
P=Q	P>Q	P<Q	OUTPUT	OUTPUT ENABLE		STD TTL	ALS	AS	L	LS	S		
Yes	Yes	No	2-State	Yes	'85	●			●	●	●	TTL	7-57

8-BIT COMPARATORS

DESCRIPTION							TYPE	TECHNOLOGY			BOOK†	PAGE NO.
INPUTS	P=Q	P=Q	P>Q	P<Q	OUTPUT	OUTPUT ENABLE		ALS	AS	LS		
20-kΩ Pull-Up	Yes	No	No	No	OC	Yes	'518	●			ADV	
	No	Yes	No	No	2-State	Yes	'520	●			ADV	
	No	Yes	No	No	OC	Yes	'522	●			ADV	
	Yes	No	Yes	No	2-State	No	'682			●	SUP	203
	Yes	No	Yes	No	OC	No	'683			●	SUP	203
Standard	Yes	No	No	No	OC	Yes	'519	●			ADV	
	No	Yes	No	No	2-State	Yes	'521	●			ADV	
	Yes	No	Yes	No	2-State	No	'684			●	SUP	203
	Yes	No	Yes	No	OC	No	'685			●	SUP	203
	Yes	No	Yes	No	2-State	Yes	'686			●	SUP	203
	Yes	No	Yes	No	OC	Yes	'687			●	SUP	203
	No	Yes	No	No	2-State	Yes	'688	●			ADV	
										●	SUP	203
	No	Yes	No		OC	Yes	'689	●			ADV	
										●	SUP	203
Latched P	No	No	Yes	Yes	2-State	Yes	'885		●		ADV	
Latched P and Q	Yes	No	Yes	Yes	Latched	Yes	'866		●		ADV	

ADDRESS COMPARATORS

DESCRIPTION	OUTPUT ENABLE	LATCHED OUTPUT	TYPE	TECHNOLOGY		BOOK†	PAGE No.
				ALS	AS		
16-Bit to 4-Bit	Yes		'677	▲		ADV	
		Yes	'678	▲		ADV	
12-Bit to 4-Bit	Yes		'679	▲		ADV	
		Yes	'680	▲		ADV	

PARITY GENERATORS/CHECKERS, ERROR DETECTION AND CORRECTION CIRCUITS

DESCRIPTION		NO. OF BITS	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
				STD TTL	ALS	AS	LS	S		
Odd/Even Parity Generators/Checkers		8	'180	●					TTL	7-269
		9	'280				●	●	TTL	7-406
						▲			ADV	
Parallel Error Detection/Correction Circuits	3-State	8	'636				●		CF	
	OC	8	'637				●		CF	
	3-State	16	'630				●		SUP	151
	OC	16	'631				●		SUP	151
	3-State	32	'632		▲				ADV	
	OC	32	'633		▲				ADV	
	3-State	32	'634		▲				ADV	
	OC	32	'635		▲				ADV	

BIPOLAR BIT-SLICE PROCESSOR ELEMENTS

DESCRIPTION	CASCADABLE TO N-BITS	TYPE	TECHNOLOGY				BOOK†	PAGE NO.
			ALS	AS	LS	S		
4-Bit-Slice	Yes	'481			●	●	BMC	3-3
8-Bit-Slice	Yes	'888		▲			ADV	
	Yes	'889		▲			ADV	

†The books are identified as follows:
- ADV = The ALS/AS Data Book
- BMC = The Bipolar Microcomputer Components Data Book for Design Engineers, third edition
- SUP = 1981 Supplement to the TTL Data Book for Design Engineers, second edition
- TTL = The TTL Data Book for Design Engineers, second edition
- CF = Data sheet is not presently available in a book. Contact the factory.

● Denotes available technology.

▲ Denotes planned new products.

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

MEMORIES

USER-PROGRAMMABLE READ-ONLY MEMORIES (PROM'S)

STANDARD PROM'S

DESCRIPTION	TYPE	ORGANIZATION	TYPE OUTPUT	BOOK†	PAGE NO.
16K-Bit Arrays	▲ TBP28S165A	2048W × 8B	3-State	CF	
	▲ TBP28S165A-35	2048W × 8B	3-State	CF	
	TBP28S166	2048W × 8B	3-State	BMC	2-13
	TBP28SA166	2048W × 8B	OC	BMC	2-13
	▲ TBP28S166-55	2048W × 8B	3-State	BMC	2-13
	▲ TBP28S166A	2048W × 8B	3-State	CF	
	▲ TBP28S166A-35	2048W × 8B	3-State	CF	
8K-Bit Arrays	TBP24S81	2048W × 4B	3-State	BMC	2-13
	‡ TBP24S81-55	2048W × 4B	3-State	BMC	2-13
	TBP24SA81	2048W × 4B	OC	BMC	2-13
	‡ TBP24SA81-55	2048W × 4B	OC	BMC	2-13
	TBP28S86	1024W × 8B	3-State	BMC	2-13
	‡ TBP28S86-60	1024W × 8B	3-State	BMC	2-13
	TBP28S86A	1024W × 8B	3-State	CF	
	‡ TBP28S86A-50	1024W × 8B	3-State	CF	
	TBP28SA86	1024W × 8B	OC	BMC	2-13
	‡ TBP28SA86-60	1024W × 8B	OC	BMC	2-13
	TBP28SA86A	1024W × 8B	OC	CF	
	‡ TBP28SA86A-50	1024W × 8B	OC	CF	
	TBP28S2708	1024W × 8B	3-State	BMC	2-13
	TBP28S2708A	1024W × 8B	3-State	CF	
	TBP28S85	1024W × 8B	3-State	BMC	2-13
4K-Bit Arrays	TBP28S42	512W × 8B	3-State	BMC	2-13
	TBP28SA42	512W × 8B	OC	BMC	2-13
	▲ TBP28S45	512W × 8B	3-State	BMC	2-13
	TBP28SA45	512W × 8B	OC	CF	
	TBP28S46	512W × 8B	3-State	BMC	2-13
	TBP28SA46	512W × 8B	OC	BMC	2-13
	TBP24S41	1024W × 4B	3-State	BMC	2-13
	TBP24SA41	1024W × 4B	OC	BMC	2-13
	TBP18S46	512W × 8B	3-State	BMC	2-7
	TBP18SA46	512W × 8B	OC	BMC	2-7
	TBP18S42	512W × 8B	3-State	BMC	2-7
	TBP18SA42	512W × 8B	OC	BMC	2-7
2K-Bit Arrays	TBP18S22	256W × 8B	3-State	BMC	2-7
	TBP18SA22	256W × 8B	OC	BMC	2-7
1K-Bit Arrays	TBP14S10	256W × 4B	3-State	BMC	2-7
	TBP14SA10	256W × 4B	OC	BMC	2-7
	TBP24S10	256W × 4B	3-State	BMC	2-13
	TBP24SA10	256W × 4B	OC	BMC	2-13
256-Bit Arrays	TBP18S030	32W × 8B	3-State	BMC	2-7
	TBP18SA030	32W × 8B	OC	BMC	2-7

LOW-POWER PROM'S

DESCRIPTION	TYPE	ORGANIZATION	TYPE OUTPUT	BOOK†	PAGE NO.
16K-Bit Arrays	▲ TBP28L166A	2048W × 8B	3-State	CF	
8K-Bit Arrays	▲ TBP28L85A	1024W × 8B	3-State	CF	
	TBP28L86	1024W × 8B	3-State	BMC	2-13
	▲ TBP28L86A	1024W × 8B	3-State	CF	
4K-Bit Arrays	TBP28L42	512W × 8B	3-State	BMC	2-13
	TBP28LA42	512W × 8B	OC	CF	
	▲ TBP28L45	512W × 8B	3-State	BMC	2-13
	TBP28L46	512W × 8B	3-State	BMC	2-13
	TBP28LA46	512W × 8B	OC	CF	
2K-Bit Arrays	TBP28L22	256W × 8B	3-State	BMC	2-13
	TBP28LA22	256W × 8B	OC	BMC	2-13

REGISTERED PROM'S

DESCRIPTION	TYPE	ORGANIZATION	TYPE OUTPUT	BOOK†	PAGE NO.
16K-Bit Arrays	▲ TBP28R166A	2048W × 8B	3-State	BMC	2-13
	▲ TBP28R165A	2048W × 8B	3-State	BMC	2-13
8K-Bit Arrays	▲ TBP28R86A	1024W × 8B	3-State	CF	
	▲ TBP28R85A	1024W × 8B	3-State	CF	
4K-Bit Arrays	▲ TBP28R46	512W × 8B	3-State	CF	
	▲ TBP28R45	512W × 8B	3-State	BMC	2-13

READ-ONLY MEMORIES (ROM'S)

DESCRIPTION	ORGANIZATION	TYPE OF OUTPUT	TYPE	TECHNOLOGY				BOOK†	PAGE NO.
				STD TTL	ALS	AS	S		
2048-Bit Arrays	512 × 4	OC	'270				●	TTL	5-58
	256 × 8	OC	'271				●	TTL	5-58
	512 × 4	3-State	'370				●	TTL	5-67
	256 × 8	3-State	'371				●	TTL	5-67
1024-Bit Arrays	256 × 4	OC	'187	●				TTL	5-49
256-Bit Arrays	32 × 8	OC	'88	A				TTL	5-27

RANDOM-ACCESS READ-WRITE MEMORIES (RAM'S)

DESCRIPTION	ORGANIZATION	TYPE OF OUTPUT	TYPE	TECHNOLOGY					BOOK†	PAGE NO.
				STD TTL	ALS	AS	LS	S		
256-Bit Arrays	256 × 1	3-State	'201					●	BMC	2-53
		OC	'301					●	BMC	2-53
	64 × 4	3-State	'217		●				ADD	
		OC	'317		●				ADV	
	32 × 8	3-State	'218		●				ADV	
		OC	'318		●				ADV	
64-Bit Arrays	16 × 4	OC	'89	●					BMC	2-41
		3-State	'189				A		BMC	2-45
								A	BMC	2-49
		3-State	'219				A		BMC	2-45
		OC	'289				A		BMC	2-45
								A	BMC	2-49
		OC	'319				A		BMC	2-45
16-Bit Arrays	16 × 1	OC	'81	A					BMC	2-35
			'84	A					BMC	2-35
16-Bit Multiple-Port Register File	8 × 2	3-State	'172	●					TTL	7-245
16-Bit Register File	4 × 4	OC	'170	●			●		TTL	7-237
		3-State	'670				●		TTL	7-526
Dual 64-Bit Register Files	16 × 4, 16 × 4	3-State	'870			▲			ADV	
			'871			▲			ADV	

FIRST-IN FIRST-OUT MEMORIES (FIFO'S)

DESCRIPTION		TYPE OF OUTPUT	TYPE	TECHNOLOGY				BOOK†	PAGE NO.
				ALS	AS	LS	S		
Asynchronous 16 × 5		3-State	'225				•	BMC	2-61
Asynchronous 16 × 4	Grated Input, Output Ready	3-State	'222			•		BMC	2-53
		3-State	'224			•		BMC	2-53
	Single Input, Output Ready	OC	'227			•		BMC	2-53
		OC	'228			•		BMC	2-53

†The books are identified as follows:
- ADV = The ALS/AS Data Book
- BMC = The Bipolar Microcomputer Components Data Book for Design Engineers, third edition
- SUP = 1981 Supplement to the TTL Data Book for Design Engineers, second edition
- TTL = The TTL Data Book for Design Engineers, second edition
- CF = Data sheet is not presently available in a book. Contact the factory.

‡Suffix indicates maximum address access time (ns).

●Denotes available technology.

▲Denotes planned new products.

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

00

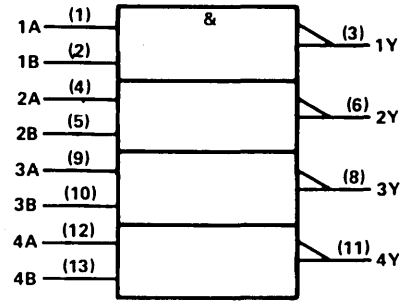
QUADRUPLE 2-INPUT POSITIVE-NAND GATES

typical performance

TYPE	POWER	DELAY
'00	10 mW	10 ns
'ALS00A	1.25 mW	3.5 ns
'H00	22 mW	6 ns
'L00	1 mW	33 ns
'LS00	2 mW	9.5 ns
'S00	19 mW	3 ns

SN5400 (J,FH) SN7400 (J,N)
SN54ALS00A (J) SN74ALS00A (N,FN)
SN54H00 (J,FH) SN74H00 (J,N)
SN54L00 (J)
SN54LS00 (J,FH) SN74LS00 (J, N, FN)
SN54S00 (J,FH) SN74S00 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{AB}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

01

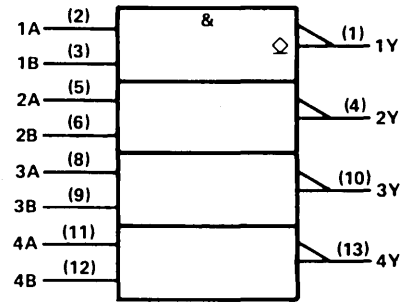
QUADRUPLE 2-INPUT POSITIVE-NAND GATES WITH OPEN-COLLECTOR OUTPUTS

typical performance

TYPE	POWER	DELAY
'01	10 mW	22 ns
'ALS01	1.28 mW	16 ns
'H01	22 mW	8 ns
'LS01	2 mW	16 ns

SN5401 (J,FH) SN7401 (J,N)
SN54ALS01 (J,FH) SN74ALS01 (N,FN)
SN54H01 (J) SN74H01 (J,N)
SN54LS01 (J,FH) SN74LS01 (J,N,FN)

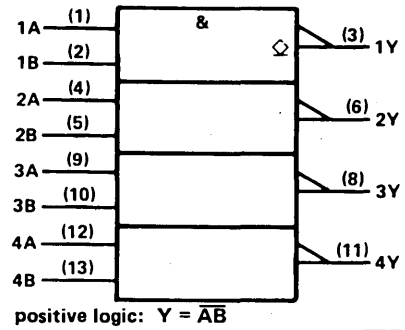
logic symbol, '01, 'ALS01, 'LS01†



pin assignments, '01, 'ALS01, 'LS01

J, N PACKAGES				FH, FN PACKAGES			
1	1Y	8	3A	1	nc	11	nc
2	1A	9	3B	2	1Y	12	3A
3	1B	10	3Y	3	1A	13	3B
4	2Y	11	4A	4	1B	14	3Y
5	2A	12	4B	5	nc	15	nc
6	2B	13	4Y	6	2Y	16	4A
7	GND	14	V_{CC}	7	nc	17	nc
				8	2A	18	4B
				9	2B	19	4Y
				10	GND	20	V_{CC}

logic symbol, 'H01†



positive logic: $Y = \overline{AB}$

pin assignments, 'H01

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

02

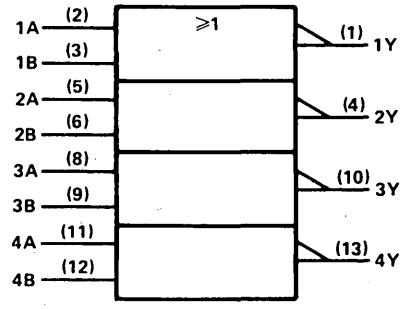
QUADRUPLE 2-INPUT POSITIVE-NOR GATES

typical performance

TYPE	POWER	DELAY
'02	14 mW	10 ns
'ALS02	1.89 mW	5.5 ns
'L02	1.5 mW	33 ns
'LS02	2.75 mW	10 ns
'S02	29 mW	3.5 ns

SN5402 (J,FH) SN7402 (J,N)
SN54ALS02 (J,FH) SN74ALS02 (N,FN)
SN54L02 (J)
SN54LS02 (J,FH) SN74LS02 (J,N,FN)
SN54S02 (J,FH) SN74S02 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{A + B}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1Y	8	3A	1	nc	11	nc
2	1A	9	3B	2	1Y	12	3A
3	1B	10	3Y	3	1A	13	3B
4	2Y	11	4A	4	1B	14	3Y
5	2A	12	4B	5	nc	15	nc
6	2B	13	4Y	6	2Y	16	4A
7	GND	14	V_{CC}	7	nc	17	nc
				8	2A	18	4B
				9	2B	19	4Y
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection

© IC MASTER 1983

03

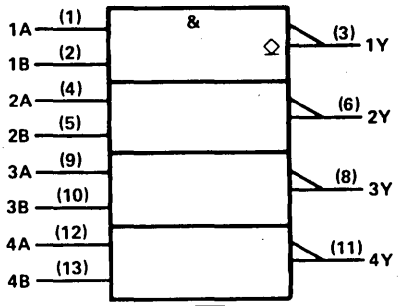
QUADRUPLE 2-INPUT POSITIVE-NAND GATES WITH OPEN-COLLECTOR OUTPUTS

typical performance

TYPE	POWER	DELAY
'03	10 mW	22 ns
'ALS03A	1.28 mW	16 ns
'L03	1 mW	46 ns
'LS03	2 mW	16 ns
'S03	17.5 mW	16 ns

SN5403 (J,FH) SN7403 (J,N)
SN54ALS03A (J,FH) SN74ALS03A (N,FN)
SN54L03 (J)
SN54LS03 (J,FH) SN74LS03 (J,N,FN)
SN54S03 (J,FH) SN74S03 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{AB}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

04

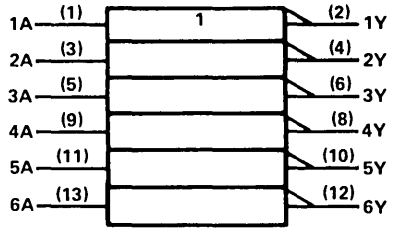
HEX INVERTERS

typical performance

TYPE	POWER	DELAY
'04	10 mW	10 ns
'ALS04	1.27 mW	3.5 ns
'H04	22 mW	6 ns
'L04	1 mW	33 ns
'LS04	2 mW	9.5 ns
'S04	19 mW	3 ns

SN5404 (J,FH) SN7404 (J,N)
SN54ALS04 (J,FH) SN74ALS04 (N,FN)
SN54H04 (J) SN74H04 (J,N)
SN54L04 (J)
SN54LS04 (J,FH) SN74LS04 (J,N,FN)
SN54S04 (J,FH) SN74S04 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{A}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	4Y	1	nc	11	nc
2	1Y	9	4A	2	1A	12	4Y
3	2A	10	5Y	3	1Y	13	4A
4	2Y	11	5A	4	2A	14	5Y
5	3A	12	6Y	5	nc	15	nc
6	3Y	13	6A	6	2Y	16	5A
7	GND	14	V_{CC}	7	nc	17	nc
				8	3A	18	6Y
				9	3Y	19	6A
				10	GND	20	V_{CC}

05

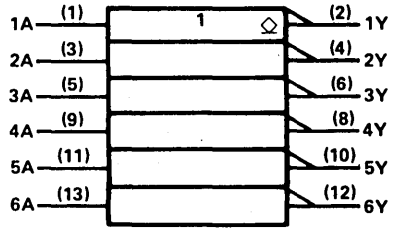
HEX INVERTERS WITH OPEN-COLLECTOR OUTPUTS

typical performance

TYPE	POWER	DELAY
'05	10 mW	24 ns
'ALS05	1.27 mW	13.5 ns
'H05	22 mW	8 ns
'LS05	2 mW	16 ns
'S05	17.5 mW	5 ns

SN5405 (J,FH) SN7405 (J,N)
SN54ALS05 (J,FH) SN74ALS05 (N,FN)
SN54H05 (J) SN74H05 (J,N)
SN54LS05 (J,FH) SN74LS05 (J,N,FN)
SN54S05 (J,FH) SN74S05 (J.N,FN)

logic symbol†



positive logic: $Y = \overline{A}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	4Y	1	nc	11	nc
2	1Y	9	4A	2	1A	12	4Y
3	2A	10	5Y	3	1Y	13	4A
4	2Y	11	5A	4	2A	14	5Y
5	3A	12	6Y	5	nc	15	nc
6	3Y	13	6A	6	2Y	16	5A
7	GND	14	V_{CC}	7	nc	17	nc
				8	3A	18	6Y
				9	3Y	19	6A
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

06

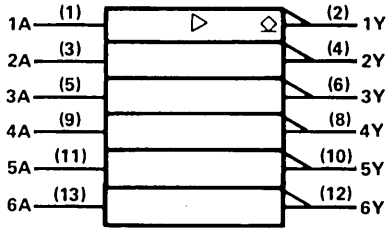
HEX INVERTER BUFFER/DRIVERS WITH OPEN-COLLECTOR HIGH-VOLTAGE OUTPUTS

typical performance

TYPE	HIGH-LEVEL OUTPUT VOLTAGE	LOW-LEVEL OUTPUT CURRENT	TYPICAL DELAY TIME	TYPICAL POWER PER GATE
SN54'	30 V	30 mA	12.5 ns	26 mW
SN74'	30 V	40 mA	12.5 ns	26 mW

SN5406 (J,FH) SN7406 (J,N)

logic symbol†



positive logic: $Y = \overline{A}$

pin assignments

J, N PACKAGES				FH PACKAGE			
1	1A	8	4Y	1	nc	11	nc
2	1Y	9	4A	2	1A	12	4Y
3	2A	10	5Y	3	1Y	13	4A
4	2Y	11	5A	4	2A	14	5Y
5	3A	12	6Y	5	nc	15	nc
6	3Y	13	6A	6	2Y	16	5A
7	GND	14	V_{CC}	7	nc	17	nc
				8	3A	18	6Y
				9	3Y	19	6A
				10	GND	20	V_{CC}

07

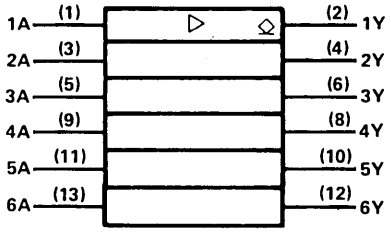
HEX BUFFERS/DRIVERS WITH OPEN-COLLECTOR HIGH-VOLTAGE OUTPUTS

typical performance

TYPE	HIGH-LEVEL OUTPUT VOLTAGE	LOW-LEVEL OUTPUT CURRENT	TYPICAL DELAY TIME	TYPICAL POWER PER GATE
SN54'	30 V	30 mA	13 ns	21 mW
SN74'	30 V	40 mA	13 ns	21 mW

SN5407 (J,FH) SN7407 (J,N)

logic symbol†



positive logic: $Y = A$

pin assignments

J, N PACKAGES				FH PACKAGE			
1	1A	8	4Y	1	nc	11	nc
2	1Y	9	4A	2	1A	12	4Y
3	2A	10	5Y	3	1Y	13	4A
4	2Y	11	5A	4	2A	14	5Y
5	3A	12	6Y	5	nc	15	nc
6	3Y	13	6A	6	2Y	16	5A
7	GND	14	V_{CC}	7	nc	17	nc
				8	3A	18	6Y
				9	3Y	19	6A
				10	GND	20	V_{CC}

08

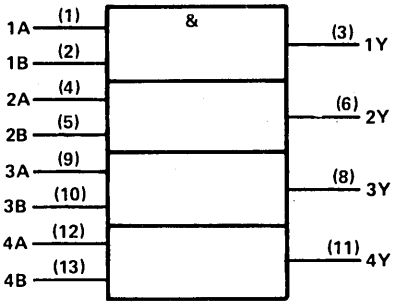
QUADRUPLE 2-INPUT POSITIVE-AND GATES

typical performance

TYPE	POWER	DELAY
'08	19 mW	15 ns
'ALS08	2.19 mW	6.5 ns
'LS08	4.25 mW	12 ns
'S08	32 mW	4.75 ns

SN5408 (J,FH) SN7408 (J,N)
SN54ALS08 (J,FH) SN74ALS08 (N,FN)
SN54LS08 (J,FH) SN74LS08 (J,N,FN)
SN54S08 (J,FH) SN74S08 (J,N,FN)

logic symbol†



positive logic: $Y = AB$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

09

QUADRUPLE 2-INPUT POSITIVE-AND GATES WITH OPEN-COLLECTOR OUTPUTS

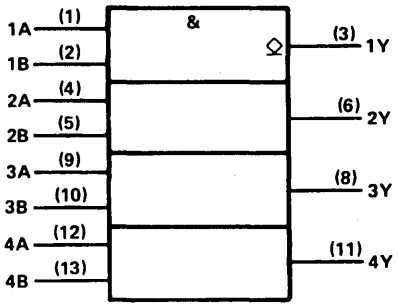
SN5409 (J,FH)
SN54ALS09 (J,FH)
SN54LS09 (J,FH)
SN54S09 (J,FH)

SN7409 (J,N)
SN74ALS09 (N,FN)
SN74LS09 (J,N,FN)
SN74S09 (J,N,FN)

typical performance

TYPE	POWER	DELAY
'09	19.4 mW	18.5 ns
'ALS09	2.22 mW	15 ns
'LS09	4.25 mW	20 ns
'S09	32 mW	6.5 ns

logic symbol†



positive logic: $Y = AB$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

10

TRIPLE 3-INPUT POSITIVE-NAND GATES

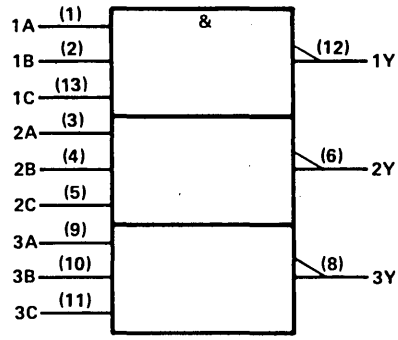
SN5410 (J,FH)
SN54ALS10 (J,FH)
SN54H10 (J)
SN54L10 (J)
SN54LS10 (J,FH)
SN54S10 (J,FH)

SN7410 (J,N)
SN74ALS10 (N,FN)
SN74H10 (J,N)
SN74LS10 (J,N,FN)
SN74S10 (J,N,FN)

typical performance

TYPE	POWER	DELAY
'10	10 mW	10 ns
'ALS10	1.27 mW	7 ns
'H10	22 mW	6 ns
'L10	1 mW	33 ns
'LS10	2 mW	9.5 ns
'S10	19 mW	3 ns

logic symbol†



positive logic: $Y = \overline{ABC}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	2A	10	3B	3	1B	13	3A
4	2B	11	3C	4	2A	14	3B
5	2C	12	1Y	5	nc	15	nc
6	2Y	13	1C	6	2B	16	3C
7	GND	14	V_{CC}	7	nc	17	nc
				8	2C	18	1Y
				9	2Y	19	1C
				10	GND	20	V_{CC}

11

TRIPLE 3-INPUT POSITIVE-AND GATES

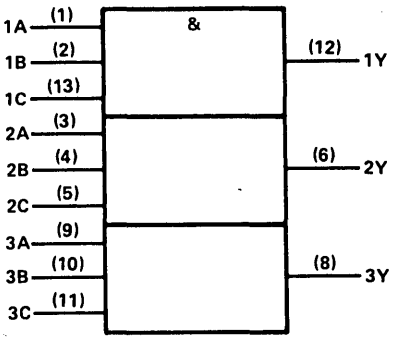
SN54ALS11 (J,FH)
SN54H11 (J)
SN54LS11 (J,FH)
SN54S11 (J,FH)

SN74ALS11 (N,FN)
SN74H11 (J,N)
SN74LS11 (J,N,FN)
SN74S11 (J,N,FN)

typical performance

TYPE	POWER	DELAY
'ALS11	2.17 mW	9 ns
'H11	40 mW	8.2 ns
'LS11	4.25 mW	12 ns
'S11	31 mW	4.75 ns

logic symbol†



positive logic: $Y = ABC$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	2A	10	3B	3	1B	13	3A
4	2B	11	3C	4	2A	14	3B
5	2C	12	1Y	5	nc	15	nc
6	2Y	13	1C	6	2B	16	3C
7	GND	14	V_{CC}	7	nc	17	nc
				8	2C	18	1Y
				9	2Y	19	1C
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

12

TRIPLE 3-INPUT POSITIVE-NAND GATES WITH OPEN-COLLECTOR OUTPUTS

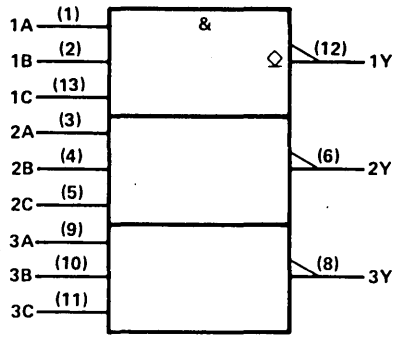
SN5412 (J,FH)
SN54ALS12 (J,FH)
SN54LS12 (J,FH)

SN7412 (J,N)
SN74ALS12 (N,FN)
SN74LS12 (J,N,FN)

typical performance

TYPE	POWER	DELAY
'12	10 mW	22 ns
'ALS12	1.27 mW	17.5 ns
'LS12	2 mW	16 ns

logic symbol†



positive logic: $Y = \overline{ABC}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	2A	10	3B	3	1B	13	3A
4	2B	11	3C	4	2A	14	3B
5	2C	12	1Y	5	nc	15	nc
6	2Y	13	1C	6	2B	16	3C
7	GND	14	V_{CC}	7	nc	17	nc
				8	2C	18	1Y
				9	2Y	19	1C
				10	GND	20	V_{CC}

13

DUAL 4-INPUT POSITIVE-NAND SCHMITT TRIGGERS

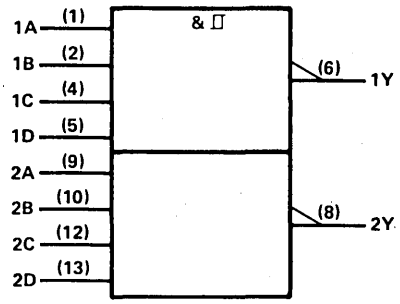
SN5413 (J,FH)
SN54LS13 (J,FH)

SN7413 (J,N)
SN74LS13 (J,N,FN)

typical performance

TYPE	HYSTERESIS	DELAY
'13	0.8 V	16.5 ns
'LS13	0.8 V	16.5 ns

logic symbol†



positive logic: $Y = \overline{ABCD}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	2Y	1	nc	11	nc
2	1B	9	2A	2	1A	12	2Y
3	nc	10	2B	3	1B	13	2A
4	1C	11	nc	4	nc	14	2B
5	1D	12	2C	5	nc	15	nc
6	1Y	13	2D	6	1C	16	nc
7	GND	14	V_{CC}	7	nc	17	nc
				8	1D	18	2C
				9	1Y	19	2D
				10	GND	20	V_{CC}

14

HEX SCHMITT-TRIGGER INVERTERS

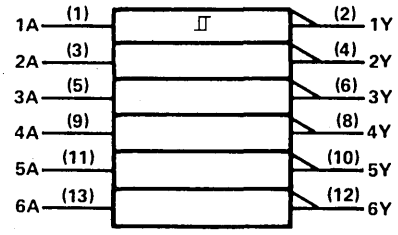
SN5414 (J,FH)
SN54LS14 (J,FH)

SN7414 (J,N)
SN74LS14 (J,N,FN)

typical performance

TYPE	HYSTERESIS	DELAY
'14	0.8 V	15 ns
'LS14	0.8 V	15 ns

logic symbol†



positive logic: $Y = \overline{A}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	4Y	1	nc	11	nc
2	1Y	9	4A	2	1A	12	4Y
3	2A	10	5Y	3	1Y	13	4A
4	2Y	11	5A	4	2A	14	5Y
5	3A	12	6Y	5	nc	15	nc
6	3Y	13	6A	6	2Y	16	5A
7	GND	14	V_{CC}	7	nc	17	nc
				8	3A	18	6Y
				9	3Y	19	6A
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

15

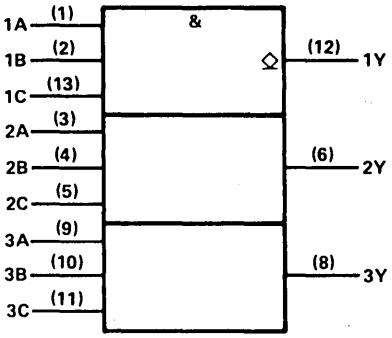
TRIPLE 3-INPUT POSITIVE-AND GATES WITH OPEN-COLLECTOR OUTPUTS

typical performance

TYPE	POWER	DELAY
'ALS15	2.22 mW	15 ns
'H15	38 mW	10.5 ns
'LS15	4.25 mW	15 ns
'S15	28 mW	15 ns

SN54ALS15 (J,FH) SN74ALS15 (N,FN)
SN54H15 (J) SN74H15 (J,N)
SN54LS15 (J,FH) SN74LS15 (J,N,FN)
SN54S15 (J,FH) SN74S15 (J,N,FN)

logic symbol†



positive logic: Y = ABC

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	2A	10	3B	3	1B	13	3A
4	2B	11	3C	4	2A	14	3B
5	2C	12	1Y	5	nc	15	nc
6	2Y	13	1C	6	2B	16	3C
7	GND	14	V_{CC}	7	nc	17	nc
				8	2C	18	1Y
				9	2Y	19	1C
				10	GND	20	V_{CC}

16

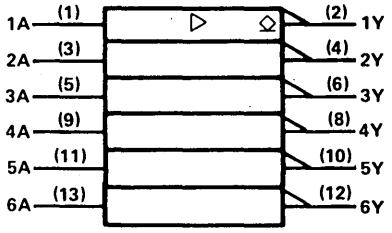
HEX INVERTER BUFFER/DRIVERS WITH OPEN-COLLECTOR HIGH-VOLTAGE OUTPUTS

typical performance

TYPE	HIGH-LEVEL OUTPUT VOLTAGE	LOW-LEVEL OUTPUT CURRENT	TYPICAL DELAY TIME	TYPICAL POWER PER GATE
SN74'	15 V	40 mA	12.5 ns	26 mW
SN54'	15 V	30 mA	12.5 ns	26 mW

SN5416 (J) SN7416 (J,N)

logic symbol†



positive logic: $Y = \overline{A}$

pin assignments

J, N PACKAGES			
1	1A	8	4Y
2	1Y	9	4A
3	2A	10	5Y
4	2Y	11	5A
5	3A	12	6Y
6	3Y	13	6A
7	GND	14	V_{CC}

17

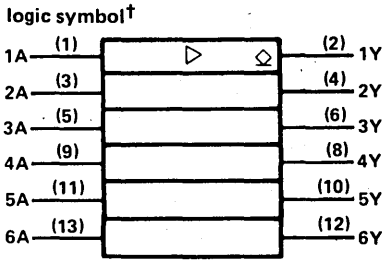
HEX BUFFERS/DRIVERS WITH OPEN-COLLECTOR HIGH-VOLTAGE OUTPUTS

typical performance

TYPE	HIGH-LEVEL OUTPUT VOLTAGE	LOW-LEVEL OUTPUT CURRENT	TYPICAL DELAY TIME	TYPICAL POWER PER GATE
SN74'	15 V	40 mA	13 ns	21 mW
SN54'	15 V	30 mA	13 ns	21 mW

SN5417 (J) SN7417 (J,N)

logic symbol†



positive logic: Y = A

pin assignments

J, N PACKAGES			
1	1A	8	4Y
2	1Y	9	4A
3	2A	10	5Y
4	2Y	11	5A
5	3A	12	6Y
6	3Y	13	6A
7	GND	14	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

18

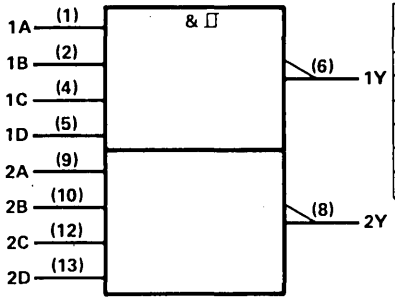
SCHMITT-TRIGGER POSITIVE-NAND GATES WITH TOTEM-POLE OUTPUTS

SN54LS18 (J,FH) SN74LS18 (J,N,FN)

typical performance

TYPE	HYSTERESIS	DELAY
'LS18	0.7 V	25 ns

logic symbol†



positive logic: $Y = \overline{ABCD}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	2Y	1	nc	11	nc
2	1B	9	2A	2	1A	12	2Y
3	nc	10	2B	3	1B	13	2A
4	1C	11	nc	4	nc	14	2B
5	1D	12	2C	5	nc	15	nc
6	1Y	13	2D	6	1C	16	nc
7	GND	14	V_{CC}	7	nc	17	nc
				8	1D	18	2C
				9	1Y	19	2D
				10	GND	20	V_{CC}

19

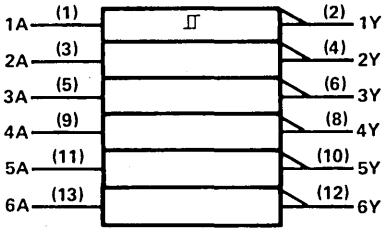
SCHMITT-TRIGGER INVERTERS WITH TOTEM-POLE OUTPUTS

SN54LS19 (J,FH) SN74LS19 (J,N,FN)

typical performance

TYPE	HYSTERESIS	DELAY
'LS19	0.7 V	16 ns

logic symbol†



positive logic: $Y = \overline{A}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	4Y	1	nc	11	nc
2	1Y	9	4A	2	1A	12	4Y
3	2A	10	5Y	3	1Y	13	4A
4	2Y	11	5A	4	2A	14	5Y
5	3A	12	6Y	5	nc	15	nc
6	3Y	13	6A	6	2Y	16	5A
7	GND	14	V_{CC}	7	nc	17	nc
				8	3A	18	6Y
				9	3Y	19	6A
				10	GND	20	V_{CC}

20

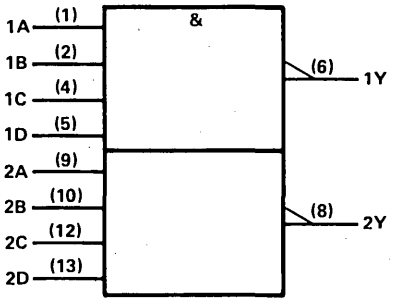
DUAL 4-INPUT POSITIVE-NAND GATES

typical performance

TYPE	POWER	DELAY
'20	10 mW	10 ns
ALS20A	1.29 mW	4 ns
'H20	22 mW	6 ns
'L20	1 mW	33 ns
'LS20	2 mW	9.5 ns
'S20	19 mW	3 ns

SN5420 (J,FH) SN7420 (J,N)
SN54ALS20A (J,FH) SN74ALS20A (N,FN)
SN54H20 (J) SN74H20 (J,N)
SN54L20 (J)
SN54LS20 (J,FH) SN74LS20 (J,N,FN)
SN54S20 (J,FH) SN74S20 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{ABCD}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	2Y	1	nc	11	nc
2	1B	9	2A	2	1A	12	2Y
3	nc	10	2B	3	1B	13	2A
4	1C	11	nc	4	nc	14	2B
5	1D	12	2C	5	nc	15	nc
6	1Y	13	2D	6	1C	16	nc
7	GND	14	V_{CC}	7	nc	17	nc
				8	1D	18	2C
				9	1Y	19	2D
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

21

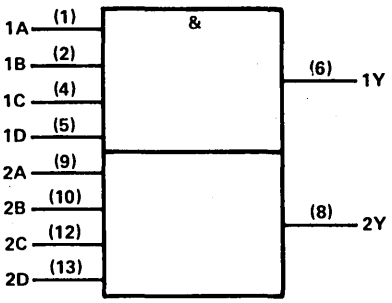
DUAL 4-INPUT POSITIVE-AND GATES

typical performance

TYPE	POWER	DELAY
'ALS21	2.21 mW	8.5 ns
'H21	40 mW	8.2 ns
'LS21	4.25 mW	12 ns

SN54ALS21 (J,FH) SN74ALS21 (N,FN)
SN54H21 (J) SN74H21 (J,N)
SN54LS21 (J,FH) SN74LS21 (J,N,FN)

logic symbol†



positive logic: $Y = ABCD$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	2Y	1	nc	11	nc
2	1B	9	2A	2	1A	12	2Y
3	nc	10	2B	3	1B	13	2A
4	1C	11	nc	4	nc	14	2B
5	1D	12	2C	5	nc	15	nc
6	1Y	13	2D	6	1C	16	nc
7	GND	14	V_{CC}	7	nc	17	nc
				8	1D	18	2C
				9	1Y	19	2D
				10	GND	20	V_{CC}

22

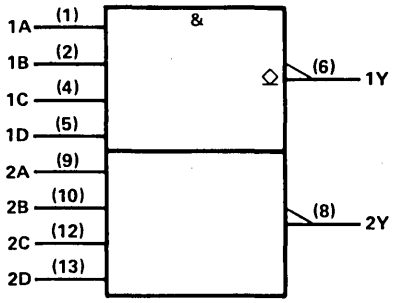
DUAL 4-INPUT POSITIVE-NAND GATES WITH OPEN-COLLECTOR OUTPUTS

typical performance

TYPE	POWER	DELAY
'22	10 mW	22 ns
'ALS22A	1.28 mW	16.5 ns
'H22	22 mW	8 ns
'LS22	2 mW	16 ns
'S22	17.5 mW	5 ns

SN5422 (J,FH) SN7422 (J,N)
SN54ALS22A (J,FH) SN74ALS22A (N,FN)
SN54H22 (J) SN74H22 (J,N)
SN54LS22 (J,FH) SN74LS22 (J,N,FN)
SN54S22 (J,FH) SN74S22 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{ABCD}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	2Y	1	nc	11	nc
2	1B	9	2A	2	1A	12	2Y
3	nc	10	2B	3	1B	13	2A
4	1C	11	nc	4	nc	14	2B
5	1D	12	2C	5	nc	15	nc
6	1Y	13	2D	6	1C	16	nc
7	GND	14	V_{CC}	7	nc	17	nc
				8	1D	18	2C
				9	1Y	19	2D
				10	GND	20	V_{CC}

23

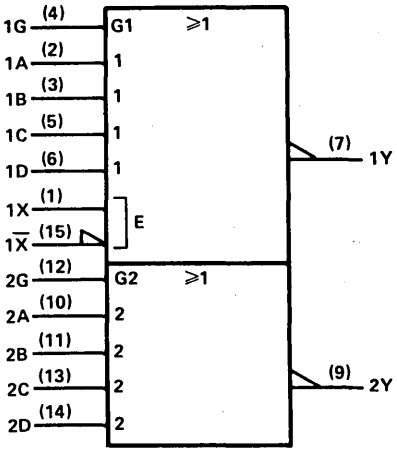
EXPANDABLE DUAL 4-INPUT POSITIVE-NOR GATES WITH STROBE

typical performance

TYPE	POWER	DELAY
'23	23 mW	10.5 ns

SN5423 (J,FH) SN7423 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	1X	9	2Y	1	nc	11	nc
2	1A	10	2A	2	1X	12	2Y
3	1B	11	2B	3	1A	13	2A
4	1G	12	2G	4	1B	14	2B
5	1C	13	2C	5	1G	15	2G
6	1D	14	2D	6	nc	16	nc
7	1Y	15	$1\overline{X}$	7	1C	17	2C
8	GND	16	V_{CC}	8	1D	18	2D
				9	1Y	19	$1\overline{X}$
				10	GND	20	V_{CC}

positive logic:

$1Y = \overline{1G\,(1A+1B+1C+1D)+X}$

$2Y = \overline{2G\,(2A+2B+2C+2D)}$

X = output of SN5460/SN7460

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

24

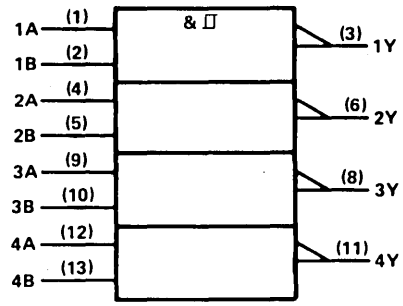
SCHMITT-TRIGGER POSITIVE-NAND GATES/INVERTERS WITH TOTEM POLE OUTPUTS

typical performance

TYPE	HYSTERESIS	DELAY
'LS24	0.7 V	19 ns

SN54LS24 (J,FH) SN74LS24 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{AB}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

25

DUAL 4-INPUT POSITIVE-NOR GATES WITH STROBE

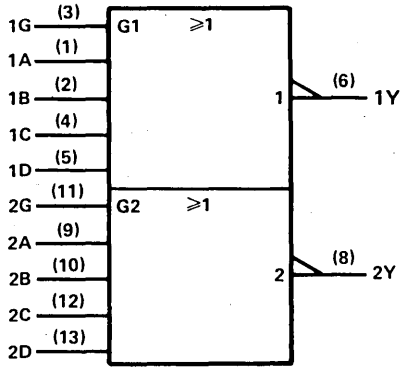
typical performance

TYPE	POWER	DELAY
'25	23 mW	10.5 ns

SN7425 (J,N)

SN5425 (J,FH) SN7425 (J,N)

logic symbol†



positive logic: $Y = \overline{G(A+B+C+D)}$

pin assignments

J, N PACKAGES				FH PACKAGE			
1	1A	8	2Y	1	nc	11	nc
2	1B	9	2A	2	1A	12	2Y
3	1G	10	2B	3	1B	13	2A
4	1C	11	2G	4	1G	14	2B
5	1D	12	2C	5	nc	15	nc
6	1Y	13	2D	6	1C	16	2G
7	GND	14	V_{CC}	7	nc	17	nc
				8	1D	18	2C
				9	1Y	19	2D
				10	GND	20	V_{CC}

26

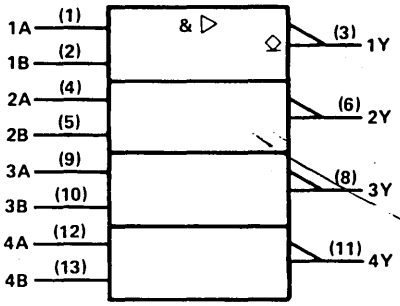
QUADRUPLE 2-INPUT HIGH-VOLTAGE INTERFACE POSITIVE-NAND GATES

typical performance

TYPE	HIGH-LEVEL OUTPUT VOLTAGE	LOW-LEVEL OUTPUT CURRENT	POWER	DELAY
'26	15 V	16 mA	10 mW	13.5 ns
'LS26	15 V	4 mA	2 mW	16 ns

SN5426 (J,FH) SN7426 (J,N)
SN54LS26 (J,FH) SN74LS26 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{AB}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

27

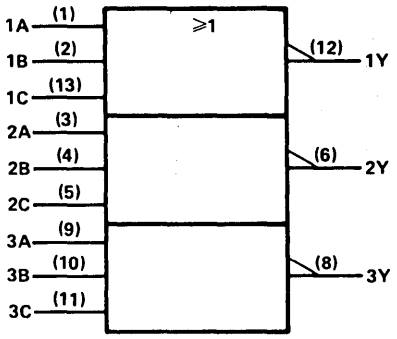
TRIPLE 3-INPUT POSITIVE-NOR GATES

typical performance

TYPE	POWER	DELAY
'27	22 mW	8.5 ns
'ALS27	2.48 mW	6 ns
'LS27	4.5 mW	10 ns

SN5427 (J,FH) SN7427 (J,N)
SN54ALS27 (J,FH) SN74ALS27 (N,FN)
SN54LS27 (J,FH) SN74LS27 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{A+B+C}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	2A	10	3B	3	1B	13	3A
4	2B	11	3C	4	2A	14	3B
5	2C	12	1Y	5	nc	15	nc
6	2Y	13	1C	6	2B	16	3C
7	GND	14	V_{CC}	7	nc	17	nc
				8	2C	18	1Y
				9	2Y	19	1C
				10	GND	20	V_{CC}

28

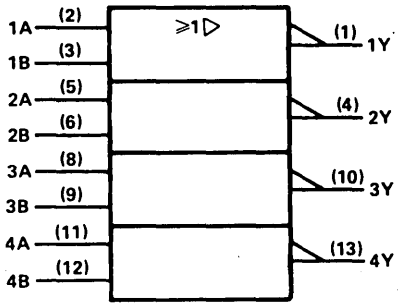
QUADRUPLE 2-INPUT POSITIVE-NOR BUFFERS

performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT	POWER (TYP)	DELAY (TYP)
'28	48 mA	−2.4 mA	28 mW	7 ns
SN54ALS'	12 mA	−1 mA	4.06 mW	4 ns
SN74ALS'	24 mA	−2.6 mA	4.06 mW	4 ns
SN54LS'	12 mA	−1.2 mA	5.5 mW	12 ns
SN74LS'	24 mA	−1.2 mA	5.5 mW	12 ns

SN5428 (J,FH) SN7428 (J,N)
SN54ALS28 (J,FH) SN74ALS28 (N,FN)
SN54LS28 (J,FH) SN74LS28 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{A+B}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1Y	8	3A	1	nc	11	nc
2	1A	9	3B	2	1Y	12	3A
3	1B	10	3Y	3	1A	13	3B
4	2Y	11	4A	4	1B	14	3Y
5	2A	12	4B	5	nc	15	nc
6	2B	13	4Y	6	2Y	16	4A
7	GND	14	V_{CC}	7	nc	17	nc
				8	2A	18	4B
				9	2B	19	4Y
				10	GND	20	V_{CC}

30

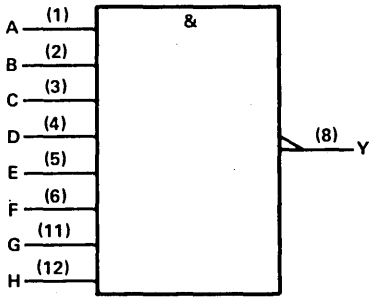
8-INPUT POSITIVE-NAND GATE

typical performance

TYPE	POWER	DELAY
'30	10 mW	10 ns
'ALS30	1.9 mW	7 ns
'H30	22 mW	6 ns
'L30	1 mW	33 ns
'LS30	2.4 mW	17 ns
'S30	19 mW	3 ns

SN5430 (J,FH) SN7430 (J,N)
SN54ALS30 (J,FH) SN74ALS30 (N, FN)
SN54H30 (J) SN74H30 (J,N)
SN54L30 (J)
SN54LS30 (J,FH) SN74LS30 (J,N,FN)
SN54S30 (J,FH) SN74S30 (J,N,FN)

logic symbol†



positive logic:
$Y = \overline{ABCDEFGH}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A	8	Y	1	nc	11	nc
2	B	9	nc	2	A	12	Y
3	C	10	nc	3	B	13	nc
4	D	11	G	4	C	14	nc
5	E	12	H	5	nc	15	nc
6	F	13	nc	6	D	16	G
7	GND	14	V_{CC}	7	nc	17	nc
				8	E	18	H
				9	F	19	nc
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

31

DELAY ELEMENTS
(delay elements for generating delay lines)

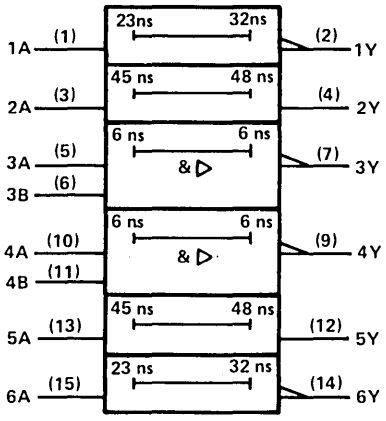
- Buffers 3 and 4 offer 3-fold increase in I_{OL} (12 mA/24 mA)
- Total power dissipation 38 mW

typical performance

DELAY ELEMENT	LOGIC	DELAY
Gates 1 and 6	Inverting	27.5 ns
Gates 2 and 5	Noninverting	46.5 ns
Buffers 3 and 4	2-Input NAND	6 ns

SN54LS31 (J,FH) SN74LS31 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	9	4Y	1	nc	11	nc
2	1Y	10	4A	2	1A	12	4Y
3	2A	11	4B	3	1Y	13	4A
4	2Y	12	5Y	4	2A	14	4B
5	3A	13	5A	5	2Y	15	5Y
6	3B	14	6Y	6	nc	16	nc
7	3Y	15	6A	7	3A	17	5A
8	GND	16	V_{CC}	8	3B	18	6Y
				9	3Y	19	6A
				10	GND	20	V_{CC}

32

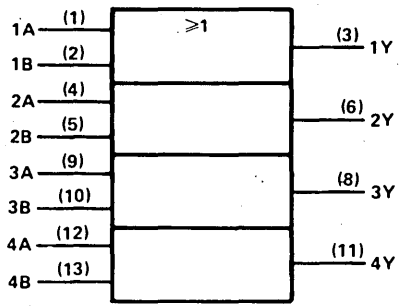
QUADRUPLE 2-INPUT POSITIVE-OR GATE

typical performance

TYPE	POWER	DELAY
'32	24 mW	12 ns
'ALS32	2.81 mW	5.5 ns
'LS32	5 mW	12 ns
'S32	35 mW	4 ns

SN5432 (J,FH) SN7432 (J,N)
SN54ALS32 (J,FH) SN74ALS32 (N,FN)
SN54LS32 (J,FH) SN74LS32 (J,N,FN)
SN54S32 (J,FH) SN74S32 (J,N,FN)

logic symbol†



positive logic: Y = A+B

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

33

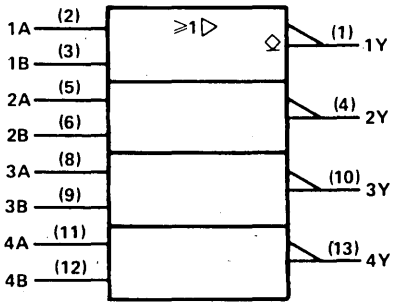
QUADRUPLE 2-INPUT POSITIVE-NOR BUFFERS WITH OPEN-COLLECTOR OUTPUTS

performance

TYPE	HIGH-LEVEL OUTPUT VOLTAGE	LOW-LEVEL OUTPUT CURRENT	POWER (TYP)	DELAY (TYP)
'33	5.5 V	48 mA	28 mW	11 ns
SN54ALS'	5.5 V	12 mA	4.06 mW	14.5 ns
SN74ALS'	5.5 V	24 mA	4.06 mW	14.5 ns
SN54LS'	5.5 V	12 mA	5.45 mW	19 ns
SN74LS'	5.5 V	24 mA	5.45 mW	19 ns

SN5433 (J,FH) SN7433 (J,N)
SN54ALS33 (J,FH) SN74ALS33 (N,FN)
SN54LS33 (J,FH) SN74LS33 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{A+B}$

pin assignments

J, N PACKAGES			
1	1Y	8	3A
2	1A	9	3B
3	1B	10	3Y
4	2Y	11	4A
5	2A	12	4B
6	2B	13	4Y
7	GND	14	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1Y	12	3A
3	1A	13	3B
4	1B	14	3Y
5	nc	15	nc
6	2Y	16	4A
7	nc	17	nc
8	2A	18	4B
9	2B	19	4Y
10	GND	20	V_{CC}

nc — no internal connection.
†Pin numbers shown on logic symbols are for J and N packages only.

© IC MASTER 1983

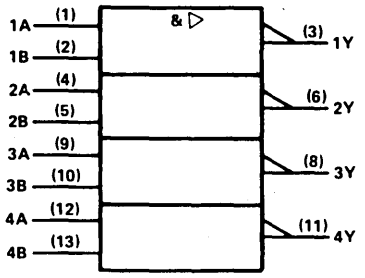
37

QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS
performance

TYPE	HIGH-LEVEL OUTPUT CURRENT	LOW-LEVEL OUTPUT CURRENT	POWER (TYP)	DELAY (TYP)
37	4.8 mA	−1.2 mA	27 mW	10.5 ns
SN54ALS'	12 mA	−1 mA	3.04 mW	4 ns
SN74ALS'	24 mA	−2.6 mA	3.04 mW	4 ns
SN54LS'	12 mA	−1.2 mA	4.3 mW	12 ns
SN74LS'	24 mA	−1.2 mA	4.3 mW	12 ns
'S37	60 mA	−3 mA	41 mW	4 ns

SN5437 (J,FH) SN7437 (J,N)
SN54ALS37 (J,FH) SN74ALS37 (N,FN)
SN54LS37 (J,FH) SN74LS37 (J,N,FN)
SN54S37 (J,FH) SN74S37 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{AB}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

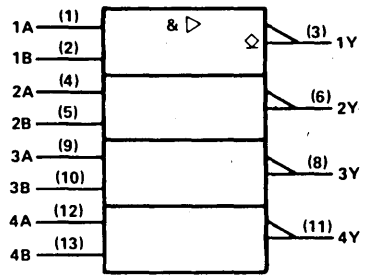
38

QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS WITH OPEN-COLLECTOR OUTPUTS
performance

TYPE	HIGH-LEVEL OUTPUT VOLTAGE	LOW-LEVEL OUTPUT CURRENT	POWER (TYP)	DELAY (TYP)
'38	5.5 V	48 mA	24.4 mW	12.5 ns
SN54ALS'	5.5 V	12 mA	3.04 mW	14.5 ns
SN74ALS'	5.5 V	24 mA	3.04 mW	14.5 ns
SN54ALS'	5.5 V	12 mA	4.3 mW	19 ns
SN74ALS'	5.5 V	24 mA	4.3 mW	19 ns
'S38	5.5 V	60 mA	41 mW	6.5 ns

SN5438 (J,FH) SN7438 (J,N)
SN54ALS38 (J,FH) SN74ALS38 (N,FN)
SN54LS38 (J,FH) SN74LS38 (J,N,FN)
SN54S38 (J,FH) SN74S38 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{AB}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

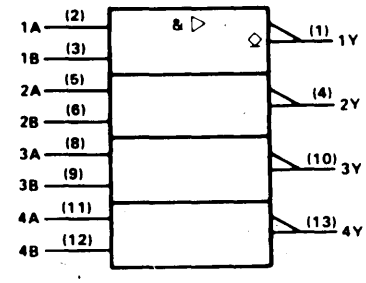
39

QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS WITH OPEN-COLLECTOR OUTPUTS
performance

TYPE	HIGH-LEVEL OUTPUT VOLTAGE	LOW-LEVEL OUTPUT CURRENT	POWER (TYP)	DELAY (TYP)
SN5439	5.5 V	60 mA	24.4 mW	12.5 ns
SN7439	5.5 V	80 mA	24.4 mW	12.5 ns

SN5439 (J,FH) SN7439 (J,N)

logic symbol†



positive logic: $Y = \overline{AB}$

pin assignments

J, N PACKAGES				FH PACKAGE			
1	1Y	8	3A	1	nc	11	nc
2	1A	9	3B	2	1Y	12	3A
3	1B	10	3Y	3	1A	13	3B
4	2Y	11	4A	4	1B	14	3Y
5	2A	12	4B	5	nc	15	nc
6	2B	13	4Y	6	2Y	16	4A
7	GND	14	V_{CC}	7	nc	17	nc
				8	2A	18	4B
				9	2B	19	4Y
				10	GND	20	V_{CC}

nc — no internal connection.
†Pin numbers shown on logic symbols are for J and N packages only.

© IC MASTER 1983

40

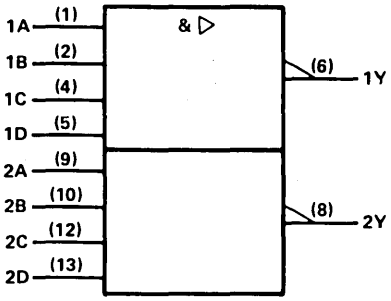
DUAL 4-INPUT POSITIVENAND BUFFERS

performance

TYPE	HIGH-LEVEL OUTPUT VOLTAGE	LOW-LEVEL OUTPUT CURRENT	POWER (TYP)	DELAY (TYP)
'40	48 mA	−1.2 mA	26 mW	10.5 ns
SN54ALS'	12 mA	−1 mA	3.04 mW	4 ns
SN74ALS'	24 mA	−2.6 mA	3.04 mW	4 ns
'H40	60 mA	−1.5 mA	44 mW	7.5 ns
SN54LS'	12 mA	−1.2 mA	4.3 mW	12 ns
SN74LS'	24 mA	−1.2 mA	4.3 mW	12 ns
'S40	60 mA	−3 mA	44 mW	4 ns

SN5440 (J,FH) SN7440 (J,N)
SN54ALS40 (J,FH) SN74ALS40 (N,FN)
SN54H40 (J) SN74H40 (J,N)
SN54LS40 (J,FH) SN74LS40 (J,N,FN)
SN54S40 (J,FH) SN74S40 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{ABCD}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	2Y	1	nc	11	nc
2	1B	9	2A	2	1A	12	2Y
3	nc	10	2B	3	1B	13	2A
4	1C	11	nc	4	nc	14	2B
5	1D	12	2C	5	nc	15	nc
6	1Y	13	2D	6	1C	16	nc
7	GND	14	V_{CC}	7	nc	17	nc
				8	1D	18	2C
				9	1Y	19	2D
				10	GND	20	V_{CC}

42

4-LINE TO 10-LINE DECODERS

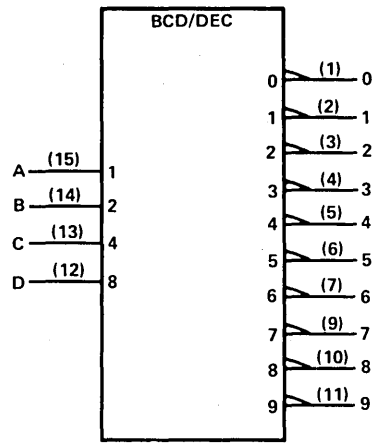
(BCD to decimal)

typical performance

TYPE	SELECT TIME	POWER
'42A	17 ns	140 mW
'L42	34 ns	70 mW
'LS42	17 ns	35 mW

SN5442A (J,FH) SN7442A (J,N)
SN54L42 (J)
SN54LS42 (J,FH) SN74LS42 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	0	9	7	1	nc	11	nc
2	1	10	8	2	0	12	7
3	2	11	9	3	1	13	8
4	3	12	D	4	2	14	9
5	4	13	C	5	3	15	D
6	5	14	B	6	nc	16	nc
7	6	15	A	7	4	17	C
8	GND	16	V_{CC}	8	5	18	B
				9	6	19	A
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

43

4-LINE TO 10-LINE DECODERS (EXCESS 3 TO DECIMAL)

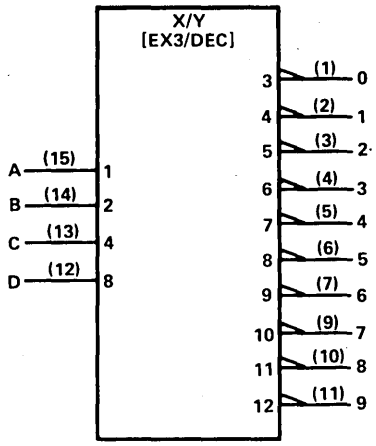
SN5443A (J,FH)
SN54L43 (J)

SN7443A (J,N)

typical performance

TYPE	SELECT TIME	POWER
'43A	17 ns	140 mW
'L43	34 ns	70 mW

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	0	9	7	1	nc	11	nc
2	1	10	8	2	0	12	7
3	2	11	9	3	1	13	8
4	3	12	D	4	2	14	9
5	4	13	C	5	3	15	D
6	5	14	B	6	nc	16	nc
7	6	15	A	7	4	17	C
8	GND	16	V_{CC}	8	5	18	B
				9	6	19	A
				10	GND	20	V_{CC}

44

4-LINE TO 10-LINE DECODERS (EXCESS 3-GRAY TO DECIMAL)

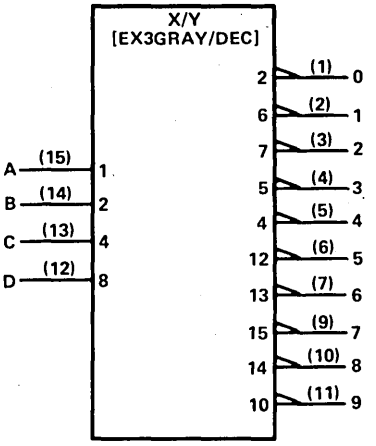
SN5444A (J,FH)
SN54L44 (J)

SN7444A (J,N)

typical performance

TYPE	SELECT TIME	POWER
'44A	17 ns	140 mW
'L44	34 ns	70 mW

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	0	9	7	1	nc	11	nc
2	1	10	8	2	0	12	7
3	2	11	9	3	1	13	8
4	3	12	D	4	2	14	9
5	4	13	C	5	3	15	D
6	5	14	B	6	nc	16	nc
7	6	15	A	7	4	17	C
8	GND	16	V_{CC}	8	5	18	B
				9	6	19	A
				10	GND	20	V_{CC}

45

BCD-TO-DECIMAL DECODER/DRIVER

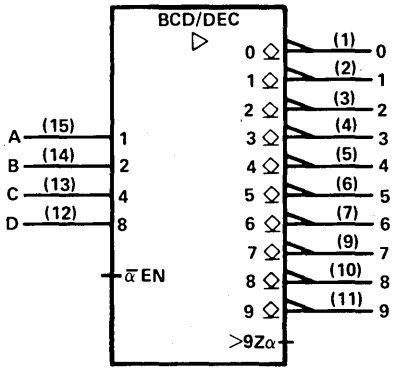
SN5445 (J,FH)

SN7445 (J,N)

typical performance

TYPE	OFF-STATE OUTPUT VOLTAGE	POWER
'45	30 V	215 mW

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	0	9	7	1	nc	11	nc
2	1	10	8	2	0	12	7
3	2	11	9	3	1	13	8
4	3	12	D	4	2	14	9
5	4	13	C	5	3	15	D
6	5	14	B	6	nc	16	nc
7	6	15	A	7	4	17	C
8	GND	16	V_{CC}	8	5	18	B
				9	6	19	A
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

46,47

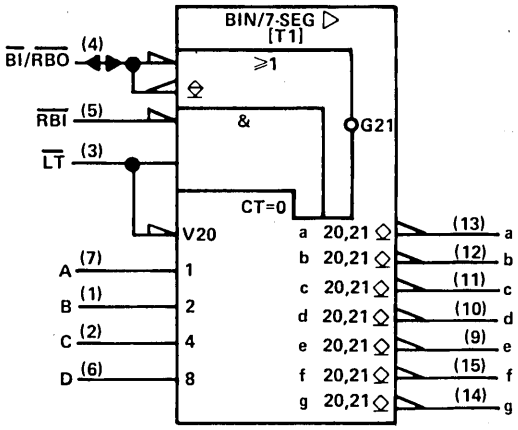
BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS
(46 - 30 V OUTPUTS
47 - 15 V OUTPUTS)

typical performance

TYPE	OFF-STATE OUTPUT VOLTAGE	POWER
'46A	30 V	320 mW
'L46	30 V	133 mW
'47A	15 V	320 mW
'L47	15 V	133 mW
'LS47	15 V	35 mW

SN5446A (J,FH) SN7446A (J,N)
SN54L46 (J)
SN5447A (J,FH) SN7447A (J,N)
SN54L47 (J)
SN54LS47 (J,FH) SN74LS47 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	9	e	1	nc	11	nc
2	C	10	d	2	B	12	e
3	$\overline{LT}$	11	c	3	C	13	d
4	$\overline{BI/RBO}$	12	b	4	$\overline{LT}$	14	c
5	$\overline{RBI}$	13	a	5	$\overline{BI/RBO}$	15	b
6	D	14	g	6	nc	16	nc
7	A	15	f	7	$\overline{RBI}$	17	a
8	GND	16	V_{CC}	8	D	18	g
				9	A	19	f
				10	GND	20	V_{CC}

48

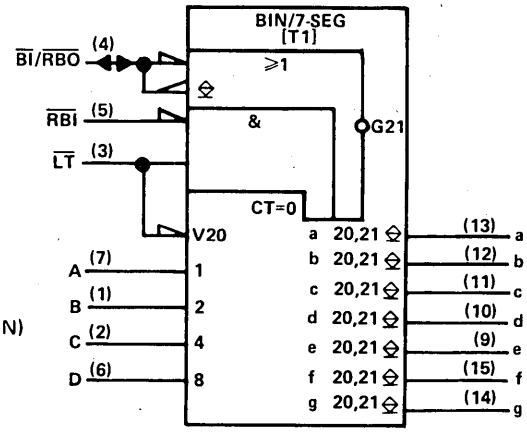
BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS

typical performance

TYPE	OFF-STATE OUTPUT VOLTAGE	POWER
'48	5.5 V	265 mW
'LS48	5.5 V	125 mW

SN5448 (J,FH) SN7448 (J,N)
SN54LS48 (J,FH) SN74LS48 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	9	e	1	nc	11	nc
2	C	10	d	2	B	12	e
3	$\overline{LT}$	11	c	3	C	13	d
4	$\overline{BI/RBO}$	12	b	4	$\overline{LT}$	14	c
5	$\overline{RBI}$	13	a	5	$\overline{BI/RBO}$	15	b
6	D	14	g	6	nc	16	nc
7	A	15	f	7	$\overline{RBI}$	17	a
8	GND	16	V_{CC}	8	D	18	g
				9	A	19	f
				10	GND	20	V_{CC}

49

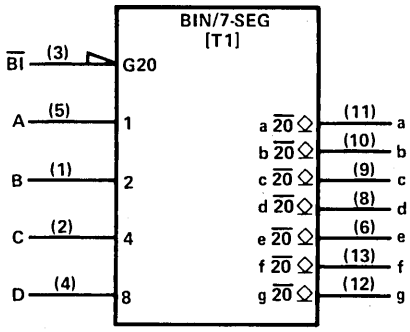
BCD TO SEVEN SEGMENT DECODERS/DRIVERS
(OPEN-COLLECTOR OUTPUTS)

typical performance

TYPE	OFF-STATE OUTPUT VOLTAGE	POWER
'49	5.5 V	165 mW
'LS49	5.5 V	40 mW

SN5449 (J,FH) SN7449 (J,N)
SN54LS49 (J,FH) SN74LS49 (J,N,FN)

logic symbol†

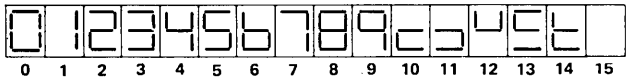


pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	8	d	1	nc	11	nc
2	C	9	c	2	B	12	d
3	$\overline{BI}$	10	b	3	C	13	c
4	D	11	a	4	$\overline{BI}$	14	b
5	A	12	g	5	nc	15	nc
6	e	13	f	6	D	16	a
7	GND	14	V_{CC}	7	nc	17	nc
				8	A	18	g
				9	e	19	f
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

FONT TABLE T1 – FOR '46, '47, '48, '49



© IC MASTER 1983

50

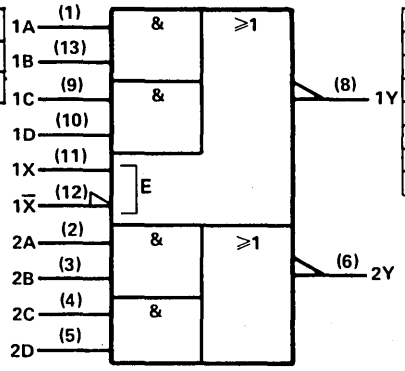
DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATES (ONE GATE EXPANDABLE)

typical performance

TYPE	POWER	DELAY
'50	14 mW	10.5 ns
'H50	29 mW	6.5 ns

SN5450 (J,FH)
SN54H50 (J)
SN7450 (J,N)
SN74H50 (J,N)

logic symbol†



positive logic: $Y = \overline{AB+CD+X}$

'50: X = output of SN5460/SN7460

'H50: X = output of SN54H60/SN74H60 or SN54H62/SN74H62

pin assignments

J, N PACKAGES				FH PACKAGE			
1	1A	8	1Y	1	nc	11	nc
2	2A	9	1C	2	1A	12	1Y
3	2B	10	1D	3	2A	13	1C
4	2C	11	1X	4	2B	14	1D
5	2D	12	1X̄	5	nc	15	nc
6	2Y	13	1B	6	2C	16	1X
7	GND	14	V_{CC}	7	nc	17	nc
				8	2D	18	1X̄
				9	2Y	19	1B
				10	GND	20	V_{CC}

51

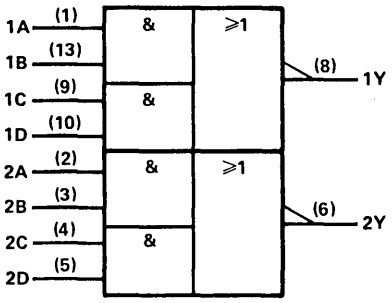
AND-OR INVERT GATES

typical performance

TYPE	POWER	DELAY
'51	14 mW	10.5 ns
'H51	29 mW	65 ns
'L51	1.5 mW	43 ns
'LS51	2.75 mW	12.5 ns
'S51	28 mW	3.5 ns

SN5451 (J,FH)
SN54H51 (J)
SN54L51 (J)
SN54LS51 (J,FH)
SN54S51 (J,FH)
SN7451 (J,N)
SN74H51 (J,N)
SN74LS51(J,N,FN)
SN74S51 (J,N,FN)

logic symbol, '51, 'H51, 'S51†

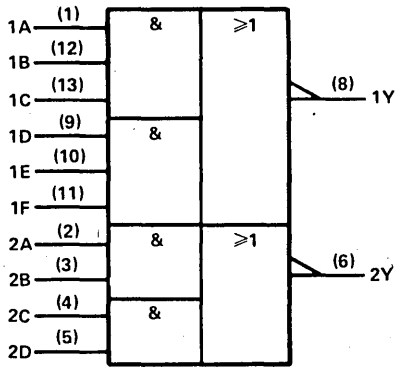


positive logic: $Y = \overline{AB+CD}$

pin assignments, '51, 'H51, 'S51

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	1Y	1	nc	11	nc
2	2A	9	1C	2	1A	12	1Y
3	2B	10	1D	3	2A	13	1C
4	2C	11	nu	4	2B	14	1D
5	2D	12	nu	5	nc	15	nc
6	2Y	13	1B	6	2C	16	nu
7	GND	14	V_{CC}	7	nc	17	nc
				8	2D	18	nu
				9	2Y	19	1B
				10	GND	20	V_{CC}

logic symbol, 'L51, 'LS51†



positive logic:

$1Y = \overline{(1A \cdot 1B \cdot 1C)+(1D \cdot 1E \cdot 1F)}$

$2Y = \overline{(2A \cdot 2B)+(2C \cdot 2D)}$

pin assignments, 'L51, 'LS51

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	1Y	1	nc	11	nc
2	2A	9	1D	2	1A	12	1Y
3	2B	10	1E	3	2A	13	1D
4	2C	11	1F	4	2B	14	1E
5	2D	12	1B	5	nc	15	nc
6	2Y	13	1C	6	2C	16	1F
7	GND	14	V_{CC}	7	nc	17	nc
				8	2D	18	1B
				9	2Y	19	1C
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

nu — make no external connection.

© IC MASTER 1983

52

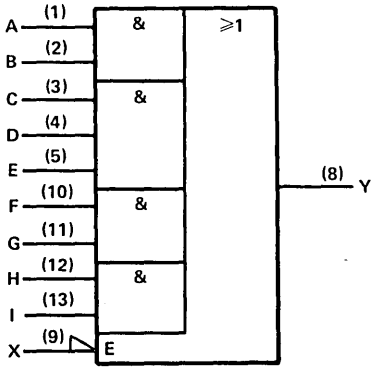
EXPANDABLE 4-WIDE AND-OR GATES

SN54H52 (J,FH) SN74H52 (J,N)

typical performance

TYPE	POWER	DELAY
'H52	88 mW	9.9 ns

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	A	8	Y	1	nc	11	nc
2	B	9	X	2	A	12	Y
3	C	10	F	3	B	13	X
4	D	11	G	4	C	14	F
5	E	12	H	5	nc	15	nc
6	nc	13	I	6	D	16	G
7	GND	14	V_{CC}	7	nc	17	nc
				8	E	18	H
				9	nc	19	I
				10	GND	20	V_{CC}

positive logic: $Y = AB+CDE+FG+HI+X$

X = output of SN54H61/SN74H61

53

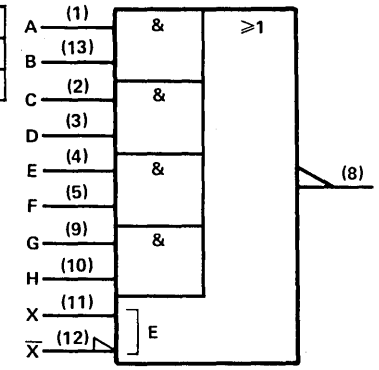
EXPANDABLE 4-WIDE AND-OR-INVERT GATES

SN5453 (J,FH) SN7453 (J,N)
SN54H53 (J) SN74H53 (J,N)

typical performance

TYPE	POWER	DELAY
'53	23 mW	10.5 ns
'H53	41 mW	6.6 ns

logic symbol, '53†



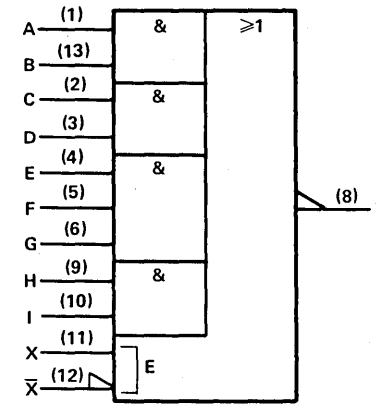
pin assignments, '53

J, N PACKAGES				FH PACKAGE			
1	A	8	Y	1	nc	11	nc
2	C	9	G	2	A	12	Y
3	D	10	H	3	C	13	G
4	E	11	X	4	D	14	H
5	F	12	$\overline{X}$	5	nc	15	nc
6	nc	13	B	6	E	16	X
7	GND	14	V_{CC}	7	nc	17	nc
				8	F	18	$\overline{X}$
				9	nc	19	B
				10	GND	20	V_{CC}

positive logic: $Y = \overline{AB+CD+EF+GH+X}$

X = output of SN5460/SN7460

logic symbol, 'H53†



pin assignments, 'H53

J, N PACKAGES			
1	A	8	Y
2	C	9	H
3	D	10	I
4	E	11	X
5	F	12	$\overline{X}$
6	G	13	B
7	GND	14	V_{CC}

positive logic: $Y = \overline{AB+CD+EFG+HI+X}$

X = output of SN54H60/SN74H60 or SN54H62/SN74H62

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

54

4-WIDE AND-OR-INVERT GATES

typical performance

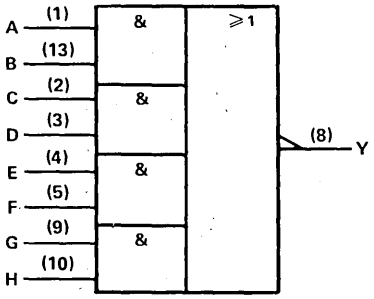
TYPE	POWER	DELAY
'54	23 mW	10.5 ns
'H54	41 mW	6.6 ns
'L54	1.5 mW	43 ns
'LS54	4.5 mW	12.5 ns

SN5454 (J,FH)
SN54H54 (J)
SN54L54 (J)
SN54LS54 (J,FH)

SN7454 (J,N)
SN74H54 (J,N)

SN74LS54 (J,N,FN)

logic symbol, '54†

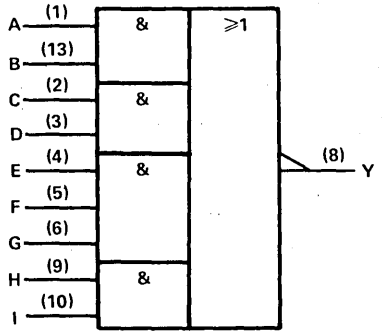


positive logic: $Y = \overline{AB+CD+EF+GH}$

pin assignments, '54

J, N PACKAGES				FH PACKAGE			
1	A	8	Y	1	nc	11	nc
2	C	9	G	2	A	12	Y
3	D	10	H	3	C	13	G
4	E	11	nu	4	D	14	H
5	F	12	nu	5	nc	15	nc
6	nc	13	B	6	E	16	nu
7	GND	14	V_{CC}	7	nc	17	nc
				8	F	18	nu
				9	nc	19	B
				10	GND	20	V_{CC}

logic symbol, 'H54†

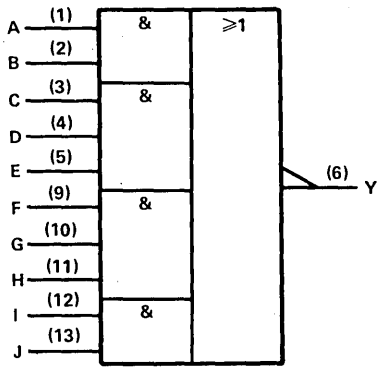


positive logic: $Y = \overline{AB+CD+EFG+HI}$

pin assignments, 'H54

J, N PACKAGES			
1	A	8	Y
2	C	9	H
3	D	10	I
4	E	11	nu
5	F	12	nu
6	G	13	B
7	GND	14	V_{CC}

logic symbol, 'L54, 'LS54†



positive logic: $Y = \overline{AB+CDE+FGH+IJ}$

pin assignments, 'L54, 'LS54

J, N PACKAGES				FH, FN PACKAGES			
1	A	8	nc	1	nc	11	nc
2	B	9	F	2	A	12	nc
3	C	10	G	3	B	13	F
4	D	11	H	4	C	14	G
5	E	12	I	5	nc	15	nc
6	Y	13	J	6	D	16	H
7	GND	14	V_{CC}	7	nc	17	nc
				8	E	18	I
				9	Y	19	J
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.
nu — make no external connection.

© IC MASTER 1983

55

2-WIDE 4-INPUT AND-OR-INVERT GATES

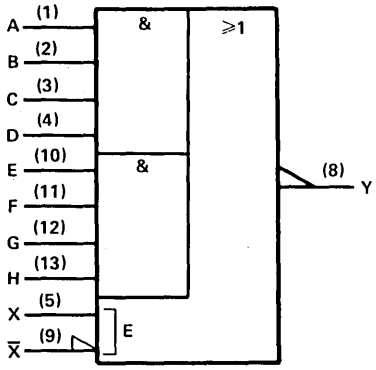
typical performance

TYPE	POWER	DELAY
'H55	30 mW	6.8 ns
'L55	1.5 mW	43 ns
'LS55	2.75 mW	12.5 ns

SN54H55 (J) SN74H55 (J,N)
SN54L55 (J)
SN54LS55 (J,FH) SN74LS55 (J,N,FN)

X = Output of SN54H60/SN74H60 or SN54H62/SN74H62

logic symbol, 'H55†

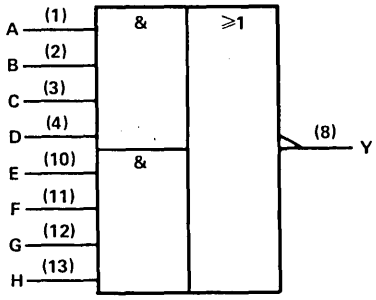


positive logic: $Y = \overline{ABCD+EFGH+X}$

pin assignments, 'H55

J, N PACKAGES			
1	A	8	Y
2	B	9	$\overline{X}$
3	C	10	E
4	D	11	F
5	X	12	G
6	nc	13	H
7	GND	14	V_{CC}

logic symbol, 'L55, 'LS55†



positive logic: $Y = \overline{ABCD+EFGH}$

pin assignments, 'L55, 'LS55

J, N PACKAGES				FH, FN PACKAGES			
1	A	8	Y	1	nc	11	nc
2	B	9	nc	2	A	12	Y
3	C	10	E	3	B	13	nc
4	D	11	F	4	C	14	E
5	nc	12	G	5	nc	15	nc
6	nc	13	H	6	D	16	F
7	GND	14	V_{CC}	7	nc	17	nc
				8	nc	18	G
				9	nc	19	H
				10	GND	20	V_{CC}

56

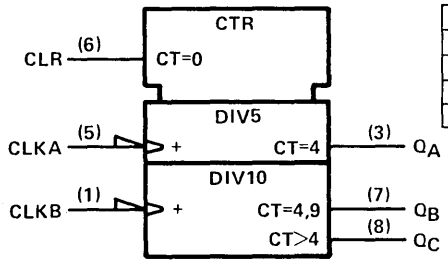
50-TO-1 FREQUENCY DIVIDER

typical performance

TYPE	CLOCK FREQUENCY	CLEAR	POWER
'LS56	25 MHz	HIGH	85 mW

SN54LS56 (JG) SN74LS56 (JG,P)

logic symbol†



pin assignments

JG, P PACKAGES			
1	CLKB	5	CLKA
2	V_{CC}	6	CLR
3	Q_A	7	Q_B
4	GND	8	Q_C

For chip carrier information, contact the factory.

†Pin numbers shown on logic symbols are for J, JG, N, and P packages only.
nc — no internal connection.

© IC MASTER 1983

57

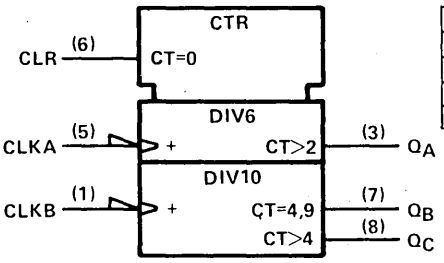
60-TO-1
FREQUENCY DIVIDER

typical performance

TYPE	CLOCK FREQUENCY	CLEAR	POWER
'LS57	25 MHz	HIGH	85 mW

SN54LS157 (JG) SN54LS157 (JG, P)

logic symbol†



pin assignments

JG, P PACKAGES			
1	CLKB	5	CLKA
2	V_{CC}	6	CLR
3	Q_A	7	Q_B
4	GND	8	Q_C

60

DUAL 4-INPUT
EXPANDERS

SN5460 (J) SN7460 (J,N)
SN54H60 (J) SN74H60 (J,N)

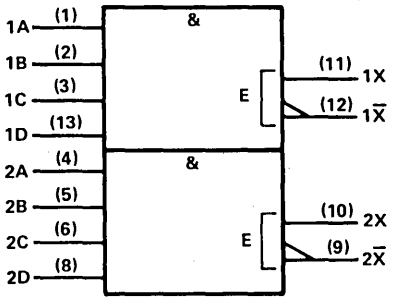
'60 positive logic:
X = ABCD when connected to X and $\overline{X}$ inputs of SN5423/SN7423, SN5450/SN7450, or SN5453/SN7453

'H60 positive logic:
X = ABCD when connected to X and $\overline{X}$ inputs of SN54H50/SN74H50, SN54H53/SN74H53, or SN54H55/SN74H55

typical performance

TYPE	POWER
'60	4 mW
'H60	6 mW

logic symbol†



pin assignments

J, N PACKAGES			
1	1A	8	2D
2	1B	9	$2\overline{X}$
3	1C	10	2X
4	2A	11	1X
5	2B	12	$1\overline{X}$
6	2C	13	1D
7	GND	14	V_{CC}

61

TRIPLE 3-INPUT
EXPANDERS

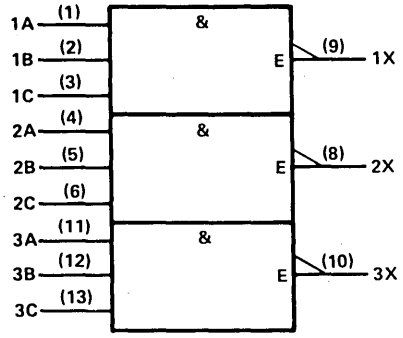
SN54H61 (J) SN74H61 (J,N)

positive logic:
X = ABC when connected to X input of SN54H52/SN74H52

typical performance

TYPE	POWER
'H61	13 mW

logic symbol†



pin assignments

J, N PACKAGES			
1	1A	8	2X
2	1B	9	1X
3	1C	10	3X
4	2A	11	3A
5	2B	12	3B
6	2C	13	3C
7	GND	14	V_{CC}

†Pin numbers shown on logic symbols are for J, JG, N, and P packages only.
nc — no internal connection.

© IC MASTER 1983

62

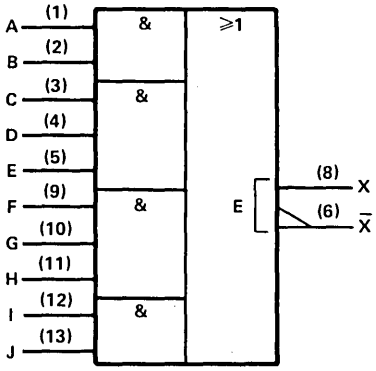
4-WIDE AND-OR EXPANDERS

typical performance

TYPE	POWER
'H62	25 mW

SN54H62 (J) SN74H62 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	A	8	X
2	B	9	F
3	C	10	G
4	D	11	H
5	E	12	I
6	X̄	13	J
7	GND	14	V_{CC}

63

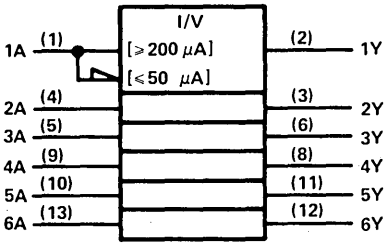
HEX CURRENT-SENSING INTERFACE GATES

typical performance

TYPE	POWER	DELAY
'LS63	3.3 mW	21 ns

SN54LS63 (J,FH) SN74LS63 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	1A	8	4Y
2	1Y	9	4A
3	2Y	10	5A
4	2A	11	5Y
5	3A	12	6Y
6	3Y	13	6A
7	GND	14	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1A	12	4Y
3	1Y	13	4A
4	2Y	14	5A
5	nc	15	nc
6	2A	16	5Y
7	nc	17	nc
8	3A	18	6Y
9	3Y	19	6A
10	GND	20	V_{CC}

64,65

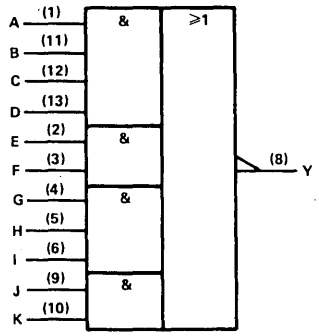
4-2-3-2 INPUT AND-OR-INVERT GATES

typical performance

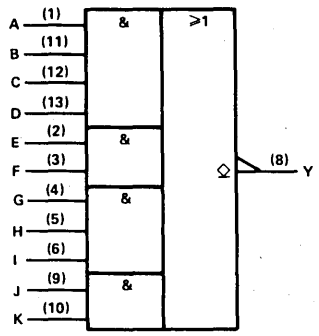
TYPE	OUTPUT	POWER	DELAY
'S64	TOTEM POLE	29 mW	3.5 ns
'S65	OPEN-COLLECTOR	36 mW	5.5 ns

SN54S64 (J,FH) SN74S64 (J,N,FN)
SN54S65 (J,FH) SN74S65 (J,N,FN)

logic symbol, 'S64†



logic symbol, 'S65†



positive logic: $Y = \overline{ABCD+EF+GHI+JK}$

pin assignments

J, N PACKAGES			
1	A	8	Y
2	E	9	J
3	F	10	K
4	G	11	B
5	H	12	C
6	I	13	D
7	GND	14	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	A	12	Y
3	E	13	J
4	F	14	K
5	nc	15	nc
6	G	16	B
7	nc	17	nc
8	H	18	C
9	I	19	D
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

68

DUAL 4-BIT DECADE COUNTER

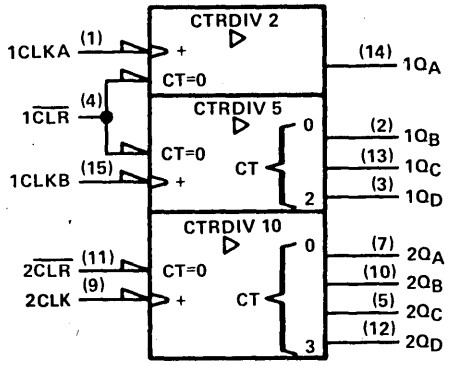
- High-drive outputs (I_{OL} rated at 8 mA/16 mA)

typical performance

COUNT FREQUENCY	CLEAR	POWER DISSIPATION
60 MHz	LOW	180 mW

SN54LS68 (J,FH) SN74LS68 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	1CLKA	9	2CLK
2	$1Q_B$	10	$2Q_B$
3	$1Q_D$	11	$2\overline{CLR}$
4	$1\overline{CLR}$	12	$2Q_D$
5	$2Q_C$	13	$1Q_C$
6	nc	14	$1Q_A$
7	$2Q_A$	15	1CLKB
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1CLKA	12	2CLK
3	$1Q_B$	13	$2Q_B$
4	$1Q_D$	14	$2\overline{CLR}$
5	$1\overline{CLR}$	15	$2Q_D$
6	nc	16	nc
7	$2Q_C$	17	$1Q_C$
8	nc	18	$1Q_A$
9	$2Q_A$	19	1CLKB
10	GND	20	V_{CC}

nc – no internal connection

69

DUAL 4-BIT BINARY COUNTER

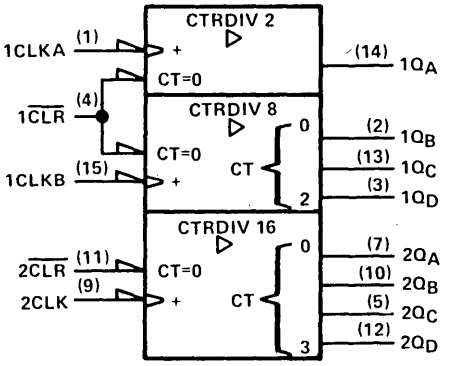
- High-drive outputs (I_{OL} rated at 8 mA/16 mA)

typical performance

COUNT FREQUENCY	CLEAR	POWER DISSIPATION
70 MHz	LOW	180 mW

SN54LS69 (J,FH) SN74LS69 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	1CLKA	9	2CLK
2	$1Q_B$	10	$2Q_B$
3	$1Q_D$	11	$2\overline{CLR}$
4	$1\overline{CLR}$	12	$2Q_D$
5	$2Q_C$	13	$1Q_C$
6	nc	14	$1Q_A$
7	$2Q_A$	15	1CLKB
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1CLKA	12	2CLK
3	$1Q_B$	13	$2Q_B$
4	$1Q_D$	14	$2\overline{CLR}$
5	$1\overline{CLR}$	15	$2Q_D$
6	nc	16	nc
7	$2Q_C$	17	$1Q_C$
8	nc	18	$1Q_A$
9	$2Q_A$	19	1CLKB
10	GND	20	V_{CC}

nc – no internal connection

†Pin numbers shown on logic symbols are for J, JT and NT packages only.
nc no internal connection.

© IC MASTER 1983

70

AND-GATED J-K POSITIVE-EDGE-TRIGGERED FLIP-FLOPS

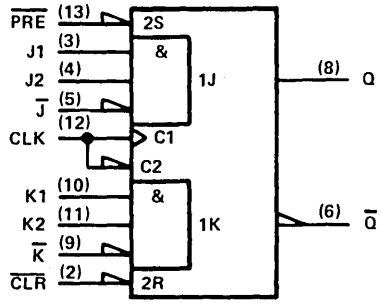
typical performance

TYPE	f_{max}	PWR/FF	SET-UP	HOLD
'70	35 MHz	65 mW	20 ns↑	5 ns↑

↑ Rising edge of clock pulse.
↓ Falling edge of clock pulse.

SN5470 (J,FH) SN7470 (J,N)

logic symbol†



positive logic: $J = J1 \cdot J2 \cdot \overline{J}$
$K = K1 \cdot K2 \cdot \overline{K}$
If inputs $\overline{J}$ and $\overline{K}$ are not used, they must be grounded.
Preset or clear function can occur only when the clock input is low.

pin assignments

J, N PACKAGES			
1	nc	8	Q
2	$\overline{CLR}$	9	$\overline{K}$
3	J1	10	K1
4	J2	11	K2
5	$\overline{J}$	12	CLK
6	$\overline{Q}$	13	$\overline{PRE}$
7	GND	14	V_{CC}

FH PACKAGE			
1	nc	11	nc
2	nc	12	Q
3	$\overline{CLR}$	13	$\overline{K}$
4	J1	14	K1
5	nc	15	nc
6	J2	16	K2
7	nc	17	nc
8	$\overline{J}$	18	CLK
9	$\overline{Q}$	19	$\overline{PRE}$
10	GND	20	V_{CC}

71

'H71: AND-OR-GATED J-K MASTER-SLAVE FLIP-FLOPS WITH PRESET

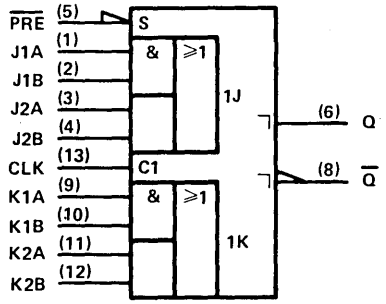
typical performance

TYPE	f_{max}	PWR/FF	SET-UP	HOLD
'H71	30 MHz	80 mW	0 ns↑	0 ns↓
'L71	30 MHz	3.8 mW	0 ns↑	0 ns↓

↑ Rising edge of clock pulse.
↓ Falling edge of clock pulse.

SN54H71 (J) SN74H71 (J,N)

logic symbol, 'H71†



positive logic: $J = (J1A \cdot J1B) + (J2A \cdot J2B)$
$K = (K1A \cdot K1B) + (K2A \cdot K2B)$

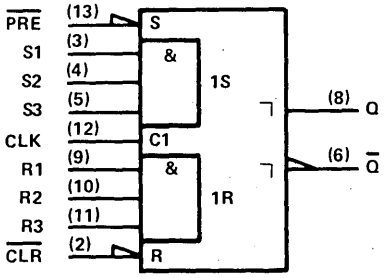
pin assignments, 'H71

J, N PACKAGES			
1	J1A	8	$\overline{Q}$
2	J1B	9	K1A
3	J2A	10	K1B
4	J2B	11	K2A
5	$\overline{PRE}$	12	K2B
6	Q	13	CLK
7	GND	14	V_{CC}

'L71: AND-GATED R-S MASTER-SLAVE FLIP-FLOPS WITH PRESET AND CLEAR

SN54L71 (J)

logic symbol, 'L71†



positive logic: $R = R1 \cdot R2 \cdot R3$
$S = S1 \cdot S2 \cdot S3$

pin assignments, 'L71

J, N PACKAGES			
1	nc	8	Q
2	$\overline{CLR}$	9	R1
3	S1	10	R2
4	S2	11	R3
5	S3	12	CLK
6	$\overline{Q}$	13	$\overline{PRE}$
7	GND	14	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

72

AND-GATED J-K MASTER-SLAVE FLIP-FLOPS WITH PRESET AND CLEAR

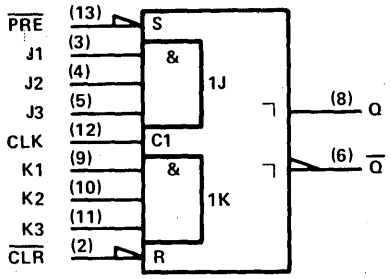
typical performance

TYPE	f_{max}	PWR/ FF	SET-UP	HOLD
'72	20 MHz	50 mW	0 ns↑	0 ns↓
'H72	30 MHz	80 mW	0 ns↑	0 ns↓
'L72	3 MHz	3.8 mW	0 ns↑	0 ns↓

↑ Rising edge of clock pulse.
↓ Falling edge of clock pulse.

SN5472 (J,FH) SN7472 (J)
SN54H72 (J) SN74H72 (J)
SN54L72 (J)

logic symbol†



positive logic: $J = J1 \cdot J2 \cdot J3$; $K1 \cdot K2 \cdot K3$

pin assignments

J, N PACKAGES			
1	nc	8	Q
2	CLR	9	K1
3	J1	10	K2
4	J2	11	K3
5	J3	12	CLK
6	Q̄	13	PRE
7	GND	14	V_{CC}

FH PACKAGE			
1	nc	11	nc
2	nc	12	Q
3	CLR	13	K1
4	J1	14	K2
5	nc	15	nc
6	J2	16	K3
7	nc	17	nc
8	J3	18	CLK
9	Q̄	19	PRE
10	GND	20	V_{CC}

73

DUAL J-K FLIP-FLOPS WITH CLEAR

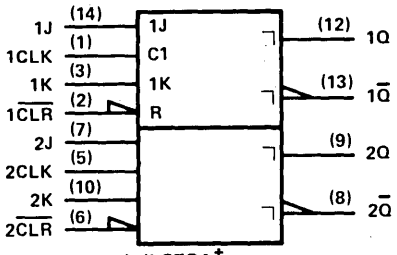
typical performance

TYPE	f_{max}	PWR/ F-F	SET-UP	HOLD
'73	20 MHz	5 mW	0 ns↑	0 ns↓
'H73	30 MHz	80 mW	0 ns↑	0 ns↓
'L73	3 MHz	3.8 mW	0 ns↑	0 ns↓
'LS73A	45 MHz	10 mW	20 ns↓	0 ns↓

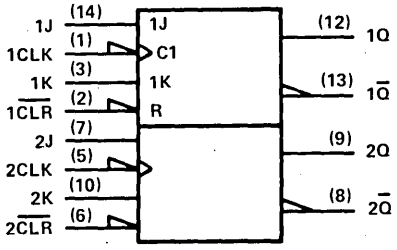
↑ Rising edge of clock pulse.
↓ Falling edge of clock pulse.

SN5473 (J) SN7473 (J,N)
SN54H73 (J) SN74H73 (J,N)
SN54L73 (J)
SN54LS73A (J SN74LS73A (J,N)

logic symbol' '73, 'H73, 'L73†



logic symbol, 'LS73A†



pin assignments

J, N PACKAGES			
1	1CLK	8	2Q̄
2	1CLR	9	2Q
3	1K	10	2K
4	V_{CC}	11	GND
5	2CLK	12	1Q
6	2CLR	13	1Q̄
7	2J	14	1J

For chip carrier information, contact the factory.

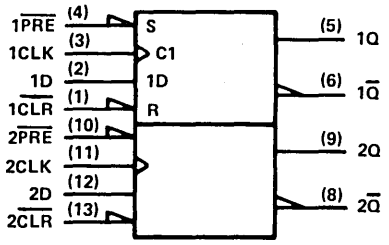
† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

74

DUAL D-TYPE POSITIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1CLR	8	2Q̄	1	nc	11	nc
2	1D	9	2Q	2	1CLR	12	2Q̄
3	1CLK	10	2PRE	3	1D	13	2Q
4	1PRE	11	2CLK	4	1CLK	14	2PRE
5	1Q	12	2D	5	nc	15	nc
6	1Q̄	13	2CLR	6	1PRE	16	2CLK
7	GND	14	V_{CC}	7	nc	17	nc
				8	1Q	18	2D
				9	1Q̄	19	2CLR
				10	GND	20	V_{CC}

typical performance

TYPE	f_{max}	PWR/ F-F	SET-UP	HOLD
'74	25 MHz	43 mW	20 ns†	5 ns†
'ALS74	50 MHz	6 mW	15 ns†	0 ns†
'AS74	125 MHz	26 mW		
'H74	43 MHz	75 mW	15 ns†	5 ns†
'L74	3 MHz	4 mW	50 ns†	15 ns†
'LS74A	33 MHz	10 mW	20 ns†	5 ns†
'S74	110 MHz	75 mW	3 ns†	2 ns†

† Rising edge of clock pulse.

SN5474 (J,FH)	SN7474 (J,N)
SN54ALS74 (J,FH)	SN74ALS74 (N,FN)
SN54AS74 (J,FH)	SN74AS74 (N,FN)
SN54H74 (J)	SN74H74 (J,N)
SN54L74 (J)	
SN54LS74A (J,FH)	SN74LS74A (J,N,FN)
SN54S74 (J,FH)	SN74S74 (J,N,FN)

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

75

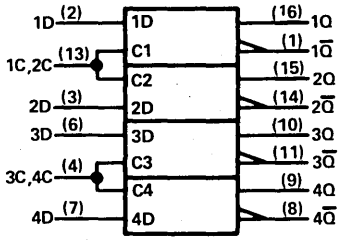
4-BIT BISTABLE LATCHES

typical performance

TYPE	OUTPUTS	DELAY	TOTAL POWER
'75	Q,$\overline{Q}$	15 ns	160 mW
'L75	Q,$\overline{Q}$	30 ns	80 mW
'LS75	Q,$\overline{Q}$	11 ns	32 mW

SN5475 (J) SN7475 (J,N)
SN54L75 (J)
SN54LS75 (J) SN74LS75 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	1$\overline{Q}$	9	4Q
2	1D	10	3Q
3	2D	11	3$\overline{Q}$
4	3C,4C	12	GND
5	V_{CC}	13	1C,2C
6	3D	14	2$\overline{Q}$
7	4D	15	2Q
8	4$\overline{Q}$	16	1Q

For chip carrier information, contact the factory.

76

DUAL J-K FLIP-FLOPS WITH PRESET AND CLEAR

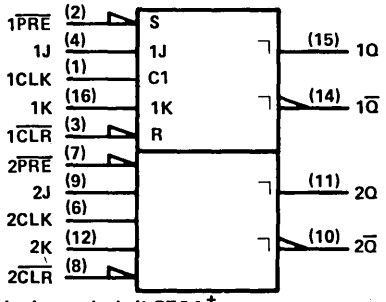
typical performance

TYPE	f_{max}	PWR/F-F	SET-UP	HOLD
'76	20 MHz	50 mW	0 ns↑	0 ns↓
'H76	30 MHz	80 mW	0 ns↑	0 ns↓
'LS76A	45 MHz	10 mW	20 ns↓	0 ns↓

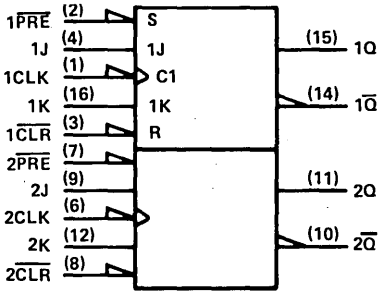
↑ Rising edge of clock pulse.
↓ Falling edge of clock pulse.

SN5476 (J) SN7476 (J,N)
SN54H76 (J) SN74H76 (J,N)
SN54LS76A (J) SN74LS76A (J,N)

logic symbol, '76, 'H76†



logic symbol, 'LS76A†



pin assignments

J, N PACKAGES			
1	1CLK	9	2J
2	1$\overline{PRE}$	10	2$\overline{Q}$
3	1$\overline{CLR}$	11	2Q
4	1J	12	2K
5	V_{CC}	13	GND
6	2CLK	14	1$\overline{Q}$
7	2$\overline{PRE}$	15	1Q
8	2$\overline{CLR}$	16	1K

For chip carrier information, contact the factory.

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

77

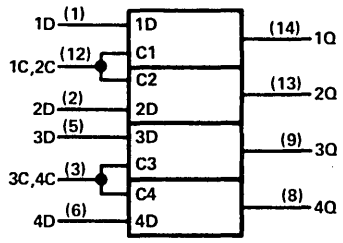
4-BIT BISTABLE LATCHES

typical performance

TYPE	OUTPUTS	DELAY	TOTAL POWER
'77	Q	15 ns	160 mW
'L77	Q	30 ns	80 mW
'LS77	Q	10 ns	35 mW

SN5477 (J)
SN54L77 (J)
SN54LS77 (J) SN74LS77 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	1D	8	4Q
2	2D	9	3Q
3	3C,4C	10	nc
4	V_{CC}	11	GND
5	3D	12	1C,2C
6	4D	13	2Q
7	nc	14	1Q

For chip carrier information, contact the factory.

78

DUAL J-K FLIP-FLOPS WITH PRESET, COMMON CLEAR, AND COMMON CLOCK

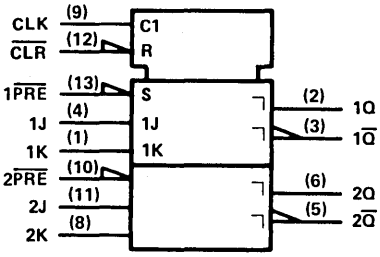
typical performance

TYPE	f_{max}	PWR/F-F	SET-UP	HOLD
'H78	30 MHz	80 mW	0 ns↑	0 ns↓
'L78	3 MHz	3.8 mW	0 ns↑	0 ns↓
'LS78A	45 MHz	10 mW	20 ns↓	0 ns↓

↑ Rising edge of clock pulse.
↓ Falling edge of clock pulse.

SN54H78 (J) SN74H78 (J,N)
SN54L78 (J)
SN54LS78A (J) SN74LS78A (J,N)

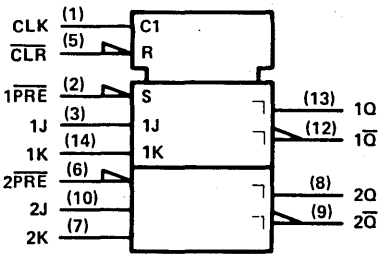
logic symbol, 'H78†



pin assignments, 'H78

J, N PACKAGES			
1	1K	8	2K
2	1Q	9	CLK
3	1Q̄	10	2PRE
4	1J	11	2J
5	2Q̄	12	CLR
6	2Q	13	1PRE
7	GND	14	V_{CC}

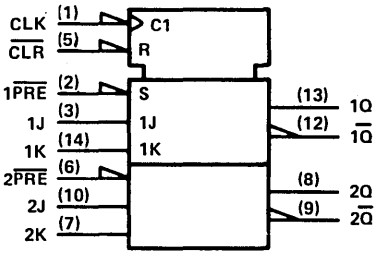
logic symbol, 'L78†



pin assignments, 'L78, 'LS78A

J, N PACKAGES			
1	CLK	8	2Q
2	1PRE	9	2Q̄
3	1J	10	2J
4	V_{CC}	11	GND
5	CLR	12	1Q̄
6	2PRE	13	1Q
7	2K	14	1K

logic symbol, 'LS78A†



For chip carrier information, contact the factory.

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

80

GATED FULL ADDERS

typical performance

TYPE	CARRY TIME	ADD TIME	POWER PER BIT
'80	10.5 ns	52 ns	105 mW

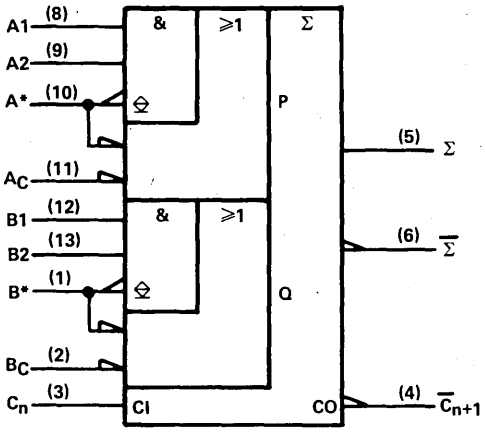
SN5480 (J,FH) SN7480 (J,N)

NOTES: 1. $A = \overline{A_C} + \overline{A^*} + A1 \cdot A2$, $B = \overline{B_C} + \overline{B^*} + B1 \cdot B2$

2. When A* is used as an input, A1 or A2 must be low. When B* is used as an input, B1 or B2 must be low.

3. When A1 and A2 or B1 and B2 are used as inputs, A* or B*, respectively, must be open or used to perform dot-AND logic.

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	B*	8	A1	1	nc	11	nc
2	B_C	9	A2	2	B*	12	A1
3	C_n	10	A*	3	B_C	13	A2
4	$\overline{C}_{n+1}$	11	A_C	4	C_n	14	A*
5	Σ	12	B1	5	nc	15	nc
6	Σ̄	13	B2	6	$\overline{C}_{n+1}$	16	A_C
7	GND	14	V_{CC}	7	nc	17	nc
				8	Σ	18	B1
				9	Σ̄	19	B2
				10	GND	20	V_{CC}

81

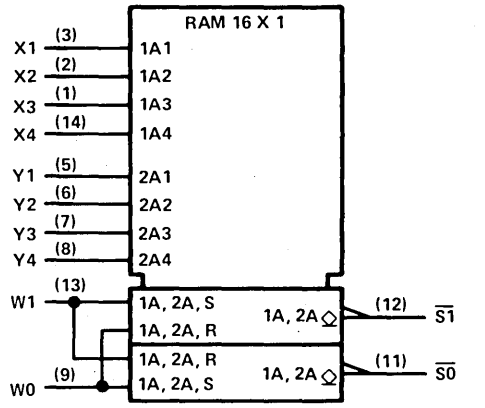
16-BIT RANDOM-ACCESS MEMORIES

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER PER BIT
'81A	15 ns	15 ns	14 mW

SN5481A (J) SN7481A (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	X3	8	Y4
2	X2	9	W0
3	X1	10	GND
4	V_{CC}	11	$\overline{S0}$
5	Y1	12	$\overline{S1}$
6	Y2	13	W1
7	Y3	14	X4

82

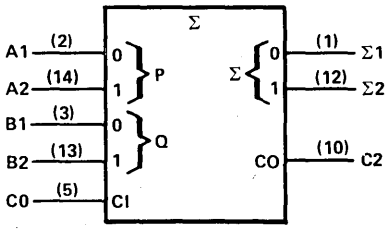
2-BIT BINARY FULL ADDERS

typical performance

TYPE	CARRY TIME	ADD TIME	POWER PER BIT
'82	14.5 ns	25 ns	87 mW

SN5482 (J) SN7482 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	Σ1	8	nc
2	A1	9	nc
3	B1	10	C2
4	V_{CC}	11	GND
5	C0	12	Σ2
6	nc	13	B2
7	nc	14	A2

For chip carrier information, contact the factory.

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

83

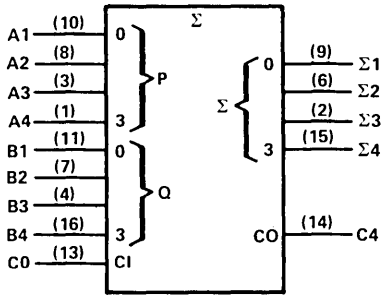
4-BIT BINARY FULL ADDERS WITH FAST CARRY

typical performance

TYPE	CARRY TIME	ADD TIME	POWER PER BIT
'83A	10 ns	16 ns	76 mW
'LS83A	10 ns	15 ns	24 mW

SN5483A (J) SN7483A (J,N)
SN54LS83A (J) SN74LS83A (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	A4	9	Σ1
2	ISI3	10	A1
3	A3	11	B1
4	B3	12	GND
5	V_{CC}	13	C0
6	Σ2	14	C4
7	B2	15	Σ4
8	A2	16	B4

For new chip carrier designs, use 'LS283 or 'S283.

84

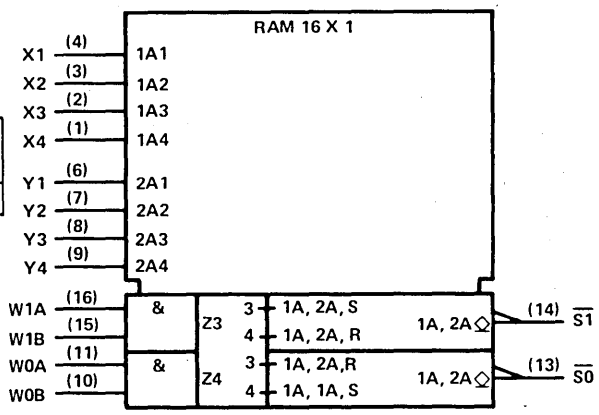
16-BIT RANDOM-ACCESS MEMORIES

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER PER BIT
'84A	15 ns	15 ns	14 mW

SN5484A (J) SN7484A (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	X4	9	Y4
2	X3	10	W0B
3	X2	11	W0A
4	X1	12	GND
5	V_{CC}	13	$\overline{S0}$
6	Y1	14	$\overline{S1}$
7	Y2	15	W1B
8	Y3	16	W1A

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

85

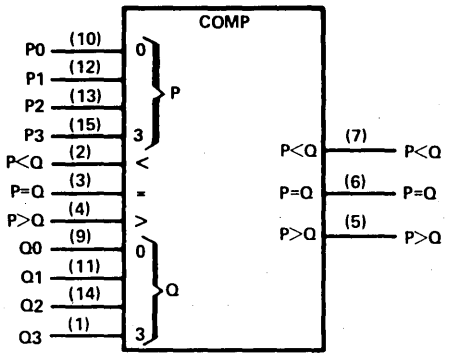
4-BIT MAGNITUDE COMPARATORS

typical performance

TYPE	COMPARE TIME	POWER
'85	21 ns	275 mW
'L85	82 ns	20 mW
'LS85	23.5 ns	52 mW
'S85	11.5 ns	365 mW

SN5485 (J,FH) SN7485 (J,N)
SN54L85 (J)
SN54LS85 (J,FH) SN74LS85 (J,N,FN)
SN54S85 (J,FH) SN74S85 (J,N,FN)

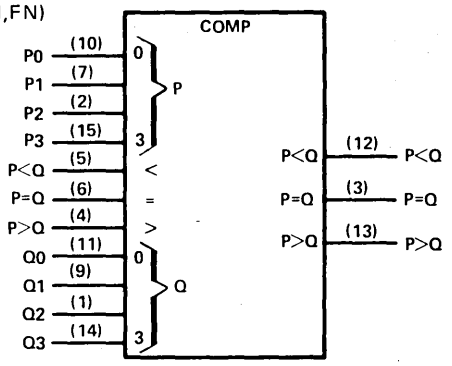
logic symbol, '85, 'LS85, 'S85†



pin assignments, '85, 'LS85, 'S85

J, N PACKAGES				FH, FN PACKAGES			
1	Q3	9	Q0	1	nc	11	nc
2	P<Qin	10	P0	2	Q3	12	Q0
3	P=Qin	11	Q1	3	P<Qin	13	P0
4	P>Qin	12	P1	4	P=Qin	14	Q1
5	P>Qout	13	P2	5	P>Qin	15	P1
6	P=Qout	14	Q2	6	nc	16	nc
7	P<Qout	15	P3	7	P>Qout	17	P2
8	GND	16	V_{CC}	8	P=Qout	18	Q2
				9	P<Qout	19	P3
				10	GND	20	V_{CC}

logic symbol, 'L85†



pin assignments, 'L85

J, N PACKAGES			
1	Q2	9	Q1
2	P2	10	P0
3	P=Qout	11	Q0
4	P>Qin	12	P<Qout
5	P<Qin	13	P>Qout
6	P=Qin	14	Q3
7	P1	15	P3
8	GND	16	V_{CC}

86

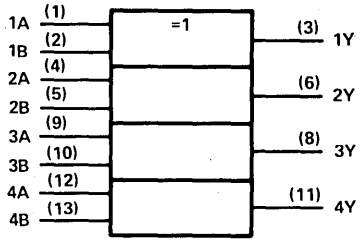
QUADRUPLE 2-INPUT EXCLUSIVE-OR GATES

typical performance

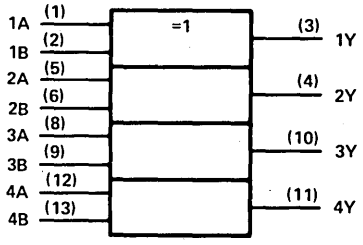
TYPE	POWER	DELAY
'86	150 mW	14 ns
'ALS86		
'L86	15 mW	55 ns
'LS86	30 mW	10 ns
'S86	250 mW	7 ns

SN5486 (J,FH) SN7486 (J,N)
SN54ALS86 (J,FH) SN74ALS86 (N,FN)
SN54L86 (J)
SN54LS86 (J,FH) SN74LS86 (J,N,FN)
SN54S86 (J,FH) SN74S86 (J,N,FN)

logic symbol, '86, 'ALS86, 'LS86, 'S86†



logic symbol, 'L86†



positive logic: $Y = A \oplus B = \bar{A}B + A\bar{B}$

pin assignments, '86, 'ALS86, 'LS86, 'S86

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

pin assignments, 'L86

J, N PACKAGES			
1	1A	8	3A
2	1B	9	3B
3	1Y	10	3Y
4	2Y	11	4Y
5	2A	12	4A
6	2B	13	4B
7	GND	14	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

87

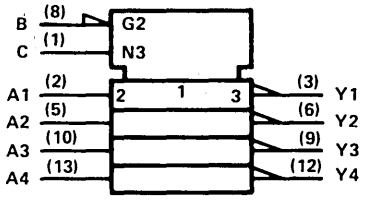
4-BIT TRUE/ COMPLEMENT, ZERO/ONE ELEMENTS

typical performance

TYPE	POWER	DELAY
'H87	270 mW	14 ns

SN54H87 (J) SN74H87 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	C	8	B
2	A1	9	Y3
3	Y1	10	A3
4	nc	11	nc
5	A2	12	Y4
6	Y2	13	A4
7	GND	14	V_{CC}

88

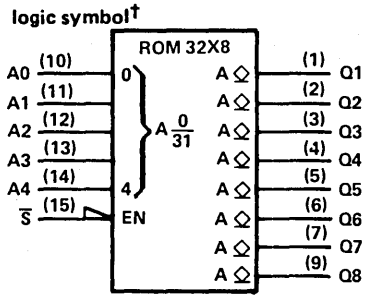
256-BIT READ-ONLY MEMORIES

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER PER BIT
'88A	26 ns	22 ns	1.1 mW

SN5488A (J) SN7488A (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	Q1	9	Q8
2	Q2	10	A0
3	Q3	11	A1
4	Q4	12	A2
5	Q5	13	A3
6	Q6	14	A4
7	Q7	15	$\overline{S}$
8	GND	16	V_{CC}

For chip carrier information, contact the factory.

89

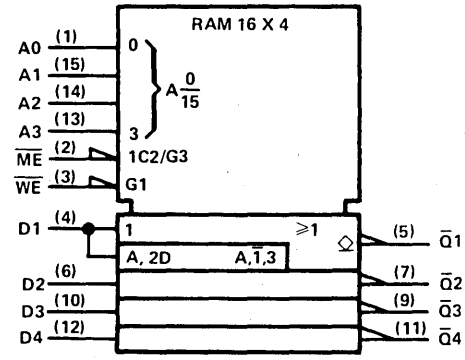
64-BIT READ/WRITE MEMORIES

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER PER BIT
'89	32 ns	30 ns	5.9 mW

SN7489 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	A0	9	$\overline{Q}3$
2	$\overline{ME}$	10	D3
3	$\overline{WE}$	11	$\overline{Q}4$
4	D1	12	D4
5	$\overline{Q}1$	13	A3
6	D2	14	A2
7	$\overline{Q}2$	15	A1
8	GND	16	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

90

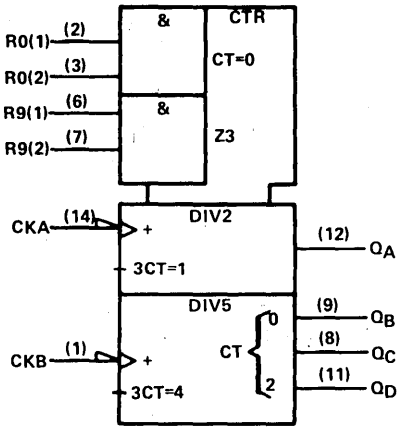
DECADE COUNTERS

typical performance

TYPE	COUNT FREQUENCY	CLEAR	TOTAL POWER
'90A	32 MHz	HIGH	160 mW
'L90	3 MHz	HIGH	20 mW
'LS90	32 MHz	HIGH	40 mW

SN5490A (J) SN7490A (J,N)
SN54L90 (J)
SN54LS90 (J) SN74LS90 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	CKB	8	Q_C
2	R0(1)	9	Q_B
3	R0(2)	10	GND
4	nc	11	Q_D
5	V_{CC}	12	Q_A
6	R9(1)	13	nc
7	R9(2)	14	CKA

For new chip carrier designs, use '290 or 'LS290.

91

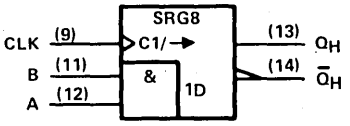
8-BIT SHIFT REGISTERS

typical performance

TYPE	SHIFT FREQUENCY	SERIAL DATA INPUT	TOTAL POWER
'91A	10 MHz	GATED D	175 mW
'L91	3 MHz	GATED D	17.5 mW
'LS91	25 MHz	GATED D	60 mW

SN5491A (J) SN7491A (J,N)
SN54L91 (J)
SN54LS91 (J) SN74LS91 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	nc	8	nc
2	nc	9	CLK
3	nc	10	GND
4	nc	11	B
5	V_{CC}	12	A
6	nc	13	QH
7	nc	14	QH

For chip carrier information, contact the factory.

92

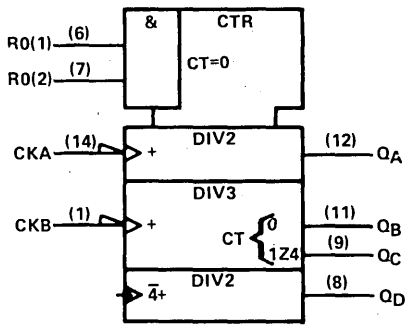
DIVIDE-BY-12 COUNTERS

typical performance

TYPE	COUNT FREQUENCY	CLEAR	TOTAL POWER
'92A	32 MHz	HIGH	160 mW
'LS92	32 MHz	HIGH	39 mW

SN5492A (J) SN7492A (J,N)
SN54LS92 (J) SN74LS92 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	CKB	8	Q_D
2	nc	9	Q_C
3	nc	10	GND
4	nc	11	Q_B
5	V_{CC}	12	Q_A
6	R0(1)	13	nc
7	R0(2)	14	CKA

For new chip carrier designs, use "LS292.

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

93

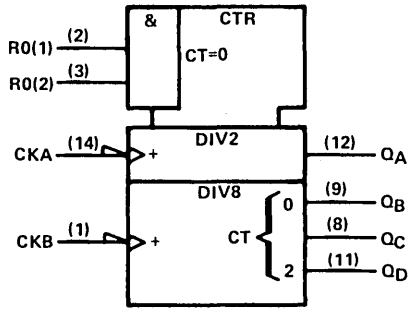
4-BIT BINARY COUNTERS

typical performance

TYPE	COUNT FREQUENCY	CLEAR	TOTAL POWER
'93A	32 MHz	HIGH	160 mW
'L93	3 MHz	HIGH	20 mW
'LS93	32 MHz	HIGH	39 mW

SN5493A (J) SN7493A (J,N)
SN54L93 (J)
SN54LS93 (J) SN74LS93 (J,N)

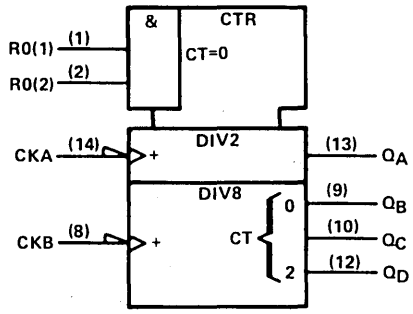
logic symbol, '93A, 'LS93†



pin assignments, '93A, 'LS93

J, N PACKAGES			
1	CKB	8	Q_C
2	R0(1)	9	Q_B
3	R0(2)	10	GND
4	nc	11	Q_D
5	V_{CC}	12	Q_A
6	nc	13	nc
7	nc	14	CKA

logic symbol, 'L93†



pin assignments, 'L93

J, N PACKAGES			
1	R0(1)	8	CKB
2	R0(2)	9	Q_B
3	nc	10	Q_C
4	V_{CC}	11	GND
5	nc	12	Q_D
6	nc	13	Q_A
7	nc	14	CKA

For new chip carrier designs, use '293 or 'LS293.

94

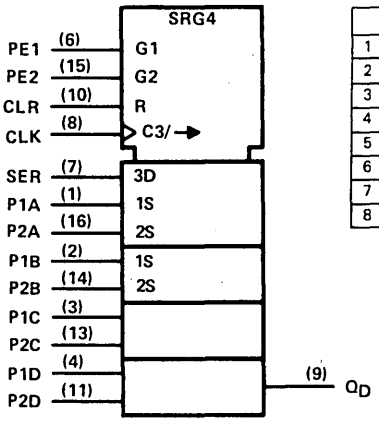
4-BIT SHIFT REGISTERS (DUAL ASYNCHRONOUS PRESETS)

typical performance

TYPE	SHIFT FREQUENCY	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'94	10 MHz	D	HIGH	175 mW

SN5494 (J) SN7494 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	P1A	9	Q_D
2	P1B	10	CLR
3	P1C	11	P2D
4	P1D	12	GND
5	V_{CC}	13	P2C
6	PE1	14	P2B
7	SER	15	PE2
8	CLK	16	P2A

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

95

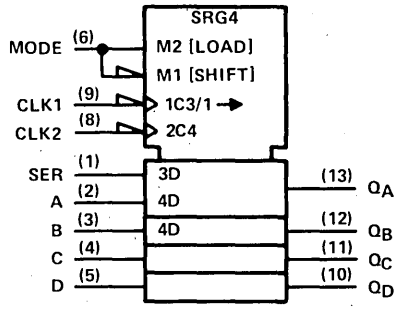
4-BIT SHIFT REGISTERS (PARALLEL IN/PARALLEL OUT, SHIFT RIGHT, SHIFT LEFT, SERIAL INPUT)

typical performance

TYPE	SHIFT FREQUENCY	SERIAL DATA INPUT	TOTAL POWER
'95A	25 MHz	D	195 mW
'L95	3 MHz	D	19 mW
'LS95B	30 MHz	D	65 mW

SN5495 A (J,FH) SN7495A (J,N)
SN54L95 (J)
SN54LS95B (J,FH) SN74LS95B (J,N,FN)

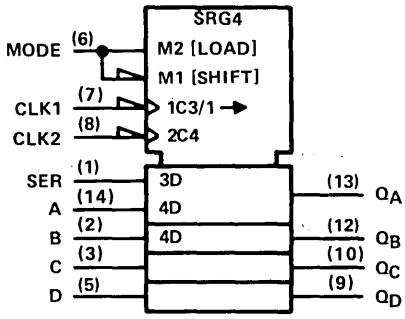
logic symbol, '95A 'LS95B†



pin assignments, '95A, 'LS95B

J, N PACKAGES				FH, FN PACKAGES			
1	SER	8	CLK2	1	nc	11	nc
2	A	9	CLK1	2	SER	12	CLK2
3	B	10	Q_D	3	A	13	CLK1
4	C	11	Q_C	4	B	14	Q_D
5	D	12	Q_B	5	nc	15	nc
6	MODE	13	Q_A	6	C	16	Q_C
7	GND	14	V_{CC}	7	nc	17	nc
				8	D	18	Q_B
				9	MODE	19	Q_A
				10	GND	20	V_{CC}

logic symbol, 'L95†



pin assignments, 'L95

J, N PACKAGES			
1	SER	8	CLK2
2	B	9	Q_D
3	C	10	Q_C
4	V_{CC}	11	GND
5	D	12	Q_B
6	MODE	13	Q_A
7	CLK1	14	A

96

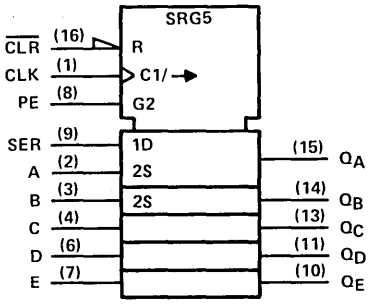
5-BIT SHIFT REGISTERS

typical performance

TYPE	SHIFT FREQUENCY	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'96	10 MHz	D	LOW	240 mW
'L96	5 MHz	D	LOW	120 mW
'LS96	10 MHz	D	LOW	60 mW

SN5496 (J) SN7496 (J,N)
SN54L96 (J)
SN54LS96 (J) SN74LS96 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	CLK	9	SER
2	A	10	Q_E
3	B	11	Q_D
4	C	12	GND
5	V_{CC}	13	Q_C
6	D	14	Q_B
7	E	15	Q_A
8	PE	16	$\overline{CLR}$

For chip carrier information, contact the factory.

97

SYNCHRONOUS 6-BIT BINARY RATE MULTIPLIERS

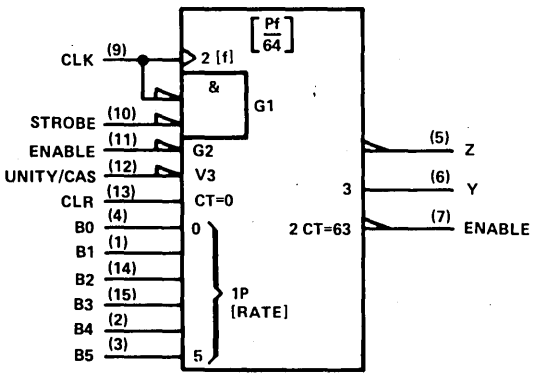
typical performance

TYPE	POWER	FREQ‡
'97	345 mW	32 MHz

‡ Maximum clock frequency

SN5497 (J,FH)
SN7497 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	B1	9	CLK	1	nc	11	nc
2	B4	10	STRB	2	B1	12	CLK
3	B5	11	ENin	3	B4	13	STRB
4	B0	12	UNITY/CAS	4	B5	14	ENin
5	Z	13	CLR	5	B0	15	UNITY/CAS
6	Y	14	B2	6	nc	16	nc
7	ENout	15	B3	7	Z	17	CLR
8	GND	16	V_{CC}	8	Y	18	B2
				9	ENout	19	B3
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

98

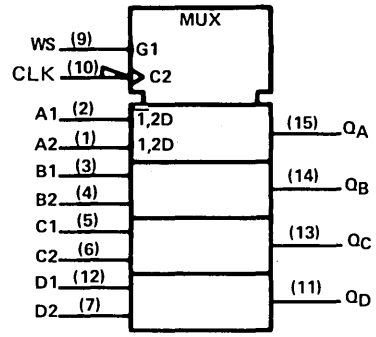
4-BIT DATA SELECTOR/ STORAGE REGISTERS

typical performance

TYPE	FREQUENCY	POWER
'L98	3 MHz	25 mW

SN54L98 (J)

logic symbol†



pin assignments

J, N PACKAGES			
1	A2	9	WS
2	A1	10	CLK
3	B1	11	Q_D
4	B2	12	D1
5	C1	13	Q_C
6	C2	14	Q_B
7	D2	15	Q_A
8	GND	16	V_{CC}

99

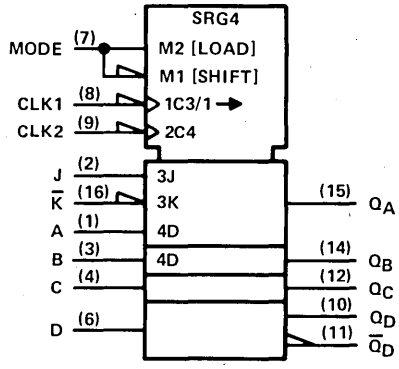
4-BIT BIDIRECTIONAL UNIVERSAL SHIFT REGISTERS

typical performance

TYPE	SHIFT FREQUENCY	SERIAL DATA INPUT	TOTAL POWER
'L99	3 MHz	J-$\overline{K}$	19 mW

SN54L99 (J)

logic symbol†



pin assignments

J, N PACKAGES			
1	A	9	CLK2
2	J	10	Q_D
3	B	11	$\overline{Q}_D$
4	C	12	Q_C
5	V_{CC}	13	GND
6	D	14	Q_B
7	MODE	15	Q_A
8	CLK1	16	$\overline{K}$

100

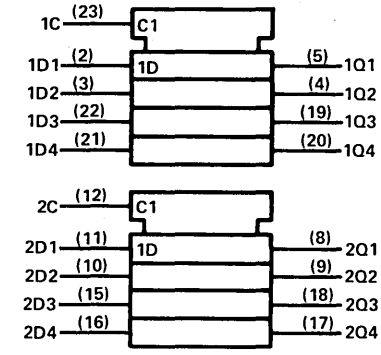
8-BIT BISTABLE LATCHES

typical performance

TYPE	DELAY	TOTAL POWER
'100	15 ns	320 mW

SN54100 (J) SN74100 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	nc	13	nc
2	1D1	14	nc
3	1D2	15	2D3
4	1Q2	16	2D4
5	1Q1	17	2Q4
6	nc	18	2Q3
7	GND	19	1Q3
8	2Q1	20	1Q4
9	2Q2	21	1D4
10	2D2	22	1D3
11	2D1	23	1C
12	2C	24	V_{CC}

For chip carrier information, contact the factory.

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

101

AND-OR-GATED J-K NEGATIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET

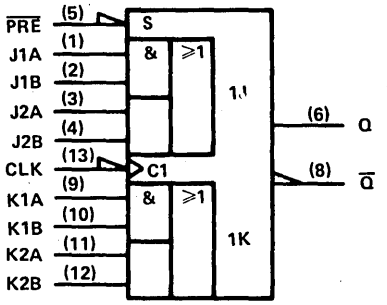
typical performance

TYPE	f_{max}	PWR	SET-UP	HOLD
'H101	50 MHz	100 mW	13 ns↓	0 ns↓

↓ Falling edge of clock pulse

SN54H101 (J) SN74H101 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	J1A	8	Q̄
2	J1B	9	K1A
3	J2A	10	K1B
4	J2B	11	K2A
5	PRE	12	K2B
6	Q	13	CLK
7	GND	14	V_{CC}

positive logic: $J = (J1A \cdot J1B) + (J2A \cdot J2B)$

$K = (K1A \cdot K1B) + (K2A \cdot K2B)$

102

AND-GATED J-K NEGATIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR

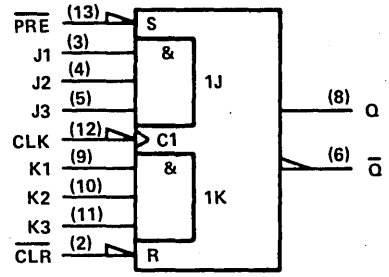
typical performance

TYPE	f_{max}	PWR	SET-UP	HOLD
'H102	50 MHz	100 mW	13 ns↓	0 ns↓

↓ Falling edge of clock pulse

SN54H102 (J) SN74H102 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	nc	8	Q
2	CLR	9	K1
3	J1	10	K2
4	J2	11	K3
5	J3	12	CLK
6	Q̄	13	PRE
7	GND	14	V_{CC}

positive logic: $J = J1 \cdot J2 \cdot J3$

$K = K1 \cdot K2 \cdot K3$

103

DUAL J-K NEGATIVE-EDGE-TRIGGERED FLIP-FLOPS WITH CLEAR

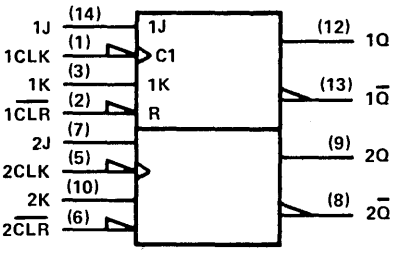
typical performance

TYPE	f_{max}	PWR/F-F	SET-UP	HOLD
'H103	50 MHz	100 mW	13 ns↓	0 ns↓

↓ Falling edge of clock pulse

SN54H103 (J) SN74H103 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	1CLK	8	2Q̄
2	1CLR	9	2Q
3	1K	10	2K
4	V_{CC}	11	GND
5	2CLK	12	1Q
6	2CLR	13	1Q̄
7	2J	14	1J

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

106

DUAL J-K NEGATIVE-EDGE TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR

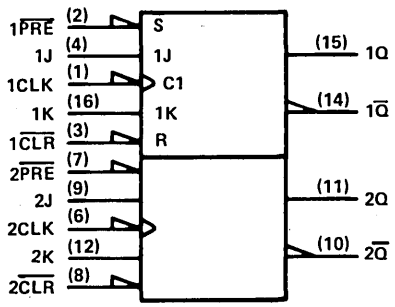
typical performance

TYPE	f_{max}	PWR/ F-F	SET-UP	HOLD
'H106	50 MHz	100 mW	13 ns↓	0 ns↓

↓ Falling edge of clock pulse

SN54H106 (J) SN74H106 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	1CLK	9	2J
2	1PRE	10	2Q̄
3	1CLR	11	2Q
4	1J	12	2K
5	V_{CC}	13	GND
6	2CLK	14	1Q̄
7	2PRE	15	1Q
8	2CLR	16	1K

107

DUAL J-K FLIP-FLOPS WITH CLEAR

typical performance

TYPE	f_{max}	PWR/ F-F	SET-UP	HOLD
'107	20 MHz	50 mW	0 ns↑	0 ns↓
'LS107A	45 MHz	10 mW	20 ns↓	0 ns↓

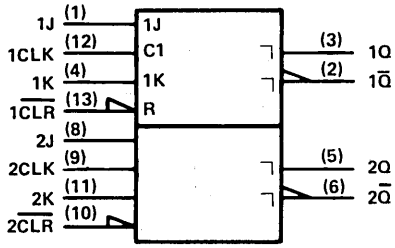
↑ Rising edge of clock pulse

↓ Falling edge of clock pulse

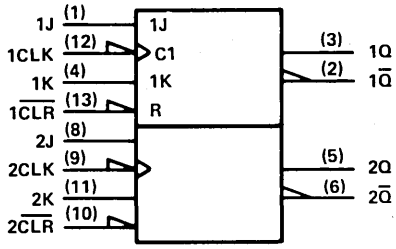
SN54107 (J,FH) SN74107 (J,N)

SN54LS107A (J,FH) SN74LS107A (J,N,FN)

logic symbol, '107†



logic symbol, 'LS107A†



pin assignments

J; N PACKAGES			
1	1J	8	2J
2	1Q̄	9	2CLK
3	1Q	10	2CLR
4	1K	11	2K
5	2Q	12	1CLK
6	2Q̄	13	1CLR
7	GND	14	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1J	12	2J
3	1Q̄	13	2CLK
4	1Q	14	2CLR
5	nc	15	nc
6	1K	16	2K
7	nc	17	nc
8	2Q	18	1CLK
9	2Q̄	19	1CLR
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

108

DUAL J-K NEGATIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET, COMMON CLEAR, AND COMMON CLOCK

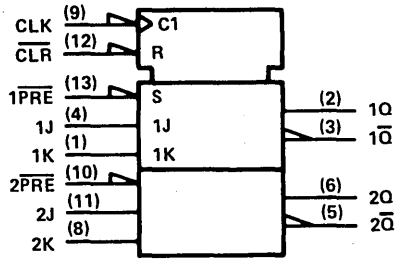
typical performance

TYPE	f_{max}	PWR/ F-F	SET-UP	HOLD
'H108	50 MHz	100 mW	13 ns↓	0 ns↓

↓ Falling edge of clock pulse

SN54H108 (J) SN74H108 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	1K	8	2K
2	1Q	9	CLK
3	1Q̄	10	2PRE
4	1J	11	2J
5	2Q̄	12	CLR
6	2Q	13	1PRE
7	GND	14	V_{CC}

109

DUAL J-K̄ POSITIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR

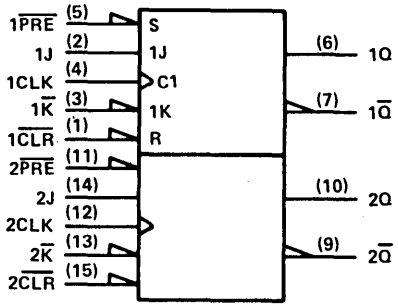
typical performance

TYPE	f_{max}	PWR/ F-F	SET-UP	HOLD
'109	33 MHz	45 mW	10 ns↑	6 ns↑
'ALS109	50 MHz	6 mW	15 ns↑	0 ns↑
'AS109	125 MHz	29 mW		
'LS109A	33 MHz	10 mW	20 ns↑	5 ns↑

↑ Rising edge of clock pulse

SN54109 (J,FH) SN74109 (J,N)
SN54ALS109 (J,FH) SN74ALS109 (N,FN)
SN54AS109 (J,FH) SN74AS109 (N,FN)
SN54LS109A (J,FH) SN74LS109A (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	1CLR	9	2Q̄
2	1J	10	2Q
3	1K	11	2PRE
4	1CLK	12	2CLK
5	1PRE	13	2K
6	1Q	14	2J
7	1Q̄	15	2CLR
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1CLR	12	2Q̄
3	1J	13	2Q
4	1K	14	2PRE
5	1CLK	15	2CLK
6	nc	16	nc
7	1PRE	17	2K
8	1Q	18	2J
9	1Q̄	19	2CLR
10	GND	20	V_{CC}

110

AND-GATED J-K MASTER-SLAVE FLIP-FLOPS WITH DATA LOCKOUT

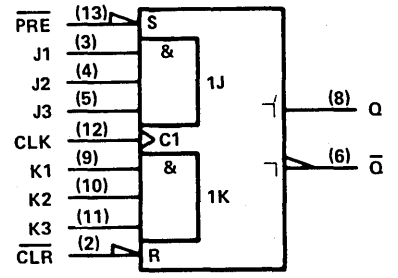
typical performance

TYPE	f_{max}	PWR	SET-UP	HOLD
'110	25 MHz	100 mW	20 ns↑	5 ns↑

↑ Rising edge of clock pulse

SN54110 (J) SN74110 (J,N)

logic symbol†



positive logic: $J = J1 \cdot J2 \cdot J3$
$K = K1 \cdot K2 \cdot K3$

pin assignments

J, N PACKAGES			
1	nc	8	Q
2	CLR	9	K1
3	J1	10	K2
4	J2	11	K3
5	J3	12	CLK
6	Q̄	13	PRE
7	GND	14	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

111

DUAL J-K MASTER-SLAVE FLIP-FLOPS WITH DATA LOCKOUT

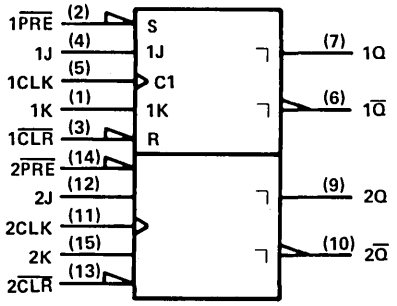
typical performance

TYPE	f_{max}	PWR/ FF	SET-UP	HOLD
'111	25 MHz	70 mW	0 ns↑	30 ns↑

↑ Rising edge of clock pulse

SN54111 (J) SN74111 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	1K	9	2Q
2	1PRE	10	2Q̄
3	1CLR	11	2CLK
4	1J	12	2J
5	1CLK	13	2CLR
6	1Q̄	14	2PRE
7	1Q	15	2K
8	GND	16	V_{CC}

112

DUAL J-K NEGATIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET AND CLEAR

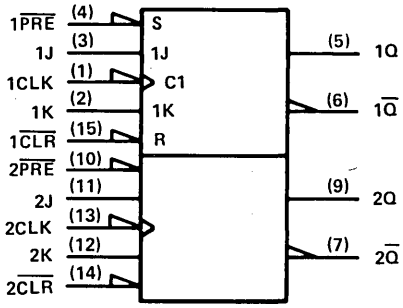
typical performance

TYPE	f_{max}	PWR/ F-F	SET-UP	HOLD
'ALS112A	40 MHz	6 mW	25 ns↓	0 ns↓
'AS112	200 MHz	95 mW		
'LS112A	45 MHz	10 mW	20 ns↓	0 ns↓
'S112	125 MHz	75 mW	3 ns↓	0 ns↓

↓ Falling edge of clock pulse

SN54ALS112A (J,FH) SN74ALS112A (N,FN)
SN54AS112 (J,FH) SN74AS112 (N,FN)
SN54LS112A (J,FH) SN74LS112A (J,N,FN)
SN54S112 (J,FH) SN74S112 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	1CLK	9	2Q
2	1K	10	2PRE
3	1J	11	2J
4	1PRE	12	2K
5	1Q	13	2CLK
6	1Q̄	14	2CLR
7	2Q̄	15	1CLR
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1CLK	12	2Q
3	1K	13	2PRE
4	1J	14	2J
5	1PRE	15	2K
6	nc	16	nc
7	1Q	17	2CLK
8	1Q̄	18	2CLR
9	2Q̄	19	1CLR
10	GND	20	V_{CC}

113

DUAL J-K NEGATIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET

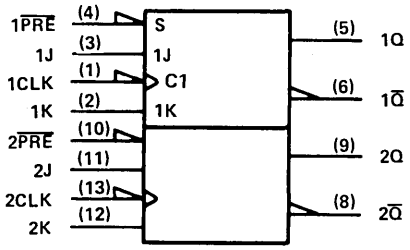
typical performance

TYPE	f_{max}	PWR/ F-F	SET-UP	HOLD
'ALS113A	40 MHz	6 mW	25 ns↓	0 ns↓
'AS113	200 MHz	95 mW		
'LS113A	45 MHz	10 mW	20 ns↓	0 ns↓
'S113	125 MHz	75 mW	3 ns↓	0 ns↓

↓ Falling edge of clock pulse

SN54ALS113A (J,FH) SN74ALS113A (N,FN)
SN54AS113 (J,FH) SN74AS113 (N,FN)
SN54LS113A (J,FH) SN74LS113A (J,N,FN)
SN54S113 (J,FH) SN74S113 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	1CLK	8	2Q̄
2	1K	9	2Q
3	1J	10	2PRE
4	1PRE	11	2J
5	1Q	12	2K
6	1Q̄	13	2CLK
7	GND	14	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1CLK	12	2Q̄
3	1K	13	2Q
4	1J	14	2PRE
5	nc	15	nc
6	1PRE	16	2J
7	nc	17	nc
8	1Q	18	2K
9	1Q̄	19	2CLK
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

114

DUAL J-K NEGATIVE-EDGE-TRIGGERED FLIP-FLOPS WITH PRESET, COMMON, AND COMMON CLOCK

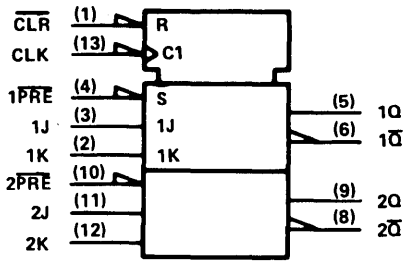
typical performance

TYPE	f_{max}	PWR/ F-F	SET-UP	HOLD
'ALS114A	40 MHz	6 mW	25 ns↓	0 ns↓
'AS114	200 MHz	95 mW		
'LS114A	45 MHz	10 mW	20 ns↓	0 ns↓
'S114	125 MHz	75 mW	3 ns↓	0 ns↓

↓ Falling edge of clock pulse

SN54ALS114A (J,FH) SN74ALS114A (N,FN)
SN54AS114 (J,FH) SN74AS114 (N,FN)
SN54LS114A (J,FH) SN74LS114A (J,N,FN)
SN54S114 (J,FH) SN74S114 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1CLR	8	2Q̄	1	nc	11	nc
2	1K	9	2Q	2	1CLR	12	2Q̄
3	1J	10	2PRE	3	1K	13	2Q
4	1PRE	11	2J	4	1J	14	2PRE
5	1Q	12	2K	5	nc	15	nc
6	1Q̄	13	CLK	6	1PRE	16	2J
7	GND	14	V_{CC}	7	nc	17	nc
				8	1Q	18	2K
				9	1Q̄	19	CLK
				10	GND	20	V_{CC}

116

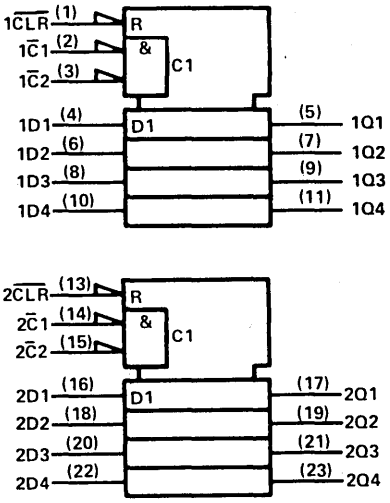
DUAL 4-BIT LATCHES

typical performance

TYPE	BITS	CLEAR	DELAY	TOTAL POWER
'116	8	LOW	11 ns	250 mW

SN54116 (J,FH) SN74116 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	1CLR	13	2CLR	1	nc	15	nc
2	1C1	14	2C1	2	1CLR	16	2CLR
3	1C2	15	2C2	3	1C1	17	2C1
4	1D1	16	2D1	4	1C2	18	2C2
5	1Q1	17	2Q1	5	1D1	19	2D1
6	1D2	18	2D2	6	1Q1	20	2Q1
7	1Q2	19	2Q2	7	1D2	21	2D2
8	1D3	20	2D3	8	nc	22	nc
9	1Q3	21	2Q3	9	1Q2	23	2Q2
10	1D4	22	2D4	10	1D3	24	2D3
11	1Q4	23	2Q4	11	1Q3	25	2Q3
12	GND	24	V_{CC}	12	1D4	26	2D4
				13	1Q4	27	2Q4
				14	GND	28	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

120

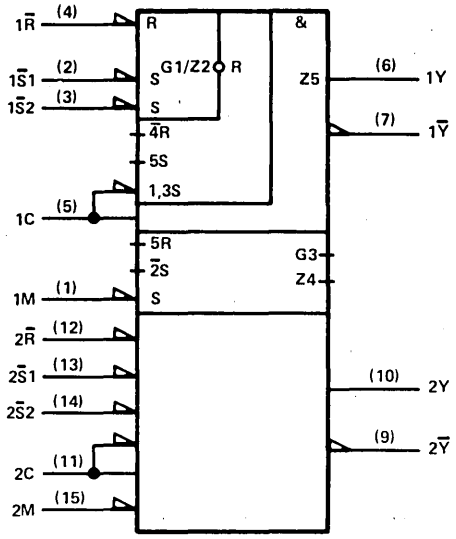
DUAL PULSE SYNCHRONIZERS/DRIVERS

typical performance

TYPE	ENABLE INPUT	COMP OUTPUT	FREQ RANGE	POWER
'120	YES	YES	DC to 30 MHz	255 mW

SN54120 (J,FH) SN74120 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	1M	9	2Ȳ	1	nc	11	nc
2	1S̄1	10	2Y	2	1M	12	2Ȳ
3	1S̄2	11	2C	3	1S̄1	13	2Y
4	1R̄	12	2R̄	4	1S̄2	14	2C
5	1C	13	2S̄1	5	1R̄	15	2R̄
6	1Y	14	2S̄2	6	nc	16	nc
7	1Ȳ	15	2M	7	1C	17	2S̄1
8	GND	16	V_{CC}	8	1Ȳ	18	2S̄2
				9	1Y	19	2M
				10	GND	20	V_{CC}

121

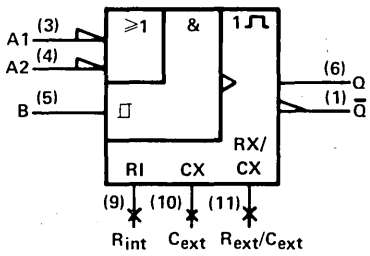
MONOSTABLE MULTIVIBRATORS

typical performance

TYPE	NO. OF INPUTS		OUTPUT PULSE RANGE	TOTAL POWER
	HI	LO		
'121	1	2	40 ns-28 s	90 mW
'L121	1	2	40 ns-28 s	40 mW

SN54121 (J) SN74121 (J,N)
SN54L121 (J)

logic symbol†



pin assignments

J, N PACKAGES			
1	Q̄	8	nc
2	nc	9	R_{int}
3	A1	10	C_{ext}
4	A2	11	R_{ext}/C_{ext}
5	B	12	nc
6	Q	13	nc
7	GND	14	V_{CC}

'121 . . . R_{int} = 2 kΩ nominal
'L121 . . . R_{int} = 4 kΩ nominal

122

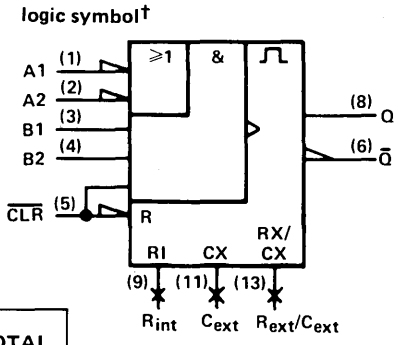
RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH CLEAR

typical performance

TYPE	NO. OF INPUTS		DIRECT CLEAR	OUTPUT PULSE RANGE	TOTAL POWER
	HI	LO			
'122	2	2	YES	45 ns-∞	115 mW
'L122	2	2	YES	90 ns-∞	55 mW
'LS122	2	2	YES	45 ns-∞	30 mW

SN54122 (J,FH) SN74122 (J,N)
SN54L122 (J)
SN54LS122 (J,FH) SN74LS122 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A1	8	Q	1	nc	11	nc
2	A2	9	R_{INT}	2	A1	12	Q
3	B1	10	nc	3	A2	13	R_{int}
4	B2	11	C_{EXT}	4	B1	14	nc
5	CLR̄	12	nc	5	nc	15	nc
6	Q̄	13	R_{ext}/C_{ext}	6	B2	16	C_{ext}
7	GND	14	V_{CC}	7	nc	17	nc
				8	CLR̄	18	nc
				9	Q̄	19	R_{ext} C_{ext}
				10	GND	20	V_{CC}

'122 . . . R_{int} = 10 kΩ nominal
'L122 . . . R_{int} = 20 kΩ nominal
'LS122 . . . R_{int} = 10 kΩ nominal

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

123

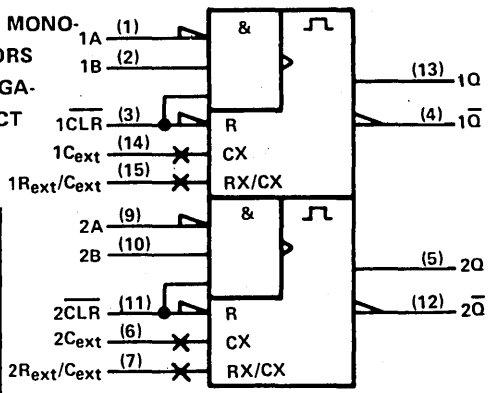
DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH POSITIVE AND NEGATIVE INPUTS AND DIRECT CLEAR

typical performance

TYPE	OUTPUT PULSE RANGE	TOTAL POWER
'123	45 ns-∞	230 mW
'L123	90 ns-∞	115 mW
'LS123	45 ns-∞	60 mW

SN54123 (J,FH) SN74123 (J,N)
SN54L123 (J)
SN54LS123 (J,FH) SN74LS123 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	9	2A	1	nc	11	nc
2	1B	10	2B	2	1A	12	2A
3	1$\overline{CLR}$	11	2$\overline{CLR}$	3	1B	13	2B
4	1$\overline{Q}$	12	2$\overline{Q}$	4	1$\overline{CLR}$	14	2$\overline{CLR}$
5	2Q	13	1Q	5	1$\overline{Q}$	15	2$\overline{Q}$
6	$2C_{ext}$	14	$1C_{ext}$	6	nc	16	nc
7	$2R_{ext}/C_{ext}$	15	$1R_{ext}/C_{ext}$	7	2Q	17	1Q
8	GND	16	V_{CC}	8	$2C_{ext}$	18	$1C_{ext}$
				9	$2R_{ext}/C_{ext}$	19	$1R_{ext}/C_{ext}$
				10	GND	20	V_{CC}

124

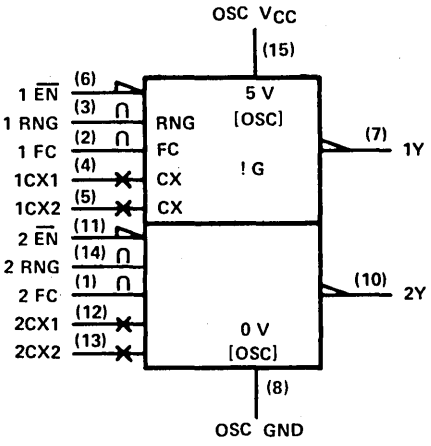
DUAL VOLTAGE-CONTROLLED OSCILLATORS WITH ENABLE INPUTS

typical performance

TYPE	FREQ RANGE	POWER
'S124	1 Hz to 60 MHz	525 mW

SN54S124 (J,FH) SN74S124 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	2FC	9	GND	1	nc	11	nc
2	1FC	10	2Y	2	2FC	12	GND
3	1RNG	11	2$\overline{EN}$	3	1FC	13	2Y
4	1CX1	12	2CX1	4	1RNG	14	2$\overline{EN}$
5	1CX2	13	2CX2	5	1CX1	15	2CX1
6	1$\overline{EN}$	14	2RNG	6	nc	16	nc
7	1Y	15	OSC V_{CC}	7	1CX2	17	2CX2
8	OSC GND	16	V_{CC}	8	1$\overline{EN}$	18	2RNG
				9	1Y	19	OSC V_{CC}
				10	OSC GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

125

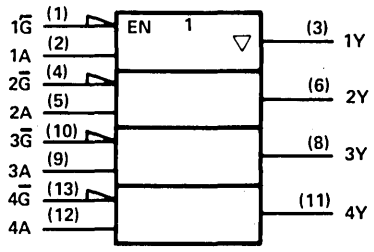
QUADRUPLE BUS BUFFER GATES WITH THREE-STATE OUTPUTS

typical performance

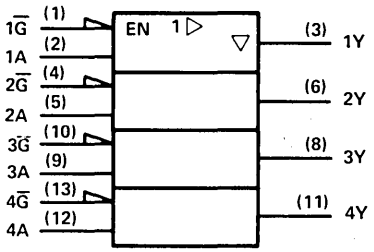
TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54125	10 ns	−2 mA	16 mA
SN74125	10 ns	−5.2 mA	16 mA
SN54LS125A	8 ns	−1 mA	12 mA
SN74LS125A	8 ns	−2.6 mA	24 mA

SN54125 (J,FH) SN74125 (J,N)
SN54LS125A (J,FH) SN74LS125A (J,N,FN)

logic symbol, '125†



logic symbol, 'LS125A†



positive logic: Y = A

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1G̅	8	3Y	1	nc	11	nc
2	1A	9	3A	2	1G̅	12	3Y
3	1Y	10	3G̅	3	1A	13	3A
4	2G̅	11	4Y	4	1Y	14	3G̅
5	2A	12	4A	5	nc	15	nc
6	2Y	13	4G̅	6	2G̅	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2A	18	4A
				9	2Y	19	4G̅
				10	GND	20	V_{CC}

126

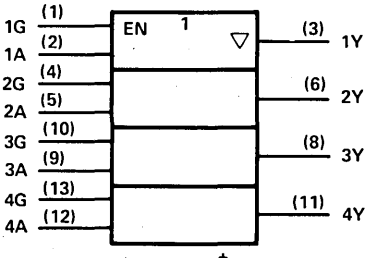
QUADRUPLE BUS BUFFER GATES WITH THREE-STATE OUTPUTS

typical performance

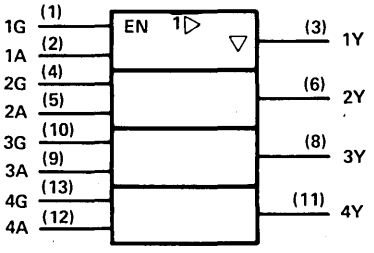
TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54126	10 ns	−2 mA	16 mA
SN74126	10 ns	−5.2 mA	16 mA
SN54LS126A	8.5 ns	−1 mA	12 mA
SN74LS126A	8.5 ns	−2.6 mA	24 mA

SN54126 (J,FH) SN74126 (J,N)
SN54LS126A (J,FH) SN74LS126A (J,N,FN)

logic symbol, '126†



logic symbol, 'LS126A†



positive logic: Y = A

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1G	8	3Y	1	nc	11	nc
2	1A	9	3A	2	1G	12	3Y
3	1Y	10	3G	3	1A	13	3A
4	2G	11	4Y	4	1Y	14	3G
5	2A	12	4A	5	nc	15	nc
6	2Y	13	4G	6	2G	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2A	18	4A
				9	2Y	19	4G
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

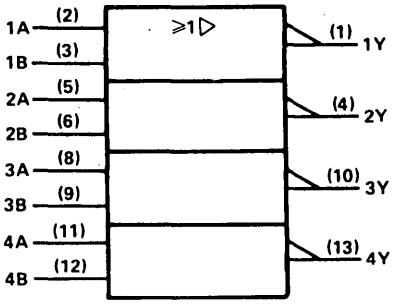
128

LINE DRIVERS
(SN54128 . . . 75 Ω DRIVER
SN74128 . . . 50 Ω DRIVER)
typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT	DELAY
SN54128	48 mA	−29 mA	7 ns
SN74128	48 mA	−42.4 mA	7 ns

SN54128 (J,FH) SN74128 (J,N)

logic symbol†



positive logic: $Y = \overline{A + B}$

pin assignments

J, N PACKAGES				FH PACKAGE			
1	1Y	8	3A	1	nc	11	nc
2	1A	9	3B	2	1Y	12	3A
3	1B	10	3Y	3	1A	13	3B
4	2Y	11	4A	4	1B	14	3Y
5	2A	12	4B	5	nc	15	nc
6	2B	13	4Y	6	2Y	16	4A
7	GND	14	V_{CC}	7	nc	17	nc
				8	2A	18	4B
				9	2B	19	4Y
				10	GND	20	V_{CC}

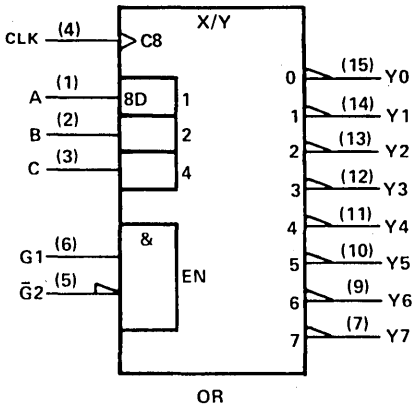
131

3- TO 8-LINE DECODERS/ DEMULTIPLEXERS WITH ADDRESS REGISTERS
(combines decoder and 3-bit address register and incorporates 2 enable inputs to simplify cascading)
typical performance

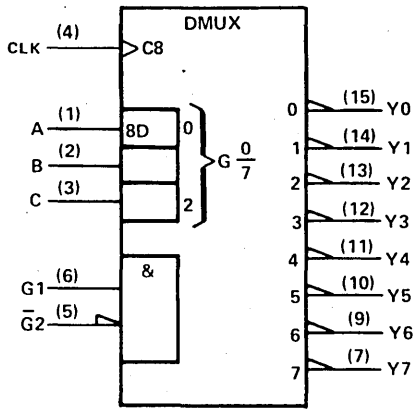
TYPE	CLOCK TO OUTPUT	ENABLE TIME	TOTAL POWER
'ALS131	8.5 ns	10 ns	25 mW

SN54ALS131 (J,FH) SN74ALS131 (N,FN)

logic symbols†



OR



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A	9	Y6	1	nc	11	nc
2	B	10	Y5	2	A	12	Y6
3	C	11	Y4	3	B	13	Y5
4	CLK	12	Y3	4	C	14	Y4
5	$\overline{G2}$	13	Y2	5	CLK	15	Y3
6	G1	14	Y1	6	nc	16	nc
7	Y7	15	Y0	7	$\overline{G2}$	17	Y2
8	GND	16	V_{CC}	8	G1	18	Y1
				9	Y7	19	Y0
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

132

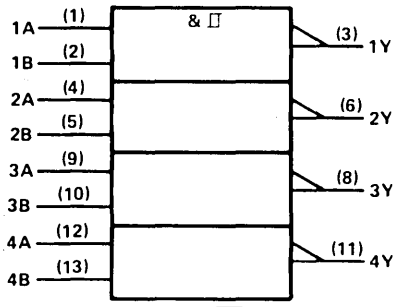
QUADRUPLE 2-INPUT POSITIVE-NAND SCHMITT TRIGGERS

typical performance

TYPE	HYSTERESIS	DELAY
'132	0.8 V	15 ns
'LS132	0.8 V	15 ns
'S132	0.55 V	8 ns

SN54132 (J,FH) SN74132 (J,N)
SN54LS132 (J,FH) SN74LS132 (J,N,FN)
SN54S132 (J,FH) SN74S132 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{AB}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

133

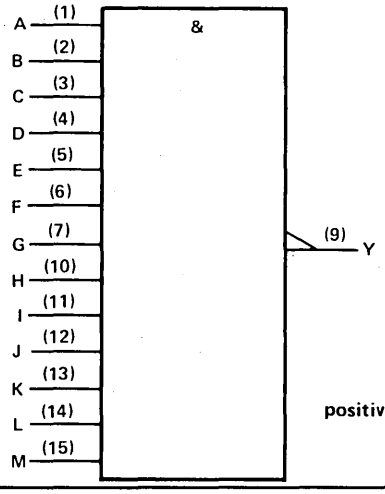
13-INPUT POSITIVE-NAND GATES

typical performance

TYPE	POWER	DELAY
'ALS133	2 mW	8 ns
'S133	19 mW	3 ns

SN54ALS133 (J,FH) SN74ALS133 (N,FN)
SN54S133 (J,FH) SN74S133 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{ABCDEFGHIJKLM}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A	9	Y	1	nc	11	nc
2	B	10	H	2	A	12	Y
3	C	11	I	3	B	13	H
4	D	12	J	4	C	14	I
5	E	13	K	5	D	15	J
6	F	14	L	6	nc	16	nc
7	G	15	M	7	E	17	K
8	GND	16	V_{CC}	8	F	18	L
				9	G	19	M
				10	GND	20	V_{CC}

134

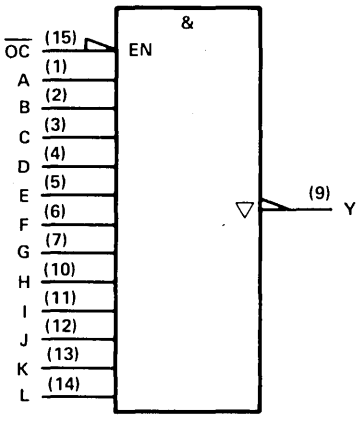
12-INPUT POSITIVE-NAND GATES WITH THREE-STATE OUTPUTS

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54S134	4.5 ns	−2 mA	20 mA
SN74S134	4.5 ns	−6.5 mA	20 mA

SN54S134 (J,FH) SN74S134 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{ABCDEFGHIJKL}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A	9	Y	1	nc	11	nc
2	B	10	H	2	A	12	Y
3	C	11	I	3	B	13	H
4	D	12	J	4	C	14	I
5	E	13	K	5	D	15	J
6	F	14	L	6	nc	16	nc
7	G	15	$\overline{OC}$	7	E	17	K
8	GND	16	V_{CC}	8	F	18	L
				9	G	19	$\overline{OC}$
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

135

QUAD EXCLUSIVE OR/NOR GATES

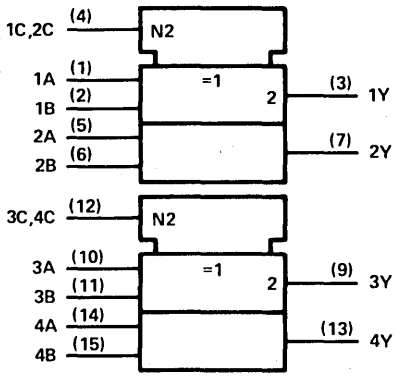
SN54S135 (J,FH)

SN74S135 (J,N,FN)

typical performance

TYPE	POWER	DELAY
'S135	325 mW	8 ns

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	9	3Y	1	nc	11	nc
2	1B	10	3A	2	1A	12	3Y
3	1Y	11	3B	3	1B	13	3A
4	1C,2C	12	3C,4C	4	1Y	14	3B
5	2A	13	4Y	5	1C,2C	15	3C,4C
6	2B	14	4A	6	nc	16	nc
7	2Y	15	4B	7	2A	17	4Y
8	GND	16	V_{CC}	8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

positive logic: $Y = A \oplus B \oplus C = A\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}\bar{B}C + ABC$

136

QUAD EXCLUSIVE-OR GATES WITH OPEN-COLLECTOR OUTPUTS

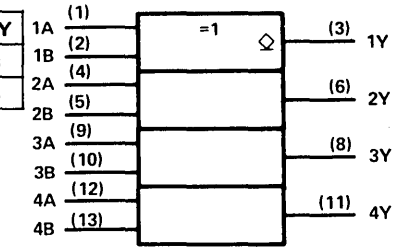
SN54136 (J,FH)
SN54LS136 (J,FH)

SN74136 (J,N)
SN74LS136 (J,N,FN)

typical performance

TYPE	POWER	DELAY
'136	150 mW	27 ns
'LS136	30 mW	18 ns

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

positive logic: $Y = A \oplus B = A\bar{B} + \bar{A}B$

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

137

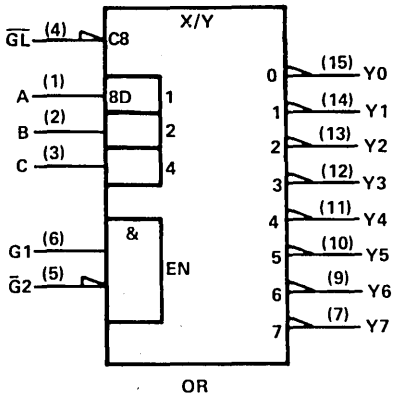
3- TO 8-LINE DECODERS/ DEMULTIPLEXERS WITH ADDRESS LATCHES

typical performance

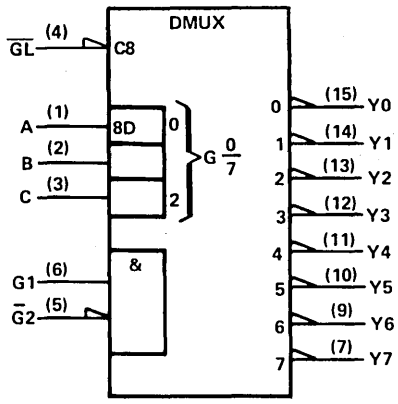
TYPE	SELECT TIME	ENABLE TIME	TOTAL POWER
'ALS137	11 ns	10 ns	25 mW
'LS137	17.5 ns	16 ns	55 mW

SN54ALS137 (J,FH) SN74ALS137 (N,FN)
SN54LS137 (J,FH) SN74LS137 (J,N,FN)

logic symbol†



OR



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A	9	Y6	1	nc	11	nc
2	B	10	Y5	2	A	12	Y6
3	C	11	Y4	3	B	13	Y5
4	$\overline{GL}$	12	Y3	4	C	14	Y4
5	$\overline{G2}$	13	Y2	5	$\overline{GL}$	15	Y3
6	G1	14	Y1	6	nc	16	nc
7	Y7	15	Y0	7	$\overline{G2}$	17	Y2
8	GND	16	V_{CC}	8	G1	18	Y1
				9	Y7	19	Y0
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

138

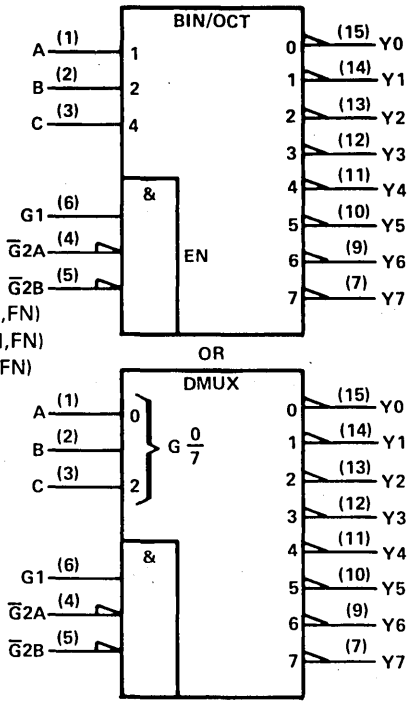
3- TO 8-LINE DECODERS/ DEMULTIPLEXERS

typical performance

TYPE	SELECT TIME	ENABLE TIME	TOTAL POWER
'ALS138	8.5 ns	9 ns	25 mW
'LS138	22 ns	21 ns	31 mW
'S138	8 ns	7 ns	245 mW

SN54ALS138 (J,FH) SN74ALS138 (N,FN)
SN54LS138 (J,FH) SN74LS138 (J,N,FN)
SN54S138 (J,FH) SN74S138 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A	9	Y6	1	nc	11	nc
2	B	10	Y5	2	A	12	Y6
3	C	11	Y4	3	B	13	Y5
4	$\overline{G}$2A	12	Y3	4	C	14	Y4
5	$\overline{G}$2B	13	Y2	5	$\overline{G}$2A	15	Y3
6	G1	14	Y1	6	nc	16	nc
7	Y7	15	Y0	7	$\overline{G}$2B	17	Y2
8	GND	16	V_{CC}	8	G1	18	Y1
				9	Y7	19	Y0
				10	GND	20	V_{CC}

139

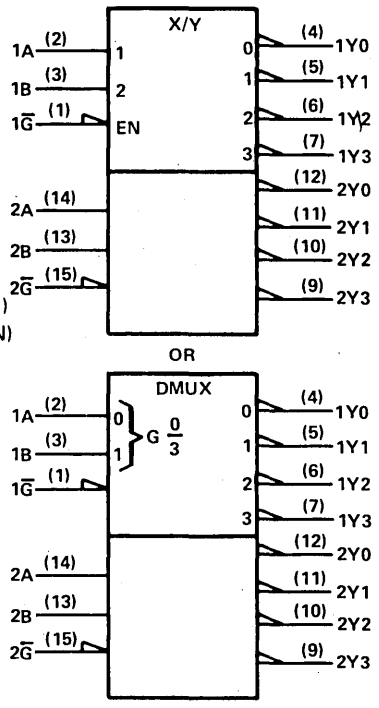
DUAL 2- TO 4-LINE DECODERS/DEMULTIPLEXERS

typical performance

TYPE	SELECT TIME	ENABLE TIME	TOTAL POWER
'ALS139			
'LS139	22 ns	19 ns	34 mW
'S139	7.5 ns	6 ns	300 mW

SN54ALS139 (J,FH) SN74ALS139 (N,FN)
SN54LS139 (J,FH) SN74LS139 (J,N,FN)
SN54S139 (J,FH) SN74S139 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1$\overline{G}$	9	2Y3	1	nc	11	nc
2	1A	10	2Y2	2	1$\overline{G}$	12	2Y3
3	1B	11	2Y1	3	1A	13	2Y2
4	1Y0	12	2Y0	4	1B	14	2Y1
5	1Y1	13	2B	5	1Y0	15	2Y0
6	1Y2	14	2A	6	nc	16	nc
7	1Y3	15	2$\overline{G}$	7	1Y1	17	2B
8	GND	16	V_{CC}	8	1Y2	18	2A
				9	1Y3	19	2$\overline{G}$
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

140

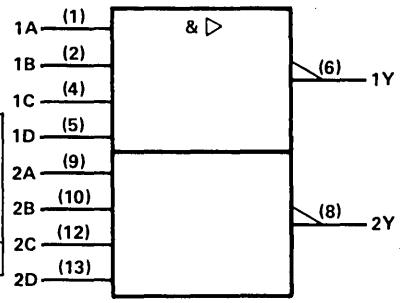
DUAL 4-INPUT POSITIVE-NAND 50-OHM LINE DRIVERS

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT	DELAY	POWER PER GATE
'S140	60 mA	–40 mA	4 ns	44 mW

SN54S140 (J,FH) SN74S140 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{ABCD}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	2Y	1	nc	11	nc
2	1B	9	2A	2	1A	12	2Y
3	nc	10	2B	3	1B	13	2A
4	1C	11	nc	4	nc	14	2B
5	1D	12	2C	5	nc	15	nc
6	1Y	13	2D	6	1C	16	nc
7	GND	14	V_{CC}	7	nc	17	nc
				8	1D	18	2C
				9	1Y	19	2D
				10	GND	20	V_{CC}

141

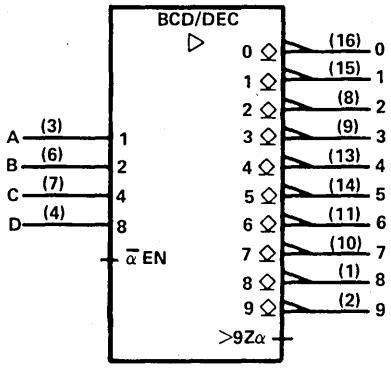
BCD-TO-DECIMAL DECODER/DRIVER

typical performance

TYPE	OUTPUT SINK CURRENT	OFF-STATE OUTPUT VOLTAGE	TOTAL POWER
'141	7 mA	60 V	80 mW

SN74141 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	8	9	3
2	9	10	7
3	A	11	6
4	D	12	GND
5	V_{CC}	13	4
6	B	14	5
7	C	15	1
8	2	16	0

142

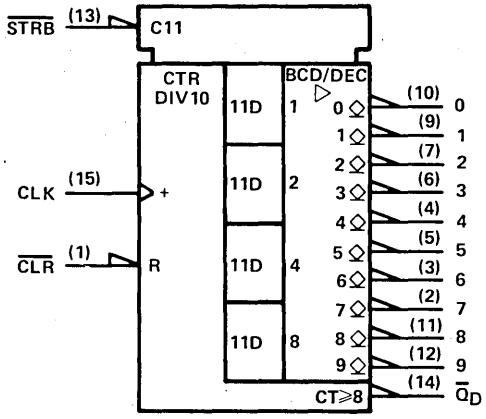
COUNTER/LATCH/DECODER/DRIVER

typical performance

TYPE	OUTPUT SINK CURRENT	OFF-STATE OUTPUT VOLTAGE	TOTAL POWER
'142	7 mA	55 V	340 mW

SN74142 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	$\overline{CLR}$	9	1
2	7	10	0
3	6	11	8
4	4	12	9
5	5	13	$\overline{STRB}$
6	3	14	$\overline{Q}_D$
7	2	15	CLK
8	GND	16	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

143,144

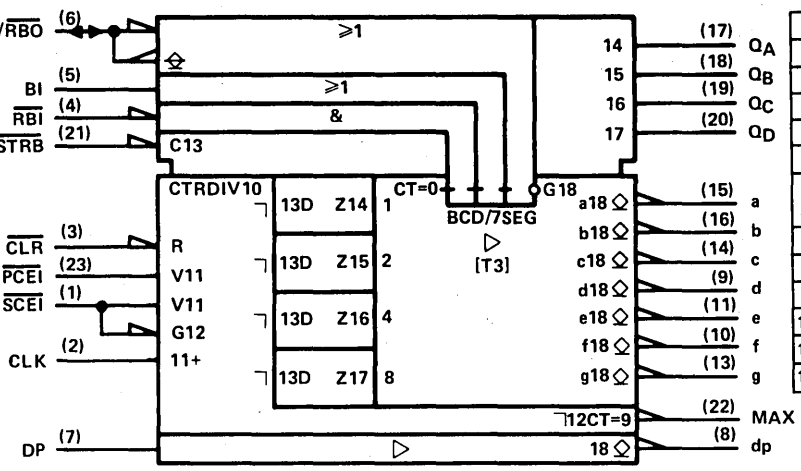
COUNTERS/LATCHES/ DECODERS/DRIVERS

typical performance

TYPE	OUTPUT SINK CURRENT	OFF-STATE OUTPUT VOLTAGE
SN54143	15 mA*	7 V
SN74143	15 mA*	7 V
SN54144	20 mA	15 V
SN74144	25 mA	15 V

SN54143 (J) SN74143 (J,N)
SN54144 (J) SN74144 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	SCEI	13	g
2	CLK	14	c
3	CLR	15	a
4	RBI	16	b
5	BI	17	QA
6	BI/RBO	18	QB
7	DP	19	QC
8	dp	20	QD
9	d	21	STRB
10	f	22	MAX
11	e	23	PCEI
12	GND	24	V_{CC}

* Constant current

145

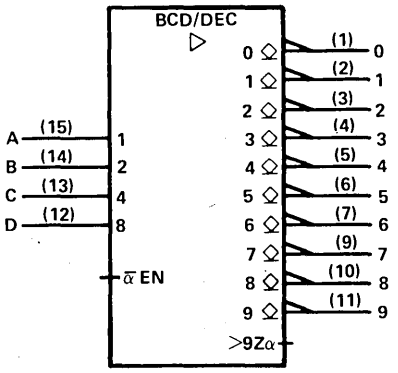
BCD-TO-DECIMAL DECODERS/ DRIVERS FOR LAMPS, RELAYS, MOS

typical performance

TYPE	OUTPUT SINK CURRENT	OFF-STATE OUTPUT VOLTAGE	TOTAL POWER
'145	80 mA	15 V	215 mW
'54LS145	12 mA	15 V	35 mW
'74LS145	80 mA	15 V	35 mW

SN54145 (J,FH) SN74145 (J,N)
SN54LS145 (J,FH) SN74LS145 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	0	9	7
2	1	10	8
3	2	11	9
4	3	12	D
5	4	13	C
6	5	14	B
7	6	15	A
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	0	12	7
3	1	13	8
4	2	14	9
5	3	15	D
6	nc	16	nc
7	4	17	C
8	5	18	B
9	6	19	A
10	GND	20	V_{CC}

147

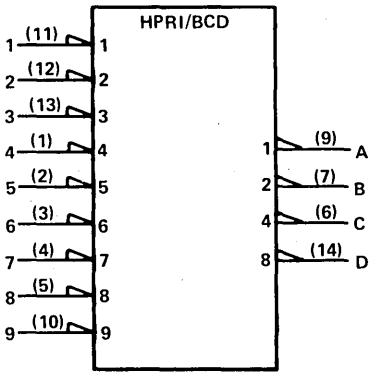
10-LINE DECIMAL TO 4-LINE BCD PRIORITY ENCODERS

typical performance

TYPE	POWER	DELAY
'147	225 mW	10 ns
'LS147	60 mW	15 ns

SN54147 (J,FH) SN74147 (J,N)
SN54LS147 (J,FH) SN74LS147 (J,N,FN)

logic symbol†



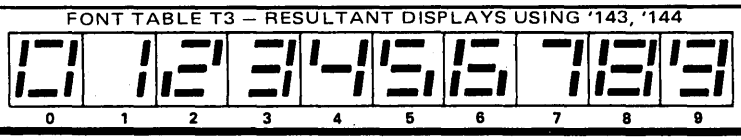
pin assignments

J, N PACKAGES			
1	4	9	A
2	5	10	9
3	6	11	1
4	7	12	2
5	8	13	3
6	C	14	D
7	B	15	nc
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	4	12	A
3	5	13	9
4	6	14	1
5	7	15	2
6	nc	16	nc
7	8	17	3
8	C	18	D
9	B	19	nc
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

FONT TABLE T3 — RESULTANT DISPLAYS USING '143, '144



© IC MASTER 1983

148

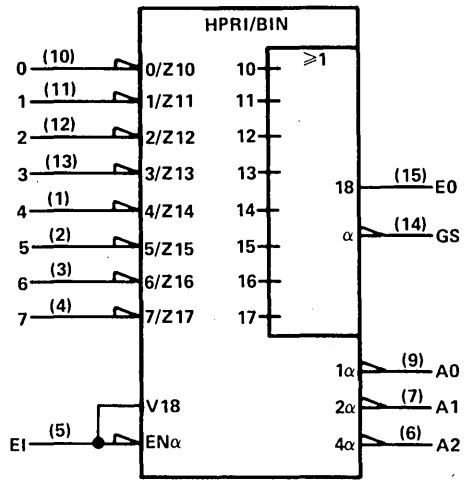
8- TO 3-LINE OCTAL PRIORITY ENCODERS

typical performance

TYPE	POWER	DELAY
'148	190 mW	12 ns
'LS148	60 mW	15 ns

SN54148 (J,FH) SN74148 (J,N)
SN54LS148 (J,FH) SN74LS148 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES	
1	4	9	A0	1 nc	11 nc
2	5	10	0	2 4	12 A0
3	6	11	1	3 5	13 0
4	7	12	2	4 6	14 1
5	E1	13	3	5 7	15 2
6	A2	14	GS	6 nc	16 nc
7	A1	15	E0	7 E1	17 3
8	GND	16	V_{CC}	8 A2	18 GS
				9 A1	19 E0
				10 GND	20 V_{CC}

150

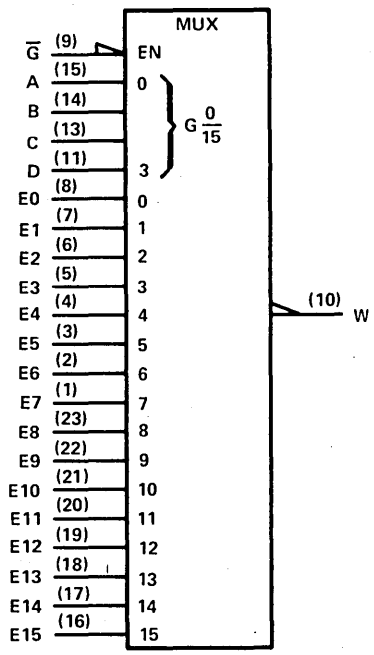
1-OF-16 DATA SELECTORS/ MULTIPLEXERS

typical performance

TYPE	DATA TO INV OUTPUT	FROM ENABLE	TOTAL POWER
'150	11 ns	18 ns	200 mW

SN54150 (J,FH) SN74150 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE	
1	E7	13	C	1 nc	15 nc
2	E6	14	B	2 E7	16 C
3	E5	15	A	3 E6	17 B
4	E4	16	E15	4 E5	18 A
5	E3	17	E14	5 E4	19 E15
6	E2	18	E13	6 E3	20 E14
7	E1	19	E12	7 E2	21 E13
8	E0	20	E11	8 nc	22 nc
9	$\overline{G}$	21	E10	9 E1	23 E12
10	W	22	E9	10 E0	24 E11
11	D	23	E8	11 $\overline{G}$	25 E10
12	GND	24	V_{CC}	12 W	26 E9
				13 D	27 E8
				14 GND	28 V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

151

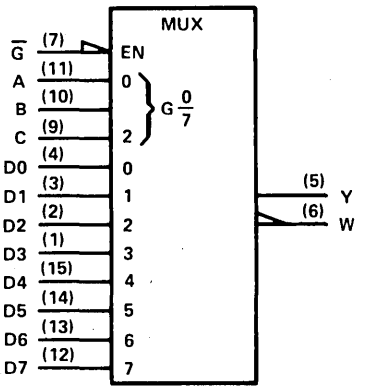
1-OF-8 DATA SELECTORS/MULTIPLEXERS

typical performance

TYPE	DELAY TIMES			TOTAL POWER
	DATA TO INV OUTPUT	DATA TO NON-INV OUTPUT	FROM ENABLE	
'151A	8 ns	16 ns	22 ns	145 mW
'ALS151	6 ns	5 ns	4.5 ns	30 mW
'AS151	3 ns	3.5 ns	5 ns	130 mW
'LS151	11 ns	18 ns	27 ns	30 mW
'S151	4.5 ns	8 ns	9 ns	225 mW

SN54151A (J,FH) SN74151A (J,N)
SN54ALS151 (J,FH) SN74ALS151 (N,FN)
SN54AS151 (J,FH) SN74AS151 (N,FN)
SN54LS151 (J,FH) SN74LS151 (J,N,FN)
SN54S151 (J,FH) SN74S151 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	D3	9	C	1	nc	11	nc
2	D2	10	B	2	D3	12	C
3	D1	11	A	3	D2	13	B
4	D0	12	D7	4	D1	14	A
5	Y	13	D6	5	D0	15	D7
6	W	14	D5	6	nc	16	nc
7	$\overline{G}$	15	D4	7	Y	17	D6
8	GND	16	V_{CC}	8	W	18	D5
				9	$\overline{G}$	19	D4
				10	GND	20	V_{CC}

152

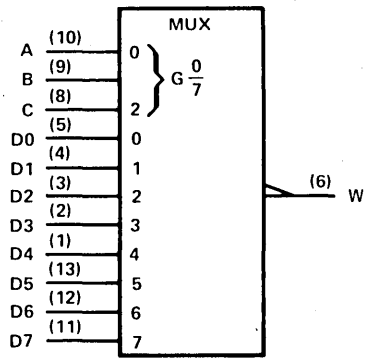
1-of-8 DATA SELECTORS/MULTIPLEXERS

typical performance

TYPE	DELAY TIMES		TOTAL POWER
	DATA TO INV OUTPUT	FROM ENABLE	
'152A	8 ns		130 mW
'LS152	11 ns	18 ns	28 mW

SN54152A (J,FH)
SN54LS152 (J,FH) SN74LS152 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	D4	8	C	1	nc	11	nc
2	D3	9	B	2	D4	12	C
3	D2	10	A	3	D3	13	B
4	D1	11	D7	4	D2	14	A
5	D0	12	D6	5	nc	15	nc
6	W	13	D5	6	D1	16	D7
7	GND	14	V_{CC}	7	nc	17	nc
				8	D0	18	D6
				9	W	19	D5
				10	GND	20	V_{CC}

153

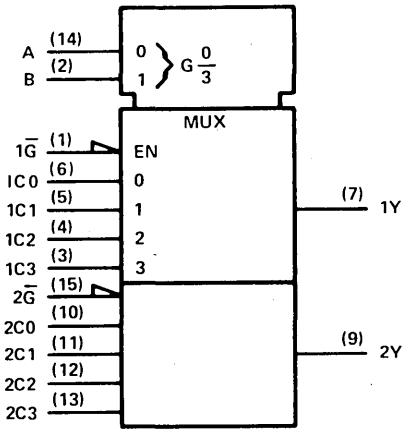
DUAL 4-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

typical performance

TYPE	DELAY TIMES		TOTAL POWER
	DATA TO NON-INV OUTPUT	FROM ENABLE	
'153	14 ns	17 ns	180 mW
'ALS153	5 ns	4.5 ns	31.5 mW
'AS153	3.5 ns	5 ns	105 mW
'L153	27 ns	34 ns	90 mW
'LS153	14 ns	17 ns	31 mW
'S153	6 ns	9.5 ns	225 mW

SN54153 (J,FH) SN74153 (J,N)
SN54ALS153 (J,FH) SN74ALS153 (N,FN)
SN54AS153 (J,FH) SN74AS153 (N,FN)
SN54L153 (J)
SN54LS153 (J,FH) SN74LS153 (J,N,FN)
SN54S153 (J,FH) SN74S153 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1$\overline{G}$	9	2Y	1	nc	11	nc
2	B	10	2C0	2	1$\overline{G}$	12	2Y
3	1C3	11	2C1	3	B	13	2C0
4	1C2	12	2C2	4	1C3	14	2C1
5	1C1	13	2C3	5	1C2	15	2C2
6	1C0	14	A	6	nc	16	nc
7	1Y	15	2$\overline{G}$	7	1C1	17	2C3
8	GND	16	V_{CC}	8	1C0	18	A
				9	1Y	19	2$\overline{G}$
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc – no internal connection.

© IC MASTER 1983

154

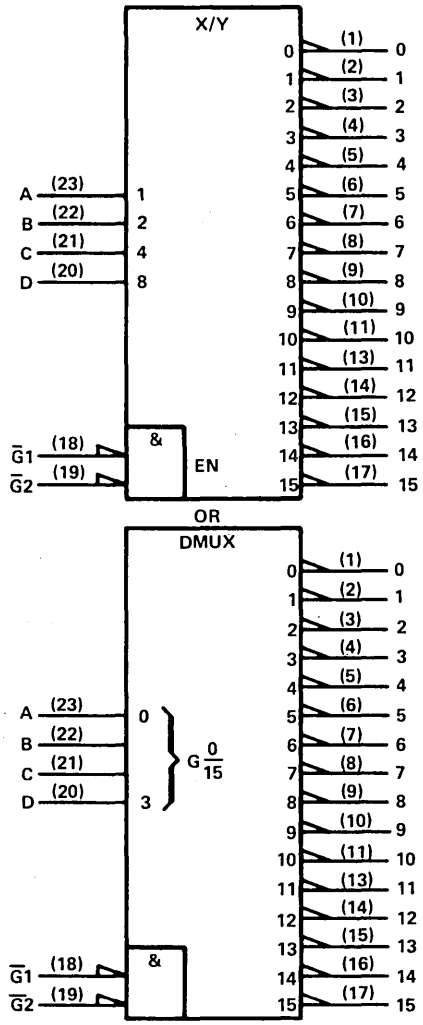
4-LINE TO 16-LINE DECODERS/ DEMULTIPLEXERS

typical performance

TYPE	SELECT TIME	ENABLE TIME	TOTAL POWER
'154	23 ns	19 ns	170 mW
'L154	46 ns	38 ns	85 mW

SN54154 (J,FH) SN74154 (J,N)
SN54L154 (J)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	0	13	11	1	nc	15	nc
2	1	14	12	2	0	16	11
3	2	15	13	3	1	17	12
4	3	16	14	4	2	18	13
5	4	17	15	5	3	19	14
6	5	18	$\overline{G1}$	6	4	20	15
7	6	19	$\overline{G2}$	7	5	21	$\overline{G1}$
8	7	20	D	8	nc	22	nc
9	8	21	C	9	6	23	$\overline{G2}$
10	9	22	B	10	7	24	D
11	10	23	A	11	8	25	C
12	GND	24	V_{CC}	12	9	26	B
				13	10	27	A
				14	GND	28	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

155

DECODERS/DEMULTIPLEXERS

(totem pole outputs)

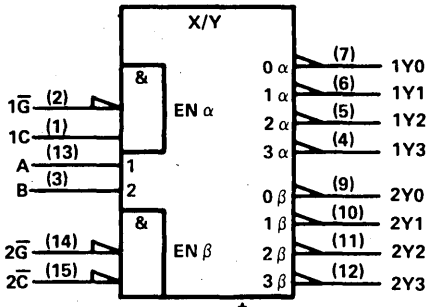
typical performance

TYPE	SELECT TIME	ENABLE TIME	TOTAL POWER
'155	21 ns	16 ns	125 mW
'LS155	18 ns	15 ns	30 mW

SN54155 (J,FH) SN74155 (J,N)
SN54LS155 (J,FH) SN74LS155 (J,N,FN)

logic symbol†

2-line to 4-line Decoder

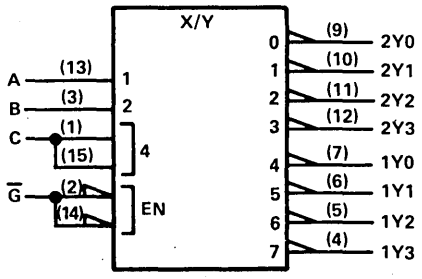


pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1C	9	2Y0	1	nc	11	nc
2	1$\overline{G}$	10	2Y1	2	1C	12	2Y0
3	B	11	2Y2	3	1$\overline{G}$	13	2Y1
4	1Y3	12	2Y3	4	B	14	2Y2
5	1Y2	13	A	5	1Y3	15	2Y3
6	1Y1	14	2$\overline{G}$	6	nc	16	nc
7	1Y0	15	2$\overline{C}$	7	1Y2	17	A
8	GND	16	V_{CC}	8	1Y1	18	2$\overline{G}$
				9	1Y0	19	2$\overline{C}$
				10	GND	20	V_{CC}

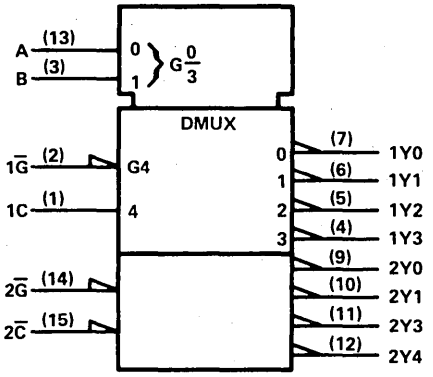
logic symbol†

3-line to 8-line Decoder



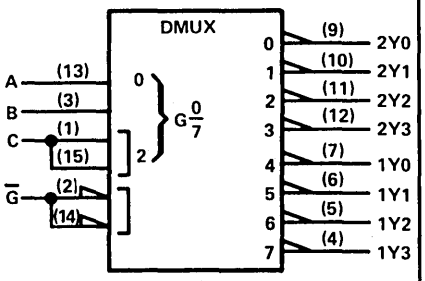
logic symbol†

1-line to 4-line DMUX



logic symbol†

1-line to 8-line DMUX



156

DECODERS/DEMULTIPLEXERS

(open-collector outputs)

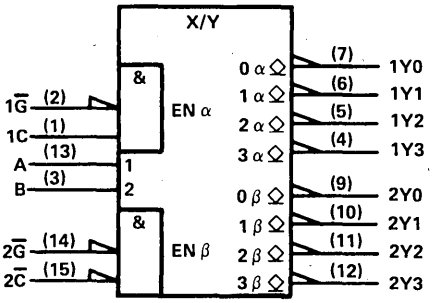
typical performance

TYPE	SELECT TIME	ENABLE TIME	TOTAL POWER
'156	23 ns	18 ns	125 mW
'LS156	33 ns	26 ns	31 mW

SN54156 (J,FH) SN74156 (J,N)
SN54LS156 (J,FH) SN74LS156 (J,N,FN)

logic symbol†

2-line to 4-line Decoder

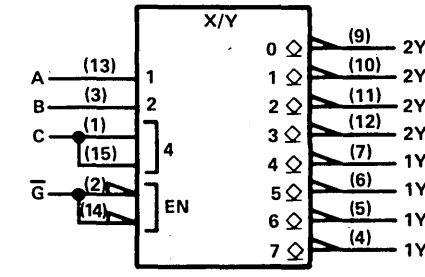


pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1C	9	2Y0	1	nc	11	nc
2	1$\overline{G}$	10	2Y1	2	1C	12	2Y0
3	B	11	2Y2	3	1$\overline{G}$	13	2Y1
4	1Y3	12	2Y3	4	B	14	2Y2
5	1Y2	13	A	5	1Y3	15	2Y3
6	1Y1	14	2$\overline{G}$	6	nc	16	nc
7	1Y0	15	2$\overline{C}$	7	1Y2	17	A
8	GND	16	V_{CC}	8	1Y1	18	2$\overline{G}$
				9	1Y0	19	2$\overline{C}$
				10	GND	20	V_{CC}

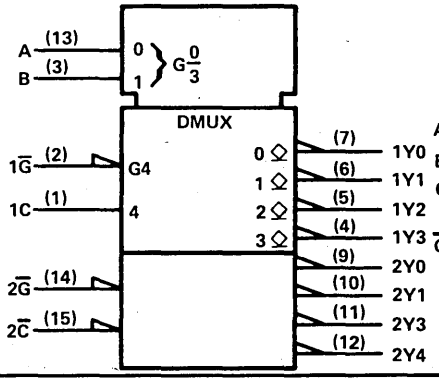
logic symbol†

3-line to 8-line Decoder



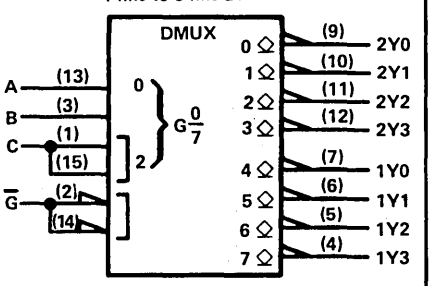
logic symbol†

1-line to 4-line DMUX



logic symbol†

1-line to 8-line DMUX



† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

157

QUAD 2- TO 1-LINE DATA SELECTORS/MULTIPLEXERS

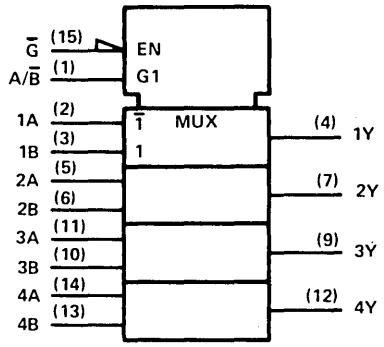
(non-inverted data outputs)

typical performance

TYPE	DELAY TIMES		TOTAL POWER
	DATA TO NON-INV OUTPUT	FROM ENABLE	
'157	9 ns	14 ns	150 mW
'ALS157	5 ns	6.5 ns	39 mW
'L157	18 ns	27 ns	75 mW
'LS157	9 ns	14 ns	49 mW
'S157	5 ns	8 ns	250 mW

SN54157 (J,FH) SN74157 (J,N)
SN54ALS157 (J,FH) SN74ALS157 (N,FN)
SN54L157 (J)
SN54LS157 (J,FH) SN74LS157 (J,N,FN)
SN54S157 (J,FH) SN74S157 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A/$\overline{B}$	9	3Y	1	nc	11	nc
2	1A	10	3B	2	A/$\overline{B}$	12	3Y
3	1B	11	3A	3	1A	13	3B
4	1Y	12	4Y	4	1B	14	3A
5	2A	13	4B	5	1Y	15	4Y
6	2B	14	4A	6	nc	16	nc
7	2Y	15	$\overline{G}$	7	2A	17	4B
8	GND	16	V_{CC}	8	2B	18	4A
				9	2Y	19	$\overline{G}$
				10	GND	20	V_{CC}

158

QUAD 2- TO 1-LINE DATA SELECTORS/MULTIPLEXERS

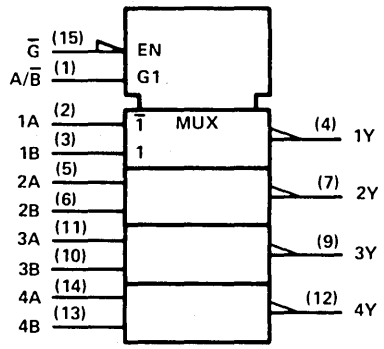
(inverted data outputs)

typical performance

TYPE	DELAY TIMES		TOTAL POWER
	DATA TO INV OUTPUT	FROM ENABLE	
'ALS158	5 ns	6.5 ns	11.5 mW
'LS158	7 ns	12 ns	24 mW
'S158	4 ns	7 ns	195 mW

SN54ALS158 (J,FH) SN74ALS158 (N,FN)
SN54LS158 (J,FH) SN74LS158 (J,N,FN)
SN54S158 (J,FH) SN74S158 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A/$\overline{B}$	9	3Y	1	nc	11	nc
2	1A	10	3B	2	A/$\overline{B}$	12	3Y
3	1B	11	3A	3	1A	13	3B
4	1Y	12	4Y	4	1B	14	3A
5	2A	13	4B	5	1Y	15	4Y
6	2B	14	4A	6	nc	16	nc
7	2Y	15	$\overline{G}$	7	2A	17	4B
8	GND	16	V_{CC}	8	2B	18	4A
				9	2Y	19	$\overline{G}$
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

159

4- TO 16-LINE DECODERS/ DEMULTIPLEXERS

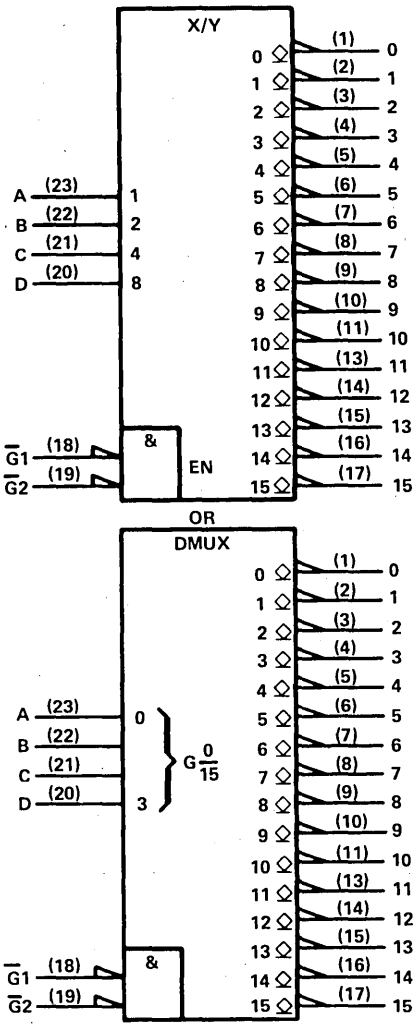
(open-collector outputs)

typical performance

TYPE	SELECT TIME	ENABLE TIME	TOTAL POWER
'159	24 ns	19 ns	170 mW

SN54159 (J,FH) SN74159 (J,N)

logic symbol, '159†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	0	13	11	1	nc	15	nc
2	1	14	12	2	0	16	11
3	2	15	13	3	1	17	12
4	3	16	14	4	2	18	13
5	4	17	15	5	3	19	14
6	5	18	$\overline{G1}$	6	4	20	15
7	6	19	$\overline{G2}$	7	5	21	$\overline{G1}$
8	7	20	D	8	nc	22	nc
9	8	21	C	9	6	23	$\overline{G2}$
10	9	22	B	10	7	24	D
11	10	23	A	11	8	25	C
12	GND	24	V_{CC}	12	9	26	B
				13	10	27	A
				14	GND	28	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

160

SYNCHRONOUS 4-BIT COUNTERS

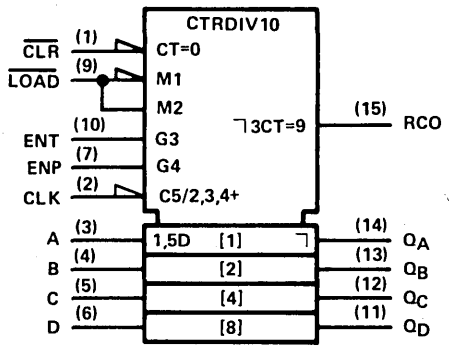
(decade, direct clear)

typical performance

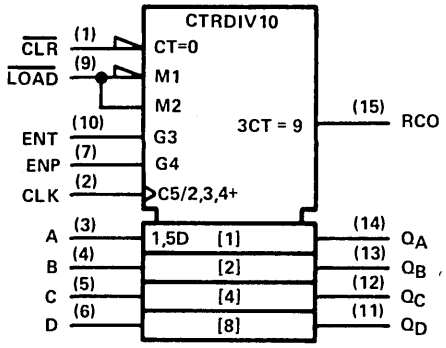
TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'160	25 MHz	ASYNC-L	305 mW
'ALS160	40 MHz	ASYNC-L	60 mW
'AS160		ASYNC-L	
'LS160A	25 MHz	ASYNC-L	93 mW

SN54160 (J,FH) SN74160 (J,N)
SN54ALS160 (J,FH) SN74ALS160 (N,FN)
SN54AS160 (J,FH) SN74AS160 (N,FN)
SN54LS160A (J,FH) SN74LS160A (J,N,FN)

logic symbol, '160†



logic symbol, 'LS160A†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{CLR}$	9	$\overline{LOAD}$	1	nc	11	nc
2	CLK	10	ENT	2	$\overline{CLR}$	12	$\overline{LOAD}$
3	A	11	Q_D	3	CLK	13	ENT
4	B	12	Q_C	4	A	14	Q_D
5	C	13	Q_B	5	B	15	Q_C
6	D	14	Q_A	6	nc	16	nc
7	ENP	15	RCO	7	C	17	Q_B
8	GND	16	V_{CC}	8	D	18	Q_A
				9	ENP	19	RCO
				10	GND	20	V_{CC}

161

SYNCHRONOUS 4-BIT COUNTERS

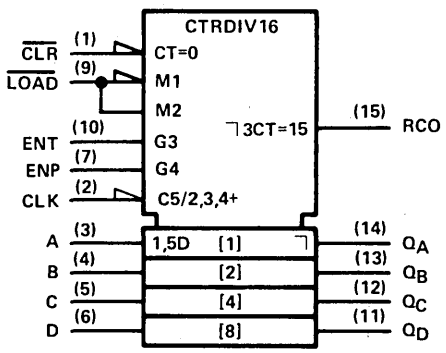
(binary, direct clear)

typical performance

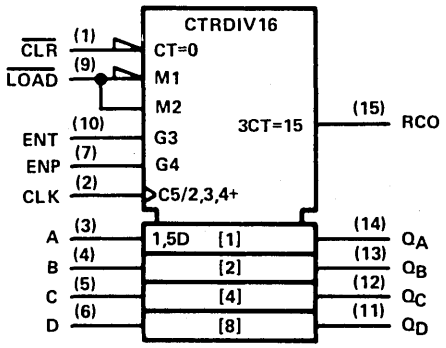
TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'161	25 MHz	ASYNC-L	305 mW
'ALS161	40 MHz	ASYNC-L	60 mW
'AS161		ASYNC-L	
'LS161A	25 MHz	ASYNC-L	93 mW

SN54161 (J,FH) SN74161 (J,N)
SN54ALS161 (J,FH) SN74ALS161 (N,FN)
SN54AS161 (J,FH) SN74AS161 (N,FN)
SN54LS161A (J,FH) SN74LS161A (J,N,FN)

logic symbol, '161†



logic symbol, 'LS161A†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{CLR}$	9	$\overline{LOAD}$	1	nc	11	nc
2	CLK	10	ENT	2	$\overline{CLR}$	12	$\overline{LOAD}$
3	A	11	Q_D	3	CLK	13	ENT
4	B	12	Q_C	4	A	14	Q_D
5	C	13	Q_B	5	B	15	Q_C
6	D	14	Q_A	6	nc	16	nc
7	ENP	15	RCO	7	C	17	Q_B
8	GND	16	V_{CC}	8	D	18	Q_A
				9	ENP	19	RCO
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

162

SYNCHRONOUS 4-BIT COUNTERS

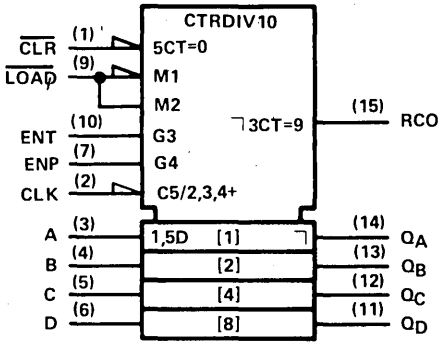
(decade, synchronous clear)

typical performance

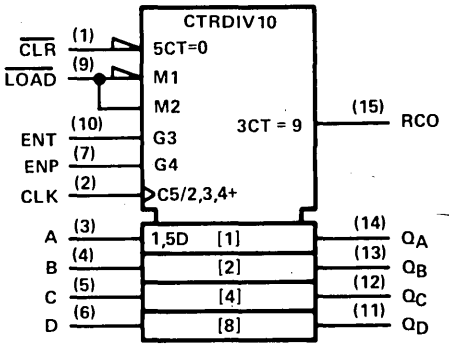
TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'162	25 MHz	SYNC-L	305 mW
'ALS162	40 MHz	SYNC-L	60 mW
'AS162		SYNC-L	
'LS162A	25 MHz	SYNC-L	93 mW
'S162	40 MHz	SYNC-L	475 mW

SN54162 (J,FH) SN74162 (J,N)
SN54ALS162 (J,FH) SN74ALS162 (N,FN)
SN54AS162 (J,FH) SN74AS162 (N,FN)
SN54LS162A (J,FH) SN74LS162A (J,N,FN)
SN54S162 (J,FH) SN74S162 (J,N,FN)

logic symbol, '162†



logic symbol, 'LS162A, 'S162†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{CLR}$	9	$\overline{LOAD}$	1	nc	11	nc
2	CLK	10	ENT	2	$\overline{CLR}$	12	$\overline{LOAD}$
3	A	11	Q_D	3	CLK	13	ENT
4	B	12	Q_C	4	A	14	Q_D
5	C	13	Q_B	5	B	15	Q_C
6	D	14	Q_A	6	nc	16	nc
7	ENP	15	RCO	7	C	17	Q_B
8	GND	16	V_{CC}	8	D	18	Q_A
				9	ENP	19	RCO
				10	GND	20	V_{CC}

163

SYNCHRONOUS 4-BIT COUNTERS

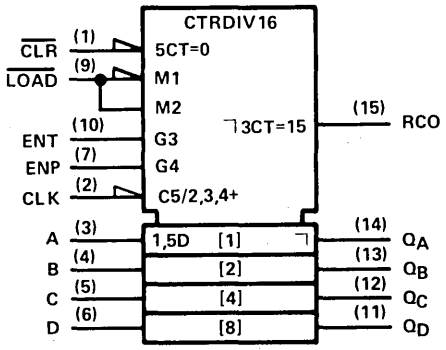
(binary, synchronous clear)

typical performance

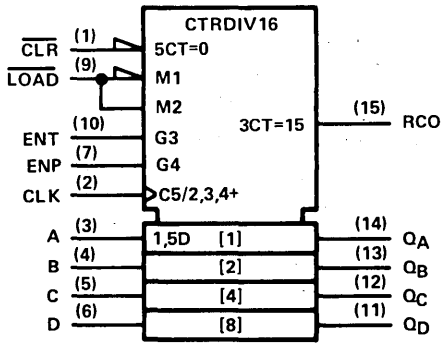
TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'163	25 MHz	SYNC-L	305 mW
'ALS163	40 MHz	SYNC-L	60 mW
'AS163		SYNC-L	
'LS163A	25 MHz	SYNC-L	93 mW
'S163	40 MHz	SYNC-L	475 mW

SN54163 (J,FH) SN74163 (J,N)
SN54ALS163 (J,FH) SN74ALS163 (N,FN)
SN54AS163 (J,FH) SN74AS163 (N,FN)
SN54LS163A (J,FH) SN74LS163A (J,N,FN)
SN54S163 (J,FH) SN74S163 (J,N,FN)

logic symbol, '163†



logic symbol, 'LS163A, 'S163†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{CLR}$	9	$\overline{LOAD}$	1	nc	11	nc
2	CLK	10	ENT	2	$\overline{CLR}$	12	$\overline{LOAD}$
3	A	11	Q_D	3	CLK	13	ENT
4	B	12	Q_C	4	A	14	Q_D
5	C	13	Q_B	5	B	15	Q_C
6	D	14	Q_A	6	nc	16	nc
7	ENP	15	RCO	7	C	17	Q_B
8	GND	16	V_{CC}	8	D	18	Q_A
				9	ENP	19	RCO
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

164

8-BIT PARALLEL OUT SERIAL SHIFT REGISTERS

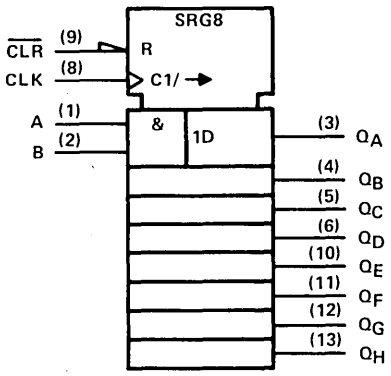
(asynchronous clear)

typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'164	25 MHz	GATED D	LOW	167 mW
'ALS164		GATED D	LOW	
'L164	12 MHz	GATED D	LOW	84 mW
'LS164	25 MHz	GATED D	LOW	80 mW

SN54164 (J,FH) SN74164 (J,N)
SN54ALS164 (J,FH) SN74ALS164 (N,FN)
SN54L164 (J)
SN54LS164 (J,FH) SN74LS164 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A	8	CLK	1	nc	11	nc
2	B	9	$\overline{CLR}$	2	A	12	CLK
3	Q_A	10	Q_E	3	B	13	$\overline{CLR}$
4	Q_B	11	Q_F	4	Q_A	14	Q_E
5	Q_C	12	Q_G	5	nc	15	nc
6	Q_D	13	Q_H	6	Q_B	16	Q_F
7	GND	14	V_{CC}	7	nc	17	nc
				8	Q_C	18	Q_G
				9	Q_D	19	Q_H
				10	GND	20	V_{CC}

165

8-BIT SHIFT REGISTERS

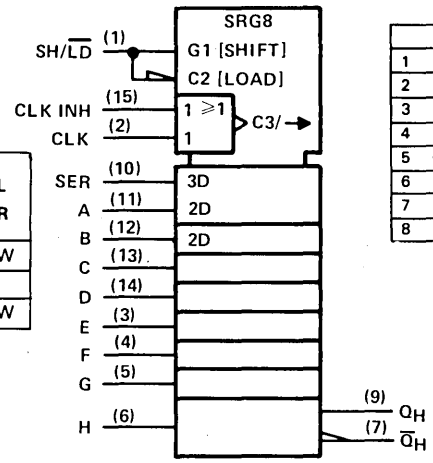
(parallel-load with complementary outputs)

typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'165	25 MHz	D	NONE	210 mW
'ALS165				
'LS165	35 MHz	D	NONE	105 mW

SN54165 (J,FH) SN74165 (J,N)
SN54ALS165 (J,FH) SN74ALS165 (N,FN)
SN54LS165 (J,FH) SN74LS165 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	SH/$\overline{LD}$	9	Q_H	1	nc	11	nc
2	CLK	10	SER	2	SH/$\overline{LD}$	12	Q_H
3	E	11	A	3	CLK	13	SER
4	F	12	B	4	E	14	A
5	G	13	C	5	F	15	B
6	H	14	D	6	nc	16	nc
7	$\overline{Q}_H$	15	CLK INH	7	G	17	C
8	GND	16	V_{CC}	8	H	18	D
				9	$\overline{Q}_H$	19	CLK INH
				10	GND	20	V_{CC}

166

8-BIT SHIFT REGISTERS

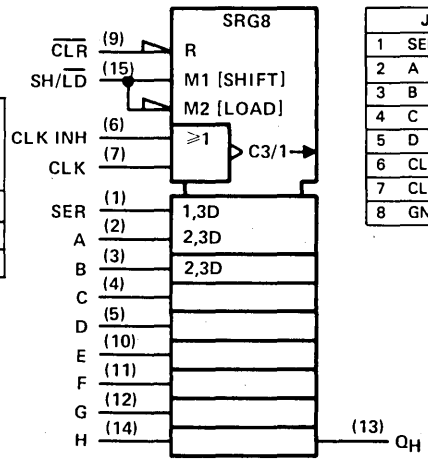
(parallel/serial input; serial output)

typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'166	20 MHz	D	LOW	360 mW
'ALS166		D	LOW	
'LS166	35 MHz	D	LOW	110 mW

SN54166 (J,FH) SN74166 (J,N)
SN54ALS166 (J,FH) SN74ALS166 (N,FN)
SN54LS166 (J,FH) SN74LS166 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	SER	9	$\overline{CLR}$	1	nc	11	nc
2	A	10	E	2	SER	12	$\overline{CLR}$
3	B	11	F	3	A	13	E
4	C	12	G	4	B	14	F
5	D	13	Q_H	5	C	15	G
6	CLK INH	14	H	6	nc	16	nc
7	CLK	15	SH/$\overline{LD}$	7	D	17	Q_H
8	GND	16	V_{CC}	8	CLK INH	18	H
				9	CLK	19	SH/$\overline{LD}$
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc – no internal connection.

© IC MASTER 1983

167

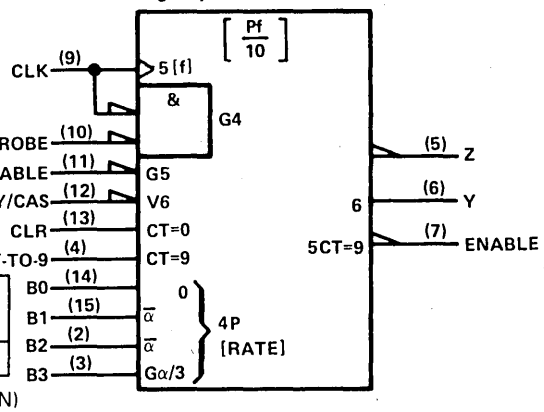
SYNCHRONOUS DECADE RATE MULTIPLIERS

typical performance

TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'167	25 MHz	ASYNC-H	270 mW

SN54167 (J,FH) SN74167 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	nc	9	CLK	1	nc	11	nc
2	B2	10	STRB	2	nc	12	CLK
3	B3	11	ENin	3	B2	13	STRB
4	SET-TO-9	12	UNITY/CAS	4	B3	14	ENin
5	Z	13	CLR	5	SET-TO-9	15	UNITY/CAS
6	Y	14	B0	6	nc	16	nc
7	ENout	15	B1	7	Z	17	CLR
8	GND	16	V_{CC}	8	Y	18	B0
				9	ENout	19	B1
				10	GND	20	V_{CC}

168

4-BIT UP/DOWN SYNCHRONOUS COUNTERS

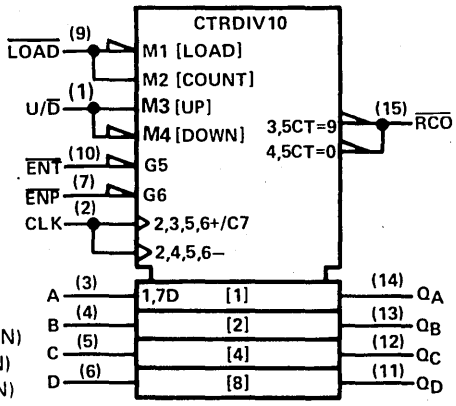
(decade)

typical performance

TYPE	COUNT FREQ	TOTAL POWER
'ALS168	40 MHz	75 mW
'AS168		
'S168	40 MHz	500 mW

SN54ALS168 (J,FH) SN74ALS168 (N,FN)
SN54AS168 (J,FH) SN74AS168 (N,FN)
SN54S168 (J,FH) SN74S168 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	U/D	9	LOAD	1	nc	11	nc
2	CLK	10	ENT	2	U/D	12	LOAD
3	A	11	Q_D	3	CLK	13	ENT
4	B	12	Q_C	4	A	14	Q_D
5	C	13	Q_B	5	B	15	Q_C
6	D	14	Q_A	6	nc	16	nc
7	ENP	15	RCO	7	C	17	Q_B
8	GND	16	V_{CC}	8	D	18	Q_A
				9	ENP	19	RCO
				10	GND	20	V_{CC}

169

4-BIT UP/DOWN SYNCHRONOUS COUNTERS

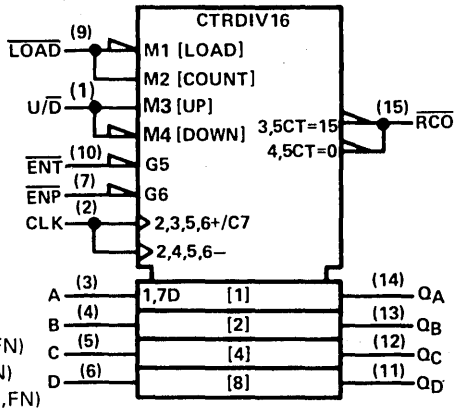
(binary)

typical performance

TYPE	COUNT FREQ	TOTAL POWER
'ALS169	40 MHz	75 mW
'AS169		
'LS169B	35 MHz	140 mW
'S169	40 MHz	500 mW

SN54ALS169 (J,FH) SN74ALS169 (N,FN)
SN54AS169 (J,FH) SN74AS169 (N,FN)
SN54LS169B (J,FH) SN74LS169B (J,N,FN)
SN54S169 (J,FH) SN74S169 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	U/D	9	LOAD	1	nc	11	nc
2	CLK	10	ENT	2	U/D	12	LOAD
3	A	11	Q_D	3	CLK	13	ENT
4	B	12	Q_C	4	A	14	Q_D
5	C	13	Q_B	5	B	15	Q_C
6	D	14	Q_A	6	nc	16	nc
7	ENP	15	RCO	7	C	17	Q_B
8	GND	16	V_{CC}	8	D	18	Q_A
				9	ENP	19	RCO
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

170

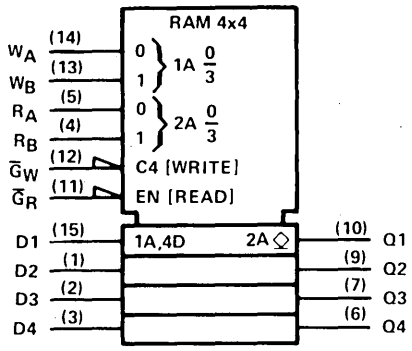
4-BY-4 REGISTER FILES

typical performance

TYPE	TYPE OF OUTPUT	ADDRESS TIME	POWER PER BIT
'170	O-C	30 ns	40 mW
'LS170	O-C	27 ns	7.8 mW

SN54170 (J,FH) SN74170 (J,N)
SN54LS170 (J,FH) SN74LS170 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	D2	9	Q2	1	nc	11	nc
2	D3	10	Q1	2	D2	12	Q2
3	D4	11	$\overline{G}_R$	3	D3	13	Q1
4	R_B	12	$\overline{G}_W$	4	D4	14	$\overline{G}_R$
5	R_A	13	W_B	5	R_B	15	$\overline{G}_W$
6	Q4	14	W_A	6	nc	16	nc
7	Q3	15	D1	7	R_A	17	W_B
8	GND	16	V_{CC}	8	Q4	18	W_A
				9	Q3	19	D1
				10	GND	20	V_{CC}

171

QUAD D-TYPE FLIP-FLOPS WITH CLEAR

- Double-Rail Outputs
- Buffered Clock and Clear Inputs
- Individual Data Inputs to Each Flip-Flop

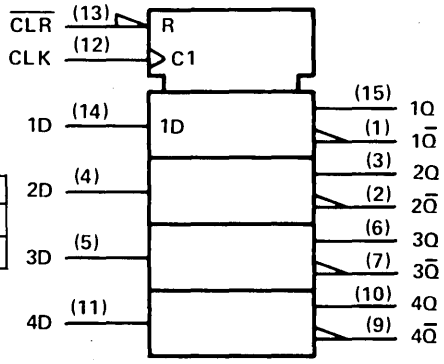
typical performance

TYPE	FREQ	POWER PER F-F	DELAY TIMES	
			SETUP	HOLD
'LS171	30 MHz	17.5 mW	20 ns↑	5 ns↑

↑ Rising edge of clock pulse

SN54LS171 (J,FH) SN74LS171 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$1\overline{Q}$	9	$4\overline{Q}$	1	nc	11	nc
2	$2\overline{Q}$	10	4Q	2	$1\overline{Q}$	12	$4\overline{Q}$
3	2Q	11	4D	3	$2\overline{Q}$	13	4Q
4	2D	12	CLK	4	2Q	14	4D
5	3D	13	$\overline{CLR}$	5	2D	15	CLK
6	3Q	14	1D	6	nc	16	nc
7	$3\overline{Q}$	15	1Q	7	3D	17	$\overline{CLR}$
8	GND	16	V_{CC}	8	3Q	18	1D
				9	$3\overline{Q}$	19	1Q
				10	GND	20	V_{CC}

For chip carrier information, contact the factory.

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

172

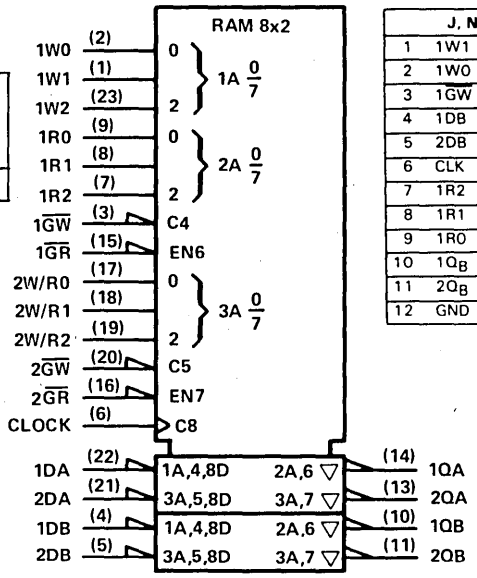
16-BIT REGISTER FILES

typical performance

TYPE	ORG	TYPE OF OUTPUT	ADDRESS TIME	POWER PER BIT
'172	8X2	3-State	33 ns	35 mW

SN74172 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	1W1	13	$2Q_A$
2	1W0	14	$1Q_A$
3	$1\overline{GW}$	15	$1\overline{GR}$
4	1DB	16	$2\overline{GR}$
5	2DB	17	2W/R0
6	CLK	18	2W/R1
7	1R2	19	2W/R2
8	1R1	20	$2\overline{GW}$
9	1R0	21	2DA
10	$1Q_B$	22	1DA
11	$2Q_B$	23	1W2
12	GND	24	V_{CC}

173

4-BIT D-TYPE REGISTERS

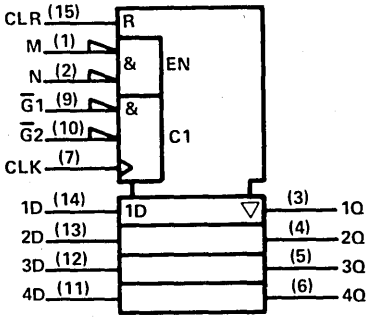
(3-state outputs)

typical performance

TYPE	FREQ	ASYNC CLEAR	TOTAL POWER
'173	25 MHz	HIGH	250 mW
'LS173A	50 MHz	HIGH	85 mW

SN54173 (J,FH) SN74173 (J,N)
SN54LS173A (J,FH) SN74LS173A (J,N,FN)

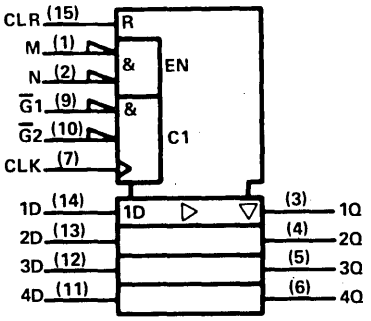
logic symbol, '173†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	M	9	$\overline{G1}$	1	nc	11	nc
2	N	10	$\overline{G2}$	2	M	12	$\overline{G1}$
3	1Q	11	4D	3	N	13	$\overline{G2}$
4	2Q	12	3D	4	1Q	14	4D
5	3Q	13	2D	5	2Q	15	3D
6	4Q	14	1D	6	nc	16	nc
7	CLK	15	CLR	7	3Q	17	2D
8	GND	16	V_{CC}	8	4Q	18	1D
				9	CLK	19	CLR
				10	GND	20	V_{CC}

logic symbol, 'LS173A†



† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

174

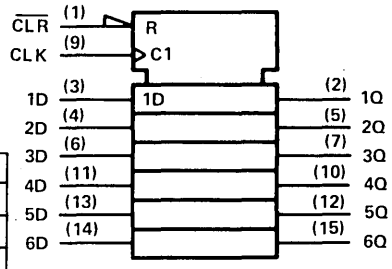
HEX D-TYPE FLIP-FLOPS
(single-rail outputs, common direct clear)
typical performance

TYPE	FREQ	POWER PER F-F	DELAY TIMES	
			SETUP	HOLD
'174	35 MHz	38 mW	20 ns†	5 ns†
'ALS174	80 MHz	6.7 mW		
'AS174	175 MHz	38 mW		
'LS174	40 MHz	10.6 mW	20 ns†	5 ns†
'S174	110 MHz	75 mW	5 ns†	3 ns†

† Rising edge of clock pulse

SN54174 (J,FH) SN74174 (J,N)
SN54ALS174 (J,FH) SN74ALS174 (N,FN)
SN54AS174 (J,FH) SN74AS174 (N,FN)
SN54LS174 (J,FH) SN74LS174 (J,N,FN)
SN54S174 (J,FH) SN74S174 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{CLR}$	9	CLK	1	nc	11	nc
2	1Q	10	4Q	2	$\overline{CLR}$	12	CLK
3	1D	11	4D	3	1Q	13	4Q
4	2D	12	5Q	4	1D	14	4D
5	2Q	13	5D	5	2D	15	5Q
6	3D	14	6D	6	nc	16	nc
7	3Q	15	6Q	7	2Q	17	5D
8	GND	16	V_{CC}	8	3D	18	6D
				9	3Q	19	6Q
				10	GND	20	V_{CC}

175

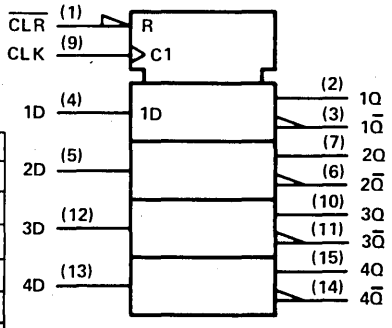
QUAD D-TYPE FLIP-FLOPS
(complementary outputs, common direct clear)
typical performance

TYPE	FREQ	POWER PER F-F	DELAY TIMES	
			SETUP	HOLD
'175	35 MHz	38 mW	20 ns†	5 ns†
'ALS175	80 MHz	7.5 mW		
'AS175	175 MHz	41 mW		
'LS175	40 MHz	10.6 mW	20 ns†	5 ns†
'S175	110 MHz	75 mW	5 ns†	3 ns†

† Rising edge of clock pulse

SN54175 (J,FH) SN74175 (J,N)
SN54ALS175 (J,FH, SN74ALS175 (N,FN)
SN54AS175 (J,FH) SN74AS175 (N,FN)
SN54LS175 (J,FH) SN74LS175 (J,N,FN)
SN54S175 (J,FH) SN74S175 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{CLR}$	9	CLK	1	nc	11	nc
2	1Q	10	3Q	2	$\overline{CLR}$	12	CLK
3	1$\overline{Q}$	11	3$\overline{Q}$	3	1Q	13	3Q
4	1D	12	3D	4	1$\overline{Q}$	14	3$\overline{Q}$
5	2D	13	4D	5	1D	15	3D
6	2$\overline{Q}$	14	4$\overline{Q}$	6	nc	16	nc
7	2Q	15	4Q	7	2D	17	4D
8	GND	16	V_{CC}	8	2$\overline{Q}$	18	4$\overline{Q}$
				9	2Q	19	4Q
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

176

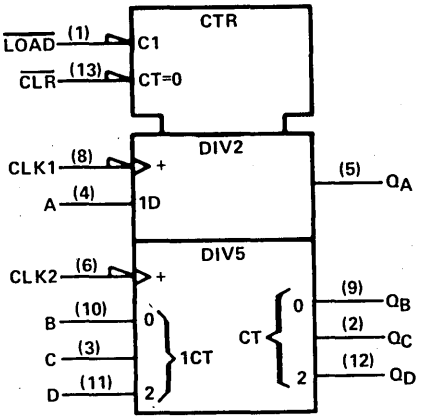
PRESETTABLE DECADE/ BIQUINARY COUNTERS

typical performance

TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'176	35 MHz	LOW	150 mW

SN54176 (J,FH) SN74176 (J,N)

logic symbol, '176†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	$\overline{LOAD}$	8	CLK1	1	nc	11	nc
2	Q_C	9	Q_B	2	$\overline{LOAD}$	12	CLK1
3	C	10	B	3	Q_C	13	Q_B
4	A	11	D	4	C	14	B
5	Q_A	12	Q_D	5	nc	15	nc
6	CLK2	13	$\overline{CLR}$	6	A	16	D
7	GND	14	V_{CC}	7	nc	17	nc
				8	Q_A	18	Q_D
				9	CLK2	19	$\overline{CLR}$
				10	GND	20	V_{CC}

177

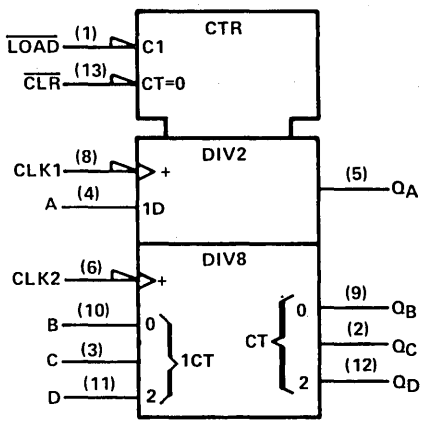
PRESETTABLE BINARY COUNTERS

typical performance

TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'177	35 MHz	LOW	150 mW

SN54177 (J,FH) SN74177 (J,N)

logic symbol, '177†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	$\overline{LOAD}$	8	CLK1	1	nc	11	nc
2	Q_C	9	Q_B	2	$\overline{LOAD}$	12	CLK1
3	C	10	B	3	Q_C	13	Q_B
4	A	11	D	4	C	14	B
5	Q_A	12	Q_D	5	nc	15	nc
6	CLK2	13	$\overline{CLR}$	6	A	16	D
7	GND	14	V_{CC}	7	nc	17	nc
				8	Q_A	18	Q_D
				9	CLK2	19	$\overline{CLR}$
				10	GND	20	V_{CC}

178

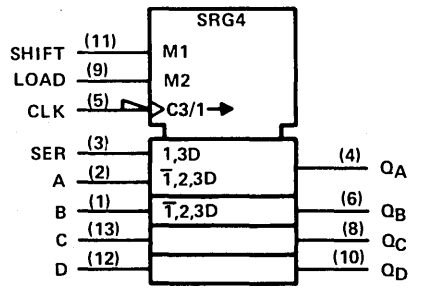
4-BIT UNIVERSAL SHIFT REGISTER

typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'178	25 MHz	D	NONE	230 mW

SN54178 (J,FH) SN74178 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	B	8	Q_C	1	nc	11	nc
2	A	9	LOAD	2	B	12	Q_C
3	SER	10	Q_D	3	A	13	LOAD
4	Q_A	11	SHIFT	4	SER	14	Q_D
5	CLK	12	D	5	nc	15	nc
6	Q_B	13	C	6	Q_A	16	SHIFT
7	GND	14	V_{CC}	7	nc	17	nc
				8	CLK	18	D
				9	Q_B	19	C
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

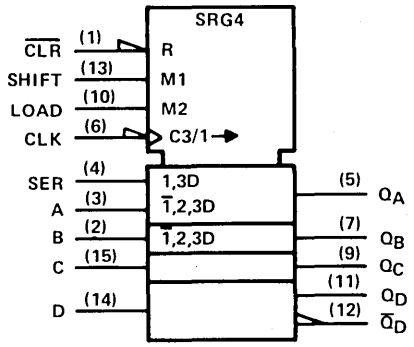
179

4-BIT UNIVERSAL SHIFT REGISTERS
(direct clear; Q_D complementary outputs)
typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'179	25 MHz	D	LOW	230 mW

SN54179 (J,FH) SN74179 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	$\overline{CLR}$	9	Q_C	1	nc	11	nc
2	B	10	LOAD	2	$\overline{CLR}$	12	Q_C
3	A	11	Q_D	3	B	13	LOAD
4	SER	12	$\overline{Q}_D$	4	A	14	Q_D
5	Q_A	13	SHIFT	5	SER	15	$\overline{Q}_D$
6	CLK	14	D	6	nc	16	nc
7	Q_B	15	C	7	Q_A	17	SHIFT
8	GND	16	V_{CC}	8	CLK	18	D
				9	Q_B	19	C
				10	GND	20	V_{CC}

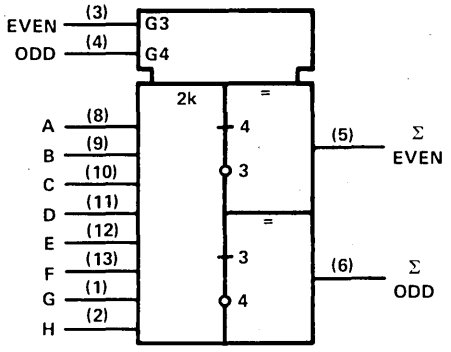
180

9-BIT ODD/EVEN PARITY GENERATORS/CHECKERS
typical performance

TYPE	POWER	DELAY
'180	170 mW	35 ns

SN54180 (J,FH) SN74180 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	G	8	A	1	nc	11	nc
2	H	9	B	2	G	12	A
3	EVEN	10	C	3	H	13	B
4	ODD	11	D	4	EVEN	14	C
5	ΣEVEN	12	E	5	nc	15	nc
6	ΣODD	13	F	6	ODD	16	D
7	GND	14	V_{CC}	7	nc	17	nc
				8	ΣEVEN	18	E
				9	ΣODD	19	F
				10	GND	20	V_{CC}

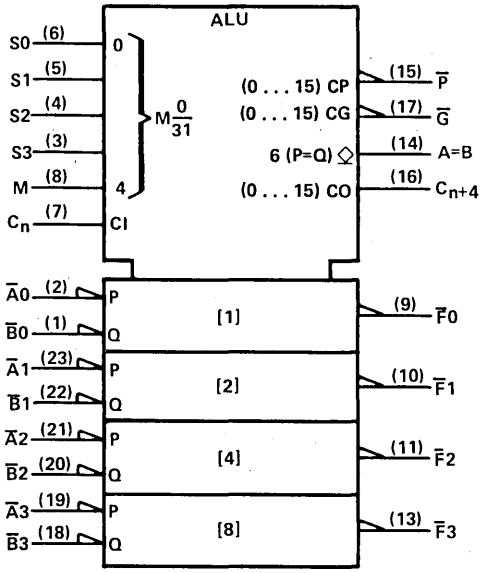
181

ARITHMETIC LOGIC UNITS/ FUNCTION GENERATORS
(16 arithmetic operations, 16 logic functions)
typical performance

TYPE	CARRY TIME	ADD TIME	TOTAL POWER
'181	12.5 ns	24 ns	455 mW
'AS181A	6 ns	5 ns	675 mW
'LS181	16 ns	24 ns	102 mW
'S181	7 ns	11 ns	600 mW

SN54181 (J,FH) SN74181 (J,N)
SN54AS181A (J,FH) SN74AS181A (N,FN)
SN54LS181 (J,FH) SN74LS181 (J,N,FN)
SN54S181 (J,FH) SN74S181 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{B}0$	13	$\overline{F}3$	1	nc	15	nc
2	$\overline{A}0$	14	A=B	2	$\overline{B}0$	16	$\overline{F}3$
3	S3	15	$\overline{P}$	3	$\overline{A}0$	17	A=B
4	S2	16	C_{n+4}	4	S3	18	$\overline{P}$
5	S1	17	$\overline{G}$	5	S2	19	C_{n+4}
6	S0	18	$\overline{B}3$	6	S1	20	$\overline{G}$
7	C_n	19	$\overline{A}3$	7	S0	21	$\overline{B}3$
8	M	20	$\overline{B}2$	8	nc	22	nc
9	$\overline{F}0$	21	$\overline{A}2$	9	C_n	23	$\overline{A}3$
10	$\overline{F}1$	22	$\overline{B}1$	10	M	24	$\overline{B}2$
11	$\overline{F}2$	23	$\overline{A}1$	11	$\overline{F}0$	25	$\overline{A}2$
12	GND	24	V_{CC}	12	$\overline{F}1$	26	$\overline{B}1$
				13	$\overline{F}2$	27	$\overline{A}1$
				14	GND	28	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

182

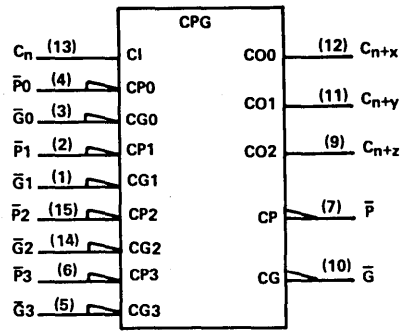
LOOK-AHEAD CARRY GENERATORS

typical performance

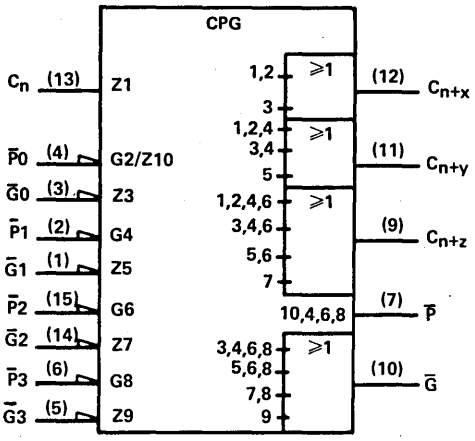
TYPE	POWER	CARRY TIME
'182	180 mW	13 ns
'S182	260 mW	7 ns

SN54182 (J,FH) SN74182 (J,N)
SN54S182 (J,FH) SN74S182 (J,N,FN)

logic symbols†



OR



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	Ḡ1	9	Cn+z	1	nc	11	nc
2	P̄1	10	Ḡ	2	Ḡ1	12	Cn+z
3	Ḡ0	11	Cn+y	3	P̄1	13	Ḡ
4	P̄0	12	Cn+x	4	Ḡ0	14	Cn+y
5	Ḡ3	13	Cn	5	P̄0	15	Cn+x
6	P̄3	14	Ḡ2	6	nc	16	nc
7	P̄	15	P̄2	7	Ḡ3	17	Cn
8	GND	16	VCC	8	P̄3	18	Ḡ2
				9	P̄	19	P̄2
				10	GND	20	VCC

183

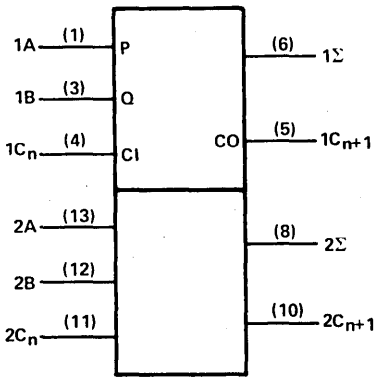
DUAL CARRY-SAVE FULL ADDERS

typical performance

TYPE	CARRY TIME	ADD TIME	POWER PER BIT
'H183	11 ns	11 ns	110 mW
'LS183	15 ns	15 ns	23 mW

SN54H183 (J,FH) SN74H183 (J,N)
SN54LS183 (J,FH) SN74LS183 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	2Σ	1	nc	11	nc
2	nc	9	nc	2	1A	12	2Σ
3	1B	10	2Cn+1	3	nc	13	nc
4	1Cn	11	2Cn	4	1B	14	2Cn+1
5	1Cn+1	12	2B	5	nc	15	nc
6	1Σ	13	2A	6	1Cn	16	2Cn
7	GND	14	VCC	7	nc	17	nc
				8	1Cn+1	18	2B
				9	1Σ	19	2A
				10	GND	20	VCC

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

184

CODE CONVERTERS

(BCD to binary)

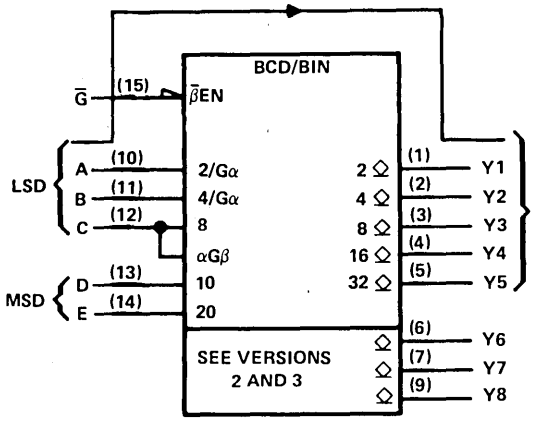
typical performance

TYPE	POWER	DELAY
'184	280 mW	25 ns

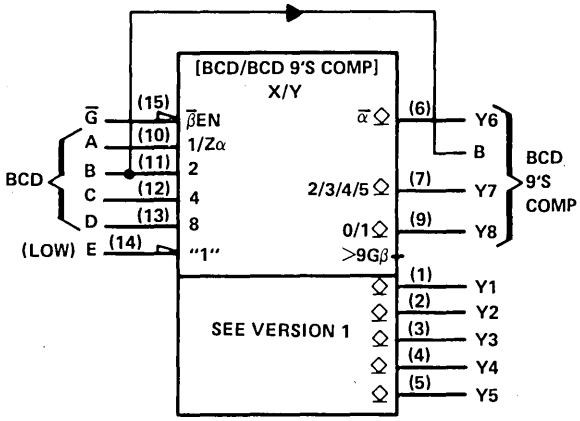
SN54184 (J,FH) SN74184 (J,N)

logic symbols†

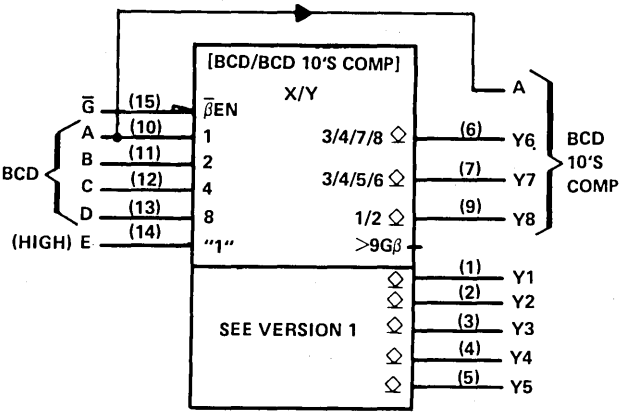
VERSION 1



VERSION 2



VERSION 3



pin assignments

J, N PACKAGES				FH PACKAGE			
1	Y1	9	Y8	1	nc	11	nc
2	Y2	10	A	2	Y1	12	Y8
3	Y3	11	B	3	Y2	13	A
4	Y4	12	C	4	Y3	14	B
5	Y5	13	D	5	Y4	15	C
6	Y6	14	E	6	nc	16	nc
7	Y7	15	$\overline{G}$	7	Y5	17	D
8	GND	16	V_{CC}	8	Y6	18	E
				9	Y7	19	$\overline{G}$
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

185

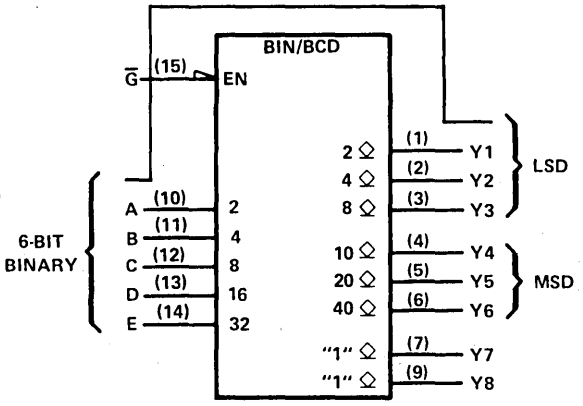
CODE CONVERTERS
(binary to BCD)

typical performance

TYPE	POWER	DELAY
'185A	280 mW	25 ns

SN54185A (J,FH) SN74185A (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	Y1	9	Y8	1	nc	11	nc
2	Y2	10	A	2	Y1	12	Y8
3	Y3	11	B	3	Y2	13	A
4	Y4	12	C	4	Y3	14	B
5	Y5	13	D	5	Y4	15	C
6	Y6	14	E	6	nc	16	nc
7	Y7	15	$\overline{G}$	7	Y5	17	D
8	GND	16	V_{CC}	8	Y6	18	E
				9	Y7	19	$\overline{G}$
				10	GND	20	V_{CC}

187

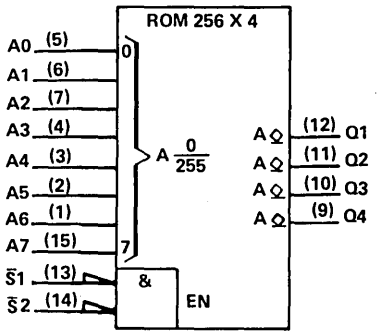
1024-BIT READ-ONLY MEMORIES
(256 4-bit words; open-collector outputs)

typical performance

TYPE	ACCESS TIMES	
	CHIP-SELECT	ADDRESS
'187	20 ns	40 ns

SN54187 (J,FH) SN74187 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	A6	9	Q4	1	nc	11	nc
2	A5	10	Q3	2	A6	12	Q4
3	A4	11	Q2	3	A5	13	Q3
4	A3	12	Q1	4	A4	14	Q2
5	A0	13	$\overline{S}$1	5	A3	15	Q1
6	A1	14	$\overline{S}$2	6	nc	16	nc
7	A2	15	A7	7	A0	17	$\overline{S}$1
8	GND	16	V_{CC}	8	A1	18	$\overline{S}$2
				9	A2	19	A7
				10	GND	20	V_{CC}

188

256-BIT PROGRAMMABLE READ-ONLY MEMORIES

(This number has been changed to TBP18SA030. Product Guide information for this TTL circuit can be found at the end of this section.)

189

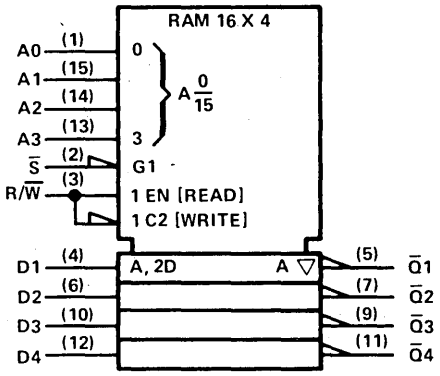
64-BIT RANDOM-ACCESS MEMORIES
(16 4-bit words; three-state outputs)

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER PER BIT
'LS189A	50 ns	35 ns	2.7 mW
'S189A	25 ns	12 ns	5.9 mW

SN54LS189A (J,FH) SN74LS189A (J,N,FN)
SN54S189A (J,FH) SN74S189A (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A0	9	$\overline{Q}$3	1	nc	11	nc
2	$\overline{S}$	10	D3	2	A0	12	$\overline{Q}$3
3	R/$\overline{W}$	11	$\overline{Q}$4	3	$\overline{S}$	13	D3
4	D1	12	D4	4	R/$\overline{W}$	14	$\overline{Q}$4
5	$\overline{Q}$1	13	A3	5	D1	15	D4
6	D2	14	A2	6	nc	16	nc
7	$\overline{Q}$2	15	A1	7	$\overline{Q}$1	17	A3
8	GND	16	V_{CC}	8	D2	18	A2
				9	$\overline{Q}$2	19	A1
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

190

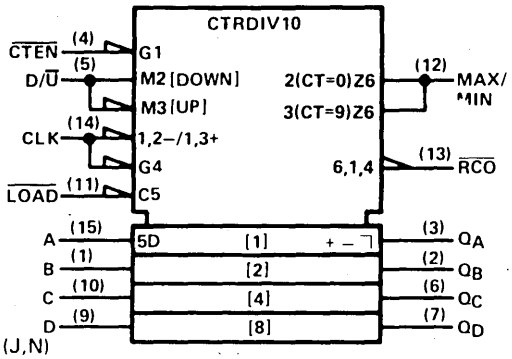
SYNCHRONOUS UP/DOWN COUNTERS (BCD)

typical performance

TYPE	COUNT FREQ	TOTAL POWER
'190	20 MHz	325 mW
'ALS190	35 MHz	60 mW
'LS190	20 MHz	100 mW

SN54190 (J,FH) SN74190 (J,N)
SN54ALS190 (J,FH) SN74ALS190 (N,FN)
SN54LS190 (J,FH) SN74LS190 (J,N,FN)

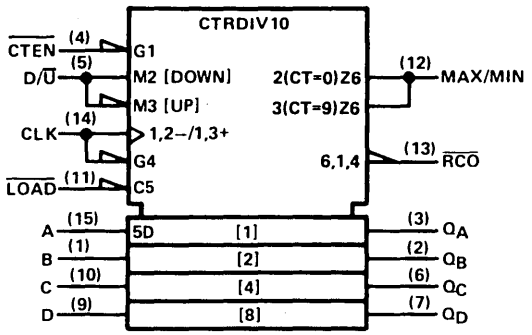
logic symbol,'190, 'LS190†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	9	D	1	nc	11	nc
2	Q_B	10	C	2	B	12	D
3	Q_A	11	$\overline{LOAD}$	3	Q_B	13	C
4	$\overline{CTEN}$	12	MAX/MIN	4	Q_A	14	$\overline{LOAD}$
5	$D/\overline{U}$	13	$\overline{RCO}$	5	$\overline{CTEN}$	15	MAX/MIN
6	Q_C	14	CLK	6	nc	16	nc
7	Q_D	15	A	7	$D/\overline{U}$	17	$\overline{RCO}$
8	GND	16	V_{CC}	8	Q_C	18	CLK
				9	Q_D	19	A
				10	GND	20	V_{CC}

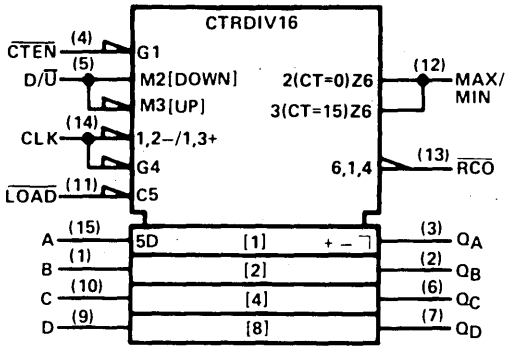
logic symbol, 'ALS190†



191

SYNCHRONOUS UP/DOWN COUNTERS (binary)

logic symbol,'191, 'LS191†



pin assignments

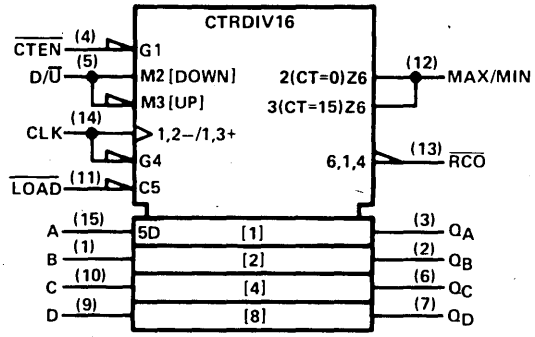
J, N PACKAGES				FH, FN PACKAGES			
1	B	9	D	1	nc	11	nc
2	Q_B	10	C	2	B	12	D
3	Q_A	11	$\overline{LOAD}$	3	Q_B	13	C
4	$\overline{CTEN}$	12	MAX/MIN	4	Q_A	14	$\overline{LOAD}$
5	$D/\overline{U}$	13	$\overline{RCO}$	5	$\overline{CTEN}$	15	MAX/MIN
6	Q_C	14	CLK	6	nc	16	nc
7	Q_D	15	A	7	$D/\overline{U}$	17	$\overline{RCO}$
8	GND	16	V_{CC}	8	Q_C	18	CLK
				9	Q_D	19	A
				10	GND	20	V_{CC}

typical performance

TYPE	COUNT FREQ	TOTAL POWER
'191	20 MHz	325 mW
'ALS191	35 MHz	60 mW
'LS191	20 MHz	90 mW

SN54191 (J,FH) SN74191 (J,N)
SN54ALS191 (J,FH) SN74ALS191 (N,FN)
SN54LS191 (J,FH) SN74LS191 (J,N,FN)

logic symbol, 'ALS191†



† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

192

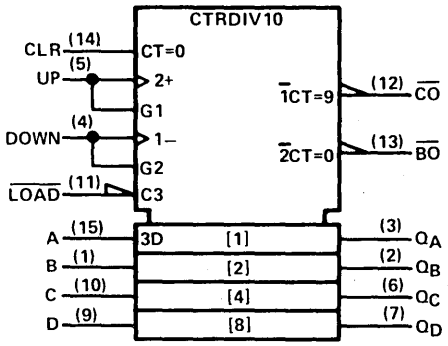
SYNCHRONOUS UP/DOWN DUAL CLOCK COUNTERS (BCD with clear)

typical performance

TYPE	COUNT FREQ	TOTAL POWER
'192	25 MHz	325 mW
'ALS192	40 MHz	50 mW
'L192	3 MHz	42 mW
'LS192	25 MHz	85 mW

SN54192 (J,FH) SN74192 (J,N)
SN54L192 (J)
SN54LS192 (J,FH) SN74LS192 (J,N,FN)
SN54ALS192 (J,FH) SN74ALS192 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	9	D	1	nc	11	nc
2	Q_B	10	C	2	B	12	D
3	Q_A	11	$\overline{LOAD}$	3	Q_B	13	C
4	DOWN	12	$\overline{CO}$	4	Q_A	14	$\overline{LOAD}$
5	UP	13	$\overline{BO}$	5	DOWN	15	$\overline{CO}$
6	Q_C	14	CLR	6	nc	16	nc
7	Q_D	15	A	7	UP	17	$\overline{BO}$
8	GND	16	V_{CC}	8	Q_C	18	CLR
				9	Q_D	19	A
				10	GND	20	V_{CC}

193

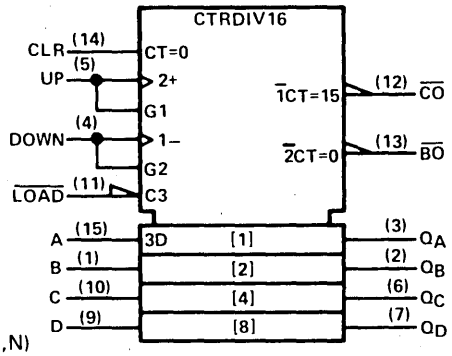
SYNCHRONOUS UP/DOWN DUAL CLOCK COUNTERS (binary with clear)

typical performance

TYPE	COUNT FREQ	TOTAL POWER
'193	25 MHz	325 mW
'ALS193	40 MHz	50 mW
'L193	3 MHz	42 mW
'LS193	25 MHz	85 mW

SN54193 (J,FH) SN74193 (J,N)
SN54L193 (J)
SN54LS193 (J,FH) SN74LS193 (J,N,FN)
SN54ALS193 (J,FH) SN74ALS193 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	9	D	1	nc	11	nc
2	Q_B	10	C	2	B	12	D
3	Q_A	11	$\overline{LOAD}$	3	Q_B	13	C
4	DOWN	12	$\overline{CO}$	4	Q_A	14	$\overline{LOAD}$
5	UP	13	$\overline{BO}$	5	DOWN	15	$\overline{CO}$
6	Q_C	14	CLR	6	nc	16	nc
7	Q_D	15	A	7	UP	17	$\overline{BO}$
8	GND	16	V_{CC}	8	Q_C	18	CLR
				9	Q_D	19	A
				10	GND	20	V_{CC}

194

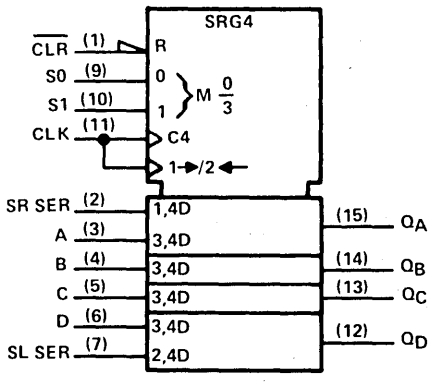
4-BIT BIDIRECTIONAL UNIVERSAL SHIFT REGISTERS

typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	TOTAL POWER
'194	25 MHz	D	195 mW
'LS194A	25 MHz	D	75 mW
'S194	70 MHz	D	450 mW

SN54194 (J,FH) SN74194 (J,N,FN)
SN54LS194A (J,FH) SN74LS194A (J,N,FN)
SN54S194 (J,FH) SN74S194 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{CLR}$	9	S0	1	nc	11	nc
2	SR SER	10	S1	2	$\overline{CLR}$	12	S0
3	A	11	CLK	3	SR SER	13	S1
4	B	12	Q_D	4	A	14	CLK
5	C	13	Q_C	5	B	15	Q_D
6	D	14	Q_B	6	nc	16	nc
7	SL SER	15	Q_A	7	C	17	Q_C
8	GND	16	V_{CC}	8	D	18	Q_B
				9	SL SER	19	Q_A
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc – no internal connection.

© IC MASTER 1983

195

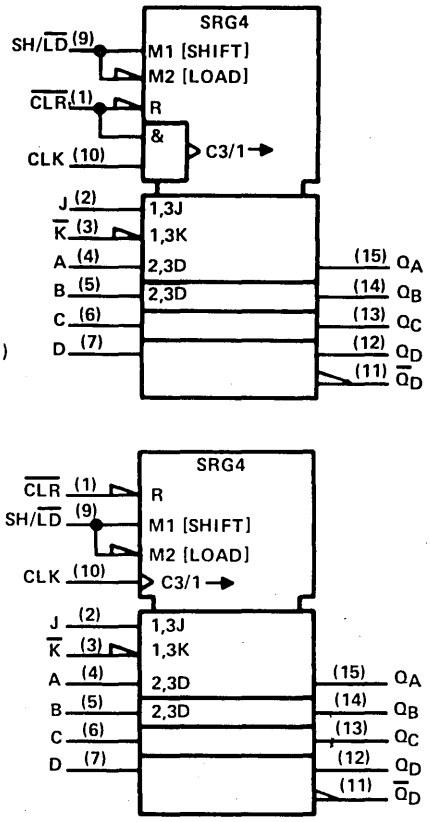
4-BIT PARALLEL-ACCESS SHIFT REGISTERS

typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	TOTAL POWER
'195	30 MHz	J-$\overline{K}$	195 mW
'LS195A	30 MHz	J-$\overline{K}$	70 mW
'S195	70 MHz	J-$\overline{K}$	375 mW

SN54195 (J,FH) SN74195 (J,N)
SN54LS195A (J,FH) SN74LS195A (J,N,FN)
SN54S195 (J,FH) SN74S195 (J,N,FN)

logic symbol, '195†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{CLR}$	9	SH/$\overline{LD}$	1	nc	11	nc
2	J	10	CLK	2	$\overline{CLR}$	12	SH/$\overline{LD}$
3	$\overline{K}$	11	$\overline{Q}_D$	3	J	13	CLK
4	A	12	Q_D	4	$\overline{K}$	14	$\overline{Q}_D$
5	B	13	Q_C	5	A	15	Q_D
6	C	14	Q_B	6	nc	16	nc
7	D	15	Q_A	7	B	17	Q_C
8	GND	16	V_{CC}	8	C	18	Q_B
				9	D	19	Q_A
				10	GND	20	V_{CC}

196

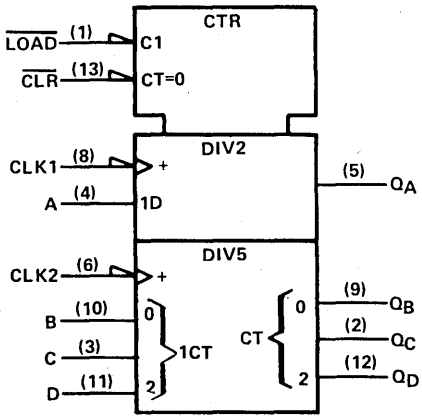
PRESETTABLE DECADE/ BIQUINARY COUNTERS/ LATCHES

typical performance

TYPE	COUNT FREQ	PARALLEL LOAD	CLEAR	TOTAL POWER
'196	50 MHz	YES	LOW	240 mW
'LS196	30 MHz	YES	LOW	60 mW
'S196	100 MHz	YES	LOW	375 mW

SN54196 (J,FH) SN74196 (J,N)
SN54LS196 (J,FH) SN74LS196 (J,N,FN)
SN54S196 (J,FH) SN74S196 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{LOAD}$	8	CLK1	1	nc	11	nc
2	Q_C	9	Q_B	2	$\overline{LOAD}$	12	CLK1
3	C	10	B	3	Q_C	13	Q_B
4	A	11	D	4	C	14	B
5	Q_A	12	Q_D	5	nc	15	nc
6	CLK2	13	$\overline{CLR}$	6	A	16	D
7	GND	14	V_{CC}	7	nc	17	nc
				8	Q_A	18	Q_D
				9	CLK2	19	$\overline{CLR}$
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

197

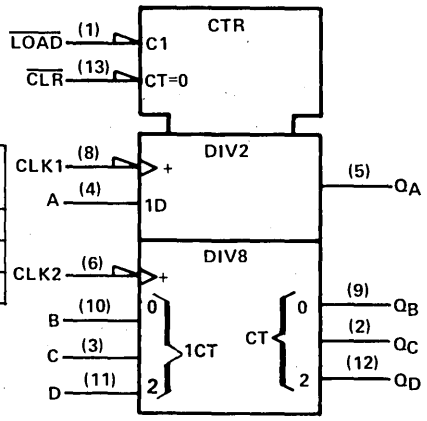
PRESETTABLE BINARY COUNTERS/LATCHES

typical performance

TYPE	COUNT FREQ	PARALLEL LOAD	CLEAR	TOTAL POWER
'197	50 MHz	YES	LOW	240 mW
'LS197	30 MHz	YES	LOW	60 mW
'S197	100 MHz	YES	LOW	375 mW

SN54197 (J,FH) SN74197 (J,N)
SN54LS197 (J,FH) SN74LS197 (J,N,FN)
SN54S197 (J,FH) SN74S197 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{LOAD}$	8	CLK1	1	nc	11	nc
2	Q_C	9	Q_B	2	$\overline{LOAD}$	12	CLK1
3	C	10	B	3	Q_C	13	Q_B
4	A	11	D	4	C	14	B
5	Q_A	12	Q_D	5	nc	15	nc
6	CLK2	13	$\overline{CLR}$	6	A	16	D
7	GND	14	V_{CC}	7	nc	17	nc
				8	Q_A	18	Q_D
				9	CLK2	19	$\overline{CLR}$
				10	GND	20	V_{CC}

198

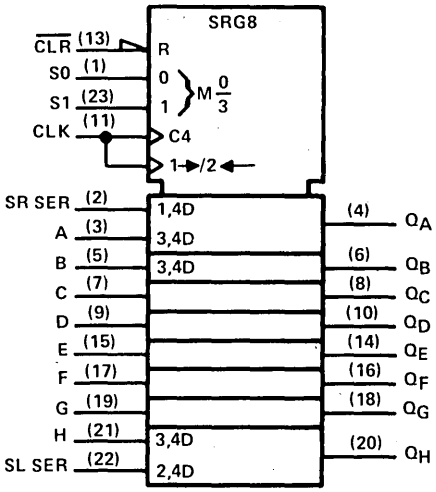
8-BIT BIDIRECTIONAL UNIVERSAL SHIFT REGISTERS

typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'198	25 MHz	D	LOW	360 mW

SN54198 (J,FH) SN74198 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	S0	13	$\overline{CLR}$	1	nc	15	nc
2	SR SER	14	Q_E	2	S0	16	$\overline{CLR}$
3	A	15	E	3	SR SER	17	Q_E
4	Q_A	16	Q_F	4	A	18	E
5	B	17	F	5	Q_A	19	Q_F
6	Q_B	18	Q_G	6	B	20	F
7	C	19	G	7	Q_B	21	Q_G
8	Q_C	20	Q_H	8	nc	22	nc
9	D	21	H	9	C	23	G
10	Q_D	22	SL SER	10	Q_C	24	Q_H
11	CLK	23	S1	11	D	25	H
12	GND	24	V_{CC}	12	Q_D	26	SL SER
				13	CLK	27	S1
				14	GND	28	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

199

8-BIT BIDIRECTIONAL UNIVERSAL SHIFT REGISTERS

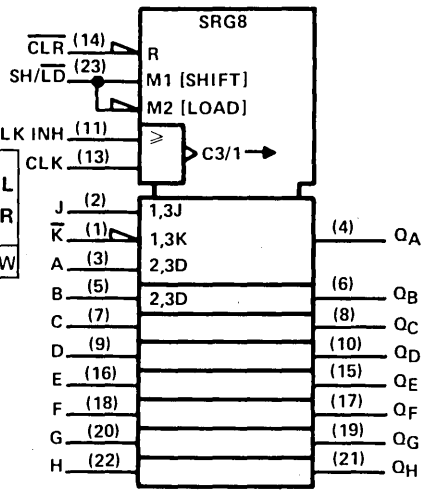
(J-$\overline{K}$ serial inputs)

typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'199	25 MHz	J-$\overline{K}$	LOW	360 mW

SN54199 (J,FH) SN74199 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	$\overline{K}$	13	CLK	1	nc	15	nc
2	J	14	$\overline{CLR}$	2	$\overline{K}$	16	CLK
3	A	15	Q_E	3	J	17	$\overline{CLR}$
4	Q_A	16	E	4	A	18	Q_E
5	B	17	Q_F	5	Q_A	19	E
6	Q_B	18	F	6	B	20	Q_F
7	C	19	Q_G	7	Q_B	21	F
8	Q_C	20	G	8	nc	22	nc
9	D	21	Q_H	9	C	23	Q_G
10	Q_D	22	H	10	Q_C	24	G
11	CLK INH	23	SH/$\overline{LD}$	11	D	25	Q_H
12	GND	24	V_{CC}	12	Q_D	26	H
				13	CLK INH	27	SH/$\overline{LD}$
				14	GND	28	V_{CC}

201

256-BIT RANDOM-ACCESS MEMORIES

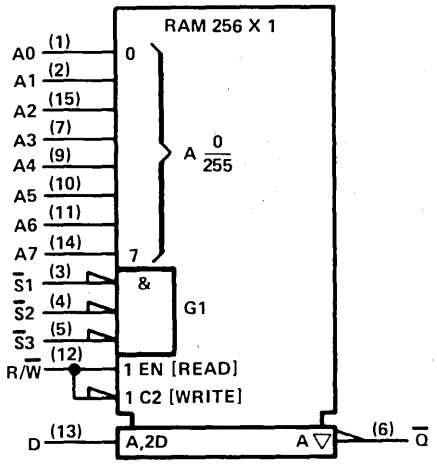
(256 1-bit words; three-state output)

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'S201	42 ns	17 ns	1.9 mW

SN74S201 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	A0	9	A4
2	A1	10	A5
3	$\overline{S1}$	11	A6
4	$\overline{S2}$	12	R/$\overline{W}$
5	$\overline{S3}$	13	D
6	$\overline{Q}$	14	A7
7	A3	15	A2
8	GND	16	V_{CC}

217

256-BIT RANDOM-ACCESS MEMORIES WITH THREE-STATE OUTPUTS

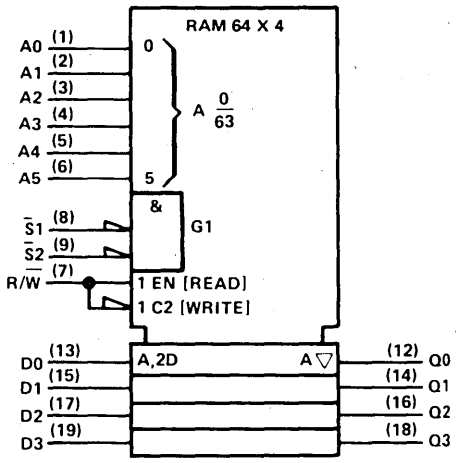
(64 words of 4 bits each)

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'ALS217	30 ns	20 ns	0.9 mW

SN54ALS217 (J,FH) SN74ALS217 (N, FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A0	11	nc	1	A0	11	nc
2	A1	12	Q0	2	A1	12	Q0
3	A2	13	D0	3	A2	13	D0
4	A3	14	Q1	4	A3	14	Q1
5	A4	15	D1	5	A4	15	D1
6	A5	16	Q2	6	A5	16	Q2
7	R/$\overline{W}$	17	D2	7	R/$\overline{W}$	17	D2
8	$\overline{S1}$	18	Q3	8	$\overline{S1}$	18	Q3
9	$\overline{S2}$	19	D3	9	$\overline{S2}$	19	D3
10	GND	20	V_{CC}	10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc – no internal connection.

© IC MASTER 1983

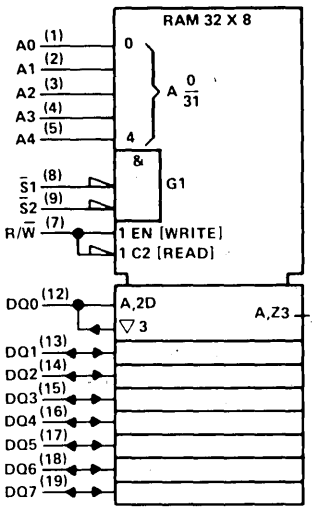
218

256-BIT RANDOM-ACCESS READ/WRITE MEMORIES WITH THREE-STATE OUTPUTS
(32 words of 8 bits each)
typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'ALS218	30 ns	20 ns	0.9 mW

SN54ALS218 (J,FH) SN74ALS218 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A0	11	nc	1	A0	11	nc
2	A1	12	DQ0	2	A1	12	DQ0
3	A2	13	DQ1	3	A2	13	DQ1
4	A3	14	DQ2	4	A3	14	DQ2
5	A4	15	DQ3	5	A4	15	DQ3
6	nc	16	DQ4	6	nc	16	DQ4
7	R/$\overline{W}$	17	DQ5	7	R/$\overline{W}$	17	DQ5
8	$\overline{S}$1	18	DQ6	8	$\overline{S}$1	18	DQ6
9	$\overline{S}$2	19	DQ7	9	$\overline{S}$2	19	DQ7
10	GND	20	V_{CC}	10	GND	20	V_{CC}

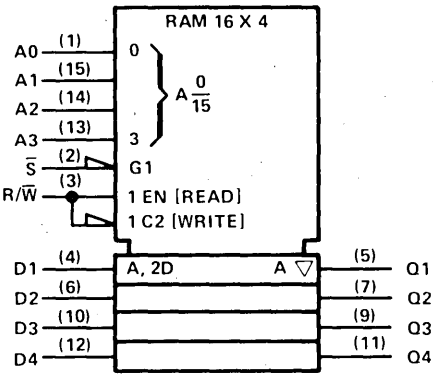
219

64-BIT RANDOM-ACCESS MEMORIES
(16 words of 4 bits each; three-state non-inverting output)
typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'LS219A	50 ns	35 ns	2.7 mW

SN54LS219A (J,FH) SN74LS219A (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A0	9	Q3	1	nc	11	nc
2	$\overline{S}$	10	D3	2	A0	12	Q3
3	R/$\overline{W}$	11	Q4	3	$\overline{S}$	13	D3
4	D1	12	D4	4	R/$\overline{W}$	14	Q4
5	Q1	13	A3	5	D1	15	D4
6	D2	14	A2	6	nc	16	nc
7	Q2	15	A1	7	Q1	17	A3
8	GND	16	V_{CC}	8	D2	18	A2
				9	Q2	19	A1
				10	GND	20	V_{CC}

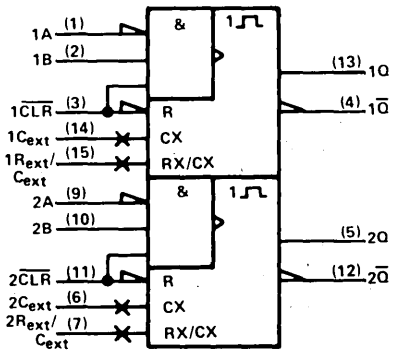
221

DUAL MONOSTABLE MULTIVIBRATORS
typical performance

TYPE	OUTPUT PULSE RANGE	TOTAL POWER
SN54221	20 ns - 21s	130 mW
SN74221	20 ns - 28s	130 mW
SN54LS221	20 ns - 49s	23 mW
SN74LS221	20 ns - 70 s	23 mW

SN54221 (J,FH) SN74221 (J,N)
SN54LS221 (J,FH) SN74LS221 (J,N,FN)

logic symbol†



pin assignments

J,N PACKAGES				FH, FN PACKAGES			
1	1A	9	2A	1	nc	11	nc
2	1B	10	2B	2	1A	12	2A
3	1$\overline{CLR}$	11	2$\overline{CLR}$	3	1B	13	2B
4	1Q	12	2Q̄	4	1$\overline{CLR}$	14	2$\overline{CLR}$
5	2Q	13	1Q̄	5	1Q̄	15	2Q̄
6	$2C_{ext}$	14	$1C_{ext}$	6	nc	16	nc
7	$2R_{ext}/C_{ext}$	15	$1R_{ext}/C_{ext}$	7	2Q	17	1Q̄
8	GND	16	V_{CC}	8	$2C_{ext}$	18	$1C_{ext}$
				9	$2R_{ext}/C_{ext}$	19	$1R_{ext}/C_{ext}$
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc – no internal connection.

© IC MASTER 1983

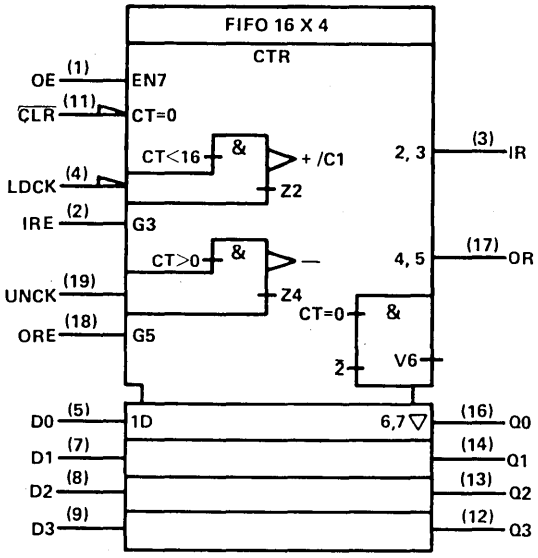
222

64-BIT FIFO MEMORIES
16 4-BIT WORDS
(input-ready enable, output-ready enable, and three-state output)
typical performance

TYPE	DELAY TIME FROM CLOCK	TOTAL POWER
'LS222	47 ns	433 mW

SN54LS222 (J) SN74LS222 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	OE	11	CLR
2	IRE	12	Q3
3	IR	13	Q2
4	LDCK	14	Q1
5	D0	15	nc
6	nc	16	Q0
7	D1	17	OR
8	D2	18	ORE
9	D3	19	UNCK
10	GND	20	V_{CC}

For chip carrier information, contact the factory.

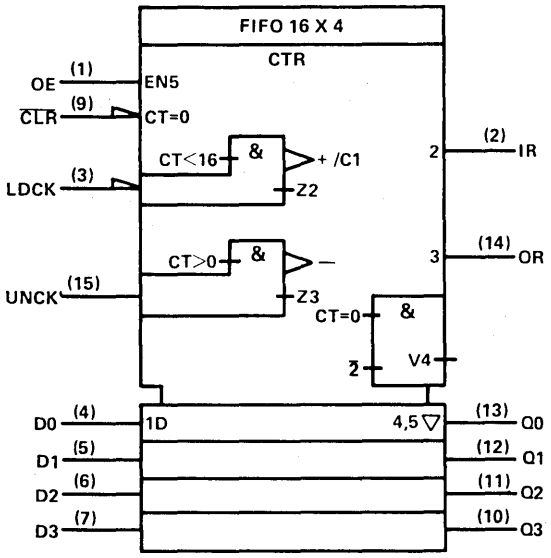
224

64-BIT FIFO MEMORIES
16 4-BIT WORDS
(three-state output)
typical performance

TYPE	DELAY TIME FROM CLOCK	TOTAL POWER
'LS224	47 ns	433 mW

SN54LS224 (J) SN74LS224 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	OE	9	CLR
2	IR	10	Q3
3	LDCK	11	Q2
4	D0	12	Q1
5	D1	13	Q0
6	D2	14	OR
7	D3	15	UNCK
8	GND	16	V_{CC}

For chip carrier information, contact the factory.

† Pin numbers shown on logic symbols are for J and N packages only.
nc – no internal connection.

© IC MASTER 1983

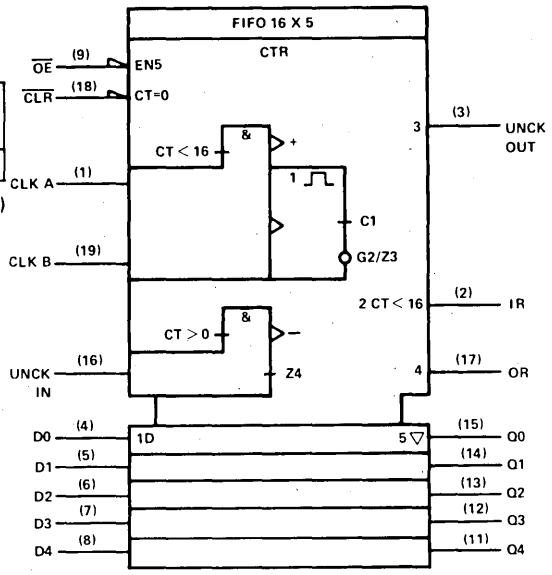
225

80-BIT FIFO MEMORIES
16 5-BIT WORDS
typical performance

OUTPUT	DELAY TIME FROM CLOCK	TOTAL POWER
3-State	50 ns	400 mW

SN74S225 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	CLK A	11	Q4
2	IR	12	Q3
3	UNCK OUT	13	Q2
4	D0	14	Q1
5	D1	15	Q0
6	D2	16	UNCK IN
7	D3	17	OR
8	D4	18	$\overline{CLR}$
9	$\overline{OE}$	19	CLK B
10	GND	20	V_{CC}

FN PACKAGES			
1	CLK A	11	Q4
2	IR	12	Q3
3	UNCK OUT	13	Q2
4	D0	14	Q1
5	D1	15	Q0
6	D2	16	UNCK IN
7	D3	17	OR
8	D4	18	$\overline{CLR}$
9	$\overline{OE}$	19	CLK B
10	GND	20	V_{CC}

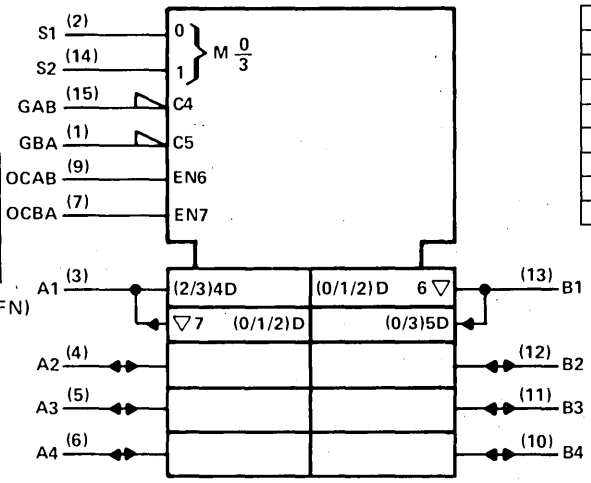
226

4-BIT PARALLEL LATCHED BUS TRANSCEIVERS
(three-state outputs)
typical performance

TYPE	MAX SOURCE CURRENT	MAX SINK CURRENT
'S226	−6.5 mA	20 mA

SN54S226 (J,FH) SN74S226 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	GBA	9	OCAB
2	S1	10	B4
3	A1	11	B3
4	A2	12	B2
5	A3	13	B1
6	A4	14	S2
7	OCBA	15	GAB
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	GBA	12	OCAB
3	S1	13	B4
4	A1	14	B3
5	A2	15	B2
6	nc	16	nc
7	A3	17	B1
8	A4	18	S2
9	OCBA	19	GAB
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

227

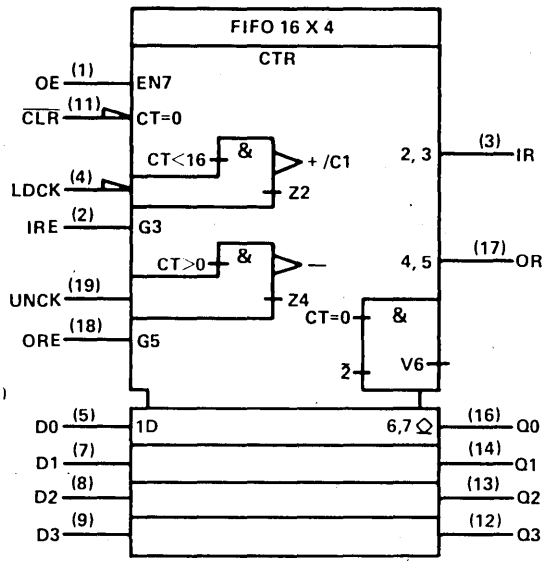
64-BIT FIFO MEMORIES
16 4-BIT WORDS
(input-ready enable, output-ready enable, open-collector outputs)

typical performance

TYPE	DELAY TIME FROM CLOCK	TOTAL POWER
'LS227	57.5 ns	433 mW

SN54LS227 (J) SN74LS227 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	OE	11	$\overline{CLR}$
2	IRE	12	Q3
3	IR	13	Q2
4	LDCK	14	Q1
5	D0	15	nc
6	nc	16	Q0
7	D1	17	OR
8	D2	18	ORE
9	D3	19	UNCK
10	GND	20	V_{CC}

For chip carrier information, contact the factory.

228

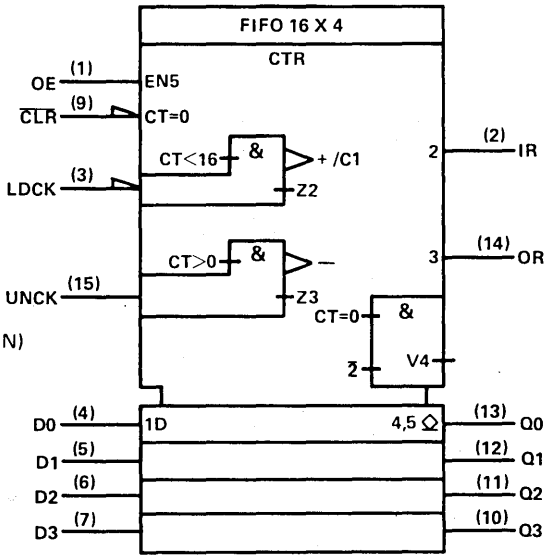
64-BIT FIFO MEMORIES
16 4-BIT WORDS
(open-collector outputs)

typical performance

TYPE	DELAY TIME FROM CLOCK	TOTAL POWER
'LS228	57.5 ns	433 mW

SN54LS228 (J) SN74LS228 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	OE	9	$\overline{CLR}$
2	IR	10	Q3
3	LDCK	11	Q2
4	D0	12	Q1
5	D1	13	Q0
6	D2	14	OR
7	D3	15	UNCK
8	GND	16	V_{CC}

For chip carrier information, contact the factory.

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

230,231

OCTAL BUFFERS AND LINE DRIVERS

(three-state outputs)

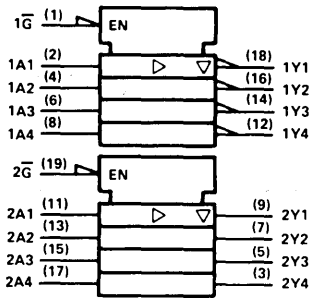
- 'AS230 has true and complementary outputs
- 'AS231 has complementary G and $\overline{G}$ inputs

typical performance

DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
3.5 ns	−15 mA	64 mA

SN54AS230 (J,FH) SN74AS230 (N,FN)
SN54AS231 (J,FH) SN74AS231 (N,FN)

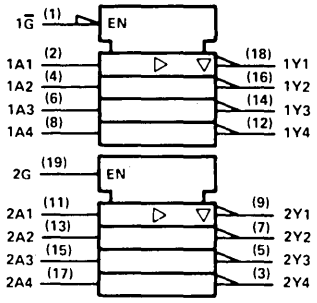
logic symbol, 'AS230†



pin assignments

J, N PACKAGES			
1	1G̅	11	2A1
2	1A1	12	1Y4
3	2Y4	13	2A2
4	1A2	14	1Y3
5	2Y3	15	2A3
6	1A3	16	1Y2
7	2Y2	17	2A4
8	1A4	18	1Y1
9	2Y1	19	2G̅
10	GND	20	V_{CC}

logic symbol, 'AS231†



FH, FN PACKAGES			
1	1G̅	11	2A1
2	1A1	12	1Y4
3	2Y4	13	2A2
4	1A2	14	1Y3
5	2Y3	15	2A3
6	1A3	16	1Y2
7	2Y2	17	2A4
8	1A4	18	1Y1
9	2Y1	19	2G̅
10	GND	20	V_{CC}

*2G on 'AS231

240

OCTAL BUFFERS/LINE DRIVERS/LINE RECEIVERS

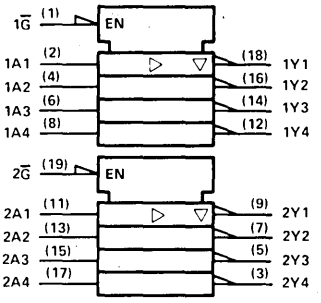
(inverted three-state outputs)

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS240	5.5 ns	−12 mA	12 mA	52 mW
SN74ALS240	5.5 ns	−15 mA	24 mA	
SN74ALS240-1	5.5 ns	−15 mA	48 mA	
SN54AS240	3.5 ns	−12 mA	48 mA	235 mW
SN74AS240	3.5 ns	−15 mA	64 mA	
SN54LS240	10 ns	−12 mA	12 mA	120 mW
SN74LS240	10 ns	−15 mA	24 mA	
SN54S240	5 ns	−12 mA	48 mA	467 mW
SN74S240	5 ns	−15 mA	64 mA	

SN54ALS240 (J,FH) SN74ALS240 (N,FN)
SN74ALS240-1 (N,FN)
SN54AS240 (J,FH) SN74AS240 (N,FN)
SN54LS240 (J,FH) SN74LS240 (J,N,FN)
SN54S240 (J,FH) SN74S240 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	1G̅	11	2A1
2	1A1	12	1Y4
3	2Y4	13	2A2
4	1A2	14	1Y3
5	2Y3	15	2A3
6	1A3	16	1Y2
7	2Y2	17	2A4
8	1A4	18	1Y1
9	2Y1	19	2G̅
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	1G̅	11	2A1
2	1A1	12	1Y4
3	2Y4	13	2A2
4	1A2	14	1Y3
5	2Y3	15	2A3
6	1A3	16	1Y2
7	2Y2	17	2A4
8	1A4	18	1Y1
9	2Y1	19	2G̅
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

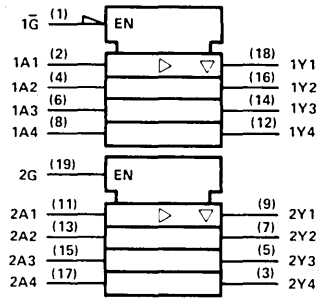
241

OCTAL BUFFERS/LINE DRIVERS/LINE RECEIVERS
(non-inverted three-state outputs)
typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS241	7 ns	−12 mA	12 mA	68 mW
SN74ALS241	7 ns	−15 mA	24 mA	
SN74ALS241-1	7 ns	−15 mA	48 mA	
SN54AS241	4 ns	−12 mA	48 mA	
SN74AS241	4 ns	−15 mA	64 mA	
SN54LS241	10 ns	−12 mA	12 mA	127 mW
SN74LS241	10 ns	−15 mA	24 mA	
SN54S241	5 ns	−12 mA	48 mA	558 mW
SN74S241	5 ns	−15 mA	64 mA	

SN54ALS241 (J,FH) SN74ALS241 (N,FN)
SN74ALS241-1 (N,FN)
SN54AS241 (J,FH) SN74AS241 (N,FN)
SN54LS241 (J,FH) SN74LS241 (J,N,FN)
SN54S241 (J,FH) SN74S241 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	1$\overline{G}$	11	2A1
2	1A1	12	1Y4
3	2Y4	13	2A2
4	1A2	14	1Y3
5	2Y3	15	2A3
6	1A3	16	1Y2
7	2Y2	17	2A4
8	1A4	18	1Y1
9	2Y1	19	2G
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	1$\overline{G}$	11	2A1
2	1A1	12	1Y4
3	2Y4	13	2A2
4	1A2	14	1Y3
5	2Y3	15	2A3
6	1A3	16	1Y2
7	2Y2	17	2A4
8	1A4	18	1Y1
9	2Y1	19	2G
10	GND	20	V_{CC}

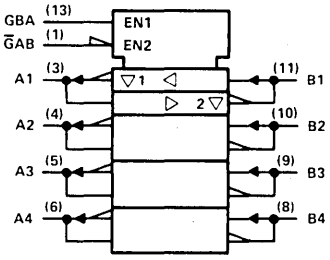
242

QUADRUPLE BUS TRANSCEIVERS
(inverted three-state outputs)
typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS242	6 ns	−12 mA	12 mA	68 mW
SN74ALS242	6 ns	−15 mA	24 mA	
SN74ALS242-1	6 ns	−15 mA	48 mA	
SN54AS242	3.5 ns	−12 mA	48 mA	
SN74AS242	3.5 ns	−15 mA	64 mA	
SN54LS242	11 ns	−12 mA	12 mA	133 mW
SN74LS242	11 ns	−15 mA	24 mA	

SN54ALS242 (J,FH) SN74ALS242 (N,FN)
SN74ALS242-1 (N,FN)
SN54AS242 (J,FH) SN74AS242 (N,FN)
SN54LS242 (J,FH) SN74LS242 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	$\overline{G}$AB	8	B4
2	nc	9	B3
3	A1	10	B2
4	A2	11	B1
5	A3	12	nc
6	A4	13	GBA
7	GND	14	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	$\overline{G}$AB	12	B4
3	nc	13	B3
4	A1	14	B2
5	nc	15	nc
6	A2	16	B1
7	nc	17	nc
8	A3	18	nc
9	A4	19	GBA
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

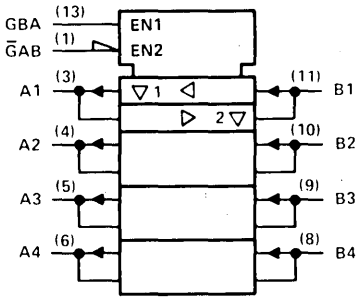
243

QUADRUPLE BUS TRANSCEIVERS
(non-inverted three-state outputs)
typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS243	8 ns	−12 mA	12 mA	93 mW
SN74ALS243	8 ns	−15 mA	24 mA	
SN74ALS243-1	8 ns	−15 mA	48 mA	
SN54AS243	4.5 ns	−12 mA	48 mA	
SN74AS243	4.5 ns	−15 mA	64 mA	
SN54LS243	12 ns	−12 mA	12 mA	138 mW
SN74LS243	12 ns	−15 mA	24 mA	

SN54ALS243 (J,FH) SN74ALS243 (N,FN)
SN74ALS243-1 (N,FN)
SN54AS243 (J,FH) SN74AS243 (N,FN)
SN54LS243 (J,FH) SN74LS243 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	G̅AB	8	B4
2	nc	9	B3
3	A1	10	B2
4	A2	11	B1
5	A3	12	nc
6	A4	13	GBA
7	GND	14	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	G̅AB	12	B4
3	nc	13	B3
4	A1	14	B2
5	nc	15	nc
6	A2	16	B1
7	nc	17	nc
8	A3	18	nc
9	A4	19	GBA
10	GND	20	V_{CC}

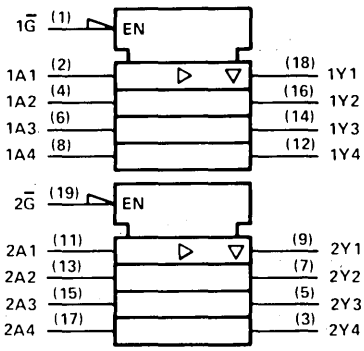
244

OCTAL BUFFERS/LINE DRIVERS/LINE RECEIVERS
(non-inverted three-state outputs)
typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS244	7 ns	−12 mA	12 mA	68 mW
SN74ALS244	7 ns	−15 mA	24 mA	
SN74ALS244-1	7 ns	−15 mA	48 mA	
SN54AS244	4.5 ns	−12 mA	48 mA	235 mW
SN74AS244	4.5 ns	−15 mA	64 mA	
SN54LS244	12 ns	−12 mA	12 mA	127 mW
SN74LS244	12 ns	−15 mA	24 mA	
SN54S244	6 ns	−12 mA	48 mA	558 mW
SN74S244	6 ns	−15 mA	64 mA	

SN54ALS244 (J,FH) SN74ALS244 (N,FN)
SNALS244-1 (N,FN)
SN54AS244 (J,FH) SN74AS244 (N,FN)
SN54LS244 (J,FH) SN74LS244 (J,N,FN)
SN54S244 (J,FH) SN74S244 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	1G̅	11	2A1
2	1A1	12	1Y4
3	2Y4	13	2A2
4	1A2	14	1Y3
5	2Y3	15	2A3
6	1A3	16	1Y2
7	2Y2	17	2A4
8	1A4	18	1Y1
9	2Y1	19	2G̅
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	1G̅	11	2A1
2	1A1	12	1Y4
3	2Y4	13	2A2
4	1A2	14	1Y3
5	2Y3	15	2A3
6	1A3	16	1Y2
7	2Y2	17	2A4
8	1A4	18	1Y1
9	2Y1	19	2G̅
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

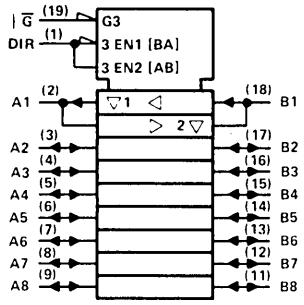
245

OCTAL BUS TRANSCEIVERS
(non-inverted three-state outputs)
typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSI-PATION
SN54ALS245	6 ns	−12 mA	12 mA	173 mW
SN74ALS245	6 ns	−15 mA	24 mA	
SN74ALS245-1	6 ns	−15 mA	48 mA	
SN54LS245	8 ns	−12 mA	12 mA	290 mW
SN74LS245	8 ns	−15 mA	24 mA	

SN54ALS245 (J,FH) SN74ALS245 (N,FN)
SN74ALS245-1 (N,FN)
SN54LS245 (J,FH) SN74LS245 (J,N,FN)

logic symbol†



pin assignments

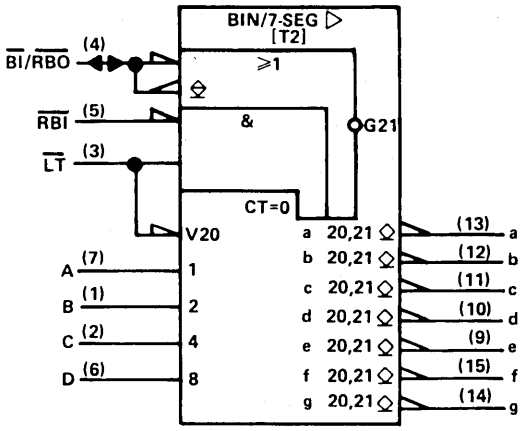
J, N PACKAGES			
1	DIR	11	B8
2	A1	12	B7
3	A2	13	B6
4	A3	14	B5
5	A4	15	B4
6	A5	16	B3
7	A6	17	B2
8	A7	18	B1
9	A8	19	$\overline{G}$
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	DIR	11	B8
2	A1	12	B7
3	A2	13	B6
4	A3	14	B5
5	A4	15	B4
6	A5	16	B3
7	A6	17	B2
8	A7	18	B1
9	A8	19	G
10	GND	20	V_{CC}

246
247

BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS WITH RIPPLE BLANKING
(246-active-low, open-collector, 30-volt outputs)
(247-active-low, open-collector, 15-volt outputs)

logic symbol†



pin assignments

J, N PACKAGES			
1	B	9	e
2	C	10	d
3	$\overline{LT}$	11	c
4	$\overline{BI}/\overline{RBO}$	12	b
5	$\overline{RBI}$	13	a
6	D	14	g
7	A	15	f
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	B	12	e
3	C	13	d
4	$\overline{LT}$	14	c
5	$\overline{BI}/\overline{RBO}$	15	b
6	nc	16	nc
7	RBI	17	a
8	D	18	g
9	A	19	f
10	GND	20	V_{CC}

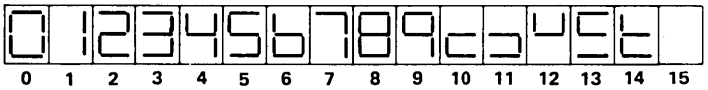
typical performance

TYPE	OUTPUT SINK CURRENT	OFF-STATE OUTPUT VOLTAGE	TOTAL POWER
'246	40 mA	30 V	320 mW
'247	40 mA	15 V	320 mW
SN54LS247	12 mA	15 V	35 mW
SN74LS247	24 mA	15 V	35 mW

SN54246 (J,FH) SN74246 (J,N)
SN54247 (J,FH) SN74247 (J,N)
SN54LS247 (J,FH) SN74LS247 (J,N,FN)

† Pin numbers shown on logic symbols are for J and N packages only.
nc – no internal connection.

FONT TABLE T2 – RESULTANT DISPLAYS USING '246 AND '247



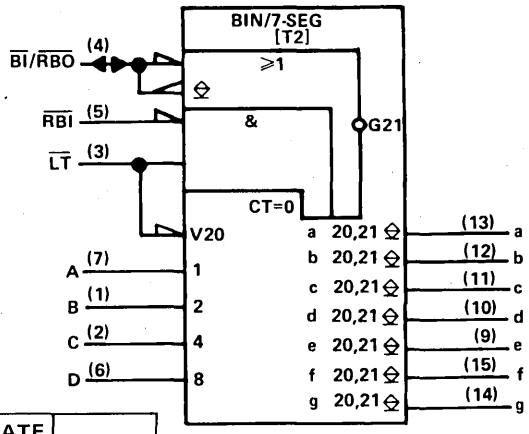
TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

248

BCD-TO-SEVEN SEGMENT DECODERS/DRIVERS
(internal pull-up outputs)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	9	e	1	nc	11	nc
2	C	10	d	2	B	12	e
3	$\overline{LT}$	11	c	3	C	13	d
4	$\overline{BI}/\overline{RBO}$	12	b	4	$\overline{LT}$	14	c
5	$\overline{RBI}$	13	a	5	$\overline{BI}/\overline{RBO}$	15	b
6	D	14	g	6	nc	16	nc
7	A	15	f	7	$\overline{RBI}$	17	a
8	GND	16	V_{CC}	8	D	18	g
				9	A	19	f
				10	GND	20	V_{CC}

typical performance

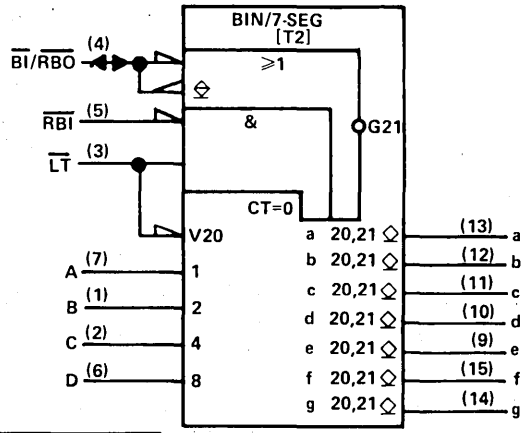
TYPE	OUTPUT SINK CURRENT	OFF-STATE OUTPUT VOLTAGE	TOTAL POWER
'248	6.4 mA	5.5 V	265 mW
SN54LS248	2 mA	5.5 V	125 mW
SN74LS248	6 mA	5.5 V	125 mW

SN54248 (J,FH) SN74248 (J,N)
SN54LS248 (J,FH) SN74LS248 (J,N,FN)

249

BCD-TO-SEVEN SEGMENT DECODERS/DRIVERS
(open-collector outputs)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	9	e	1	nc	11	nc
2	C	10	d	2	B	12	e
3	$\overline{LT}$	11	c	3	C	13	d
4	$\overline{BI}/\overline{RBO}$	12	b	4	$\overline{LT}$	14	c
5	$\overline{RBI}$	13	a	5	$\overline{BI}/\overline{RBO}$	15	b
6	D	14	g	6	nc	16	nc
7	A	15	f	7	$\overline{RBI}$	17	a
8	GND	16	V_{CC}	8	D	18	g
				9	A	19	f
				10	GND	20	V_{CC}

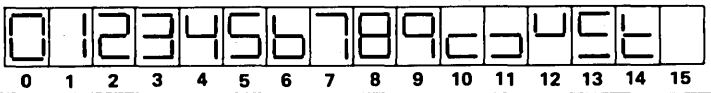
typical performance

TYPE	OUTPUT SINK CURRENT	OFF-STATE OUTPUT VOLTAGE	TOTAL POWER
'249	10 mA	5.5 V	265 mW
SN54LS249	4 mA	5.5 V	40 mW
SN74LS249	8 mA	5.5 V	40 mW

SN54249 (J,FH) SN74249 (J,N)
SN54LS249 (J,FH) SN74LS249 (J,N,FN)

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

FONT TABLE T2 — RESULTANT DISPLAYS USING '248 AND '249



© IC MASTER 1983

251

DATA SELECTORS/ MULTIPLEXERS

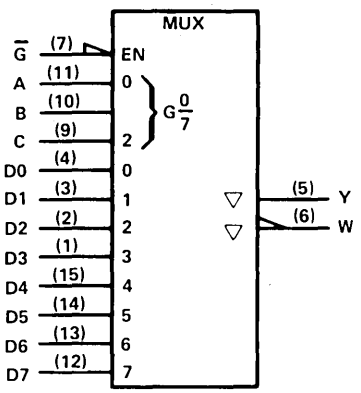
(true and inverted three-state outputs)

typical performance

TYPE	DELAY TIMES			TOTAL POWER
	DATA TO INV OUTPUT	DATA TO NON-INV OUTPUT	FROM ENABLE	
'251	17 ns	21 ns	21 ns	250 mW
'ALS251	6 ns	5 ns	4.5 ns	37.5 mW
'AS251	2.7 ns	3.5 ns	5.5 ns	140 mW
'LS251	17 ns	21 ns	21 ns	35 mW
'S251	4.5 ns	8 ns	14 ns	275 mW

SN54251 (J,FH) SN74251 (J,N)
SN54ALS251 (J,FH) SN74ALS251 (N,FN)
SN54AS251 (J,FH) SN74AS251 (N,FN)
SN54LS251 (J,FH) SN74LS251 (J,N,FN)
SN54S251 (J,FH) SN74S251 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	D3	9	C
2	D2	10	B
3	D1	11	A
4	D0	12	D7
5	Y	13	D6
6	W	14	D5
7	$\overline{G}$	15	D4
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	D3	12	C
3	D2	13	B
4	D1	14	A
5	D0	15	D7
6	nc	16	nc
7	Y	17	D6
8	W	18	D5
9	$\overline{G}$	19	D4
10	GND	20	V_{CC}

253

DUAL DATA SELECTORS/ MULTIPLEXERS

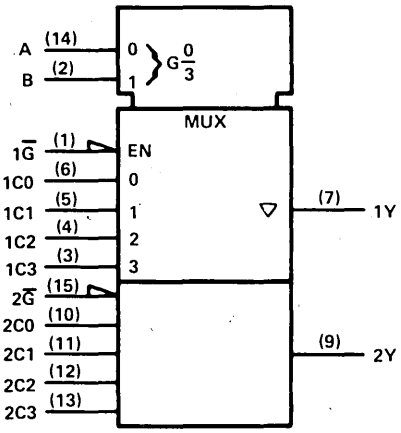
(three-state outputs)

typical performance

TYPE	DELAY TIMES		TOTAL POWER
	DATA TO NON-INV OUTPUT	FROM ENABLE	
'ALS253	5 ns	4.5 ns	32 mW
'AS253	3.3 ns	5.5 ns	117 mW
'LS253	12 ns	16 ns	35 mW

SN54ALS253 (J,FH) SN74ALS253 (N,FN)
SN54AS253 (J,FH) SN74AS253 (N,FN)
SN54LS253 (J,FH) SN74LS253 (J,N,FN)
SN54S253 (J,FH) SN74S253 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	$1\overline{G}$	9	2Y
2	B	10	2C0
3	1C3	11	2C1
4	1C2	12	2C2
5	1C1	13	2C3
6	1C0	14	A
7	1Y	15	$2\overline{G}$
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	$1\overline{G}$	12	2Y
3	B	13	2C0
4	1C3	14	2C1
5	1C2	15	2C2
6	nc	16	nc
7	1C1	17	2C3
8	1C0	18	A
9	1Y	19	$2\overline{G}$
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc – no internal connection.

© IC MASTER 1983

257

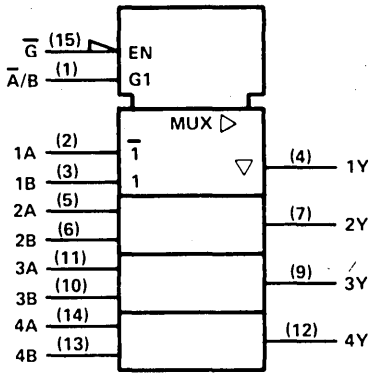
QUAD DATA SELECTORS/ MULTIPLEXERS

(non-inverted three-state outputs)

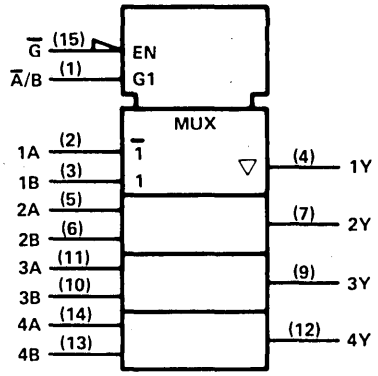
TYPE	DELAY TIMES: DATA TO NON-INV OUTPUT	DELAY TIMES: FROM ENABLE	TOTAL POWER
'ALS257	4.3 ns	7.5 ns	33.5 mW
'LS257	11 ns	18 ns	60 mW
'S257	5 ns	14 ns	320 mW

SN54ALS257 (J,FH) SN74ALS257 (N,FN)
SN54LS257 (J,FH) SN74LS257 (J,N,FN)
SN54S257 (J,FH) SN74S257 (J,N,FN)

logic symbol, 'ALS257, 'LS257†



logic symbol, 'S257†



pin assignments

J, N PACKAGES			
1	$\overline{A}$/B	9	3Y
2	1A	10	3B
3	1B	11	3A
4	1Y	12	4Y
5	2A	13	4B
6	2B	14	4A
7	2Y	15	$\overline{G}$
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	$\overline{A}$/B	12	3Y
3	1A	13	3B
4	1B	14	3A
5	1Y	15	4Y
6	nc	16	nc
7	2A	17	4B
8	2B	18	4A
9	2Y	19	$\overline{G}$
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

258

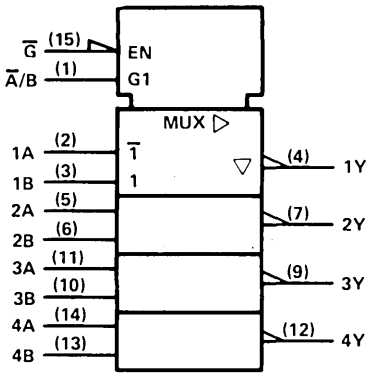
QUAD DATA SELECTORS/ MULTIPLEXERS
(inverted three-state outputs)

typical performance

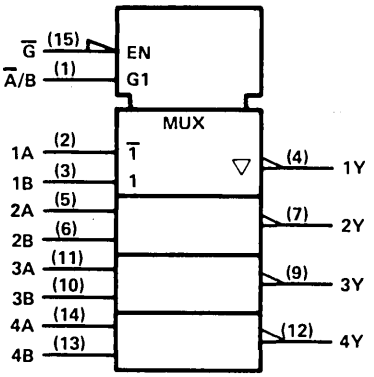
TYPE	DELAY TIMES: DATA TO INV OUTPUT	DELAY TIMES: FROM ENABLE	TOTAL POWER
'ALS258	3 ns	7.5 ns	29 mW
'LS258	11 ns	19 ns	60 mW
'S258	4 ns	14 ns	280 mW

SN54ALS258 (J,FH) SN74ALS258 (N,FN)
SN54LS258 (J,FH) SN74LS258 (J,N,FN)
SN54S258 (J,FH) SN74S258 (J,N,FN)

logic symbol, 'ALS258, 'LS258†



logic symbol, 'S258†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{A}$/B	9	3Y	1	nc	11	nc
2	1A	10	3B	2	$\overline{A}$/B	12	3Y
3	1B	11	3A	3	1A	13	3B
4	1Y	12	4Y	4	1B	14	3A
5	2A	13	4B	5	1Y	15	4Y
6	2B	14	4A	6	nc	16	nc
7	2Y	15	$\overline{G}$	7	2A	17	4B
8	GND	16	V_{CC}	8	2B	18	4A
				9	2Y	19	$\overline{G}$
				10	GND	20	V_{CC}

259

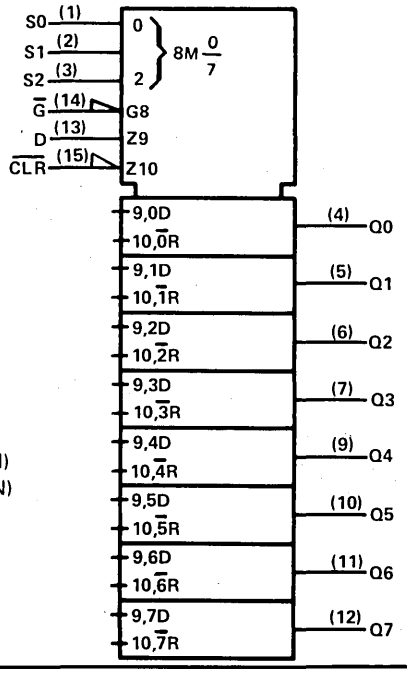
8-BIT ADDRESSABLE LATCHES

typical performance

TYPE	CLEAR	DELAY	TOTAL POWER
'259	LOW	12 ns	300 mW
'ALS259	LOW		
'LS259	LOW	17 ns	110 mW

SN54259 (J,FH) SN74259 (J,N)
SN54ALS259 (J,FH) SN74ALS259 (N,FN)
SN54LS259 (J,FH) SN74LS259 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	S0	9	Q4	1	nc	11	nc
2	S1	10	Q5	2	S0	12	Q4
3	S2	11	Q6	3	S1	13	Q5
4	Q0	12	Q7	4	S2	14	Q6
5	Q1	13	D	5	Q0	15	Q7
6	Q2	14	$\overline{G}$	6	nc	16	nc
7	Q3	15	$\overline{CLR}$	7	Q1	17	D
8	GND	16	V_{CC}	8	Q2	18	$\overline{G}$
				9	Q3	19	$\overline{CLR}$
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

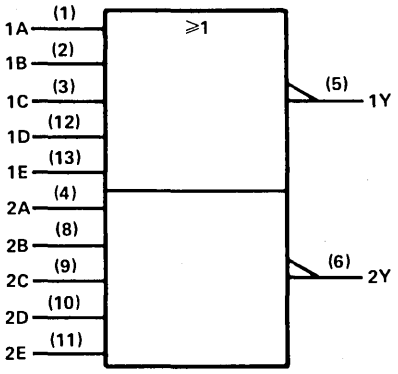
260

DUAL 5-INPUT POSITIVE-NOR GATES

TYPE	POWER/ GATE	DELAY
'S260	54 mW	4 ns

SN54S260 (J,FH) SN74S260 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	2B	1	nc	11	nc
2	1B	9	2C	2	1A	12	2B
3	1C	10	2D	3	1B	13	2C
4	2A	11	2E	4	1C	14	2D
5	1Y	12	1D	5	nc	15	nc
6	2Y	13	1E	6	2A	16	2E
7	GND	14	V_{CC}	7	nc	17	nc
				8	1Y	18	1D
				9	2Y	19	1E
				10	GND	20	V_{CC}

positive logic: $Y = \overline{ABCD}$

261

2-BIT BY 4-BIT PARALLEL BINARY MULTIPLIERS

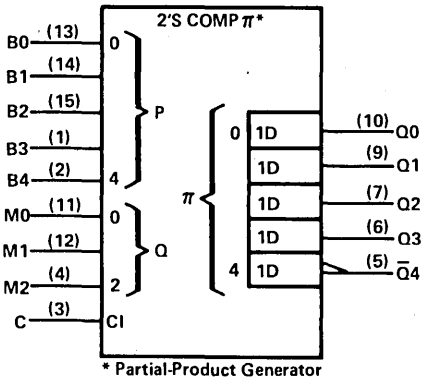
typical performance

TYPE	POWER	TIME**
'LS261	100 mW	25 ns

SN54LS261 (J,FH) SN74LS261 (J,N,FN)

** 5-Bit Product Time

logic symbol†



* Partial-Product Generator

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B3	9	Q1	1	nc	11	nc
2	B4	10	Q0	2	B3	12	Q1
3	C	11	M0	3	B4	13	Q0
4	M2	12	M1	4	C	14	M0
5	$\overline{Q4}$	13	B0	5	M2	15	M1
6	Q3	14	B1	6	nc	16	nc
7	Q2	15	B2	7	$\overline{Q4}$	17	B0
8	GND	16	V_{CC}	8	Q3	18	B1
				9	Q2	19	B2
				10	GND	20	V_{CC}

265

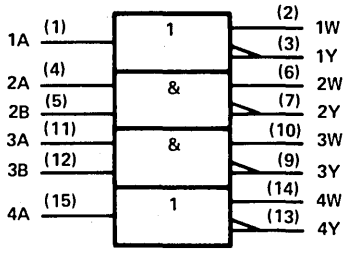
QUAD COMPLEMENTARY-OUTPUT ELEMENTS

typical performance

TYPE	POWER
'265	125 mW

SN54265 (J,FH) SN74265 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	1A	9	3Y	1	nc	11	nc
2	1W	10	3W	2	1A	12	3Y
3	1Y	11	3A	3	1W	13	3W
4	2A	12	3B	4	1Y	14	3A
5	2B	13	4Y	5	2A	15	3B
6	2W	14	4W	6	nc	16	nc
7	2Y	15	4A	7	2B	17	4Y
8	GND	16	V_{CC}	8	2W	18	4W
				9	2Y	19	4A
				10	GND	20	V_{CC}

266

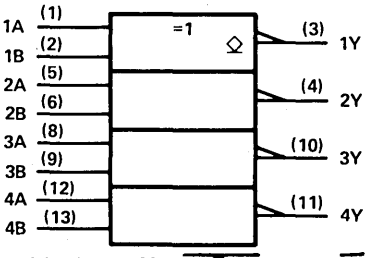
QUAD 2-INPUT EXCLUSIVE-NOR GATES WITH OPEN-COLLECTOR OUTPUTS

typical performance

TYPE	POWER	DELAY
'LS266	40 mW	18 ns

SN54LS266 (J,FH) SN74LS266 (J,N,FN)

logic symbol†



positive logic: $Y = \overline{A} \oplus \overline{B} = AB + \overline{A}\,\overline{B}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3A	1	nc	11	nc
2	1B	9	3B	2	1A	12	3A
3	1Y	10	3Y	3	1B	13	3B
4	2Y	11	4Y	4	1Y	14	3Y
5	2A	12	4A	5	nc	15	nc
6	2B	13	4B	6	2Y	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2A	18	4A
				9	2B	19	4B
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

270

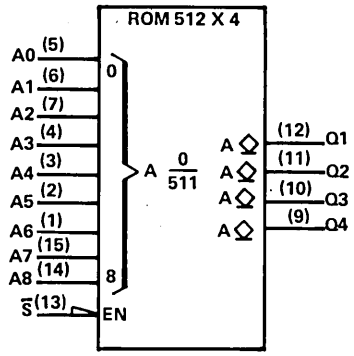
2048-BIT READ-ONLY MEMORIES
(open-collector outputs, 512 4-bit words)

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'S270	45 ns	15 ns	0.26 mW

SN54S270 (J) SN74S270 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	A6	9	Q4
2	A5	10	Q3
3	A4	11	Q2
4	A3	12	Q1
5	A0	13	S̄
6	A1	14	A8
7	A2	15	A7
8	GND	16	V_{CC}

For chip carrier information, contact the factory.

271

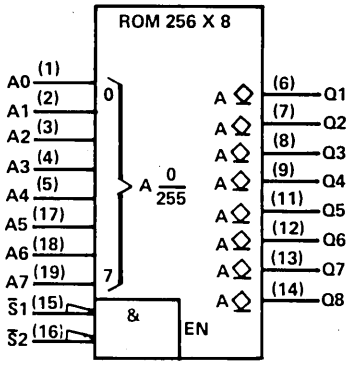
2048-BIT READ-ONLY MEMORIES
(open-collector outputs, 256 8-bit words)

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'S271	45 ns	15 ns	0.26 mW

SN54S271 (J,FH) SN74S271 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A0	11	Q5	1	A0	11	Q5
2	A1	12	Q6	2	A1	12	Q6
3	A2	13	Q7	3	A2	13	Q7
4	A3	14	Q8	4	A3	14	Q8
5	A4	15	S̄1	5	A4	15	S̄1
6	Q1	16	S̄2	6	Q1	16	S̄2
7	Q2	17	A5	7	Q2	17	A5
8	Q3	18	A6	8	Q3	18	A6
9	Q4	19	A7	9	Q4	19	A7
10	GND	20	V_{CC}	10	GND	20	V_{CC}

273

OCTAL D-TYPE FLIP-FLOPS
(common clock, single-rail outputs)

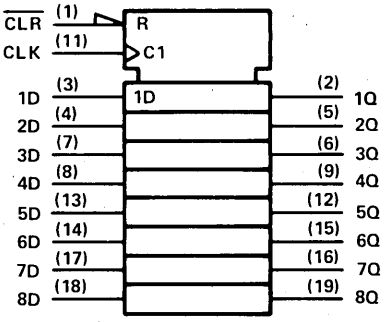
typical performance

TYPE	FREQ	POWER PER F-F	DATA TIMES	
			SETUP	HOLD
'273	40 MHz	39 mW	20 ns†	5 ns†
'ALS273	50 MHz	9.4 mW		
'LS273	40 MHz	10.6 mW	20 ns†	5 ns†

† Rising edge of clock pulse

SN54273 (J,FH) SN74273 (J,N)
SN54ALS273 (J,FH) SN74ALS273 (N,FN)
SN54LS273 (J,FH) SN74LS273 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	CLR	11	CLK	1	CLR	11	CLK
2	1Q	12	5Q	2	1Q	12	5Q
3	1D	13	5D	3	1D	13	5D
4	2D	14	6D	4	2D	14	6D
5	2Q	15	6Q	5	2Q	15	6Q
6	3Q	16	7Q	6	3Q	16	7Q
7	3D	17	7D	7	3D	17	7D
8	4D	18	8D	8	4D	18	8D
9	4Q	19	8Q	9	4Q	19	8Q
10	GND	20	V_{CC}	10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

274

4-BIT BY 4-BIT BINARY MULTIPLIERS

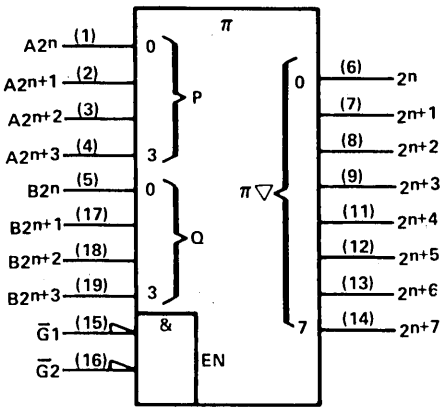
typical performance

TYPE	POWER	TIME*
'S274	525 mW	50 ns

SN54S274 (J,FH) SN74S274 (J,N,FN)

* 8-Bit Product Time

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$A2^n$	11	2^{n+4}	1	$A2^n$	11	2^{n+4}
2	$A2^{n+1}$	12	2^{n+5}	2	$A2^{n+1}$	12	2^{n+5}
3	$A2^{n+2}$	13	2^{n+6}	3	$A2^{n+2}$	13	2^{n+6}
4	$A2^{n+3}$	14	2^{n+7}	4	$A2^{n+3}$	14	2^{n+7}
5	$B2^n$	15	$\overline{G}1$	5	$B2^n$	15	$\overline{G}1$
6	2^n	16	$\overline{G}2$	6	2^n	16	$\overline{G}2$
7	2^{n+1}	17	$B2^{n+1}$	7	2^{n+1}	17	$B2^{n+1}$
8	2^{n+2}	18	$B2^{n+2}$	8	2^{n+2}	18	$B2^{n+2}$
9	2^{n+3}	19	$B2^{n+3}$	9	2^{n+3}	19	$B2^{n+3}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

275

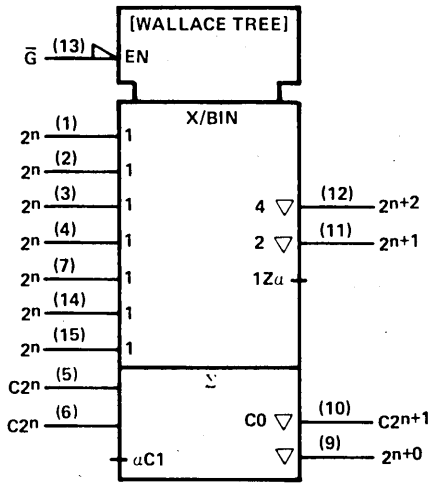
7-BIT-SLICE WALLACE TREES

typical performance

TYPE	POWER
'LS275	125 mW
'S275	525 mW

SN54LS275 (J,FH) SN74LS275 (J,N,FN)
SN54S275 (J,FH) SN74S275 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	2^n	9	2^{n+0}	1	nc	11	nc
2	2^n	10	$C2^{n+1}$	2	2^n	12	2^{n+0}
3	2^n	11	2^{n+1}	3	2^n	13	$C2^{n+1}$
4	2^n	12	2^{n+2}	4	2^n	14	2^{n+1}
5	$C2^n$	13	$\overline{G}$	5	2^n	15	2^{n+2}
6	$C2^n$	14	2^n	6	nc	16	nc
7	2^n	15	2^n	7	$C2^n$	17	$\overline{G}$
8	GND	16	V_{CC}	8	$C2^n$	18	2^n
				9	2^n	19	2^n
				10	GND	20	V_{CC}

276

QUAD J-$\overline{K}$ FLIP-FLOPS

(separate clocks, edge-triggering, common direct clear and preset)

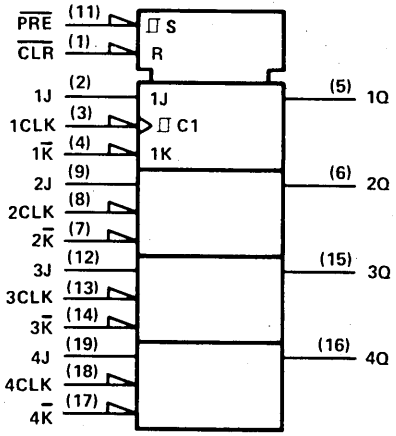
typical performance

TYPE	FREQ	POWER/ F-F	DATA TIMES	
			SETUP	HOLD
'276	50 MHz	75 mW	3 ns↓	10 ns↓

↓ Falling edge of clock pulse

SN54276 (J,FH) SN74276 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	$\overline{CLR}$	11	$\overline{PRE}$	1	$\overline{CLR}$	11	$\overline{PRE}$
2	1J	12	3J	2	1J	12	3J
3	1CLK	13	3CLK	3	1CLK	13	3CLK
4	$1\overline{K}$	14	$3\overline{K}$	4	$1\overline{K}$	14	$3\overline{K}$
5	1Q	15	3Q	5	1Q	15	3Q
6	2Q	16	4Q	6	2Q	16	4Q
7	$2\overline{K}$	17	$4\overline{K}$	7	$2\overline{K}$	17	$4\overline{K}$
8	2CLK	18	4CLK	8	2CLK	18	4CLK
9	2J	19	4J	9	2J	19	4J
10	GND	20	V_{CC}	10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

278

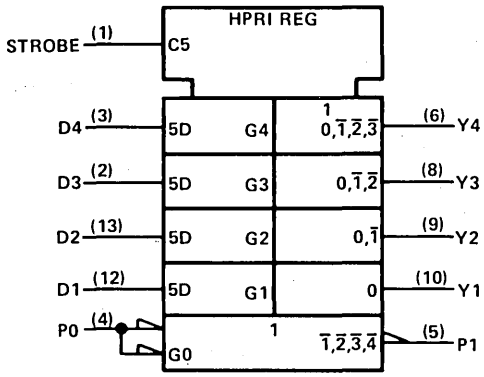
4-BIT CASCADABLE PRIORITY REGISTERS

typical performance

TYPE	POWER	DELAY
'278	275 mW	35 ns

SN54278 (J,FH) SN74278 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	STRB	8	Y3	1	nc	11	nc
2	D3	9	Y2	2	STRB	12	Y3
3	D4	10	Y1	3	D3	13	Y2
4	P0	11	nc	4	D4	14	Y1
5	P1	12	D1	5	nc	15	nc
6	Y4	13	D2	6	P0	16	nc
7	GND	14	V_{CC}	7	nc	17	nc
				8	P1	18	D1
				9	Y4	19	D2
				10	GND	20	V_{CC}

279

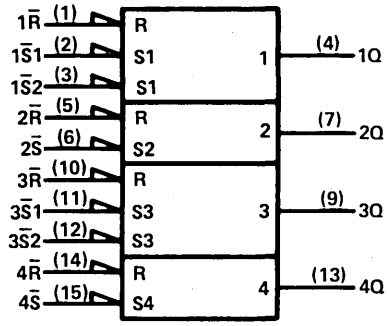
QUAD $\overline{S}$-$\overline{R}$ LATCHES

typical performance

TYPE	POWER	DELAY
'279	90 mW	12 ns
'LS279	19 mW	12 ns

SN54279 (J,FH) SN74279 (J,N,FN)
SN54LS279 (J,FH) SN74LS279 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$1\overline{R}$	9	3Q	1	nc	11	nc
2	$1\overline{S}1$	10	$3\overline{R}$	2	$1\overline{R}$	12	3Q
3	$1\overline{S}2$	11	$3\overline{S}1$	3	$1\overline{S}1$	13	$3\overline{R}$
4	1Q	12	$3\overline{S}2$	4	$1\overline{S}2$	14	$3\overline{S}1$
5	$2\overline{R}$	13	4Q	5	1Q	15	$3\overline{S}2$
6	$2\overline{S}$	14	$4\overline{R}$	6	nc	16	nc
7	2Q	15	$4\overline{S}$	7	$2\overline{R}$	17	4Q
8	GND	16	V_{CC}	8	$2\overline{S}$	18	$4\overline{R}$
				9	2Q	19	$4\overline{S}$
				10	GND	20	V_{CC}

280

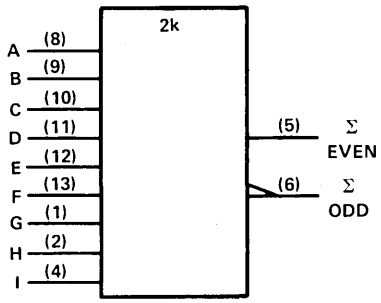
9-BIT ODD/EVEN PARITY GENERATORS/CHECKERS

typical performance

TYPE	POWER	DELAY
'AS280		
'LS280	80 mW	31 ns
'S280	335 mW	13 ns

SN54AS280 (J,FH) SN74AS280 (N,FN)
SN54LS280 (J,FH) SN74LS280 (J,N,FN)
SN54S280 (J,FH) SN74S280 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	G	8	A	1	nc	11	nc
2	H	9	B	2	G	12	A
3	nc	10	C	3	H	13	B
4	I	11	D	4	nc	14	C
5	ΣEVEN	12	E	5	nc	15	nc
6	ΣODD	13	F	6	I	16	D
7	GND	14	V_{CC}	7	nc	17	nc
				8	ΣEVEN	18	E
				9	ΣODD	19	F
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

281

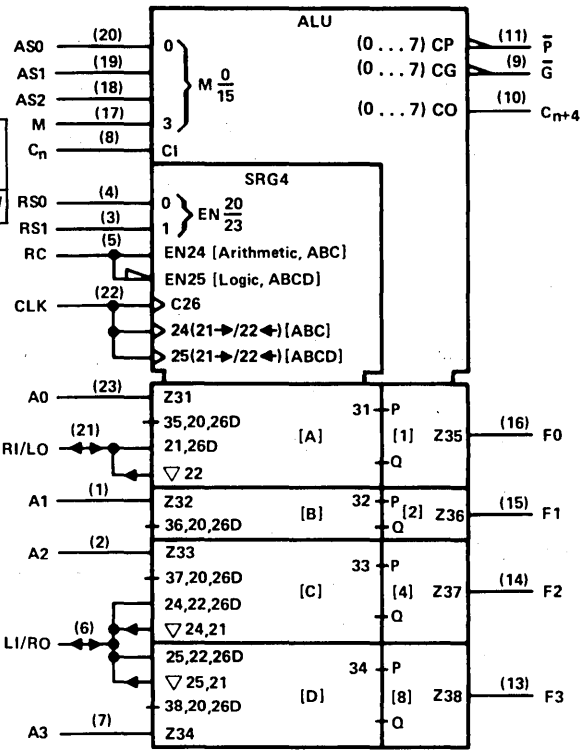
4-BIT PARALLEL BINARY ACCUMULATORS

typical performance

TYPE	ADD TIME	TOTAL POWER
'S281	20 ns	720 mW

SN54S281 (J,FH)
SN74S281 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A1	13	F3	1	nc	15	nc
2	A2	14	F2	2	A1	16	F3
3	RS1	15	F1	3	A2	17	F2
4	RS0	16	F0	4	RS1	18	F1
5	RC	17	M	5	RS0	19	F0
6	LI/RO	18	AS2	6	RC	20	M
7	A3	19	AS1	7	LI/RO	21	AS2
8	C_n	20	AS0	8	nc	22	nc
9	$\overline{G}$	21	RI/LO	9	A3	23	AS1
10	C_{n+4}	22	CLK	10	C_n	24	AS0
11	$\overline{P}$	23	A0	11	$\overline{G}$	25	RI/LO
12	GND	24	V_{CC}	12	C_{n+4}	26	CLK
				13	$\overline{P}$	27	A0
				14	GND	28	V_{CC}

283

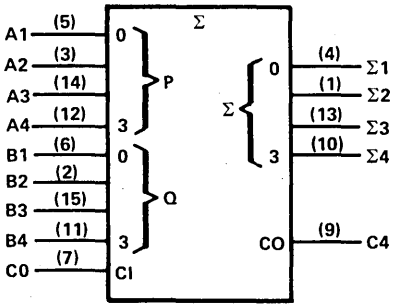
4-BIT BINARY FULL ADDERS

typical performance

TYPE	CARRY TIME	ADD TIME	POWER/ BIT
'283	10 ns	16 ns	76 mW
'LS283	10 ns	15 ns	24 mW
'S283	7 ns	11 ns	124 mW

SN54283 (J,FH)
SN54LS283 (J,FH)
SN54S283 (J,FH)
SN74283 (J,N)
SN74LS283 (J,N,FN)
SN74S283 (J,N,FN)

logic symbol†



typical performance

J, N PACKAGES				FH, FN PACKAGES			
1	Σ2	9	C4	1	nc	11	nc
2	B2	10	Σ4	2	Σ2	12	C4
3	A2	11	B4	3	B2	13	Σ4
4	Σ1	12	A4	4	A2	14	B4
5	A1	13	Σ3	5	Σ1	15	A4
6	B1	14	A3	6	nc	16	nc
7	C0	15	B3	7	A1	17	Σ3
8	GND	16	V_{CC}	8	B1	18	A3
				9	C0	19	B3
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

284

4-BIT BY 4-BIT PARALLEL BINARY MULTIPLIERS USED WITH '285

- MSB's for 4 X 4 multiplier ('285 provides LSB's)
- Use 'S274, 'LS275, 'S275 for new designs/larger multipliers

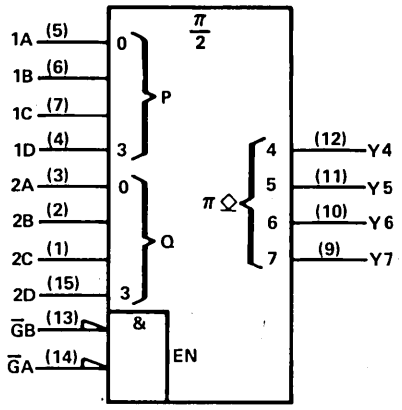
typical performance

TYPE	POWER	TIME*
'284	460 mW	40 ns

SN54284 (J,FH) SN74284 (J,N)

* 8-Bit Product Time

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	2C	9	Y7	1	nc	11	nc
2	2B	10	Y6	2	2C	12	Y7
3	2A	11	Y5	3	2B	13	Y6
4	1D	12	Y4	4	2A	14	Y5
5	1A	13	$\overline{GB}$	5	1D	15	Y4
6	1B	14	$\overline{GA}$	6	nc	16	nc
7	1C	15	2D	7	1A	17	$\overline{GB}$
8	GND	16	V_{CC}	8	1B	18	$\overline{GA}$
				9	1C	19	2D
				10	GND	20	V_{CC}

285

4-BIT BY 4-BIT PARALLEL BINARY MULTIPLIERS USED WITH '284

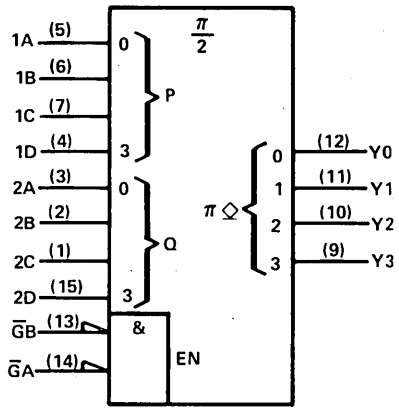
- LSB's for 4 X 4 multiplier ('284 provides MSB's)
- Use 'S274, 'LS275, 'S275 for new designs/larger multipliers

typical performance

TYPE	POWER
'285	460 mW

SN54285 (J,FH) SN74285 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	2C	9	Y3	1	nc	11	nc
2	2B	10	Y2	2	2C	12	Y3
3	2A	11	Y1	3	2B	13	Y2
4	1D	12	Y0	4	2A	14	Y1
5	1A	13	$\overline{GB}$	5	1D	15	Y0
6	1B	14	$\overline{GA}$	6	nc	16	nc
7	1C	15	2D	7	1A	17	$\overline{GB}$
8	GND	16	V_{CC}	8	1B	18	$\overline{GA}$
				9	1C	19	2D
				10	GND	20	V_{CC}

287

(This number has been changed to TBP14S10. Product Guide information for this TTL circuit can be found at the end of this section.)

288

(This number has been changed to TBP18S030. Product Guide information for this TTL circuit can be found at the end of this section.)

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

289

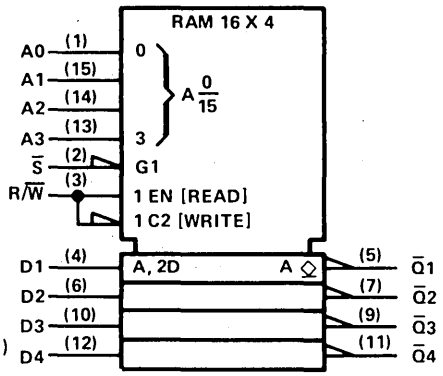
64-BIT RANDOM-ACCESS MEMORIES
(16 4-bit words, open-collector outputs)

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'LS289A	50 ns	35 ns	2.7 mW
'S289A	25 ns	12 ns	5.9 mW

SN54LS289A (J,FH) SN74LS289A (J,N,FN)
SN54S289A (J,FH) SN74S289A (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A0	9	Q̄3	1	nc	11	nc
2	S̄	10	D3	2	A0	12	Q̄3
3	R/W̄	11	Q̄4	3	S̄	13	D3
4	D1	12	D4	4	R/W̄	14	Q̄4
5	Q̄1	13	A3	5	D1	15	D4
6	D2	14	A2	6	nc	16	nc
7	Q̄2	15	A1	7	Q̄1	17	A3
8	GND	16	V_{CC}	8	D2	18	A2
				9	Q̄2	19	A1
				10	GND	20	V_{CC}

290

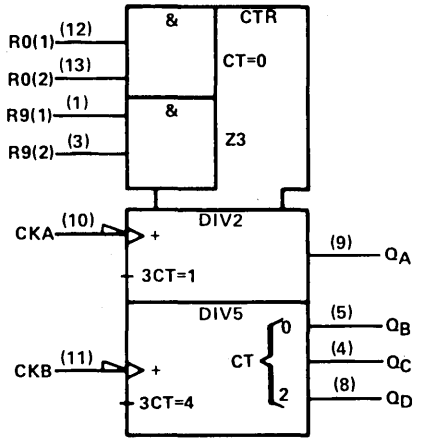
DECADE COUNTERS
(divide-by-two and divide-by-five)

typical performance

TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'290	32 MHz	HIGH	160 mW
'LS290	32 MHz	HIGH	40 mW

SN54290 (J,FH) SN74290 (J,N)
SN54LS290 (J,FH) SN74LS290 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	R9(1)	8	Q_D	1	nc	11	nc
2	nc	9	Q_A	2	R9(1)	12	Q_D
3	R9(2)	10	CKA	3	nc	13	Q_A
4	Q_C	11	CKB	4	R9(2)	14	CKA
5	Q_B	12	R0(1)	5	nc	15	nc
6	nc	13	R0(2)	6	Q_C	16	CKB
7	GND	14	V_{CC}	7	nc	17	nc
				8	Q_B	18	R0(1)
				9	nc	19	R0(2)
				10	GND	20	V_{CC}

292

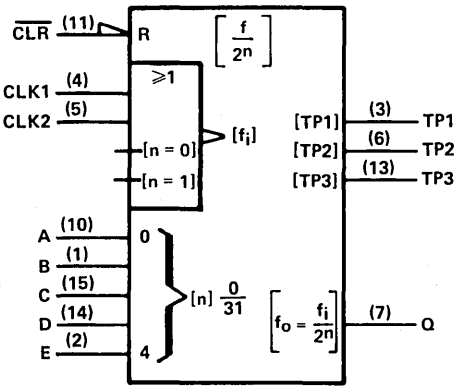
PROGRAMMABLE FREQUENCY DIVIDERS/DIGITAL TIMERS
(digitally programmable from 2^2 to 2^{31})

typical performance

TYPE	POWER	f_{max}
'LS292	200 mW	50 MHz

SN54LS292 (J,FH) SN74LS292 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	9	nc	1	nc	11	nc
2	E	10	A	2	B	12	nc
3	TP1	11	CLR	3	E	13	A
4	CLK1	12	nc	4	TP1	14	CLR
5	CLK2	13	TP3	5	CLK1	15	nc
6	TP2	14	D	6	nc	16	nc
7	Q	15	C	7	CLK2	17	TP3
8	GND	16	V_{CC}	8	TP2	18	D
				9	Q	19	C
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

293

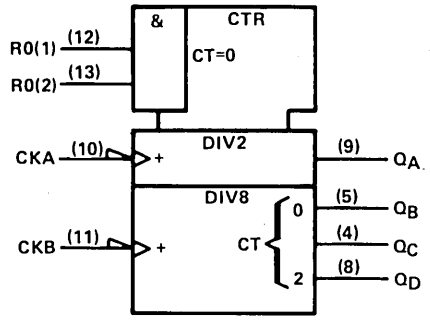
4-BIT BINARY COUNTERS
(divide-by-two and divide-by-eight)

typical performance

TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'293	32 MHz	HIGH	160 mW
'LS293	32 MHz	HIGH	39 mW

SN54293 (J,FH) SN74293 (J,N)
SN54LS293 (J,FH) SN74LS293 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	nc	8	Q_D	1	nc	11	nc
2	nc	9	Q_A	2	nc	12	Q_D
3	nc	10	CKA	3	nc	13	Q_A
4	Q_C	11	CKB	4	nc	14	CKA
5	Q_B	12	R0(1)	5	nc	15	nc
6	nc	13	R0(2)	6	Q_C	16	CKB
7	GND	14	V_{CC}	7	nc	17	nc
				8	Q_B	18	R0(1)
				9	nc	19	R0(2)
				10	GND	20	V_{CC}

294

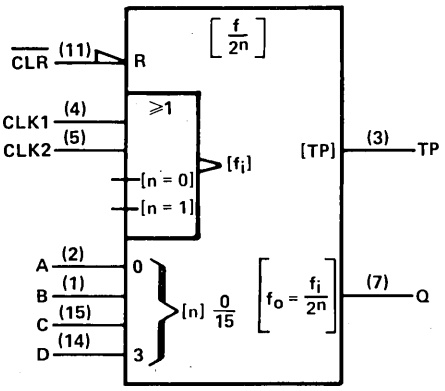
PROGRAMMABLE FREQUENCY DIVIDERS/DIGITAL TIMERS
(digitally programmable from 2^2 to 2^{15})

typical performance

TYPE	POWER	f_{max}
'LS294	150 mW	50 MHz

SN54LS294 (J,FH) SN74LS294 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	9	nc	1	nc	11	nc
2	A	10	nc	2	B	12	nc
3	TP	11	$\overline{CLR}$	3	A	13	nc
4	CLK1	12	nc	4	TP	14	$\overline{CLR}$
5	CLK2	13	nc	5	CLK1	15	nc
6	nc	14	D	6	nc	16	nc
7	Q	15	C	7	CLK2	17	nc
8	GND	16	V_{CC}	8	nc	18	D
				9	Q	19	C
				10	GND	20	V_{CC}

295

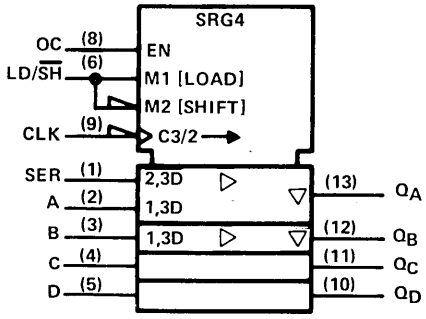
4-BIT BIDIRECTIONAL UNIVERSAL SHIFT REGISTERS

typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	TOTAL POWER
'LS295B	30 MHz	D	70 mW

SN54LS295B (J,FH) SN74LS295B (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	SER	8	OC	1	nc	11	nc
2	A	9	CLK	2	SER	12	OC
3	B	10	Q_D	3	A	13	CLK
4	C	11	Q_C	4	B	14	Q_D
5	D	12	Q_B	5	nc	15	nc
6	LD/SH	13	Q_A	6	C	16	Q_C
7	GND	14	V_{CC}	7	nc	17	nc
				8	D	18	Q_B
				9	LD/SH	19	Q_A
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

297

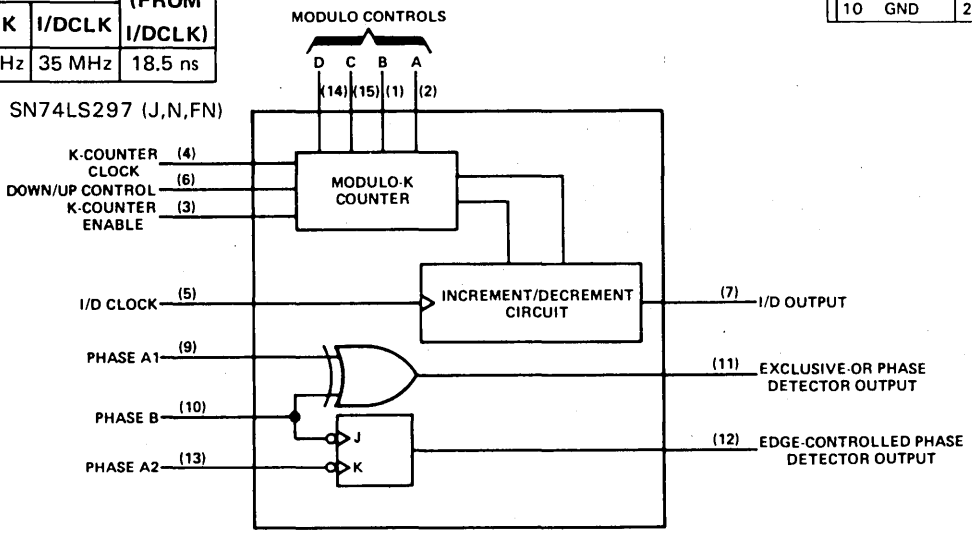
DIGITAL PHASE-LOCKED-LOOP FILTERS
(cascadable for higher-order loops)

typical performance

TYPE	POWER	f_{max}		DELAY (FROM I/DCLK)
		KCLK	I/DCLK	
'LS297	375 mW	50 MHz	35 MHz	18.5 ns

SN54LS297 (J,FH) SN74LS297 (J,N,FN)

simplified block diagram†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	9	ϕA1	1	nc	11	nc
2	A	10	ϕB	2	B	12	ϕA1
3	ENCTR	11	XOPRD	3	A	13	ϕB
4	K CLK	12	ECPD	4	ENCTR	14	XOPRD
5	I/D CLK	13	ϕA2	5	K CLK	15	ECPD
6	D/$\overline{U}$	14	D	6	nc	16	nc
7	I/D OUT	15	C	7	I/D CLK	17	ϕA2
8	GND	16	V_{CC}	8	D/$\overline{U}$	18	D
				9	I/D OUT	19	C
				10	GND	20	V_{CC}

298

QUAD 2-INPUT MULTIPLEXERS WITH STORAGE

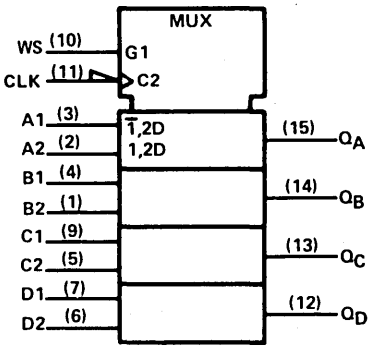
typical performance

TYPE	POWER	DELAY*
'298	195 mW	20 ns
'LS298	65 mW	20 ns

* From clock to non-inverted output

SN54298 (J,FH) SN74298 (J,N)
SN54LS298 (J,FH) SN74LS298 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B2	9	C1	1	nc	11	nc
2	A2	10	WS	2	B2	12	C1
3	A1	11	CLK	3	A2	13	WS
4	B1	12	Q_D	4	A1	14	CLK
5	C2	13	Q_C	5	B1	15	Q_D
6	D2	14	Q_B	6	nc	16	nc
7	D1	15	Q_A	7	C2	17	Q_C
8	GND	16	V_{CC}	8	D2	18	Q_B
				9	D1	19	Q_A
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

299

8-BIT BIDIRECTIONAL UNIVERSAL SHIFT/STORAGE REGISTERS

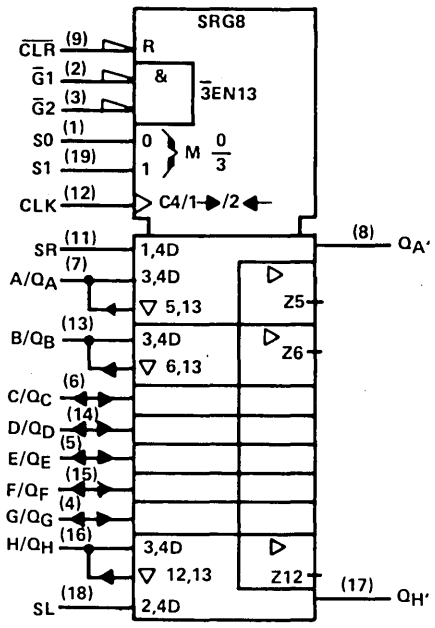
(three-state outputs)

typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'ALS299	30 MHz	D	LOW	100 mW
'LS299	35 MHz	D	LOW	175 mW
'S299	50 MHz	D	LOW	750 mW

SN54ALS299 (J,FH) SN74ALS299 (N,FN)
SN54LS299 (J,FH) SN74LS299 (J,N,FN)
SN54S299 (J,FH) SN74S299 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	S0	11	SR
2	$\overline{G}1$	12	CLK
3	$\overline{G}2$	13	B/Q_B
4	G/Q_G	14	D/Q_D
5	E/Q_E	15	F/Q_F
6	C/Q_C	16	H/Q_H
7	A/Q_A	17	$Q_{H'}$
8	$Q_{A'}$	18	SL
9	$\overline{CLR}$	19	S1
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	S0	11	SR
2	$\overline{G}1$	12	CLK
3	$\overline{G}2$	13	B/Q_B
4	G/Q_G	14	D/Q_D
5	E/Q_E	15	F/Q_F
6	C/Q_C	16	H/Q_H
7	A/Q_A	17	$Q_{H'}$
8	Q_A	18	SL
9	$\overline{CLR}$	19	S1
10	GND	20	V_{CC}

301

256-BIT RANDOM-ACCESS MEMORIES

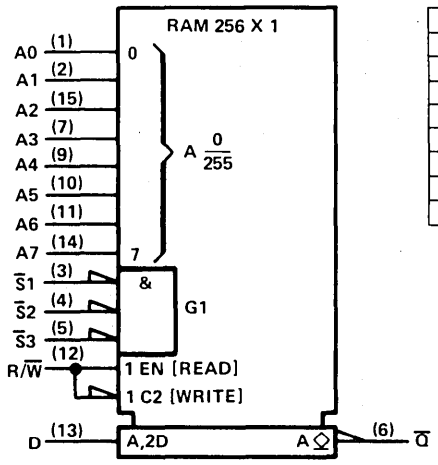
(256 1-bit words, open-collector output)

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'S301	42 ns	13 ns	1.9 mW

SN74S301 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	A0	9	A4
2	A1	10	A5
3	$\overline{S}1$	11	A6
4	$\overline{S}2$	12	$R/\overline{W}$
5	$\overline{S}3$	13	D
6	$\overline{Q}$	14	A7
7	A3	15	A2
8	GND	16	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

317

256-BIT RANDOM-ACCESS MEMORIES WITH OPEN-COLLECTOR OUTPUTS

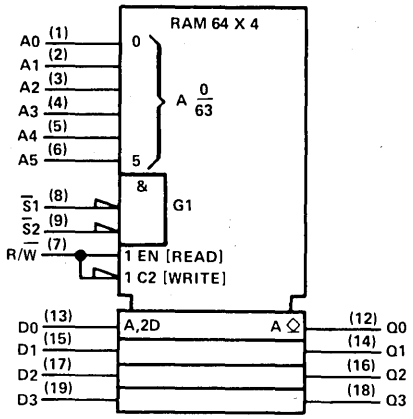
(64 words of 4 bits each)

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'ALS317	30 ns	20 ns	0.9 mW

SN54ALS317 (J,FH) SN74ALS317 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A0	11	nc	1	A0	11	nc
2	A1	12	Q0	2	A1	12	Q0
3	A2	13	D0	3	A2	13	D0
4	A3	14	Q1	4	A3	14	Q1
5	A4	15	D1	5	A4	15	D1
6	A5	16	Q2	6	A5	16	Q2
7	R/W̄	17	D2	7	R/W̄	17	D2
8	S̄1	18	Q3	8	S̄1	18	Q3
9	S̄2	19	D3	9	S̄2	19	D3
10	GND	20	V_{CC}	10	GND	20	V_{CC}

318

256-BIT RANDOM-ACCESS MEMORIES WITH OPEN-COLLECTOR OUTPUTS

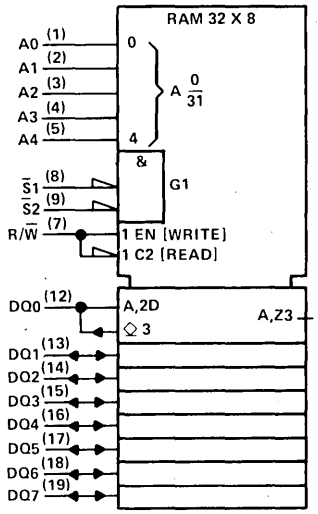
(32 words of 8 bits each)

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'ALS318	30 ns	20 ns	0.9 mW

SN54ALS318 (J,FH) SN74ALS318 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A0	11	nc	1	A0	11	nc
2	A1	12	DQ0	2	A1	12	DQ0
3	A2	13	DQ1	3	A2	13	DQ1
4	A3	14	DQ2	4	A3	14	DQ2
5	A4	15	DQ3	5	A4	15	DQ3
6	nc	16	DQ4	6	nc	16	DQ4
7	R W̄	17	DQ5	7	R W̄	17	DQ5
8	S̄1	18	DQ6	8	S̄1	18	DQ6
9	S̄2	19	DQ7	9	S̄2	19	DQ7
10	GND	20	V_{CC}	10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc – no internal connection.

© IC MASTER 1983

319

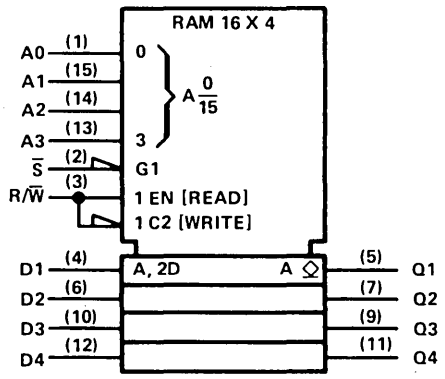
64-BIT RANDOM ACCESS MEMORIES
(16-four bit words, open-collector outputs)

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'LS319A	50 ns	35 ns	2.7 mW

SN54LS319A (J,FH) SN74LS319A (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A0	9	Q3	1	nc	11	nc
2	S̄	10	D3	2	A0	12	Q3
3	R/W̄	11	Q4	3	S̄	13	D3
4	D1	12	D4	4	R/W̄	14	Q4
5	Q1	13	A3	5	D1	15	D4
6	D2	14	A2	6	nc	16	nc
7	Q2	15	A1	7	Q1	17	A3
8	GND	16	V_{CC}	8	D2	18	A2
				9	Q2	19	A1
				10	GND	20	V_{CC}

320

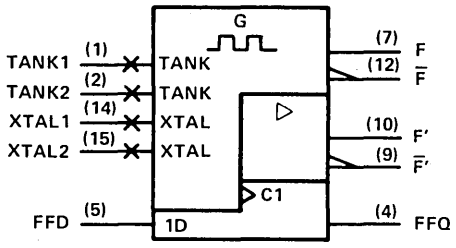
CRYSTAL-CONTROLLED OSCILLATORS

typical performance

TYPE	f_{max}	POWER
'LS320	30 MHz	210 mW

SN54LS320 (J) SN74LS320 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	TANK1	9	F̄'
2	TANK2	10	F'
3	GND1	11	$V_{CC'}$
4	FFQ	12	F̄
5	FFD	13	nc
6	nc	14	XTAL1
7	F	15	XTAL2
8	GND2	16	V_{CC}

For chip carrier information, contact the factory.

321

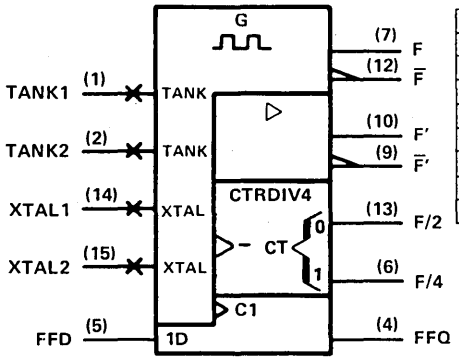
CRYSTAL-CONTROLLED OSCILLATORS
(with F/2 and F/4 count-down outputs)

typical performance

TYPE	FREQ	POWER
'LS321	30 MHz	235 mW

SN54LS321 (J) SN74LS321 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	TANK1	9	F̄'
2	TANK2	10	F'
3	GND1	11	$V_{CC'}$
4	FFQ	12	F̄
5	FFD	13	F/2
6	F/4	14	XTAL1
7	F	15	XTAL2
8	GND2	16	V_{CC}

For chip carrier information, contact the factory.

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

322

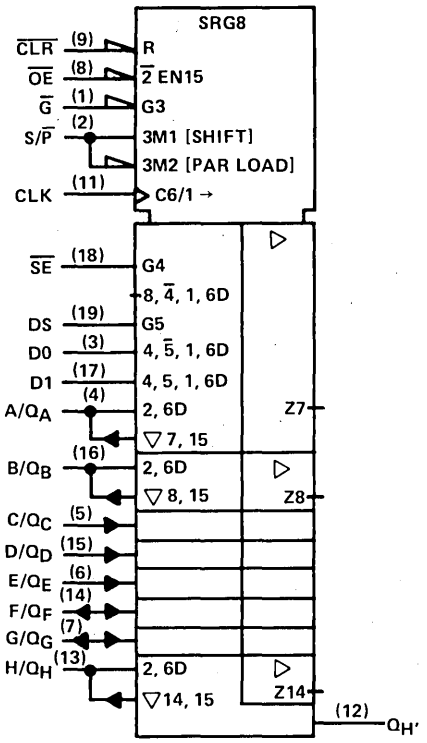
8-BIT SHIFT REGISTERS WITH SIGN EXTEND
(three-state outputs, multiplexed I/O)

typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	ASYNC CLEAR	POWER
'LS322A	35 MHz	D	LOW	175 mW

SN54LS322A (J,FH) SN74LS322A (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{G}$	11	CLK	1	$\overline{G}$	11	CLK
2	S/$\overline{P}$	12	$Q_{H'}$	2	S/$\overline{P}$	12	$Q_{H'}$
3	D0	13	H/Q_H	3	D0	13	H/Q_H
4	A/Q_A	14	F/Q_F	4	A/Q_A	14	F/Q_F
5	C/Q_C	15	D/Q_D	5	C/Q_C	15	D/Q_D
6	E/Q_E	16	B/Q_B	6	E/Q_E	16	B/Q_B
7	G/Q_G	17	D1	7	G/Q_G	17	D1
8	$\overline{OE}$	18	$\overline{SE}$	8	$\overline{OE}$	18	$\overline{SE}$
9	$\overline{CLR}$	19	DS	9	$\overline{CLR}$	19	DS
10	GND	20	V_{CC}	10	GND	20	V_{CC}

323

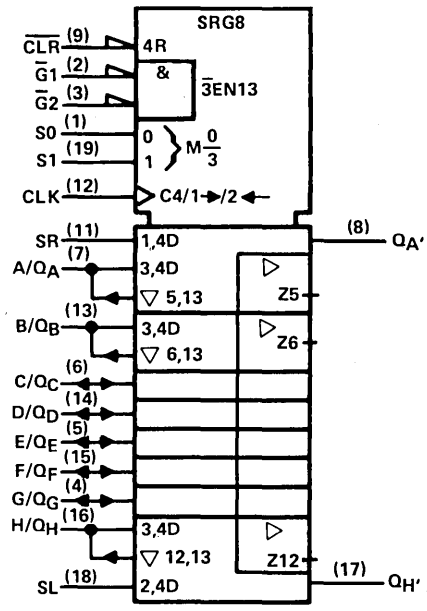
8-BIT BIDIRECTIONAL SHIFT/STORAGE REGISTERS
(three-state outputs)

typical performance

TYPE	SHIFT FREQ	SERIAL DATA INPUT	POWER
'ALS323	30 MHz	D	100 mW
'LS323	35 MHz	D	175 mW

SN54ALS323 (J,FH) SN74ALS323 (N,FN)
SN54LS323 (J,FH) SN74LS323 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	S0	11	SR	1	S0	11	SR
2	$\overline{G}$1	12	CLK	2	$\overline{G}$1	12	CLK
3	$\overline{G}$2	13	B/Q_B	3	$\overline{G}$2	13	B/Q_B
4	G/Q_G	14	D/Q_D	4	G/Q_G	14	D/Q_D
5	E/Q_E	15	F/Q_F	5	E/Q_E	15	F/Q_F
6	C/Q_C	16	H/Q_H	6	C/Q_C	16	H/Q_H
7	A/Q_A	17	$Q_{H'}$	7	A/Q_A	17	$Q_{H'}$
8	Q_A	18	SL	8	Q_A	18	SL
9	$\overline{CLR}$	19	S1	9	$\overline{CLR}$	19	S1
10	GND	20	V_{CC}	10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

347

BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS

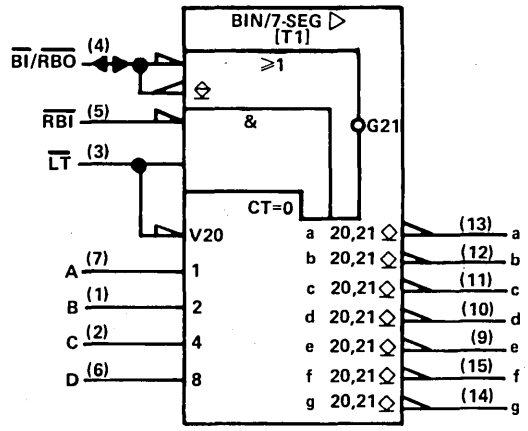
(open-collector outputs, low-voltage version of 'LS47)

typical performance

TYPE	OUTPUT SINK CURRENT	OFF-STATE OUTPUT VOLTAGE	POWER
SN54LS347	12 mA	7 V	35 mW
SN74LS347	24 mA	7 V	35 mW

SN54LS347 (J,FH) SN74LS347 (J,N, FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	B	9	e
2	C	10	d
3	$\overline{LT}$	11	c
4	$\overline{BI}/\overline{RBO}$	12	b
5	$\overline{RBI}$	13	a
6	D	14	g
7	A	15	f
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	B	12	e
3	C	13	d
4	$\overline{LT}$	14	c
5	$\overline{BI}/\overline{RBO}$	15	b
6	nc	16	nc
7	$\overline{RBI}$	17	a
8	D	18	g
9	A	19	f
10	GND	20	V_{CC}

348

8-LINE TO 3-LINE PRIORITY ENCODERS

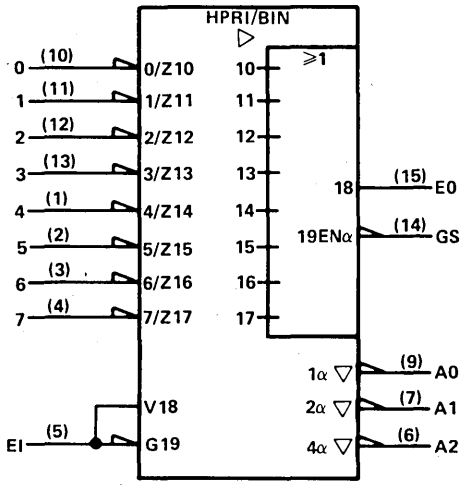
(with three-state outputs)

typical performance

TYPE	DELAY	POWER
'LS348	16 ns	63 mW

SN54LS348 (J,FH) SN74LS348 (J,N,FN)

logic symbol†



pin assignments

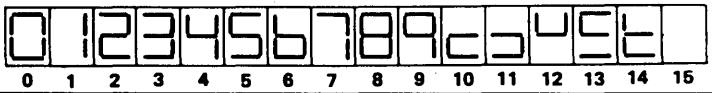
J, N PACKAGES			
1	4	9	A0
2	5	10	0
3	6	11	1
4	7	12	2
5	E1	13	3
6	A2	14	GS
7	A1	15	E0
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	4	12	A0
3	5	13	0
4	6	14	1
5	7	15	2
6	nc	16	nc
7	E1	17	3
8	A2	18	GS
9	A1	19	E0
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

FONT TABLE T1 — NUMERICAL DESIGNATIONS AND RESULTANT DISPLAYS USING 'LS347



TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 225012 • DALLAS, TEXAS 75265

© IC MASTER 1983

351

DUAL 8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

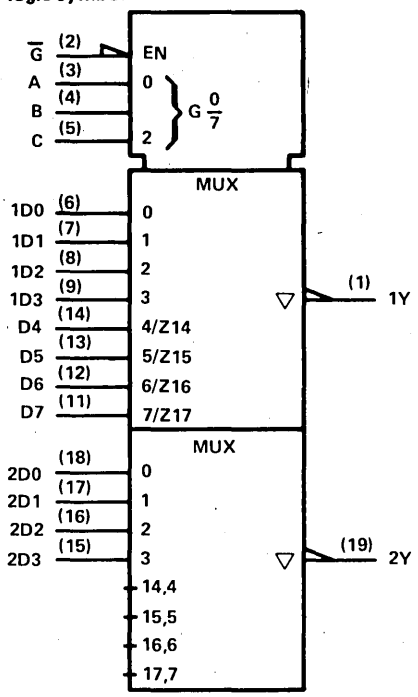
(three-state outputs; four common data inputs)

typical performance

TYPE	DELAY TIMES		TOTAL POWER
	DATA TO INV OUTPUT	FROM ENABLE	
'351	10 ns	17 ns	220 mW

SN74351 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	1Y	11	D7
2	$\overline{G}$	12	D6
3	A	13	D5
4	B	14	D4
5	C	15	2D3
6	1D0	16	2D2
7	1D1	17	2D1
8	1D2	18	2D0
9	1D3	19	2Y
10	GND	20	V_{CC}

352

DUAL 4-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

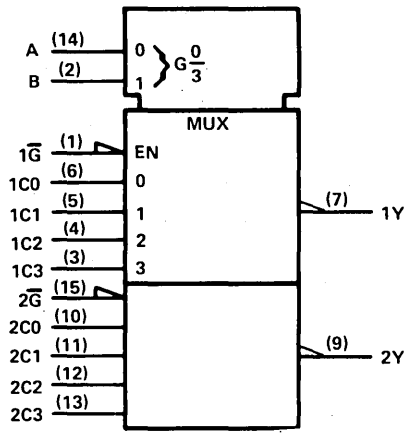
(inverting version of 'LS153)

typical performance

TYPE	DELAY TIMES		TOTAL POWER
	DATA TO INV OUTPUT	FROM ENABLE	
'ALS352	6 ns	4.5 ns	32.5 mW
'AS352	2.7 ns	4.5 ns	122.5 mW
'LS352	15 ns	18.5 ns	31 mW

SN54ALS352 (J,FH) SN74ALS352 (N,FN)
SN54AS352 (J,FH) SN74AS352 (N,FN)
SN54LS352 (J,FH) SN74LS352 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1$\overline{G}$	9	2Y	1	nc	11	nc
2	B	10	2C0	2	1$\overline{G}$	12	2Y
3	1C3	11	2C1	3	B	13	2C0
4	1C2	12	2C2	4	1C3	14	2C1
5	1C1	13	2C3	5	1C2	15	2C2
6	1C0	14	A	6	nc	16	nc
7	1Y	15	2$\overline{G}$	7	1C1	17	2C3
8	GND	16	V_{CC}	8	1C0	18	A
				9	1Y	19	2$\overline{G}$
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

353

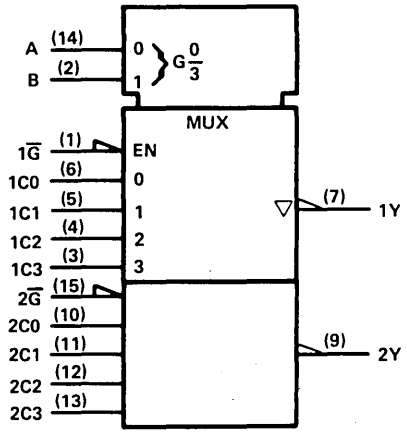
DUAL 4-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS
(three-state outputs, inverting version of 'LS253

typical performance

TYPE	DELAY TIMES		TOTAL POWER
	DATA TO INV OUTPUT	FROM ENABLE	
'ALS353	6 ns	4.5 ns	40 mW
'AS353	2.7 ns	5.5 ns	130 mW
'LS353	12 ns	13 ns	43 mW

SN54ALS353 (J,FH) SN74ALS353 (N,FN)
SN54AS353 (J,FH) SN74AS353 (N,FN)
SN54LS353 (J,FH) SN74LS353 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1G̅	9	2Y	1	nc	11	nc
2	B	10	2C0	2	1G̅	12	2Y
3	1C3	11	2C1	3	B	13	2C0
4	1C2	12	2C2	4	1C3	14	2C1
5	1C1	13	2C3	5	1C2	15	2C2
6	1C0	14	A	6	nc	16	nc
7	1Y	15	2G̅	7	1C1	17	2C3
8	GND	16	V_{CC}	8	1C0	18	A
				9	1Y	19	2G̅
				10	GND	20	V_{CC}

354

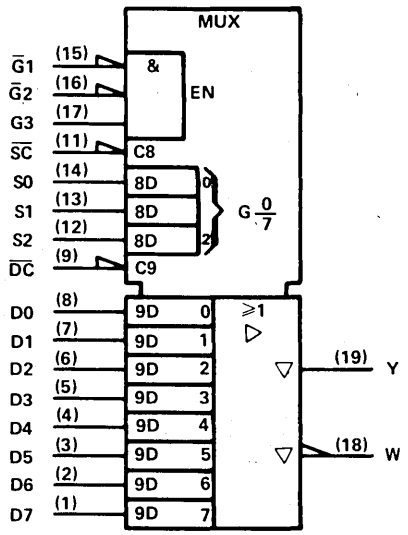
8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS/ TRANSPARENT REGISTERS
(three-state outputs)

typical performance

TYPE	DELAY TIMES		
	DATA TO INV OUTPUT	DATA TO NON-INV OUTPUT	FROM ENABLE
'LS354	23.5 ns	23.5 ns	16 ns

SN54LS354 (J,FH) SN74LS354 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	D7	11	S̅C̅	1	D7	11	S̅C̅
2	D6	12	S2	2	D6	12	S2
3	D5	13	S1	3	D5	13	S1
4	D4	14	S0	4	D4	14	S0
5	D3	15	G1̅	5	D3	15	G1̅
6	D2	16	G2̅	6	D2	16	G2̅
7	D1	17	G3	7	D1	17	G3
8	D0	18	W	8	D0	18	W
9	D̅C̅	19	Y	9	D̅C̅	19	Y
10	GND	20	V_{CC}	10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc – no internal connection.

© IC MASTER 1983

355

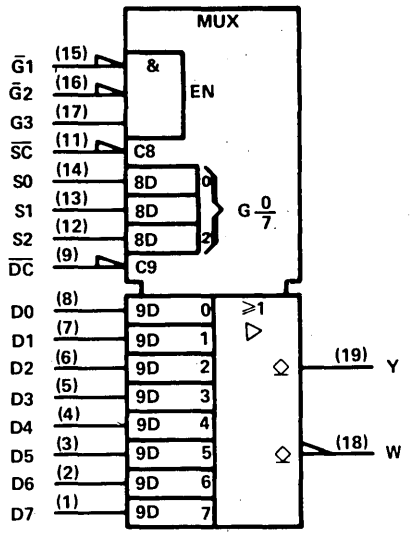
8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS/ TRANSPARENT REGISTERS
(open-collector outputs)

typical performance

DELAY TIMES		
DATA TO INV OUTPUT	DATA TO NON-INV OUTPUT	FROM ENABLE
31.5 ns	30 ns	21.5 ns

SN54LS355 (J,FH) SN74LS355 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	D7	11	$\overline{SC}$	1	D7	11	$\overline{SC}$
2	D6	12	S2	2	D6	12	S2
3	D5	13	S1	3	D5	13	S1
4	D4	14	S0	4	D4	14	S0
5	D3	15	$\overline{G1}$	5	D3	15	$\overline{G1}$
6	D2	16	$\overline{G2}$	6	D2	16	$\overline{G2}$
7	D1	17	G3	7	D1	17	G3
8	D0	18	W	8	D0	18	W
9	$\overline{DC}$	19	Y	9	$\overline{DC}$	19	Y
10	GND	20	V_{CC}	10	GND	20	V_{CC}

356

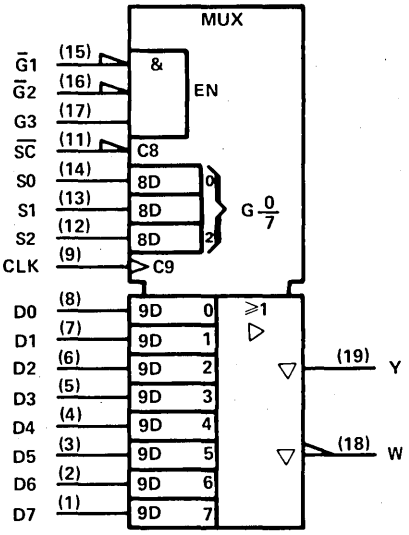
8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS/ EDGE-TRIGGERED REGISTERS
(three-state output)

typical performance

DELAY TIMES		
DATA TO INV OUTPUT	DATA TO NON-INV OUTPUT	FROM ENABLE
23.5 ns	23.5 ns	16 ns

SN54LS356 (J,FH) SN74LS356 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	D7	11	$\overline{SC}$	1	D7	11	$\overline{SC}$
2	D6	12	S2	2	D6	12	S2
3	D5	13	S1	3	D5	13	S1
4	D4	14	S0	4	D4	14	S0
5	D3	15	$\overline{G1}$	5	D3	15	$\overline{G1}$
6	D2	16	$\overline{G2}$	6	D2	16	$\overline{G2}$
7	D1	17	G3	7	D1	17	G3
8	D0	18	W	8	D0	18	W
9	CLK	19	Y	9	CLK	19	Y
10	GND	20	V_{CC}	10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

357

8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS/ EDGE-TRIGGERED REGISTERS

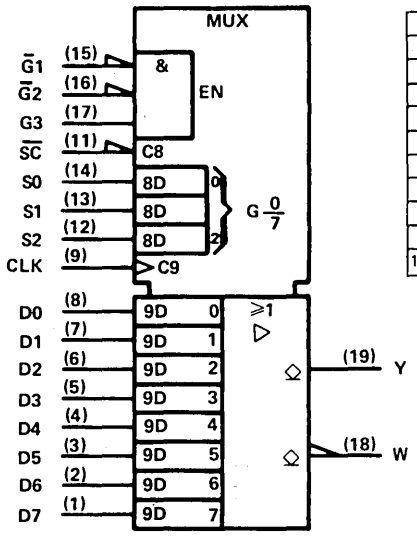
(open-collector outputs)

typical performance

DELAY TIMES		
DATA TO INV OUTPUT	DATA TO NON-INV OUTPUT	FROM ENABLE
31.5 ns	30 ns	25 ns

SN544LS357 (J,FH) SN74LS357 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	D7	11	SC	1	D7	11	SC
2	D6	12	S2	2	D6	12	S2
3	D5	13	S1	3	D5	13	S1
4	D4	14	S0	4	D4	14	S0
5	D3	15	G1	5	D3	15	G1
6	D2	16	G2	6	D2	16	G2
7	D1	17	G3	7	D1	17	G3
8	D0	18	W	8	D0	18	W
9	CLK	19	Y	9	CLK	19	Y
10	GND	20	V_{CC}	10	GND	20	V_{CC}

365

HEX BUS DRIVERS

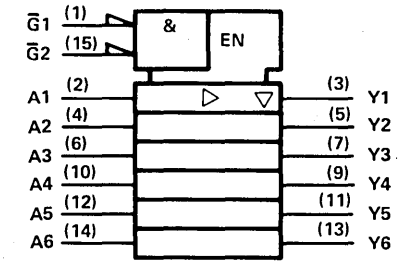
(non-inverted three-state outputs, gated enable inputs)

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54365A	12 ns	−2 mA	32 mA	325 mW
SN74365A	12 ns	−5.2 mA	32 mA	325 mW
SN54ALS365	7 ns	−12 mA	12 mA	53 mW
SN74ALS365	7 ns	−15 mA	24 mA	53 mW
SN74ALS365-1	7 ns	−15 mA	48 mA	53 mW
SN54LS365A	9.5 ns	−1 mA	12 mA	70 mW
SN74LS365A	9.5 ns	−2.6 mA	24 mA	70 mW

SN54365A (J,FH) SN74365A (J,N) SN74ALS365-1 (N,FN)
SN54ALS365 (J,FH) SN74ALS365 (N,FN) **SN54LS365A (J,FH)** SN74LS365A (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	G1	9	Y4	1	nc	11	nc
2	A1	10	A4	2	G1	12	Y4
3	Y1	11	Y5	3	A1	13	A4
4	A2	12	A5	4	Y1	14	Y5
5	Y2	13	Y6	5	A2	15	A5
6	A3	14	A6	6	nc	16	nc
7	Y3	15	G2	7	Y2	17	Y6
8	GND	16	V_{CC}	8	A3	18	A6
				9	Y3	19	G2
				10	GND	20	V_{CC}

366

HEX BUS DRIVERS

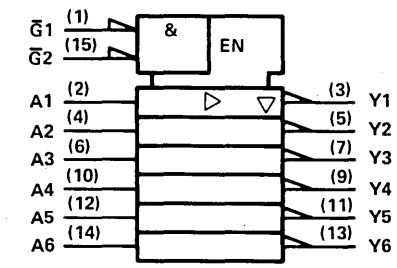
(inverted three-state outputs, gated enable inputs)

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS366	5.5 ns	−12 mA	12 mA	40 mW
SN74ALS366	5.5 ns	−15 mA	24 mA	40 mW
SN74ALS366-1	5.5 ns	−15 mA	48 mA	40 mW
SN54366A	11 ns	−2 mA	32 mA	295 mW
SN74366A	11 ns	−5.2 mA	32 mA	295 mW
SN54LS366A	9.5 ns	−1 mA	12 mA	60 mW
SN74LS366A	9.5 ns	−2.6 mA	24 mA	60 mW

SN54366A (J,FH) SN74366A (J,N) SN74ALS366-1 (N,FN)
SN54ALS366 (J,FC) SN74ALS366 (N,FN) SN54LS366A (J,FH) SN74LS366A (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	G1	9	Y4	1	nc	11	nc
2	A1	10	A4	2	G1	12	Y4
3	Y1	11	Y5	3	A1	13	A4
4	A2	12	A5	4	Y1	14	Y5
5	Y2	13	Y6	5	A2	15	A5
6	A3	14	A6	6	nc	16	nc
7	Y3	15	G2	7	Y2	17	Y6
8	GND	16	V_{CC}	8	A3	18	A6
				9	Y3	19	G2
				10	GND	20	V_{CC}

nc — no internal connection.

†Pin numbers shown on logic symbols are for J and N packages only.

© IC MASTER 1983

367

HEX BUS DRIVERS

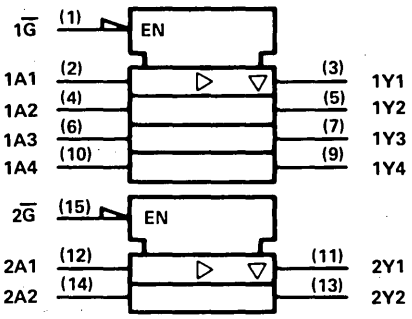
(non-inverted three-state outputs organized to facilitate handling of 4-bit data)

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS367	7 ns	−12 mA	12 mA	53 mW
SN74ALS367	7 ns	−15 mA	24 mA	53 mW
SN74ALS367-1	7 ns	−15 mA	48 mA	53 mW
SN54367A	12 ns	−2 mA	32 mA	325 mW
SN74367A	12 ns	−5.2 mA	32 mA	325 mW
SN54LS367A	9.5 ns	−1 mA	12 mA	70 mW
SN74LS367A	9.5 ns	−2.6 mA	24 mA	70 mW

SN54367A (J,FH) SN74367A (J,N)
SN54ALS367 (J,FH) SN74ALS367 (N,FN)
SN74ALS367-1 (N,FN)
SN54LS367A (J,FH) SN74LS367A (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1G̅	9	1Y4	1	nc	11	nc
2	1A1	10	1A4	2	1G̅	12	1Y4
3	1Y1	11	2Y1	3	1A1	13	1A4
4	1A2	12	2A1	4	1Y1	14	2Y1
5	1Y2	13	2Y2	5	1A2	15	2A1
6	1A3	14	2A2	6	nc	16	nc
7	1Y3	15	2G̅	7	1Y2	17	2Y2
8	GND	16	V_{CC}	8	1A3	18	2A2
				9	1Y3	19	2G̅
				10	GND	20	V_{CC}

368

HEX BUS DRIVERS

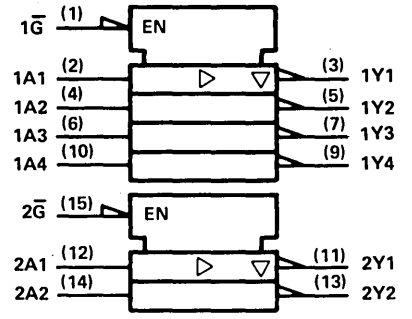
(inverted three-state outputs organized to facilitate handling of 4-bit data)

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS368	5.5 ns	−12 mA	12 mA	40 mW
SN74ALS368	5.5 ns	−15 mA	24 mA	40 mW
SN74ALS368-1	5.5 ns	−15 mA	48 mA	40 mW
SN54368A	11 ns	−2 mA	32 mA	295 mW
SN74368A	11 ns	−5.2 mA	32 mA	295 mW
SN54LS368A	9.5 ns	−1 mA	12 mA	60 mW
SN74LS368A	9.5 ns	−2.6 mA	24 mA	60 mW

SN54368A (J,FH) SN74368A (J,N)
SN54ALS368 (J,FH) SN74ALS368 (N,FN)
SN74ALS368-1 (N,FN)
SN54LS368A (J,FH) SN74LS368A (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1G̅	9	1Y4	1	nc	11	nc
2	1A1	10	1A4	2	1G̅	12	1Y4
3	1Y1	11	2Y1	3	1A1	13	1A4
4	1A2	12	2A1	4	1Y1	14	2Y1
5	1Y2	13	2Y2	5	1A2	15	2A1
6	1A3	14	2A2	6	nc	16	nc
7	1Y3	15	2G̅	7	1Y2	17	2Y2
8	GND	16	V_{CC}	8	1A3	18	2A2
				9	1Y3	19	2G̅
				10	GND	20	V_{CC}

370

2048-BIT READ-ONLY MEMORIES

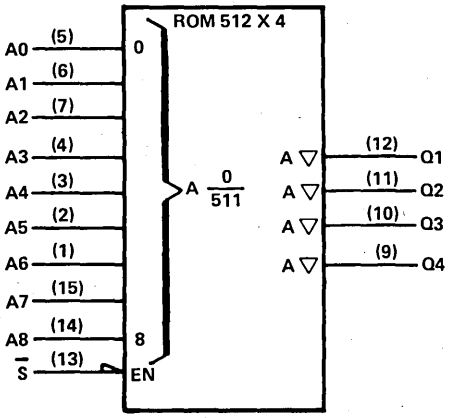
(512 4-bit words; three-state outputs)

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'S370	45 ns	15 ns	0.26 mW

SN54S370 (J) SN74S370 (J,N)

logic symbol†



pin assignments

J, N PACKAGES			
1	A6	9	Q4
2	A5	10	Q3
3	A4	11	Q2
4	A3	12	Q1
5	A0	13	S̅
6	A1	14	A8
7	A2	15	A7
8	GND	16	V_{CC}

For chip carrier information, contact the factory.

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

371

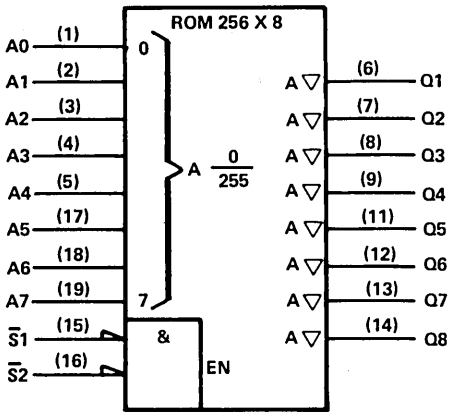
2048-BIT READ-ONLY MEMORIES
(256 8-bit words; three-state outputs)

typical performance

TYPE	ADDRESS TIME	ENABLE TIME	POWER/ BIT
'S371	45 ns	15 ns	0.26 mW

SN54S371 (J,FH) SN74S371 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A0	11	Q5	1	A0	11	Q5
2	A1	12	Q6	2	A1	12	Q6
3	A2	13	Q7	3	A2	13	Q7
4	A3	14	Q8	4	A3	14	Q8
5	A4	15	$\overline{S1}$	5	A4	15	$\overline{S1}$
6	Q1	16	$\overline{S2}$	6	Q1	16	$\overline{S2}$
7	Q2	17	A5	7	Q2	17	A5
8	Q3	18	A6	8	Q3	18	A6
9	Q4	19	A7	9	Q4	19	A7
10	GND	20	V_{CC}	10	GND	20	V_{CC}

373

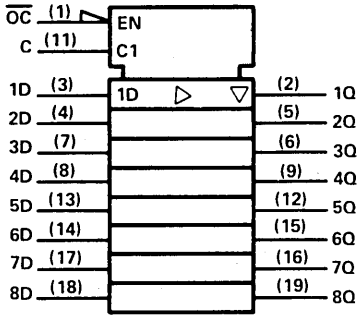
OCTAL D-TYPE LATCHES
(three-state outputs, common output control, common enable)

typical performance

TYPE	OUT-PUTS	DELAY	TOTAL POWER
'ALS373	Q	8 ns	70 mW
'AS373			
'LS373	Q	19 ns	120 mW
'S373	Q	7 ns	525 mW

SN54ALS373 (J,FH) SN74ALS373 (N,FN)
SN54AS373 (J,FH) SN74AS373 (N,FN)
SN54LS373 (J,FH) SN74LS373 (J,N,FN)
SN54S373 (J,FH) SN74S373 (J,N,FN)

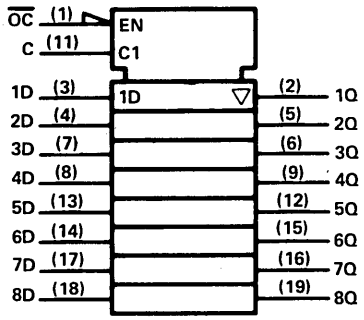
logic symbol, 'LS373, 'ALS373, 'AS373†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{OC}$	11	C	1	$\overline{OC}$	11	C
2	1Q	12	5Q	2	1Q	12	5Q
3	1D	13	5D	3	1D	13	5D
4	2D	14	6D	4	2D	14	6D
5	2Q	15	6Q	5	2Q	15	6Q
6	3Q	16	7Q	6	3Q	16	7Q
7	3D	17	7D	7	3D	17	7D
8	4D	18	8D	8	4D	18	8D
9	4Q	19	8Q	9	4Q	19	8Q
10	GND	20	V_{CC}	10	GND	20	V_{CC}

logic symbol, 'S373†



† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

374

OCTAL D-TYPE FLIP-FLOPS
(three-state outputs, common output control, common clock)

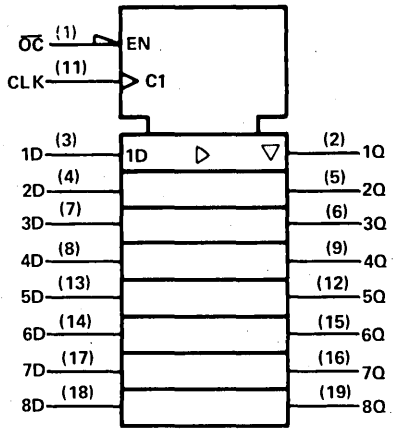
typical performance

TYPE	FREQ	POWER PER F-F	DATA TIMES SET-UP	DATA TIMES HOLD
'ALS374	50 MHz	10 mW		
'AS374				
'LS374	50 MHz	17 mW	20 ns↑	0 ns↑
'S374	100 MHz	56 mW	5 ns↑	2 ns↑

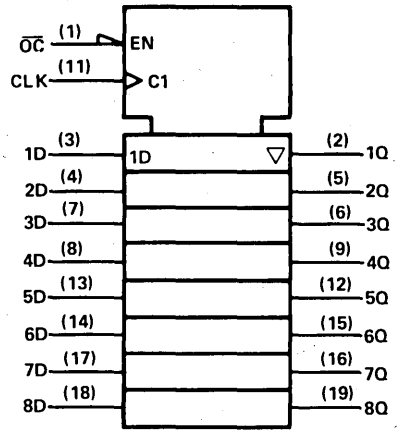
↑ Rising edge of clock pulse

SN54ALS374 (J,FH) SN74ALS374 (N,FN)
SN54AS374 (J,FH) SN74AS374 (N,FN)
SN54LS374 (J,FH) SN74LS374 (J,N,FN)
SN54S374 (J,FH) SN74S374 (J,N,FN)

logic symbol, 'LS374, 'ALS374, 'AS374



logic symbol, 'S374†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{OC}$	11	CLK	1	$\overline{OC}$	11	CLK
2	1Q	12	5Q	2	1Q	12	5Q
3	1D	13	5D	3	1D	13	5D
4	2D	14	6D	4	2D	14	6D
5	2Q	15	6Q	5	2Q	15	6Q
6	3Q	16	7Q	6	3Q	16	7Q
7	3D	17	7D	7	3D	17	7D
8	4D	18	8D	8	4D	18	8D
9	4Q	19	8Q	9	4Q	19	8Q
10	GND	20	V_{CC}	10	GND	20	V_{CC}

375

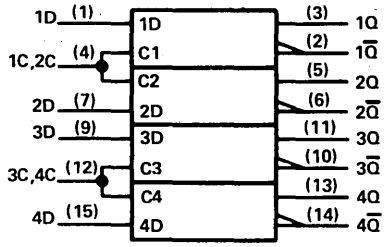
4-BIT BISTABLE LATCHES

typical performance

OUTPUTS	DELAY	TOTAL POWER
Q,$\overline{Q}$	12 ns	32 mW

SN54LS375 (J,FH) SN74LS375 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1D	9	3D	1	nc	11	nc
2	1Q̄	10	3Q̄	2	1D	12	3D
3	1Q	11	3Q	3	1Q̄	13	3Q̄
4	1C,2C	12	3C,4C	4	1Q	14	3Q
5	2Q	13	4Q	5	1C,2C	15	3C,4C
6	2Q̄	14	4Q̄	6	nc	16	nc
7	2D	15	4D	7	2Q	17	4Q
8	GND	16	V_{CC}	8	2Q̄	18	4Q̄
				9	2D	19	4D
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

376

QUAD J-$\overline{K}$ FLIP-FLOPS
(common clock, common clear)

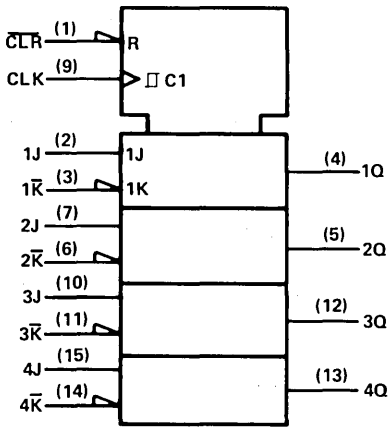
typical performance

FREQ	POWER PER F-F	DATA TIMES	
		SET-UP	HOLD
45 MHz	65 mW	0 ns↑	20 ns↑

↑ Rising edge of clock pulse

SN54376 (J,FH) SN74376 (J,N)

logic symbol†



pin assignments

J, N PACKAGES				FH PACKAGE			
1	$\overline{CLR}$	9	CLK	1	nc	11	nc
2	1J	10	3J	2	$\overline{CLR}$	12	CLK
3	1$\overline{K}$	11	3$\overline{K}$	3	1J	13	3J
4	1Q	12	3Q	4	1$\overline{K}$	14	3$\overline{K}$
5	2Q	13	4Q	5	1Q	15	3Q
6	2$\overline{K}$	14	4$\overline{K}$	6	nc	16	nc
7	2J	15	4J	7	2Q	17	4Q
8	GND	16	V_{CC}	8	2$\overline{K}$	18	4$\overline{K}$
				9	2J	19	4J
				10	GND	20	V_{CC}

377

OCTAL D-TYPE FLIP-FLOPS
(single-rail outputs, common enable, common clock)

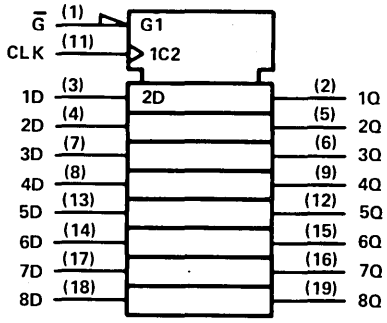
typical performance

FREQ	POWER PER F-F	DATA TIMES	
		SET-UP	HOLD
40 MHz	10.6 mW	20 ns↑	5 ns↑

↑ Rising edge of clock pulse

SN54LS377 (J,FH) SN74LS377 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{G}$	11	CLK	1	$\overline{G}$	11	CLK
2	1Q	12	5Q	2	1Q	12	5Q
3	1D	13	5D	3	1D	13	5D
4	2D	14	6D	4	2D	14	6D
5	2Q	15	6Q	5	2Q	15	6Q
6	3Q	16	7Q	6	3Q	16	7Q
7	3D	17	7D	7	3D	17	7D
8	4D	18	8D	8	4D	18	8D
9	4Q	19	8Q	9	4Q	19	8Q
10	GND	20	V_{CC}	10	GND	20	V_{CC}

378

HEX D-TYPE FLIP-FLOPS
(single-rail outputs, common enable, common clock)

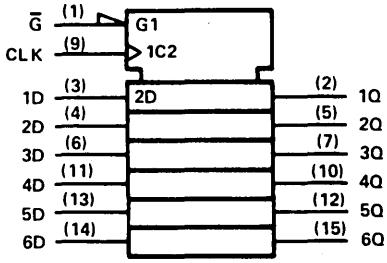
typical performance

FREQ	POWER PER F-F	DATA TIMES	
		SET-UP	HOLD
40 MHz	10.6 mW	20 ns↑	5 ns↑

↑ Rising edge of clock pulse

SN54LS378 (J,FH) SN74LS378 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{G}$	9	CLK	1	nc	11	nc
2	1Q	10	4Q	2	$\overline{G}$	12	CLK
3	1D	11	4D	3	1Q	13	4Q
4	2D	12	5Q	4	1D	14	4D
5	2Q	13	5D	5	2D	15	5Q
6	3D	14	6D	6	nc	16	nc
7	3Q	15	6Q	7	2Q	17	5D
8	GND	16	V_{CC}	8	3D	18	6D
				9	3Q	19	6Q
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

379

QUAD D-TYPE FLIP-FLOPS
(double-rail outputs, common enable, common clock)

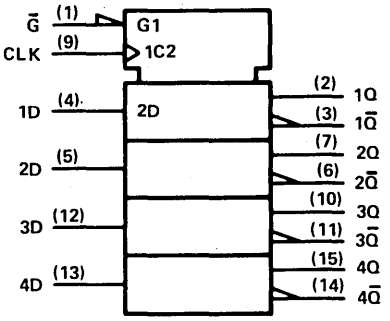
typical performance

FREQ	POWER PER F-F	DATA TIMES	
		SET-UP	HOLD
40 MHz	10.6 mW	20 ns†	5 ns†

† Rising edge of clock pulse

SN54LS379 (J,FH)
SN74LS379 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{G}$	9	CLK	1	nc	11	nc
2	1Q	10	3Q	2	$\overline{G}$	12	CLK
3	1$\overline{Q}$	11	3$\overline{Q}$	3	1Q	13	3Q
4	1D	12	3D	4	1$\overline{Q}$	14	3$\overline{Q}$
5	2D	13	4D	5	1D	15	3D
6	2$\overline{Q}$	14	4$\overline{Q}$	6	nc	16	nc
7	2Q	15	4Q	7	2D	17	4D
8	GND	16	V_{CC}	8	2$\overline{Q}$	18	4$\overline{Q}$
				9	2Q	19	4Q
				10	GND	20	V_{CC}

381

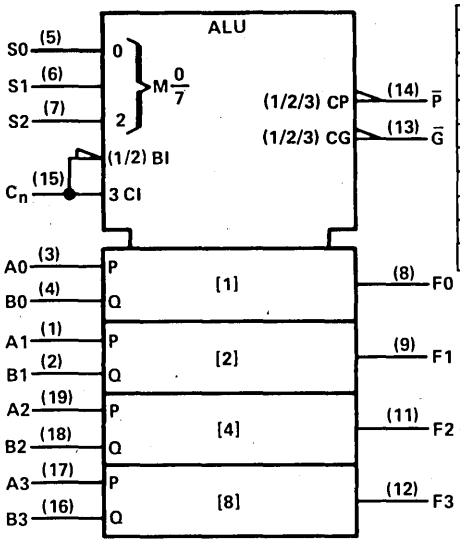
ARITHMETIC LOGIC UNITS/ FUNCTION GENERATORS
(8 binary functions, use 'S182 for look-ahead carry)

typical performance

TYPE	CARRY TIME	ADD TIME	TOTAL POWER
'LS381	16 ns	21 ns	175 mW
'S381	11 ns	20 ns	525 mW

SN54LS381 (J,FH)
SN54S381 (J,FH)
SN74LS381 (J,N,FN)
SN74S381 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A1	11	F2	1	A1	11	F2
2	B1	12	F3	2	B1	12	F3
3	A0	13	$\overline{G}$	3	A0	13	$\overline{G}$
4	B0	14	$\overline{P}$	4	B0	14	$\overline{P}$
5	S0	15	C_n	5	S0	15	C_n
6	S1	16	B3	6	S1	16	B3
7	S2	17	A3	7	S2	17	A3
8	F0	18	B2	8	F0	18	B2
9	F1	19	A2	9	F1	19	A2
10	GND	20	V_{CC}	10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

382

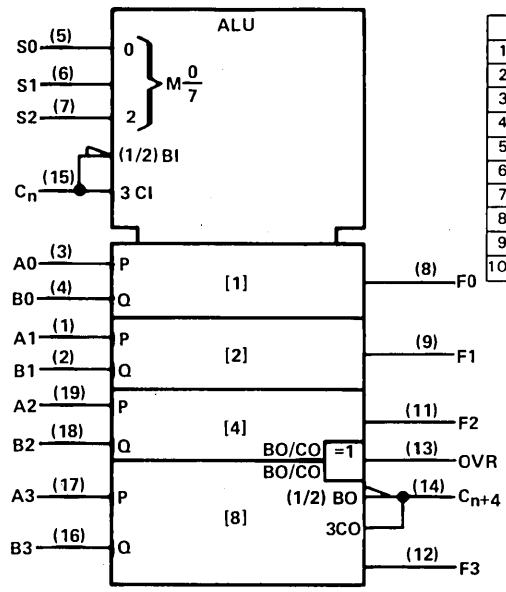
ARITHMETIC LOGIC UNITS/ FUNCTION GENERATORS
(ripple carry and overflow outputs)

typical performance

TYPE	CARRY TIME	ADD TIME	TOTAL POWER
'LS382	27 ns	18 ns	175 mW

SN54LS382 (J,FH)
SN74LS382 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A1	11	F2	1	A1	11	F2
2	B1	12	F3	2	B1	12	F3
3	A0	13	OVR	3	A0	13	OVR
4	B0	14	C_{n+4}	4	B0	14	C_{n+4}
5	S0	15	C_n	5	S0	15	C_n
6	S1	16	B3	6	S1	16	B3
7	S2	17	A3	7	S2	17	A3
8	F0	18	B2	8	F0	18	B2
9	F1	19	A2	9	F1	19	A2
10	GND	20	V_{CC}	10	GND	20	V_{CC}

384

8-BIT BY 1-BIT TWO'S-COMPLEMENT MULTIPLIERS

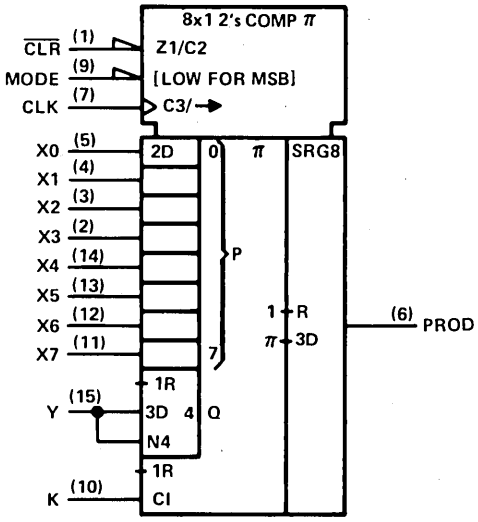
- Magnitude-only multiplication
- Cascadable for any number of bits
- Serial multiplier data input
- Serial data output for multiplication product
- 8-Bit parallel multiplicand data input
- 40 MHz typical max clock frequency

typical performance

MAX CLOCK FREQ	DELAY FROM CLOCK	DELAY FROM CLEAR	TOTAL POWER
40 MHz	15 ns	17 ns	455 mW

SN54LS384 (J,FH)
SN74LS384 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{CLR}$	9	MODE	1	nc	11	nc
2	X3	10	K	2	$\overline{CLR}$	12	MODE
3	X2	11	X7	3	X3	13	K
4	X1	12	X6	4	X2	14	X7
5	X0	13	X5	5	X1	15	X6
6	PROD	14	X4	6	nc	16	nc
7	CLK	15	Y	7	X0	17	X5
8	GND	16	V_{CC}	8	PROD	18	X4
				9	CLK	19	Y
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

385

QUADRUPLE SERIAL ADDERS/ SUBTRACTORS

- Buffered clock, direct clear inputs
- Independent two's-complement addition/subtraction

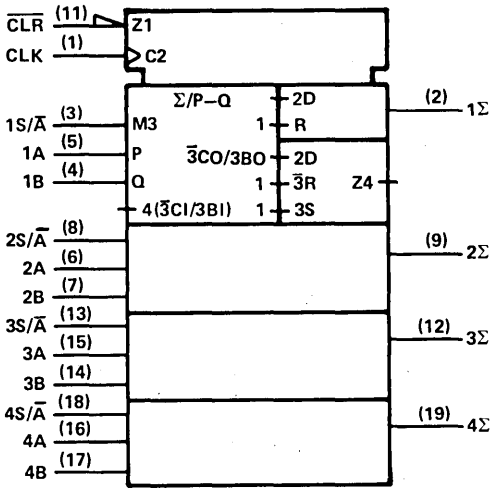
typical performance

f_{max}	DELAY	POWER
40 MHz	16 ns	240 mW

SN54LS385 (J,FH)

SN74LS385 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	CLK	11	CLR	1	CLK	11	CLR
2	1Σ	12	3Σ	2	1Σ	12	3Σ
3	1S/Ā	13	3S/Ā	3	1S/Ā	13	3S/Ā
4	1B	14	3B	4	1B	14	3B
5	1A	15	3A	5	1A	15	3A
6	2A	16	4A	6	2A	16	4A
7	2B	17	4B	7	2B	17	4B
8	2S/Ā	18	4S/Ā	8	2S/Ā	18	4S/Ā
9	2Σ	19	4Σ	9	2Σ	19	4Σ
10	GND	20	V_{CC}	10	GND	20	V_{CC}

386

QUAD 2-INPUT EXCLUSIVE-OR GATES

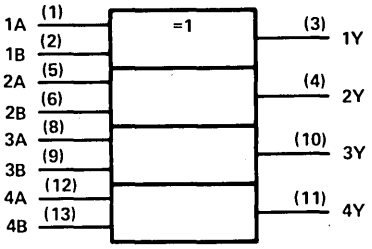
typical performance

TYPE	DELAY	TOTAL POWER
'LS386	10 ns	30 mW

SN54LS386 (J,FH)

SN74LS386 (J,N,FN)

logic symbol†



positive logic: $Y = A \oplus B = \overline{A}B + A\overline{B}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3A	1	nc	11	nc
2	1B	9	3B	2	1A	12	3A
3	1Y	10	3Y	3	1B	13	3B
4	2Y	11	4Y	4	1Y	14	3Y
5	2A	12	4A	5	nc	15	nc
6	2B	13	4B	6	2Y	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2A	18	4A
				9	2B	19	4B
				10	GND	20	V_{CC}

387

(This number has been changed to TBP14SA10. Product Guide information for this PROM can be found at the end of this section.)

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

390

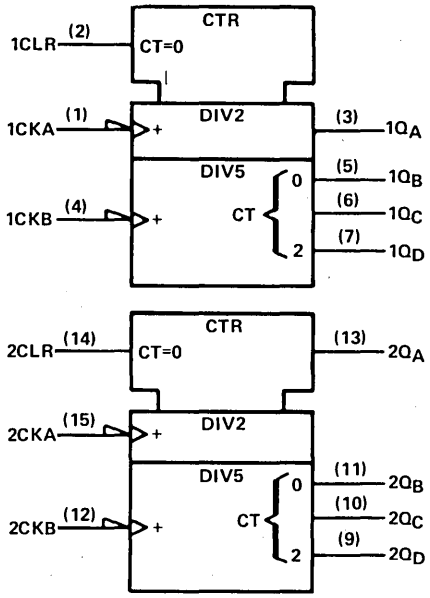
DUAL DECADE COUNTERS
(bi-quinary or bcd sequences)

typical performance

TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'390	25 MHz	HIGH	210 mW
'LS390	35 MHz	HIGH	75 mW

SN54390 (J,FH) SN74390 (J,N)
SN54LS390 (J,FH) SN74LS390 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1CKA	9	$2Q_D$	1	nc	11	nc
2	1CLR	10	$2Q_C$	2	1CKA	12	$2Q_D$
3	$1Q_A$	11	$2Q_B$	3	1CLR	13	$2Q_C$
4	1CKB	12	2CKB	4	$1Q_A$	14	$2Q_B$
5	$1Q_B$	13	$2Q_A$	5	1CKB	15	2CKB
6	$1Q_C$	14	2CLR	6	nc	16	nc
7	$1Q_D$	15	2CKA	7	$1Q_B$	17	$2Q_A$
8	GND	16	V_{CC}	8	$1Q_C$	18	2CLR
				9	$1Q_D$	19	2CKA
				10	GND	20	V_{CC}

393

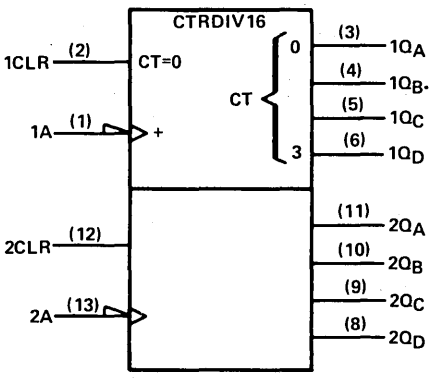
DUAL 4-BIT BINARY COUNTERS

typical performance

TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'393	25 MHz	HIGH	190 mW
'LS393	35 MHz	HIGH	75 mW

SN54393 (J,FH) SN74393 (J,N)
SN54LS393 (J,FH) SN74LS393 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	$2Q_D$	1	nc	11	nc
2	1CLR	9	$2Q_C$	2	1A	12	$2Q_D$
3	$1Q_A$	10	$2Q_B$	3	1CLR	13	$2Q_C$
4	$1Q_B$	11	$2Q_A$	4	$1Q_A$	14	$2Q_B$
5	$1Q_C$	12	2CLR	5	nc	15	nc
6	$1Q_D$	13	2A	6	$1Q_B$	16	$2Q_A$
7	GND	14	V_{CC}	7	nc	17	nc
				8	$1Q_C$	18	2CLR
				9	$1Q_D$	19	2A
				10	GND	20	V_{CC}

395

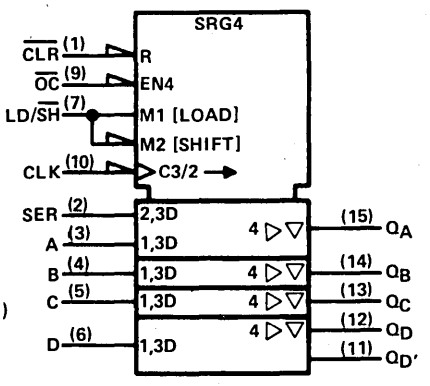
4-BIT UNIVERSAL SHIFT REGISTERS
(three-state outputs)

typical performance

SHIFT FREQ	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
30 MHz	D	LOW	75 mW

SN54LS395A (J,FH) SN74LS395A (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{CLR}$	9	$\overline{OC}$	1	nc	11	nc
2	SER	10	CLK	2	$\overline{CLR}$	12	$\overline{OC}$
3	A	11	Q_D	3	SER	13	CLK
4	B	12	Q_D	4	A	14	Q_D
5	C	13	Q_C	5	B	15	Q_D
6	D	14	Q_B	6	nc	16	nc
7	LD/SH	15	Q_A	7	C	17	Q_C
8	GND	16	V_{CC}	8	D	18	Q_B
				9	LD/SH	19	Q_A
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

396

OCTAL STORAGE REGISTERS

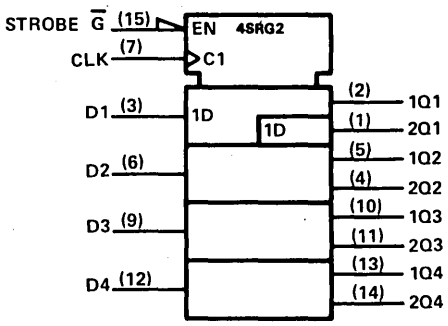
- Parallel access
- Applications:
  - N-bit storage files
  - HEX/BCD serial to parallel converters

typical performance

TYPE	MAX CLOCK FREQ	DELAY	POWER
'LS396	30 MHz	20 ns	120 mW

SN54LS396 (J,FH) SN74LS396 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	2Q1	9	D3	1	nc	11	nc
2	1Q1	10	1Q3	2	2Q1	12	D3
3	D1	11	2Q3	3	1Q1	13	1Q3
4	2Q2	12	D4	4	D1	14	2Q3
5	1Q2	13	1Q4	5	2Q2	15	D4
6	D2	14	2Q4	6	nc	16	nc
7	CLK	15	$\overline{G}$	7	1Q2	17	1Q4
8	GND	16	V_{CC}	8	D2	18	2Q4
				9	CLK	19	$\overline{G}$
				10	GND	20	V_{CC}

398

QUAD 2-INPUT MULTIPLEXERS WITH STORAGE

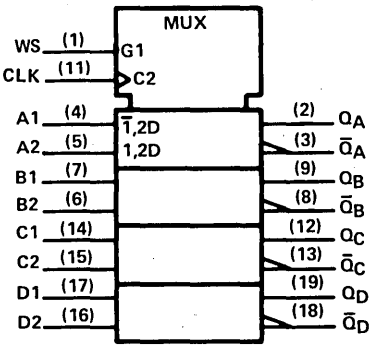
(double-rail outputs)

typical performance

TYPE	DELAY TIMES		TOTAL POWER
	CLOCK TO INV OUTPUT	CLOCK TO NON-INV OUTPUT	
'LS398	20 ns	20 ns	32 mW

SN54LS398 (J,FH) SN74LS398 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	WS	11	CLK	1	WS	11	CLK
2	Q_A	12	Q_C	2	Q_A	12	Q_C
3	$\overline{Q}_A$	13	$\overline{Q}_C$	3	$\overline{Q}_A$	13	$\overline{Q}_C$
4	A1	14	C1	4	A1	14	C1
5	A2	15	C2	5	A2	15	C2
6	B2	16	D2	6	B2	16	D2
7	B1	17	D1	7	B1	17	D1
8	$\overline{Q}_B$	18	$\overline{Q}_D$	8	$\overline{Q}_B$	18	$\overline{Q}_D$
9	Q_B	19	Q_D	9	Q_B	19	Q_D
10	GND	20	V_{CC}	10	GND	20	V_{CC}

399

QUAD 2-INPUT MULTIPLEXERS WITH STORAGE

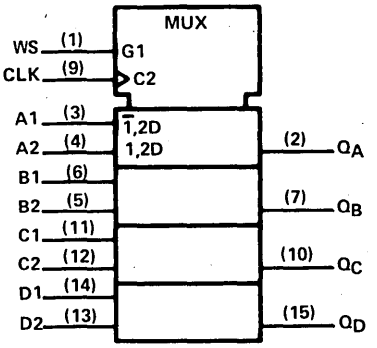
typical performance

TYPE	DELAY	TOTAL POWER
'LS399	20 ns*	37 mW

* From clock to output

SN54LS399 (J,FH) SN74LS399 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	WS	9	CLK	1	nc	11	nc
2	Q_A	10	Q_C	2	WS	12	CLK
3	A1	11	C1	3	Q_A	13	Q_C
4	A2	12	C2	4	A1	14	C1
5	B2	13	D2	5	A2	15	C2
6	B1	14	D1	6	nc	16	nc
7	Q_B	15	Q_D	7	B2	17	D2
8	GND	16	V_{CC}	8	B1	18	D1
				9	Q_B	19	Q_D
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc – no internal connection.

© IC MASTER 1983

412

MULTI-MODE BUFFERED 8-BIT LATCHES

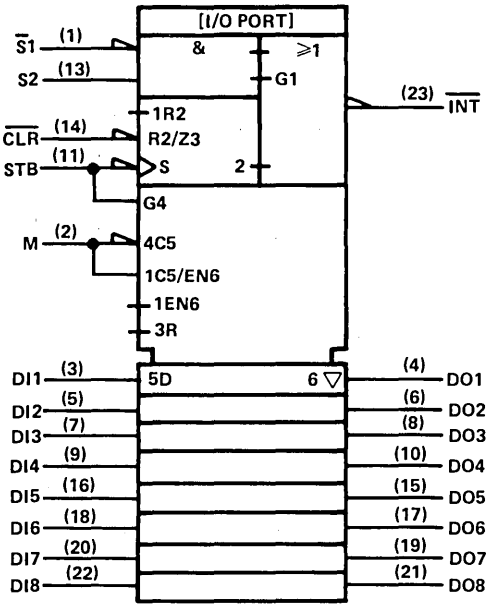
(three-state outputs; direct clear)

typical performance

CLEAR	OUTPUTS	DELAY	TOTAL POWER
LOW	Q	11 ns	410 mW

SN54S412 (J,FH) SN74S412 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	S1	13	S2	1	nc	15	nc
2	M	14	CLR	2	S1	16	S2
3	DI1	15	DO5	3	M	17	CLR
4	DO1	16	DI5	4	DI1	18	DO5
5	DI2	17	DO6	5	DO1	19	DI5
6	DO2	18	DI6	6	DI2	20	DO6
7	DI3	19	DO7	7	DO2	21	DI6
8	DO3	20	DI7	8	nc	22	nc
9	DI4	21	DO8	9	DI3	23	DO7
10	DO4	22	DI8	10	DO3	24	DI7
11	STB	23	INT	11	DI4	25	DO8
12	GND	24	VCC	12	DO4	26	DI8
				13	STB	27	INT
				14	GND	28	VCC

422

RE-TRIGGERABLE MONOSTABLE MULTIVIBRATORS

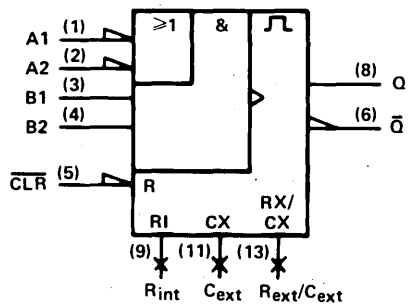
- Internal timing resistor
- Up to 100% duty cycle
- Will not trigger from clear

typical performance

NO. OF INPUTS		OUTPUT PULSE RANGE	TOTAL POWER
HIGH	LOW		
2	2	40 ns-∞	30 mW

SN54LS422 (J,FH) SN74LS422 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A1	8	Q	1	nc	11	nc
2	A2	9	R_{int}	2	A1	12	Q
3	B1	10	nc	3	A2	13	R_{int}
4	B2	11	C_{ext}	4	B1	14	nc
5	CLR	12	nc	5	nc	15	nc
6	Q̄	13	R_{ext}/C_{ext}	6	B2	16	C_{ext}
7	GND	14	VCC	7	nc	17	nc
				8	CLR	18	nc
				9	Q̄	19	R_{ext}/C_{ext}
				10	GND	20	VCC

423

RE-TRIGGERABLE MONOSTABLE MULTIVIBRATORS

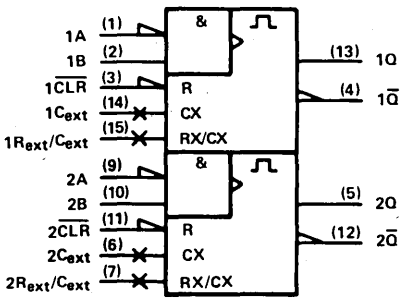
- Up to 100% duty cycle
- Will not trigger from clear

typical performance

NO. OF INPUTS		OUTPUT PULSE RANGE	TOTAL POWER
HIGH	LOW		
1	1	40 ns-∞	60 mW

SN54LS423 (J,FH) SN74LS423 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	9	2A	1	nc	11	nc
2	1B	10	2B	2	1A	12	2A
3	1CLR	11	2CLR	3	1B	13	2B
4	1Q̄	12	2Q̄	4	1CLR	14	2CLR
5	2Q	13	1Q	5	1Q̄	15	2Q̄
6	$2C_{ext}$	14	$1C_{ext}$	6	nc	16	nc
7	$2R_{ext}/C_{ext}$	15	$1R_{ext}/C_{ext}$	7	2Q	17	1Q
8	GND	16	VCC	8	$2C_{ext}$	18	$1C_{ext}$
				9	$2R_{ext}/C_{ext}$	19	$1R_{ext}/C_{ext}$
				10	GND	20	VCC

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

425

QUAD GATES

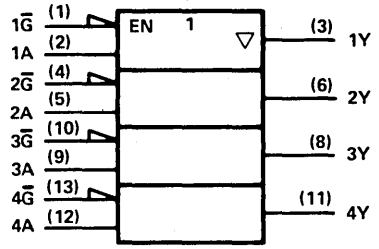
(three-state outputs, active-low enabling)

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54425	10 ns	−2 mA	16 mA
SN74425	10 ns	−5.2 mA	16 mA

SN54425 (J,FH) SN74425 (J,N)

logic symbol†



positive logic: Y = A

pin assignments

J, N PACKAGES				FH PACKAGE			
1	1G	8	3Y	1	nc	11	nc
2	1A	9	3A	2	1G	12	3Y
3	1Y	10	3G	3	1A	13	3A
4	2G	11	4Y	4	1Y	14	3G
5	2A	12	4A	5	nc	15	nc
6	2Y	13	4G	6	2G	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2A	18	4A
				9	2Y	19	4G
				10	GND	20	V_{CC}

426

QUAD GATES

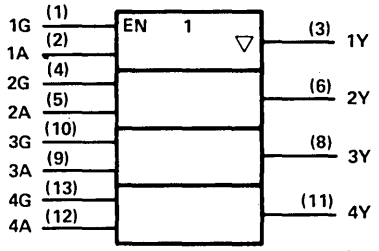
(three-state outputs, active-high enabling)

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54426	10 ns	−2 mA	16 mA
SN74426	10 ns	−5.2 mA	16 mA

SN54426 (J,FH) SN74426 (J,N)

logic symbol†



positive logic: Y = A

pin assignments

J, N PACKAGES				FH PACKAGE			
1	1G	8	3Y	1	nc	11	nc
2	1A	9	3A	2	1G	12	3Y
3	1Y	10	3G	3	1A	13	3A
4	2G	11	4Y	4	1Y	14	3G
5	2A	12	4A	5	nc	15	nc
6	2Y	13	4G	6	2G	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2A	18	4A
				9	2Y	19	4G
				10	GND	20	V_{CC}

428, 438

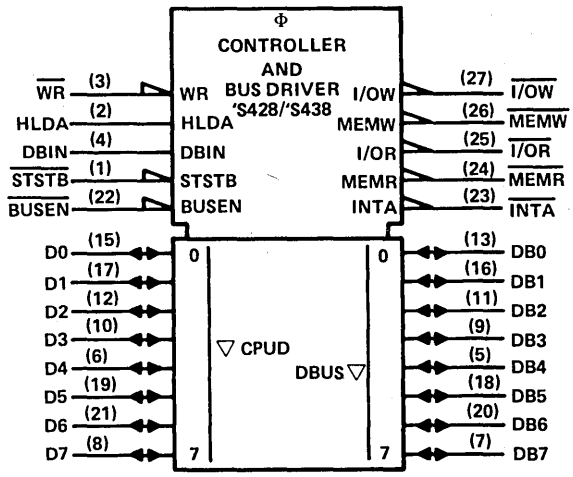
SYSTEM CONTROLLER FOR 8080A

typical performance

TYPE	POWER
'S428	700 mW
'S438	700 mW

SN74S428 (J,N,FN)
SN74S438 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FN PACKAGE			
1	$\overline{STSTB}$	15	D0	1	$\overline{STSTB}$	15	D0
2	HLDA	16	DB1	2	HLDA	16	DB1
3	$\overline{WR}$	17	D1	3	$\overline{WR}$	17	D1
4	DBIN	18	DB5	4	DBIN	18	DB5
5	DB4	19	D5	5	DB4	19	D5
6	D4	20	DB6	6	D4	20	DB6
7	DB7	21	D6	7	DB7	21	D6
8	D7	22	$\overline{BUSEN}$	8	D7	22	$\overline{BUSEN}$
9	DB3	23	$\overline{INTA}$	9	DB3	23	$\overline{INTA}$
10	D3	24	$\overline{MEMR}$	10	D3	24	$\overline{MEMR}$
11	DB2	25	$\overline{I/OR}$	11	DB2	25	$\overline{I/OR}$
12	D2	26	$\overline{MEMW}$	12	D2	26	$\overline{MEMW}$
13	DB0	27	$\overline{I/OW}$	13	DB0	27	$\overline{I/OW}$
14	GND	28	V_{CC}	14	GND	28	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

436, 437

LINE DRIVER/MEMORY DRIVER CIRCUITS – MOS MEMORY INTERFACE

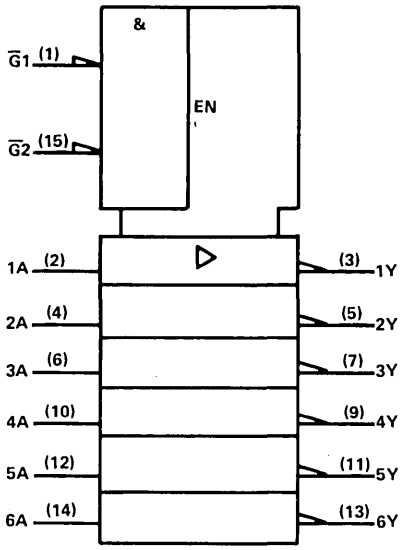
- Drives high-impedance loads
- Provides high-speed switching
- Requires minimum input current
- Damping output resistor for reducing transients ('436)
- Total power . . . 70 mW

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT	DELAY
'S436	150 mA	–1 mA	5.5 ns
'S437	150 mA	–1 mA	5.5 ns

SN54S436 (J,FH) SN74S436 (J,N,FN)
SN54S437 (J,FH) SN74S437 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{G1}$	9	4Y	1	nc	11	nc
2	1A	10	4A	2	$\overline{G1}$	12	4Y
3	1Y	11	5Y	3	1A	13	4A
4	2A	12	5A	4	1Y	14	5Y
5	2Y	13	6Y	5	2A	15	5A
6	3A	14	6A	6	nc	16	nc
7	3Y	15	$\overline{G2}$	7	2Y	17	6Y
8	GND	16	V_{CC}	8	3A	18	6A
				9	3Y	19	$\overline{G2}$
				10	GND	20	V_{CC}

QUAD TRIDIRECTIONAL BUS TRANSCEIVERS

440 (OPEN-COLLECTOR OUTPUTS, NONINVERTED LOGIC)
441 (OPEN-COLLECTOR OUTPUTS, INVERTED LOGIC)
442 (THREE-STATE OUTPUTS, NONINVERTED LOGIC)
443 (THREE-STATE OUTPUTS, INVERTED LOGIC)
444 (THREE-STATE OUTPUTS, INVERTED AND NONINVERTED LOGIC)

ALSO SEE 'LS448

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54LS440	22 ns	–	12 mA
SN74LS440	22 ns	–	24 mA
SN54LS441	15 ns	–	12 mA
SN74LS441	15 ns	–	24 mA
SN54LS442	11.5 ns	–12 mA	12 mA
SN74LS442	11.5 ns	–15 mA	24 mA
SN54LS443	8 ns	–12 mA	12 mA
SN74LS443	8 ns	–15 mA	24 mA
SN54LS444	9 ns	–12 mA	12 mA
SN74LS444	9 ns	–15 mA	24 mA

SN54LS440 (J,FH) SN74LS440 (J,FN)
SN54LS441 (J,FH) SN74LS441 (J,FN)
SN54LS442 (J,FH) SN74LS442 (J,FN)
SN54LS443 (J,FH) SN74LS443 (J,FN)
SN54LS444 (J,FH) SN74LS444 (J,FN)

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{CS}$	11	S0	1	$\overline{CS}$	11	S0
2	B1	12	S1	2	B1	12	S1
3	C1	13	A4	3	C1	13	A4
4	C2	14	A3	4	C2	14	A3
5	B2	15	A2	5	B2	15	A2
6	B3	16	A1	6	B3	16	A1
7	C3	17	$\overline{GA}$	7	C3	17	$\overline{GA}$
8	C4	18	$\overline{GB}$	8	C4	18	$\overline{GB}$
9	B4	19	$\overline{GC}$	9	B4	19	$\overline{GC}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

For logic symbols see next two pages.

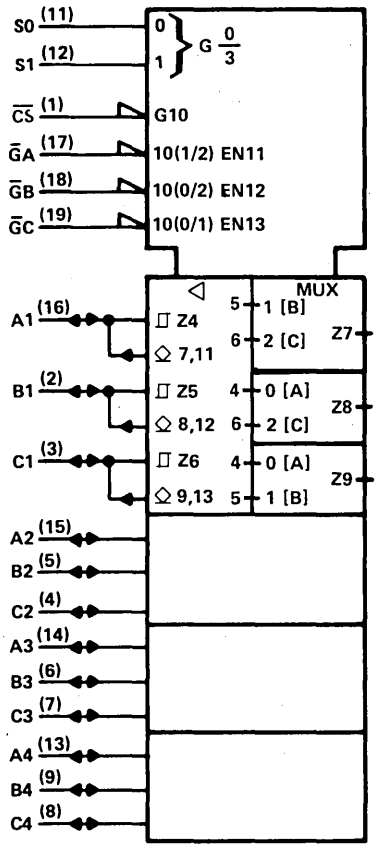
† Pin numbers shown on logic symbols are for J and N packages only.
nc – no internal connection.

© IC MASTER 1983

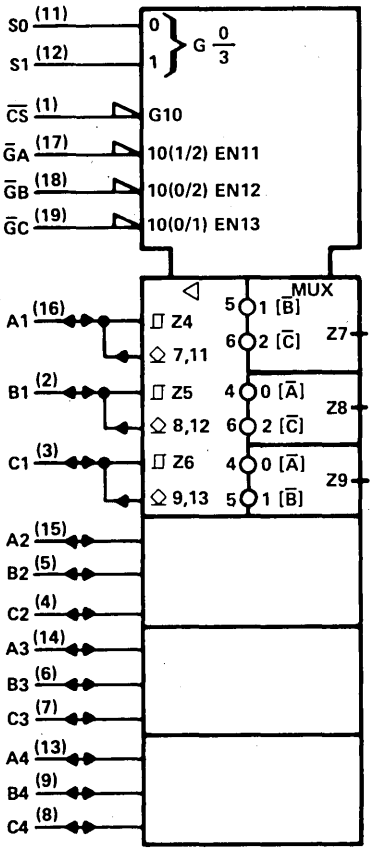
440, 441, 442, 443, 444 (continued)

logic symbol

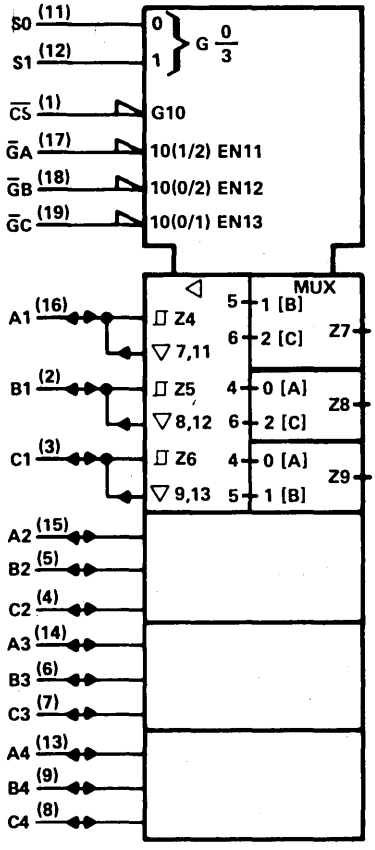
'LS440†



'LS441†



'LS442†



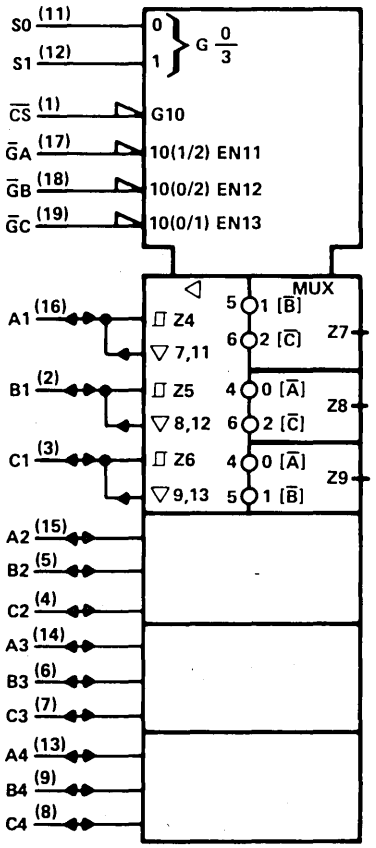
† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

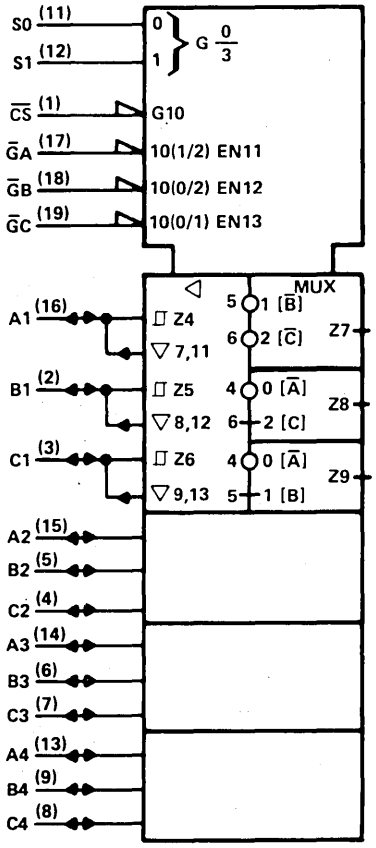
© IC MASTER 1983

440, 441, 442, 443, 444 (continued)

'LS443†



'LS444†



445

BCD-TO-DECIMAL DECODERS/DRIVERS

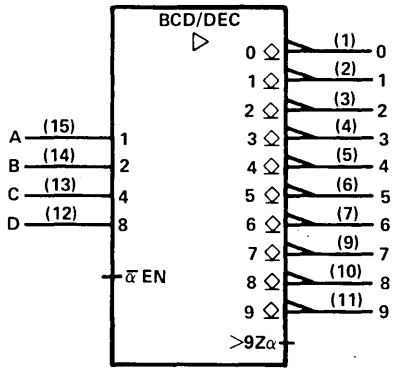
- Use as lamp, relay, or MOS driver
- Low-voltage version of 'LS145
- Full decoding of input logic
- All outputs off for invalid BCD input conditions

typical performance

OUTPUT SINK CURRENT	OFF-STATE OUTPUT VOLTAGE	TOTAL POWER
80 mA	7 V	35 mW

SN54LS445 (J,FH) SN74LS445 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	0	9	7	1	nc	11	nc
2	1	10	8	2	0	12	7
3	2	11	9	3	1	13	8
4	3	12	D	4	2	14	9
5	4	13	C	5	3	15	D
6	5	14	B	6	nc	16	nc
7	6	15	A	7	4	17	C
8	GND	16	V_{CC}	8	5	18	B
				9	6	19	A
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

446

QUAD BUS TRANSCEIVERS WITH DIRECTION CONTROLS

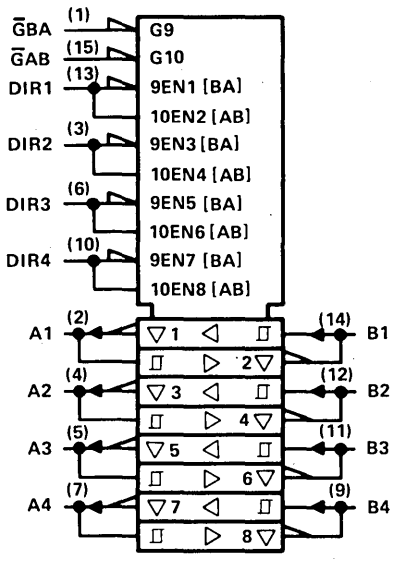
- Three-state outputs
- True ('LS449) and inverting ('LS446) outputs
- P-N-P inputs to reduce dc bus line loading

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54LS446	7.5 ns	−12 mA	12 mA
SN74LS446	7.5 ns	−15 mA	24 mA

SN54LS446 (J,FH) SN74LS446 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	GBA	9	B4	1	nc	11	nc
2	A1	10	DIR4	2	GBA	12	B4
3	DIR2	11	B3	3	A1	13	DIR4
4	A2	12	B2	4	DIR2	14	B3
5	A3	13	DIR1	5	A2	15	B2
6	DIR3	14	B1	6	nc	16	nc
7	A4	15	GAB	7	A3	17	DIR1
8	GND	16	V_{CC}	8	DIR3	18	B1
				9	A4	19	GAB
				10	GND	20	V_{CC}

447

BCD-TO-SEVEN-SEGMENT DECODERS/DRIVERS

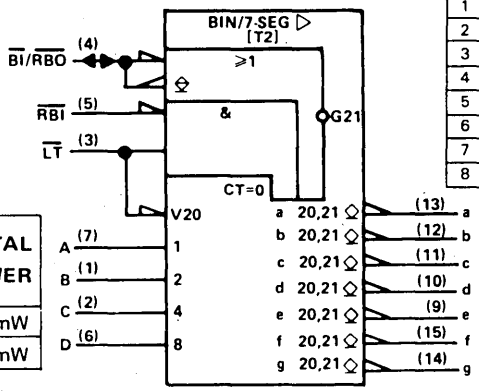
- Low-voltage version of 'LS247
- Open-collector outputs drive indicators directly
- Ripple blanking

typical performance

TYPE	OUTPUT SINK CURRENT	OFF-STATE OUTPUT VOLTAGE	TOTAL POWER
SN54LS447	1.6 mA	7 V	35 mW
SN74LS447	3.2 mA	7 V	35 mW

SN54LS447 (J,FH) SN74LS447 (J,N,FN)

logic symbol†

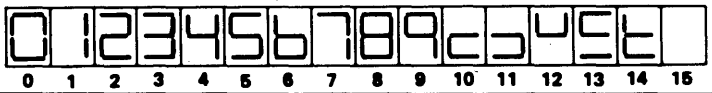


pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	9	e	1	nc	11	nc
2	C	10	d	2	B	12	e
3	LT	11	c	3	C	13	d
4	BI/RBO	12	b	4	LT	14	c
5	RBI	13	a	5	BI/RBO	15	b
6	D	14	g	6	nc	16	nc
7	A	15	f	7	RBI	17	a
8	GND	16	V_{CC}	8	D	18	g
				9	A	19	f
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc – no internal connection.

FONT TABLE T2 – NUMERICAL DESIGNATIONS AND RESULTANT DISPLAYS USING '447



© IC MASTER 1983

448

QUAD TRIDIRECTIONAL BUS TRANSCEIVERS

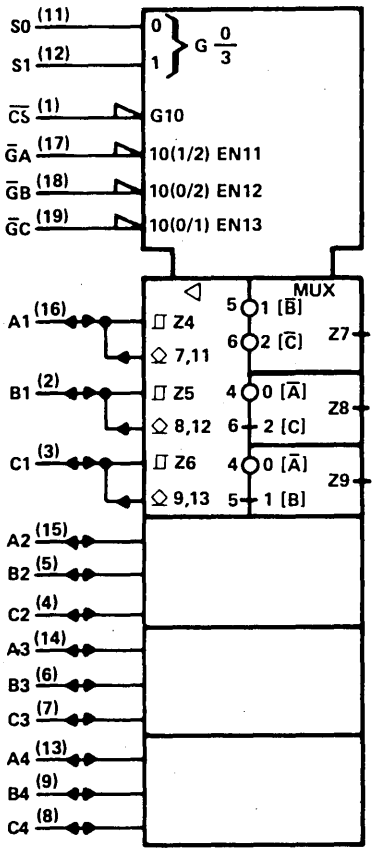
(OPEN-COLLECTOR OUTPUTS, INVERTED AND NONINVERTED LOGIC)

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54LS448	17.5 ns	–	12 mA
SN74LS448	17.5 ns	–	24 mA

SN54LS448 (J,FH) SN74LS448 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{CS}$	11	S0	1	$\overline{CS}$	11	S0
2	B1	12	S1	2	B1	12	S1
3	C1	13	A4	3	C1	13	A4
4	C2	14	A3	4	C2	14	A3
5	B2	15	A2	5	B2	15	A2
6	B3	16	A1	6	B3	16	A1
7	C3	17	$\overline{GA}$	7	C3	17	$\overline{GA}$
8	C4	18	$\overline{GB}$	8	C4	18	$\overline{GB}$
9	B4	19	$\overline{GC}$	9	B4	19	$\overline{GC}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

449

QUAD BUS TRANSCEIVERS WITH DIRECTION CONTROLS

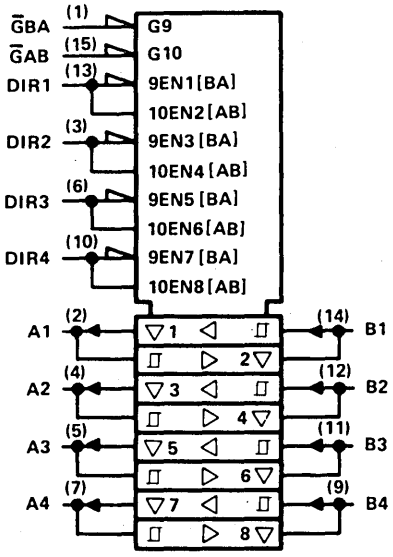
- Three-state outputs
- True ('LS449) and inverting ('LS446) outputs
- P-N-P inputs to reduce dc bus line loading

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54LS449	10.5 ns	–12 mA	12 mA
SN74LS449	10.5 ns	–15 mA	24 mA

SN54LS449 (J,FH) SN74LS449 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{GBA}$	9	B4	1	nc	11	nc
2	A1	10	DIR4	2	$\overline{GBA}$	12	B4
3	DIR2	11	B3	3	A1	13	DIR4
4	A2	12	B2	4	DIR2	14	B3
5	A3	13	DIR1	5	A2	15	B2
6	DIR3	14	B1	6	nc	16	nc
7	A4	15	$\overline{GAB}$	7	A3	17	DIR1
8	GND	16	V_{CC}	8	DIR3	18	B1
				9	A4	19	$\overline{GAB}$
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc – no internal connection.

© IC MASTER 1983

465, 466

OCTAL BUFFERS WITH THREE-STATE OUTPUTS

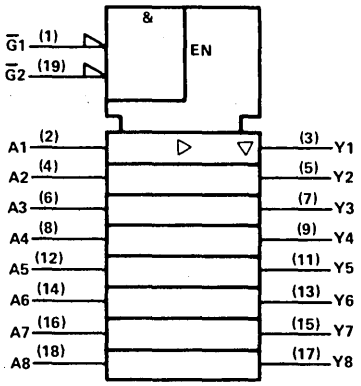
- P-N-P inputs reduce bus loading
- '465 true outputs
- '466 inverted outputs

typical performance

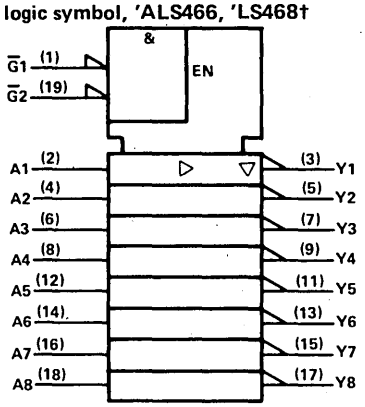
TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54ALS465		−12 mA	12 mA
SN74ALS465		−15 mA	24 mA
SN54ALS466	7 ns	−12 mA	12 mA
SN74ALS466	7 ns	−15 mA	24 mA
SN54LS465	11 ns	−1 mA	12 mA
SN74LS465	11 ns	−2.5 mA	24 mA
SN54LS466	8 ns	−1 mA	12 mA
SN74LS466	8 ns	−2.5 mA	24 mA

SN54ALS465 (J,FH) SN74ALS465 (N,FN)
SN54ALS466 (J,FH) SN74ALS466 (N,FN)
SN54LS465 (J) SN74LS465 (J,N)
SN74LS466 (J) SN74LS466 (J,N)

logic symbol, 'ALS465, 'LS465†



logic symbol, 'ALS466, 'LS468†



pin assignments

J, N PACKAGES			
1	$\overline{G}1$	11	Y5
2	A1	12	A5
3	Y1	13	Y6
4	A2	14	A6
5	Y2	15	Y7
6	A3	16	A7
7	Y3	17	Y8
8	A4	18	A8
9	Y4	19	$\overline{G}2$
10	GND	20	V_{CC}

'ALS465, 'ALS466

FH, FN PACKAGES			
1	$\overline{G}1$	11	Y5
2	A1	12	A5
3	Y1	13	Y6
4	A2	14	A6
5	Y2	15	Y7
6	A3	16	A7
7	Y3	17	Y8
8	A4	18	A8
9	Y4	19	$\overline{G}2$
10	GND	20	V_{CC}

For chip carrier information, contact the factory.

467, 468

OCTAL BUFFERS WITH THREE-STATE OUTPUTS

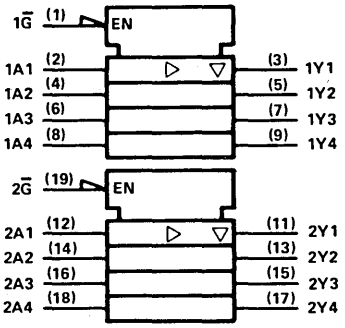
- P-N-P inputs reduce bus loading
- '467 true outputs
- '468 inverted outputs

typical performance

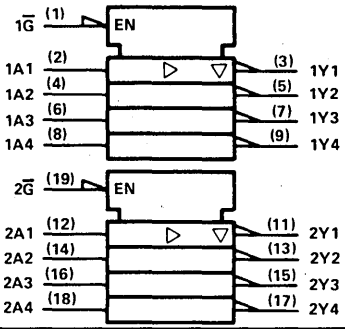
TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54ALS467		−12 mA	12 mA
SN74ALS467		−15 mA	24 mA
SN54ALS468	7 ns	−12 mA	12 mA
SN74ALS468	7 ns	−15 mA	24 mA
SN54LS467	11 ns	−1 mA	12 mA
SN74LS467	11 ns	−2.5 mA	24 mA
SN54LS468	8 ns	−1 mA	12 mA
SN74LS468	8 ns	−2.5 mA	24 mA

SN54ALS467 (J,FH) SN74ALS467 (N,FN)
SN54ALS468 (J,FH) SN74ALS468 (N,FN)
SN54LS467 (J) SN74LS467 (J,N)
SN54LS468 (J) SN74LS468 (J,N)

logic symbol, 'ALS467, 'LS467



logic symbol, 'ALS468, 'LS468



pin assignments

J, N PACKAGES			
1	$\overline{1G}$	11	2Y1
2	1A1	12	2A1
3	1Y1	13	2Y2
4	1A2	14	2A2
5	1Y2	15	2Y3
6	1A3	16	2A3
7	1Y3	17	2Y4
8	1A4	18	2A4
9	1Y4	19	$\overline{2G}$
10	GND	20	V_{CC}

'ALS467, 'ALS468

FH, FN PACKAGES			
1	$\overline{1G}$	11	2Y1
2	1A1	12	2A1
3	1Y1	13	2Y2
4	1A2	14	2A2
5	1Y2	15	2Y3
6	1A3	16	2A3
7	1Y3	17	2Y4
8	1A4	18	2A4
9	1Y4	19	$\overline{2G}$
10	GND	20	V_{CC}

For chip carrier information, contact the factory.

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

481

4-BIT-SLICE
CASCADABLE
PROCESSOR
ELEMENTS

typical performance

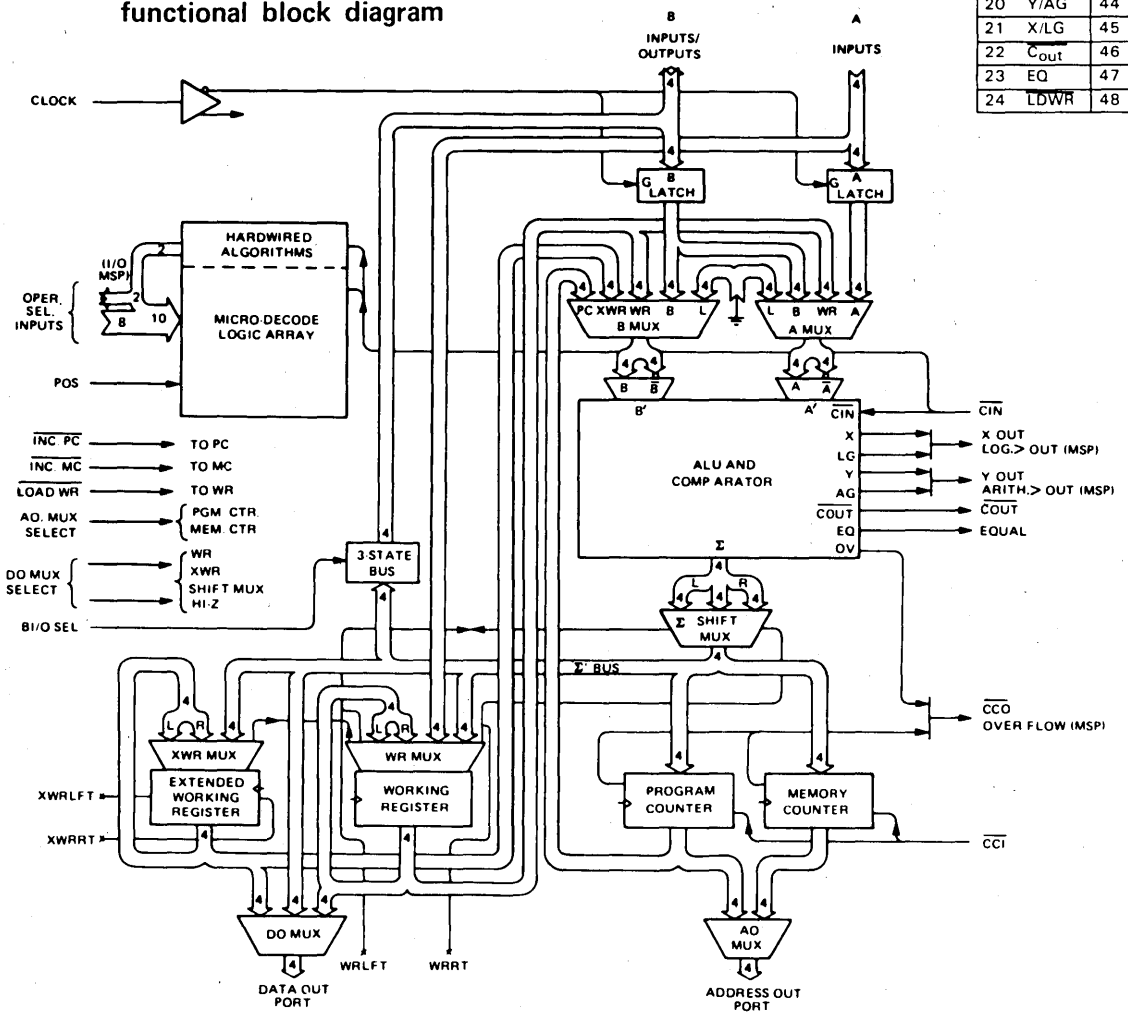
TYPE	OPERATION TIME
'LS481	120 ns
'S481	100 ns

SN74LS481 (J,N)
SN74S481 (J,N)

pin assignments

J, N PACKAGES			
1	B1/02	25	WRLFT
2	B1/03	26	WRRT
3	A13	27	XWRLFT
4	A12	28	XWRRT
5	A11	29	D0
6	A10	30	D1
7	OP0	31	DOP3
8	OP1	32	DOP2
9	OP2	33	DOP1
10	OP3	34	$\overline{\text{DOP0}}$
11	OP7	35	$\overline{\text{INC MC}}$
12	V_{CC}	36	GND
13	OP6	37	$\overline{\text{CCO}}$/OV
14	OP5	38	AOP0
15	OP8	39	AOP1
16	PO9	40	AOP2
17	OP4	41	AOP3
18	$\overline{C_{in}}$	42	AOSEL
19	POS	43	$\overline{\text{INC PC}}$
20	Y/AG	44	$\overline{\text{CCI}}$
21	X/LG	45	CLK
22	$\overline{C_{out}}$	46	BI/O0
23	EQ	47	BI/01
24	$\overline{\text{LDWR}}$	48	BI/O SEL

functional block diagram



© IC MASTER 1983

482

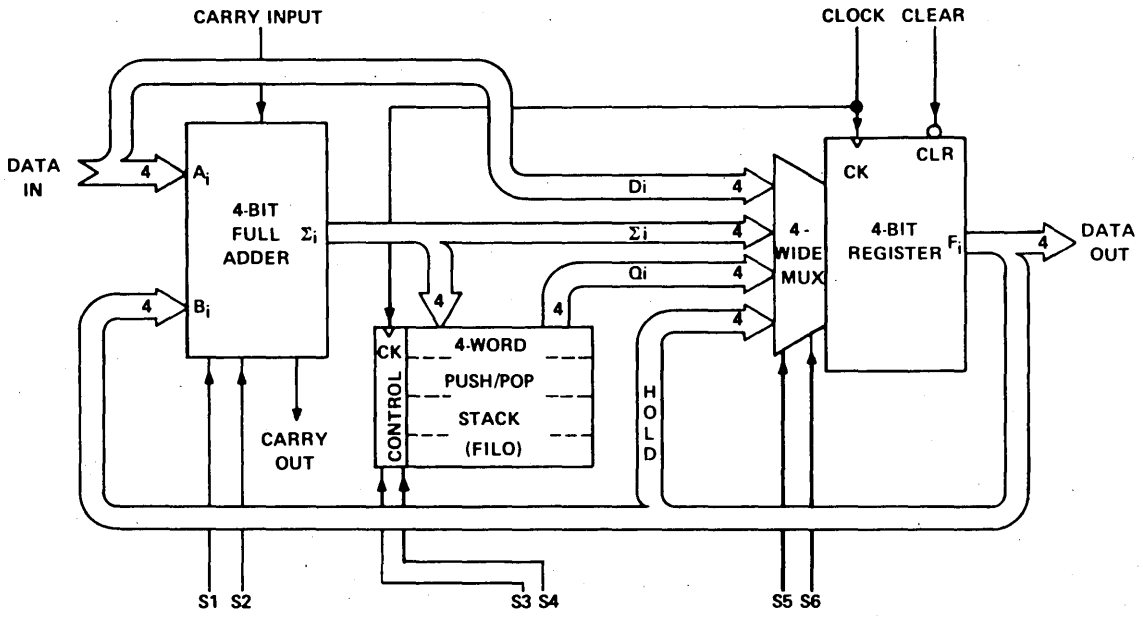
4-BIT-SLICE EXPANDABLE CONTROL ELEMENTS

SN54S482 (J,FH)
SN74S482 (J,N,FN)

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	S4	11	A0	1	S4	11	A0
2	S3	12	F3	2	S3	12	F3
3	C_{out}	13	F2	3	C_{out}	13	F2
4	C_{in}	14	F1	4	C_{in}	14	F1
5	S1	15	F0	5	S1	15	F0
6	S2	16	$\overline{CLR}$	6	S2	16	$\overline{CLR}$
7	A3	17	S6	7	A3	17	S6
8	A2	18	S5	8	A2	18	S5
9	A1	19	CLK	9	A1	19	CLK
10	GND	20	V_{CC}	10	GND	20	V_{CC}

functional block diagram



nc — no internal connection.

© IC MASTER 1983

484, 485

BCD-TO-BINARY AND BINARY-TO-BCD CODE CONVERTERS

('484 BCD-to-binary)

('485 binary-to-BCD)

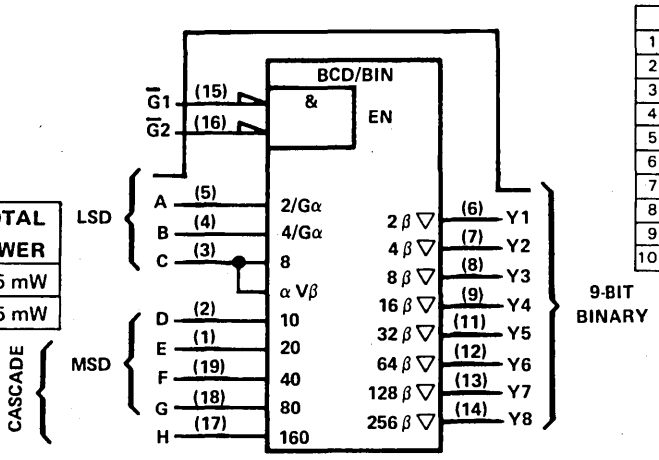
typical performance

TYPE	DELAY TIME PER PKG LEVEL	TOTAL POWER
'S484	45 ns	525 mW
'S485	45 ns	525 mW

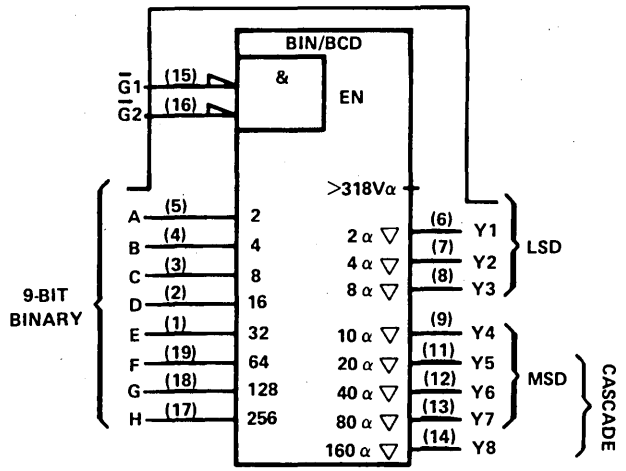
SN54S484 (J,FH)
SN54S485 (J,FH)

SN74S484 (J,N,FN)
SN74S485 (J,N,FN)

logic symbol 'S484†



logic symbol 'S485†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	E	11	Y5	1	E	11	Y5
2	D	12	Y6	2	D	12	Y6
3	C	13	Y7	3	C	13	Y7
4	B	14	Y8	4	B	14	Y8
5	A	15	$\overline{G1}$	5	A	15	$\overline{G1}$
6	Y1	16	$\overline{G2}$	6	Y1	16	$\overline{G2}$
7	Y2	17	H	7	Y2	17	H
8	Y3	18	G	8	Y3	18	G
9	Y4	19	F	9	Y4	19	F
10	GND	20	V_{CC}	10	GND	20	V_{CC}

490

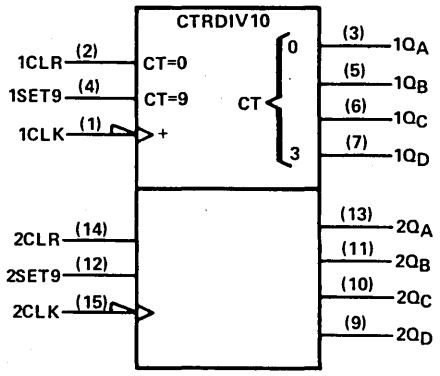
DUAL DECADE COUNTERS

typical performance

TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'490	25 MHz	HIGH	225 mW
'LS490	35 MHz	HIGH	75 mW

SN54490 (J,FH) SN74490 (J,N)
SN54LS490 (J,FH) SN74LS490 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1CLK	9	$2Q_D$	1	nc	11	nc
2	1CLR	10	$2Q_C$	2	1CLK	12	$2Q_D$
3	$1Q_A$	11	$2Q_B$	3	1CLR	13	$2Q_C$
4	1SET9	12	2SET9	4	$1Q_A$	14	$2Q_B$
5	$1Q_B$	13	$2Q_A$	5	1SET9	15	2SET9
6	$1Q_C$	14	2CLR	6	nc	16	nc
7	$1Q_D$	15	2CLK	7	$1Q_B$	17	$2Q_A$
8	GND	16	V_{CC}	8	$1Q_C$	18	2CLR
				9	$1Q_D$	19	2CLK
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

518,519,520, 521,522

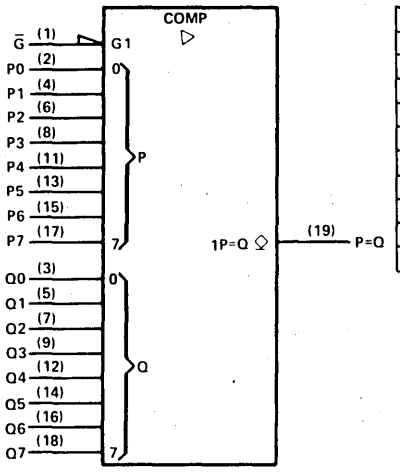
8-BIT MAGNITUDE COMPARATORS

- Compares two 8-bit words

TYPE	INPUT PULL-UP RESISTOR	OUTPUT FUNCTION AND CONFIGURATION	COMPARE TIME	POWER
ALS518	yes	P = Q open-collector	17.5 ns	50 mW
ALS519	no	P = Q open-collector	17.5 ns	37.5 mW
ALS520	yes	$\overline{P=Q}$ totem-pole	9 ns	50 mW
ALS521	no	$\overline{P=Q}$ totem-pole	9 ns	37.5 mW
ALS522	yes	$\overline{P=Q}$ open-collector	15.5 ns	50 mW

SN54ALS518(J,FH) SN74ALS518(N,FN)
SN54ALS519 (J,FH) SN74ALS519 (N,FN)
SN54ALS520 (J,FH) SN74ALS520 (N,FN)
SN54ALS521 (J,FH) SN74ALS521 (N,FN)
SN54ALS522 (J,FH) SN74ALS522 (N,FN)

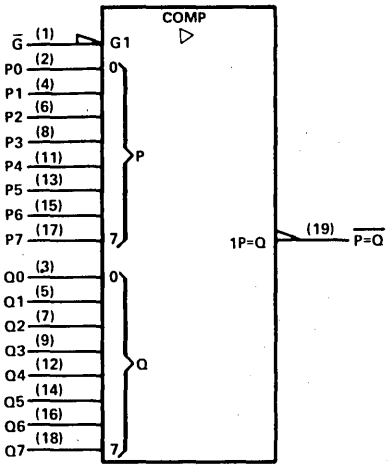
logic symbol 'ALS518, 'ALS519†



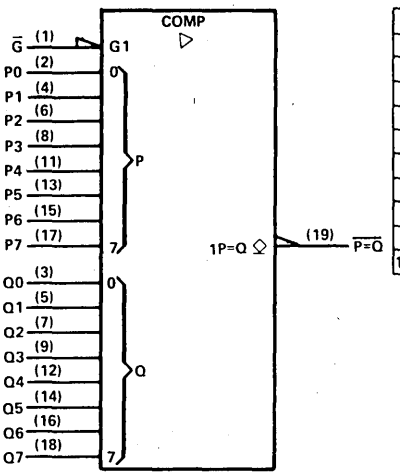
pin assignments, 'ALS518, 'ALS519

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{G}$	11	P4	1	$\overline{G}$	11	P4
2	P0	12	Q4	2	P0	12	Q4
3	Q0	13	P5	3	Q0	13	P5
4	P1	14	Q5	4	P1	14	Q5
5	Q1	15	P6	5	Q1	15	P6
6	P2	16	Q6	6	P2	16	Q6
7	Q2	17	P7	7	Q2	17	P7
8	P3	18	Q7	8	P3	18	Q7
9	Q3	19	P=Q	9	Q3	19	P=Q
10	GND	20	V_{CC}	10	GND	20	V_{CC}

logic symbol 'ALS520, 'ALS521†



logic symbol 'ALS522†



pin assignments, 'ALS520, 'ALS521, 'ALS522

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{G}$	11	P4	1	$\overline{G}$	11	P4
2	P0	12	Q4	2	P0	12	Q4
3	Q0	13	P5	3	Q0	13	P5
4	P1	14	Q5	4	P1	14	Q5
5	Q1	15	P6	5	Q1	15	P6
6	P2	16	Q6	6	P2	16	Q6
7	Q2	17	P7	7	Q2	17	P7
8	P3	18	Q7	8	P3	18	Q7
9	Q3	19	$\overline{P=Q}$	9	Q3	19	$\overline{P=Q}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

© IC MASTER 1983

533

OCTAL D-TYPE TRANSPARENT LATCHES

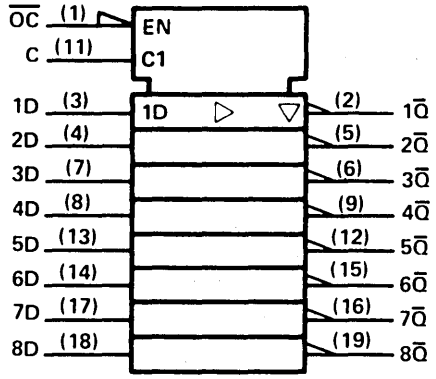
- Three-state buffer-type outputs drive bus lines directly
- Inverting outputs

typical performance

TYPE	OUTPUTS	DELAY	TOTAL POWER
ALS533	$\overline{Q}$	10 ns	60 mW
AS533	$\overline{Q}$	5 ns	

SN54ALS533 (J,FH) SN74ALS533 (N,FN)
SN54AS533 (J,FH) SN74AS533 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{OC}$	11	C	1	$\overline{OC}$	11	C
2	1$\overline{Q}$	12	5$\overline{Q}$	2	1$\overline{Q}$	12	5$\overline{Q}$
3	1D	13	5D	3	1D	13	5D
4	2D	14	6D	4	2D	14	6D
5	2$\overline{Q}$	15	6$\overline{Q}$	5	2$\overline{Q}$	15	6$\overline{Q}$
6	3$\overline{Q}$	16	7$\overline{Q}$	6	3$\overline{Q}$	16	7$\overline{Q}$
7	3D	17	7D	7	3D	17	7D
8	4D	18	8D	8	4D	18	8D
9	4$\overline{Q}$	19	8$\overline{Q}$	9	4$\overline{Q}$	19	8$\overline{Q}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

534

OCTAL D-TYPE EDGE-TRIGGERED FLIP-FLOPS

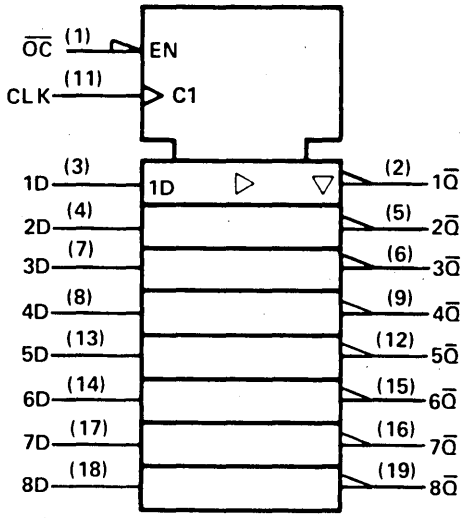
- Three-state buffer-type outputs drive bus lines directly
- Inverting outputs

typical performance

TYPE	F-MAX	PWR/F/F	DATA TIMES	
			SET-UP	HOLD
ALS534	50 MHz	10.4 mW		
AS534	165 MHz			

SN54ALS534 (J,FH) SN74ALS534 (N,FN)
SN54AS534 (J,FH) SN74AS534 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{OC}$	11	CLK	1	$\overline{OC}$	11	CLK
2	1$\overline{Q}$	12	5$\overline{Q}$	2	1$\overline{Q}$	12	5$\overline{Q}$
3	1D	13	5D	3	1D	13	5D
4	2D	14	6D	4	2D	14	6D
5	2$\overline{Q}$	15	6$\overline{Q}$	5	2$\overline{Q}$	15	6$\overline{Q}$
6	3$\overline{Q}$	16	7$\overline{Q}$	6	3$\overline{Q}$	16	7$\overline{Q}$
7	3D	17	7D	7	3D	17	7D
8	4D	18	8D	8	4D	18	8D
9	4$\overline{Q}$	19	8$\overline{Q}$	9	4$\overline{Q}$	19	8$\overline{Q}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

†Pin numbers shown on logic symbols are for J and N packages only.

© IC MASTER 1983

538

3- TO 8-LINE DECODERS/ DEMULTIPLEXERS

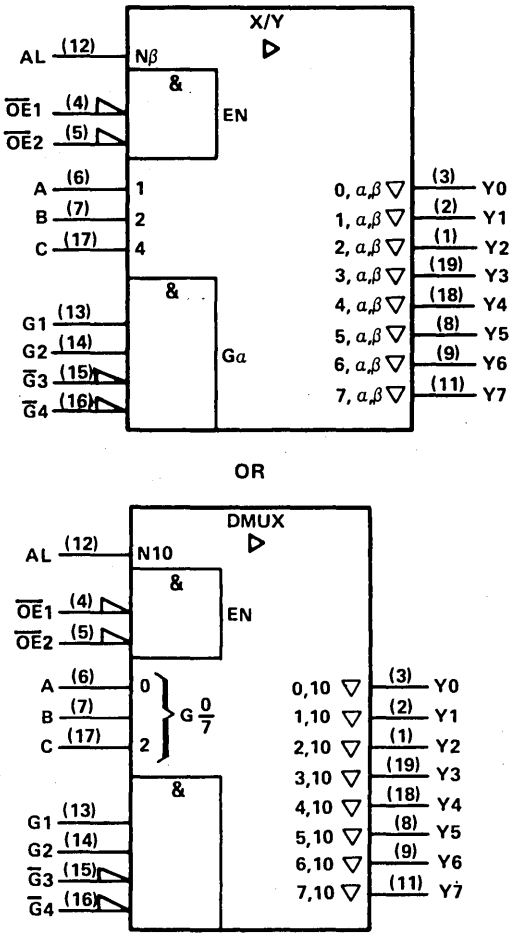
- Three-state outputs
- Output polarity control
- Multiple enables for expansion

typical performance

TYPE	SELECT TIME	ENABLE TIME	TOTAL POWER
'ALS538			

SN54ALS538 (J,FH) SN74ALS538 (N, FN)

logic symbol†



OR

pin assignments

J, N PACKAGES			
1	Y2	11	Y7
2	Y1	12	AL
3	Y0	13	G1
4	$\overline{OE1}$	14	G2
5	$\overline{OE2}$	15	$\overline{G3}$
6	A	16	$\overline{G4}$
7	B	17	C
8	Y5	18	Y4
9	Y6	19	Y3
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	Y2	11	Y7
2	Y1	12	AL
3	Y0	13	G1
4	$\overline{OE1}$	14	G2
5	$\overline{OE2}$	15	$\overline{G3}$
6	A	16	$\overline{G4}$
7	B	17	C
8	Y5	18	Y4
9	Y6	19	Y3
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

539

2- TO 4-LINE DECODERS/ DEMULTIPLEXERS

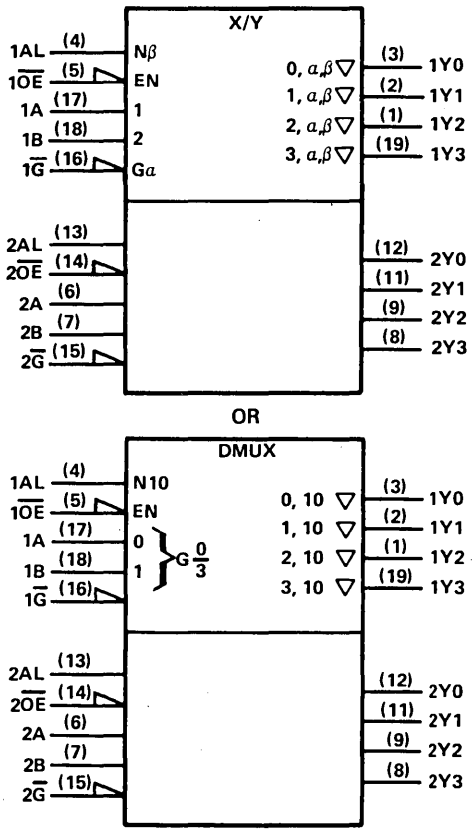
- Three-state outputs
- Output polarity control

typical performance

TYPE	SELECT TIME	ENABLE TIME	TOTAL POWER
'ALS539			

SN54ALS539 (J,FH) SN74ALS539 (N, FN)

logic symbols†



pin assignments

J, N PACKAGES			
1	1Y2	11	2Y1
2	1Y1	12	2Y0
3	1Y0	13	2AL
4	1AL	14	2$\overline{OE}$
5	1$\overline{OE}$	15	2$\overline{G}$
6	2A	16	1$\overline{G}$
7	2B	17	1A
8	2Y3	18	1B
9	2Y2	19	1Y3
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	1Y2	11	2Y1
2	1Y1	12	2Y0
3	1Y0	13	2AL
4	1AL	14	2$\overline{OE}$
5	1$\overline{OE}$	15	2$\overline{G}$
6	2A	16	1$\overline{G}$
7	2B	17	1A
8	2Y3	18	1B
9	2Y2	19	1Y3
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

540, 541

OCTAL BUFFERS AND LINE DRIVERS

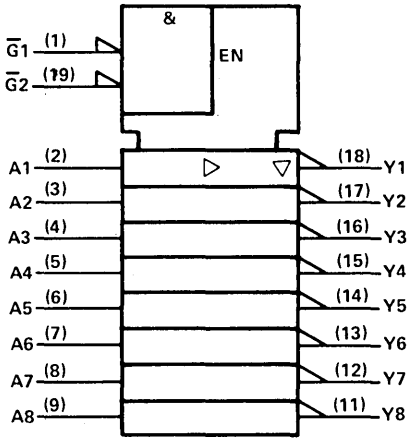
- Three-state output drives bus lines or buffer memory address registers
- 'LS540 for inverted data output
- 'LS541 for true data output

typical performance

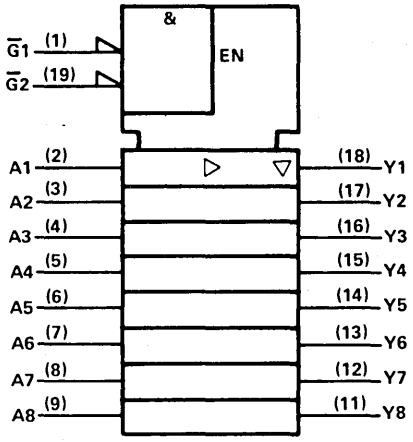
TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54ALS540	6 ns	−12 mA	12 mA
SN74ALS540	6 ns	−15 mA	24 mA
SN54ALS541	6 ns	−12 mA	12 mA
SN74ALS541	6 ns	−15 mA	24 mA
SN54LS540	9 ns	−12 mA	12 mA
SN74LS540	9.5 ns	−15 mA	24 mA
SN54LS541	9 ns	−12 mA	12 mA
SN74LS541	9.5 ns	−15 mA	24 mA

SN54ALS540 (J,FH) SN74ALS540 (N,FN)
SN54ALS541 (J,FH) SN74ALS541 (N,FN)
SN54LS540 (J,FH) SN74LS540 (J,N,FN)
SN54LS541 ((J,FH) SN74LS541 (J,N,FN)

logic symbol, 'LS540, 'ALS540†



logic symbol, 'LS541, 'ALS541†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{G}1$	11	Y8	1	$\overline{G}1$	11	Y8
2	A1	12	Y7	2	A1	12	Y7
3	A2	13	Y6	3	A2	13	Y6
4	A3	14	Y5	4	A3	14	Y5
5	A4	15	Y4	5	A4	15	Y4
6	A5	16	Y3	6	A5	16	Y3
7	A6	17	Y2	7	A6	17	Y2
8	A7	18	Y1	8	A7	18	Y1
9	A8	19	$\overline{G}2$	9	A8	19	$\overline{G}2$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

560

SYNCHRONOUS 4-BIT COUNTERS

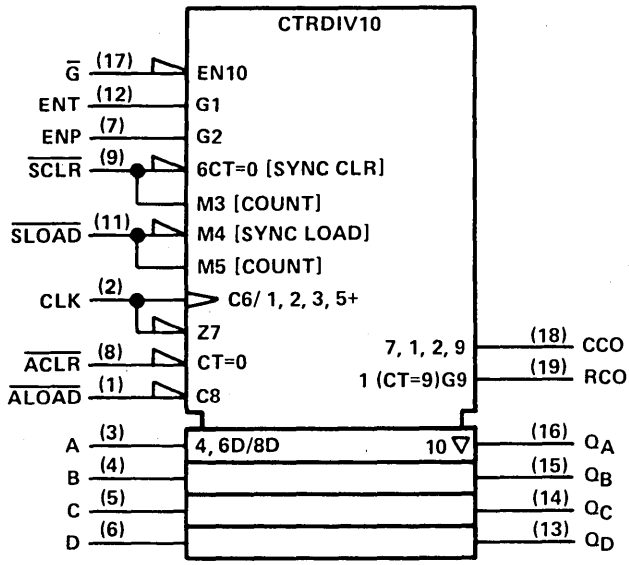
(decade, synchronous and asynchronous clear)

typical performance

TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'ALS560	30 MHz	Low	100 mW

SN54ALS560 (J,FH) SN74ALS560 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	ALOAD	11	SLOAD
2	CLK	12	ENT
3	A	13	Q_D
4	B	14	Q_C
5	C	15	Q_B
6	D	16	Q_A
7	ENP	17	$\overline{G}$
8	ACLR	18	CCO
9	SCLR	19	RCO
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	ALOAD	11	SLOAD
2	CLK	12	ENT
3	A	13	Q_D
4	B	14	Q_C
5	C	15	Q_B
6	D	16	Q_A
7	ENP	17	$\overline{G}$
8	ACLR	18	CCO
9	SCLR	19	RCO
10	GND	20	V_{CC}

561

SYNCHRONOUS 4-BIT COUNTERS

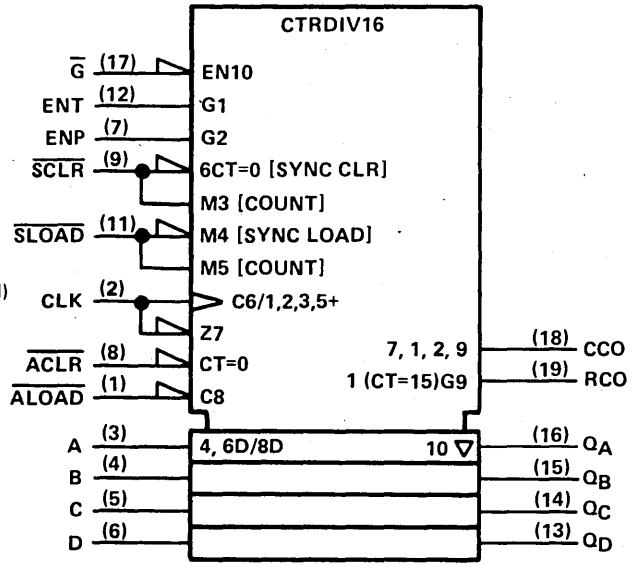
(binary, synchronous and asynchronous clear)

typical performance

TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'ALS561	40 MHz	Low	100 mW

SN54ALS561 (J,FH) SN74ALS561 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	ALOAD	11	SLOAD
2	CLK	12	ENT
3	A	13	Q_D
4	B	14	Q_C
5	C	15	Q_B
6	D	16	Q_A
7	ENP	17	$\overline{G}$
8	ACLR	18	CCO
9	SCLR	19	RCO
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	ALOAD	11	SLOAD
2	CLK	12	ENT
3	A	13	Q_D
4	B	14	Q_C
5	C	15	Q_B
6	D	16	Q_A
7	ENP	17	$\overline{G}$
8	ACLR	18	CCO
9	SCLR	19	RCO
10	GND	20	V_{CC}

Pin numbers shown on logic symbols are for J and N packages only.

© IC MASTER 1983

563

OCTAL D-TYPE TRANSPARENT LATCHES WITH INVERTED OUTPUTS

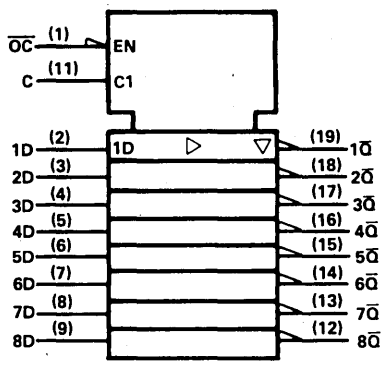
- Buffer-type outputs drive bus lines directly
- Inverted outputs

typical performance

TYPE	DELAY	TOTAL POWER
'ALS563	11 ns	67.5 mW

SN54ALS563 (J,FH) SN74ALS563 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{OC}$	11	C	1	$\overline{OC}$	11	C
2	1D	12	$8\overline{Q}$	2	1D	12	$8\overline{Q}$
3	2D	13	$7\overline{Q}$	3	2D	13	$7\overline{Q}$
4	3D	14	$6\overline{Q}$	4	3D	14	$6\overline{Q}$
5	4D	15	$5\overline{Q}$	5	4D	15	$5\overline{Q}$
6	5D	16	$4\overline{Q}$	6	5D	16	$4\overline{Q}$
7	6D	17	$3\overline{Q}$	7	6D	17	$3\overline{Q}$
8	7D	18	$2\overline{Q}$	8	7D	18	$2\overline{Q}$
9	8D	19	$1\overline{Q}$	9	8D	19	$1\overline{Q}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

564

OCTAL D-TYPE EDGE-TRIGGERED FLIP-FLOPS

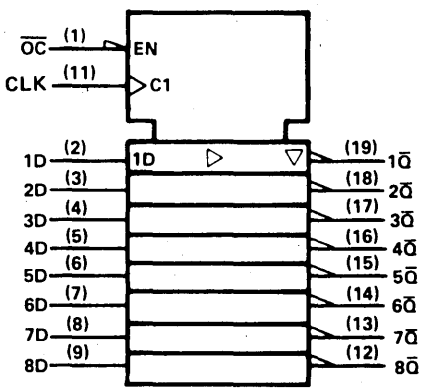
- Buffer-type outputs drive bus lines directly
- Inverted outputs

typical performance

TYPE	f_{max}	PWR/ F-F
'ALS564	50 MHz	8.4 mW

SN54ALS564 (J,FH) SN74ALS564 (N,FN)

logic symbol†



pin assignment

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{OC}$	11	CLK	1	$\overline{OC}$	11	CLK
2	1D	12	$8\overline{Q}$	2	1D	12	$8\overline{Q}$
3	2D	13	$7\overline{Q}$	3	2D	13	$7\overline{Q}$
4	3D	14	$6\overline{Q}$	4	3D	14	$6\overline{Q}$
5	4D	15	$5\overline{Q}$	5	4D	15	$5\overline{Q}$
6	5D	16	$4\overline{Q}$	6	5D	16	$4\overline{Q}$
7	6D	17	$3\overline{Q}$	7	6D	17	$3\overline{Q}$
8	7D	18	$2\overline{Q}$	8	7D	18	$2\overline{Q}$
9	8D	19	$1\overline{Q}$	9	8D	19	$1\overline{Q}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

†Pin numbers shown on logic symbols are for J and N packages only.

© IC MASTER 1983

568

SYNCHRONOUS 4-BIT UP/DOWN COUNTERS

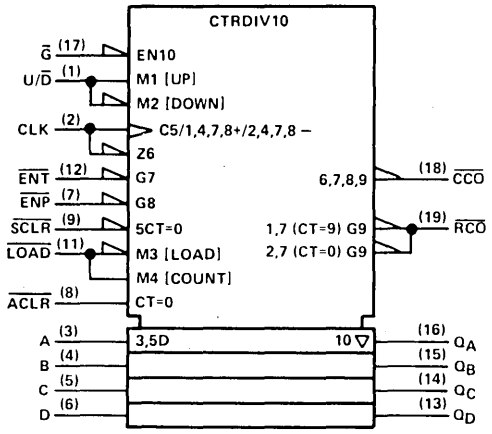
(decade, synchronous and asynchronous clear)

typical performance

TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'ALS568	30 MHz	Low	93 mW

SN54ALS568 (J,FH) SN74ALS568 (N,FN)

logic symbol†



pin assignment

J, N PACKAGES				FH, FN PACKAGES			
1	U/D	11	LOAD	1	U/D	11	LOAD
2	CLK	12	ENT	2	CLK	12	ENT
3	A	13	Q_D	3	A	13	Q_D
4	B	14	Q_C	4	B	14	Q_C
5	C	15	Q_B	5	C	15	Q_B
6	D	16	Q_A	6	D	16	Q_A
7	ENP	17	G	7	ENP	17	G
8	ACLR	18	CCO	8	ACLR	18	CCO
9	SCLR	19	RCO	9	SCLR	19	RCO
10	GND	20	V_{CC}	10	GND	20	V_{CC}

569

SYNCHRONOUS 4-BIT UP/DOWN COUNTERS

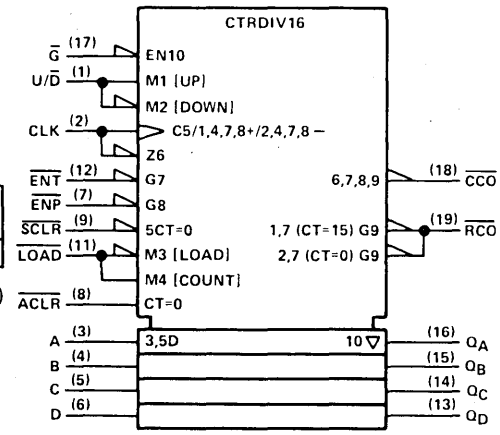
(binary, synchronous and asynchronous clear)

typical performance

TYPE	COUNT FREQ	CLEAR	TOTAL POWER
'ALS569	40 MHz	Low	93 mW

SN54ALS569 (J,FH) SN74ALS569 (N,FN)

logic symbol†



pin assignment

J, N PACKAGES				FH, FN PACKAGES			
1	U/D	11	LOAD	1	U/D	11	LOAD
2	CLK	12	ENT	2	CLK	12	ENT
3	A	13	Q_D	3	A	13	Q_D
4	B	14	Q_C	4	B	14	Q_C
5	C	15	Q_B	5	C	15	Q_B
6	D	16	Q_A	6	D	16	Q_A
7	ENP	17	G	7	ENP	17	G
8	ACLR	18	CCO	8	ACLR	18	CCO
9	SCLR	19	RCO	9	SCLR	19	RCO
10	GND	20	V_{CC}	10	GND	20	V_{CC}

†Pin numbers shown on logic symbols are for J and N packages only.

© IC MASTER 1983

573

OCTAL D-TYPE TRANSPARENT LATCHES

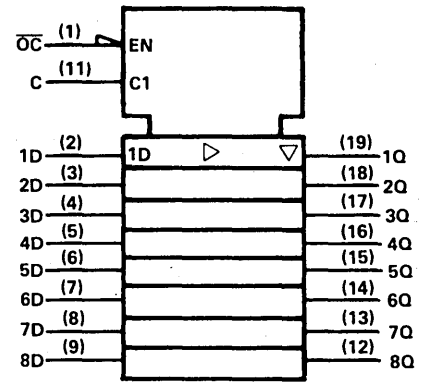
- Functionally equivalent to 'LS373 and 'S373
- Three-state buffer-type outputs drive bus lines directly
- Approximately half the power of 'LS373

typical performance

TYPE	OUTPUTS	DELAY	TOTAL POWER
'ALS573	Q	11 ns	67.5 mW
'AS573			

SN54ALS573 (J,FH) SN74ALS573 (N,FN)
SN54AS573 (J,FH) SN74AS573 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	OC	11	C	1	OC	11	C
2	1D	12	8Q	2	1D	12	8Q
3	2D	13	7Q	3	2D	13	7Q
4	3D	14	6Q	4	3D	14	6Q
5	4D	15	5Q	5	4D	15	5Q
6	5D	16	4Q	6	5D	16	4Q
7	6D	17	3Q	7	6D	17	3Q
8	7D	18	2Q	8	7D	18	2Q
9	8D	19	1Q	9	8D	19	1Q
10	GND	20	V_{CC}	10	GND	20	V_{CC}

574

OCTAL D-TYPE EDGE-TRIGGERED FLIP-FLOPS

- Functionally equivalent to 'LS374 and 'S374
- Three-state buffer-type outputs drive bus lines directly
- Approximately half the power of 'LS374

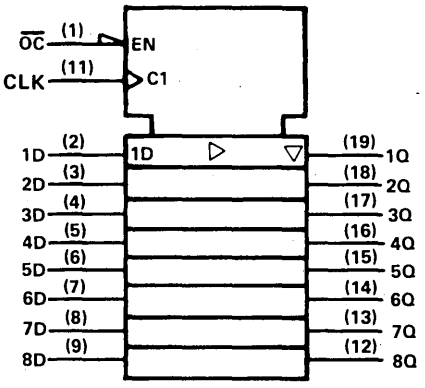
typical performance

TYPE	f_{max}	PWR/ F-F	DATA TIMES	
			SET-UP	HOLD
'ALS574	50 MHz	8.44 mW	10 ns	4 ns
'AS574				

† Rising edge of clock pulse

SN54ALS574 (J,FH) SN74ALS574 (N,FN)
SN54AS574 (J,FH) SN74AS574 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	OC	11	CLK	1	OC	11	CLK
2	1D	12	8Q	2	1D	12	8Q
3	2D	13	7Q	3	2D	13	7Q
4	3D	14	6Q	4	3D	14	6Q
5	4D	15	5Q	5	4D	15	5Q
6	5D	16	4Q	6	5D	16	4Q
7	6D	17	3Q	7	6D	17	3Q
8	7D	18	2Q	8	7D	18	2Q
9	8D	19	1Q	9	8D	19	1Q
10	GND	20	V_{CC}	10	GND	20	V_{CC}

575

OCTAL D-TYPE EDGE-TRIGGERED FLIP-FLOPS

- 3-state buffer-type outputs drive bus-lines directly
- Noninverting outputs

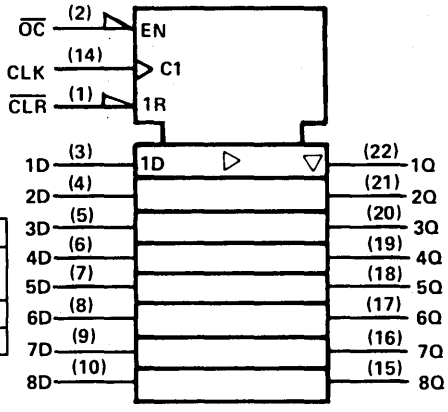
typical performance

TYPE	f_{max}	PWR/ F-F	DATA TIMES	
			SET-UP	HOLD
'ALS575	50 MHz	8.4 mW	10 nst	4 nst
'AS575				

†Rising edge of clock pulse

SN54ALS575 (J,FH) SN74ALS575 (N,FN)
SN54AS575 (J,FH) SN74AS575 (N,FN)

logic symbol, 'ALS575, 'AS575



pin assignment

J, N PACKAGES				FH, FN PACKAGES			
1	CLR	13	nc	1	nc	15	nc
2	OC	14	CLK	2	CLR	16	nc
3	1D	15	8Q	3	OC	17	CLK
4	2D	16	7Q	4	1D	18	8Q
5	3D	17	6Q	5	2D	19	7Q
6	4D	18	5Q	6	3D	20	6Q
7	5D	19	4Q	7	4D	21	5Q
8	6D	20	3Q	8	nc	22	nc
9	7D	21	2Q	9	5D	23	4Q
10	8D	22	1Q	10	6D	24	3Q
11	nc	23	nc	11	7D	25	2Q
12	GND	24	V_{CC}	12	8D	26	1Q
				13	nc	27	nc
				14	GND	28	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

576

OCTAL D-TYPE EDGE-TRIGGERED FLIP-FLOPS

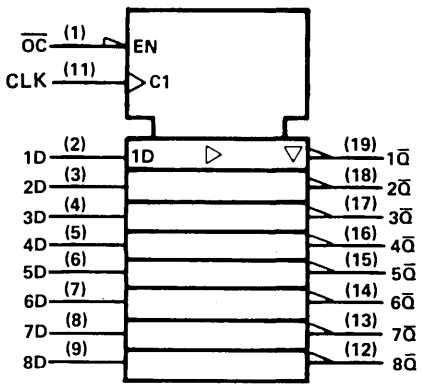
- Buffer-type outputs drive bus lines directly
- Inverted outputs

typical performance

TYPE	f_{max}	PWR/ F-F
'ALS576	50MHz	8.4 mW
'AS576		

SN54ALS576 (J,FH) SN74ALS576 (N,FN)
SN54AS576 (J,FH) SN74AS576 (N,FN)

logic symbol†



pin assignments

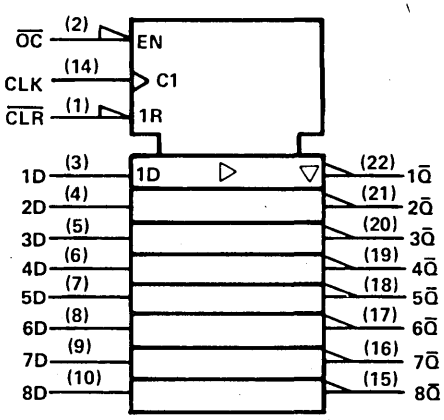
J, N PACKAGES				FH, FN PACKAGES			
1	OC	11	CLK	1	OC	11	CLK
2	1D	12	8Q	2	1D	12	8Q
3	2D	13	7Q	3	2D	13	7Q
4	3D	14	6Q	4	3D	14	6Q
5	4D	15	5Q	5	4D	15	5Q
6	5D	16	4Q	6	5D	16	4Q
7	6D	17	3Q	7	6D	17	3Q
8	7D	18	2Q	8	7D	18	2Q
9	8D	19	1Q	9	8D	19	1Q
10	GND	20	V_{CC}	10	GND	20	V_{CC}

577

OCTAL D-TYPE EDGE-TRIGGERED FLIP-FLOPS

- Buffer-type outputs drive bus lines directly
- Inverted outputs
- Synchronous clear

logic symbol, 'ALS577, 'AS577



pin assignment

J, N PACKAGES				FH, FN PACKAGES			
1	CLR	13	nc	1	nc	15	nc
2	OC	14	CLK	2	CLR	16	nc
3	1D	15	8Q	3	OC	17	CLK
4	2D	16	7Q	4	1D	18	8Q
5	3D	17	6Q	5	2D	19	7Q
6	4D	18	5Q	6	3D	20	6Q
7	5D	19	4Q	7	4D	21	5Q
8	6D	20	3Q	8	nc	22	nc
9	7D	21	2Q	9	5D	23	4Q
10	8D	22	1Q	10	6D	24	3Q
11	nc	23	nc	11	7D	25	2Q
12	GND	24	V_{CC}	12	8D	26	1Q
				13	nc	27	nc
				14	GND	28	V_{CC}

typical performance

TYPE	f_{max}	POWER/ F-F	DATA TIMES	
			SET-UP	HOLD
'ALS577	50 MHz	8.4 mW	10 nst	4 nst
'AS577				

†Rising edge of clock pulse
SN54ALS577 (J,FH) SN74ALS577(N,FN)
SN54AS577 (J,FH) SN74AS577(N,FN)

†Pin numbers shown on logic symbols are for J and N packages only.
nc -- no internal connection.

© IC MASTER 1983

580

OCTAL D-TYPE TRANSPARENT LATCHES WITH INVERTED OUTPUTS

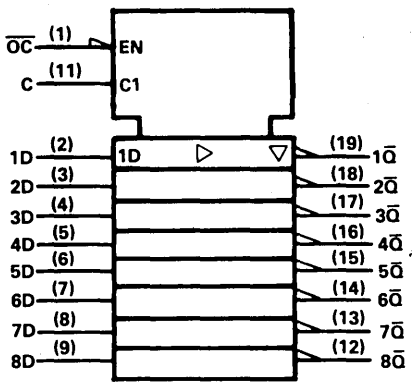
- Three-state buffer-type outputs drive bus lines directly

typical performance

TYPE	DELAY	TOTAL POWER
'ALS580	11 ns	67.5 mW
'AS580		

SN54ALS580 (J,FH) SN74ALS580 (N,FN)
SN54AS580 (J,FH) SN74AS580 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{OC}$	11	C	1	$\overline{OC}$	11	C
2	1D	12	8Q	2	1D	12	8Q
3	2D	13	7Q	3	2D	13	7Q
4	3D	14	6Q	4	3D	14	6Q
5	4D	15	5Q	5	4D	15	5Q
6	5D	16	4Q	6	5D	16	4Q
7	6D	17	3Q	7	6D	17	3Q
8	7D	18	2Q	8	7D	18	2Q
9	8D	19	1Q	9	8D	19	1Q
10	GND	20	V_{CC}	10	GND	20	V_{CC}

590, 591

8-BIT BINARY COUNTERS WITH OUTPUT REGISTERS

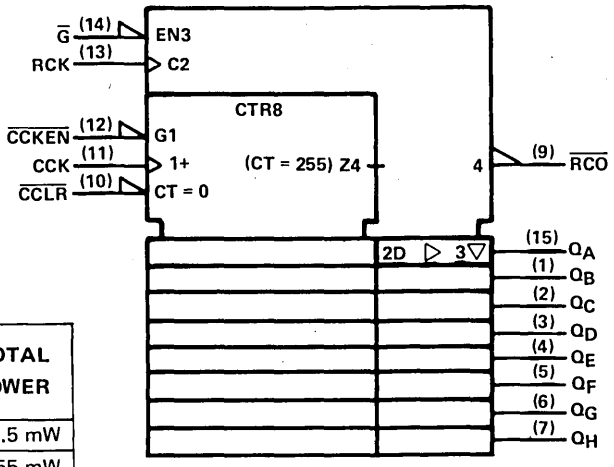
- 'LS590 has three-state register outputs
- 'LS591 has open-collector register outputs
- Counter has direct clear

typical performance

TYPE	MAX COUNT FREQ	PARALLEL LOAD	CLEAR	TOTAL POWER
'LS590	20 MHz	SYNC	SYNC-L	166.5 mW
'LS591	20 MHz	SYNC	SYNC-L	155 mW

SN54LS590 (J,FH) SN74LS590 (J,N,FN)
SN54LS591 (J,FH) SN74LS591 (J,N,FN)

logic symbol, 'LS590†

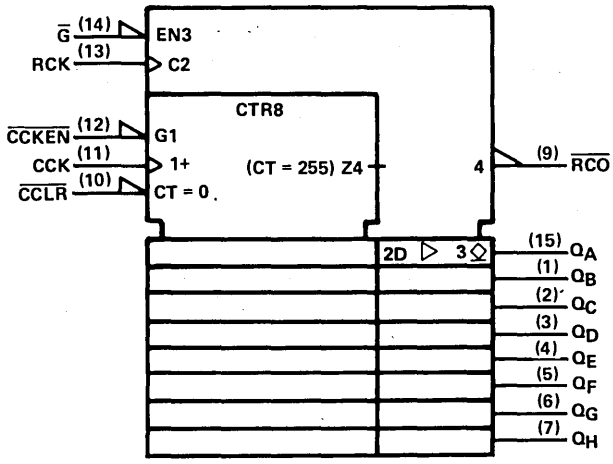


pin assignments

J, N PACKAGES			
1	Q_B	9	$\overline{RCO}$
2	Q_C	10	$\overline{CCLR}$
3	Q_D	11	CCK
4	Q_E	12	$\overline{CCKEN}$
5	Q_F	13	RCK
6	Q_G	14	$\overline{G}$
7	Q_H	15	Q_A
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	Q_B	12	$\overline{RCO}$
3	Q_C	13	$\overline{CCLR}$
4	Q_D	14	CCK
5	Q_E	15	$\overline{CCKEN}$
6	nc	16	nc
7	Q_F	17	RCK
8	Q_G	18	$\overline{G}$
9	Q_H	19	Q_A
10	GND	20	V_{CC}

logic symbol, 'LS591†



† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

592

8-BIT BINARY COUNTERS WITH INPUT REGISTERS

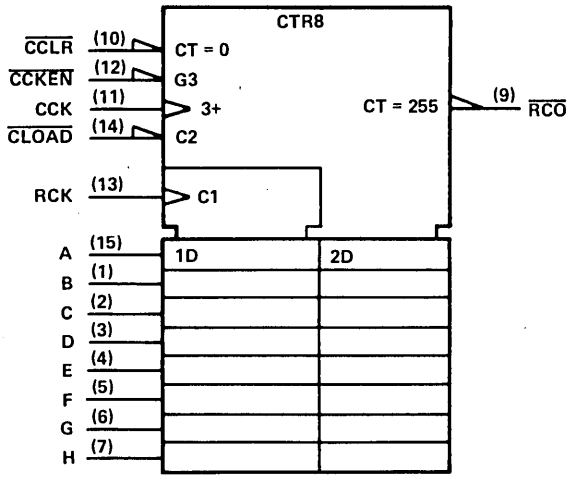
- Has parallel register inputs
- Counter has direct overriding load and clear
- Guaranteed counter frequency . . . dc to 20 MHz

typical performance

MAX COUNT FREQ	PARALLEL LOAD	CLEAR	TOTAL POWER
20 MHz	SYNC	SYNC-L	130 mW

SN54LS592 (J,FH)
SN74LS592 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	B	9	RCO
2	C	10	CCLR
3	D	11	CCK
4	E	12	CCKEN
5	F	13	RCK
6	G	14	CLOAD
7	H	15	A
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	B	12	RCO
3	C	13	CCLR
4	D	14	CCK
5	E	15	CCKEN
6	nc	16	nc
7	F	17	RCK
8	G	18	CLOAD
9	H	19	A
10	GND	20	V_{CC}

593

8-BIT BINARY COUNTERS WITH INPUT REGISTERS

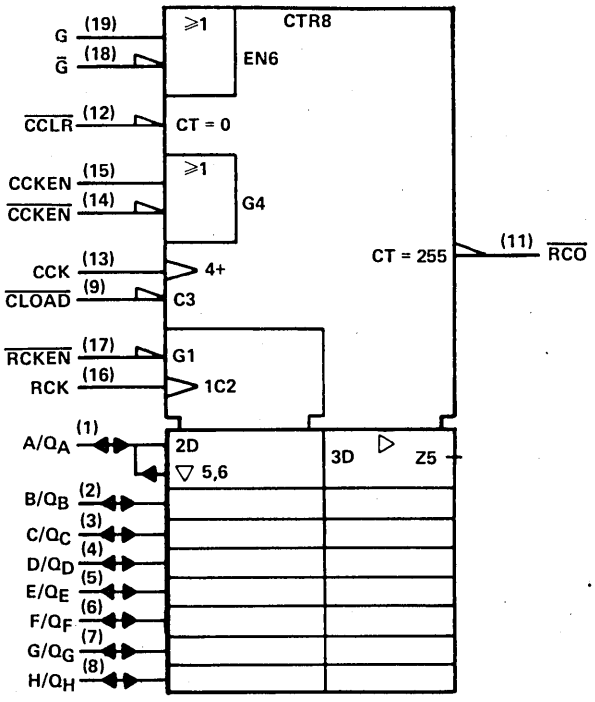
- Has parallel three-state I/O: register inputs/counter outputs
- Counter has direct overriding load and clear
- Guaranteed counter frequency . . . dc to 20 MHz

typical performance

MAX COUNT FREQ	PARALLEL LOAD	CLEAR	TOTAL POWER
20 MHz	SYNC	SYNC-L	177 mW

SN54LS593 (J,FH)
SN74LS593 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	A/Q_A	11	RCO
2	B/Q_B	12	CCLR
3	C/Q_C	13	CCK
4	D/Q_D	14	CCKEN
5	E/Q_E	15	CCKEN
6	F/Q_F	16	RCK
7	G/Q_G	17	RCKEN
8	H/Q_H	18	$\bar{G}$
9	CLOAD	19	G
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	A/Q_A	11	RCO
2	B/Q_B	12	CCLR
3	C/Q_C	13	CCK
4	D/Q_D	14	CCKEN
5	E/Q_E	15	CCKEN
6	F/Q_F	16	RCK
7	G/Q_G	17	RCKEN
8	H/Q_H	18	$\bar{G}$
9	CLOAD	19	G
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

594

8-BIT SHIFT REGISTERS WITH OUTPUT LATCHES

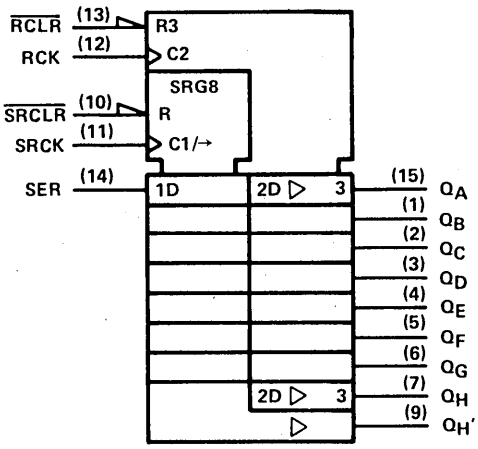
- Serial-in, parallel-out shift registers with storage
- Buffered outputs
- Guaranteed shift frequency . . . dc to 20 MHz

typical performance

TYPE	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'LS594	D	Low	

SN54LS594 (J,FH) SN74LS594 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	Q_B	9	$Q_{H'}$
2	Q_C	10	$\overline{SRCLR}$
3	Q_D	11	SRCK
4	Q_E	12	RCK
5	Q_F	13	$\overline{RCLR}$
6	Q_G	14	SER
7	Q_H	15	Q_A
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	Q_B	12	$Q_{H'}$
3	Q_C	13	$\overline{SRCLR}$
4	Q_D	14	SRCK
5	Q_E	15	RCK
6	nc	16	nc
7	Q_F	17	$\overline{RCLR}$
8	Q_G	18	SER
9	Q_H	19	Q_A
10	GND	20	V_{CC}

595, 596

8-BIT SHIFT REGISTERS WITH OUTPUT LATCHES

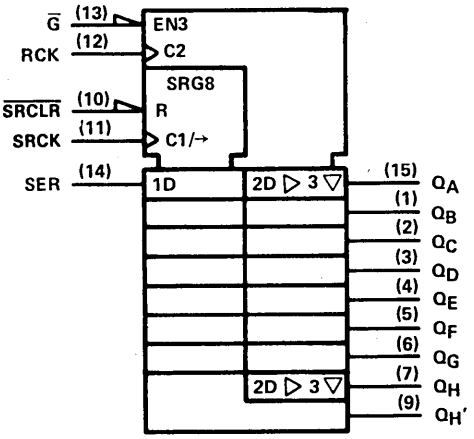
- Serial-in, parallel-out shift registers with storage
- 'LS595 has three-state parallel outputs
- 'LS596 has open-collector parallel outputs
- Guaranteed shift frequency . . . dc to 20 MHz

typical performance

TYPE	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'LS595	D	LOW	167 mW
'LS596	D	LOW	160 mW

SN54LS595 (J,FH) SN74LS595 (J,N,FN)
SN54LS596 (J,FH) SN74LS596 (J,N,FN)

logic symbol, 'LS595†

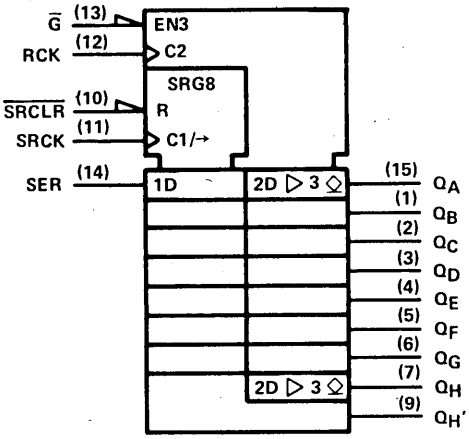


pin assignments

J, N PACKAGES			
1	Q_B	9	$Q_{H'}$
2	Q_C	10	$\overline{SRCLR}$
3	Q_D	11	$\overline{SRCK}$
4	Q_E	12	RCK
5	Q_F	13	$\overline{G}$
6	Q_G	14	SER
7	Q_H	15	Q_A
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	Q_B	12	Q_H
3	Q_C	13	$\overline{SCLR}$
4	Q_D	14	SCK
5	Q_E	15	RCK
6	nc	16	nc
7	Q_F	17	$\overline{G}$
8	Q_G	18	SER
9	Q_H	19	Q_A
10	GND	20	V_{CC}

logic symbol, 'LS596†



† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

597

8-BIT SHIFT REGISTERS WITH INPUT LATCHES

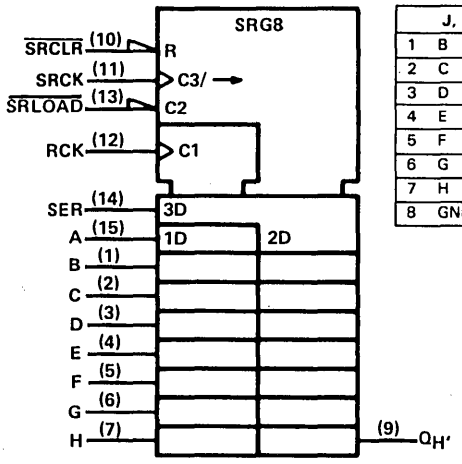
- Has parallel storage register inputs
- Shift register has direct overriding load and clear
- Guaranteed shift frequency . . . dc to 20 MHz

typical performance

TYPE	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'LS597	D	LOW	130 mW

SN54LS597 (J,FH) SN74LS597 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	B	9	$Q_{H'}$	1	nc	11	nc
2	C	10	$\overline{SRCLR}$	2	B	12	$Q_{H'}$
3	D	11	SRCK	3	C	13	$\overline{SRCLR}$
4	E	12	RCK	4	D	14	SRCK
5	F	13	$\overline{SRLOAD}$	5	E	15	RCK
6	G	14	SER	6	nc	16	nc
7	H	15	A	7	F	17	$\overline{SRLOAD}$
8	GND	16	V_{CC}	8	G	18	SER
				9	H	19	A
				10	GND	20	V_{CC}

598

8-BIT SHIFT REGISTERS WITH INPUT LATCHES

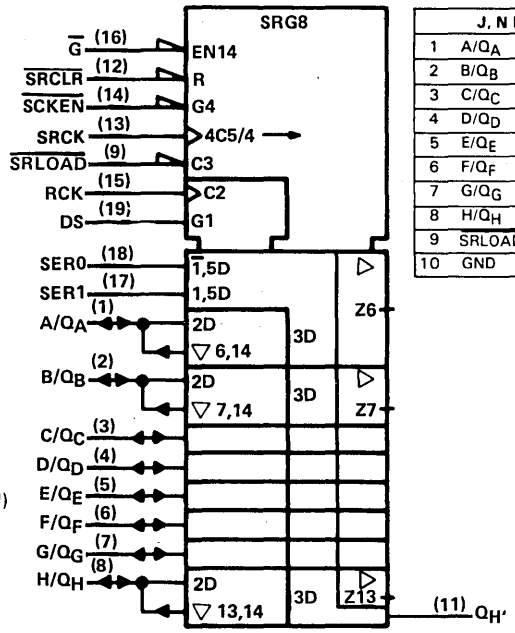
- Has parallel three-state I/O storage register inputs, shift register outputs
- Shift register has direct overriding load and clear
- Guaranteed shift frequency . . . dc to 20 MHz

typical performance

TYPE	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'LS598	D	LOW	177 mW

SN54LS598 (J,FH) SN74LS598 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	A/Q_A	11	$Q_{H'}$	1	A/Q_A	11	$Q_{H'}$
2	B/Q_B	12	$\overline{SRCLR}$	2	B/Q_B	12	$\overline{SRCLR}$
3	C/Q_C	13	SRCK	3	C/Q_C	13	SRCK
4	D/Q_D	14	$\overline{SRCKEN}$	4	D/Q_D	14	$\overline{SCKEN}$
5	E/Q_E	15	RCK	5	E/Q_E	15	RCK
6	F/Q_F	16	$\overline{G}$	6	F/Q_F	16	$\overline{G}$
7	G/Q_G	17	SER1	7	G/Q_G	17	SER1
8	H/Q_H	18	SER0	8	H/Q_H	18	SER0
9	$\overline{SRLOAD}$	19	DS	9	$\overline{SRLOAD}$	19	DS
10	GND	20	V_{CC}	10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

599

8-BIT SHIFT REGISTERS WITH OUTPUT LATCHES

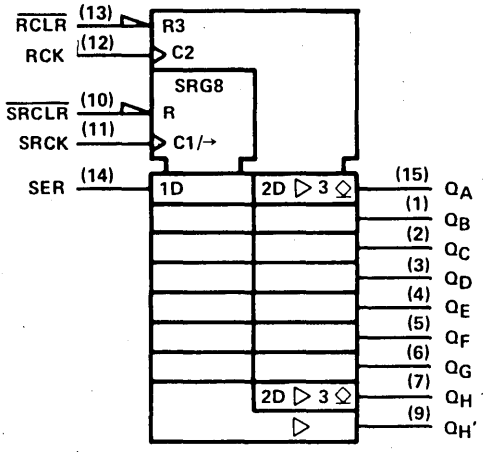
- Serial-in, parallel-out shift registers
- Open-collector outputs
- Guaranteed shift frequency
  . . . dc to 20 MHz

typical performance

TYPE	SERIAL DATA INPUT	ASYNC CLEAR	TOTAL POWER
'LS599	D	Low	

SN54LS599 (J,FH) SN74LS599 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	Q_B	9	Q_H
2	Q_C	10	$\overline{SRCLR}$
3	Q_D	11	SRCK
4	Q_E	12	RCK
5	Q_F	13	$\overline{RCLR}$
6	Q_G	14	SER
7	Q_H	15	Q_A
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	Q_B	12	$Q_{H'}$
3	Q_C	13	$\overline{SRCLR}$
4	Q_D	14	SRCK
5	Q_E	15	RCK
6	nc	16	nc
7	Q_F	17	$\overline{RCLR}$
8	Q_G	18	SER
9	Q_H	19	Q_A
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

600

MEMORY REFRESH CONTROLLERS

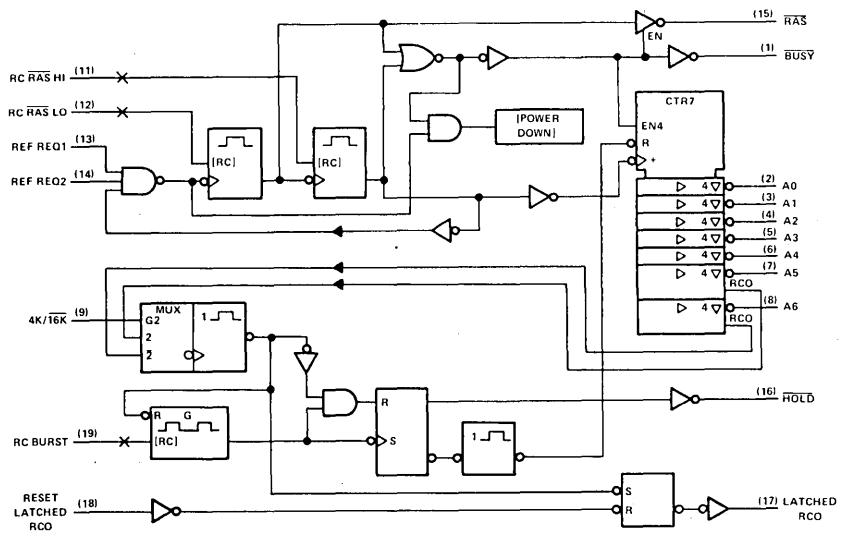
- Controls refresh cycle of 4K or 16K dynamic RAM's
- Three-state outputs drive bus lines directly
- Time to initiate refresh request is typically 30 ns
- Refresh modes: transparent, burst

SN54LS600A (J) SN74LS600A (J,N)

pin assignments

J,N PACKAGES			
1	$\overline{BUSY}$	11	RC $\overline{RAS}$ HI
2	A0	12	RC $\overline{RAS}$ LO
3	A1	13	REF REQ1
4	A2	14	REF REQ2
5	A3	15	$\overline{RAS}$
6	A4	16	$\overline{HOLD}$
7	A5	17	LATCHED RCO
8	A6	18	RESET LATCHED RCO
9	4K/$\overline{16K}$	19	RC BURST
10	GND	20	V_{CC}

logic diagram†



For chip carrier information, contact the factory.

601

MEMORY REFRESH CONTROLLERS

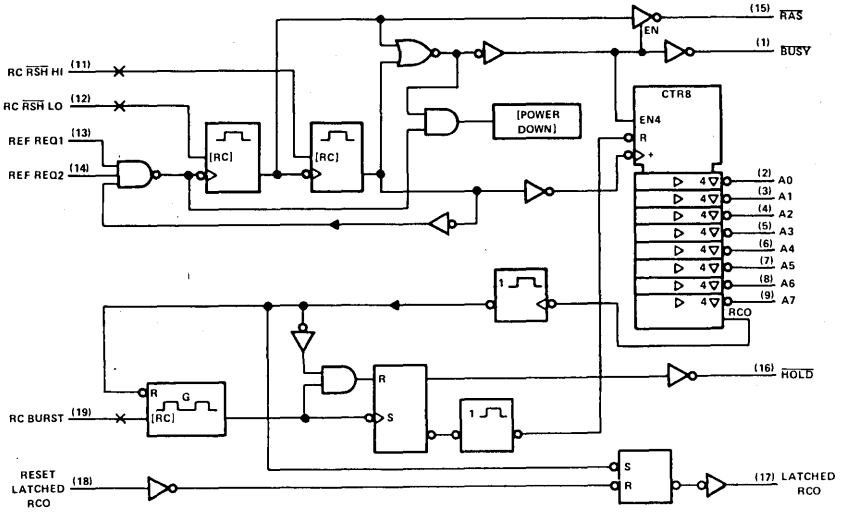
- Controls refresh cycle of 64K dynamic RAM's
- Three-state outputs drive bus lines directly
- Time to initiate refresh request is typically 30 ns
- Refresh modes: transparent, burst

SN54LS601A (J) SN74LS601A (J,N)

pin assignments

J,N PACKAGES			
1	$\overline{BUSY}$	11	RC $\overline{RAS}$ HI
2	A0	12	RC $\overline{RAS}$ LO
3	A1	13	REF REQ1
4	A2	14	REF REQ2
5	A3	15	$\overline{RAS}$
6	A4	16	$\overline{HOLD}$
7	A5	17	LATCHED RCO
8	A6	18	RESET LATCHED RCO
9	A7	19	RC BURST
10	GND	20	V_{CC}

logic diagram†



For chip carrier information, contact the factory.

†Pin numbers shown on logic symbols are for J and N packages only

nc — no internal connection.

© IC MASTER 1983

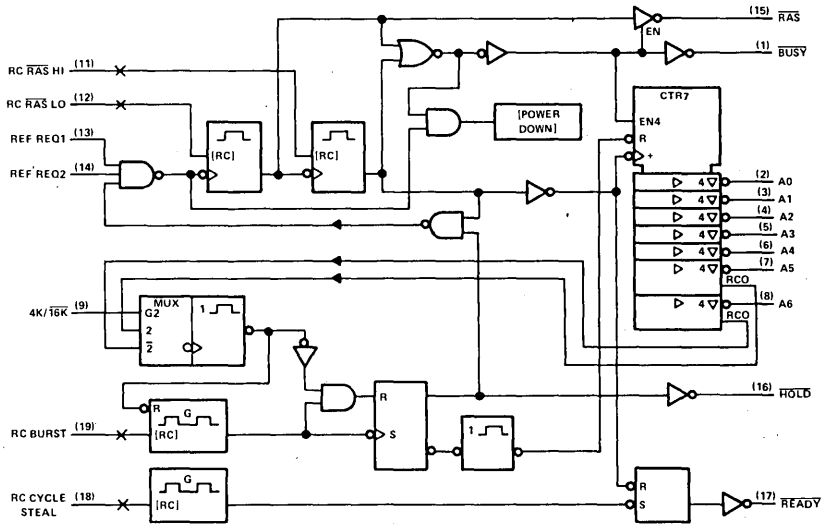
602

MEMORY REFRESH CONTROLLERS

- Controls refresh cycle of 4K or 16K dynamic RAM's
- Three-state outputs drive bus lines directly
- Time to initiate refresh request is typically 30 ns
- Refresh modes: cycle steal, burst

SN54LS602A (J) SN74LS602A (J,N)

logic diagram†



pin assignments

J, N PACKAGES			
1	$\overline{BUSY}$	11	RC $\overline{RAS}$ HI
2	A0	12	RC $\overline{RAS}$ LO
3	A1	13	REF REQ1
4	A2	14	REF REQ2
5	A3	15	$\overline{RAS}$
6	A4	16	$\overline{HOLD}$
7	A5	17	READY
8	A6	18	RC CYCLE STEAL
9	4K/16K	19	RC BURST
10	GND	20	V_{CC}

For chip carrier information, contact the factory.

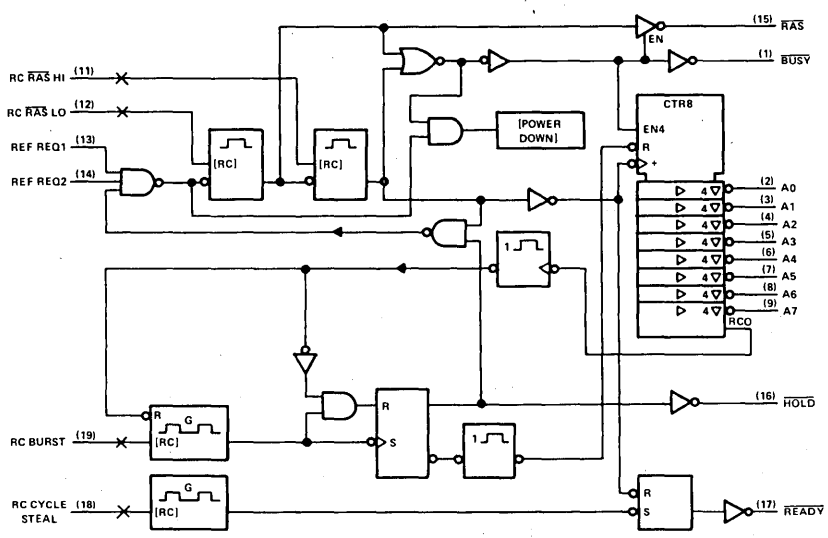
603

MEMORY REFRESH CONTROLLERS

- Controls refresh cycle of 64K dynamic RAM's
- Three-state outputs drive bus lines directly
- Time to initiate refresh request is typically 30 ns
- Refresh modes: cycle steal, burst

SN54LS603A (J) SN74LS603A (J,N)

logic diagram†



pin assignments

J, N PACKAGES			
1	$\overline{BUSY}$	11	RC $\overline{RAS}$ HI
2	A0	12	RC $\overline{RAS}$ LO
3	A1	13	REF REQ1
4	A2	14	REF REQ2
5	A3	15	$\overline{RAS}$
6	A4	16	$\overline{HOLD}$
7	A5	17	$\overline{READY}$
8	A6	18	RC CYCLE STEAL
9	A7	19	RC BURST
10	GND	20	V_{CC}

For chip carrier information, contact the factory.

†Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

604, 605
606, 607

OCTAL 2-INPUT MULTIPLEXED REGISTERS

- 16 D-type registers — one for each data input
- 'LS604 and 'LS606 feature three-state outputs
- Multiplexers select stored data from either A or B bus
- Application-oriented:
  - max speed - ('LS604, 'LS605)
  - glitch-free operation - ('LS606, 'LS607)

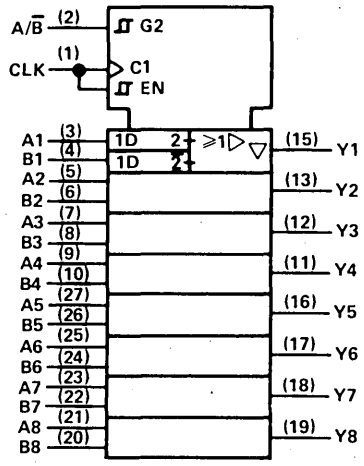
typical performance

TYPE	DELAY	POWER
'LS604	23.5 ns	275 mW
'LS605	26 ns	200 mW
'LS606	31 ns	275 mW
'LS607	31 ns	200 mW

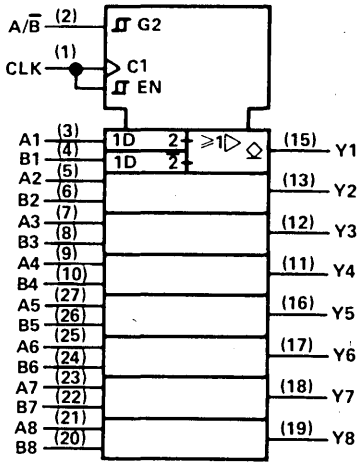
SN54LS604 (JD,FH)
SN54LS605 (JD,FH)
SN54LS606 (JD,FH)
SN54LS607 (JD,FH)

SN74LS604 (JD,N,FN)
SN74LS605 (JD,N,FN)
SN74LS606 (JD,N,FN)
SN74LS607 (JD,N,FN)

logic symbol, 'LS604, 'LS606†



logic symbol, 'LS605, 'LS607†



pin assignments

JD, N PACKAGES				FH, FN PACKAGES			
1	CLK	15	Y1	1	CLK	15	Y1
2	$\overline{A/B}$	16	Y5	2	$\overline{A/B}$	16	Y5
3	A1	17	Y6	3	A1	17	Y6
4	B1	18	Y7	4	B1	18	Y7
5	A2	19	Y8	5	A2	19	Y8
6	B2	20	B8	6	B2	20	B8
7	A3	21	A8	7	A3	21	A8
8	B3	22	B7	8	B3	22	B7
9	A4	23	A7	9	A4	23	A7
10	B4	24	B6	10	B4	24	B6
11	Y4	25	A6	11	Y4	25	A6
12	Y3	26	B5	12	Y3	26	B5
13	Y2	27	A5	13	Y2	27	A5
14	GND	28	V_{CC}	14	GND	28	V_{CC}

†Pin numbers shown on logic symbols are for JD and N packages only.

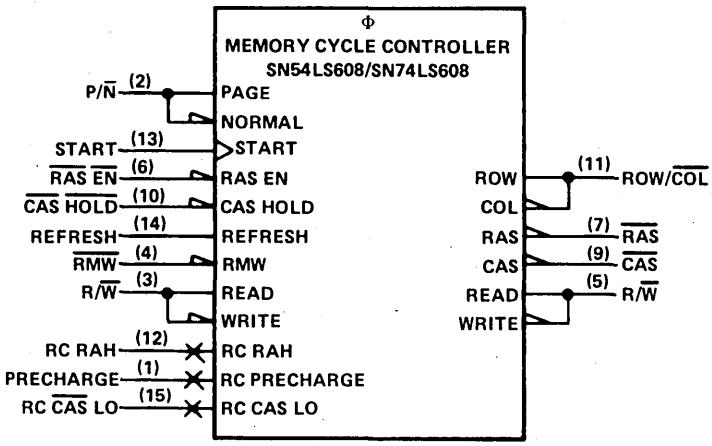
© IC MASTER 1983

608

MEMORY CYCLE CONTROLLERS

- Read cycle
- Write cycle
- Read, modify, write cycle
- RAS only refresh cycle
- Page or normal modes
- Stand-alone controller for CPU-to-memory interface

logic symbol†



SN54LS608 (J,FH) SN74LS608 (J,N,FN)

pin assignments

J, N PACKAGES			
1	PRECHARGE	9	CAS
2	P/N	10	CAS HOLD
3	R/W in	11	ROW/COL
4	RMW	12	RC RAH
5	R/W out	13	START
6	RAS EN	14	REFRESH
7	RAS	15	RC CAS LO
8	GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	PRECHARGE	12	CAS
3	P/N	13	CAS HOLD
4	R/W in	14	ROW/COL
5	RMW	15	RC RAH
6	nc	16	nc
7	R/W out	17	START
8	RAS EN	18	REFRESH
9	RAS	19	RC CAS LO
10	GND	20	V_{CC}

†Pin numbers shown on logic symbols are for J and N packages only.

© IC MASTER 1983

610, 611
612, 613

MEMORY MAPPERS

typical performance

TYPE	MAP OUTPUTS LATCHED	MAP OUTPUT TYPE
'LS610	Yes	3-State
'LS611	Yes	O-C
'LS612	No	3-State
'LS613	No	O-C

- Designed for paged memory mapping
- Expands four address lines to 12 address lines

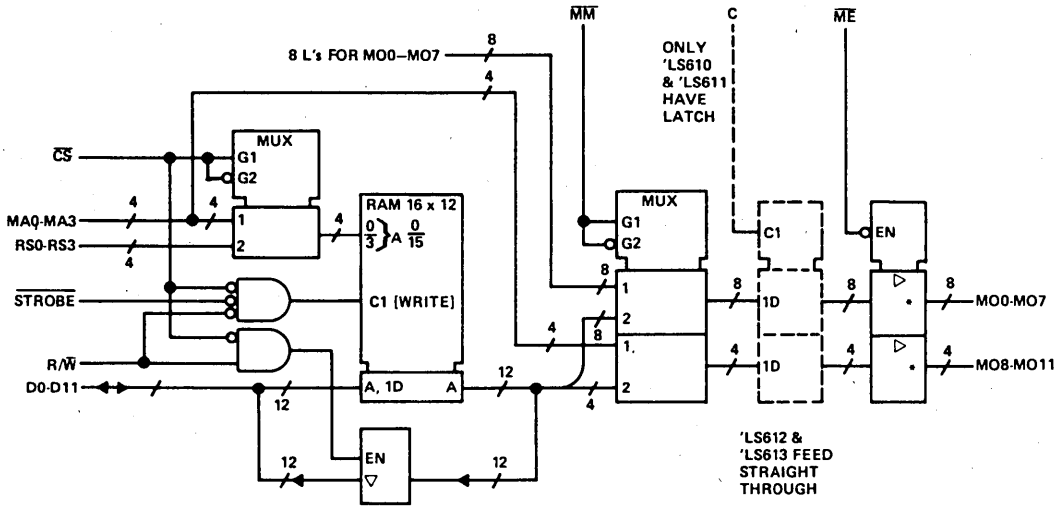
SN54LS610 (JD,FC) SN74LS610 (JD,N)
SN54LS611 (JD,FC) SN74LS611 (JD,N)
SN54LS612 (JD,FC) SN74LS612 (JD,N)
SN54LS613 (JD,FC) SN74LS613 (JD,N)

pin assignments

JD, N PACKAGES		FC PACKAGE	
1 RS2	21 $\overline{ME}$	1 RS2	23 $\overline{ME}$
2 MA3	22 MO6	2 MA3	24 MO6
3 RS3	23 MO7	3 RS3	25 MO7
4 $\overline{CS}$	24 MO8	4 $\overline{CS}$	26 MO8
5 $\overline{STROBE}$	25 MO9	5 $\overline{STROBE}$	27 MO9
6 R/$\overline{W}$	26 MO10	6 nc	28 nc
7 D0	27 MO11	7 R/$\overline{W}$	29 MO10
8 D1	28 ★	8 D0	30 MO11
9 D2	29 D6	9 D1	31 ★
10 D3	30 D7	10 D2	32 D6
11 D4	31 D8	11 D3	33 D7
12 D5	32 D9	12 D4	34 D8
13 $\overline{MM}$	33 D10	13 D5	35 D9
14 MO0	34 D11	14 $\overline{MM}$	36 D10
15 MO1	35 MA0	15 MO0	37 D11
16 MO2	36 RS0	16 MO1	38 MA0
17 MO3	37 MA1	17 nc	39 nc
18 MO4	38 RS1	18 MO2	40 RS0
19 MO5	39 MA2	19 MO3	41 MA1
20 GND	40 V_{CC}	20 MO4	42 RS1
		21 MO5	43 MA2
		22 GND	44 V_{CC}

★ C on 'LS610 and 'LS611
nc on 'LS612 and 'LS613

functional block diagram (positive logic)



*'LS610 and 'LS612 have 3-state (▽) map outputs.
'LS611 and 'LS613 have open-collector (◇) map outputs.

nc — no internal connection.

© IC MASTER 1983

620, 621
622, 623

OCTAL BUS TRANSCEIVERS

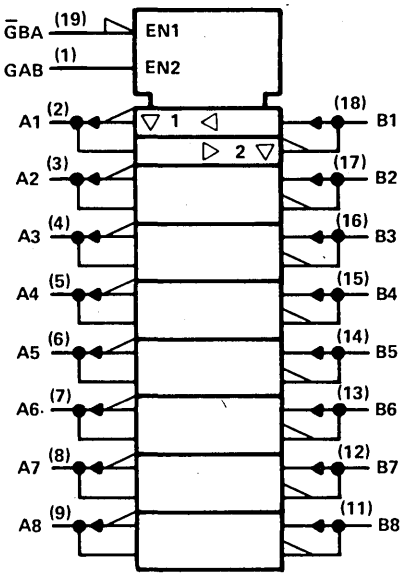
- Bidirectional bus transceivers
- Local bus latch capability

typical performance

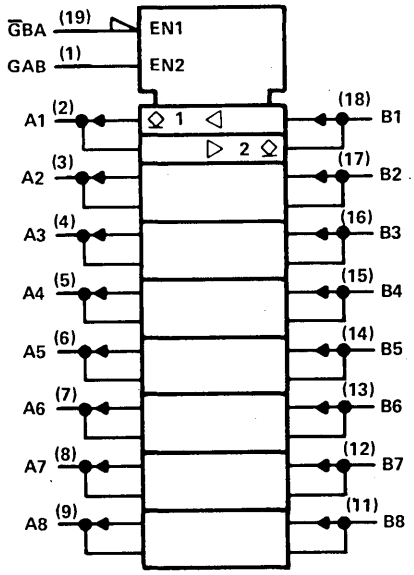
TYPE	OUTPUT	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54ALS620	3-State	−12 mA	12 mA
SN74ALS620	3-State	−15 mA	24 mA
SN74ALS620-1	3-State	−15 mA	48 mA
SN54ALS621	O-C	—	12 mA
SN74ALS621	O-C	—	24 mA
SN74ALS621-1	O-C	—	48 mA
SN54ALS622	O-C	—	12 mA
SN74ALS622	O-C	—	24 mA
SN74ALS622-1	O-C	—	48 mA
SN54ALS623	3-State	−12 mA	12 mA
SN74ALS623	3-State	−15 mA	24 mA
SN74ALS623-1	3-State	−15 mA	48 mA
SN54LS620	3-State	−12 mA	12 mA
SN74LS620	3-State	−15 mA	24 mA
SN54LS621	O-C	—	12 mA
SN74LS621	O-C	—	24 mA
SN54LS622	O-C	—	12 mA
SN74LS622	O-C	—	24 mA
SN54LS623	3-State	−12 mA	12 mA
SN74LS623	3-State	−15 mA	24 mA

SN54ALS620 (J,FH)	SN74ALS620 (N,FN)
	SN74ALS620-1 (N,FN)
SN54ALS621 (J,FH)	SN74ALS621 (N,FN)
	SN74ALS621-1 (N,FN)
SN54ALS622 (J,FH)	SN74ALS622 (N,FN)
	SN74ALS622-1 (N,FN)
SN54ALS623 (J,FH)	SN74ALS623 (N,FN)
	SN74ALS623-1 (N,FN)
SN54LS620 (J,FH)	SN74LS620 (J,N,FN)
SN54LS621 (J,FH)	SN74LS621 (J,N,FN)
SN54LS622 (J,FH)	SN74LS622 (J,N,FN)
SN54LS623 (J,FH)	SN74LS623 (J,N,FN)

logic symbol, 'ALS620, 'LS620†



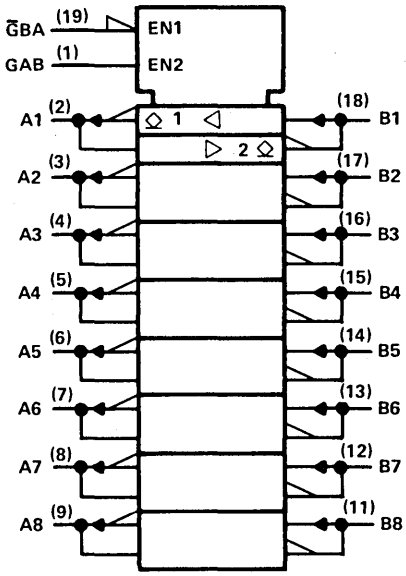
logic symbol, 'ALS621, 'LS621†



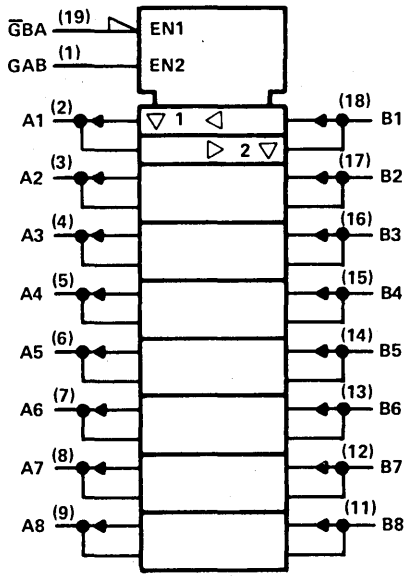
pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	GAB	11	B8	1	GAB	11	B8
2	A1	12	B7	2	A1	12	B7
3	A2	13	B6	3	A2	13	B6
4	A3	14	B5	4	A3	14	B5
5	A4	15	B4	5	A4	15	B4
6	A5	16	B3	6	A5	16	B3
7	A6	17	B2	7	A6	17	B2
8	A7	18	B1	8	A7	18	B1
9	A8	19	$\overline{GBA}$	9	A8	19	$\overline{GBA}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

logic symbol, 'ALS622, 'LS622†



logic symbol, 'ALS623, 'LS623†



† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

624

VOLTAGE-CONTROLLED OSCILLATORS

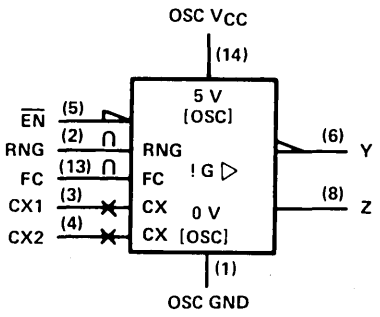
typical performance

TYPE	REPLACES
'LS624	'LS324

- Separate supply voltage pins for isolation of input/output signals
- Maximum output frequency = 20 MHz
- Improved version of original VCO family

SN54LS624 (J,FH) SN74LS624 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	OSC GND	8	Z
2	RNG	9	V_{CC}
3	CX1	10	nc
4	CX2	11	nc
5	$\overline{EN}$	12	nc
6	Y	13	FREQ CONT
7	GND	14	OSC V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	OSC GND	12	Z
3	RNG	13	V_{CC}
4	CX1	14	nc
5	nc	15	nc
6	CX2	16	nc
7	nc	17	nc
8	$\overline{EN}$	18	nc
9	Y	19	FREQ CONT
10	GND	20	OSC V_{CC}

625

VOLTAGE-CONTROLLED OSCILLATORS

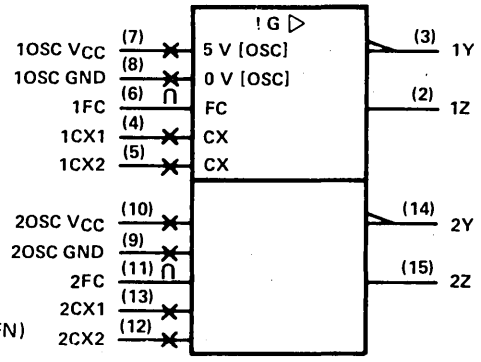
typical performance

TYPE	REPLACES
'LS625	'LS325

- Separate supply voltage pins for input/output isolation
- Maximum output frequency = 20 MHz
- Improved version of original family

SN54LS625 (J,FH) SN74LS625 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	GND	9	2OSC GND
2	1Z	10	2OSC V_{CC}
3	1Y	11	2FC
4	1CX1	12	2CX2
5	1CX2	13	2CX1
6	1FC	14	2Y
7	1OSC V_{CC}	15	2Z
8	1OSC GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	GND	12	2OSC GND
3	1Z	13	2OSC V_{CC}
4	1Y	14	2FC
5	1CX1	15	2CX2
6	nc	16	nc
7	1CX2	17	2CX1
8	1FC	18	2Y
9	1OSC V_{CC}	19	2Z
10	1OSC GND	20	V_{CC}

626

VOLTAGE-CONTROLLED OSCILLATORS

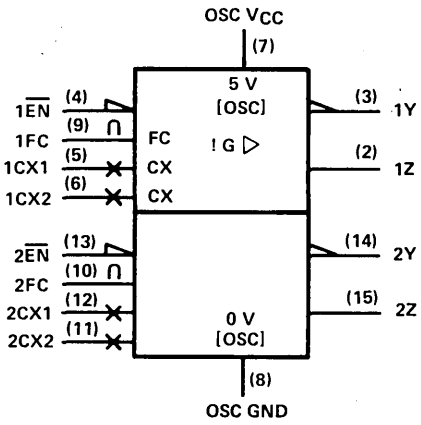
typical performance

TYPE	REPLACES
'LS626	'LS326

- Separate supply voltage pins for input/output isolation
- Maximum output frequency = 20 MHz
- Improved version of original family

SN54LS626 (J,FH) SN74LS626 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	GND	9	1FC
2	1Z	10	2FC
3	1Y	11	2CX2
4	1$\overline{EN}$	12	2CX1
5	1CX1	13	2$\overline{EN}$
6	1CX2	14	2Y
7	OSC V_{CC}	15	2Z
8	OSC GND	16	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	GND	12	1FC
3	1Z	13	2FC
4	1Y	14	2CX2
5	1$\overline{EN}$	15	2CX1
6	nc	16	nc
7	1CX1	17	2$\overline{EN}$
8	1CX2	18	2Y
9	OSC V_{CC}	19	2Z
10	OSC GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

627

VOLTAGE-CONTROLLED OSCILLATORS

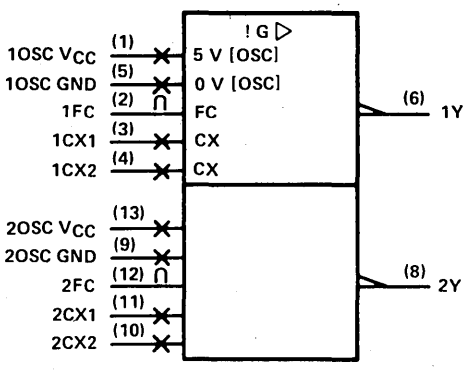
TYPE	REPLACES
'LS627	'LS327

- Separate supply voltage pins for input/output isolation
- Maximum output frequency = 20 MHz
- Improved version of original family

SN54LS627 (J,FH)
SN74LS627 (J,N,FN)

typical performance

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1OSC VCC	8	2Y	1	nc	11	nc
2	1FC	9	2OSC GND	2	1OSC VCC	12	2Y
3	1CX1	10	2CX2	3	1FC	13	2OSC GND
4	1CX2	11	2CX1	4	1CX1	14	2CX2
5	1OSC GND	12	2FC	5	nc	15	nc
6	1Y	13	2OSC VCC	6	1CX2	16	2CX1
7	GND	14	VCC	7	nc	17	nc
				8	1OSC GND	18	2FC
				9	1Y	19	2OSC VCC
				10	GND	20	VCC

628

VOLTAGE-CONTROLLED OSCILLATORS

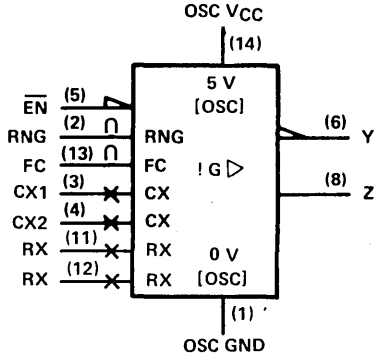
TYPE	REPLACES
'LS628	'LS324

- Separate supply voltage pins for input/output oscillators
- Maximum output frequency = 20 MHz
- Improved version of original family

SN54LS628 (J,FH)
SN74LS628 (J,N,FN)

typical performance

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	OSC GND	8	Z	1	nc	11	nc
2	RNG	9	VCC	2	OSC GND	12	Z
3	CX1	10	nc	3	RNG	13	VCC
4	CX2	11	RX	4	CX1	14	nc
5	$\overline{EN}$	12	RX	5	nc	15	nc
6	Y	13	FC	6	CX2	16	RX
7	GND	14	OSC VCC	7	nc	17	nc
				8	$\overline{EN}$	18	RX
				9	Y	19	FC
				10	GND	20	OSC VCC

629

VOLTAGE-CONTROLLED OSCILLATORS

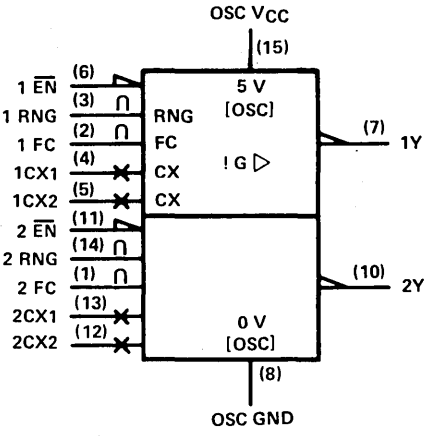
TYPE	REPLACES
'LS629	'LS124

- Separate power supply pins for input/output isolation
- Maximum output frequency = 20 MHz
- Improved version of original family

SN54LS629 (J,FH)
SN74LS629 (J,N,FN)

typical performance

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	2FC	9	GND	1	nc	11	nc
2	1FC	10	2Y	2	2FC	12	GND
3	1RNG	11	2$\overline{EN}$	3	1FC	13	2Y
4	1CX1	12	2CX1	4	1RNG	14	2$\overline{EN}$
5	1CX2	13	2CX2	5	1CX1	15	2CX1
6	1$\overline{EN}$	14	2RNG	6	nc	16	nc
7	1Y	15	OSC VCC	7	1CX2	17	2CX2
8	OSC GND	16	VCC	8	1$\overline{EN}$	18	2RNG
				9	1Y	19	OSC VCC
				10	OSC GND	20	VCC

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

630, 631

16-BIT PARALLEL ERROR DETECTION AND CORRECTION CIRCUITS

- Fast processing times:
  - Write cycle: generates check word in 45 ns typical
  - Read cycle: flags errors in 27 ns typical
- Detects and corrects single bit error
- Detects and flags dual-bit errors

typical performance

TYPE	OUTPUT	DELAY	POWER
'LS630	3-State	27 ns	715 mW
'LS631	O-C	28 ns	565 mW

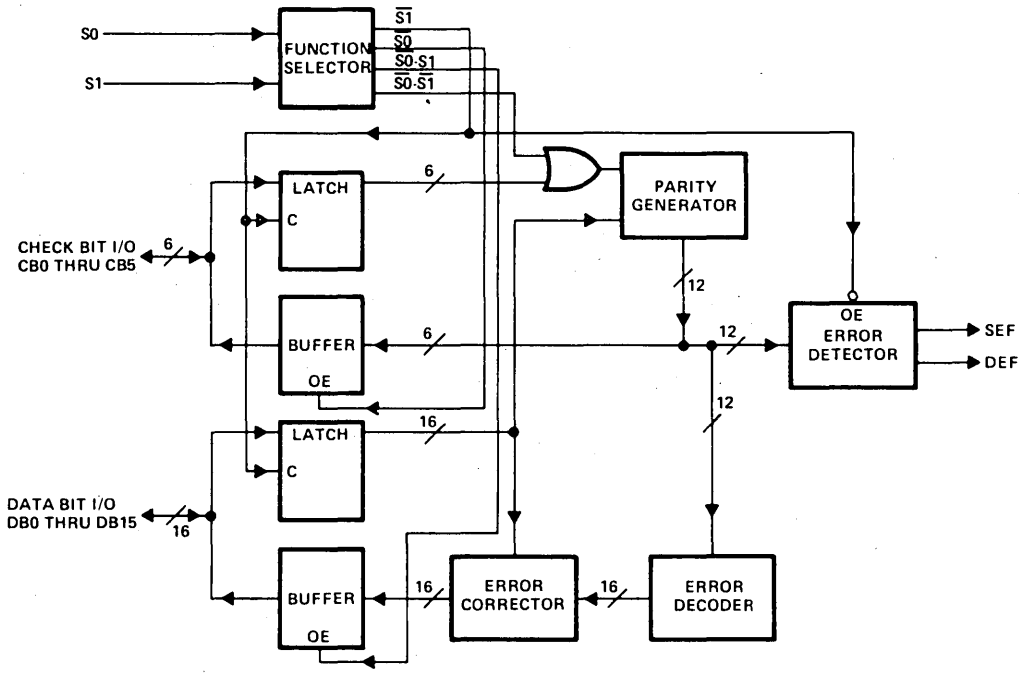
SN54LS630 (JD,FH)
SN54LS631 (JD,FH)

SN74LS630 (JD,N,FN)
SN74LS631 (JD,N,FN)

pin assignments

JD, N PACKAGES				FH, FN PACKAGES			
1	DEF	15	DB12	1	DEF	15	DB12
2	DB0	16	DB13	2	DB0	16	DB13
3	DB1	17	DB14	3	DB1	17	DB14
4	DB2	18	DB15	4	DB2	18	DB15
5	DB3	19	CB5	5	DB3	19	CB5
6	DB4	20	CB4	6	DB4	20	CB4
7	DB5	21	CB3	7	DB5	21	CB3
8	DB6	22	CB2	8	DB6	22	CB2
9	DB7	23	CB1	9	DB7	23	CB1
10	DB8	24	CB0	10	DB8	24	CB0
11	DB9	25	S0	11	DB9	25	S0
12	DB10	26	S1	12	DB10	26	S1
13	DB11	27	SEF	13	DB11	27	SEF
14	GND	28	V_{CC}	14	GND	28	V_{CC}

functional block diagram



nc — no internal connection.

© IC MASTER 1983

632, 633

32-BIT PARALLEL ERROR DETECTION AND CORRECTION CIRCUITS

- Detects and Corrects Single-bit errors
- Detects and Flags dual-bit errors
- Fast processing times
- Byte-Write capability

typical performance

TYPE	OUTPUT	DELAY	POWER
'ALS632	3-State		
'ALS633	O-C		

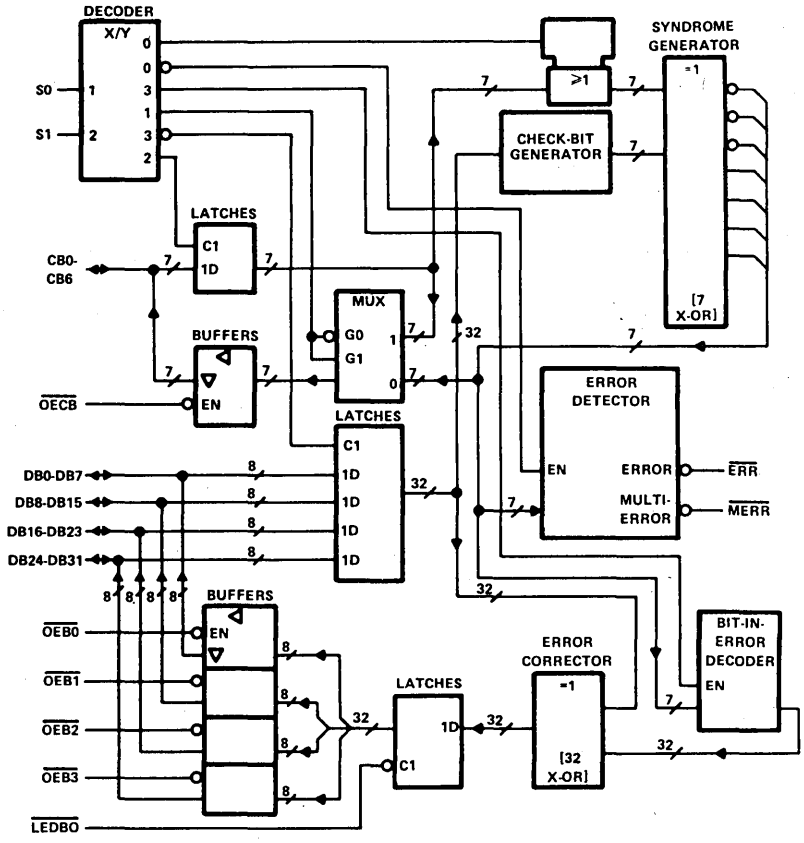
SN54ALS632 (JD) SN74ALS632 (N)
SN54ALS633 (JD) SN74ALS633 (N)

pin assignments

JD, N PACKAGES			
1	$\overline{\text{LEDBO}}$	27	CB3
2	$\overline{\text{MERR}}$	28	CB2
3	$\overline{\text{ERR}}$	29	CB1
4	DB0	30	CB0
5	DB1	31	DB16
6	DB2	32	DB17
7	DB3	33	DB18
8	DB4	34	DB19
9	DB5	35	DB20
10	$\overline{\text{OEB0}}$	36	DB21
11	DB6	37	$\overline{\text{OEB2}}$
12	DB7	38	DB22
13	GND	39	DB23
14	DB8	40	GND
15	DB9	41	DB24
16	$\overline{\text{OEB1}}$	42	DB25
17	DB10	43	$\overline{\text{OEB3}}$
18	DB11	44	DB26
19	DB12	45	DB27
20	DB13	46	DB28
21	DB14	47	DB29
22	DB15	48	DB30
23	CB6	49	DB31
24	CB5	50	S0
25	CB4	51	S1
26	$\overline{\text{OECB}}$	52	V_{CC}

For chip carrier information, contact the factory.

logic diagram (positive logic)



© IC MASTER 1983

634, 635

32-BIT PARALLEL ERROR DETECTION AND CORRECTION CIRCUITS

- Detects and Corrects single-bit errors
- Detects and Flags dual-bit errors
- Fast processing times

typical performance

TYPE	OUTPUT	DELAY	POWER
'ALS634	3-State		
'ALS635	O-C		

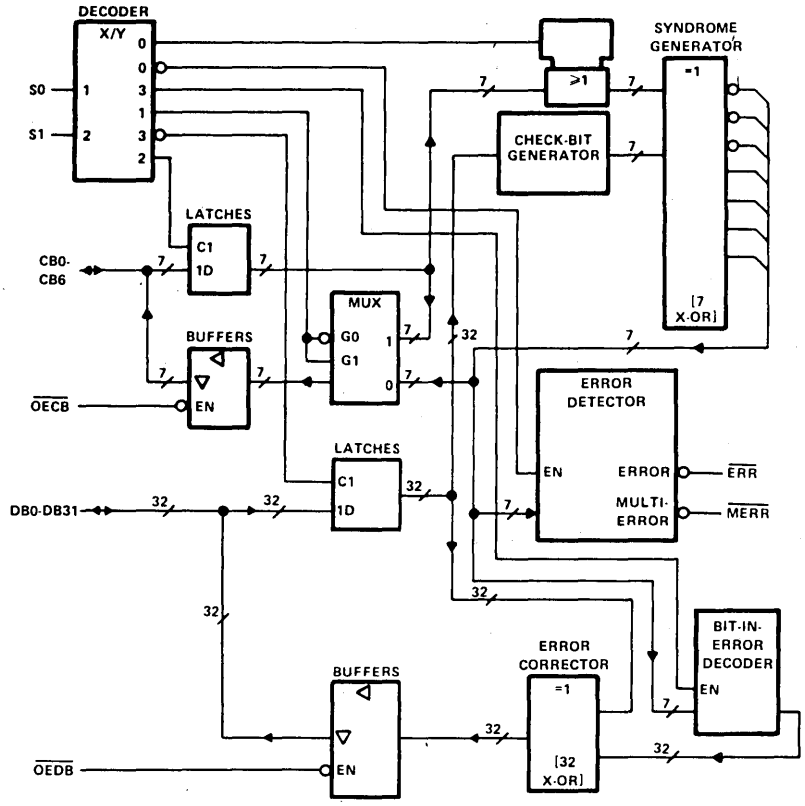
SN54ALS634 (JD) SN74ALS634 (N)
SN54ALS635 (JD) SN74ALS635 (N)

pin assignments

JD, N PACKAGES			
1	$\overline{MERR}$	25	CB3
2	$\overline{ERR}$	26	CB2
3	DB0	27	CB1
4	DB1	28	CB0
5	DB2	29	DB16
6	DB3	30	DB17
7	DB4	31	DB18
8	DB5	32	DB19
9	$\overline{OEDB}$	33	DB20
10	DB6	34	DB21
11	DB7	35	DB22
12	GND	36	DB23
13	DB8	37	GND
14	DB9	38	DB24
15	DB10	39	DB25
16	DB11	40	DB26
17	DB12	41	DB27
18	DB13	42	DB28
19	DB14	43	DB29
20	DB15	44	DB30
21	CB6	45	DB31
22	CB5	46	S0
23	CB4	47	S1
24	$\overline{OECB}$	48	V_{CC}

For chip carrier information, contact the factory.

logic diagram (positive logic)



© IC MASTER 1983

636, 637

8-BIT PARALLEL ERROR DETECTION AND CORRECTION CIRCUITS

- Fast processing times:
  - Write cycle: generates check word in 45 ns typical
  - Read cycle: flags errors in 27 ns typical
- Detects and corrects single bit error
- Detects and flags dual-bit errors

typical performance

TYPE	OUTPUT	DELAY	POWER
'LS636	3-State	27 ns	500 mW
'LS637	O-C	28 ns	450 mW

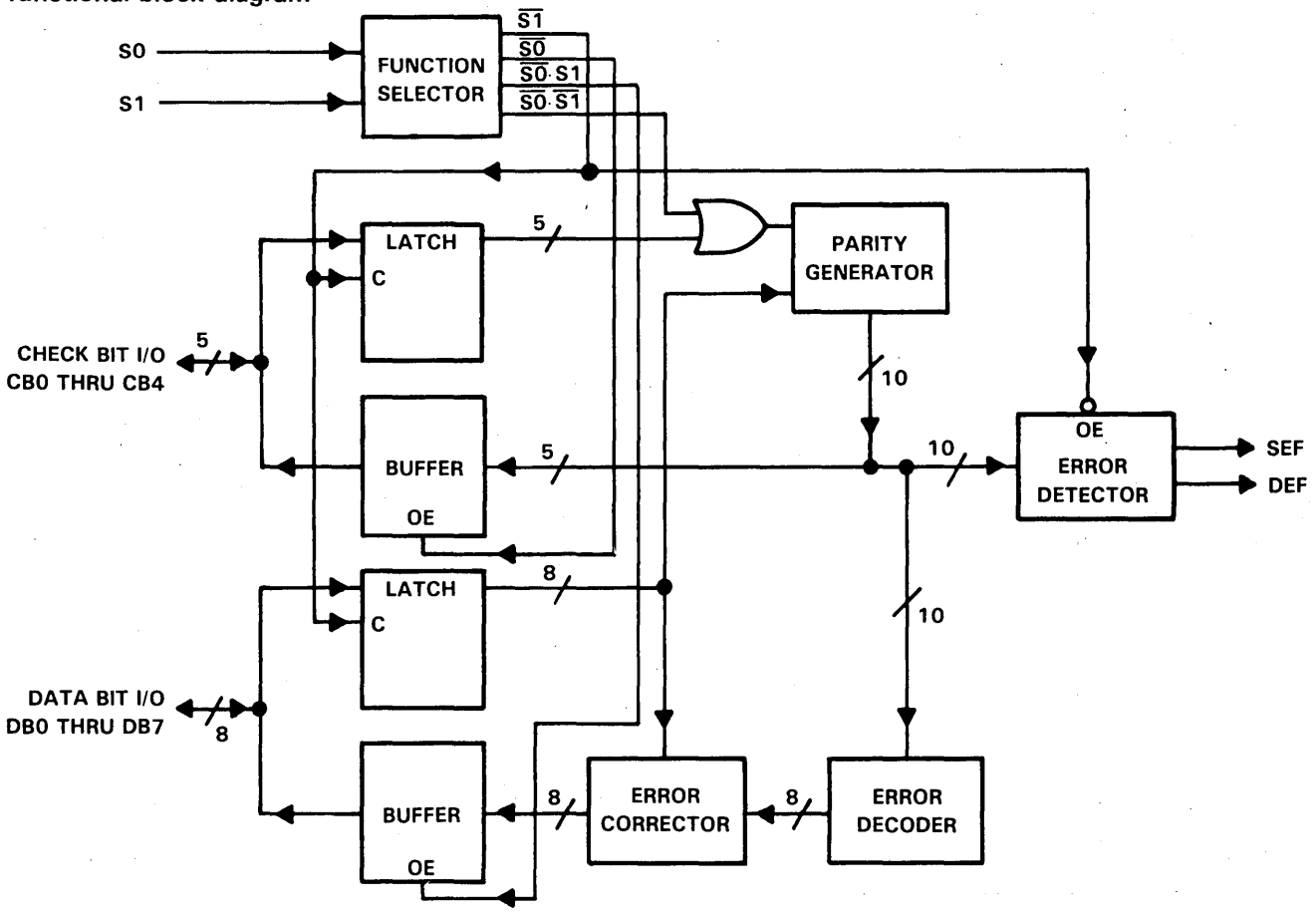
SN54LS636 (J) SN74LS636 (J,N)
SN54LS637 (J) SN74LS637 (J,N)

pin assignments

J, N PACKAGES			
1	DEF	11	CB4
2	DB0	12	nc
3	DB1	13	CB3
4	DB2	14	CB2
5	DB3	15	CB1
6	DB4	16	CB0
7	DB5	17	S0
8	DB6	18	S1
9	DB7	19	SEF
10	GND	20	V_{CC}

For chip carrier information, contact the factory.

functional block diagram



nc no internal connection.

© IC MASTER 1983

638, 639

OCTAL BUS TRANSCEIVERS

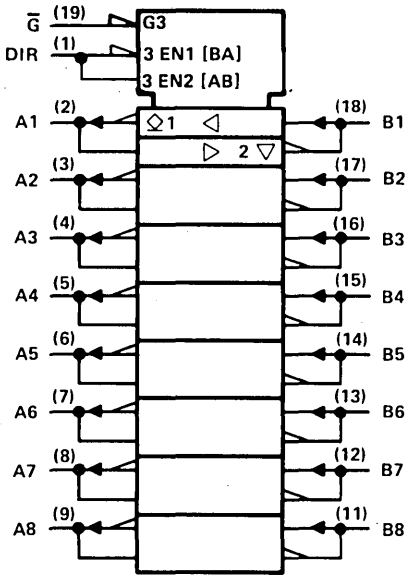
- Bidirectional bus transceivers
- "A" bus outputs are open-collector; "B" bus outputs are three-state
- 'ALS638, 'LS638 – inverting logic
- 'ALS639, 'LS639 – true logic

typical performance

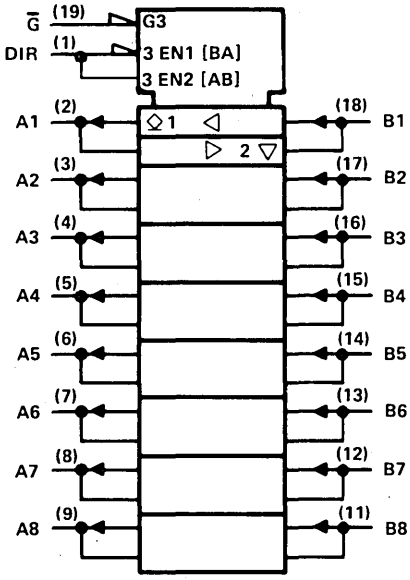
TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54ALS638	5 ns	−12 mA	12 mA
SN74ALS638	5 ns	−15 mA	24 mA
SN74ALS638-1	5 ns	−15 mA	48 mA
SN54ALS639	6 ns	−12 mA	12 mA
SN74ALS639	6 ns	−15 mA	24 mA
SN74ALS639-1	6 ns	−15 mA	48 mA
SN54LS638	11 ns	−12 mA	12 mA
SN74LS638	11 ns	−15 mA	24 mA
SN54LS639	13.5 ns	−12 mA	12 mA
SN74LS639	13.5 ns	−15 mA	24 mA

SN54ALS638 (J,FH) SN74ALS638 (N,FN)
SN74ALS638-1 (N,FN)
SN54ALS639 (J,FH) SN74ALS639 (N,FN)
SN74ALS639-1 (N,FN)
SN54LS638 (J,FH) SN74LS638 (J,N,FN)
SN54LS639 (J,FH) SN74LS639 (J,N,FN)

logic symbol, 'ALS638, 'LS638†



logic symbol, 'ALS639, 'LS639†



pin assignments

J, N PACKAGES			
1	DIR	11	B8
2	A1	12	B7
3	A2	13	B6
4	A3	14	B5
5	A4	15	B4
6	A5	16	B3
7	A6	17	B2
8	A7	18	B1
9	A8	19	$\overline{G}$
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	DIR	11	B8
2	A1	12	B7
3	A2	13	B6
4	A3	14	B5
5	A4	15	B4
6	A5	16	B3
7	A6	17	B2
8	A7	18	B1
9	A8	19	$\overline{G}$
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

640, 641, 642
643, 644, 645

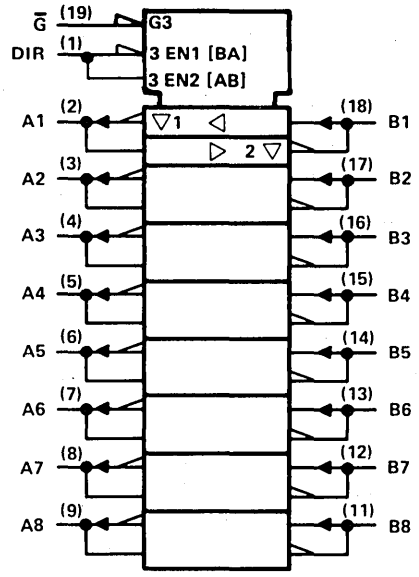
OCTAL BUS TRANSCEIVERS

TYPE	OUTPUT	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54ALS640	3-State	5 ns	−12 mA	12 mA
SN74ALS640	3-State	5 ns	−15 mA	24 mA
SN74ALS640-1	3-State	5 ns	−15 mA	48 mA
SN54ALS641	O-C	15 ns	N/A	12 mA
SN74ALS641	O-C	15 ns	N/A	24 mA
SN74ALS641-1	O-C	15 ns	N/A	48 mA
SN54ALS642	O-C	20 ns	N/A	12 mA
SN74ALS642	O-C	20 ns	N/A	24 mA
SN74ALS642-1	O-C	20 ns	N/A	48 mA
SN54ALS643	3-State	5 ns	−12 mA	12 mA
SN74ALS643	3-State	5 ns	−15 mA	24 mA
SN74ALS643-1	3-State	5 ns	−15 mA	48 mA
SN54ALS644	O-C	20 ns	N/A	12 mA
SN74ALS644	O-C	20 ns	N/A	24 mA
SN74ALS644-1	O-C	20 ns	N/A	48 mA
SN54ALS645	3-State	6 ns	−12 mA	12 mA
SN74ALS645	3-State	6 ns	−15 mA	24 mA
SN74ALS645-1	3-State	6 ns	−15 mA	48 mA
SN54LS640	3-State	7 ns	−12 mA	12 mA
SN74LS640	3-State	7 ns	−15 mA	24 mA
SN74LS640-1	3-State	7 ns	−15 mA	48 mA
SN54LS641	O-C	16.5 ns	N/A	12 mA
SN74LS641	O-C	16.5 ns	N/A	24 mA
SN74LS641-1	O-C	16.5 ns	N/A	48 mA
SN54LS642	O-C	16.5 ns	N/A	12 mA
SN74LS642	O-C	16.5 ns	N/A	24 mA
SN74LS642-1	O-C	16.5 ns	N/A	48 mA
SN54LS643	3-State	8.5 ns	−12 mA	12 mA
SN74LS643	3-State	8.5 ns	−15 mA	24 mA
SN74LS643-1	3-State	8.5 ns	−15 mA	48 mA
SN54LS644	O-C	16.5 ns	N/A	12 mA
SN74LS644	O-C	16.5 ns	N/A	24 mA
SN74LS644-1	O-C	16.5 ns	N/A	48 mA
SN54LS645	3-State	9.5 ns	−12 mA	12 mA
SN74LS645	3-State	9.5 ns	−15 mA	24 mA
SN74LS645-1	3-State	9.5 ns	−15 mA	48 mA

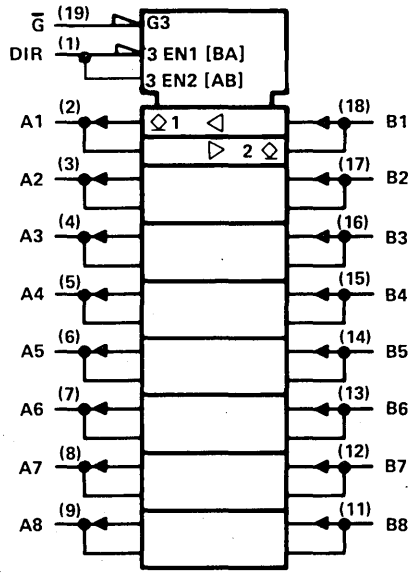
pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	DIR	11	B8	1	DIR	11	B8
2	A1	12	B7	2	A1	12	B7
3	A2	13	B6	3	A2	13	B6
4	A3	14	B5	4	A3	14	B5
5	A4	15	B4	5	A4	15	B4
6	A5	16	B3	6	A5	16	B3
7	A6	17	B2	7	A6	17	B2
8	A7	18	B1	8	A7	18	B1
9	A8	19	$\overline{G}$	9	A8	19	$\overline{G}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

logic symbol, 'ALS640, 'LS640†



logic symbol, 'ALS641, 'LS641†



SN54ALS640 (J,FH)	SN74ALS640 (N,FN)	SN74ALS640-1 (N,FN)
SN54ALS641 (J,FH)	SN74ALS641 (N,FN)	SN74ALS641-1 (N,FN)
SN54ALS642 (J,FH)	SN74ALS642 (N,FN)	SN74ALS642-1 (N,FN)
SN54ALS643 (J,FH)	SN74ALS643 (N,FN)	SN74ALS643-1 (N,FN)
SN54ALS644 (J,FH)	SN74ALS644 (N,FN)	SN74ALS644-1 (N,FN)
SN54ALS645 (J,FH)	SN74ALS645 (N,FN)	SN74ALS645-1 (N,FN)
SN54LS640 (J,FH)	SN74LS640 (J,N,FN)	SN74LS640-1 (J,N,FN)
SN54LS641 (J,FH)	SN74LS641 (J,N,FN)	SN74LS641-1 (J,N,FN)
SN54LS642 (J,FH)	SN74LS642 (J,N,FN)	SN74LS642-1 (J,N,FN)
SN54LS643 (J,FH)	SN74LS643 (J,N,FN)	SN74LS643-1 (J,N,FN)
SN54LS644 (J,FH)	SN74LS644 (J,N,FN)	SN74LS644-1 (J,N,FN)
SN54LS645 (J,FH)	SN74LS645 (J,N,FN)	SN74LS645-1 (J,N,FN)

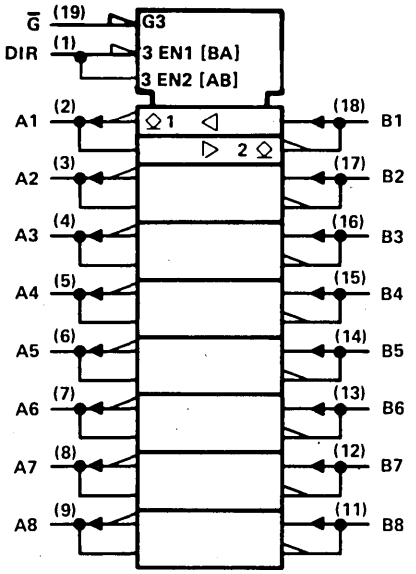
† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

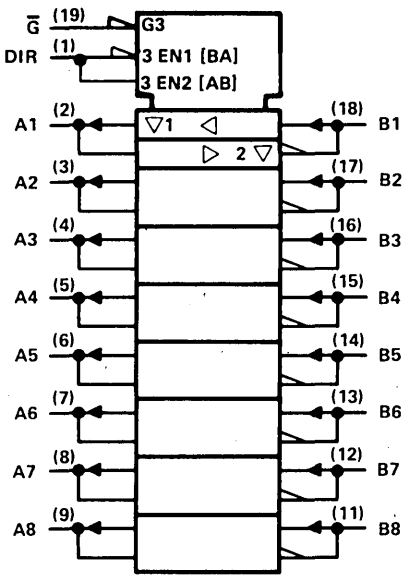
© IC MASTER 1983

640, 641, 642
643, 644 645 continued

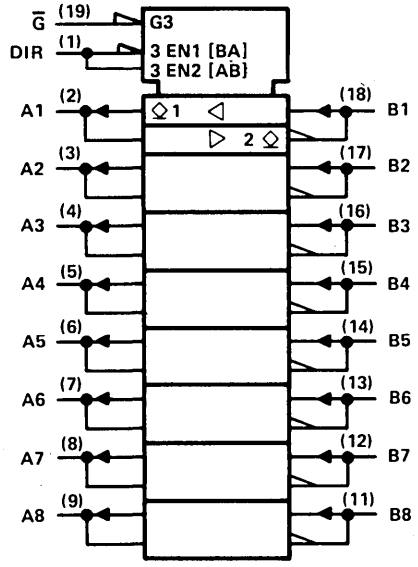
logic symbol, 'LS642†



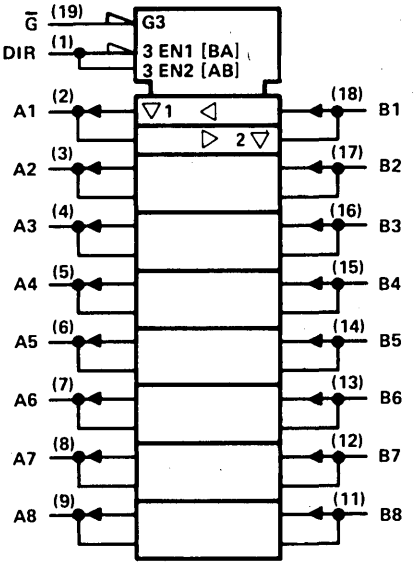
logic symbol, 'ALS643, 'LS643†



logic symbol, 'LS644†



logic symbol, 'ALS645, 'LS645†



† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

646, 647, 648, 649

OCTAL BUS TRANSCEIVERS AND REGISTERS

- Bidirectional
- Independent registers for A and B busses

typical performance

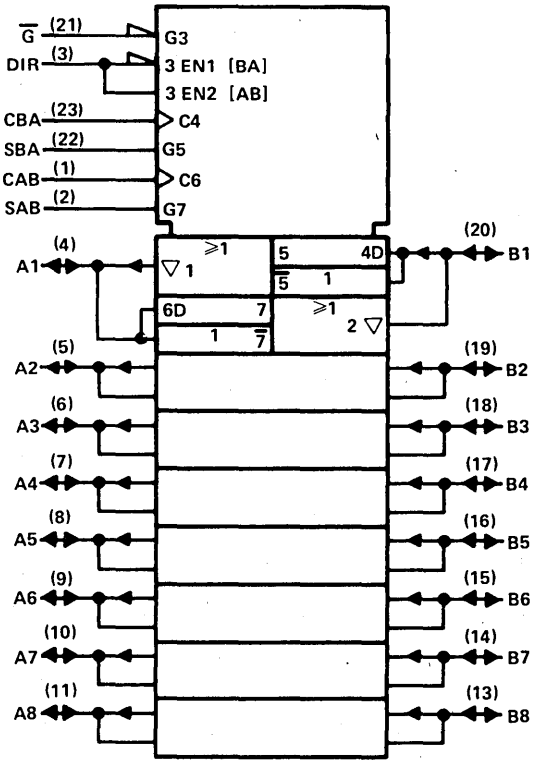
TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	OUTPUT TYPE	OUTPUT INV
SN54ALS646		−12 mA	12 mA	3-State	No
SN74ALS646		−15 mA	24 mA	3-State	No
SN74ALS646-1		−15 mA	48 mA	3-State	No
SN54ALS647		N/A	12 mA	O-C	No
SN74ALS647		N/A	24 mA	O-C	No
SN74ALS647-1		N/A	48 mA	O-C	No
SN54ALS648		−12 mA	12 mA	3-State	Yes
SN74ALS648		−15 mA	24 mA	3-State	Yes
SN74ALS648-1		−15 mA	48 mA	3-State	Yes
SN54ALS649		N/A	12 mA	O-C	Yes
SN74ALS649		N/A	24 mA	O-C	Yes
SN74ALS649-1		N/A	48 mA	O-C	Yes
SN54LS646	19 ns	−12 mA	12 mA	3-State	No
SN74LS646	19 ns	−15 mA	24 mA	3-State	No
SN74LS647	25 ns	N/A	12 mA	O-C	No
SN74LS647	25 ns	N/A	24 mA	O-C	No
SN54LS648	20.5 ns	−12 mA	12 mA	3-State	Yes
SN74LS648	20.5 ns	−15 mA	24 mA	3-State	Yes
SN54LS649	25 ns	N/A	12 mA	O-C	Yes
SN74LS649	25 ns	N/A	24 mA	O-C	Yes

pin assignments

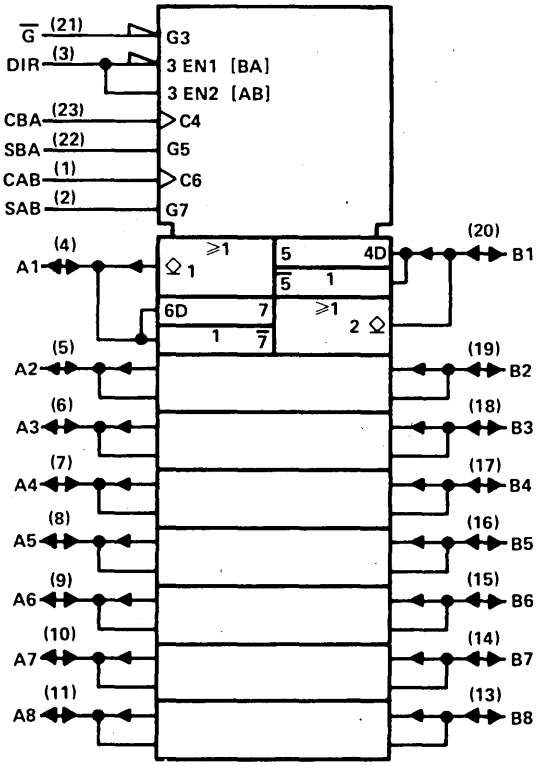
JT, NT PACKAGES				FH, FN PACKAGES			
1	CAB	13	B8	1	nc	15	nc
2	SAB	14	B7	2	CAB	16	B8
3	DIR	15	B6	3	SAB	17	B7
4	A1	16	B5	4	DIR	18	B6
5	A2	17	B4	5	A1	19	B5
6	A3	18	B3	6	A2	20	B4
7	A4	19	B2	7	A3	21	B3
8	A5	20	B1	8	nc	22	nc
9	A6	21	$\overline{G}$	9	A4	23	B2
10	A7	22	SBA	10	A5	24	B1
11	A8	23	CBA	11	A6	25	$\overline{G}$
12	GND	24	V_{CC}	12	A7	26	SBA
				13	A8	27	CBA
				14	GND	28	V_{CC}

SN54ALS646 (JT,FH)	SN74ALS646 (NT,FN)
	SN74ALS646-1 (NT,FN)
SN54ALS647 (JT,FH)	SN74ALS647 (NT,FN)
	SN74ALS647-1 (NT,FN)
SN54ALS648 (JT,FH)	SN74ALS648 (NT,FN)
	SN74ALS648-1 (NT,FN)
SN54ALS649 (JT,FH)	SN74ALS649 (NT,FN)
	SN74ALS649-1 (NT,FN)
SN54LS646 (JT,FH)	SN74LS646 (JT,NT,FN)
SN54LS647 (JT,FH)	SN74LS647 (JT,NT,FN)
SN54LS648 (JT,FH)	SN74LS648 (JT,NT,FN)
SN54LS649 (JT,FH)	SN74LS649 (JT,NT,FN)

logic symbol, 'ALS646, 'LS646†



logic symbol, 'ALS647, 'LS647†

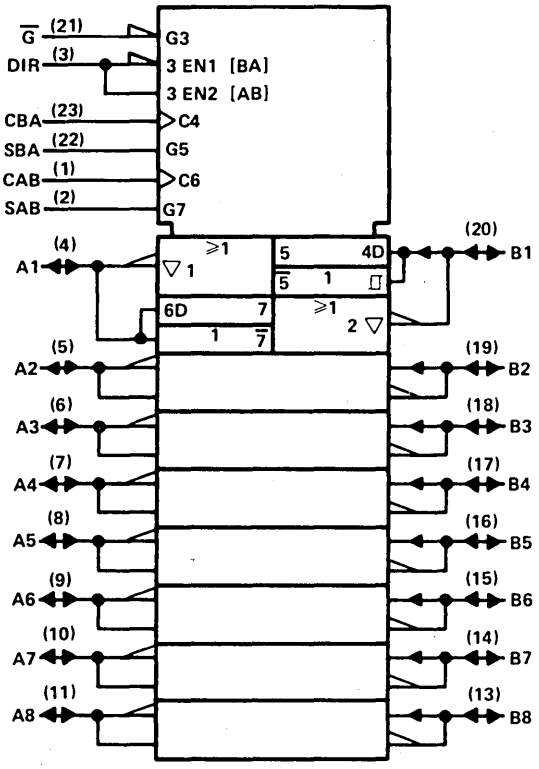


†Pin numbers shown on logic symbols are for JT and NT packages only.
nc — no internal connection.

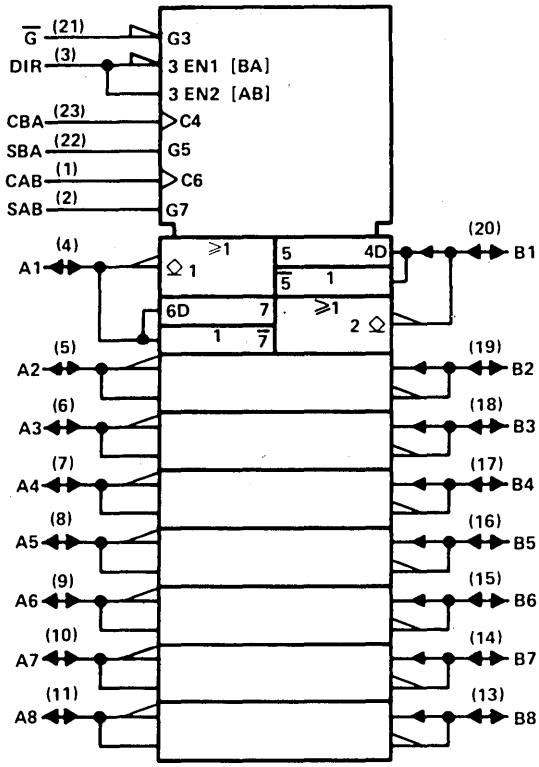
© IC MASTER 1983

646, 647, 648, 649 continued

logic symbol, 'ALS648, 'LS648†



logic symbol, 'ALS649, 'LS649†



†Pin numbers shown on logic symbols are for JT and NT packages only.

nc — no internal connection.

© IC MASTER 1983

651, 652

OCTAL BUS TRANSCEIVERS AND REGISTERS

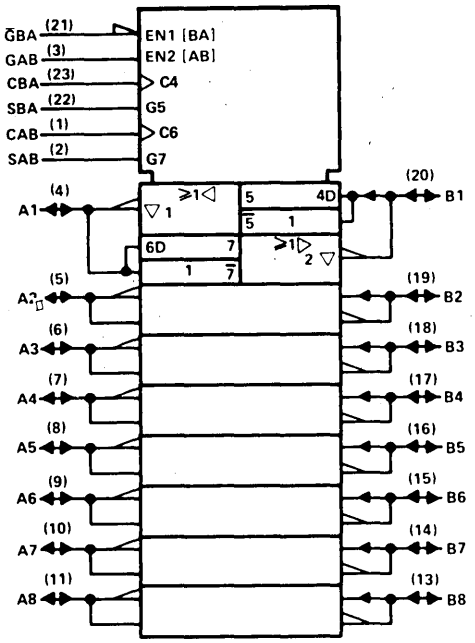
- Bidirectional
- Independent registers for A and B busses

typical performance

TYPE	MAX SOURCE CURRENT	MAX SINK CURRENT	OUTPUT TYPE A B	OUTPUT INV A,B
SN54ALS651	−12 mA	12 mA	3-State	Yes
SN54LS651	−12 mA	12 mA	3-State	Yes
SN74ALS651	−15 mA	24 mA	3-State	Yes
SN74ALS651-1	−15 mA	48 mA	3-State	Yes
SN74LS651	−15 mA	24 mA	3-State	Yes
SN54ALS652	−12 mA	12 mA	3-State	No
SN54LS652	−12 mA	12 mA	3-State	No
SN74ALS652	−15 mA	24 mA	3-State	No
SN74ALS652-1	−15 mA	48 mA	3-State	No
SN74LS652	−15 mA	24 mA	3-State	No

SN54ALS651 (JT,FH) SN74ALS651 (NT,FN)
SN74ALS651-1 (NT,FN)
SN54LS651 (JT,FH) SN74LS651 (JT,NT,FN)
SN54ALS652 (JT,FH) SN74ALS652 (NT,FN)
SN74ALS652-1 (NT,FN)
SN54LS652 (JT,FH) SN74LS652 (JT,NT,FN)

logic symbol, 'ALS651, 'LS651†

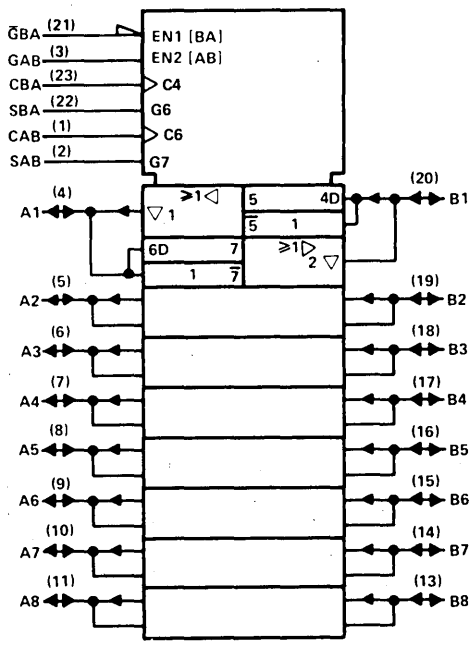


pin assignments

JT, NT PACKAGES			
1	CAB	13	B8
2	SAB	14	B7
3	GAB	15	B6
4	A1	16	B5
5	A2	17	B4
6	A3	18	B3
7	A4	19	B2
8	A5	20	B1
9	A6	21	GBA
10	A7	22	SBA
11	A8	23	CBA
12	GND	24	V_{CC}

FH, FN PACKAGES			
1	nc	15	nc
2	CAB	16	B8
3	SAB	17	B7
4	GAB	18	B6
5	A1	19	B5
6	A2	20	B4
7	A3	21	B3
8	nc	22	nc
9	A4	23	B2
10	A5	24	B1
11	A6	25	GBA
12	A7	26	SBA
13	A8	27	CBA
14	GND	28	V_{CC}

logic symbol, 'ALS652, 'LS652†



†Pin numbers shown on logic symbols are for JT and NT packages only.
nc – no internal connection.

© IC MASTER 1983

653, 654

OCTAL BUS TRANSCEIVERS AND REGISTERS

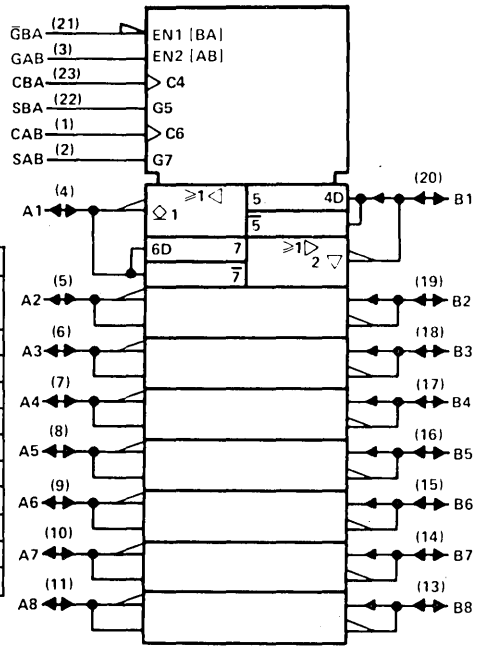
- Bidirectional
- Independent registers for A and B busses

typical performance

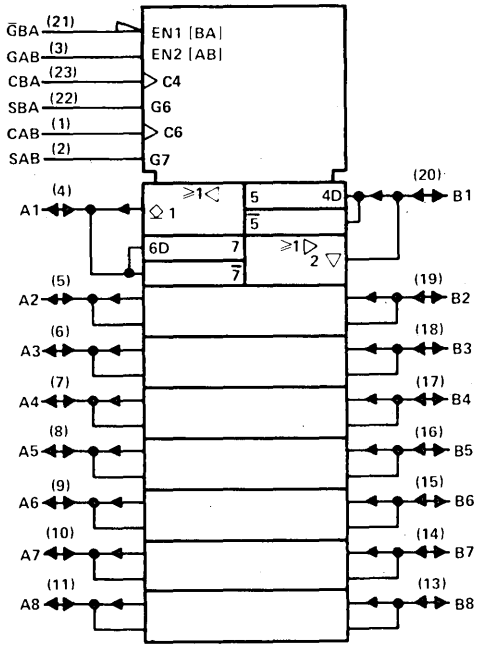
TYPE	MAX SOURCE CURRENT	MAX SINK CURRENT	OUTPUT TYPE A	OUTPUT TYPE B	INV A, B
SN54ALS653	−12 mA	12 mA	O-C	3-State	Yes
SN74ALS653	−15 mA	24 mA	O-C	3-State	Yes
SN74ALS653-1	−15 mA	48 mA	O-C	3-State	Yes
SN54ALS654	−12 mA	12 mA	O-C	3-State	No
SN74ALS654	−15 mA	24 mA	O-C	3-State	No
SN74ALS654-1	−15 mA	48 mA	O-C	3-State	No
SN54LS653	−12 mA	12 mA	O-C	3-State	Yes
SN74LS653	−15 mA	24 mA	O-C	3-State	Yes
SN54LS654	−12 mA	12 mA	O-C	3-State	No
SN74LS654	−15 mA	24 mA	O-C	3-State	No

SN54ALS653 (JT,FH) SN74ALS653 (NT,FN)
SN54ALS654 (JT,FH) SN74ALS653-1 (NT,FN)
SN74ALS654 (NT,FN)
SN74ALS654-1 (NT,FN)
SN54LS653 (JT,FH) SN74LS653 (JT,NT,FN)
SN54LS654 (JT,FH) SN74LS654 (JT,NT,FN)

logic symbol, 'ALS653, 'LS653†



logic symbol, 'ALS654, 'LS654†



pin assignments

JT, NT PACKAGES			
1	CAB	13	B8
2	SAB	14	B7
3	GAB	15	B6
4	A1	16	B5
5	A2	17	B4
6	A3	18	B3
7	A4	19	B2
8	A5	20	B1
9	A6	21	$\overline{G}$BA
10	A7	22	SBA
11	A8	23	CBA
12	GND	24	V_{CC}

FH, FN PACKAGES			
1	nc	15	nc
2	CAB	16	B8
3	SAB	17	B7
4	GAB	18	B6
5	A1	19	B5
6	A2	20	B4
7	A3	21	B3
8	nc	22	nc
9	A4	23	B2
10	A5	24	B1
11	A6	25	$\overline{G}$BA
12	A7	26	SBA
13	A8	27	CBA
14	GND	28	V_{CC}

† Pin numbers shown on logic symbols are for JT and NT packages only.
nc – no internal connection.

© IC MASTER 1983

668, 669

SYNCHRONOUS 4-BIT UP/ DOWN COUNTERS

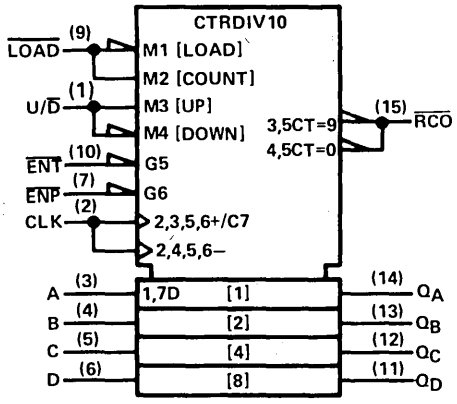
- Programmable, look-ahead
- Decade counter ('LS668)
- Binary counter ('LS669)

typical performance

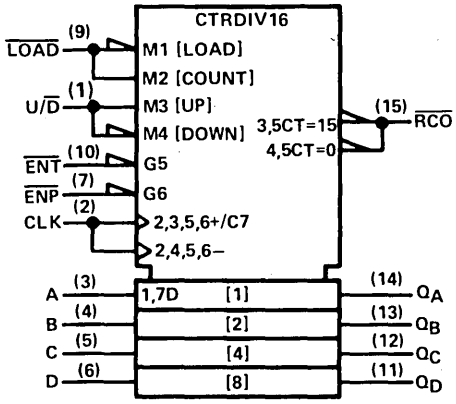
TYPE	COUNT FREQ	PARALLEL LOAD	TOTAL POWER
'LS668	32 MHz	Sync	100 mW
'LS669	32 MHz	Sync	100 mW

SN54LS668 (J,FH) SN74LS668 (J,N,FN)
SN54LS669 (J,FH) SN74LS669 (J,N,FN)

logic symbol, 'LS668†



logic symbol, 'LS669†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	U/D	9	LOAD	1	nc	11	nc
2	CLK	10	ENT	2	U/D	12	LOAD
3	A	11	Q_D	3	CLK	13	ENT
4	B	12	Q_C	4	A	14	Q_D
5	C	13	Q_B	5	B	15	Q_C
6	D	14	Q_A	6	nc	16	nc
7	ENP	15	RCO	7	C	17	Q_B
8	GND	16	V_{CC}	8	D	18	Q_A
				9	ENP	19	RCO
				10	GND	20	V_{CC}

670

4-BY-4 REGISTER FILES

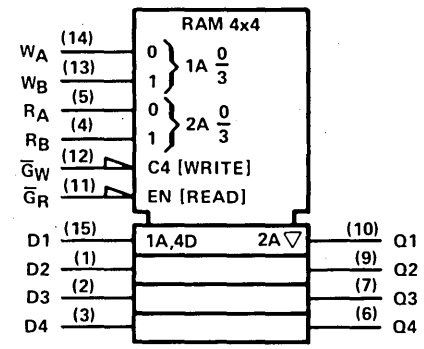
- 3-state outputs
- Simultaneous read/write
- Expandable to 1024 words

typical performance

ADDRESS TIME	ENABLE TIME	POWER/ BIT
24 ns	19 ns	9.3 mW

SN54LS670 (J,FH) SN74LS670 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	D2	9	Q2	1	nc	11	nc
2	D3	10	Q1	2	D2	12	Q2
3	D4	11	$\overline{G}_R$	3	D3	13	Q1
4	R_B	12	$\overline{G}_W$	4	D4	14	$\overline{G}_R$
5	R_A	13	W_B	5	R_B	15	$\overline{G}_W$
6	Q4	14	W_A	6	nc	16	nc
7	Q3	15	D1	7	R_A	17	W_B
8	GND	16	V_{CC}	8	Q4	18	W_A
				9	Q3	19	D1
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

671, 672

4-BIT UNIVERSAL SHIFT REGISTERS/LATCHES WITH THREE-STATE OUTPUTS

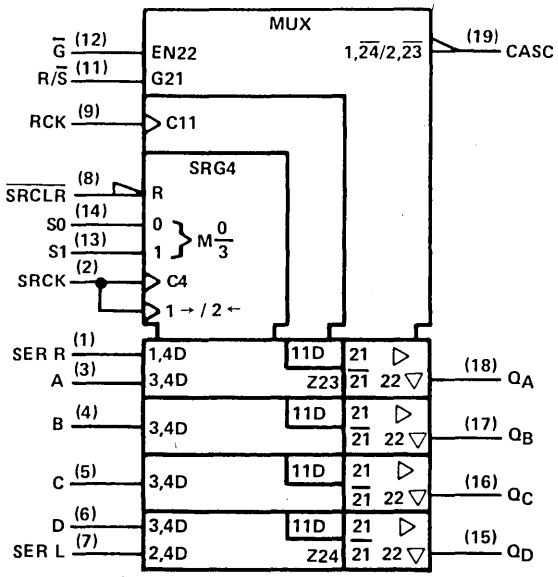
- '671 has direct SR clear
- '672 has synchronous SR clear
- Expandable to any word length
- Multiplexed outputs for shift register or latched data
- Four modes of shift register
  - Inhibit clock
  - Shift right
  - Shift left
  - Parallel load

typical performance

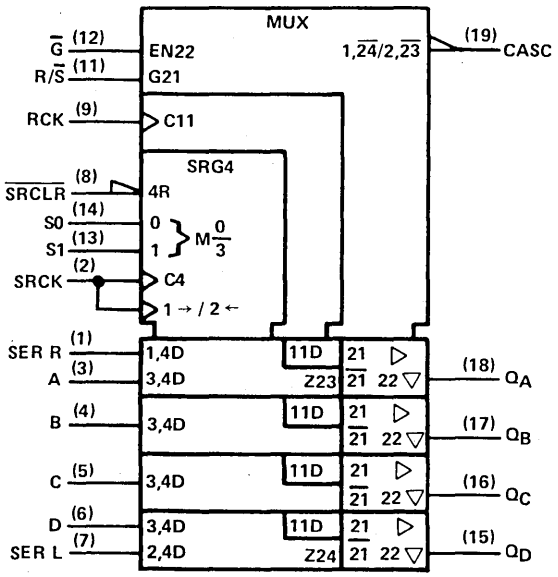
TYPE	TOTAL POWER
'LS671	170 mW
'LS672	170 mW

SN54LS671 (J,FH) SN74LS671 (J,N,FN)
SN54LS672 (J,FH) SN74LS672 (J,N,FN)

logic symbol, 'LS671†



logic symbol, 'LS672†



pin assignments

J, N PACKAGES			
1	SER R	11	R/S
2	SRCK	12	G
3	A	13	S1
4	B	14	S0
5	C	15	Q_D
6	D	16	Q_C
7	SER L	17	Q_B
8	SRCLR	18	Q_A
9	RCK	19	CASC
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	SER R	11	R/S
2	SRCK	12	G
3	A	13	S1
4	B	14	S0
5	C	15	Q_D
6	D	16	Q_C
7	SER L	17	Q_B
8	SRCLR	18	Q_A
9	RCK	19	CASC
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

673

16-BIT SHIFT REGISTERS

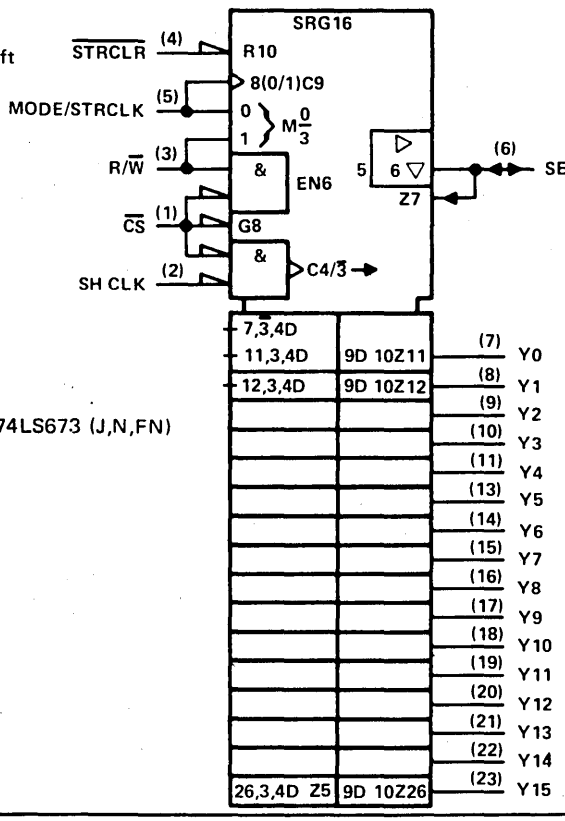
- 16-bit serial-in/serial-out shift register with three-state outputs
- 16-bit parallel-out storage register
- Converts serial to parallel data flow

typical performance

TYPE	SHIFT FREQ	TOTAL POWER
'LS673	20 MHz	255 mW

SN54LS673 (J,FH) SN74LS673 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	$\overline{CS}$	13	Y5
2	SH CLK	14	Y6
3	$R/\overline{W}$	15	Y7
4	$\overline{STRCLR}$	16	Y8
5	MODE/STRCLR	17	Y9
6	SER/Q15	18	Y10
7	Y0	19	Y11
8	Y1	20	Y12
9	Y2	21	Y13
10	Y3	22	Y14
11	Y4	23	Y15
12	GND	24	V_{CC}

FH, FN PACKAGES			
1	nc	15	nc
2	$\overline{CS}$	16	Y5
3	SH CLK	17	Y6
4	$R/\overline{W}$	18	Y7
5	$\overline{STRCLR}$	19	Y8
6	MODE/STRCLR	20	Y9
7	SER/Q15	21	Y10
8	nc	22	nc
9	Y0	23	Y11
10	Y1	24	Y12
11	Y2	25	Y13
12	Y3	26	Y14
13	Y4	27	Y15
14	GND	28	V_{CC}

674

16-BIT SHIFT REGISTER

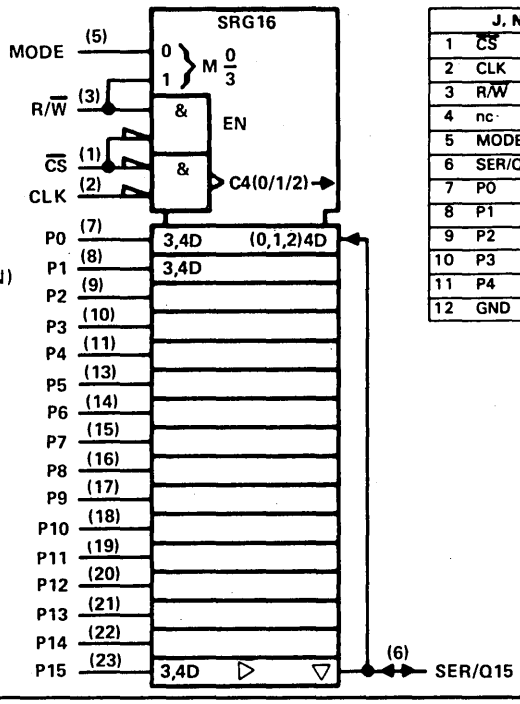
- Performs parallel to serial conversion
- Three-state outputs

typical performance

TYPE	SHIFT FREQ	TOTAL POWER
'LS674	20 MHz	125 mW

SN54LS674 (J,FH) SN74LS674 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	$\overline{CS}$	13	P5
2	CLK	14	P6
3	$R/\overline{W}$	15	P7
4	nc	16	P8
5	MODE	17	P9
6	SER/Q15	18	P10
7	P0	19	P11
8	P1	20	P12
9	P2	21	P13
10	P3	22	P14
11	P4	23	P15
12	GND	24	V_{CC}

FH, FN PACKAGES			
1	nc	15	nc
2	$\overline{CS}$	16	P5
3	CLK	17	P6
4	$R/\overline{W}$	18	P7
5	nc	19	P8
6	MODE	20	P9
7	SER/Q15	21	P10
8	nc	22	nc
9	P0	23	P11
10	P1	24	P12
11	P2	25	P13
12	P3	26	P14
13	P4	27	P15
14	GND	28	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

677, 678

ADDRESS COMPARATORS

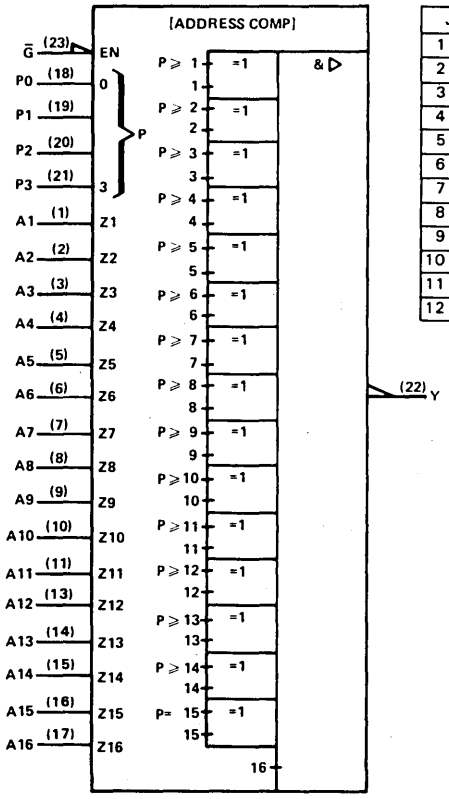
- 'ALS677 is a 16-bit to 4-bit comparator with enable
- 'ALS678 is a 16-bit to 4-bit comparator with latch

typical performance

TYPE	DELAY	POWER
'ALS677		
'ALS678		

SN54ALS677 (JT,FH) SN74ALS677 (NT,FN)
SN54ALS678 (JT,FH) SN74ALS678 (NT,FN)

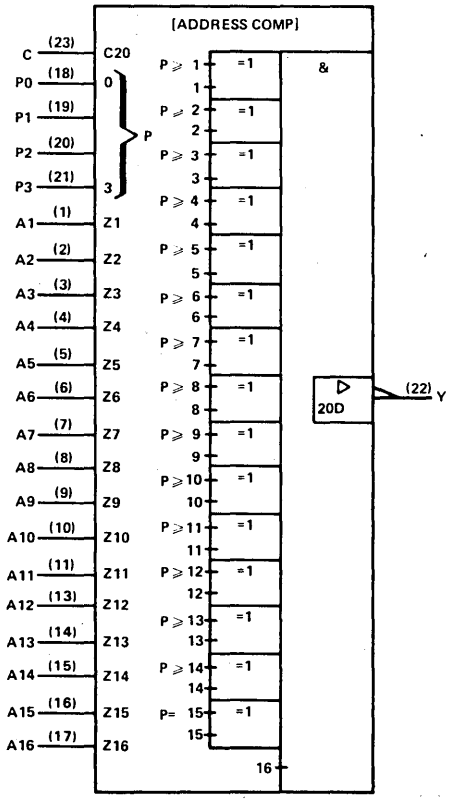
logic symbol, 'ALS677†



pin assignments, 'ALS677

JT, NT PACKAGES				FH, FN PACKAGES			
1	A1	13	A12	1	nc	15	nc
2	A2	14	A13	2	A1	16	A12
3	A3	15	A14	3	A2	17	A13
4	A4	16	A15	4	A3	18	A14
5	A5	17	A16	5	A4	19	A15
6	A6	18	P0	6	A5	20	A16
7	A7	19	P1	7	A6	21	P0
8	A8	20	P2	8	nc	22	nc
9	A9	21	P3	9	A7	23	P1
10	A10	22	Y	10	A8	24	P2
11	A11	23	$\overline{G}$	11	A9	25	P3
12	GND	24	V_{CC}	12	A10	26	Y
				13	A11	27	$\overline{G}$
				14	GND	28	V_{CC}

logic symbol, 'ALS678†



pin assignments, 'ALS678

JT, NT PACKAGES				FH, FN PACKAGES			
1	A1	13	A12	1	nc	15	nc
2	A2	14	A13	2	A1	16	A12
3	A3	15	A14	3	A2	17	A13
4	A4	16	A15	4	A3	18	A14
5	A5	17	A16	5	A4	19	A15
6	A6	18	P0	6	A5	20	A16
7	A7	19	P1	7	A6	21	P0
8	A8	20	P2	8	nc	22	nc
9	A9	21	P3	9	A7	23	P1
10	A10	22	Y	10	A8	24	P2
11	A11	23	C	11	A9	25	P3
12	GND	24	V_{CC}	12	A10	26	Y
				13	A11	27	C
				14	GND	28	V_{CC}

†Pin numbers shown on logic symbols are for JT and NT packages only.
nc — no internal connection.

© IC MASTER 1983

679, 680

ADDRESS COMPARATORS

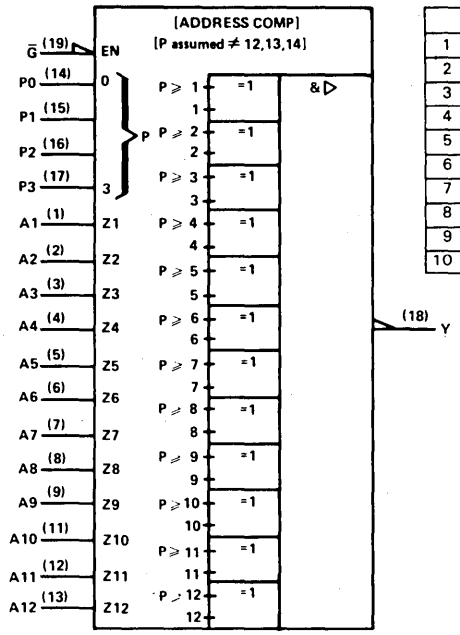
- 'ALS679 is a 12-bit to 4-bit comparator with enable
- 'ALS680 is a 12-bit to 4-bit comparator with latch

typical performance

TYPE	DELAY	POWER
'ALS679		
'ALS680		

SN54ALS679 (J,FH) SN74ALS679 (N,FN)
SN54ALS680 (J,FH) SN74ALS680 (N,FN)

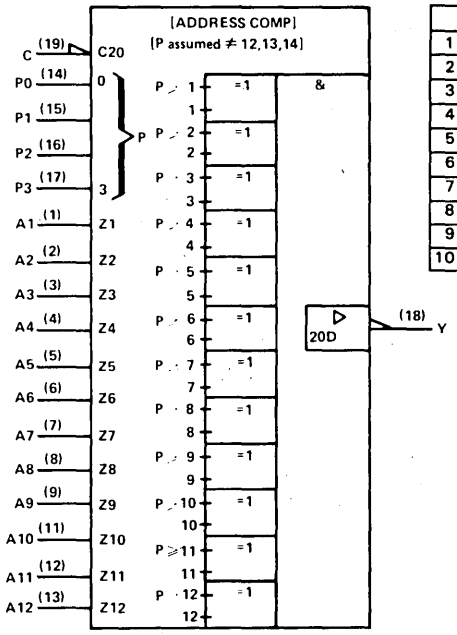
logic symbol, 'ALS679†



pin assignmens, 'ALS679

J, N PACKAGES				FH, FN PACKAGES			
1	A1	11	A10	1	A1	11	A10
2	A2	12	A11	2	A2	12	A11
3	A3	13	A12	3	A3	13	A12
4	A4	14	P0	4	A4	14	P0
5	A5	15	P1	5	A5	15	P1
6	A6	16	P2	6	A6	16	P2
7	A7	17	P3	7	A7	17	P3
8	A8	18	Y	8	A8	18	Y
9	A9	19	$\overline{G}$	9	A9	19	$\overline{G}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

logic symbol, 'ALS680†



pin assignments, 'ALS680

J, N PACKAGES				FH, FN PACKAGES			
1	A1	11	A10	1	A1	11	A10
2	A2	12	A11	2	A2	12	A11
3	A3	13	A12	3	A3	13	A12
4	A4	14	P0	4	A4	14	P0
5	A5	15	P1	5	A5	15	P1
6	A6	16	P2	6	A6	16	P2
7	A7	17	P3	7	A7	17	P3
8	A8	18	Y	8	A8	18	Y
9	A9	19	C	9	A9	19	C
10	GND	20	V_{CC}	10	GND	20	V_{CC}

†Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

681

4-BIT PARALLEL BINARY ACCUMULATORS

- Contains two synchronous registers
- B register frequency = 20 MHz
- Arithmetic operations include B minus A and A minus B
- Bus-driving I/O ports

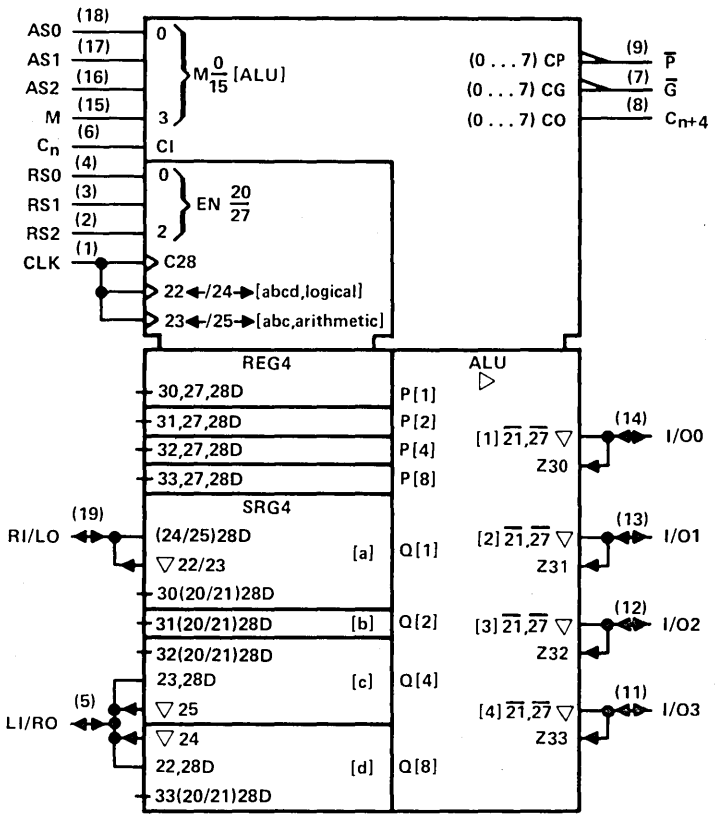
typical performance

TYPE	LOAD TIME	ACC TIME
'LS681	75 ns	50 ns

SN54LS681 (J,FH)

SN74LS681 (J,N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	CLK	11	I/O3
2	RS2	12	I/O2
3	RS1	13	I/O1
4	RS0	14	I/O0
5	LI/RO	15	M
6	C_n	16	AS2
7	$\overline{G}$	17	AS1
8	C_{n+4}	18	AS0
9	$\overline{P}$	19	RI/LO
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	CLK	11	I/O3
2	RS2	12	I/O2
3	RS1	13	I/O1
4	RS0	14	I/O0
5	LI/RO	15	M
6	C_n	16	AS2
7	$\overline{G}$	17	AS1
8	C_{n+4}	18	AS0
9	$\overline{P}$	19	RI/LO
10	GND	20	V_{CC}

†Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

682, 683, 684, 685

8-BIT MAGNITUDE COMPARATORS

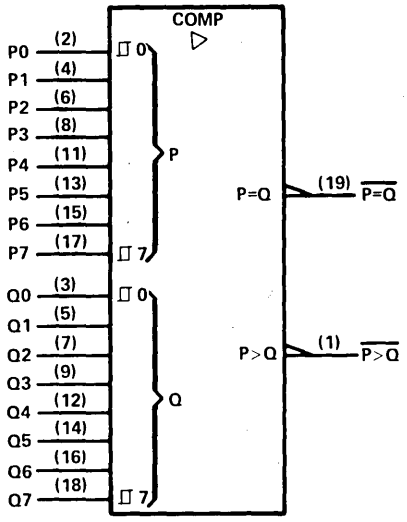
- Compares two 8-bit words
- 'LS682 and 'LS683 includes 20-kilohm pull-up resistor on Q inputs

typical performance

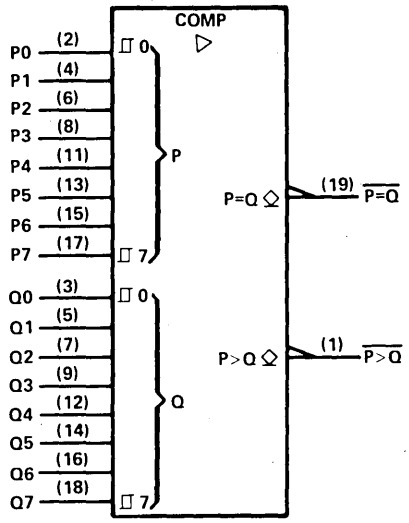
TYPE	COMPARE TIME	TYPE OUTPUT	TOTAL POWER
'LS682	14 ns	Totem Pole	210 mW
'LS683	24 ns	O-C	210 mW
'LS684	16 ns	Totem Pole	200 mW
'LS685	24 ns	O-C	200 mW

SN54LS682 (J,FH) SN74LS682 (J,N,FN)
SN54LS683 (J,FH) SN74LS683 (J,N,FN)
SN54LS684 (J,FH) SN74LS684 (J,N,FN)
SN54LS685 (J,FH) SN74LS685 (J,N,FN)

logic symbol, 'LS682, 'LS684†



logic symbol, 'LS683, 'LS685†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	P>Q	11	P4	1	P>Q	11	P4
2	P0	12	Q4	2	P0	12	Q4
3	Q0	13	P5	3	Q0	13	P5
4	P1	14	Q5	4	P1	14	Q5
5	Q1	15	P6	5	Q1	15	P6
6	P2	16	Q6	6	P2	16	Q6
7	Q2	17	P7	7	Q2	17	P7
8	P3	18	Q7	8	P3	18	Q7
9	Q3	19	P=Q	9	Q3	19	P=Q
10	GND	20	V_{CC}	10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

686, 687

8-BIT MAGNITUDE COMPARATORS

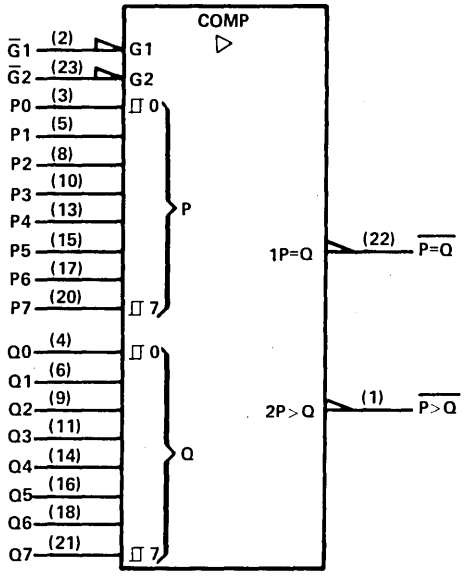
- Compares two 8-bit words

typical performance

TYPE	COMPARE TIME	TYPE OUTPUT	TOTAL POWER
'LS686	17 ns	Totem-Pole	220 mW
'LS687	22 ns	O-C	220 mW

SN54LS686 (JT,FH) SN74LS686 (JT,NT,FN)
SN54LS687 (JT,FH) SN74LS687 (JT,NT,FN)

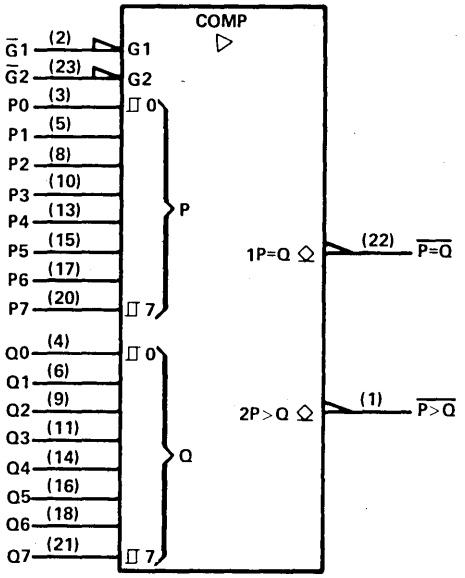
logic symbol, 'LS686†



pin assignments

JT, NT PACKAGES				FH, FN PACKAGES			
1	P>Q	13	P4	1	nc	15	nc
2	G1	14	Q4	2	P>Q	16	P4
3	P0	15	P5	3	G1	17	Q4
4	Q0	16	Q5	4	P0	18	P5
5	P1	17	P6	5	Q0	19	Q5
6	Q1	18	Q6	6	P1	20	P6
7	nc	19	nc	7	Q1	21	Q6
8	P2	20	P7	8	nc	22	nc
9	Q2	21	Q7	9	nc	23	nc
10	P3	22	P=Q	10	P2	24	P7
11	Q3	23	G2	11	Q2	25	Q7
12	GND	24	V_{CC}	12	P3	26	P=Q
				13	Q3	27	G2
				14	GND	28	V_{CC}

logic symbol, 'LS687†



†Pin numbers shown on logic symbols are for JT and NT packages only.
nc — no internal connection.

© IC MASTER 1983

688, 689

8-BIT MAGNITUDE COMPARATORS

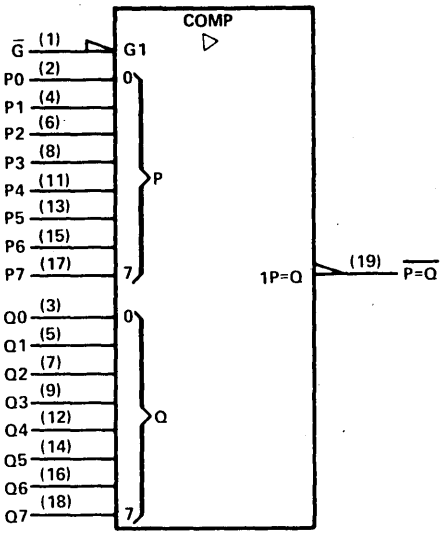
- Compares two 8-bit words

typical performance

TYPE	COMPARE TIME	TYPE OUTPUT	TOTAL POWER
'ALS688	9.5 ns	Totem-Pole	37.5 mW
'ALS689	15..5 ns	O-C	37.5 mW
'LS688	14.5 ns	Totem-Pole	200 mW
'LS689	23 ns	O-C	200 mW

SN54ALS688 (J,FH) SN74ALS688 (J,FN)
SN54ALS689 (J,FH) SN74ALS689 (N,FN)
SN54LS688 (J,FH) SN74LS688 (J,N,FN)
SN54LS689 (J,FH) SN74LS689 (J,N,FN)

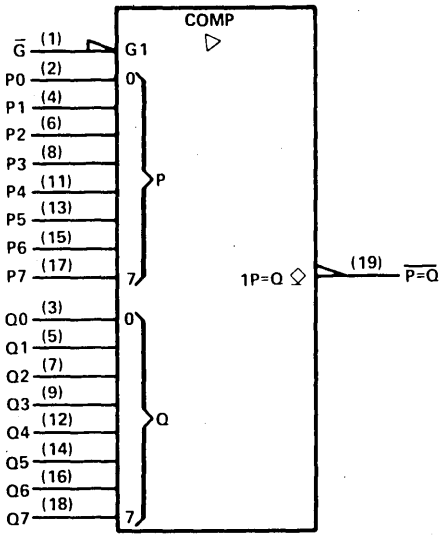
logic symbol, 'ALS688, 'LS688†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	$\overline{G}$	11	P4	1	$\overline{G}$	11	P4
2	P0	12	Q4	2	P0	12	Q4
3	Q0	13	P5	3	Q0	13	P5
4	P1	14	Q5	4	P1	14	Q5
5	Q1	15	P6	5	Q1	15	P6
6	P2	16	Q6	6	P2	16	Q6
7	Q2	17	P7	7	Q2	17	P7
8	P3	18	Q7	8	P3	18	Q7
9	Q3	19	$\overline{P=Q}$	9	Q3	19	$\overline{P=Q}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

logic symbol, 'ALS689, 'LS689†



† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

690, 691
692, 693

SYNCHRONOUS COUNTERS WITH OUTPUT REGISTERS

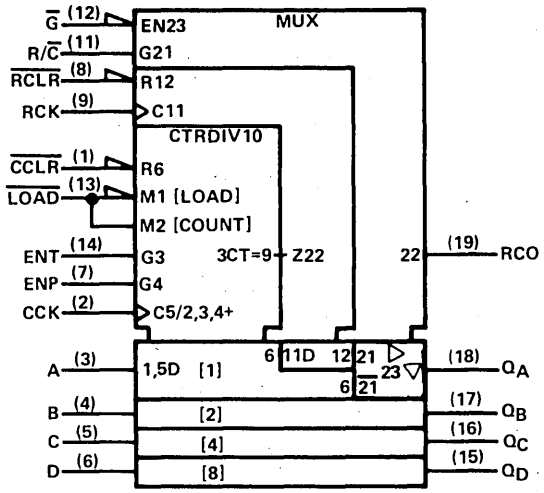
- Multiplexed three-state outputs
- 4-bit counters/registers
- 'LS690, 'LS692: Decade counters
- 'LS691, 'LS693: Binary counters

typical performance

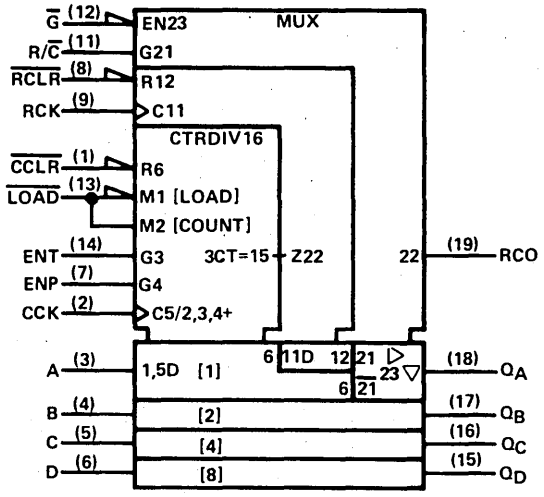
TYPE	CLEAR	MAX CLOCK FREQ	TOTAL POWER
'LS690	Direct	20 MHz	237 mW
'LS691	Direct	20 MHz	237 mW
'LS692	Sync-L	20 MHz	237 mW
'LS693	Sync-L	20 MHz	237 mW

SN54LS690 (J,FH) SN74LS690 (J,N,FN)
SN54LS691 (J,FH) SN74LS691 (J,N,FN)
SN54LS692 (J,FH) SN74LS692 (J,N,FN)
SN54LS693 (J,FH) SN74LS693 (J,N,FN)

logic symbol, 'LS690†



logic symbol, 'LS691†

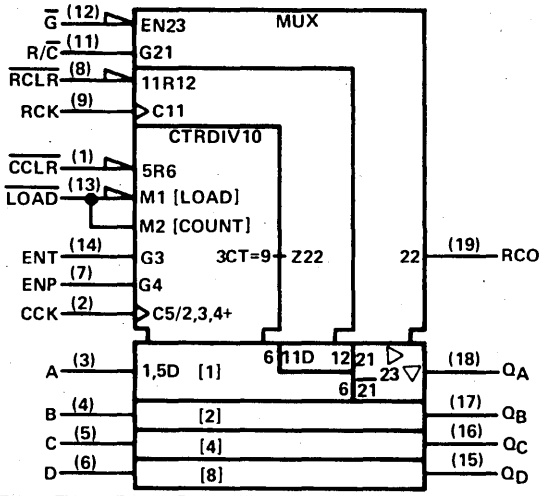


pin assignments

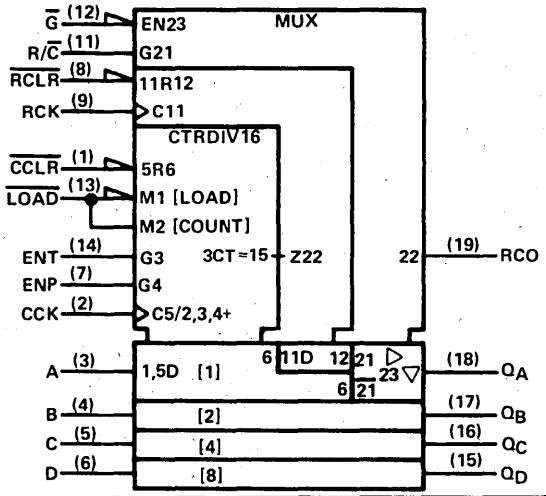
J, N PACKAGES			
1	$\overline{CCLR}$	11	R/$\overline{C}$
2	CCK	12	$\overline{G}$
3	A	13	$\overline{LOAD}$
4	B	14	ENT
5	C	15	Q_D
6	D	16	Q_C
7	ENP	17	Q_B
8	$\overline{RCLR}$	18	Q_A
9	RCK	19	RCO
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	$\overline{CCLR}$	11	R/$\overline{C}$
2	CCK	12	$\overline{G}$
3	A	13	$\overline{LOAD}$
4	B	14	ENT
5	C	15	Q_D
6	D	16	Q_C
7	ENP	17	Q_B
8	$\overline{RCLR}$	18	Q_A
9	RCK	19	RCO
10	GND	20	V_{CC}

logic symbol, 'LS692†



logic symbol, 'LS693†



† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

696, 697, 698, 699

SYNCHRONOUS UP/DOWN COUNTERS WITH OUTPUT REGISTERS, MULTIPLEXED THREE-STATE OUTPUTS

- 4-bit counters/registers
- 'LS696, 'LS698: Decade counters
- 'LS697, 'LS699: Binary counters

typical performance

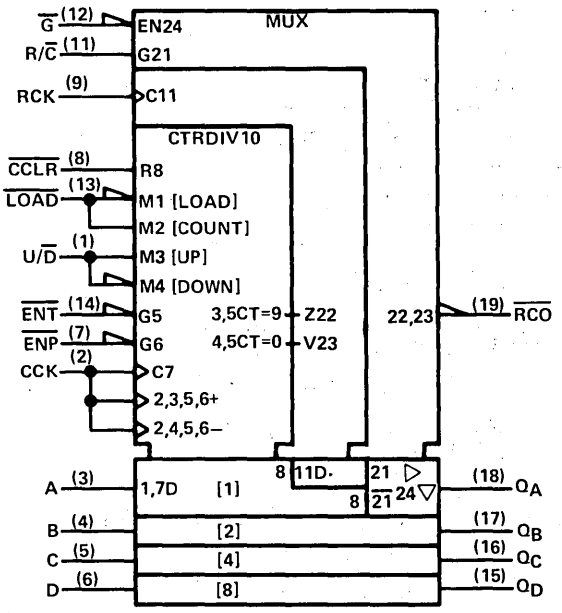
TYPE	MAX CLOCK FREQ	CLEAR	TOTAL POWER
'LS696	20 MHz	Async-L	237 mW
'LS697	20 MHz	Async-L	237 mW
'LS698	20 MHz	Sync-L	237 mW
'LS699	20 MHz	Sync-L	237 mW

SN54LS696 (J,FH) SN74LS696 (J,N,FN)
SN54LS697 (J,FH) SN74LS697 (J,N,FN)
SN54LS698 (J,FH) SN74LS698 (J,N,FN)
SN54LS699 (J,FH) SN74LS699 (J,N,FN)

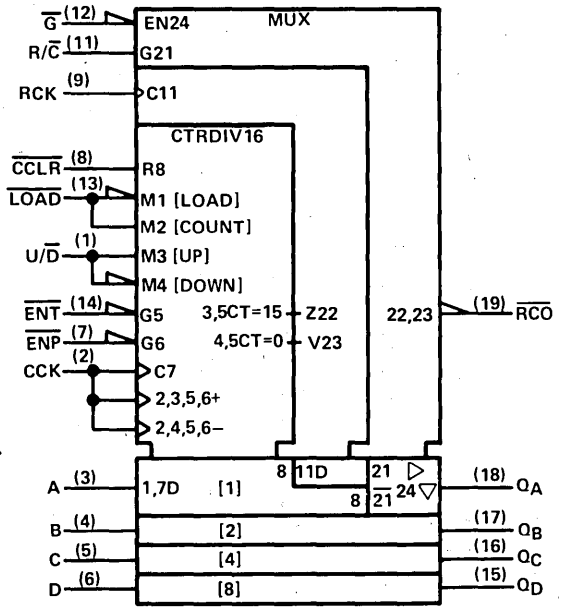
pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	U/$\overline{D}$	11	R/$\overline{C}$	1	U/D	11	R/$\overline{C}$
2	CCK	12	$\overline{G}$	2	CCK	12	$\overline{G}$
3	A	13	$\overline{LOAD}$	3	A	13	$\overline{LOAD}$
4	B	14	$\overline{ENT}$	4	B	14	$\overline{ENT}$
5	C	15	Q_D	5	C	15	Q_D
6	D	16	Q_C	6	D	16	Q_C
7	$\overline{ENP}$	17	Q_B	7	$\overline{ENP}$	17	Q_B
8	$\overline{CCLR}$	18	Q_A	8	$\overline{CCLR}$	18	Q_A
9	RCK	19	$\overline{RCO}$	9	RCK	19	$\overline{RCO}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

logic symbol, 'LS696†



logic symbol, 'LS697†

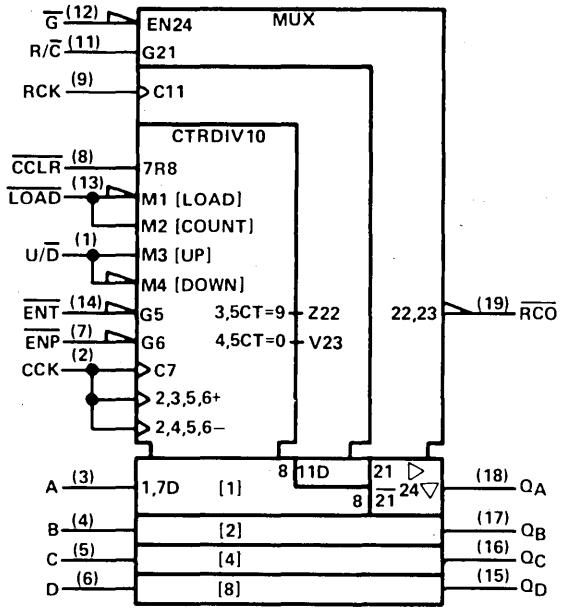


† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

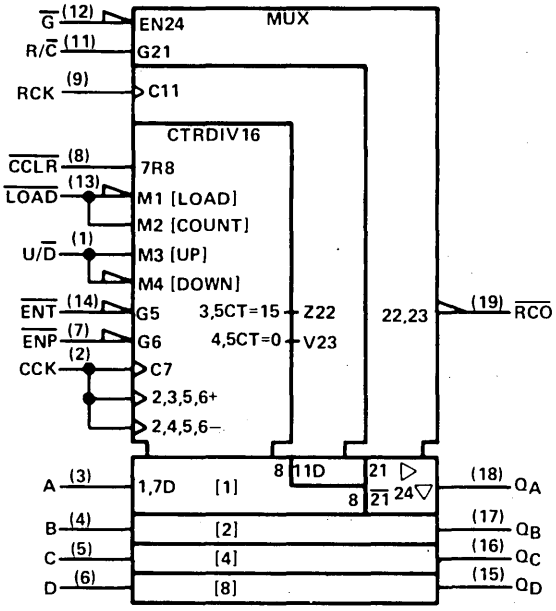
© IC MASTER 1983

696, 697, 698, 699 continued

logic symbol, 'LS698†



logic symbol, 'LS699†



pin assignments

J, N PACKAGES			
1	U/D	11	R/C
2	CCK	12	G
3	A	13	LOAD
4	B	14	ENT
5	C	15	Q_D
6	D	16	Q_C
7	ENP	17	Q_B
8	CCLR	18	Q_A
9	RCK	19	RCO
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	U/D	11	R/C
2	CCK	12	G
3	A	13	LOAD
4	B	14	ENT
5	C	15	Q_D
6	D	16	Q_C
7	ENP	17	Q_B
8	CCLR	18	Q_A
9	RCK	19	RCO
10	GND	20	V_{CC}

800

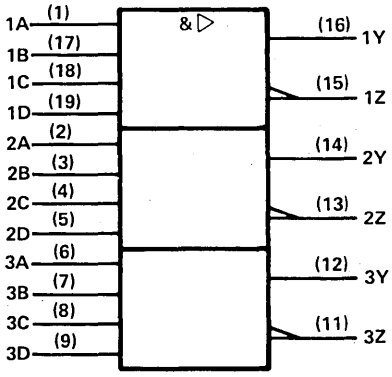
TRIPLE 4-INPUT AND/NAND DRIVERS

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT	POWER/ GATE
SN54AS800	40 mA	−40 mA	25 mW
SN74AS800	48 mA	−48 mA	25 mW

SN54AS800 (J,FH) SN74AS800 (N,FN)

logic symbol†



positive logic: $Y = ABCD$

$Z = \overline{ABCD}$

pin assignments

J, N PACKAGES			
1	1A	11	3Z
2	2A	12	3Y
3	2B	13	2Z
4	2C	14	2Y
5	2D	15	1Z
6	3A	16	1Y
7	3B	17	1B
8	3C	18	1C
9	3D	19	1D
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	1A	11	3Z
2	2A	12	3Y
3	2B	13	2Z
4	2C	14	2Y
5	2D	15	1Z
6	3A	16	1Y
7	3B	17	1B
8	3C	18	1C
9	3D	19	1D
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.

nc — no internal connection.

© IC MASTER 1983

802

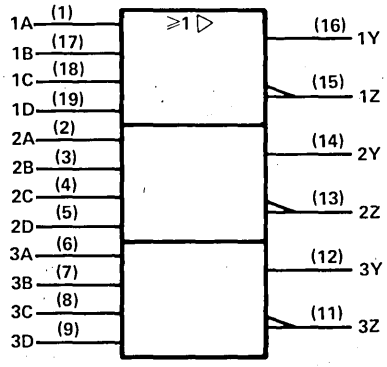
TRIPLE 4-INPUT OR/NOR LINE DRIVERS

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT	POWER/GATE
SN54AS802	40 mA	−40 mA	25 mW
SN74AS802	48 mA	−48 mA	25 mW

SN54AS802 (J,FH) SN74AS802 (N,FN)

logic symbol†



positive logic: $Y = A+B+C+D$

$Z = \overline{A+B+C+D}$

pin assignments

J, N PACKAGES			
1	1A	11	3Z
2	2A	12	3Y
3	2B	13	2Z
4	2C	14	2Y
5	2D	15	1Z
6	3A	16	1Y
7	3B	17	1B
8	3C	18	1C
9	3D	19	1D
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	1A	11	3Z
2	2A	12	3Y
3	2B	13	2Z
4	2C	14	2Y
5	2D	15	1Z
6	3A	16	1Y
7	3B	17	1B
8	3C	18	1C
9	3D	19	1D
10	GND	20	V_{CC}

804

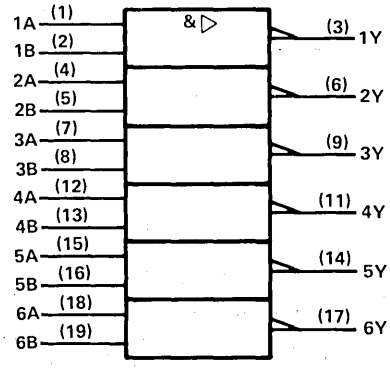
HEX 2-INPUT NAND DRIVERS

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT	DELAY	POWER/GATE
SN54ALS804	12 mA	−12 mA	3 ns	3.4 mW
SN74ALS804	24 mA	−15 mA	3 ns	3.4 mW
SN54AS804A	40 mA	−40 mA	2.7 ns	9 mW
SN74AS804A	48 mA	−48 mA	2.7 ns	9 mW

SN54ALS804 (J,FH) SN74ALS804 (N,FN)
SN54AS804A (J,FH) SN74AS804A (N,FN)

logic symbol†



positive logic: $Y = \overline{AB}$

pin assignments

J, N PACKAGES			
1	1A	11	4Y
2	1B	12	4A
3	1Y	13	4B
4	2A	14	5Y
5	2B	15	5A
6	2Y	16	5B
7	3A	17	6Y
8	3B	18	6A
9	3Y	19	6B
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	1A	11	4Y
2	1B	12	4A
3	1Y	13	4B
4	2A	14	5Y
5	2B	15	5A
6	2Y	16	5B
7	3A	17	6Y
8	3B	18	6A
9	3Y	19	6B
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

805

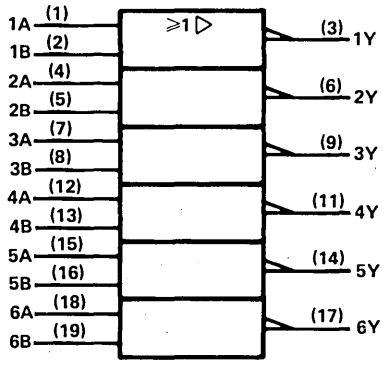
HEX 2-INPUT NOR DRIVERS

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT	DELAY	POWER/ GATE
SN54ALS805	12 mA	−12 mA	3.5 ns	4.2 mw
SN74ALS805	24 mA	−15 mA	3.5 ns	4.2 mW
SN54AS805A	40 mA	−40 mA	2.7 ns	12 mW
SN74AS805A	48 mA	−48 mA	2.7 ns	12 mW

SN54ALS805 (J,FH) SN74ALS805 (N,FN)
SN54AS805A (J,FH) SN74AS805A (N,FN)

logic symbol†



positive logic: $Y = \overline{A+B}$

pin assignments

J, N PACKAGES			
1	1A	11	4Y
2	1B	12	4A
3	1Y	13	4B
4	2A	14	5Y
5	2B	15	5A
6	2Y	16	5B
7	3A	17	6Y
8	3B	18	6A
9	3Y	19	6B
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	1A	11	4Y
2	1B	12	4A
3	1Y	13	4B
4	2A	14	5Y
5	2B	15	5A
6	2Y	16	5B
7	3A	17	6Y
8	3B	18	6A
9	3Y	19	6B
10	GND	20	V_{CC}

808

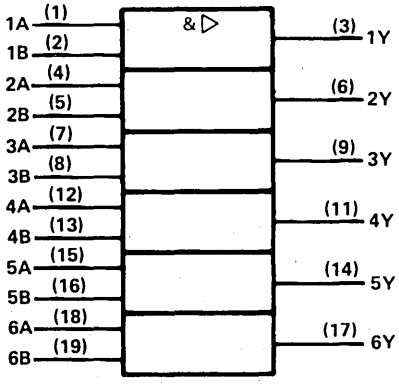
HEX 2-INPUT AND DRIVERS

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT	DELAY	POWER/ GATE
SN54ALS808	12 mA	−12 mA	4.3 ns	4.5 mW
SN74ALS808	24 mA	−15 mA	4.3 ns	4.5 mW
SN54AS808A	40 mA	−40 mA	3.2 ns	13 mW
SN74AS808A	48 mA	−48 mA	3.2 ns	13 mW

SN54ALS808 (J,FH) SN74ALS808 (N,FN)
SN54AS808A (J,FH) SN74AS808A (N,FN)

logic symbol†



positive logic: $Y = AB$

pin assignments

J, N PACKAGES			
1	1A	11	4Y
2	1B	12	4A
3	1Y	13	4B
4	2A	14	5Y
5	2B	15	5A
6	2Y	16	5B
7	3A	17	6Y
8	3B	18	6A
9	3Y	19	6B
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	1A	11	4Y
2	1B	12	4A
3	1Y	13	4B
4	2A	14	5Y
5	2B	15	5A
6	2Y	16	5B
7	3A	17	6Y
8	3B	18	6A
9	3Y	19	6B
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

832

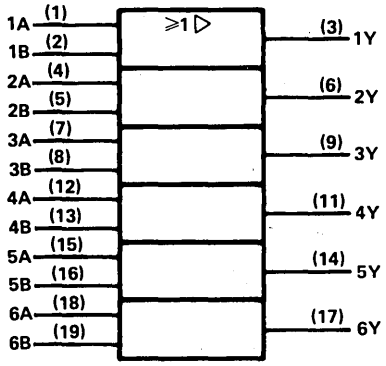
HEX 2-INPUT OR DRIVERS

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT	DELAY	POWER/GATE
SN54ALS832	12 mA	−12 mA	4 ns	5.3 mW
SN74ALS832	24 mA	−15 mA	4 ns	5.3 mW
SN54AS832A	40 mA	−40 mA	3 ns	17 mW
SN74AS832A	48 mA	−48 mA	3 ns	17 mW

SN54ALS832 (J,FH) SN74ALS832 (N,FN)
SN54AS832A (J,FH) SN74AS832A (N,FN)

logic symbol†



positive logic: Y = A+B

pin assignments

J, N PACKAGES			
1	1A	11	4Y
2	1B	12	4A
3	1Y	13	4B
4	2A	14	5Y
5	2B	15	5A
6	2Y	16	5B
7	3A	17	6Y
8	3B	18	6A
9	3Y	19	6B
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	1A	11	4Y
2	1B	12	4A
3	1Y	13	4B
4	2A	14	5Y
5	2B	15	5A
6	2Y	16	5B
7	3A	17	6Y
8	3B	18	6A
9	3Y	19	6B
10	GND	20	V_{CC}

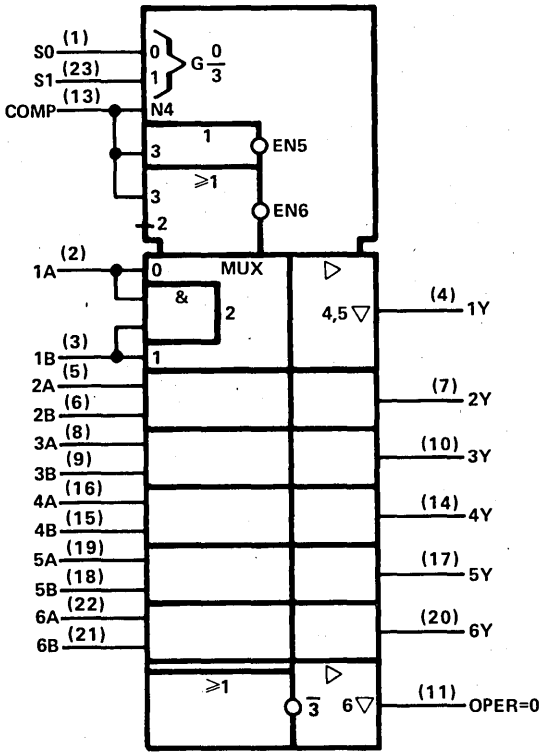
857

HEX 2-TO-1 UNIVERSAL MULTIPLEXER

- Three-state buffer-type outputs
- True or complementary data

SN54ALS857 (JT) SN74ALS857 (JT,NT)
SN54AS857 (JT,FH) SN74AS857 (NT,FN)

logic symbol†



pin assignments

JT, NT PACKAGES			
1	S0	13	COMP
2	1A	14	4Y
3	1B	15	4B
4	1Y	16	4A
5	2A	17	5Y
6	2B	18	5B
7	2Y	19	5A
8	3A	20	6Y
9	3B	21	6B
10	3Y	22	6A
11	OPER=0	23	S1
12	GND	24	V_{CC}

FH, FN PACKAGES			
1	nc	15	nc
2	S0	16	COMP
3	1A	17	4Y
4	1B	18	4B
5	1Y	19	4A
6	2A	20	5Y
7	2B	21	5B
8	nc	22	nc
9	2Y	23	5A
10	3A	24	6Y
11	3B	25	6B
12	3Y	26	6A
13	OPER=0	27	S1
14	GND	28	V_{CC}

†Pin numbers shown on logic symbols are for J, JT, N, and NT packages only.
nc — no internal connection.

© IC MASTER 1983

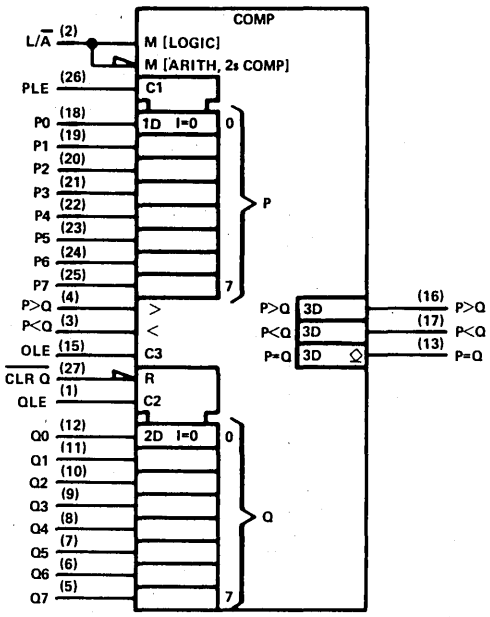
866

8-BIT MAGNITUDE COMPARATORS

- Fast compare to zero
- Arithmetic and logical comparison
- Open-collector output for P = Q

SN54AS866 (JD,FH) SN74AS866 (N,FN)

logic symbol†



pin assignments

JD, N PACKAGES			
1	QLE	15	OLE
2	L/$\overline{A}$	16	P>Qout
3	P<Qin	17	P<Qout
4	P>Qin	18	P0
5	Q7	19	P1
6	Q6	20	P2
7	Q5	21	P3
8	Q4	22	P4
9	Q3	23	P5
10	Q2	24	P6
11	Q1	25	P7
12	Q0	26	PLE
13	P = Qout	27	$\overline{CLRQ}$
14	GND	28	V_{CC}

FH, FN PACKAGES			
1	QLE	15	OLE
2	L/$\overline{A}$	16	P>Qout
3	P<Qin	17	P<Qout
4	P>Qin	18	P0
5	Q7	19	P1
6	Q6	20	P2
7	Q5	21	P3
8	Q4	22	P4
9	Q3	23	P5
10	Q2	24	P6
11	Q1	25	P7
12	Q0	26	PLE
13	P = Qout	27	$\overline{CLRQ}$
14	GND	28	V_{CC}

867, 869

8-BIT SYNCHRONOUS BIDIRECTIONAL COUNTERS

- 'AS867 has asynchronous clear
- 'AS869 has synchronous clear
- Ripple carry output for N-bit cascading
- Fully programmable with synchronous counting and loading

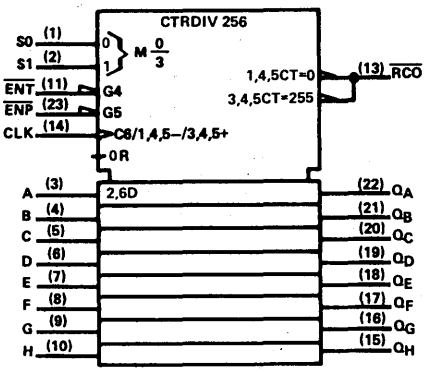
FUNCTION TABLE

S1	S0	FUNCTION
L	L	Clear
L	H	Count Down
H	L	Load
H	H	Count Up

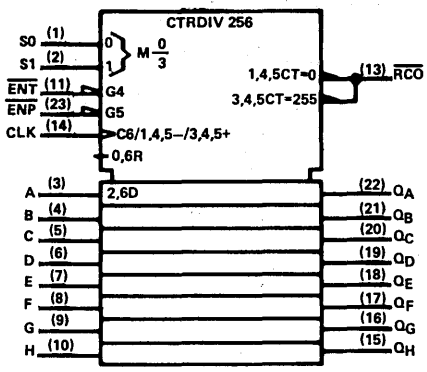
Supersedes table in *1981 Supplement to TTL Data Book*

SN54AS867 (JT,FH) SN74AS867 (NT,FN)
SN54AS869 (JT,FH) SN74AS869 (NT,FN)

logic symbol, 'AS867†



logic symbol, 'AS869†



pin assignments

JT, NT PACKAGES			
1	S0	13	$\overline{RCO}$
2	S1	14	CLK
3	A	15	Q_H
4	B	16	Q_G
5	C	17	Q_F
6	D	18	Q_E
7	E	19	Q_D
8	F	20	Q_C
9	G	21	Q_B
10	H	22	Q_A
11	$\overline{ENT}$	23	$\overline{ENP}$
12	GND	24	V_{CC}

FH, FN PACKAGES			
1	nc	15	nc
2	S0	16	$\overline{RCO}$
3	S1	17	CLK
4	A	18	Q_H
5	B	19	Q_G
6	C	20	Q_F
7	D	21	Q_E
8	nc	22	nc
9	E	23	Q_D
10	F	24	Q_C
11	G	25	Q_B
12	H	26	Q_A
13	$\overline{ENT}$	27	$\overline{ENP}$
14	GND	28	V_{CC}

†Pin numbers shown on logic symbols are for JT and NT packages only.

© IC MASTER 1983

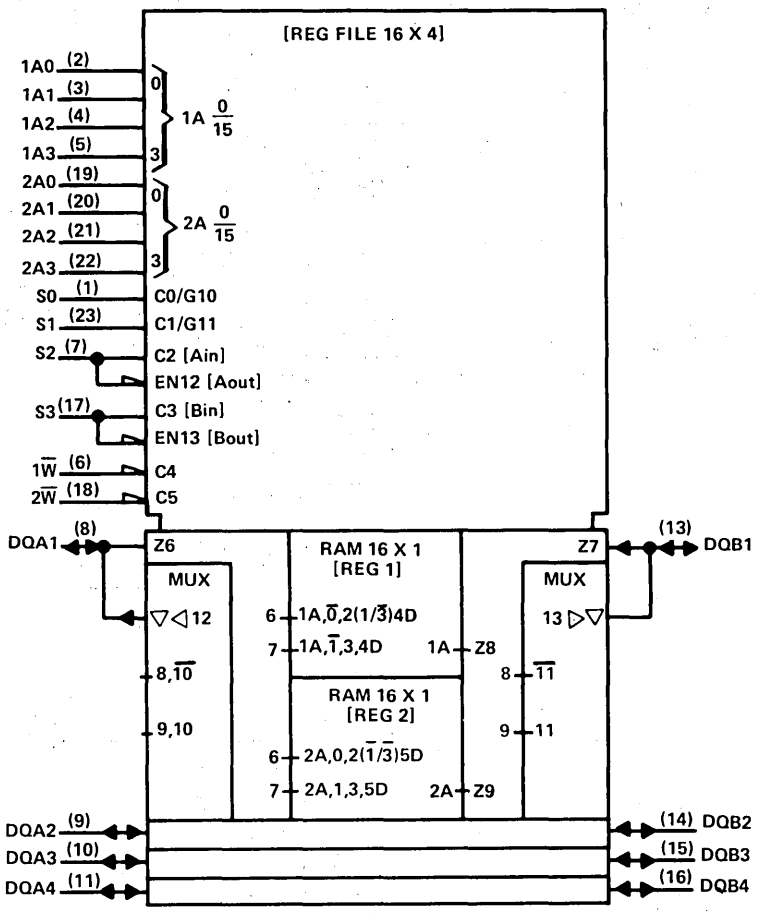
870

DUAL 16-BY-4 REGISTER FILES

- Each register file has individual write/enable controls and address lines
- Has two 4-bit data I/O ports
- 24-pin 300-mil package

SN54AS870 (JT,FH)
SN74AS870 (NT,FN)

logic symbol†



pin assignments

JT, NT PACKAGES			
1	S0	13	DQB1
2	1A0	14	DQB2
3	1A1	15	DQB3
4	1A2	16	DQB4
5	1A3	17	S3
6	1W̄	18	2W̄
7	S2	19	2A0
8	DQA1	20	2A1
9	DQA2	21	2A2
10	DQA3	22	2A3
11	DQA4	23	S1
12	GND	24	V_{CC}

FH, FN PACKAGES			
1	nc	15	nc
2	S0	16	DQB1
3	1A0	17	DQB2
4	1A1	18	DQB3
5	1A2	19	DQB4
6	1A3	20	S3
7	1W̄	21	2W̄
8	nc	22	nc
9	S2	23	2A0
10	DQA1	24	2A1
11	DQA2	25	2A2
12	DQA3	26	2A3
13	DQA4	27	S1
14	GND	28	V_{CC}

†Pin numbers shown on logic symbols are for JT and NT packages only.
nc — no internal connection.

© IC MASTER 1983

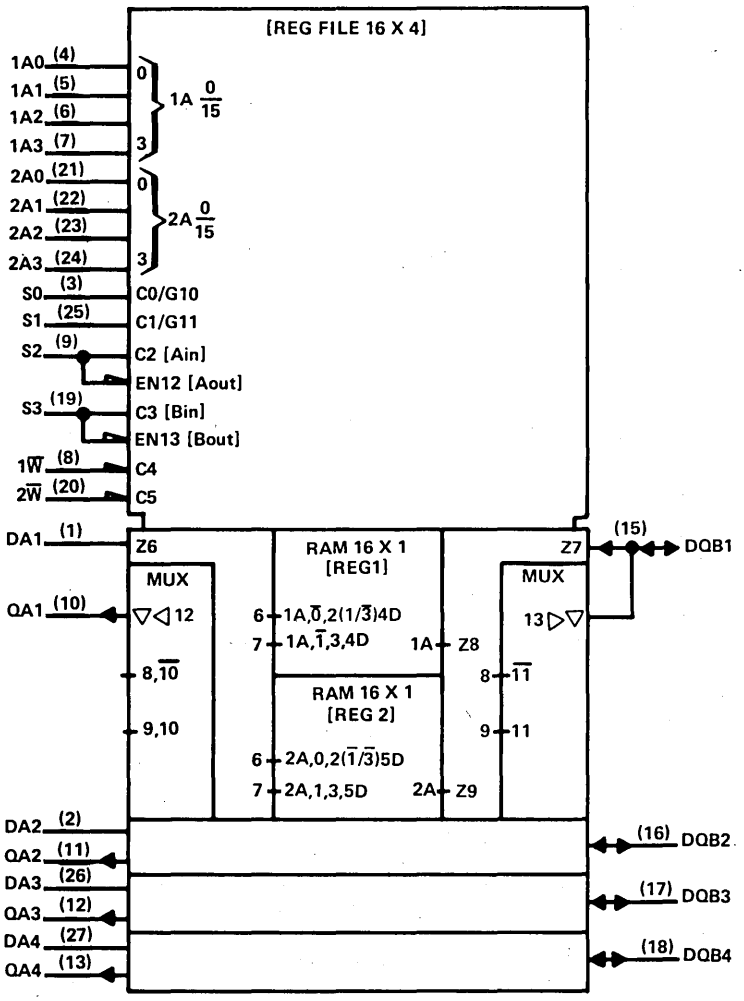
871

DUAL 16-BY-4 REGISTER FILES

- Each register file has individual write/enable controls and address lines
- Has one 4-bit data I/O port; the other 4-bit data word has individual data inputs and data outputs
- 28-pin, 600-mil package

SN54AS871 (J,FH)
SN74AS871 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES			
1	DA1	15	DQB1
2	DA2	16	DQB2
3	S0	17	DQB3
4	1A0	18	DQB4
5	1A1	19	S3
6	1A2	20	$\overline{2W}$
7	1A3	21	2A0
8	$\overline{1W}$	22	2A1
9	S2	23	2A2
10	QA1	24	2A3
11	QA2	25	S1
12	QA3	26	DA3
13	QA4	27	DA4
14	GND	28	V_{CC}

FH, FN PACKAGES			
1	DA1	15	DQB1
2	DA2	16	DQB2
3	S0	17	DQB3
4	1A0	18	DQB4
5	1A1	19	S3
6	1A2	20	$\overline{2W}$
7	1A3	21	2A0
8	$\overline{1W}$	22	2A1
9	S2	23	2A2
10	QA1	24	2A3
11	QA2	25	S1
12	QA3	26	DA3
13	QA4	27	DA4
14	GND	28	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

873

DUAL 4-BIT D-TYPE LATCHES

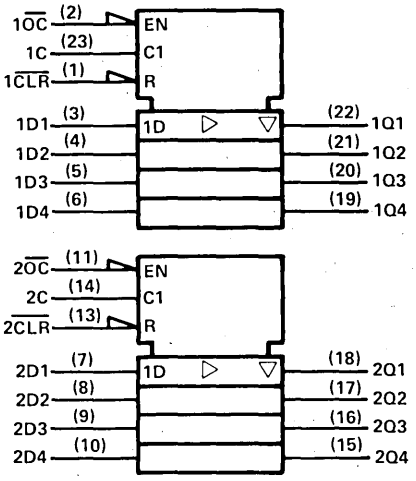
- Three-state buffer-type outputs drive bus lines directly
- Each 4-bit word has enable, clear, and output control inputs

typical performance

TYPE	CLEAR	OUTPUT	DELAY	POWER
'ALS873	LOW	Q	11 ns	67.5 mW

SN54ALS873 (JT,FH) · SN74ALS873 (NT,FN)
SN54AS873 (JT,FH) SN74AS873 (NT,FN)

logic symbol†



pin assignments

JT, NT PACKAGES				FH, FN PACKAGES			
1	1CLR	13	2CLR	1	nc	15	nc
2	1OC	14	2C	2	1CLR	16	2CLR
3	1D1	15	2Q4	3	1OC	17	2C
4	1D2	16	2Q3	4	1D1	18	2Q4
5	1D3	17	2Q2	5	1D2	19	2Q3
6	1D4	18	2Q1	6	1D3	20	2Q2
7	2D1	19	1Q4	7	1D4	21	2Q1
8	2D2	20	1Q3	8	nc	22	nc
9	2D3	21	1Q2	9	2D1	23	1Q4
10	2D4	22	1Q1	10	2D2	24	1Q3
11	2OC	23	1C	11	2D3	25	1Q2
12	GND	24	V_{CC}	12	2D4	26	1Q1
				13	2OC	27	1C
				14	GND	28	V_{CC}

874

DUAL 4-BIT D-TYPE EDGE-TRIGGERED FLIP-FLOPS

- Three-state buffer-type outputs
- Each 4-bit word has clock, clear, and output control inputs

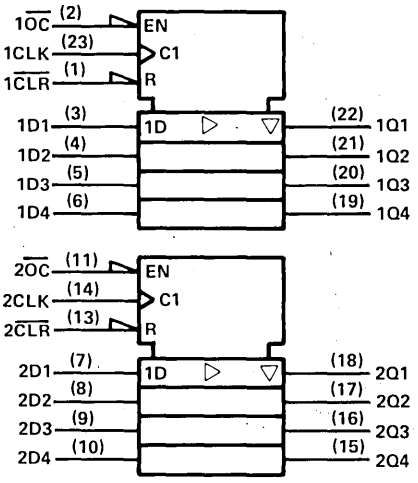
typical performance

TYPE	FREQ	POWER	DATA TIMES	
			SET-UP	HOLD
SN54ALS874	50 MHz	86.7 mW	10 ns↑	4 ns↑
SN74ALS874	50 MHz	86.7 mW	10 ns↑	0 ns↑

↑ Rising edge of clock pulse

SN54ALS874 (JT,FH) SN74ALS874 (NT,FN)
SN54AS874 (JT,FH) SN74AS874 (NT,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1CLR	13	2CLR	1	nc	15	nc
2	1OC	14	2CLK	2	1CLR	16	2CLR
3	1D1	15	2Q4	3	1OC	17	2CLK
4	1D2	16	2Q3	4	1D1	18	2Q4
5	1D3	17	2Q2	5	1D2	19	2Q3
6	1D4	18	2Q1	6	1D3	20	2Q2
7	2D1	19	1Q4	7	1D4	21	2Q1
8	2D2	20	1Q3	8	nc	22	nc
9	2D3	21	1Q2	9	2D1	23	1Q4
10	2D4	22	1Q1	10	2D2	24	1Q3
11	2OC	23	1CLK	11	2D3	25	1Q2
12	GND	24	V_{CC}	12	2D4	26	1Q1
				13	2OC	27	1CLK
				14	GND	28	V_{CC}

†Pin numbers shown on logic symbols are for JT and NT packages only.
nc — no internal connection.

© IC MASTER 1983

876

DUAL 4-BIT D-TYPE EDGE-TRIGGERED FLIP-FLOPS WITH INVERTED OUTPUTS

- Three-state buffer-type outputs drive bus lines directly
- Each 4-bit word has own clock, preset, and output control inputs

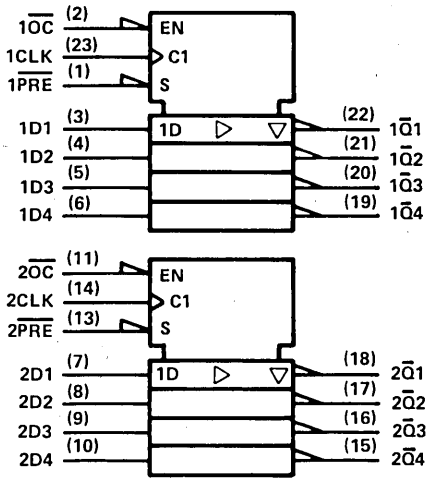
typical performance

TYPE	FREQ	POWER	DATA TIMES	
			SET-UP	HOLD
SN54ALS876	50 MHz	86.7 mW	10 ns↑	4 ns↑
SN74ALS876	50 MHz	86.7 mW	10 ns↑	0 ns↑

↑ Rising edge of clock pulse

SN54ALS876 (JT,FH)
SN54AS876 (JT,FH)
SN74ALS876 (NT,FN)
SN74AS876 (NT,FN)

logic symbol†



pin assignments

JT, NT PACKAGES			
1	1PRE	13	2PRE
2	1OC	14	2CLK
3	1D1	15	2Q4
4	1D2	16	2Q3
5	1D3	17	2Q2
6	1D4	18	2Q1
7	2D1	19	1Q4
8	2D2	20	1Q3
9	2D3	21	1Q2
10	2D4	22	1Q1
11	2OC	23	1CLK
12	GND	24	V_{CC}

FH, FN PACKAGES			
1	nc	15	nc
2	1PRE	16	2PRE
3	1OC	17	2CLK
4	1D1	18	2Q4
5	1D2	19	2Q3
6	1D3	20	2Q2
7	1D4	21	2Q1
8	nc	22	nc
9	2D1	23	1Q4
10	2D2	24	1Q3
11	2D3	25	1Q2
12	2D4	26	1Q1
13	2OC	27	1CLK
14	GND	28	V_{CC}

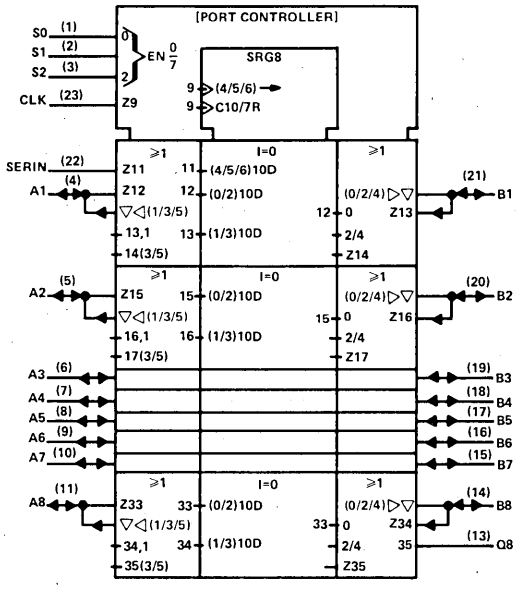
877

8-BIT UNIVERSAL TRANSCEIVER/PORT CONTROLLERS

- 8 selectable transceiver/port functions
- 3-state buffer-type outputs drive bus lines directly
- 24-pin 300-mil package

SN54AS877 (JT,FH)
SN74AS877 (NT,FN)

logic symbol†



pin assignments

JT, NT PACKAGES			
1	S0	13	Q8
2	S1	14	B8
3	S2	15	B7
4	A1	16	B6
5	A2	17	B5
6	A3	18	B4
7	A4	19	B3
8	A5	20	B2
9	A6	21	B1
10	A7	22	SERIN
11	A8	23	CLK
12	GND	24	V_{CC}

FH, FN PACKAGES			
1	nc	15	nc
2	S0	16	Q8
3	S1	17	B8
4	S2	18	B7
5	A1	19	B6
6	A2	20	B5
7	A3	21	B4
8	nc	22	nc
9	A4	23	B3
10	A5	24	B2
11	A6	25	B1
12	A7	26	SERIN
13	A8	27	CLK
14	GND	28	V_{CC}

†Pin numbers shown on logic symbols are for JT and NT packages only.
nc — no internal connection.

© IC MASTER 1983

878

DUAL 4-BIT D-TYPE EDGE-TRIGGERED FLIP-FLOPS

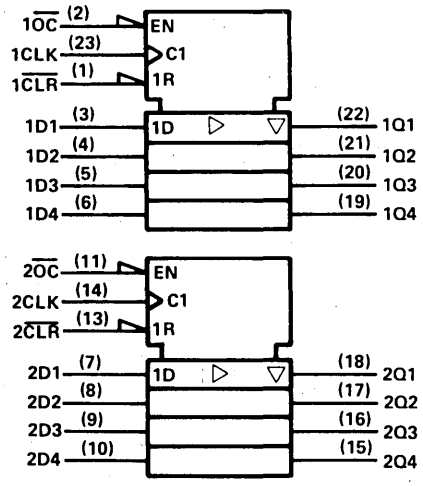
- Three-state buffer-type outputs
- Each 4-bit word has clock, clear, and output control inputs

typical performance

TYPE	FREQ	POWER	DATA TIMES	
			SET-UP	HOLD
SN54ALS878	50 MHz	86.7 mW	10 ns†	4 ns†
SN74ALS878	50 MHz	86.7 mW	10 ns†	0 ns†
SN54AS878				
SN74AS878				

†Rising edge of clock pulse
SN54ALS878 (JT,FH) SN74ALS878 (NT,FN)
SN54AS878 (JT,FH) SN74AS878 (NT,FN)

logic symbol, 'ALS878, 'AS878†



pin assignments

JT, NT PACKAGES			
1	1CLR	13	2CLR
2	1OC	14	2CLK
3	1D1	15	2Q4
4	1D2	16	2Q3
5	1D3	17	2Q2
6	1D4	18	2Q1
7	2D1	19	1Q4
8	2D2	20	1Q3
9	2D3	21	1Q2
10	2D4	22	1Q1
11	2OC	23	1CLK
12	GND	24	V_{CC}

FH, FN PACKAGES			
1	nc	15	nc
2	1CLR	16	2CLR
3	1OC	17	2CLK
4	1D1	18	2Q4
5	1D2	19	2Q3
6	1D3	20	2Q2
7	1D4	21	2Q1
8	nc	22	nc
9	2D1	23	1Q4
10	2D2	24	1Q3
11	2D3	25	1Q2
12	2D4	26	1Q1
13	2OC	27	1CLK
14	GND	28	V_{CC}

879

DUAL 4-BIT D-TYPE EDGE-TRIGGERED FLIP-FLOPS WITH INVERTED OUTPUTS

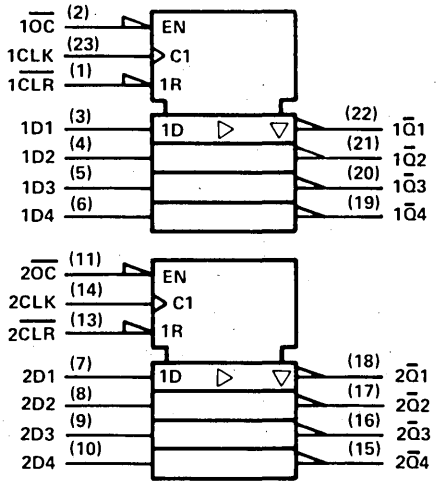
- Three state buffer-type outputs
- Each 4-bit word has clock, clear, and output control inputs.

typical performance

TYPE	FREQ	POWER	DATA TIMES	
			SET-UP	HOLD
SN54ALS879	50 MHz	86.7 mW	10 ns†	4 ns†
SN74ALS879	50 MHz	86.7 mW	10 ns†	0 ns†
SN54AS879				
SN74AS879				

†Rising edge of clock pulse
SN54ALS879 (JT,FH) SN74ALS879 (NT,FN)
SN54AS879 (JT,FH) SN74AS879 (NT,FN)

logic symbol, 'ALS879, 'AS879†



pin assignments

JT, NT PACKAGES			
1	1CLR	13	2CLR
2	1OC	14	2CLK
3	1D1	15	2Q̄4
4	1D2	16	2Q̄3
5	1D3	17	2Q̄2
6	1D4	18	2Q̄1
7	2D1	19	1Q̄4
8	2D2	20	1Q̄3
9	2D3	21	1Q̄2
10	2D4	22	1Q̄1
11	2OC	23	1CLK
12	GND	24	V_{CC}

FH, FN PACKAGES			
1	nc	15	nc
2	1CLR	16	2CLR
3	1OC	17	2CLK
4	1D1	18	2Q̄4
5	1D2	19	2Q̄3
6	1D3	20	2Q̄2
7	1D4	21	2Q̄1
8	nc	22	nc
9	2D1	23	1Q̄4
10	2D2	24	1Q̄3
11	2D3	25	1Q̄2
12	2D4	26	1Q̄1
13	2OC	27	1CLK
14	GND	28	V_{CC}

†Pin numbers shown on logic symbols are for JT and NT packages only.
nc — no internal connection.

© IC MASTER 1983

880

DUAL 4-BIT D-TYPE LATCHES WITH INVERTED OUTPUTS

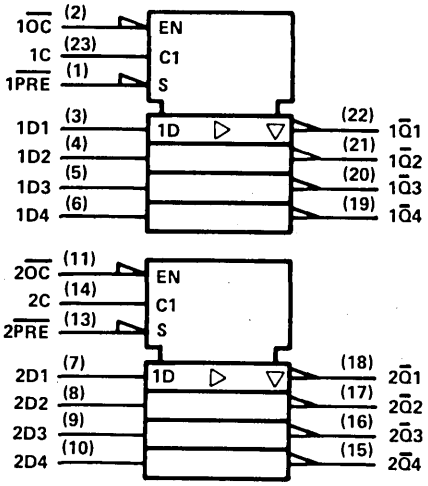
- Three-state buffer-type outputs drive bus lines directly
- Each 4-bit word has enable, preset, and output control inputs

typical performance

TYPE	OUTPUT	DELAY	POWER
'ALS880	$\overline{Q}$	11.5 ns	88 mW

SN54ALS880(JT,FH) SN74ALS880 (NT,FN)
SN54AS880 (JT,FH) SN74AS880 (NT,FN)

logic symbol†



pin assignments

JT, NT PACKAGES				FH, FN PACKAGES			
1	1PRE	13	2PRE	1	nc	15	nc
2	1OC	14	2C	2	1PRE	16	2PRE
3	1D1	15	2Q4	3	1OC	17	2C
4	1D2	16	2Q3	4	1D1	18	2Q4
5	1D3	17	2Q2	5	1D2	19	2Q3
6	1D4	18	2Q1	6	1D3	20	2Q2
7	2D1	19	1Q4	7	1D4	21	2Q1
8	2D2	20	1Q3	8	nc	22	nc
9	2D3	21	1Q2	9	2D1	23	1Q4
10	2D4	22	1Q1	10	2D2	24	1Q3
11	2OC	23	1C	11	2D3	25	1Q2
12	GND	24	V_{CC}	12	2D4	26	1Q1
				13	2OC	27	1C
				14	GND	28	V_{CC}

881

ARITHMETIC LOGIC UNITS/ FUNCTION GENERATORS

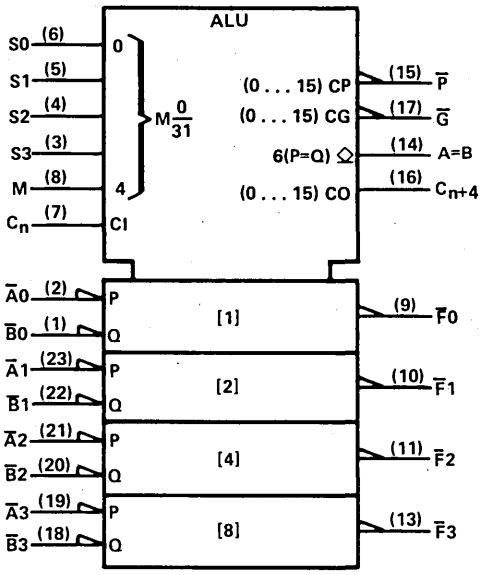
- 4-bit ALU's/Function Generators
- Same operating modes as 'AS181A, 'S181A expanded to include status register checks

typical performance

TYPE	CARRY TIME	16-BIT ADD TIME	TOTAL POWER
'AS881A	7.5 ns	20 ns	560 mW

SN54AS881A (JT,FH)
SN74AS881A (NT,FN)

logic symbol†



pin assignments

JT, NT PACKAGES			
1	$\overline{B}0$	13	$\overline{F}3$
2	$\overline{A}0$	14	A=B
3	S3	15	$\overline{P}$
4	S2	16	C_{n+4}
5	S1	17	$\overline{G}$
6	S0	18	$\overline{B}3$
7	C_n	19	$\overline{A}3$
8	M	20	$\overline{B}2$
9	$\overline{F}0$	21	$\overline{A}2$
10	$\overline{F}1$	22	$\overline{B}1$
11	$\overline{F}2$	23	$\overline{A}1$
12	GND	24	V_{CC}

FH, FN PACKAGES			
1	nc	15	nc
2	$\overline{B}0$	16	$\overline{F}3$
3	$\overline{A}0$	17	A=B
4	S3	18	$\overline{P}$
5	S2	19	C_{n+4}
6	S1	20	$\overline{G}$
7	S0	21	$\overline{B}3$
8	nc	22	nc
9	C_n	23	$\overline{A}3$
10	M	24	$\overline{B}2$
11	$\overline{F}0$	25	$\overline{A}2$
12	$\overline{F}1$	26	$\overline{B}1$
13	$\overline{F}2$	27	$\overline{A}1$
14	GND	28	V_{CC}

†Pin numbers shown on logic symbols are for JT and NT packages only.
nc – no internal connection.

© IC MASTER 1983

882

32-BIT LOOK-AHEAD CARRY GENERATORS

- Directly compatible with 'AS181, 'AS881, and 'S181 ALU's

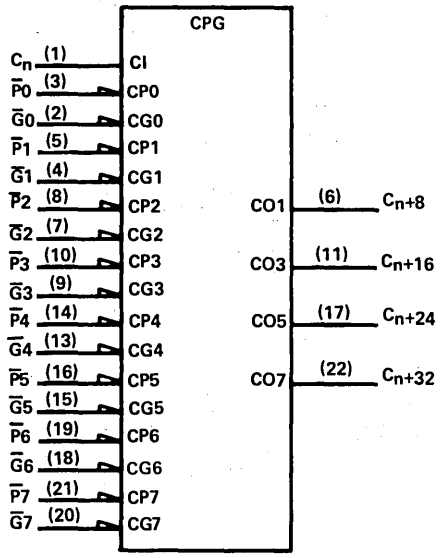
typical performance

TYPE	CARRY TIME	TOTAL POWER
'AS882	8 ns	325 mW

SN54AS882 (JT,FH)

SN74AS882 (NT,FN)

logic symbol†



pin assignments

JT, NT PACKAGES				FH, FN PACKAGES			
1	C_n	13	$\overline{G}4$	1	nc	15	nc
2	$\overline{G}0$	14	$\overline{P}4$	2	C_n	16	$\overline{G}4$
3	$\overline{P}0$	15	$\overline{G}5$	3	$\overline{G}0$	17	$\overline{P}4$
4	$\overline{G}1$	16	$\overline{P}5$	4	$\overline{P}0$	18	$\overline{G}5$
5	$\overline{P}1$	17	C_{n+24}	5	$\overline{G}1$	19	$\overline{P}5$
6	C_{n+8}	18	$\overline{G}6$	6	$\overline{P}1$	20	C_{n+24}
7	$\overline{G}2$	19	$\overline{P}6$	7	C_{n+8}	21	$\overline{G}6$
8	$\overline{P}2$	20	$\overline{G}7$	8	nc	22	nc
9	$\overline{G}3$	21	$\overline{P}7$	9	$\overline{G}2$	23	$\overline{P}6$
10	$\overline{P}3$	22	C_{n+32}	10	$\overline{P}2$	24	$\overline{G}7$
11	C_{n+16}	23	nc	11	$\overline{G}3$	25	$\overline{P}7$
12	GND	24	V_{CC}	12	$\overline{P}3$	26	C_{n+32}
				13	C_{n+16}	27	nc
				14	GND	28	V_{CC}

885

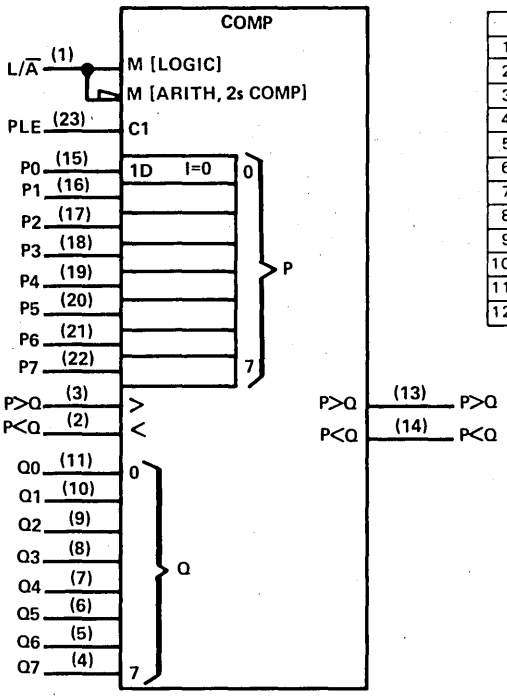
8-BIT MAGNITUDE COMPARATORS

- Choice of logical or arithmetic comparisons
- Latchable P input ports; power clear

SN54AS885 (JT,FH)

SN74AS885 (NT,FN)

logic symbol†



pin assignments

JT, NT PACKAGES				FH, FN PACKAGES			
1	L/$\overline{A}$	13	P>Qout	1	nc	15	nc
2	P<Qin	14	P<Qout	2	L/$\overline{A}$	16	P>Qout
3	P>Qin	15	P0	3	P<Qin	17	P<Qout
4	Q7	16	P1	4	P>Qin	18	P0
5	Q6	17	P2	5	Q7	19	P1
6	Q5	18	P3	6	Q6	20	P2
7	Q4	19	P4	7	Q5	21	P3
8	Q3	20	P5	8	nc	22	nc
9	Q2	21	P6	9	Q4	23	P4
10	Q1	22	P7	10	Q3	24	P5
11	Q0	23	PLE	11	Q2	25	P6
12	GND	24	V_{CC}	12	Q1	26	P7
				13	Q0	27	PLE
				14	GND	28	V_{CC}

†Pin numbers shown on logic symbols are for JT and NT packages only.

nc – no internal connection.

© IC MASTER 1983

1000

QUAD 2-INPUT NAND GATES

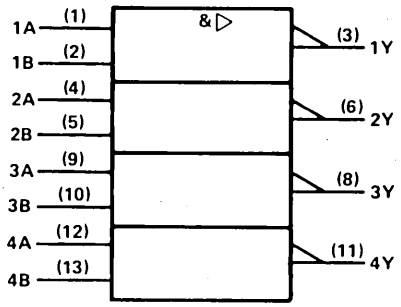
- Increased output drive capability over 'LS00

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT	DELAY	POWER/GATE
SN54ALS1000	12 mA	−1 mA	4 ns	3 mW
SN74ALS1000	24 mA	−2.6 mA	4 ns	3 mW

SN54ALS1000 (J,FH) SN74ALS1000 (N,FN)

logic symbol†



positive logic: $Y = \overline{AB}$

pin assignments

J, N PACKAGES			
1	1A	8	3Y
2	1B	9	3A
3	1Y	10	3B
4	2A	11	4Y
5	2B	12	4A
6	2Y	13	4B
7	GND	14	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1A	12	3Y
3	1B	13	3A
4	1Y	14	3B
5	nc	15	nc
6	2A	16	4Y
7	nc	17	nc
8	2B	18	4A
9	2Y	19	4B
10	GND	20	V_{CC}

1002

QUAD 2-INPUT NOR BUFFER GATES

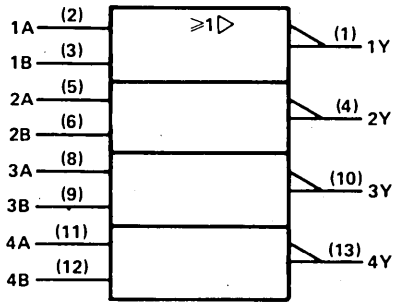
- Increased output drive capability over 'LS02

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT	DELAY	POWER/GATE
SN54ALS1002	12 mA	−1 mA	4 ns	4 mW
SN74ALS1002	24 mA	−2.6 mA	4 ns	4 mW
SN54AS1002				
SN74AS1002				

SN54ALS1002 (J,FH) SN74ALS1002 (N,FN)
SN54AS1002 (J,FH) SN74AS1002 (N,FN)

logic symbol†



positive logic: $Y = \overline{A+B}$

pin assignments

J, N PACKAGES			
1	1Y	8	3A
2	1A	9	3B
3	1B	10	3Y
4	2Y	11	4A
5	2A	12	4B
6	2B	13	4Y
7	GND	14	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1Y	12	3A
3	1A	13	3B
4	1B	14	3Y
5	nc	15	nc
6	2Y	16	4A
7	nc	17	nc
8	2A	18	4B
9	2B	19	4Y
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

1003

QUAD 2-INPUT NAND BUFFER GATES WITH OPEN-COLLECTOR OUTPUTS

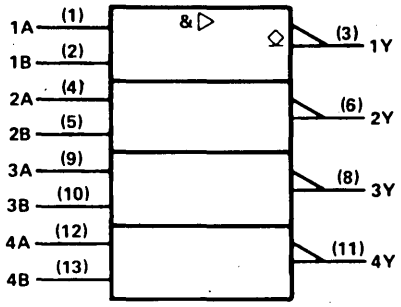
- Increased drive capability over 'LS03

typical performance

TYPE	HIGH-LEVEL OUTPUT VOLTAGE	LOW-LEVEL OUTPUT CURRENT	DELAY	POWER/GATE
SN54ALS1003	5.5 V	12 mA	14.5 ns	3 mW
SN74ALS1003	5.5 V	24 mA	14.5 ns	3 mW

SN54ALS1003 (J,FH) SN74ALS1003 (N,FN)

logic symbol†



positive logic: $Y = \overline{AB}$

pin assignments

J, N PACKAGES			
1	1A	8	3Y
2	1B	9	3A
3	1Y	10	3B
4	2A	11	4Y
5	2B	12	4A
6	2Y	13	4B
7	GND	14	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1A	12	3Y
3	1B	13	3A
4	1Y	14	3B
5	nc	15	nc
6	2A	16	4Y
7	nc	17	nc
8	2B	18	4A
9	2Y	19	4B
10	GND	20	V_{CC}

1004

HEX INVERTER BUFFER GATES

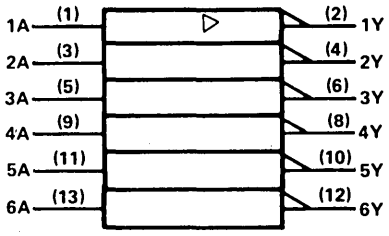
- Increased drive capability over LS04

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT
SN54ALS1004	12 mA	−1 mA
SN74ALS1004	24 mA	−2.6 mA

SN54ALS1004 (J,FH) SN74ALS1004 (N,FN)

logic symbol†



positive logic: $Y = \overline{A}$

pin assignments

J, N PACKAGES			
1	1A	8	4Y
2	1Y	9	4A
3	2A	10	5Y
4	2Y	11	5A
5	3A	12	6Y
6	3Y	13	6A
7	GND	14	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1A	12	4Y
3	1Y	13	4A
4	2A	14	5Y
5	nc	15	nc
6	2Y	16	5A
7	nc	17	nc
8	3A	18	6Y
9	3Y	19	6A
10	GND	20	V_{CC}

1005

HEX INVERTER BUFFER GATES WITH OPEN-COLLECTOR OUTPUTS

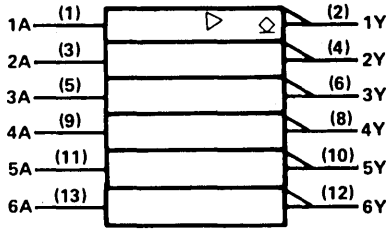
- Increased drive capability over LS05

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT
SN54ALS1005	12 mA	−1 mA
SN74ALS1005	24 mA	−2.6 mA

SN54ALS1005 (J,FH) SN74ALS1005 (N,FN)

logic symbol†



positive logic: $Y = \overline{A}$

pin assignments

J, N PACKAGES			
1	1A	8	4Y
2	1Y	9	4A
3	2A	10	5Y
4	2Y	11	5A
5	3A	12	6Y
6	3Y	13	6A
7	GND	14	V_{CC}

FH, FN PACKAGES			
1	nc	11	nc
2	1A	12	4Y
3	1Y	13	4A
4	2A	14	5Y
5	nc	15	nc
6	2Y	16	5A
7	nc	17	nc
8	3A	18	6Y
9	3Y	19	6A
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

1008

QUADRUPLE 2-INPUT POSITIVE-AND BUFFER GATES

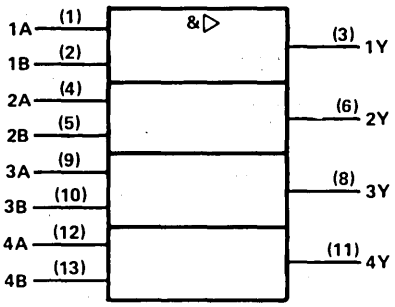
- Increased drive capability over LS08

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT
SN54ALS1008	12 mA	−1 MA
SN74ALS1008	24 mA	−2.6 mA
SN54AS1008		
SN74AS1008		

SN54ALS1008 (J,FH) SN74ALS1008 (N,FN)
SN54AS1008 (J,FH) SN74AS1008 (N,FN)

logic symbol†



positive logic: Y = AB

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

1010

TRIPLE 3-INPUT POSITIVE-NAND BUFFER GATES

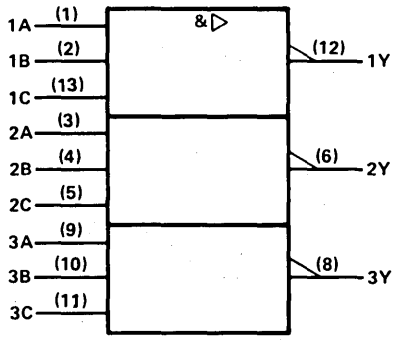
- Increased drive capability over LS10

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT
SN54ALS1010	12 mA	−1 mA
SN74ALS1010	24 mA	−2.6 mA

SN54ALS1010 (J,FH) SN74ALS1010 (N,FN)

logic symbol†



positive logic: $Y = \overline{ABC}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	2A	10	3B	3	1B	13	3A
4	2B	11	3C	4	2A	14	3B
5	2C	12	1Y	5	nc	15	nc
6	2Y	13	1C	6	2B	16	3C
7	GND	14	V_{CC}	7	nc	17	nc
				8	2C	18	1Y
				9	2Y	19	1C
				10	GND	20	V_{CC}

1011

TRIPLE 3-INPUT POSITIVE-AND BUFFER GATES

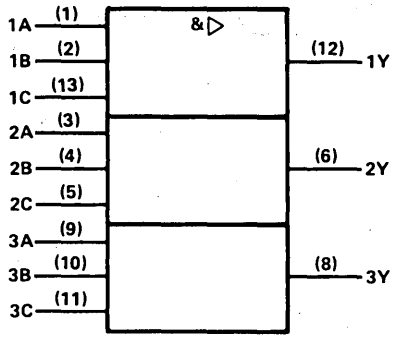
- Increased drive capability over LS11

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT
SN54ALS1011	12 mA	−1 mA
SN74ALS1011	24 mA	−2.6 mA

SN54ALS1011 (J,FH) SN74ALS1011 (N,FN)

logic symbol†



positive logic: Y = ABC

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	2A	10	3B	3	1B	13	3A
4	2B	11	3C	4	2A	14	3B
5	2C	12	1Y	5	nc	15	nc
6	2Y	13	1C	6	2B	16	3C
7	GND	14	V_{CC}	7	nc	17	nc
				8	2C	18	1Y
				9	2Y	19	1C
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

1020

DUAL 4-INPUT NAND BUFFER GATES

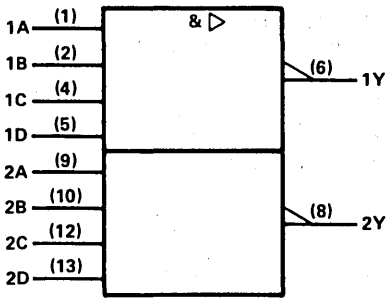
- Increased drive capability over LS20

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT
SN54ALS1020	12 mA	−1 mA
SN74ALS1020	24 mA	−2.6 mA

SN54ALS1020 (J,FH) SN74ALS1020 (N,FN)

logic symbol†



powitive logic: $Y = \overline{ABCD}$

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	2Y	1	nc	11	nc
2	1B	9	2A	2	1A	12	2Y
3	nc	10	2B	3	1B	13	2A
4	1C	11	nc	4	nc	14	2B
5	1D	12	2C	5	nc	15	nc
6	1Y	13	2D	6	1C	16	nc
7	GND	14	V_{CC}	7	nc	17	nc
				8	1D	18	2C
				9	1Y	19	2D
				10	GND	20	V_{CC}

1032

QUADRUPLE 2-INPUT POSITIVE-OR BUFFER GATE

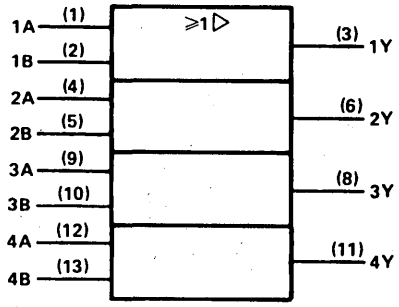
- Increased drive capability over LS32

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT
SN54ALS1032	12 mA	−1 mA
SN74ALS1032	24 mA	−2.6 mA
SN54AS1032		
SN74AS1032		

SN54ALS1032(J,FH) SN74ALS1032 (N,FN)
SN54AS1032 (J,FH) SN74AS1032 (N,FN)

logic symbol†



positive logic: Y = A+B

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	3Y	1	nc	11	nc
2	1B	9	3A	2	1A	12	3Y
3	1Y	10	3B	3	1B	13	3A
4	2A	11	4Y	4	1Y	14	3B
5	2B	12	4A	5	nc	15	nc
6	2Y	13	4B	6	2A	16	4Y
7	GND	14	V_{CC}	7	nc	17	nc
				8	2B	18	4A
				9	2Y	19	4B
				10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

1034

HEX BUFFERS

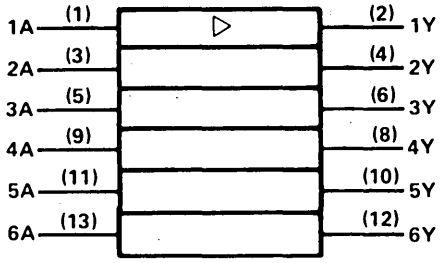
- Non-inverting outputs

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT CURRENT
SN54ALS1034	12 mA	−1 mA
SN74ALS1034	24 mA	−2.6 mA
SN54AS1034		
SN74AS1034		

SN54ALS1034 (J,FH) SN74ALS1034 (N,FN)
SN54AS1034 (J,FH) SN74AS1034 (N,FN)

logic symbol†



positive logic Y = A

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	4Y	1	nc	11	nc
2	1Y	9	4A	2	1A	12	4Y
3	2A	10	5Y	3	1Y	13	4A
4	2Y	11	5A	4	2A	14	5Y
5	3A	12	6Y	5	nc	15	nc
6	3Y	13	6A	6	2Y	16	5A
7	GND	14	V_{CC}	7	nc	17	nc
				8	3A	18	6Y
				9	3Y	19	6A
				10	GND	20	V_{CC}

1035

HEX BUFFERS WITH OPEN-COLLECTOR OUTPUTS

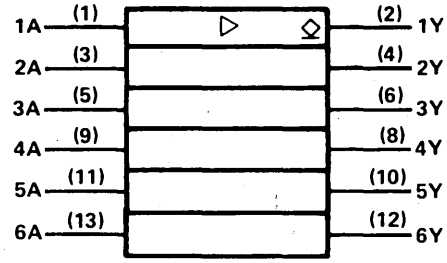
- Non-inverting outputs

typical performance

TYPE	LOW-LEVEL OUTPUT CURRENT	HIGH-LEVEL OUTPUT VOLTAGE
SN54ALS1035	12 mA	5.5 V
SN74ALS1035	24 mA	5.5 V

SN54ALS1035 (J,FH) SN74ALS1035 (N,FN)

logic symbol†



Positive logic Y = A

pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1A	8	4Y	1	nc	11	nc
2	1Y	9	4A	2	1A	12	4Y
3	2A	10	5Y	3	1Y	13	4A
4	2Y	11	5A	4	2A	14	5Y
5	3A	12	6Y	5	nc	15	nc
6	3Y	13	6A	6	2Y	16	5A
7	GND	14	V_{CC}	7	nc	17	nc
				8	3A	18	6Y
				9	3Y	19	6A
				10	GND	20	V_{CC}

†Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

1240

OCTAL BUFFERS/LINE DRIVERS/LINE RECEIVERS
(inverted three-state outputs)

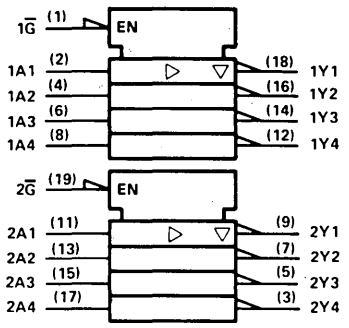
- Low power version of 'ALS240, AS240

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS1240	9	−12 mA	8 mA	47.5 mW
SN74ALS1240	9	−15 mA	16 mA	
SN74ALS1240-1	9	−15 mA	24 mA	

SN54ALS1240 (J,FH) SN74ALS1240 (N, FN)
SN74ALS1240-1 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1G̅	11	2A1	1	1G̅	11	2A1
2	1A1	12	1Y4	2	1A1	12	1Y4
3	2Y4	13	2A2	3	2Y4	13	2A2
4	1A2	14	1Y3	4	1A2	14	1Y3
5	2Y3	15	2A3	5	2Y3	15	2A3
6	1A3	16	1Y2	6	1A3	16	1Y2
7	2Y2	17	2A4	7	2Y2	17	2A4
8	1A4	18	1Y1	8	1A4	18	1Y1
9	2Y1	19	2G̅	9	2Y1	19	2G̅
10	GND	20	V_{CC}	10	GND	20	V_{CC}

1241

OCTAL BUFFERS/LINE DRIVERS/LINE RECEIVERS
(non-inverted three-state outputs)

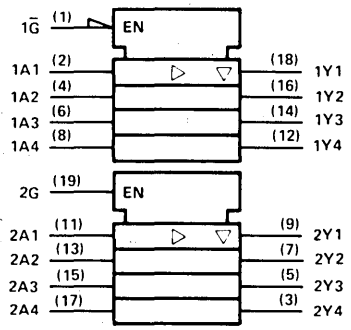
- Low power version of 'ASL241, LS241

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS1241	9	−12 mA	8 mA	47.5 mW
SN74ALS1241	9	−15 mA	16 mA	
SN74ALS1241-1	9	−15 mA	24 mA	

SN54ALS1241 (J,FH) SN74ALS1241 (N,FN)
SN74ALS1241-1 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1G̅	11	2A1	1	1G̅	11	2A1
2	1A1	12	1Y4	2	1A1	12	1Y4
3	2Y4	13	2A2	3	2Y4	13	2A2
4	1A2	14	1Y3	4	1A2	14	1Y3
5	2Y3	15	2A3	5	2Y3	15	2A3
6	1A3	16	1Y2	6	1A3	16	1Y2
7	2Y2	17	2A4	7	2Y2	17	2A4
8	1A4	18	1Y1	8	1A4	18	1Y1
9	2Y1	19	2G	9	2Y1	19	2G
10	GND	20	V_{CC}	10	GND	20	V_{CC}

1242

QUADRUPLE BUS TRANSCEIVERS
(inverted three-state outputs)

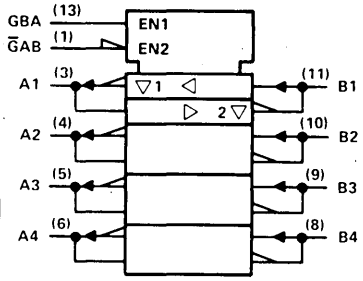
- Low power version of ALS242, LS242

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS1242		−12 mA	8 mA	
SN74ALS1242		−15 mA	16 mA	
SN74ALS1242-1		−15 mA	24 mA	

SN54ALS1242 (J,FH) SN74ALS1242 (N, FN)
SN74ALS1242-1 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	G̅AB	8	B4	1	nc	11	nc
2	nc	9	B3	2	G̅AB	12	B4
3	A1	10	B2	3	nc	13	B3
4	A2	11	B1	4	A1	14	B2
5	A3	12	nc	5	nc	15	nc
6	A4	13	GBA	6	A2	16	B1
7	GND	14	V_{CC}	7	nc	17	nc
				8	A3	18	nc
				9	A4	19	GBA
				10	GND	20	V_{CC}

†Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

1243

QUADRUPLE BUS TRANSCEIVERS
(non-inverted three-state outputs)

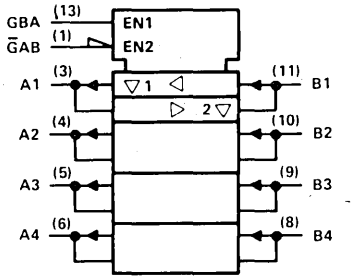
- Low power version of ALS243, LS243

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS1243		−12 mA	8 mA	
SN74ALS1243		−15 mA	16 mA	
SN74ALS1243-1		−15 mA	24 mA	

SN54ALS1243 (J,FH) SN74ALS1243 (N,FN)
SN74ALS1243-1 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	GAB	8	B4	1	nc	11	nc
2	nc	9	B3	2	GAB	12	B4
3	A1	10	B2	3	nc	13	B3
4	A2	11	B1	4	A1	14	B2
5	A3	12	nc	5	nc	15	nc
6	A4	13	GBA	6	A2	16	B1
7	GND	14	V_{CC}	7	nc	17	nc
				8	A3	18	nc
				9	A4	19	GBA
				10	GND	20	V_{CC}

1244

OCTAL BUFFERS/LINE DRIVERS/LINE RECEIVERS
(non-inverted three-state outputs)

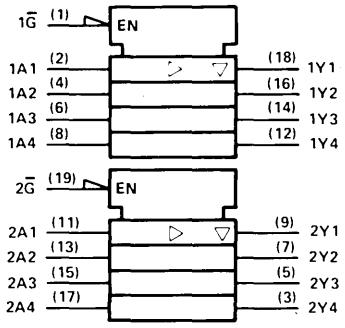
- Low power version of ALS244, LS244

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS1244	9 ns	−12 mA	8 mA	45 mW
SN74ALs1244	9 ns	−15 mA	16 mA	
SN74ALS1244-1	9 ns	−15 mA	24 mA	

SN54ALS1244 (J,FH) SN74ALS1244 (N,FN)
SN74ALS1244-1 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	1G	11	2A1	1	1G	11	2A1
2	1A1	12	1Y4	2	1A1	12	1Y4
3	2Y4	13	2A2	3	2Y4	13	2A2
4	1A2	14	1Y3	4	1A2	14	1Y3
5	2Y3	15	2A3	5	2Y3	15	2A3
6	1A3	16	1Y2	6	1A3	16	1Y2
7	2Y2	17	2A4	7	2Y2	17	2A4
8	1A4	18	1Y1	8	1A4	18	1Y1
9	2Y1	19	2G	9	2Y1	19	2G
10	GND	20	V_{CC}	10	GND	20	V_{CC}

1245

OCTAL BUS TRANSCEIVERS
(non-inverted three-state outputs)

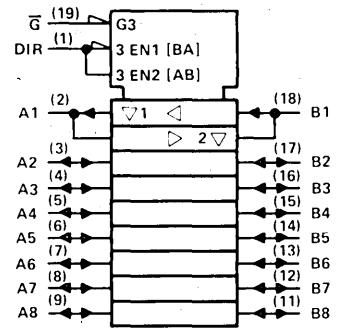
- Low power version of ALS245, LS245

typical performance

TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT	POWER DISSIPATION
SN54ALS1245	8	−12 mA	8 mA	113 mW
SN74ALS1245	8	−15 mA	16 mA	
SN74ALS1245-1	8	−15 mA	24 mA	

SN54ALS1245 (J,FH) SN74ALS1245 (N,FN)
SN74ALS1245-1 (N,FN)

logic symbol†



pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	DIR	11	B8	1	DIR	11	B8
2	A1	12	B7	2	A1	12	B7
3	A2	13	B6	3	A2	13	B6
4	A3	14	B5	4	A3	14	B5
5	A4	15	B4	5	A4	15	B4
6	A5	16	B3	6	A5	16	B3
7	A6	17	B2	7	A6	17	B2
8	A7	18	B1	8	A7	18	B1
9	A8	19	G	9	A8	19	G
10	GND	20	V_{CC}	10	GND	20	V_{CC}

†Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

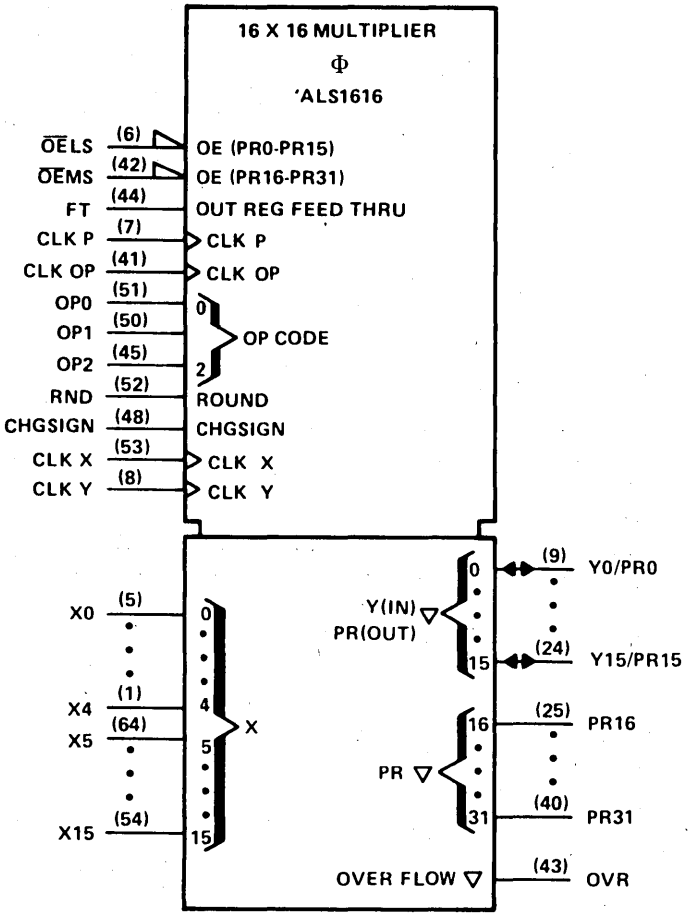
© IC MASTER 1983

1616

16-×-16-BIT MULTIMODE MULTIPLIERS

- Multiplies Any Combination of Unsigned, Signed, Integer, or Fractional Inputs
- Registered Inputs and Outputs
- Comparable to TRW's MPY-16HJ
- Choice of Single-Signed, Double-Signed, Unsigned, or Signed Fractionally Adjusted Output
- Overflow Detected if a Combination of Input Data and/or Output Formats Result in a Number that Cannot be Represented
- Rounding is Provided for Both Integer and Fractional Results
- Flexible Input-Output Format Aids in Expansion to Multiple Precision Results
- 55 ns Typical Unclocked Multiply Time
- Power Dissipation Approximately 1.5 W
- 3-State Outputs
- Ideal for Signal Processing, Including Digital Filters, FFTs, and Automatic Line Integration
- Output may be Complemented
- Package Options Include Both Plastic and Ceramic Chip Carriers in Addition to Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

logic symbol



pin assignments

JD PACKAGE			
1	X4	33	PR24
2	X3	34	PR25
3	X2	35	PR26
4	X1	36	PR27
5	X0	27	PR28
6	OELS	38	PR29
7	CLKP	39	PR30
8	CLKY	40	PR31
9	Y0/PRO	41	CLKOP
10	Y1/PR1	42	OEMS
11	Y2/PR2	43	OVR
12	Y3/PR3	44	FT
13	Y4/PR4	45	OP2
14	Y5/PR5	46	GND
15	Y6/PR6	47	GND
16	Y7/PR7	48	CHGSIGN
17	Y8/PR8	49	V_{CC}
18	Y9/PR9	50	OP1
19	Y10/PR10	51	OP0
20	Y11/PR11	52	RND
21	Y12/PR12	53	CLKX
22	Y13/PR13	54	X15
23	Y14/PR14	55	X14
24	Y15/PR15	56	X13
25	PR16	57	X12
26	PR17	58	X11
27	PR18	59	X10
28	PR19	60	X9
29	PR20	61	X8
20	PR21	62	X7
31	PR22	63	X6
32	PR23	64	X5

For chip carrier information, contact the factory.

SN54ALS1616 (JD) SN74ALS1616 (JD)

© IC MASTER 1983

1620, 1621, 1622, 1623

OCTAL BUS TRANSCEIVERS

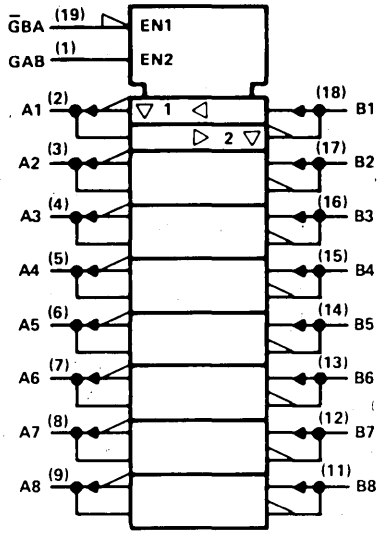
- Bidirectional bus transceivers
- Low power version of ALS 620, 621, 622, 623

typical performance

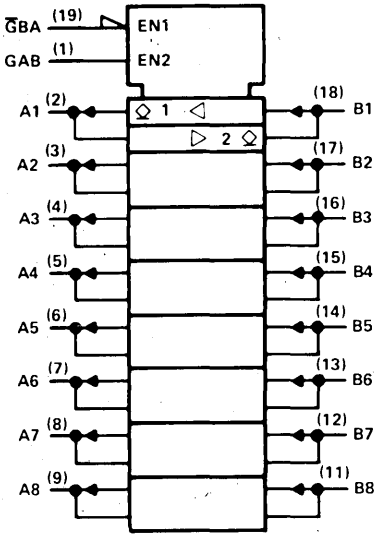
TYPE	OUTPUT	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54ALS1620	3-State	−12	8 mA
SN74ALS1620	3-State	−15	16 mA
SN74ALS1620-1	3-State	−15	24 mA
SN54ALS1621	O-C	N/A	8 mA
SN74ALS1621	O-C	N/A	16 mA
SN74ALS1621-1	O-C	N/A	24 mA
SN54ALS1622	O-C	N/A	8 mA
SN74ALS1622	O-C	N/A	16 mA
SN74ALS1622-1	O-C	N/A	24 mA
SN54ALS1623	3-State	−12	8 mA
SN74ALS1623	3-State	−15	16 mA
SN74ALS1623-1	3-State	−15	24 mA

SN54ALS1620 (J,FH) SN74ALS1620 (N,FN)
SN74ALS1620-1 (N,FN)
SN54ALS1621 (J,FH) SN74ALS1621 (N,FN)
SN74ALS1621-1 (N,FN)
SN54ALS1622 (J,FH) SN74ALS1622 (N,FN)
SN74ALS1622-1 (N,FN)
SN54ALS1623 (J,FH) SN74ALS1623 (N,FN)
SN74ALS1623-1 (N,FN)

logic symbol, 'ALS1620, 'LS1620†



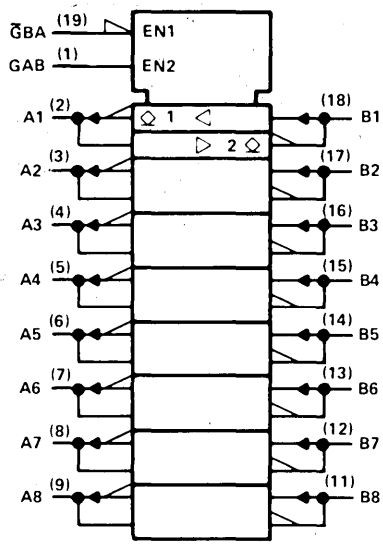
logic symbol, 'ALS1621, 'LS1621†



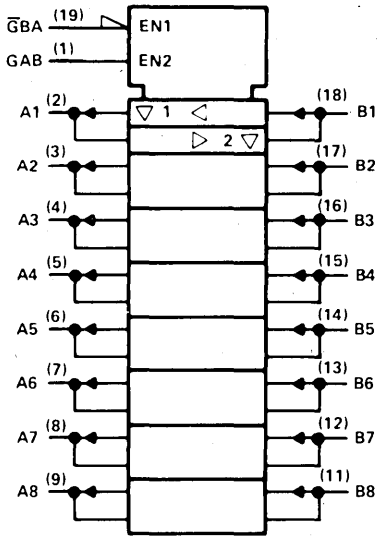
pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	GAB	11	B8	1	GAB	11	B8
2	A1	12	B7	2	A1	12	B7
3	A2	13	B6	3	A2	13	B6
4	A3	14	B5	4	A3	14	B5
5	A4	15	B4	5	A4	15	B4
6	A5	16	B3	6	A5	16	B3
7	A6	17	B2	7	A6	17	B2
8	A7	18	B1	8	A7	18	B1
9	A8	19	GBA	9	A8	19	GBA
10	GND	20	V_{CC}	10	GND	20	V_{CC}

logic symbol, 'ALS1622, 'LS1622†



logic symbol, 'ALS1623, 'LS1623†



†Pin numbers shown on logic symbols are for J and N packages only.

nc no internal connection.

© IC MASTER 1983

1638, 1639

OCTAL BUS TRANSCEIVERS

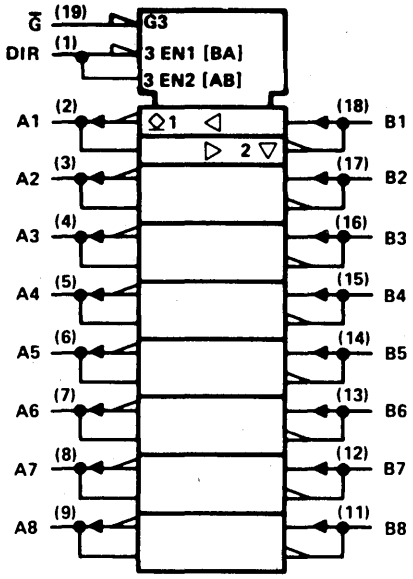
- Bidirectional bus transceivers
- "A" bus outputs are open-collector: "B" bus outputs are three-state
- 'ALS1638—inverting logic
- 'ALS1639—true logic
- Low power versions of 'ALS638, 'ALS639

typical performance

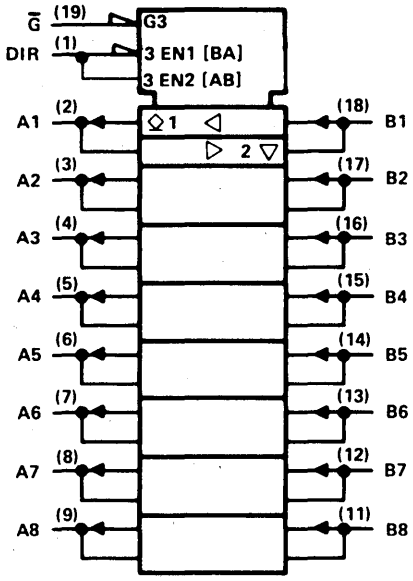
TYPE	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54ALS1638	7 ns	−12 mA	8 mA
SN74ALS1638	7 ns	−15 mA	16 mA
SN74ALS1638-1	7 ns	−15 mA	24 mA
SN54ALS1639	8 ns	−12 mA	8 mA
SN74ALS1639	8 ns	−15 mA	16 mA
SN74ALS1639-1	8 ns	−15 mA	24 mA

SN54ALS1638 (J,FH)
SN54ALS1639 (J,FH)
SN74ALS1638 (N,FN)
SN74ALS1639 (N,FN)
SN74ALS1638-1 (N,FN)
SN74ALS1639-1 (N,FN)

logic symbol, 'ALS1638†



logic symbol, 'ALS1639†



pin assignments

J, N PACKAGES			
1	DIR	11	B8
2	A1	12	B7
3	A2	13	B6
4	A3	14	B5
5	A4	15	B4
6	A5	16	B3
7	A6	17	B2
8	A7	18	B1
9	A8	19	$\overline{G}$
10	GND	20	V_{CC}

FH, FN PACKAGES			
1	DIR	11	B8
2	A1	12	B7
3	A2	13	B6
4	A3	14	B5
5	A4	15	B4
6	A5	16	B3
7	A6	17	B2
8	A7	18	B1
9	A8	19	$\overline{G}$
10	GND	20	V_{CC}

† Pin numbers shown on logic symbols are for J and N packages only.
nc — no internal connection.

© IC MASTER 1983

1640, 1641, 1642
1643, 1644, 1645

OCTAL BUS TRANSCEIVERS

- Low power versions of 'ALS640, 'ALS641, 'ALS642 'ALS643, 'ALS644, 'ALS645

typical performance

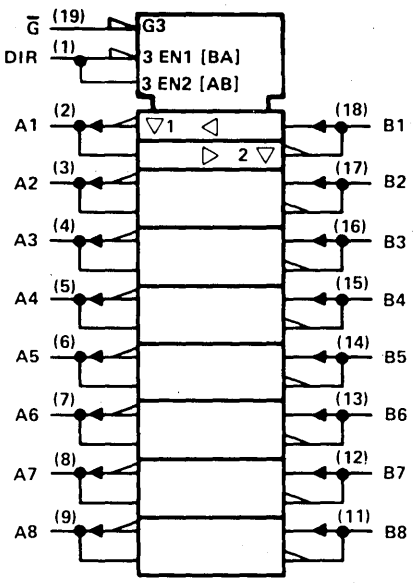
TYPE	OUTPUT	DELAY	MAX SOURCE CURRENT	MAX SINK CURRENT
SN54ALS1640	3-State	7 ns	−12 mA	8 mA
SN74ALS1640	3-State	7 ns	−15 mA	16 mA
SN74ALS1640-1	3-State	7 ns	−15 mA	24 mA
SN54ALS1641	O-C		N/A	8 mA
SN74ALS1641	O-C		N/A	16 mA
SN74ALS1641-1	O-C		N/A	24 mA
SN54ALS1642	O-C		N/A	8 mA
SN74ALS1642	O-C		N/A	16 mA
SN74ALS1642-1	O-C		N/A	24 mA
SN54ALS1643	3-State		−12 mA	8 mA
SN74ALS1643	3-State		−15 mA	16 mA
SN74ALS1643-1	3-State		−15 mA	24 mA
SN54ALS1644	O-C		N/A	8 mA
SN74ALS1644	O-C		N/A	16 mA
SN74ALS1644-1	O-C		N/A	24 mA
SN54ALS1645	3-State	10 ns	−12 mA	8 mA
SN74ALS1645	3-State	10 ns	−15 mA	16 mA
SN74ALS1645-1	3-State	10 ns	−15 mA	24 mA

SN54ALS1640 (J,FH) SN74ALS1640 (N,FN)
SN54ALS1641 (J,FH) SN74ALS1641 (N,FN)
SN54ALS1642 (J,FH) SN74ALS1642 (N,FN)
SN54ALS1643 (J,FH) SN74ALS1643 (N,FN)
SN54ALS1644 (J,FH) SN74ALS1644 (N,FN)
SN54ALS1645 (J,FH) SN74ALS1645 (N,FN)
SN74ALS1640-1 (N,FN)
SN74ALS1641-1 (N,FN)
SN74ALS1642-1 (N,FN)
SN74ALS1643-1 (N,FN)
SN74ALS1644-1 (N,FN)
SN74ALS1645-1 (N,FN)

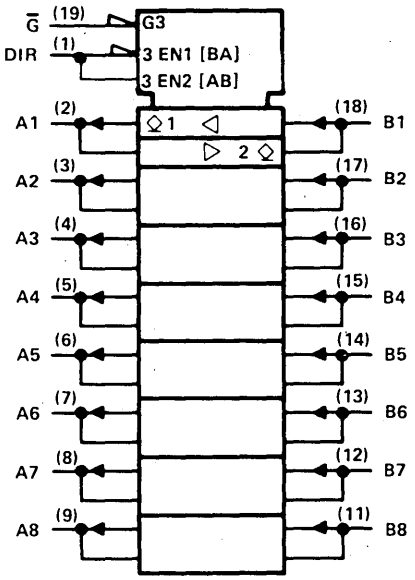
pin assignments

J, N PACKAGES				FH, FN PACKAGES			
1	DIR	11	B8	1	DIR	11	B8
2	A1	12	B7	2	A1	12	B7
3	A2	13	B6	3	A2	13	B6
4	A3	14	B5	4	A3	14	B5
5	A4	15	B4	5	A4	15	B4
6	A5	16	B3	6	A5	16	B3
7	A6	17	B2	7	A6	17	B2
8	A7	18	B1	8	A7	18	B1
9	A8	19	$\overline{G}$	9	A8	19	$\overline{G}$
10	GND	20	V_{CC}	10	GND	20	V_{CC}

logic symbol, 'ALS1640†



logic symbol, 'ALS1641†

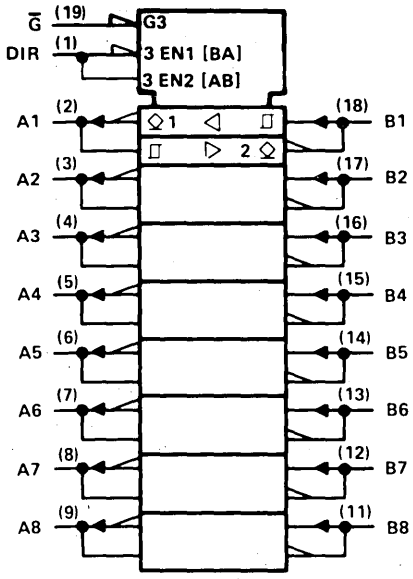


†Pin numbers shown on logic symbols are for J and N packages only.
nc no internal connection.

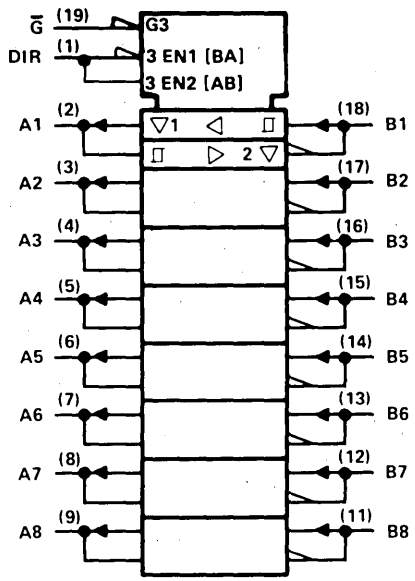
© IC MASTER 1983

1640, 1641, 1642
1643, 1644, 1645 continued

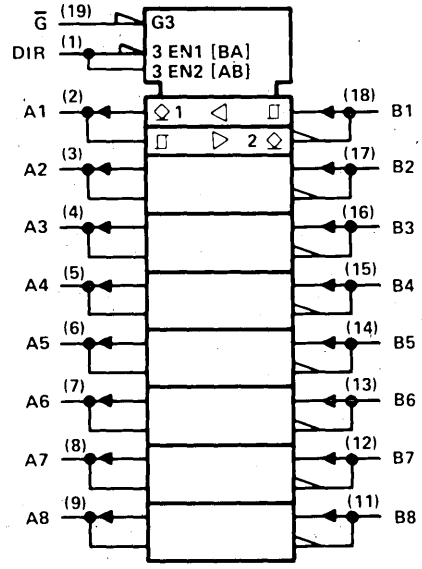
logic symbol, 'ALS1642†



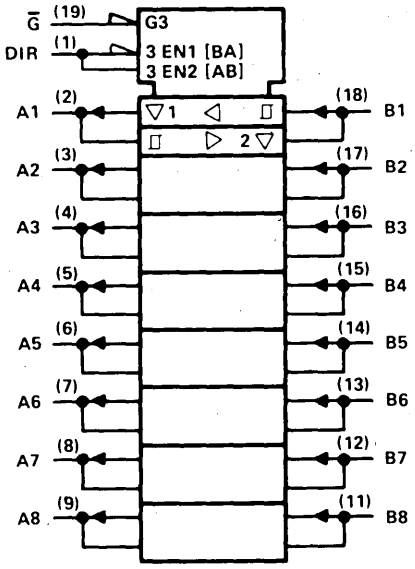
logic symbol, 'ALS1643†



logic symbol, 'ALS1644†



logic symbol, 'ALS1645†



†Pin numbers shown on logic symbols are for J and N packages only.

© IC MASTER 1983

'PL16L8

FIELD-PROGRAMMABLE LOGIC, FIXED-OR ARRAYS

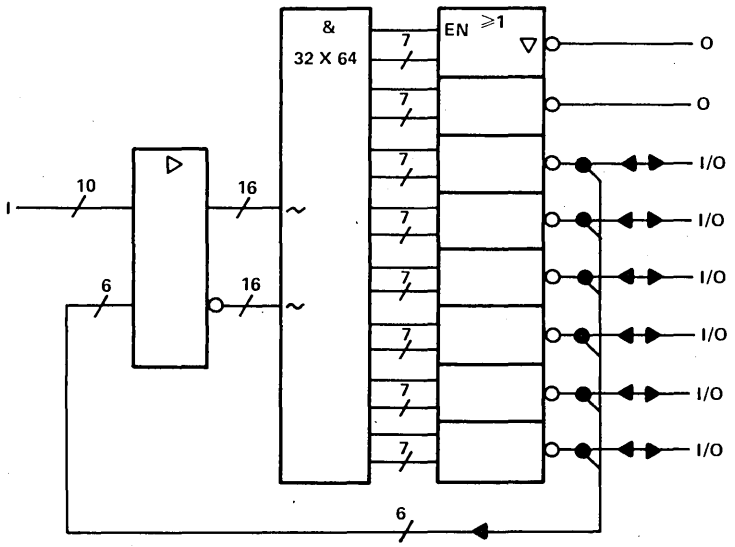
- Octal 16-input AND-OR-INVERT gate array

pin assignments

J, N PACKAGES			
1	I	11	I
2	I	12	O
3	I	13	I/O
4	I	14	I/O
5	I	15	I/O
6	I	16	I/O
7	I	17	I/O
8	I	18	I/O
9	I	19	O
10	GND	20	V_{CC}

SN54PL16L8 (J) SN74PL16L8 (J,N)

functional block diagram



~denotes fused inputs

'PL16R4

FIELD-PROGRAMMABLE LOGIC, FIXED-OR ARRAYS

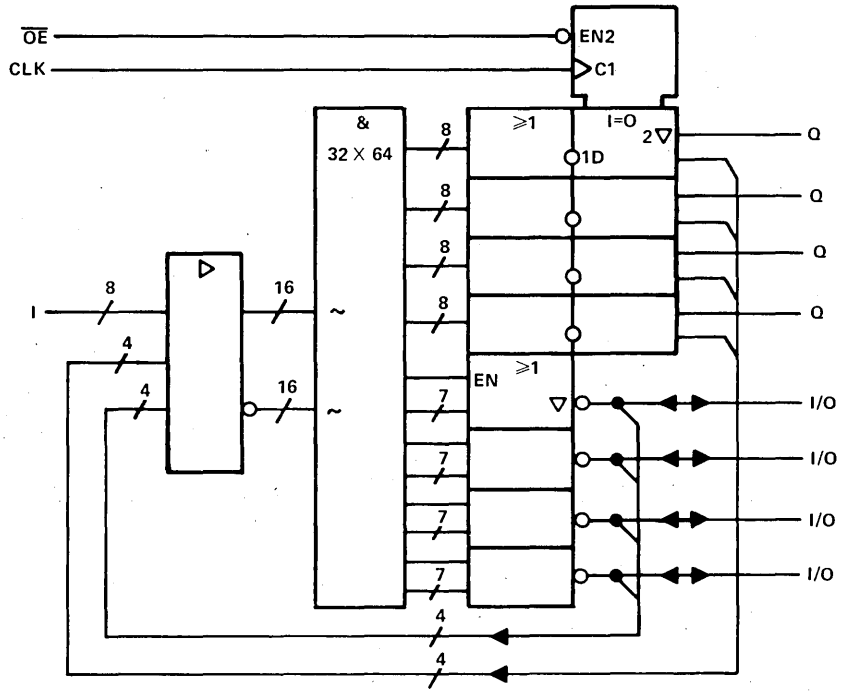
- Quad 16-input registered AND-OR gate array

pin assignments

J, N PACKAGES			
1	CLK	11	$\overline{OE}$
2	I	12	I/O
3	I	13	I/O
4	I	14	Q
5	I	15	Q
6	I	16	Q
7	I	17	Q
8	I	18	I/O
9	I	19	I/O
10	GND	20	V_{CC}

SN54ALS16R4 (J) SN74ALS16R4 (J,N)

functional block diagram



~denotes fused inputs

© IC MASTER 1983

'PL16R6

FIELD-PROGRAMMABLE
LOGIC, FIXED-OR ARRAYS

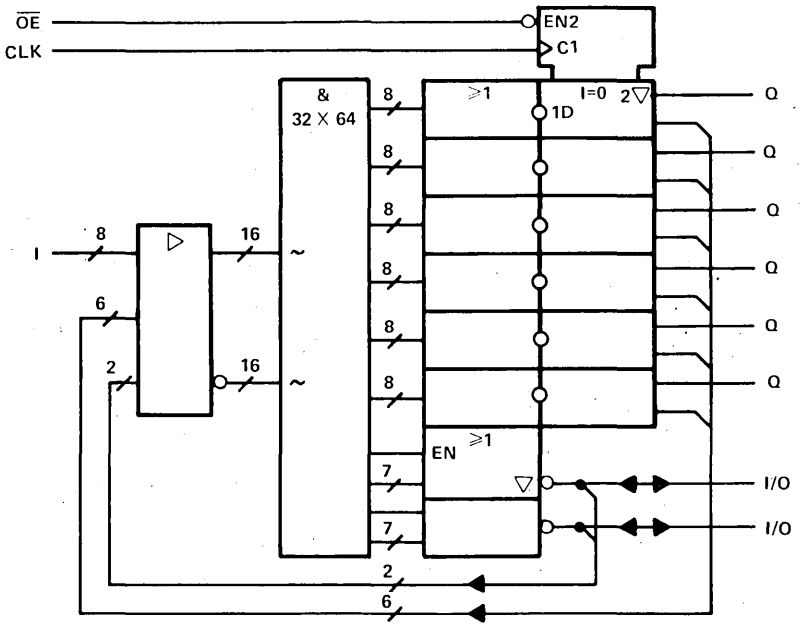
- Hex 16-input registered AND-OR gate array

pin assignments

J, N PACKAGES			
1	CLK	11	$\overline{OE}$
2	I	12	I/O
3	I	13	Q
4	I	14	Q
5	I	15	Q
6	I	16	Q
7	I	17	Q
8	I	18	Q
9	I	19	I/O
10	GND	20	V_{CC}

SN54PL16R6 (J) SN74PL16R6 (J,N)

functional block diagram



~denotes fused inputs

'PL16R8

FIELD-PROGRAMMABLE
LOGIC, FIXED-OR ARRAYS

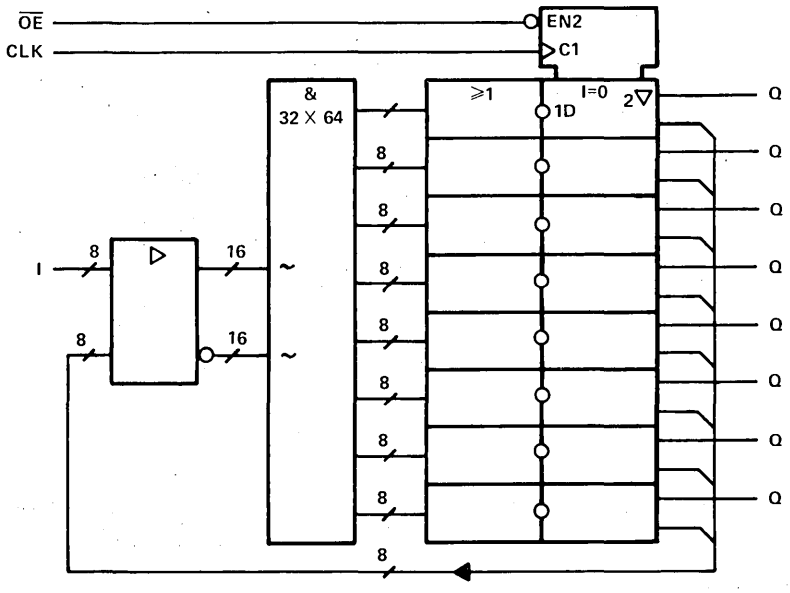
- Octal 16-input registered AND-OR gate array

pin assignments

J, N PACKAGES			
1	CLK	11	$\overline{OE}$
2	I	12	Q
3	I	13	Q
4	I	14	Q
5	I	15	Q
6	I	16	Q
7	I	17	Q
8	I	18	Q
9	I	19	Q
10	GND	20	V_{CC}

SN54PL16R8 (J) SN74PL16R8 (J,N)

functional block diagram



~denotes fused inputs

© IC MASTER 1983

'PL20L8

FIELD-PROGRAMMABLE LOGIC, FIXED-OR ARRAYS

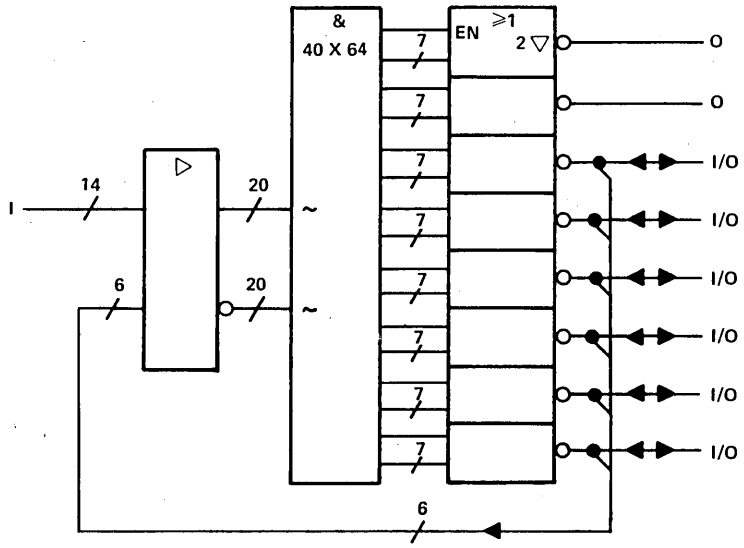
- Octal 20-input AND-OR-INVERT gate array

pin assignments

JT, NT PACKAGES			
1	I	13	I
2	I	14	I/PRELOAD
3	I	15	O
4	I	16	I/O
5	I	17	I/O
6	I	18	I/O
7	I	19	I/O
8	I	20	I/O
9	I	21	I/O
10	I	22	O
11	I	23	I
12	GND	24	V_{CC}

SN54PL20L8 (JT) SN74PL20LB (JT,NT)

functional block diagram



~denotes fused inputs

'PL20R4

FIELD-PROGRAMMABLE LOGIC, FIXED-OR ARRAYS

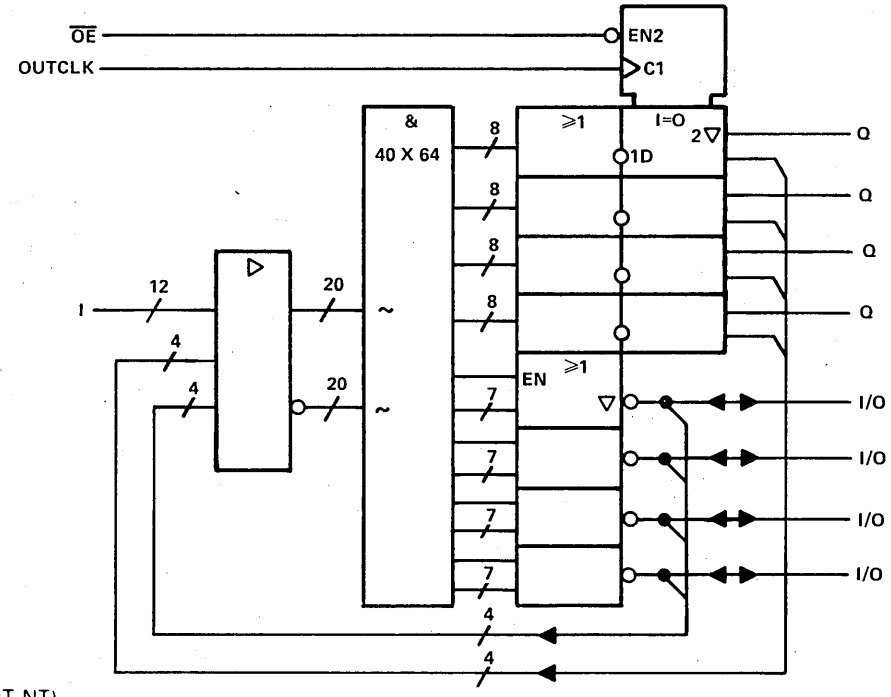
- Quad 20-input registered AND-OR gate array

pin assignments

JT, NT PACKAGES			
1	OUTCLK	13	$\overline{OE}$
2	I	14	I/PRELOAD
3	I	15	I/O
4	I	16	I/O
5	I	17	Q
6	I	18	Q
7	I	19	Q
8	I	20	Q
9	I	21	I/O
10	I	22	I/O
11	I	23	I
12	GND	24	V_{CC}

SN54PL20R4 (JT) SN74PL20R4 (JT,NT)

functional block diagram



~denotes fused inputs

© IC MASTER 1983

'PL20R6

FIELD-PROGRAMMABLE
LOGIC, FIXED-OR ARRAYS

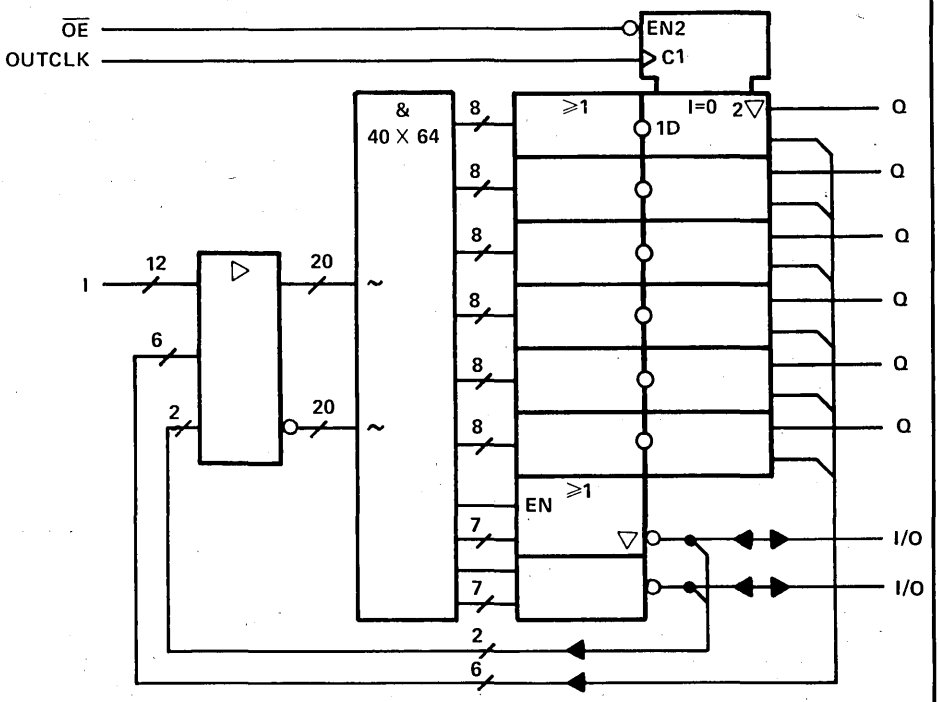
- Hex 20-input registered AND-OR gate array.

pin assignments

JT, NT PACKAGES			
1	OUT CLK	24	V_{CC}
2	I	23	I
3	I	22	I/O
4	I	21	Q
5	I	20	Q
6	I	19	Q
7	I	18	Q
8	I	17	Q
9	I	16	Q
10	I	15	I/O
11	I	14	I/PRELOAD
12	GND	13	$\overline{OE}$

SN54PL20R6 (JT) SN74PL20R6 (JT, NT)

functional block diagram



~ denotes fused inputs.

'PL20R8

FIELD-PROGRAMMABLE
LOGIC, FIXED-OR ARRAYS

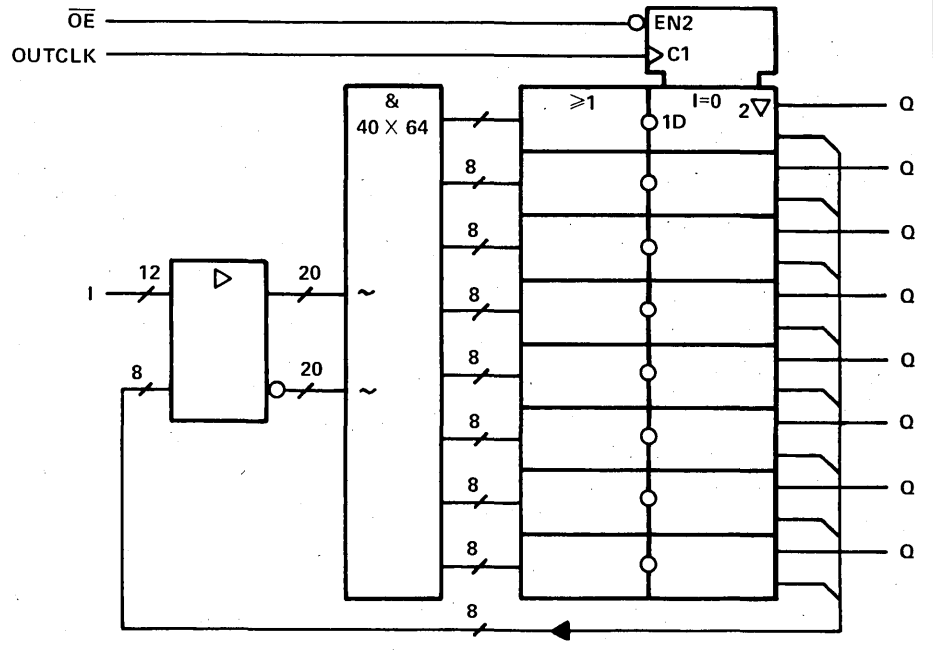
- Octal 20-input registered AND-OR gate array.

pin assignments

JT, NT PACKAGES			
1	OUT CLK	24	V_{CC}
2	I	23	I
3	I	22	Q
4	I	21	Q
5	I	20	Q
6	I	19	Q
7	I	18	Q
8	I	17	Q
9	I	16	Q
10	I	15	Q
11	I	14	I/PRELOAD
12	GND	13	$\overline{OE}$

SN54PL20R8 (JT) SN74PL20R8 (JT,NT)

functional block diagram



~ denotes fused inputs.

© IC MASTER 1983

'PL333, 'PL335

FIELD-PROGRAMMABLE LOGIC SEQUENCERS

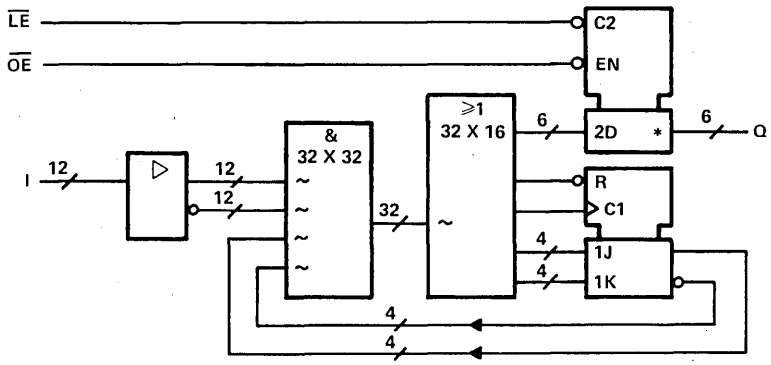
- 'PL333 — three-state outputs
- 'PL335 — open-collector outputs
- 12 input variables
- 32 product terms
- 6-bit output latch
- 4-bit state register

pin assignments

J, JT, NT PACKAGES			
1	I	13	Q
2	I	14	Q
3	I	15	Q
4	I	16	Q
5	I	17	$\overline{OE}$
6	I	18	$\overline{LE}$
7	I	19	PM
8	I	20	PL
9	I	21	I
10	Q	22	I
11	Q	23	I
12	GND	24	V_{CC}

SN54PL333 (J) SN74PL333 (JT,NT)
SN54PL335 (J) SN74PL335 (JT,NT)

functional block diagram



~ denotes fused inputs

- 'PL333 has 3-state (▽) outputs, 'PL335 has open-collector (◇) outputs.

nc — no internal connection.

© IC MASTER 1983

'PL839, PL840

FIELD-PROGRAMMABLE LOGIC ARRAYS

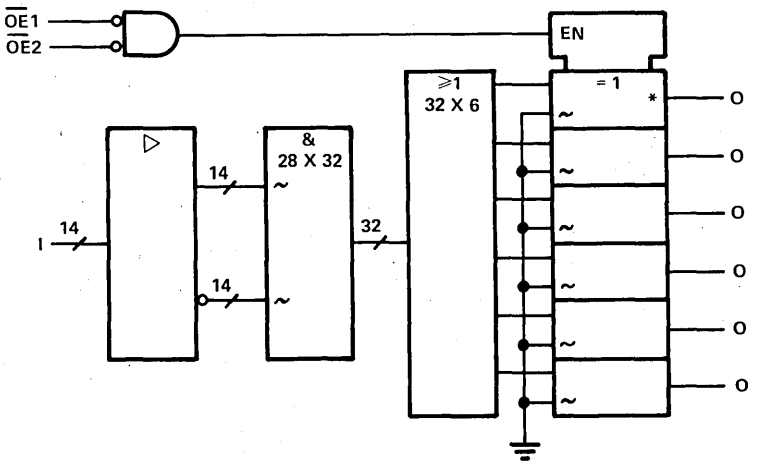
- 'PL839 – three-state outputs
- 'PL840 – open-collector outputs
- Programmable output polarity

pin assignments

J, JT, NT PACKAGES			
1	$\overline{OE}1$	13	$\overline{OE}2$
2	I	14	O
3	I	15	O
4	I	16	O
5	I	17	I
6	I	18	I
7	I	19	I
8	I	20	I
9	O	21	I
10	O	22	I
11	O	23	I
12	GND	24	V_{CC}

SN54PL839 (J) SN74PL839 (JT,NT)
SN54PL840 (J) SN74PL840 (JT,NT)

functional block diagram



~ denotes fused inputs.

* 'PL839 has 3-state (▽) outputs; 'PL840 has open-collector (◇) outputs.

nc – no internal connection.

© IC MASTER 1983

'PLR19L8

FIELD-PROGRAMMABLE
LOGIC, FIXED-OR ARRAYS

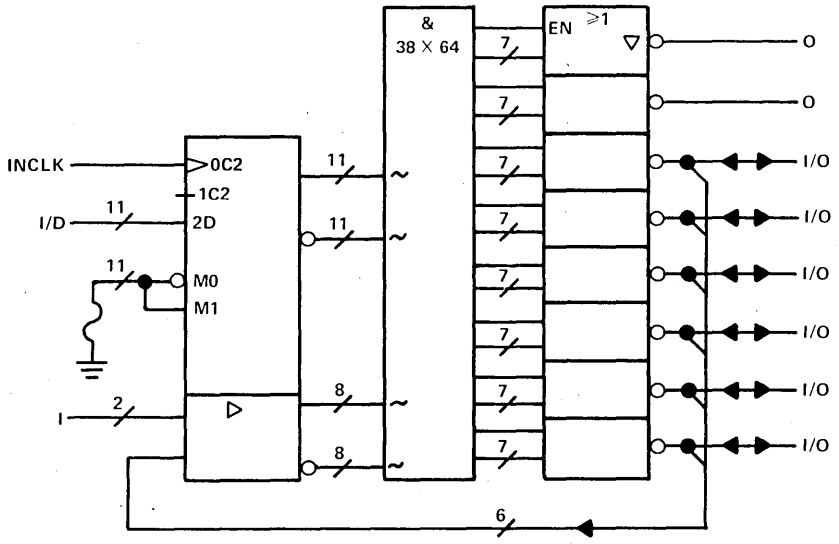
- Octal 19-input registered AND-OR-INVERT gate array

pin assignments

JT, NT PACKAGES			
1	I	13	I
2	I/D	14	INCLK/PRELOAD
3	I/D	15	O
4	I/D	16	I/O
5	I/D	17	I/O
6	I/D	18	I/O
7	I/D	19	I/O
8	I/D	20	I/O
9	I/D	21	I/O
10	I/D	22	O
11	I/D	23	I/D
12	GND	24	V_{CC}

SN54PLR19L8 (JT) SN74PLR19L8 (JT,NT)

functiona block diagram



'PLR19R4

FIELD-PROGRAMMABLE
LOGIC, FIXED-OR ARRAYS

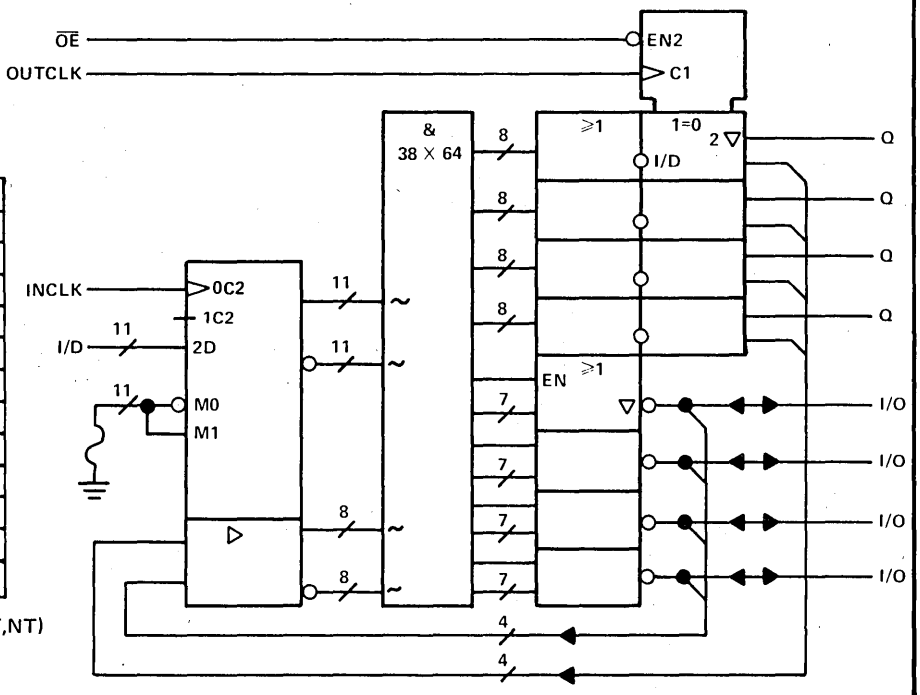
- Quad 19-input registered AND-OR gate array

pin assignments

JT, NT PACKAGES			
1	OUTCLK	13	$\overline{OE}$
2	I/D	14	INCLK/PRELOAD
3	I/D	15	I/O
4	I/D	16	I/O
5	I/D	17	Q
6	I/D	18	Q
7	I/D	19	Q
8	I/D	20	Q
9	I/D	21	I/O
10	I/D	22	I/O
11	I/D	23	I/D
12	GND	24	V_{CC}

SN54PLR19R4 (JT) SN74PLR19R4 (JT,NT)

functional block diagram



© IC MASTER 1983

'PLR19R6

FIELD-PROGRAMMABLE
LOGIC, FIXED-OR ARRAYS

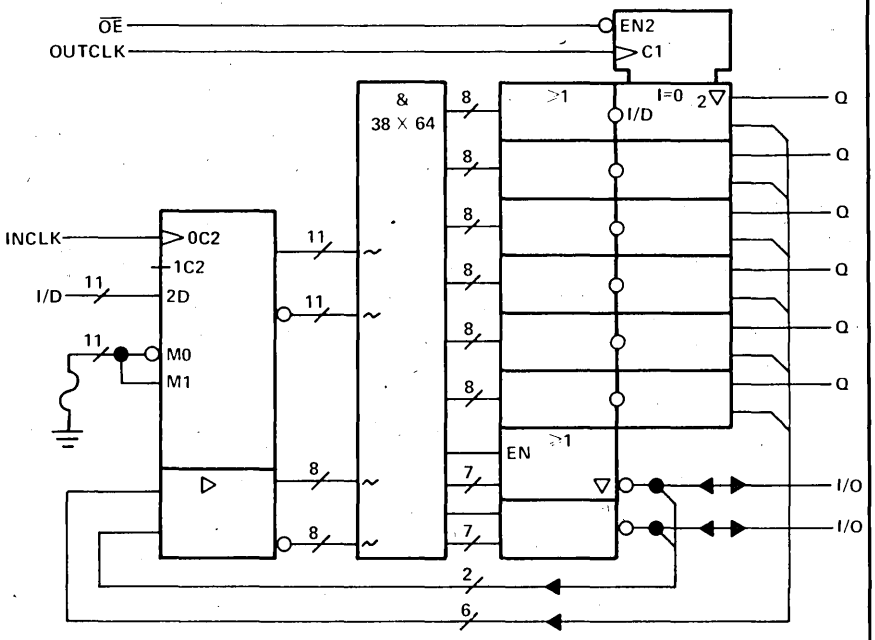
- Hex 19-input registered AND-OR gate array

pin assignments

JT, NT PACKAGES			
1	OUTCLK	13	$\overline{OE}$
2	I/D	14	INCLK/PRELOAD
3	I/D	15	I/O
4	I/D	16	Q
5	I/D	17	Q
6	I/D	18	Q
7	I/D	19	Q
8	I/D	20	Q
9	I/D	21	Q
10	I/D	22	I/O
11	I/D	23	I/D
12	GND	24	V_{CC}

SN54PLR19R6 (JT) SN74PLR19R6 (JT,NT)

functional block diagram



'PLR19R8

FIELD-PROGRAMMABLE
LOGIC, FIXED-OR ARRAYS

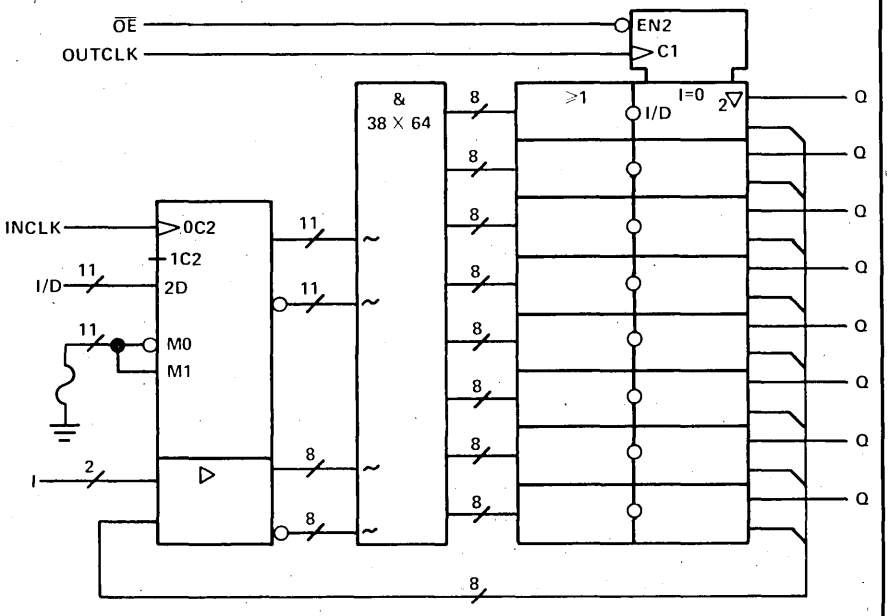
- Octal 19-input registered AND-OR gate array

pin assignments

JT, NT PACKAGES			
1	OUTCLK	13	$\overline{OE}$
2	I/D	14	INCLK/PRELOAD
3	I/D	15	Q
4	I/D	16	Q
5	I/D	17	Q
6	I/D	18	Q
7	I/D	19	Q
8	I/D	20	Q
9	I/D	21	Q
10	I/D	22	Q
11	I/D	23	I/D
12	GND	24	V_{CC}

SN54PLR19R8 (JT) SN74PLR19R8 (JT,NT)

functional block diagram



© IC MASTER 1983

'PLT19L8

FIELD-PROGRAMMABLE
LOGIC, FIXED-OR ARRAYS

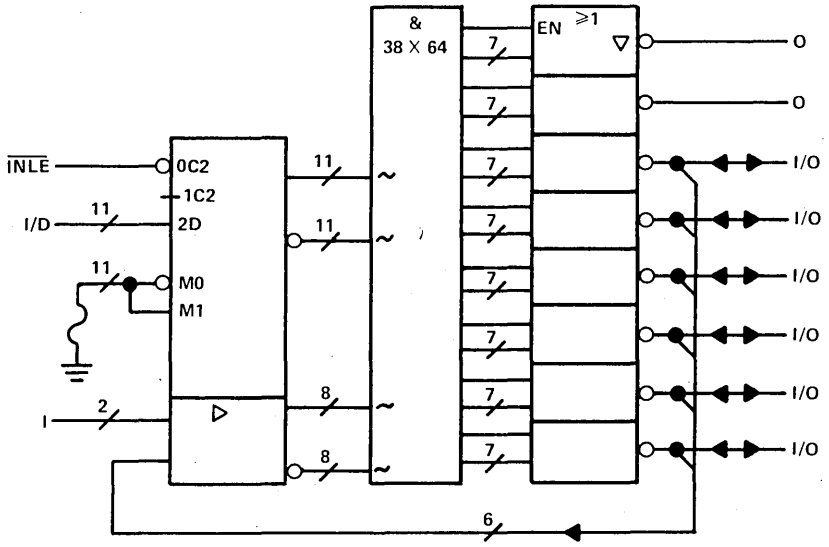
- Octal 19-input latched AND-OR-INVERT gate array

pin assignments

JT, NT PACKAGES			
1	I	13	I
2	I/D	14	$\overline{\text{INLE}}$/PRELOAD
3	I/D	15	O
4	I/D	16	I/O
5	I/D	17	I/O
6	I/D	18	I/O
7	I/D	19	I/O
8	I/D	20	I/O
9	I/D	21	I/O
10	I/D	22	O
11	I/D	23	I/D
12	GND	24	V_{CC}

SN54PLT19L8 (JT) SN74PLT19L8 (JT,NT)

functional block diagram



'PLT19R4

FIELD-PROGRAMMABLE
LOGIC, FIXED-OR ARRAYS

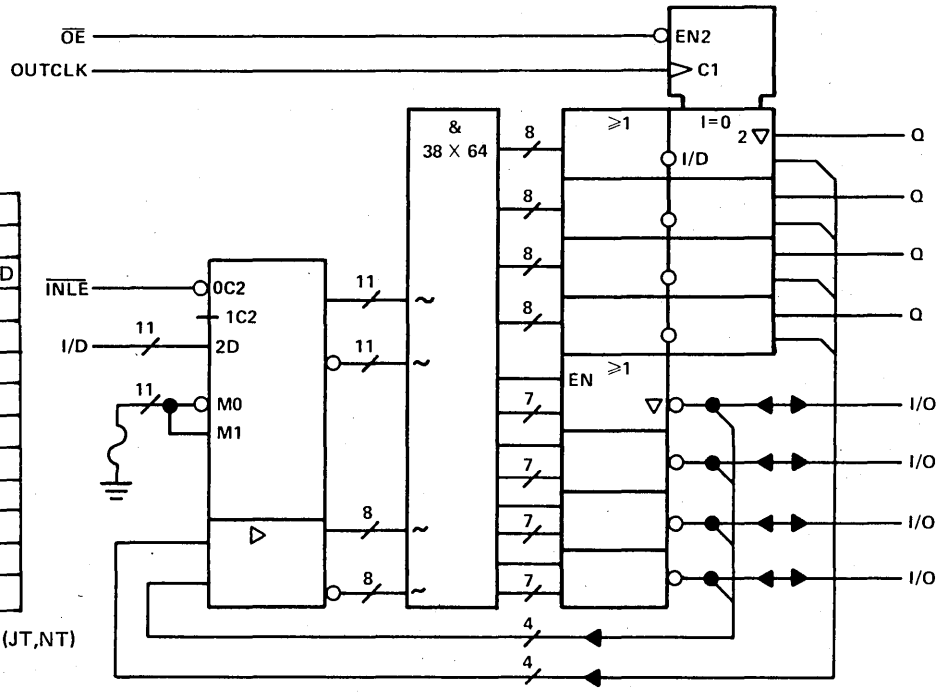
- Quad 19-input registered AND-OR gate array.

pin assignments

JT, NT PACKAGES			
1	OUTCLK	13	$\overline{\text{OE}}$
2	I/D	14	$\overline{\text{INLE}}$/PRELOAD
3	I/D	15	I/O
4	I/D	16	I/O
5	I/D	17	Q
6	I/D	18	Q
7	I/D	19	Q
8	I/D	20	Q
9	I/D	21	I/O
10	I/D	22	I/O
11	I/D	23	I/D
12	GND	24	V_{CC}

SN54PLT19R4 (JT) SN74PLT19R4 (JT,NT)

functional block diagram



DIGITAL

Texas Instruments

© IC MASTER 1983

'PLT19R6

FIELD-PROGRAMMABLE
LOGIC, FIXED-OR ARRAYS

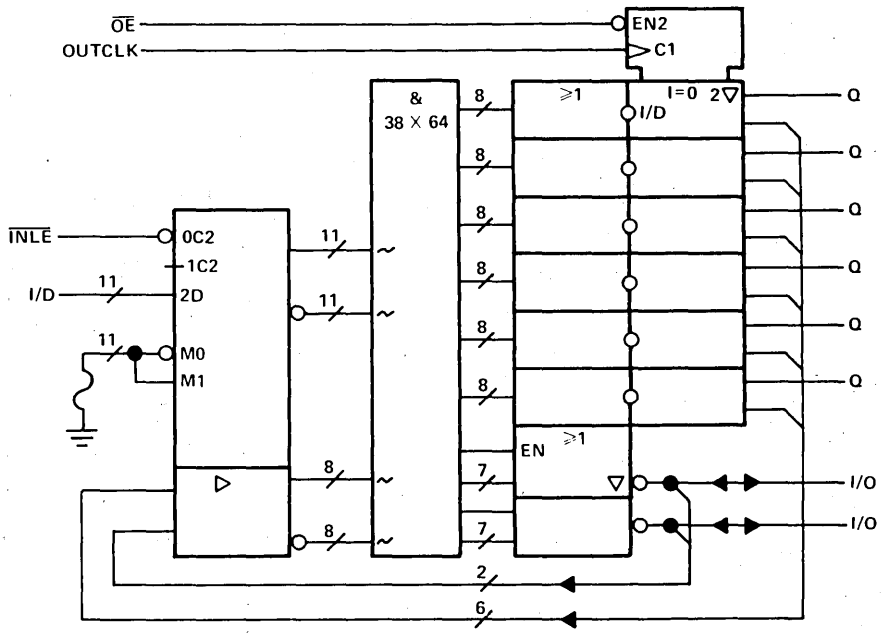
- Hex 19-input latched AND-OR gate array

pin assignments

JT, NT PACKAGES			
1	OUTCLK	13	$\overline{OE}$
2	I/D	14	$\overline{INLE}$/PRELOAD
3	I/D	15	I/O
4	I/D	16	Q
5	I/D	17	Q
6	I/D	18	Q
7	I/D	19	Q
8	I/D	20	Q
9	I/D	21	Q
10	I/D	22	I/O
11	I/D	23	I/D
12	GND	24	V_{CC}

SN54PLT19R6 (JT) SN74PLT19R6 (JT,NT)

functional block diagram



'PLT19R8

FIELD-PROGRAMMABLE
LOGIC, FIXED-OR ARRAYS

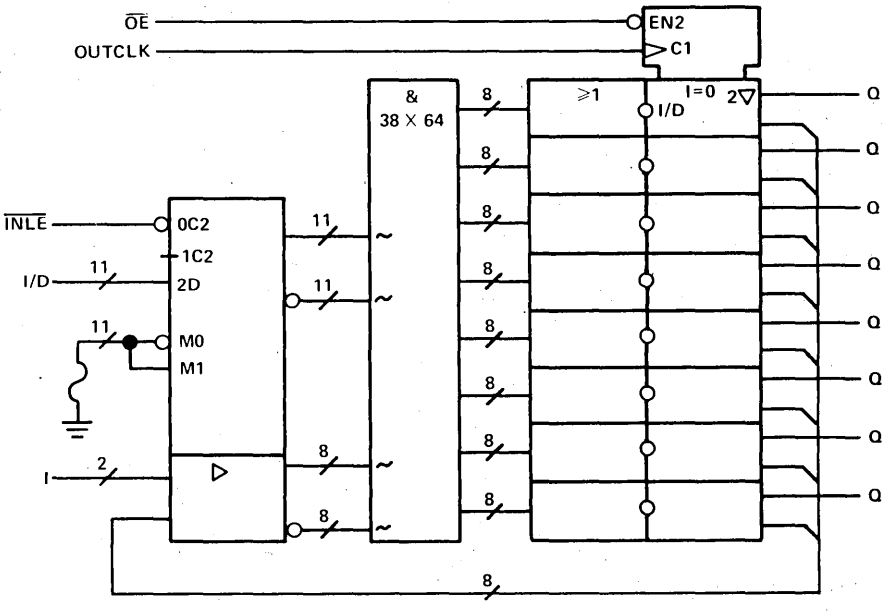
- Octal 19-input latched AND-OR gate array

pin assignments

JT, NT PACKAGES			
1	OUTCLK	13	$\overline{OE}$
2	I/D	14	$\overline{INLE}$/PRELOAD
3	I/D	15	Q
4	I/D	16	Q
5	I/D	17	Q
6	I/D	18	Q
7	I/D	19	Q
8	I/D	20	Q
9	I/D	21	Q
10	I/D	22	Q
11	I/D	23	I/D
12	GND	24	V_{CC}

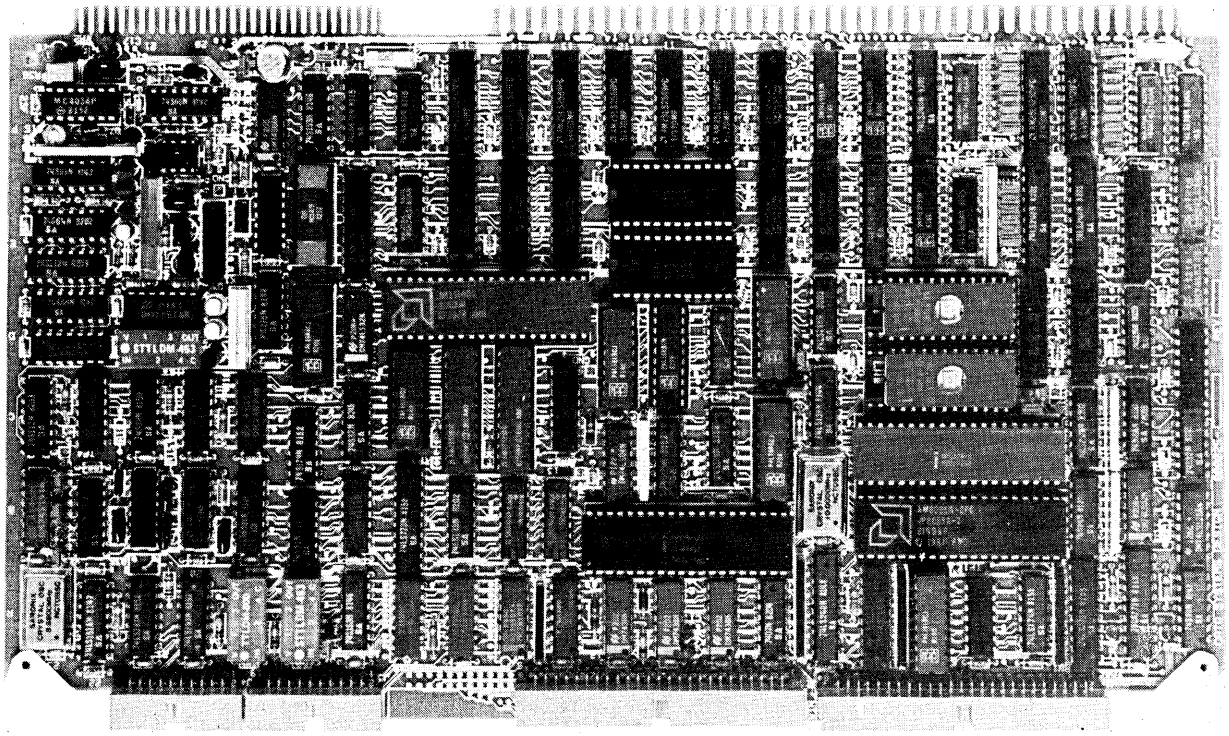
SN54PLT19R8 (JT) SN74PLT19R8 (JT,NT)

functional block diagram



© IC MASTER 1983

For Key Data On Every IC On This Board, The Place To Look Is...



The Data System Design 7215 is a single-board controller with pipelined architecture that can simultaneously control Winchester, streaming tape, and floppy drives.

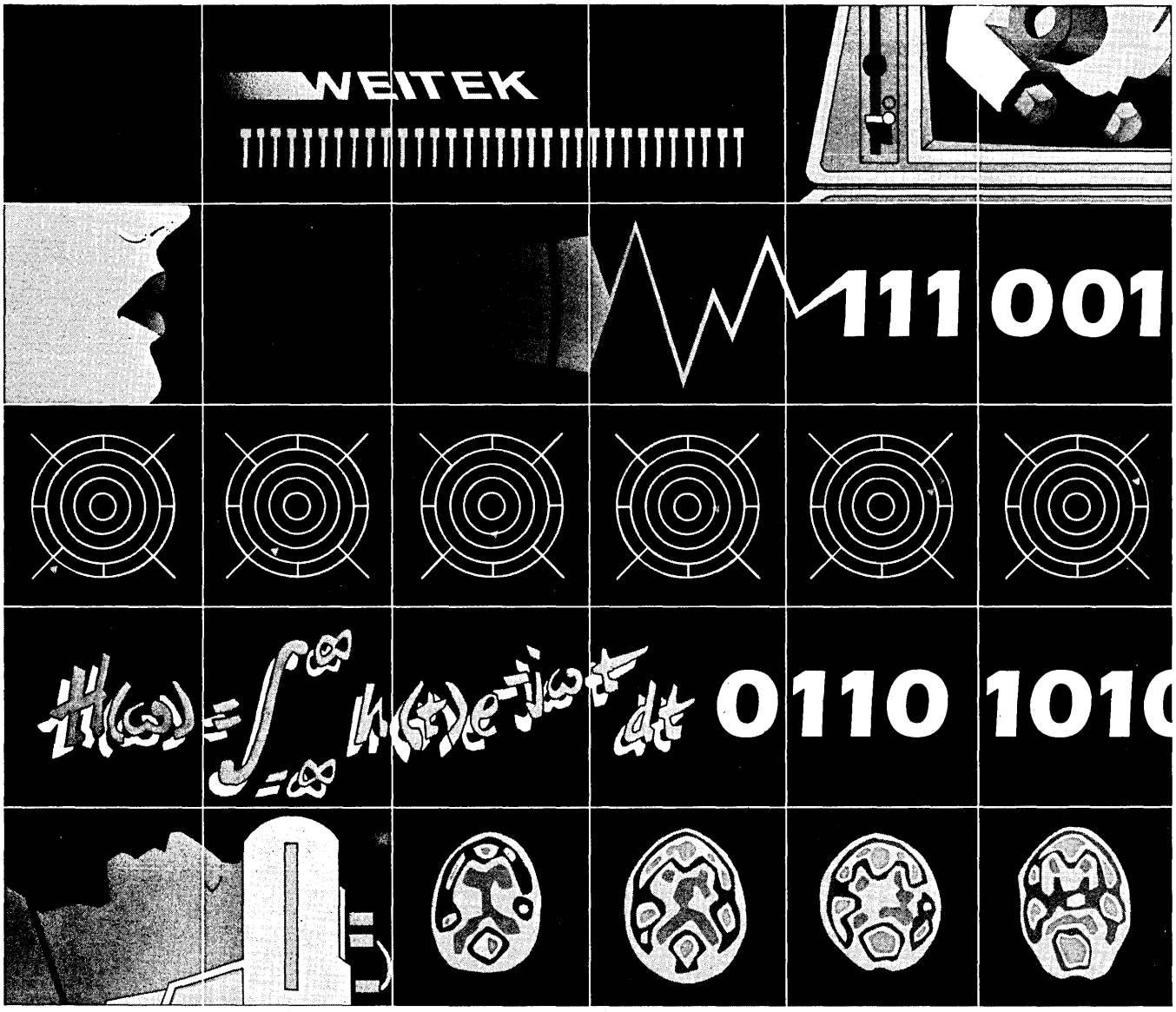
Device No.	Description
AM25LS2569	Up-Down Binary Counter with Synchronous Preset
AM2910	Dual Retriggerable Monostable Multivibrator
AM26S02	Programmable Schottky Read-Only Memory
AM27S35	12-Bit Microprogram Controller
AM8085	Complete 8-Bit Parallel Central Processing Unit
CA3130	5-to-16-Volt Single Stash Supply Op Amp
2732	4096 x 8 TTL PROM
8237	DMA Controller
DM7438	Quad 2-Input TTL NAND Buffer
DM8334	8-Bit Addressable TTL Latch
DS75107	Differential Line Receiver
F74S132	Quad 2-Input NAND Schmitt-Trigger
MC4024	Dual Voltage-Controlled TTL Multivibrator
MK4802	2048 x 8 Static NMOS RAM
PAL16L8	Field Programmable Logic Array
PAL16R6	Field Programmable Logic Array
PAL16R8	Field Programmable Logic Array
7407	Hex Buffer/Driver
74123	Dual Retriggerable Monostable Multivibrator
74368	Hex Inverter, 3-State
74LS02	Quad 2-Input TTL NOR Gate
74LS04	Hex Inverter
74LS125	Quad Gated TTL Buffer, 3-State
74LS138	3 Line to 8 Line Decoder/Demultiplexer
74LS151	8-Input Multiplexer
74LS161	Binary Counter
74LS166	8-Bit Parallel-In, Serial-Out Shift Register with Clear

Device No.	Description
74LS174	Hex D-Type Edge-Triggered Flip-Flop with Clear
74LS240	Octal Bus Driver (Schmitt Trigger)
74LS244	Octal Bus Driver (Schmitt Trigger), Non-Inverting
74LS257	Quad 2-Input Multiplexer, Non-Inverting
74LS273	Octal D-Type Edge-Triggered Flip-Flop, 3-State
74LS299	8-Bit Universal Shift Register
74LS365	Hex Buffer, 3-State
74LS373	8-Bit Latch
74LS374	Octal D-Type Edge-Triggered Flip-Flop, 3-State
74LS393	Dual 4-Bit Binary Counter
74LS533	D-Type 8-Bit Latch
74LS670	16-Bit (4x4) Register File with Simultaneous Read/Write
74S00	Quad 2-Input NAND Gate
74S03	Quad 2-Input NAND Gate, Open Collector
74S04	Hex Inverter
74S112	Dual "J-K" Negative Edge-Triggered Flip-Flop
74S151	8-Input Multiplexer
74S153	Dual 4-Input Multiplexer
74S174	Hex D-Type Edge-Triggered Flip-Flop with Clear
74S175	Quad D-Type Edge-Triggered Flip-Flop with Clear
74S240	Line Driver, Single Ended, 3-State, Inverting
74S32	Quad 2-Input OR Gate
74S51	Dual 2-Wide 2-Input AND-OR-Invert Gate
74S64	4-2-3-2-Input AND-OR-Invert Gate
74S74	Dual D-Type Positive Edge-Triggered Flip-Flop
75110	Line Driver, Differential, Twisted Pair Level Shifting

Representative list of ICs on the Data Systems Design 7215 board.
Key specifications for all of these ICs can be found in IC MASTER.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER



Wherever you use Weitek's NMOS 16 x 16's, you'll have 2.5W to spare.

Until now, you've had to accept bipolar TTL multipliers and multiplier-accumulators that consume up to 5W of valuable power. Now Weitek introduces the WTL 1010 and WTL 1016. Through advanced NMOS VLSI design, they offer the same high speed processing at just half the power.

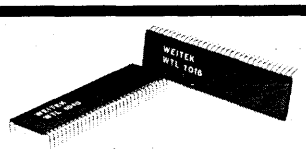
	Data Size	Speed*	Power*
WTL 1016 Multiplier	16x16	140 ns	2.5W
WTL 1010 Multiplier – Accumulator	16x16	165 ns	3.0W

*Test Conditions: T_A = 0-75° C, V_{CC} = 5V ± 5%

Whether you're designing military signal processing systems, graphics systems, digital filters or Fast Fourier Transform processors . . . wherever you've used other 16 x 16 multipliers and multiplier – accumulators . . . the WTL 1016 and WTL 1010 are pin-for-pin functional replacements. Power supply requirements of 5V and TTL input/output levels are compatible, too.

For immediate detailed information, phone Weitek now at (408) 727-6625. We'll tell you everything about WTL 1016 and WTL 1010. –The only question you'll have to answer is what to do with the power you'll have to spare.

All Weitek 16x16's are processed to MIL STD 883.



WEITEK

Coming on Strong in VLSI

3255 Scott Blvd., Bldg. 2B ■ Santa Clara, California 95054
(408) 727-6625 TELEX 171596 AAA Com Suvl

© IC MASTER 1983

WEITEK

Coming on Strong in VLSI

WTL 1016

WTL1016
NMOS 16 x 16 PARALLEL MULTIPLIER

DIGITAL

Weitek

Features

- 16x16 parallel array multiplier
- High speed, 100ns typical multiply time
- Standard NMOS Technology
- Low Power, 1.5W typical
- Single 5V supply
- Standard TTL compatible I/O levels
- Output latch mode selectable for clocked or transparent operation
- Mixed mode two's complement and unsigned magnitude multiplication
- Pin-for-pin functional replacement for TRW MPY16HJ and AMD Am29516
- Processed to MIL STD 883

Description

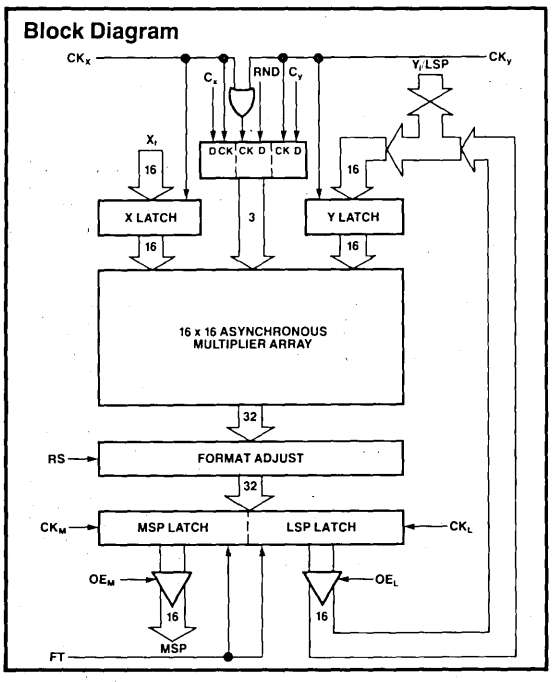
WTL 1016 is an NMOS 16x16 parallel array multiplier characterized by high speed, high performance, and low power dissipation. A typical multiply time of 100ns, advanced NMOS processing, and a multiplication scheme based on Booth's algorithm, all provide state-of-the-art performance at a power dissipation level 50% less than that of existing bipolar TTL counterparts.

A pin-for-pin functional replacement for TRW's MPY16HJ and AMD's Am29516, WTL 1016 operates from a single 5 volt supply and is compatible with standard TTL logic levels.

The architecture of WTL 1016 (see Block Diagram) generates a 32 bit product of two 16 bit data words input to the X and Y data latches. These operands can be specified as either two's complement or unsigned magnitude for mixed or unmixed mode operation. Input lines C_x and C_y control the input data representation. Two series-configured 32 bit registers, at the output of the multiplier array, provide product format adjustment and two 16 bit latch functions for the most and least significant halves (MSP and LSP) of the product. Feed-through control line, FT, allows the flexibility of either clocked or asynchronous operation of the MSP and LSP latches. In the asynchronous mode, the product latches are transparent to data flow. The 32 bit product is output on two 16 bit three-state buses. The LSP portion of the product output and the Y input operand share common I/O pins.

The WTL 1016 finds applications in a variety of digital signal processing functions and upgrades to mini and microcomputer systems. In the area of digital signal processing, applications include digital filtering, FFT, floating point, image/video, and speech (recognition and synthesis) processing.

Block Diagram



Printed in the U.S.A. Copyright 1982, WEITEK Corporation, All Rights Reserved.

WEITEK

Coming on Strong in VLSI

WTL1516/1517
ADVANCED DATA

WTL1516/1517
NMOS 16 × 16 PARALLEL MULTIPLIERS

DIGITAL

Weitek

Features

- 16×16 parallel array multiplier
- High-speed, 90 ns typical multiply time
- Standard NMOS technology (I_{CC}=230 mA typical)
- Low power
- WTL1517 optimized for microprogramming single clock with register enables
- Standard TTL power 5V supply and input/ output levels
- Input/output latches selectable for clocked or transparent mode of operation
- Mixed mode two's complement and unsigned magnitude multiplication
- WTL1516 pin-for-pin functional replacement for TRW MPY16HJ, AMD 29516/29517 and WTL1016
- WTL1517 pin-for-pin functional replacement for AMD 29517

Description

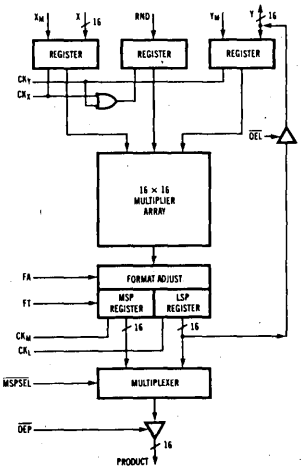
The WTL1516/1517 are 16×16 parallel array, high-speed multipliers (Tm=90 ns typical) fabricated using NMOS silicon gate technology. By use of a modified Booths algorithm and advanced NMOS VLSI design processes, these multipliers provide a performance comparable to existing bipolar TTL multipliers at less than half the power consumption (I_{CC}=230 mA typical). The WTL1516/1517 also use standard TTL power supplies of 5V. The multipliers have input and output latches which can be operated in a clocked mode or transparent mode.

Applications of the multipliers include a variety of digital signal processing systems including floating point processors, FFT processors, image/ video processors, speech recognition and synthesis, digital filtering, etc. Input data are accepted in the form of 16-bit two's complement and unsigned magnitude in mixed or unmixed mode.

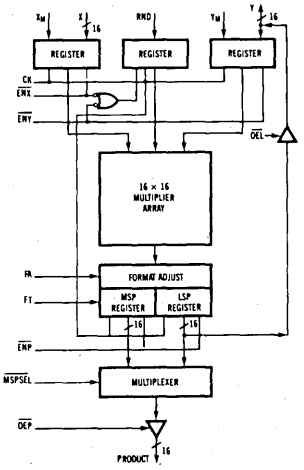
In the WTL1516 the X, Y, MSP and LSP registers have independent clocks (CK_X, CK_Y, CK_M, CK_L). The output multiplexer control (MSPSEL) uses a pin which is a supply ground in the TRW MPY16HJ and WTL1016. When this control is LOW the function is that of the MPY16HJ and WTL1016, thus allowing full compatibility.

The WTL1517 differs in that it has a single clock input (CK) and three register enables (ENX, ENY, ENP) for the two input registers and the entire product. This allows use of the WTL1517 in microprogrammed systems. In both devices data are entered into the registers on the positive edge of the clock.

Logic Diagrams



WTL1516



WTL1517

3255 Scott Boulevard, Bldg. 2B • Santa Clara, CA 95050 • Telephone (408) 727-6625 • Telex 171596 AAA Com Suvl

© Copyright 1982, WEITEK Corporation. All rights reserved.

© IC MASTER 1983

WTL2516/2517
NMOS 16 × 16 PARALLEL MULTIPLIERS

Features

- 16×16 parallel array multiplier
- 200 ns typical multiply time
- NMOS technology
- Low power, 0.6W typical
- Low cost plastic package
- WTL2517 optimized for microprogramming single clock with register enables
- Standard TTL power 5V supply and input/output levels
- Input/output latches selectable for clocked or transparent mode of operation
- Mixed mode two's complement and unsigned magnitude multiplication
- WTL2516 pin-for-pin functional replacement for TRW MPY16HJ, AMD 29516/29517 and WTL1016
- WTL2517 pin-for-pin functional replacement for AMD 29517

Description

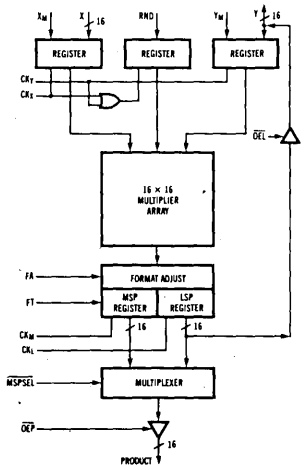
The WTL2516/2517 are 16×16 parallel array, high-speed multipliers (Tm = 200 ns typical) fabricated using NMOS silicon gate technology. By use of a modified Booths algorithm and advanced NMOS VLSI design processes, these multipliers provide a performance comparable to existing bipolar TTL multipliers at less than 1/4 the power consumption (I_{CC} = 120 mA typical). The WTL2516/2517 also use standard TTL power supplies of 5V. The multipliers have input and output latches which can be operated in a clocked mode or transparent mode.

The multipliers are particularly useful in low to moderate performance, low cost, digital computationally intensive applications. These include low cost, relatively low resolution graphics functions involving 3D image rotation such as video games, small business/desk-top computers and low cost graphics displays. Other functions include voice frequency, digital filtering and processing for modems, speech synthesis, speech recognition and consumer audio. Input data are accepted in the form of 16-bit two's complement and unsigned magnitude in mixed or unmixed mode.

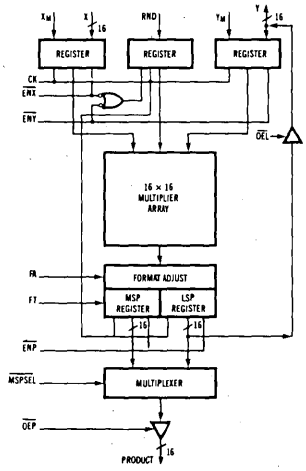
In the WTL2516 the X, Y, MSP and LSP registers have independent clocks (CK_X, CK_Y, CK_M, CK_L). The output multiplexer control (MSPSEL) uses a pin which is a supply ground in the TRW MPY16HJ and WTL1016. When this control is LOW the function is that of the MPY16HJ and WTL1016, thus allowing full compatibility.

The WTL2517 differs in that it has a single clock input (CK) and three register enables (ENX, ENY, ENP) for the two input registers and the entire product. This allows use of the WTL2517 in microprogrammed systems. In both devices data are entered into the registers on the positive edge of the clock.

Logic Diagrams



WTL2516



WTL2517

3255 Scott Boulevard, Bldg. 2B • Santa Clara, CA 95050 • Telephone (408) 727-6625 • Telex 171596 AAA Com Suvl

© Copyright 1982, WEITEK Corporation. All rights reserved.

WEITEK

Coming on Strong in VLSI

WTL1024
ADVANCED DATA

WTL1024
NMOS 24 × 24 PARALLEL MULTIPLIER

DIGITAL

Weitek

Features

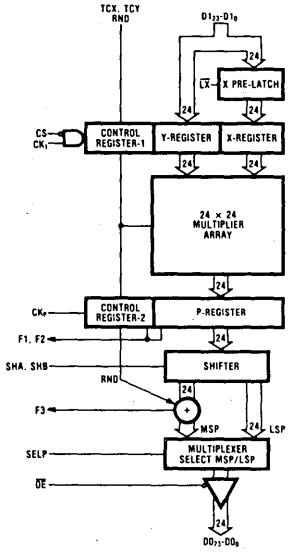
- 24×24 bit parallel multiplication with double precision output.
- Pipelined architecture, with separate 24-bit wide inputs and outputs.
- High-speed, Tm=220 ns typical.
- Low power NMOS fabrication, I_{CC}=300 mA typical.
- TTL compatible input/output.
- Two's complement, unsigned magnitude selectable modes with mixed mode operation.
- Product left shift up to three bits.
- Product round with overflow flag.
- Useful in 16-bit computer systems for extended integer arithmetic operations.
- Provides floating point 24-bit mantissa multiply with external standard TTL for exponent adjust.

Description

The WTL1024 is a 24×24 operand input, 48-bit product output parallel multiplier, fabricated using advanced NMOS VLSI design processes to provide high speed (Tm=220 ns typical) at low power (I_{CC}=300 mA typical). Pipelined architecture is used for ease of use in microcomputer based systems with operands and products loaded and unloaded 24 bits at a time. Inputs and outputs are latched with inputs having a separate chip select and outputs having three state capability. Separate operand data format controls are provided by TCX and TCY for classification of operands as two's complement or sign magnitude data. F1 and F2 are output flag signals derived from the most significant bits of the product register. The product can be shifted left from 0 to 3 bit positions by means of a pair of shift control inputs, SHA and SHB. The output flag signals, F1 and F2, and shift control inputs, SHA and SHB, can be used in conjunction with a standard TTL ALU to provide exponent data normalization for floating point operations.

Rounding of the product to 24 bits is under control of the RND control input and is performed after shifting. Flag F3 indicates when overflow occurs in the round operation. The two halves of the 48-bit product (MSP and LSP) are selected for output by the SELP output multiplexer control. Output enable signal $\overline{OE}$ controls three state. The WTL1024 is useful in integer operations such as in 16-bit computer/microcomputer data environment where recursive computations often require the ability to handle extended product operations. For floating point data multiplication operations, the WTL1024 can provide mantissa multiplication in conjunction with external readily available LSI circuits such as the 74S381 ALU and 2901 bit slice, etc., for exponent adjust.

Logic Diagram



WTL1024

3255 Scott Boulevard, Bldg. 2B • Santa Clara, CA 95050 • Telephone (408) 727-6625 • Telex 171596 AAA Com Suvl

Copyright 1982, WEITEK Corporation. All rights reserved.

© IC MASTER 1983

WEITEK

Coming on Strong in VLSI

WTL 1010

Features

- 16x16 parallel multiplication and product accumulation
- High speed, 115ns typical multiply-accumulate time
- NMOS silicon gate technology
- Low power, 1.9W typical
- Single 5V supply
- Standard TTL compatible I/O levels
- Performs subtraction and double precision addition and multiplication
- Round control
- Pin-for-pin functional replacement for TRW 1010J
- Processed to MIL STD 883

Description

The WTL 1010 is a 16x16 parallel multiplier-accumulator (MAC). Fabricated using NMOS silicon gate technology, the WTL 1010 offers a low power alternative to existing bipolar TTL counterparts (power dissipation <50%) with no loss in performance. The high performance is achieved through high speed operation (115ns typical multiply-accumulate time), use of the efficient Booth's algorithm, and advanced VLSI technology.

A pin-for-pin functional replacement for TRW's TDC 1010J, the WTL 1010 operates from a single 5 volt supply and is compatible with standard TTL logic levels.

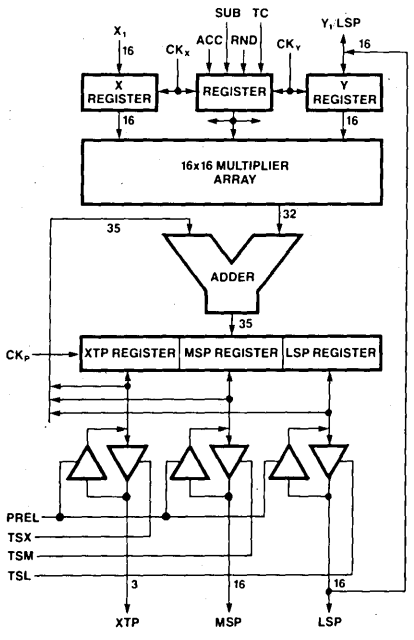
The WTL 1010, under control of the ACC input (see Block Diagram), performs either the multiply only or multiply-accumulate function. In either mode, input data, X_1 and Y_1 can be specified as two's complement or unsigned magnitude. Input data representation is selectable via input control line TC. In the multiply only mode, extended product (XTP) data is sign extended or set to zero for two's complement and unsigned magnitude arithmetic, respectively. Additionally, a RND control is available for rounding up the most significant product (MSP) and extended product (XTP) data. In the multiply-accumulate mode the double precision accumulated answer is rounded back to single precision or single precision plus XTP bits.

Device architecture provides input and output data registers; three state output data buses with independent, non-registered control; initial data pre-loading capability; and requires time sharing of the common least significant product (LSP) and input data (Y_1) I/O lines. Input lines TSX, TSM and TSL respectively control the outputs of the XTP, MSP and LSP registers.

In the multiply-accumulate mode (ACC active) output data can be added to or subtracted from the next product. When SUB is also active, subtraction is performed. Otherwise addition is performed. When control line PREL is active, all output lines are forced to the high impedance state and external data can be loaded into the output registers. In this mode, TSX, TSM, and TSL change function and control loading of data into the output registers (see Preload Truth Table).

The WTL 1010 can be efficiently applied in a variety of digital signal processing functions including digital filtering (recursive, non-recursive, wave) and FFT processing (complex multiplication, butterfly computation). Additionally the WTL 1010 can effectively be employed in upgrading the computational capability of mini and microcomputer systems.

Block Diagram



Printed in the U.S.A. Copyright 1982, WEITEK Corporation, All Rights Reserved.

INTRODUCTION TO MICROPROCESSORS

This section begins with a "Master Selection Guide" that covers all major parameters needed to choose a microprocessor for particular application.
Next, once you've chosen the proper microprocessor for your application, go to the "System Components" section. Arranged alphanumerically by microprocessor, it shows all the available peripheral devices that work with a particular microprocessor.
Finally, there is a "General Purpose" section describing devices that can be used in different microprocessor systems, not necessarily with one family.
All manufacturers are covered in alphanumeric sequence.

Detailed Product Information provided by:

Advanced Micro Devices	1201
American Microsystems, Inc.	1247
Fairchild	1253
Fujitsu Microelectronics	1305
General Instrument	1309
Harris Semiconductor	1333
Hitachi	1345
Intel	1347
Motorola Semiconductor	1361
RCA	1457
Seeq, Inc.	1492
Signetics	1501
Synertek	1526
Texas Instruments	1552
Western Digital	1566
Zilog	1605

The manufacturers listed above have provided detailed information on their latest and most significant products.

© IC MASTER 1983

EINFÜHRUNG MIKRO-PROZESSOREN

Dieser Abschnitt beginnt mit einem "Master Selection Guide", der alle Parameter enthält, die zur Auswahl eines für einen bestimmten Anwendungsfall geeigneten Mikroprozessors erforderlich sind.

Haben Sie einmal den für Ihren Anwendungsfall geeigneten Mikroprozessor gefunden, so gehen Sie weiter zum Abscnitt "Systemkomponenten" (System Components). In alphanumerischer Reihenfolge der Mikroprozessoren, enthält dieser Teil alle peripheren Bausteine, die für einen bestimmten Mokroprozessor verfügbar sind.

Schlieβlich gibt es noch den Abschnitt "Allgemeine Verwendung" (General Purpose) mit einer Beschreibung von Bauelementen, die für verschiedene Mikroprozessoren geeignet und nicht ausschlieβlich an ein System gebunded sind.

Alle Hersteller sind in alphanumerischer Reihenfolge aufgeführt.

© IC MASTER 1983

INTRODUCTION AUX MICRO-PROCESSEURS

Cette Section débute par un Guide Général de Sélection qui couvre tous les paramètres importants utilisés dans le choix d'un microprocesseur pour une application bien déterminée.

Après avoir choisi le microprocesseur nécessaire à votre application, reportez-vous à la Section "Composants du Système (System Components). Une liste alphanumérique des microprocesseurs indique quels types d'appareils sont à utiliser avec tel ou tel microprocesseur.

Enfin, une Section intitulée "Applications Générales" ((General Purpose) décrit les appareils qui peuvant être utilisée dans différents systèmes de microprocesseur, et n'appartenent pas uniquement à une sule famille.

Toutes les sociétés fabricantes sont étudiées par ordre alphanumérique.

© IC MASTER 1983

INTRODUCCIÓN AL MICROPROCESOR

Esta sección empieza con una Guía Maestra de Selección que cubre los parámetros necesitados en la selección del microprocesor para una aplicación determinada.

Después, una vez escogido el microprocesor para su aplicación, refiérase a la sección "Componentes de Sistema." Arreglado en orden alfabético y numérico por microprocesor, muestra todas las componentes periferales que funcionan con un microprocesor determinado.

Finalmente, hay una sección de "Propósito General" describiendo las componentes que pueden ser usadas en distintos sistemas de microprocesores, no necesariamente dentro de una familia.

Todos los fabricantes aparencen en orden alfabético y numérico.

© IC MASTER 1983

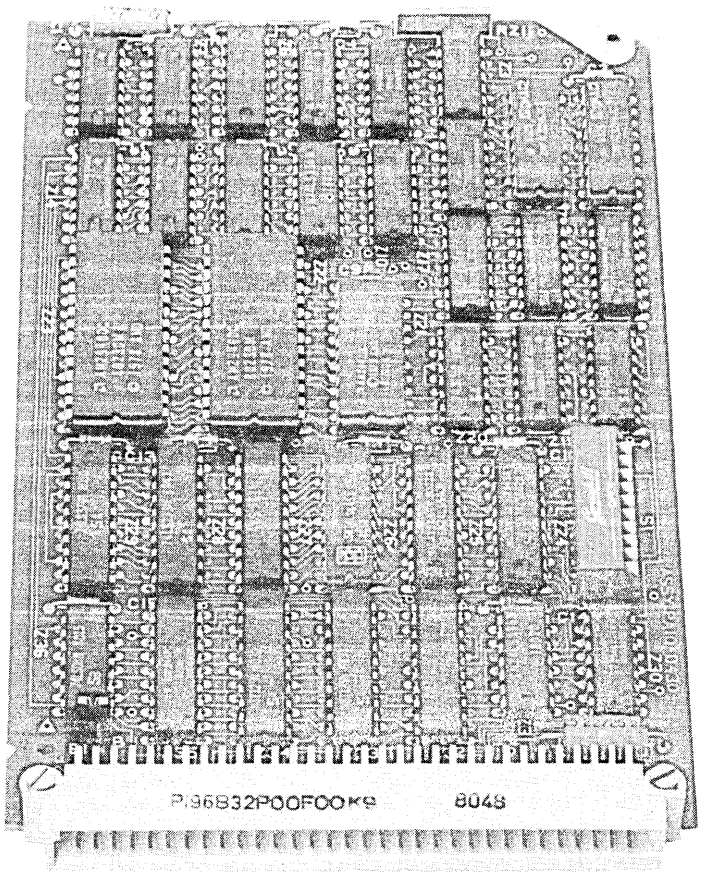
マイクロプロセサーへの案内

このセクションは"マスターセレクションガイド"で始り利用者皆様のお知りになり度いマイクロプロセサーを選択するのに必要な全ての主要パラメーターを記載しています。そのマイクロプロセサーを見つけたら次に"システムコンポーネント"セクションに進んで下さい。マイクロプロセサーがアルファベット順，数字の若い順に並んでおり，そのマイクロプロセサーの周辺製品が記載されています。

最后は"ジェネラルパーパスセクション"であり，一つのマイクロプロセサーファミリー丈でなく他のマイクロプロセサーシステムにも使用される製品を紹介しています。全てのメーカーはアルファベット順，若い数字順にのっています。

© IC MASTER 1983

For Key Data On Every IC On This Board, The Place To Look Is...



This Rockwell RM65-5104(E) card is used to transfer data between memory and peripheral circuits.

Device No.	Description
74LS08	Quad 2-Input AND Gate
74F244	Octal Buffer/Line Driver
74LS240	Octal Bus Driver (Schmitt Trigger)
74LS136	Quad 2-Input Exclusive-OR Gate
74F04	Hex Inverter
74LS374	Octal D-Type Edge-Triggered Flip-Flop, 3-State
74LS273	Octal Edge-Triggered Flip-Flop with Clear
74LS541	Octal Bus Driver, Noninverting
74LS645	Octal Bus Transceiver
74LS540	Octal Bus Driver, Inverting

Device No.	Description
74LS682	8-Bit Magnitude Comparitor
AM2940	DMA Address Generator
AM2942	Programmable Timer
74LS155	Decoder/Demultiplexer
74LS148	Priority Encoder
74LS74	Dual D-Type Edge-Triggered Flip-Flop
74LS32	Quadruple 2-Input OR Gate
74LS112	Dual J-K Flip-Flop
74LS126	Quadruple Bus Buffer Gate
74LS00	Quadruple 2-Input NAND Gate
PAL12H6	Field Programmable Array

Representative list of ICs on Rockwell Direct Memory Access Card.
Key specifications for all of these ICs can be found in IC MASTER.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

MICROPROCESSORS

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
2BS	TTL	5		512			6/1	opt.	priority	x	x
2BS	TTL	5	≥18	512			6/1	opt.	priority		
2BS	TTL	5	18	512			6/1	optional			
4BS	TTL	5	9				10/1			x	
4BS	TTL	5	9	User defined			10/1	optional	vectored	x	
4BS	TTL	5	9	User defined			10/1	optional	vectored	x	
4BS	TTL	5	4xN	User defined			8/1	optional	vectored	x	
4BS	TTL	5	4xN	User defined			8/1	optional	vectored	x	
4BS	TTL	5	9	User defined			10/1	optional	vectored		
4BS	TTL	5	4XN	User defined			10/1	optional	vectored		
4BS	TTL	5	8				10/1				
4BS	ECL	-2,-5.2								x	
4BS	TTL	5	9				10/1	optional	vectored		
4BS	TTL	5	User defined	User defined			10/1	optional	vectored		
4BS	TTL	5	9	User defined			10/1	optional		x	
4BS	TTL	5	9	User defined			10/1	opt.		x	
4BS	TTL-LS	5	10	4XN			8/1			x	
4BS	TTL-LS	5	10	4XN			10/1			x	
8BS	ECL	-2,-4.5					30				
8BS	NMOS	5	8,16,24	4K	64	1.5K	2/1	yes			
8BS	NMOS	5	8,16,24	4K	64	1.5K	2/1	yes			
8BS	NMOS	5	8,16,24	8K	64		2/1	yes			
8BS	NMOS	5	8,16,24	8K	64		2/1	yes			
4	CMOS	5	8,16	512	16x4	512	2/1	yes	vectored	x	
4	CMOS	5	8,16	1024	32x4	1024	2/1	yes	vectored	x	
4	NMOS	5	8,16	4K	192x4	4K	2/1	yes	vectored	x	
4	NMOS	5	8,16	2K	128x4	2K	2/1	yes	vectored	x	
4	NMOS	5	8,16	4K	192x4	4K	2/1	yes	vectored	x	
4	NMOS	5	8,16	2K	192x4	2K	2/1	yes	vectored	x	
4	NMOS	5	8,16	2K	128x4	2K	2/1	yes	vectored	x	
4	NMOS	5	8,16	4K	192x4	4K	2/1	yes	vectored	x	
4	NMOS	5	8,16	2K	128x4	2K	2/1	yes	vectored	x	
4	NMOS	5	8,16	1K	64x4	1K	2/1	yes	vectored	x	
4	NMOS	5	8,16	1K	64x4	1K	2/1	yes	vectored	x	
4	CMOS	3.5-6	8,16	4K	192x4	4K	2/1	yes	vectored	x	
4	CMOS	3.5-6	8,16	2K	128x4	2K	2/1	yes	vectored	x	
4	CMOS	5	8,16	1K	64Kx4	1K	2/1	yes	vectored	x	
4	CMOS	3.5-6	8,16	2K	128x4	2K	2/1	yes	vectored	x	
4	CMOS	2.5-3.5	8,16	2K	128x4	2K	2/1	yes	vectored	x	
4	CMOS	5	8,16	1K	64Kx4	1K	2/1	yes	vectored	x	

BS = Bit Slice

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
x					Signetics		3000	Intel	
					Intel	Use 74S182 for look-ahead carry and N3001 microprogram control unit.	N3000	Signetics	
					Intel	Use 74S182 for look-ahead carry and N3001 microprogram control unit.	N3002	Signetics	
x					Fairchild, NEC-Micro, National, Raytheon	Eight function ALU. Four status flags. Microprogrammable. Interrupt requires AM2914 chip.	AM2901	**AMD (1201)**	
x					Fairchild, Motorola, National, NEC-Micro, Raytheon	Interrupt option requires AM2914 interrupt controller chip. Advertised to be 25% faster than AM2901.	AM2901A	**AMD (1201)**	
x					Fairchild, National, NEC-Micro, Raytheon	Advertised to be up to 25% faster than AM2901A. Available in MIL temperature. Interrupt option requires AM2914 interrupt controller chip.	AM2901B	**AMD (1201)**	
x					Fairchild, NEC-Micro, National, Raytheon	Expandable register file. Built-in normalization and division logic. Built-in parity generation.	AM2903	**AMD (1203)**	
x					Fairchild, NEC-Micro, National, Raytheon	Automatic BCD add, subtract and conversion between binary and BCD. Improved byte handling.	AM29203	**AMD (1203)**	
					AMD, Motorola, National, NEC-Micro, Raytheon	Interrupt option requires 2914 interrupt controller chip.	F2901A	Fairchild	
					AMD, Motorola, National, NEC-Micro, Raytheon	Hardware multiply and divide, normalize, parity.	F2903	Fairchild	10
x						RAM on-chip.	6701	MMI	
							MC10800	Motorola	
					AMD, Fairchild, National, Raytheon		MC2901A	Motorola	
					AMD, Fairchild, National	Hardware multiply and divide; normalize; parity.	MC2903	Motorola	
					AMD, Fairchild, Motorola, NEC-Micro, Raytheon	Interrupt capability requires peripheral chip.	IDM2901A/A-1	**National (3856)**	
x					AMD, Fairchild, Motorola, National, NEC-Micro	Microassembler on timeshare.	2900	Raytheon	
						24,780 Micro- and Macro-instructions.	SN74LS481	**TI (953)**	
						24,780 Micro- and Macro-instructions.	SN74S481	TI	
							F100220	Fairchild	
						16 bit counter, 23 I/O lines.	R6500/41	Rockwell	20
						16 bit counter, 47 I/O lines.	R6500/42	Rockwell	
						16 bit counter, 23 I/O lines.	R6500/43	Rockwell	
						16 bit counter, 23 I/O lines.	R6541Q	Rockwell	
x						Low cost, 12 I/O ports TTL/CMOS compatible.	MB88201	**Fujitsu (1306)**	
x						Low cost, 12 I/O ports TTL/CMOS compatible.	MB88202	**Fujitsu (1306)**	
x						36 I/O ports TTL/CMOS compatible, on board PLA.	MB88401	**Fujitsu (1306)**	
x						37 I/O ports TTL/CMOS compatible.	MB8841	**Fujitsu (1306)**	
x						32 I/O ports TTL/CMOS compatible, 8 bit A/D.	MB88411	**Fujitsu (1306)**	
x						32 I/O ports TTL/CMOS compatible, 8 bit A/D.	MB88413	**Fujitsu (1306)**	
x						23 I/O ports TTL/CMOS compatible.	MB8842	**Fujitsu (1306)**	30
x						57 I/O ports TTL/CMOS compatible, watch dog timer, power down detect.	MB88421	**Fujitsu (1306)**	
x						57 I/O ports TTL/CMOS compatible, watch dog timer, power down detect.	MB88423	**Fujitsu (1306)**	
x						37 I/O ports TTL/CMOS compatible.	MB8843	**Fujitsu (1306)**	
x						23 I/O ports TTL/CMOS compatible.	MB8844	**Fujitsu (1306)**	
x						Other Vcc ranges available, 36 I/O ports TTL/CMOS compatible.	MB88501	**Fujitsu (1306)**	
x						Other Vcc ranges available, 36 I/O ports TTL/CMOS compatible.	MB88503	**Fujitsu (1306)**	
x						37 I/O ports TTL/CMOS compatible.	MB8851	**Fujitsu (1306)**	
x						37 I/O ports TTL/CMOS compatible.	MB8851A	**Fujitsu (1306)**	
x						37 I/O ports TTL/CMOS compatible.	MB8851L	**Fujitsu (1306)**	
x						37 I/O ports TTL/CMOS compatible.	MB8853	**Fujitsu (1306)**	40

Bold face indicates additional data is provided on the page noted.

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
4	CMOS	5	8,16	2K	128x4	2K	2/1	yes	vectored	x	
4	CMOS	5	8,16	2K	128x4	2K	2/1	yes	vectored	x	
4	CMOS	5	8,16	1K	64x4	1K	2/1	yes	vectored	x	
4	CMOS	5	8,16	4K	196x4	4K	2/1	yes	vectored	x	
4	CMOS	3.5-6	8,16	1K	64x4	1K	2/1	yes	vectored	x	
4	CMOS	2.5-3.5	8,16	1K	64x4	1K	2/1	yes	vectored	x	
4	CMOS	5	10		256x4	2.1Kx10	.5/	no		x	
4	CMOS	5	10		160x4	2.1Kx10	.5/	yes		x	
4	PMOS	-10	10	512	32x4	512x10	0.5/0	no		x	x
4	CMOS	5	10	512	32x4	512x10	0.5/0	no		x	x
4	PMOS	-10	10	1024	80x4	1024x10	0.5/0	yes	dual	x	x
4	CMOS	5	10	1024	80x4	1024x10	0.5/0	yes	dual	x	x
4	PMOS	-10	10	2048	160x4	2048x10	0.5/0	yes	dual	x	x
4	CMOS	5	10	2048	160x4	2048x10	0.5/0	yes	dual	x	x
4	PMOS	-10	10	2048	160x4	2048x10	0.5/0	yes	dual	x	x
4	CMOS	5	10	2048	160x4	2048x10	0.5/0	yes	dual	x	x
4	CMOS	5	10		160x4	4Kx10	.5/	yes		x	
4	CMOS	5	10		160x4	4Kx10	.5/	yes		x	
4	CMOS	1.4-2.0	9	1024			.0327/	yes		x	x
4	PMOS	6-9.5	9	1024			0.5/	no		x	x
4	CMOS	3-6	8	1K	64x4	1024	600/0	no		x	x
4	CMOS	3-6	8	1K			600/0	no		x	x
4	NMOS	4.5-6.3	8	2K	160x4	.25/1		yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	160x4	2048	.25/	yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	160x4	See comments	.25/	yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	160x4	2048	.25/	yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	160x4	See comments	.25/	yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	160x4	2048	.25/	yes	vectored	x	x
4	NMOS	4.5-6.3	8	1K	64x4	See comments	4/1	yes	vectored	x	x
4	NMOS	4.5-6.3	8	1K	64x4	See comments	4/1	no		x	x
4	NMOS	4.5-9.5	8	2K	128x4	See comments	2.1/1	yes	vectored	x	x
4	NMOS	4.5-9.5	8	2048	128x4	See comments	2.1/	yes		x	x
4	CMOS	2.4-6.0	8	512	32x4	512	.25/1	no		x	x
4	NMOS	4.5-6.3	8	512	32x4	512	.25/1	no		x	x
4	CMOS	2.4-6.0	8	512	32x4	512	.25/1	no		x	x

© IC MASTER 1983

Software Support									
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit	Alternate Sources	Comments	Model	Source	Line
x						6 bit 3 CHL D/A, 34 I/O ports TTL/CMOS compatible.	MB88535	**Fujitsu (1306)**	
x						6 bit 3 CHL, 13 bit 1 CHL D/A 34 I/O ports TTL/CMOS compatible.	MB88536	**Fujitsu (1306)**	
x						23 I/O ports TTL/CMOS compatible.	MB8854	**Fujitsu (1306)**	
x						LCD driver, 29 I/O ports TTL/CMOS compatible.	MB88541	**Fujitsu (1306)**	
x						23 I/O ports TTL/CMOS compatible.	MB8854A	**Fujitsu (1306)**	
x						23 I/O ports TTL/CMOS compatible.	MB8854L	**Fujitsu (1306)**	
x						2 5-bit A/D converters, drives dot matrix LCDs.	HD4470	Hitachi	
x						Drives seven segment LCDs, on chip counter timer. 32 I/O lines.	HD44790	Hitachi	
x		x	x	x			HMCS42	Hitachi	
x		x	x	x		CMOS HMCS42.	HMCS42C	Hitachi	10
x		x	x	x		On chip counter.	HMCS43	Hitachi	
x		x	x	x		CMOS HMCS43.	HMCS43C	Hitachi	
x		x	x	x		On chip counter.	HMCS44A	Hitachi	
x		x	x	x		CMOS HMCS44A.	HMCS44C	Hitachi	
x		x	x	x		On chip counter.	HMCS45	Hitachi	
x		x	x	x			HMCS45C	Hitachi	
x						Enlarged ROM version of HMC543C, 32 I/O lines.	HMCS46C	Hitachi	
x						Enhanced I/O version of HMC54C, 44 I/O lines.	HMCS47C	Hitachi	
		x		x		Display processor on chip which formats, decodes, and displays. Up to 128 duplex LCD drivers capability with 58 on chip in present configuration. 4 programmable inputs.	M1001	Monosil	
		x		x		On chip display processor controls 8 digit LED multiplexed display. 2-4 bit I/O ports, 1-4 bit input port, 1-4 bit output port.	M1111	Monosil	20
x		x	x	x		48 version, MC141099, permits use of external PROM, RAM or ROM for program development.	MC141000	Motorola	
x		x	x	x		48 D/N version, MC141099, permits use of external PROM, RAM or ROM for program development.	MC141200	Motorola	
x		x	x	x		Same as COP2440 except no on chip ROM and faster execution time (4μs). Interfaces with MM2716 EPROM. COP2304 is extended temperature range device.	COP2404	National	
x					Eurotechnique	Dual CPU microcontroller, programmable counter, zero crossing detector serial I/O port. 35 I/O lines, COP23XX extended temperature range.	COP2440	National	
x		x	x	x		Piggyback Microcontroller. Same as COP2440 except socket for development EPROM.	COP2440R	National	
x					Eurotechnique	Same as COP2440 except 23 I/O lines.	COP2441	National	
x		x	x	x		Piggyback Microcontroller. Same as COP2441 except socket for development EPROM.	COP2441R	National	
x					Eurotechnique	Same as COP2440 except 19 I/O lines.	COP2442	National	
x		x	x	x	Western Digital	Has piggyback EPROM socket. Will accept: MM2716, NM27C16, MM2758A, MM2758B. 1K byte accessable.	COP402	National	
x		x	x	x	Western Digital	Has piggyback EPROM socket. Will accept: MM2716, NM27C16, MM2758A, MM2758B. 1K byte accessable.	COP402M	National	30
x		x	x	x	Western Digital	Has piggyback EPROM socket. Will accept MM2716, 2758A, 2758B or NM27C16 EPROM. 2K Byte accessable. Open drain memory interface drivers.	COP404LP	National	
x		x	x	x	Western Digital	Same as COP404LP except push pull memory interface drivers.	COP404LS	National	
x		x	x	x		4μs instruction cycle time, 20 I/O lines, 2 level subroutine stack, COP310C operates extended temperature range, COP210C operates full temperature range.	COP410C	**National (1361)**	
x		x	x	x	Eurotechnique, Western Digital	16 I/O lines, 24 pins, COP310L has extended temperature range (-40°C to -85°C).	COP410L	**National (1361)**	
x		x	x	x		4μs instruction cycle time, 16 I/O lines, 2 level subroutine stack, COP311C operates extended temperature range, COP211C operates full temperature range.	COP411C	**National (1361)**	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
4	NMOS	4.5-6.3	8	512	32x4	512	.25/1	no		x	x
4	NMOS	4.5-6.3	8	1024	64x4	1K	2.1/1	yes	vectored	x	x
4	CMOS	2.4-6.0	8	1024	64x4	1K	2.1/1	yes	vectored	x	x
4	NMOS	4.5-9.5	8	1024	64x4	1K	2.1/1	yes	vectored	x	x
4	NMOS	4.5-6.3	8	1024	64x4	1K	2.1/1	yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	160x4	2K	1.0/1	yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	160x4	2K		yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	160x4	2K		yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	160x4	2K		yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	160x4	2K		yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	128x4	2K	2.1/1	yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	128x4	2K	2.1/1	yes	vectored	x	x
4	NMOS	4.5-6.3	8	2048	128x4	2K	2.1/1	no		x	x
4	PMOS	8.5	8	630			.4/1	no		x	
4	PMOS	8.5	8	2K-16K			.4/1	yes		x	x
4	PMOS	8.5	8	2K-16K			.4/1	yes		x	x
4	PMOS	8.5	8	1536			.4/1	no		x	
4	CMOS	5	8		96x4 max	2000 max	.440/1	yes		x	
4	PMOS	-6 to -10	8	750	48x4	768	0.3/1			x	
4	CMOS	3-6	8	2K	128x4	2K	4/0	yes	vectored	x	x
4	CMOS	4-6	8	1536	40x4	1536	4/0			x	x
4	CMOS	5	8	1536	40x4	1536	4/0			x	x
4	CMOS	3-6	8	768	32x4	768	4/0			x	x
4	CMOS	3-6	8	1280	64x4	1280	4/0	yes	vectored	x	x
4	NMOS	5	8	1024	64x4	1024	0.45/1				
4	NMOS	5	8	768	32x4	768	.45/1			x	x
4	NMOS	5	8	512	16x4	512	.45/1			x	x
4	NMOS	5	8	512	16x4	512	.45/1			x	x
4	NMOS	5	8	2048	128x4	2048	.45/1			x	x
4	PMOS	-15	8	1024	64x4	1024	.3/1			x	x
4	PMOS	-15	8	768	32x4	768	.3/1			x	x
4	PMOS	-15	8	2048	128x4	2048	.3/1			x	x
4	CMOS	5	8	1024	64x4	1024	.5/1			x	x

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
x		x	x	x	Eurotechnique, Western Digital	13 I/O lines, 20 pins, COP311L has extended temperature range (-40°C to -85°C).	COP411L	**National (1361)**	
x		x	x	x	Eurotechnique, Western Digital	COP32X is extended temperature range version. Also available in smaller packages: COP421 series-24 pins, COP422 series-20 pins.	COP420	National	
x		x	x	x	Eurotechnique, Western Digital	CMOS version of COP420.	COP420C	National	
x		x	x	x	Eurotechnique, Western Digital	Same as COP420 except 23 I/O lines.	COP420L	National	
x		x	x	x		Basically the same as COP420 except piggyback microcontroller. CPU, RAM, I/O and EPROM socket. Accepts: MM2716, NMC27C16, MM2758A, MM2758B. 1K byte accessable.	COP420R	National	
x		x	x	x	Eurotechnique	CPU version of COP2440 series, COP340 is extended temperature range version. 40 pins. 35 I/O lines.	COP440	National	
x		x	x	x		Piggyback Microcontroller: CPU, RAM, I/O and EPROM socket. Accepts: MM2716, NMC27C16, MM2758A, MM27588 EPROMs. Same electrical specs as base P/N.	COP440R	National	
x		x	x	x	Eurotechnique	CPU version of COP2440 series, COP341 is extended temperature range version. 28 pins. 23 I/O lines.	COP441	National	
x		x	x	x		Piggyback Microcontroller: CPU, RAM, I/O and EPROM socket. Accepts: MM2716, NMC27C16, MM2758A, MM27588 EPROMs. Same electrical specs as base P/N.	COP441R	National	
x		x	x	x	Eurotechnique	CPU version of COP2440 series, COP342 is extended temperature range version. 24 pins. 19 I/O lines.	COP442	National	10
x		x	x	x	Eurotechnique, Western Digital	28 pins, 16 I/O lines.	COP444L	National	
x		x	x	x		Piggyback Microcontroller: CPU, RAM, I/O and EPROM socket. Accepts: MM2716, NMC27C16, MM2758A, MM27588 EPROMs. Same electrical specs as base P/N.	COP444LR	National	
x		x	x	x	Eurotechnique, Western Digital	24 pin package, no interrupt, 12 I/O lines.	COP445L	National	
x		x	x	x		1 chip calculator based system, expandable I/O.	MM57140	National	
x		x	x	x		2 chip calculator based system, expandable RAM, ROM, I/O.	MM5781	National	
x		x	x	x		2 chip calculator based system, expandable RAM, ROM, I/O.	MM5782	National	
x		x	x	x		1 chip calculator based system, expandable RAM, I/O.	MM5799	National	
x						μCOM-4 single chip microprocessor family. Consists of 14 individual devices with various RAM, ROM, I/O subroutine stack level options.	uCOM-4	NEC-Micro	
x						Directly drives 8 digit, 8 segment LED display, 24 I/O lines.	uPD7520	NEC-Micro	
x		x	x	x		30 I/O lines, 8-Bit programmable timer.	MSM5840RS	**OKI (3873)**	20
x		x	x	x		13 I/O lines, 40 LCD segment outputs, 12-Bit timer.	MSM58421GSK	**OKI (3873)**	
x		x	x	x		9 I/O lines, 24 Vacuum Fluorescent segment outputs, 8-Bit timer.	MSM58422RS	**OKI (3873)**	
x		x	x	x		21 I/O lines, 8-Bit timer.	MSM5842RS	**OKI (3873)**	
x		x	x	x		30 I/O lines, 8-Bit timer/counter.	MSM5845RS	**OKI (3873)**	
x		x	x	x			MN1400	Panasonic	
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1402	Panasonic	
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1403	Panasonic	
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1404	Panasonic	
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1405	Panasonic	
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1430	Panasonic	30
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1432	Panasonic	
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1435	Panasonic	
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1450	Panasonic	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
4	CMOS	5	8	512	16x4	512	.5/1			x	x
4	CMOS	5	8	512	16x4	512	.5/1			x	x
4	CMOS	5	8	2048	128x4	2048	.5/1			x	x
4	NMOS	5	8	1024	64x4		.45/1			x	x
4	NMOS	5	8	2048	64x4		.45/1			x	x
4	NMOS	5	8	2048	128x4		.45/1			x	x
4	NMOS	5	8		128x4	1536	/1	yes		x	x
4	NMOS	5	8		152x4	2048	/1	yes		x	x
4	NMOS	5	8		256x4	4096	/1	yes		x	x
4	NMOS	5	8		152x4	2048	/1	yes		x	x
4	NMOS	5	8		256x4	4096	/1	yes		x	x
4	PMOS	-15 or 5,-10	8		48x4	670	.1/4	yes		x	
4	PMOS	-15 or 5,-10	8		48x4	640	.1/4	yes		x	
4	PMOS	-15 or 5,-10	8		128x4	2K	.1/4	yes		x	
4	PMOS	-15 or 5,-10	8		128x4	2K	.1/4	yes		x	
4	PMOS	5	8		128	2048	.8/	yes	1	x	x
4	PMOS	5	8		256	4096	.8/	yes	1	x	x
4	PMOS	5	8		256	3072	.8/	yes	1	x	x
4	PMOS	17	8,16	4K			0.256/2	yes		x	x
4	PMOS	-15	8,16	several choices						x	x
4	PMOS	17	8,16	4K	128x4	2048	0.199/0 or 2	yes		x	x
4	NMOS	5	8	2048			.4/0	yes		x	
4	NMOS	5	8	1024			.4/0	yes		x	
4	CMOS	3	8	2268			0.032/	no		x	x
4	CMOS	3	8	1827			0.032/	no		x	
4	CMOS	3-6	8	1K	64x4		1/1				
4	PMOS	-15V	8	1K	64x4		.4/1				
4	CMOS	3-6	8	1K	256x4		1/1				
4	CMOS	3-6	8	2K	128x4		1/1				
4	PMOS	-15V	8	4K	128x4		.55/1				
4	PMOS	-15V	8	2K	128x4		.55/1				

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source		Line
		Programs								
Cross Assembler	High Level Language	Debug	Diagnostic	Edit						
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1453	Panasonic		
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1454	Panasonic		
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1455	Panasonic		
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1498	Panasonic		
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1499	Panasonic		
x		x	x	x		All the MN14XX series members are available in at least one other process type.	MN1499A	Panasonic		
x		x	x	x		All the MN15XX series members have bidirectional I/O lines, 8 bit counter/timer, 8 bit serial shift register, and power down feature to save contents of RAM.	MN1541	Panasonic		
x		x	x	x		All the MN15XX series members have bidirectional I/O lines, 8 bit counter/timer, 8 bit serial shift register, and power down feature to save contents of RAM.	MN1542	Panasonic		
x		x	x	x		All the MN15XX series members have bidirectional I/O lines, 8 bit counter/timer, 8 bit serial shift register, and power down feature to save contents of RAM.	MN1544	Panasonic		
x		x	x	x		All the MN15XX series members have bidirectional I/O lines, 8 bit counter/timer, 8 bit serial shift register, and power down feature to save contents of RAM.	MN1562	Panasonic		10
x		x	x	x		All the MN15XX series members have bidirectional I/O lines, 8 bit counter/timer, 8 bit serial shift register, and power down feature to save contents of RAM.	MN1564	Panasonic		
x						22 I/O lines.	MM75	Rockwell		
x						31 I/O lines.	MM78EL	Rockwell		
x						31 I/O lines.	MM78L	Rockwell		
x						Can drive LED or 14 segment vacuum fluorescent displays. Tone generator, push-pull speaker drive output.	MM78LA	Rockwell		
							MM78LS	Rockwell		
							MM79LS	Rockwell		
							MM89LS	Rockwell		
x			x				PPS-4	Rockwell		
x			x			1-chip parallel microcomputer, several memory options and instruction sets, other supply voltages available.	PPS-4/1	Rockwell		20
x			x			The PPS-4/2 is a 2 chip clock, direct display drive, expanded I/O on CPU chip, 128-4 RAM, 2048x8 ROM, 16 I/O ports on separate memory-I/O chip.	PPS-4/2	Rockwell		
x				x			LM6402	Sanyo		
x				x			LM6405	Sanyo		
x						LCD direct drive. Optional external 1K RAM-MH-51015.	SM-4	Sharp		
x						LCD direct drive.	SM-5	Sharp		
						ROMless system evaluator supports TMS1000/1200 CMOS family members.	SE1000C	TI		
						ROMless system evaluator supports TMS1000/1070/1200/1270/1700 PMOS family members.	SE1000P	TI		
						ROMless system evaluator supports TMS1004 CMOS family members.	SE1004C	TI	(1560)	
						ROMless system evaluator supports TMS1100/1300 CMOS family members.	SE1100C	TI	(1560)	
						ROMless system evaluator supports TMS1400/1470/1600/1670 PMOS family members.	SE1400P	TI	(1560)	30
						ROMless system evaluator supports TMS2100/2170/2300/2370 PMOS family members.	SE2100P	TI	(1560)	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
4	PMOS	9	8	2K	128x4						
4	PMOS	-15	8	2K	128x4		.4/1				
4	PMOS	-15	8	4K	256x4		.55/1				
4	PMOS	-15	8	1K	64x4	1K	0.4/			x	x
4	CMOS	3-6	8	1K	64x4	1K	1/			x	x
4	CMOS	3-6	8	1K	256x4	1K	1/1			x	x
4	PMOS	-15	8	1K	64x4	1K	0.4/			x	
4	CMOS	3-6	8	1K	64x4	1K	1/1			x	
4	PMOS	-15	8	2K	128x4	2K	0.4/			x	x
4	CMOS		8	2K	128	2K	1.0/			x	x
4	PMOS	-15	8	2K	128x4	2K	.4/1			x	x
4	PMOS	-15	8	1K	64x4	1K	0.4/			x	x
4	CMOS	3-6	8	1K	64x4	1K	1/	yes		x	x
4	PMOS	-15	8	1K	64x4	1K	0.4/			x	
4	CMOS	3-6	8	1K	64x4	1K	1/1			x	
4	PMOS	-15	8	2K	128x4	2K	0.4/			x	x
4	CMOS		8	2K	128	2K	1.0/			x	x
4	PMOS	-15	8	2K	128x4	2K	.4/1			x	x
4	PMOS	-15	8	4K	128x4	4K	.55/1			x	x
4	PMOS	-15	8	4K	128x4	4K	.55/1			x	x
4	PMOS	-15	8	4K	64x4	4K	.55/1			x	x
4	PMOS	-15	8	4K	64x4	4K	.55/1			x	x
4	PMOS	-15	8	4K	64x4	4K	.4/1			x	x
4	PMOS		8	2K	128x4	2K	.55/1	yes		x	x
4	PMOS	9	8	2K	128x4	2K				x	x
4	PMOS		8	2K	128x4	2K	.55/1	yes		x	x
4	PMOS	3	8	2K	128x4	2K				x	x
4	PMOS	3	8	2K	128x4	2K				x	x
4	PMOS		8	2K	128x4	2K	.55/1	yes		x	x
4	PMOS		8	2K	128x4	2K	.55/1	yes		x	x
4	PMOS	9	8	4K	256x4	4K	.55/1	yes		x	x
4	PMOS	9	8	4K	256x4	4K	.55/1	yes		x	x
4	PMOS	9	8	4K	256x4	4K	.55/1	yes		x	x

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source		Line
		Programs								
Cross Assembler	High Level Language	Debug	Diagnostic	Edit						
						ROMless system evaluator supports TMS2132 PMOS family members.	SE2130P	TI	(1560)	
						ROMless system evaluator supports TMS1100/1170/1300/1370 PMOS family members.	SE2200P	TI	(1560)	
						ROMless system evaluator supports TMS2400/2470/2600/2670 PMOS family members.	SE2400P	TI	(1560)	
x		x	x	x		64 pin version, TMS-1099/SE-1, permits use of external PROM, RAM or ROM for program development. -9 volt VDD version available.	TMS1000	TI	(1557)	
x		x	x	x		3 level subroutine nesting 32 term output PLA. TMS1099/C/SE-3 for program development.	TMS1000C	TI	(1557)	
x		x	x	x		Expanded RAM version of TMS1000C.	TMS1004C	TI	(1558)	
x		x	x	x		3.5 V output drive capability. -9 volt VDD version available.	TMS1070	TI	(1557)	
x		x	x	x		Vacuum fluorescent drive (-35V) capability on output, 22 I/O lines.	TMS1070C	TI	(1557)	
x		x	x	x		A 64-pin version, TMS1098/SE-2 permits use of external PROM/RAM/ROM for program development. -9 volt VDD version available.	TMS1100	TI	(1557)	
x		x	x	x		CMOS version of TMS1100. 22 I/O lines.	TMS1100C	TI	(1557)	10
x		x	x	x		Fluorescent drive capability otherwise same as TMS1100. -9V VDD version available.	TMS1170	TI	(1557)	
x		x	x	x		64 pin version, TMS-1099/SE-1, permits use of external PROM, RAM or ROM for program development. -9 volt VDD version available.	TMS1200	TI	(1557)	
x		x	x	x		3 level subroutine nesting 32 term output PLA. TMS1099/C/SE-3 for program development.	TMS1200C	TI	(1557)	
x		x	x	x		3.5 V output drive capability. -9 volt VDD version available.	TMS1270	TI	(1557)	
x		x	x	x		Expanded I/O version of TMS1070C.	TMS1270C	TI	(1557)	
x		x	x	x		A 64-pin version, TMS1098/SE-2 permits use of external PROM/RAM/ROM for program development. -9 volt VDD version available.	TMS1300	TI	(1557)	
x		x	x	x		CMOS version of TMS1300. 28 I/O lines.	TMS1300C	TI	(1557)	
x		x	x	x		27 I/O lines, fluorescent drive capability. -9V VDD version available.	TMS1370	TI	(1557)	
x		x	x	x		Expanded memory version of TMS1000. -9V VDD version available.	TMS1400	TI	(1557)	
x		x	x	x		Vacuum fluorescent drive version of TMS1400. -9V VDD version available.	TMS1470	TI	(1557)	20
x		x	x	x		32 I/O lines. -9V VDD version available.	TMS1600	TI	(1557)	
x		x	x	x		Vacuum fluorescent drive version of TMS1600. -9V VDD version available.	TMS1670	TI	(1557)	
x		x	x	x		21 I/O lines, increased ROM version of TMS1000. -9V VDD version available.	TMS1700	TI	(1557)	
x		x	x	x		Interval timer, 8 bit A/D, Zerg crossing detector, handles up to -15V on outputs.	TMS2100	TI	(1558)	
x		x	x	x		Complex sound generator, LED segment outputs, handles up to -9V on outputs.	TMS2132	TI	(1558)	
x		x	x	x		Same as TMS2100 except handles up to -35V on output and has one less I/O line.	TMS2170	TI	(1558)	
x		x	x	x		LCD output driver 4-6 display digits, 32-40 segments. Handles up to -3V on outputs.	TMS2220	TI	(1558)	
x		x	x	x		LCD output driver 7.5-10 display digits, 60-80 segments. Handles up to -3V on outputs.	TMS2240	TI		
x		x	x	x		Event counter, two A/D input channels. Handles up to -15V on outputs.	TMS2300	TI	(1558)	
x		x	x	x		Same as TMS2300 except handles up to -35V on outputs.	TMS2370	TI	(1558)	30
x		x	x	x		Handles up to -15V on outputs.	TMS2400	TI	(1558)	
x		x	x	x		Handles up to -35V on outputs one less I/O line than TMS2400.	TMS2470	TI	(1558)	
x		x	x	x		Handles up to -15V on outputs.	TMS2600	TI	(1558)	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
4	PMOS	9	8	4K	256x4	4K	.55/1	yes		x	x
4	PMOS	9	8	2K	128x4	2K	.5/	yes		x	x
4	CMOS	4-6	8	4K	160x4		.2/1	yes		x	
4	NMOS	5	8	2K	128x4		.5/1	yes		x	
4	NMOS	5	8	4K	256x4		.25/1	yes		x	
4	PMOS	-8,5	10,20	400,512			0.1/0				x
8	HMOS	5	8,16,24	65K	128		12/	yes	vectored		
8	NMOS	5	8,16	4K	64		6/1	yes	vectored	x	
8	NMOS	5	8,16	4K	64		6/1	yes	vectored	x	
8	NMOS	5	8,16	4K	64	1024	6/0	yes	vectored	x	
8	NMOS	5	8,16	4K	128	2048	6/0	yes	vectored	x	
8	HMOS	5	8,16,24	65K	128	4K	12/	yes	vectored		
8	NMOS	5,12	8,16,24	65K			2/2	yes	vectored		
8	NMOS	5	8,16,24	65K			3/0	yes	vectored	x	x
8	HMOS	5	8-48	1M			8/1	yes	vectored		
8	NMOS	5,12	8,16,24	65K			4/2	yes	vectored		
8	NMOS	5	8,16,24	65K			3/0	yes	vectored	x	x
8	HMOS	5	8-48	1M			8/1	yes	vectored		
8	HMOS	5	8-48	1M			8/1	yes	vectored		
8	NMOS	5	8,16,24	65K			2/2	yes	vectored	x	x
8	NMOS	5	8,16	65K	128	2K	2/2	yes	vectored	x	x
8	NMOS	5	8,16,24	65K	128		2/2	yes	vectored	x	x
8	NMOS	5	8,16,24	65K	128		2/2	yes	vectored	x	x
8	NMOS	5	8-32	65K	64	1100	4/	yes	vectored	x	
8	NMOS	5	8-32	65K			1/1	yes	vectored	x	x
8	NMOS	5	8,16,24	65K	128		1.5/2	yes	vectored	x	x
8	NMOS	5	8,16,24	65K			1.5/2	yes	vectored	x	x
8	NMOS	5	8-32	65K			1.5/1	yes	vectored	x	x
8	NMOS	5	8-32	65K			2/1	yes	vectored	x	x
8	NMOS	5,12	16,32,48	16M			3/0	yes	vectored		
8	NMOS	5	8,16,24	65K			1/	yes	vectored	x	x
8	NMOS	5	8,16,24	65K			2/	yes	vectored	x	x
8	NMOS	5	8,16,24	65K			3/1	yes	vectored		

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source		Line
		Programs								
Cross Assembler	High Level Language	Debug	Diagnostic	Edit						
x		x	x	x		Handles up to -35V on outputs.	TMS2670	TI	(1558)	
x		x	x	x		Complex sound generator, LED segment outputs, handles up to -9V on outputs.	TMS3132	TI		
x						Evaluator chip for TLCS-46A series microprocessors. Use with external 4K ROM, 34 I/O lines.	TCP4600AC	Toshiba		
x						Evaluator chip for TLCS-43 series microprocessors. Use with external 2K ROM, 35 I/O lines.	TMP4300C	Toshiba		
x						Evaluator chip for TLCS-47 series microprocessors. Use with external 4K ROM, 35 I/O lines.	TMP4700C	Toshiba		
						64-pin version, CR2872 permits use of external PROM, RAM, ROM for program development.	WD40	Western		
					Intel	Same as AM8051, less 4K ROM.	AM8031	AMD		
	x	x	x	x	Fujitsu, Intel, National, NEC, Signetics, Siemens	ROMless version of 8048.	AM8035	**AMD**	**(1232)**	
x	x	x	x	x	Fujitsu, Intel, National, NEC, Signetics, Siemens	ROMless version of 8049.	AM8039	**AMD**	**(1232)**	
	x	x	x	x	Fujitsu, Intel, National, NEC, Signetics, Siemens	Low standby power mode. On-chip battery charging.	AM8048	**AMD**	**(1232)**	10
x	x	x	x	x	Fujitsu, Intel, National, NEC, Signetics, Siemens	Low standby power mode. On-chip battery charging.	AM8049	**AMD**	**(1232)**	
					Intel	Two 16 bit counters, serial I/O ports, Boolean processor.	AM8051	AMD		
					Intel, NEC-Micro, National, Raytheon, Signetics, Mitsubishi	Priority interrupts with Intel 8214.	AM8080A	**AMD**	**(1233)**	
x	x	x	x	x	Intel, NEC-Micro, Mitsubishi	8085A-2 runs at 5 MHz.	AM8085A	**AMD**	**(1234)**	
					Intel	Same part as iAPX88/10.	AM8088	AMD		
					Intel, NEC-Micro, National, Raytheon, Signetics, Mitsubishi	Priority interrupts with Intel 8214.	AM9080A	**AMD**	**(1233)**	
x	x	x	x	x	Intel, NEC-Micro, Mitsubishi	Meets full MIL temperature range.	AM9085A	AMD		
					Intel, NEC-Micro	Same part as AM8088.	iAPX88/10	AMD		
					Intel	Two chip set using iAPX88/10 plus 8087 numeric data processor.	iAPX88/20	AMD		
					Fairchild, Motorola, Hitachi, Fujitsu	DMA through HALT and three state control.	S6800	AMI		20
					Motorola, Hitachi, Fujitsu, Fairchild	DMA thru HALT and three state control, software compatible with S6800.	S6801	AMI		
					Fairchild, Motorola, Hitachi, Fujitsu	Consists of S6800 with 6821 and 6875 on chip.	S6802	AMI		
					Motorola, Fairchild, Hitachi	ROMless version of S6801.	S6803	AMI		
					Hitachi, Motorola	20 programmable bidirectional I/O lines, self check ROM.	S6805	**AMI**	**(1248)**	
					Fairchild, Motorola, Hitachi	On chip oscillator, enhanced 6800 command set, compatible with entire S6800 family.	S6809	AMI	**(1247)**	
					Fairchild, Motorola, Hitachi, Fujitsu	Consists of S6800 with 6821 and 6875 on chip, CPU runs at 1.5 MHz.	S68A02	AMI		
					Fairchild, Motorola, Hitachi, Fujitsu	S68A08 is same as S68A02 without RAM.	S68A08	AMI		
					Fairchild, Motorola, Hitachi	On chip oscillator, enhanced 6800 command set, compatible with entire S6800 family. CPU runs at 1.5 MHz.	S68A09	AMI	**(1247)**	
					Fairchild, Motorola, Hitachi	On chip oscillator, enhanced 6800 command set, compatible with entire S6800 family. CPU runs at 2 MHz.	S68B09	AMI	**(1247)**	
					SMC	8 bit data bus, 16 bit internal operations. Software compatible with TMS9900.	S9980	AMI		30
x	x		x		Synertek, Rockwell	Software compatible with 6502. 4 MHz maximum crystal or clock external frequency.	MPS6500	CSG		
x	x		x		Synertek, Rockwell	Software compatible with 6502. 4 MHz maximum crystal or clock external frequency.	MPS6500/1A	CSG		
					GTE Micro, Synertek	MPS6503/04/05/06 and /07 have 28 pin packages, 4 or 8K addressing, MPS6512 has external clock, MPS6513/14 and /15 have external clocks and 28-pin package.	MPS6502	CSG		

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
8	NMOS	5	8,16,24	65K			3/1	yes	vectored		
8	CMOS	5	8,16,24	65K			3/1	yes	vectored		
8	NMOS	5	8-200	16M			10/2	yes	vectored		
8	NMOS	5	8-24	2K	64	1K/2K/3K/4K	4/0	yes	vectored	x	x
8	NMOS	5	8-24	4K	128	1K/2K/3K/4K	4/0	yes	vectored	x	x
8	NMOS	5	8-24	2K			4/0	yes	vectored	x	x
8	NMOS	5	8-24	4K	64	4K	4/0	yes	vectored	x	x
8	CMOS	5	8-24	2K	64	1K/2K/3K/4K	4/0	yes	vectored	x	x
8	NMOS	5	8-24	2K	64	2K	4/0	yes	vectored	x	x
8	NMOS	5	8-24	4K	128	2K/4K	4/0	yes	vectored	x	x
8	NMOS	5	8-24	2K			4/0	yes	vectored	x	x
8	NMOS	5	8-24	65K			2/2	yes	vectored	x	x
8	NMOS	5	8-24	65K	128	2K	1/2	yes	vectored	x	x
8	NMOS	5	8-24	65K	128		2/2	yes	vectored		
8	NMOS	5	8,16,24	65K	128		8/2	yes	vectored	x	x
8	NMOS	5	8-24	65K			4/	yes	vectored		
8	HMOS	5	8-32	65K			1/1	yes	vectored		
8	HMOS	5	8-32	65K			1/1	yes	vectored		
8	HMOS	5	8-32	65K			1.5/1	yes	vectored		
8	HMOS	5	8-32	65K			1.5/1	yes	vectored		
8	HMOS	5	8-32	65K			2/1	yes	vectored		
8	HMOS	5	8-32	65K			2/1	yes	vectored		
8	NMOS	5,12	8-24	65K	64		2/0			x	x
8	NMOS	5	8,16,24	65K			2/2	yes	vectored		
8	NMOS	5	8,16,24	65K	128		2/2	yes	vectored		
8	NMOS	5	8-32	65K			1/1	yes	vectored		
8	NMOS	5	8-32	65K			1.5/1	yes	vectored		
8	NMOS	5	8-32	65K			2.0/1	yes	vectored		
8	NMOS	5	8,16,24	65K	128		12/1	yes	vectored		
8	NMOS	5	8,16	4K	64		6/1	yes	vectored		
8	NMOS	5	8,16	4K	128		6/1	yes	vectored		
8	NMOS	5	8,16	4K	64	1K	6/1	yes	vectored		
8	NMOS	5	8,16	4K	128	2K	6/1	yes	vectored		

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
					GTE Micro, Synertek	MPS6503/04/05/06 and /07 have 28 pin packages, 4 or 8K addressing, MPS6512 has external clock, MPS6513/14 and /15 have external clocks and 28-pin package.	MPS6512	CSG	
						CMOS version of 6502 MPU with enhanced instruction set. 3-state address bus for DMA application.	MPS65C02	CSG	
					National, Synertek, Eurotechnique	8 bit version of F16032 16 bit CPU. 32 bit internal architecture. Software upward compatible with F16016 and F16032.	F16008	Fairchild	
x	x	x	x	x	Mostek, Motorola	One chip microcomputer. Programmable hardware, timer on-chip. Software compatible with F8. Choice of ROM size.	F3870	**Fairchild (1253)**	
x	x	x	x	x	Mostek	Stand-by power down, 64 bytes of executable RAM available. Choice of ROM size.	F3872	**Fairchild (1254)**	
x	x	x	x	x	Mostek	Stand-by power down, 64 bytes of executable RAM available.	F3876	Fairchild	
x	x	x	x	x	Mostek	Software compatible with the F8. On chip timer. One chip microcomputer.	F3878	Fairchild	
x	x	x	x	x	Mostek, Motorola	One chip microcomputer. Programmable hardware, timer on-chip. Software compatible with F8. Choice of ROM size. CMOS version.	F38C70	**Fairchild (1257)**	
x		x	x	x		2K EPROM program storage.	F38E70	**Fairchild (1258)**	
x	x	x	x	x	Mostek	Stand-by power down, 64 bytes of executable RAM available. Choice of RAM size.	F38L72	Fairchild	10
x	x	x	x	x	Mostek	Stand-by power down, 64 bytes of executable RAM available, low power.	F38L76	Fairchild	
x	x	x	x	x	AMI, Fujitsu, Hitachi, Motorola	DMA through HALT and three state control, slower clock speeds available.	F6800	**Fairchild (1253,1269,1278)**	
x	x	x	x	x	AMI, Fujitsu, Hitachi, Motorola	DMA through HALT and three state control, software compatible with F6800.	F6801	**Fairchild (1270)**	
						DMA through HALT and three state control on chip clock, software compatible with F6800.	F6802	**Fairchild (1278)**	
x	x	x	x	x	AMI, Hitachi, Motorola	Same as F6801 with out ROM.	F6803	**Fairchild (1270)**	
						DMA through HALT, software compatible with F6800, programmable timer.	F6808	**Fairchild (1278)**	
					AMI, Fujitsu, Motorola, Hitachi	Compatible with entire F6800 family, on chip oscillator.	F6809	**Fairchild (1272)**	
						Compatible with entire F6800 family, requires external clock.	F6809E	**Fairchild (1272,1274)**	
					AMI, Fujitsu, Motorola, Hitachi	Compatible with entire F6800 family, on chip oscillator. Runs at 1.5 MHz.	F68A09	**Fairchild (1272)**	
						Compatible with entire F6800 family, requires external clock. Runs at 1.5 MHz.	F68A09E	**Fairchild (1272,1274)**	20
					AMI, Fujitsu, Motorola, Hitachi	Compatible with entire F6800 family, on chip oscillator. Runs at 2.0 MHz.	F68B09	**Fairchild (1272)**	
						Compatible with entire F6800 family, requires external clock. Runs at 2 MHz.	F68B09E	**Fairchild (1272,1274)**	
x			x		Mostek, SGS	DMA through HALT, three state control, hardware multiply.	F8	**Fairchild (1253,1268)**	
					AMI, Fairchild, Motorola, Hitachi	DMA thru HALT, three state control, RAMless MBL6802.	MBL6800	Fujitsu	
					AMI, Fairchild, Motorola, Hitachi	MBL6802 has MBL6800, 6810 and 6875 on-chip. DMA thru HALT, three state control.	MBL6802	Fujitsu	
					AMI, Fairchild, Motorola, Hitachi	General purpose 8 bit parallel processor.	MBL6809	Fujitsu	
					AMI, Fairchild, Motorola, Hitachi	General purpose 8 bit parallel processor.	MBL68A09	Fujitsu	
					AMI, Fairchild, Motorola, Hitachi	General purpose 8 bit parallel processor.	MBL68B09	Fujitsu	
					Intel	ROMless MBL8051.	MBL8031	**Fujitsu (1307)**	
					Intel	Can be used with external RAM and ROM, 27 I/O lines.	MBL8035	Fujitsu	30
					Intel	ROMless MBL8049.	MBL8039	Fujitsu	
					Intel	Can be used with external RAM and ROM, 27 I/O lines.	MBL8048	Fujitsu	
					Intel	Can be used with external RAM and ROM.	MBL8049	Fujitsu	

Bold face indicates additional data is provided on the page noted.

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
8	NMOS	5	8,16,24	65K	128	4K	12/1	yes	vectored		
8	NMOS	5	8-48	1M			5/1	yes	vectored		
8	CMOS	5	8,16	4K	128		6/1	yes	vectored		
8	CMOS	5	8,16	4K	128	2K	6/1	yes	vectored		
8	NMOS	5	12	512x12	32	512x12	1/1	no		x	x
8	NMOS	5	12	512x12	32	512x12	4/4	no		x	x
8	NMOS	5	12	512x12	32	512x12	1/1	no		x	x
8	NMOS	5	12	512x12	32	512x12	4/1	yes		x	x
8	NMOS	5	13	1024x13	64	1024x13	8/1	yes		x	x
8	NMOS	5	13	2048x13	64	2048x13	8/1	yes		x	
8	CMOS	5	12	512x12	32	512x12	1.1/1	no		x	x
8	CMOS	5	8	4K			4/1	yes	vectored		
8	CMOS	5	8	65K			1/1	yes	vectored		
8	CMOS	5	8	4K			1/1	yes	vectored		
8	CMOS	5	8	8K			1/1	yes	vectored		
8	CMOS	5	8	4K			1/1	yes	vectored		
8	CMOS	5	8	4K			1/1	yes	vectored		
8	CMOS	5	8	8K			1/1	yes	vectored		
8	CMOS	5	8	65K			4/1	yes	vectored		
8	CMOS	5	8	8K			4/1	yes	vectored		
8	CMOS	5	8	4K			4/1	yes	vectored		
8	CMOS	5	8	4K			4/1	yes	vectored		
8	CMOS	5	8	8K			4/1	yes	vectored		
8	CMOS	5	8	65K			4/1	yes	vectored		
8	CMOS	5	8	4K			4/1	yes	vectored		
8	CMOS	5	8	65K			1/1	yes	vectored		
8	CMOS	5	8	4K			1/1	yes	vectored		
8	CMOS	5	8	8K			1/1	yes	vectored		
8	CMOS	5	8	4K			1/1	yes	vectored		
8	CMOS	5	8	64K	64	2K	2	yes		x	x
8	CMOS	5	8-24	65K	128	4K					
8	CMOS	5	8-24	65K	128						
8	CMOS	5	8-24	4K	64	4K					
8	NMOS	5	8-24	65K			2/2	yes	vectored		

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
					Intel	Two 16 bit counters, serial I/O port, Boolean processor.	MBL8051	**Fujitsu (1307)**	
					Intel, NEC-Micro, AMD	Software compatible with MBL8086.	MBL8088	**Fujitsu (1305)**	
					Intel	CMOS version of MBL8039.	MBL80C39	**Fujitsu (1307)**	
						CMOS version of MBL8049.	MBL80C49	**Fujitsu (1307)**	
x		x	x	x	Plessey	32 8-bit registers. Arithmetic logic unit and 32 user defined TTL compatible input-output lines. Self contained oscillator. Stand alone controller.	PIC1650A	**GI (1319)**	
x		x	x	x	Plessey	All the features of the PIC1650A but with 12 I/O lines, crystal oscillator.	PIC1654	**GI (1319)**	
x		x	x	x	Plessey	All the features of the PIC1650A but with 20 I/O lines.	PIC1655A	**GI (1319)**	
x		x	x	x	Plessey	All the features of the PIC1655A but with internal and external interrupts. 3 level stack, crystal oscillator.	PIC1656	**GI (1319)**	
	x	x	x	x	Plessey	Expanded PIC1650 instruction set. 1024x13 bit program ROM. 64 8-bit registers, 6 level stack, 2 external interrupts. 32 I/O lines.	PIC1670	**GI (1309,1319)**	
		x	x	x	Plessey		PIC1672	**GI (1319)**	10
x					Plessey	Low power -12 mW. Wide power supply range (2.5-6V).	PIC16C55	**GI (1319)**	
						Bus compatible with MC6800.	G54SC103	GTE Micro	
					Synertek, CSG	Pin compatible with NMOS 6500 processors, bus compatible with MC6800. On-board clock oscillator.	G65SC02	GTE Micro	
					Synertek, CSG	Pin compatible with NMOS 6500 processors, bus compatible with MC6800.	G65SC03	GTE Micro	
					Synertek, CSG	Pin compatible with NMOS 6500 processors, bus compatible with MC6800.	G65SC04	GTE Micro	
					Synertek, CSG	Pin compatible with NMOS 6500 processors, bus compatible with MC6800.	G65SC05	GTE Micro	
					Synertek, CSG	Pin compatible with NMOS 6500 processors, bus compatible with MC6800.	G65SC06	GTE Micro	
					Synertek, CSG	Pin compatible with NMOS 6500 processors, bus compatible with MC6800.	G65SC07	GTE Micro	
						Bus compatible with MC6800. On board clock oscillator.	G65SC102	GTE Micro	
						Bus compatible with MC6800.	G65SC104	GTE Micro	20
						Bus compatible with MC6800.	G65SC105	GTE Micro	
						Bus compatible with MC6800.	G65SC106	GTE Micro	
						Bus compatible with MC6800.	G65SC107	GTE Micro	
						Bus compatible with MC6800. On board clock oscillator.	G65SC112	GTE Micro	
						Bus compatible with MC6800.	G65SC115	GTE Micro	
					Synertek, CSG	Pin compatible with NMOS 6500 processors, bus compatible with MC6800.	G65SC12	GTE Micro	
					Synertek, CSG	Pin compatible with NMOS 6500 processors, bus compatible with MC6800.	G65SC13	GTE Micro	
					Synertek, CSG	Pin compatible with NMOS 6500 processors, bus compatible with MC6800.	G65SC14	GTE Micro	
					Synertek, CSG	Pin compatible with NMOS 6500 processors, bus compatible with MC6800.	G65SC15	GTE Micro	
x	x	x	x	x		Uses 65SC00 CPU, on board sine wave generator, 16 bit timer, bus compatible with 6800.	G65SC150	GTE Micro	30
						CMOS version of HD6801. Various options available on HD6301X family member chips.	HD6301	Hitachi	
						CMOS version of HD6803. Various options available on HD6303X family member chips.	HD6303	**Hitachi (1345)**	
						CMOS. Various options available on HD6333X family member chips.	HD6333	**Hitachi (1345)**	
						CMOS version of HD6805. Various options available on HD63L05X family member chips.	HD63L05	**Hitachi (1345)**	
						Various options available on HD6800X family member chips.	HD6800	**Hitachi (1345)**	

Bold face indicates additional data is provided on the page noted.

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
8	NMOS	5	8-24	65K	128	2K	1/1	yes	vectored		
8	NMOS	5	8-24	65K	128		2/1	yes	vectored		
8	NMOS	5	8-24	65K	128		1.25/1	yes	vectored		
8	NMOS	5	8-24	4K	64	4K	3.5/1	yes	vectored		
8	NMOS	5	8-24	65K			2/2	yes	vectored		
8	NMOS	5	8-24	65K			2/1	yes	vectored		
8	NMOS	5	8-24	65K			2/1	yes	vectored		
8	NMOS	5	8-24								
8	NMOS	5	8-24	2K	112	2K	4/1	yes	vectored		
8	CMOS	4-12	8,16,24	65K			6.4/0				
8	CMOS	4-6.5	8,16,24	65K			3.2/0				
8	PMOS	-9,5	8,16,24	16K			.8/2	yes	vectored	x	
8	HMOS	5	8,16	1K	64	1K	3.58/			x	x
8	HMOS	5	8,16,24	65K	128		12/	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	256		12/1	yes	vectored	x	x
8	HMOS	5	8,16	4K	64		11/1	yes	vectored	x	x
8	HMOS	5	8,16	4K	64		8/	yes	vectored	x	x
8	HMOS	5	8,16	4K	128		11/	yes	vectored	x	x
8	HMOS	5	8	4K	256		11/1	yes	vectored	x	x
8	HMOS	5	8,16	4K	64	1K	8/	yes	vectored	x	x
8	HMOS	5	8,16	4K	128	2K	11/	yes	vectored	x	x
8	HMOS	5	8	4K	256	4K	11/1	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	128	4K	12/	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	256		12/1	yes	vectored	x	x
8	NMOS	5,12	8,16,24	65K			2/2	yes	vectored	x	x
8	NMOS	5	8,16,24	65K			3/1	yes	vectored	x	x
8	HMOS	5	8,16,24	65K			3,5,6/1	yes	vectored	x	x
8	HMOS	5	8-48	1MB			5/1	yes	see comments	x	
8	CHMOS	5	8,16,24	65K	128		12/1	yes	vectored	x	x
8	CHMOS	5	8	4K	128		11/1	yes	vectored	x	x
8	CHMOS	5	8	4K	128	2K	11/1	yes	vectored	x	x
8	CHMOS	5	8,16,24	65K	128	4K	12/1	yes	vectored	x	x
8	HMOS	5	8,16	4K	64	1K	11/	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	128	4K	12/	yes	vectored	x	x
8											

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
						Various options available on HD6801X family member chips.	HD6801	Hitachi	
						Various options available on HD6802X family member chips.	HD6802	**Hitachi (1345)**	
						Various options available on HD6803X family member chips.	HD6803	**Hitachi (1345)**	
						Various options available on HD6805X family member chips.	HD6805	Hitachi	
						Various options available on HD6808X family member chips.	HD6808	Hitachi	
						Various options available on HD6809X family member chips.	HD6809	**Hitachi (1345)**	
						Same as HD6809, but with external clock, various options available on HD6809EX family member chips.	HD6809E	**Hitachi (1345)**	
						HD6801 with piggyback socket for EPROM (HN2716), various options available on HD68P01X member chips.	HD68P01	Hitachi	
						HD6805 with piggyback socket for EPROM (HN462532), various options available on HD68P05X family member chips.	HD68P05	Hitachi	
						To be used with external ROM, RAM.	HCMP1802	Hughes	10
					RCA	To be used with external ROM, RAM.	HCMP1802C	Hughes	
x	x	x	x	x		8 level interrupts with 8214 priority interrupt chip.	8008	Intel	
x		x	x	x	Signetics, NEC-Micro	Software subset of 8048.	8021H	Intel	
x	x	x	x	x	AMD	Two 16 bit counters, serial I/O port Boolean processor.	8031	Intel	
x	x	x	x	x		Three 16-bit timer/counter. Serial I/O port.	8032	Intel	
x		x	x	x		Can be used with external ROM and RAM. 27 I/O lines.	8035H	Intel	
x		x	x	x	AMD	8035HL-1 has 11 MHz clock. Can be used with external RAM and ROM. 27 I/O lines.	8035HL	Intel	
x		x	x	x	AMD	Can be used with external ROM and RAM.	8039HL	Intel	
		x	x	x		27 I/O lines. Can be used with external RAM and ROM.	8040H	Intel	
x		x	x	x	AMD	1K ROM. 27 I/O lines. 8048H-1 has 11 MHz clock. Can be used with external RAM and ROM.	8048H	Intel	20
x		x	x	x	AMD, NEC-Micro, OKI, Fujitsu, Signetics, Mitsubishi	Can be used with external ROM and RAM.	8049H	Intel	
		x	x	x		27 I/O lines. Can be used with external RAM and ROM.	8050AH	Intel	
x	x	x	x	x	AMD	Two 16 bit counters, serial I/O port Boolean processor, 4K ROM.	8051	Intel	
x	x	x	x	x		Three 16-bit timer/counter. Serial I/O port.	8052	Intel	
x	x	x	x	x	AMD, NEC-Micro, TI, National, Mitsubishi	8080A-1 runs at 3.125 MHz max, -2 runs at 2.63 MHz max.	8080A	Intel	
x	x	x	x	x	AMD, NEC-Micro, Mitsubishi	8080A compatible with multiplexed bus operation. 8085A-2 runs at 5 MHz.	8085A	Intel	
x	x	x	x	x	AMD	8085AH-1 runs 6 MHz, AH-2 runs 5 MHz, AH runs 3 MHz. M8085AH mil version.	8085AH	Intel	
		x	x	x	AMD	I/O processor concentrator and intelligent DMA controller. 4 special purpose input interrupts, 2 DMA request interrupts, 2 general purpose interrupt outputs.	8089	**Intel (1349)**	
x	x	x	x	x	Intersil	Two 16 bit timer/counters, serial I/O port. Boolean processor. Can be used with external ROM or RAM.	80C31	Intel	
		x	x	x	NEC-Micro, National, Toshiba	Low power operation 27 I/O lines. Can be used with external RAM and ROM.	80C39	Intel	30
		x	x	x		Low power operation 27 I/O lines. Can be used with external RAM and ROM.	80C49	Intel	
x	x	x	x	x	Intersil	Two 16 bit timer/counters, serial I/O port. Boolean processor. Can be used with external ROM or RAM.	80C51	Intel	
x		x	x	x	AMD	1K EPROM. Can be used with external ROM and RAM.	8748H	Intel	
x	x	x	x	x		Two 16 bit counters, serial I/O port Boolean processor, 4K EPROM.	8751	Intel	
						Two chip CP/M÷86 operating system processor. Standard on-chip BIOS. Compatible with 8086/87/88/186 up to 8 MHz without wait states.	88/50	Intel	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
8	HMOS	5	8-48	1M			8/1	yes	vectored	x	x
8	HMOS	5	8-48	1M			8/1	yes	vectored	x	x
8	HMOS	5	8-48	1M			8/1	yes	vectored	x	x
8	HMOS	5	8-48	1M			8/1	yes	vectored	x	x
8	CMOS	5	8,16,24	65K	128		6/0	yes	vectored	x	x
8	NMOS	5	8,16	4K	64		6/	yes	vectored		
8	NMOS	5	8-16	4K	128		11/0	yes	vectored	x	
8	NMOS	5	8,16	4K	64	1K	6/	yes	vectored		
8	NMOS	5	8-16	4K	128	2K	11/0	yes	vectored	x	
8	NMOS	5,12	8-24	65K			2/2	yes	vectored	x	
8	NMOS	5	8-24	65K			3/0	yes	vectored	x	x
8	CMOS	5	8,16	4K	128	2K	6/	yes	vectored		
8	NMOS	5	8,16	4K	64	1K	6/	yes	vectored		
8	NMOS	5	8	4K	256	4K	11/	yes	vectored		
8	NMOS	5,12	8,16,24	65K	64	1K	2/0	yes	vectored	x	x
8	NMOS	5	8,16,24	4K	128	4032	4/0	yes	vectored	x	x
8	NMOS	5	8,16,24	2112	128	2K	4/0	yes	vectored	x	x
8	NMOS	5	8,16,24	4K	128	4032	4/0	yes	vectored	x	x
8	NMOS	5	8-36	65K			4/2	yes	vectored	x	x
8	CMOS	3-6	8,16,24	8K	112		5/1	yes	external, timer, software	x	x
8	CMOS	3-6	8,16,24	1K	64	1K	4/1	yes	external, timer	x	x
8	CMOS	3-6	8,16,24	2K	112	2.1K	4/1	yes	external, timer	x	x
8	CMOS	5	8,16,24			21.06	4/	yes	vectored, multilevel	x	x
8	NMOS	5	8,16,24	4K	128	4032	4/0	yes	vectored	x	x
8	NMOS	5	8,16,24	65K			1/2	yes	vectored, multilevel	x	x
8		5		1M							
8	HMOS	5	8,16,24	65K	128	2K	1/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24	65K	128	2K	1.25/	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	192	4K	1/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24	65K	192	4K	1.25/	yes	vectored	x	x
8	NMOS	5	8,16,24	65K	128		2/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24	65K	128		1.25/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24	65K	128		1.25/	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	12		1/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24	65K	128		1.25/	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	192		1/	yes	vectored multi	x	x
8	HMOS	5	8,16,24	65K	128		1.25/	yes	vectored	x	x
8	HMOS	5	8,16,24	2K	32	1K	4/	yes	vectored	x	x

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
	x	x	x	x		High integration 8-bit microprocessor, 2 independent DMA channels, 3 programmable 16-bit timers, programmable memory and peripheral chip-select logic, clock generator, object code compatible with all existing iAPX86/88 software, 10 new instruction types.	iAPX188	**Intel (1348)**	
	x	x	x	x	NEC-Micro, AMD	8088 runs 5 MHz, -2 runs 8 MHz.	iAPX88/10	**Intel (1347)**	
	x	x	x	x	AMD	Two chip set using iAPX88/10 plus 8087 numeric data processor.	iAPX88/20	**Intel (1348)**	
	x	x	x	x		Two chip set using iAPX88/10 plus 80130-3 operating system processor.	iAPX88/30	**Intel (1349)**	
			x		AMI, Motorola	Timer on-chip.	MD68SC02	Mitel	
					Intel	27 I/O lines, can be used with external RAM and ROM.	M5L8035	Mitsubishi	
x	x	x	x	x	Intel, NEC-Micro, Signetics	Low standby power mode, slower clock speeds available. On-chip battery charging.	M5L8039	Mitsubishi	
					Intel	27 I/O lines, can be used with external RAM and ROM.	M5L8048	Mitsubishi	
x	x	x	x	x	Intel, NEC-Micro, Signetics	Low standby power mode, slower clock speeds available. On-chip battery charging.	M5L8049	Mitsubishi	
x	x	x	x	x	AMD, Intel, National, NEC-Micro, Signetics, TI		M5L8080A	Mitsubishi	10
x	x	x	x	x	AMD, NEC-Micro, Intel	8080A compatible with multiplexed bus operation.	M5L8085AP	Mitsubishi	
					Intel	CMOS M5L8049.	M5L80C49	Mitsubishi	
					Intel	1K EPROM, can be used with external ROM & RAM.	M5L8748	Mitsubishi	
					Intel	27 lines I/O, can be used with external RAM and ROM.	M5M8050	Mitsubishi	
x		x	x	x	Fairchild, SGS	Programmable timer.	MK3850	Mostek	
x		x	x	x	Fairchild, Motorola	One chip microcomputer. Programmable hardware, timer on-chip: 3K, 2K, 1K PROM versions available.	MK3870	Mostek	
x		x	x	x	Fairchild, Motorola	Programmable hardware timer, baud rate generator.	MK3873	Mostek	
x		x	x	x	Fairchild, Motorola	Programmable hardware timer, baud rate generator.	MK3875	Mostek	
x	x		x		NEC-Micro, Zilog	8080A software compatible, 25 MHz optional frequency.	MK3880	Mostek	
x		x	x	x	RCA	Single chip CPU and I/O, up to 8K external address space, 16 programmable bidirectional I/O lines.	MC146805E2	Motorola	20
x		x	x	x	RCA	Single chip CMOS, 20 I/O (16 programmable bidirectional) self check mode.	MC146805F2	Motorola	
x		x	x	x	RCA	32 programmable bidirectional I/O lines. Self check mode.	MC146805G2	Motorola	
x		x	x	x		CMOS, 32 programmable bidirectional I/O lines, bootstrap.	MC1468705G2	Motorola	
x			x		Fairchild, Mostek, SGS-ATES	One chip microcomputer. Programmable hardware timer on-chip. 3K, 2K, 1K PROM versions available.	MC3870	Motorola	
x	x		x		AMI, Fairchild, Hitachi, Fujitsu	DMA through HALT and three state control.	MC6800	**Motorola (1351)**	
						MC68008 completely code compatible with MC68000. 32 bit internal architecture, general purpose machine.	MC68008	**Motorola (1356)**	
x	x	x	x	x	AMI, Hitachi, Fujitsu, Fairchild		MC6801	**Motorola (1351,1730)**	
x	x	x	x	x			MC6801-1	**Motorola (1351,1730)**	
x	x	x	x	x		Serial I/O.	MC6801U4	Motorola	
x	x	x	x	x		Serial I/O.	MC6801U4-1	Motorola	30
x	x	x	x	x	AMI, Fairchild, Hitachi, Fujitsu		MC6802	**Motorola (1351)**	
x	x	x	x	x	AMI, Fairchild, Hitachi	Expansion bus.	MC6803	**Motorola (1351)**	
x	x	x	x	x		Serial I/O, timer, expansion bus.	MC6803-1	**Motorola (1351)**	
x	x	x	x	x		Serial I/O, timer, external clock.	MC6803E	**Motorola (1351)**	
x	x	x	x	x		Serial I/O, timer, expansion bus.	MC6803E-1	**Motorola (1351)**	
x	x	x	x	x		Serial I/O, timer.	MC6803U4	Motorola	
x	x	x	x	x		Serial I/O, timer, expansion bus.	MC6803U4-1	Motorola	
x	x	x	x	x		20 bidirectional I/O lines, 64 byte data ROM.	MC6804P2	Motorola	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
8	HMOS	5	8,16,24	2K	64	1100	4/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24	1K	112	1100	4/	yes	multilevel	x	x
8	HMOS	5	8,16,24	2K	64	1.8K	4/	yes	vectored	x	x
8	HMOS	5	8,16,24	4K	64	2K	4/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24		112	3.8K	4/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24	2.5K	64	2.5K	4/	yes	external, timer, software	x	x
8	HMOS	5	8,16,24	4K	64	2K	4/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24		112	3.8K	4/	yes	vectored, multilevel	x	x
8	NMOS	5	8,16,24	65K			2/2	yes	vectored, multilevel	x	x
8	HMOS	5	8-32	65K			4/	yes	vectored	x	x
8	HMOS	5	8-32	65K			4/	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	128	2K	1/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24	65K	128	2K	1.25/	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	128		1/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24	65K	128		1.25/	yes	vectored	x	x
8	NMOS	5	8,16,24	65K	128	2K	1/	yes	vectored, multilevel	x	x
8	NMOS	5	8,16,24	65K	128	2K	1.25/	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	192	4K	1/	yes	vectored multi	x	x
8	HMOS	5	8,16,24	65K	192	4K	1.25/	yes	vectored	x	x
8	HMOS	5	8,16,24	1.8K	112	1.8K	4/	yes	external, timer, software	x	x
8	HMOS	5	8,16,24	3.7K	112	3.7K	4/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24	3.7K	112	3.7K	4/	yes	vectored, multilevel	x	x
8	HMOS	5	8,16,24	65K	128	2K	1.5/	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	128		1.5/	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	128	2K	2/	yes	vectored	x	x
8	HMOS	5	8,16,24	65K	128		2.0/	yes	vectored	x	x
8	XMOS	5	8,16	4K	64		11/1	yes	vectored	x	x
8	NMOS	5	8,16	4K	64		11/1	yes	vectored	x	x
8	XMOS	5	8,16	4K	128		11/1	yes	vectored	x	x
8	XMOS	5	8,16	4K	128		11/1	yes	vectored	x	x
8	XMOS	5	8,16	4K	256		11/1	yes	vectored	x	x
8	NMOS	5	8,16	4K	256		11/1	yes	vectored	x	x
8	XMOS	5	8,16	4K	64	1K	11/1	yes	vectored	x	x
8	NMOS	5	8,16	4K	64	1K	11/	yes	vectored	x	x
8	XMOS	5	8,16	4K	128	2K	11/1	yes	vectored	x	x
8	XMOS	5	8,16	4K	128	2K	11/1	yes	vectored	x	x
8	XMOS	5	8,16	4K	256	4K	11/1	yes	vectored	x	x
8	NMOS	5	8,16	4K	256	4K	11/1	yes	vectored	x	x
8	NMOS	5	8,16	65K			4/1	yes	vectored	x	x
8	NMOS	5	8,16,24	64K	64		4/1	yes	vectored	x	x
8	NMOS	5	8,16,24	64K	64	2.5K	4/1	yes	vectored	x	x
8	NMOS	5	8,16,24	64K	64	2.5K	4/1	yes	vectored	x	x
8	NMOS	5,12	8,16,24	65K			3/2	yes	vectored	x	x

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
		x	x	x	AMI, Hitachi	20 programmable bidirectional I/O lines.	MC6805P2	Motorola	
x		x	x	x		20 I/O, standby RAM mode.	MC6805P4	Motorola	
x	x	x	x	x		20 programmable bidirectional I/O lines, self check.	MC6805P6	Motorola	
		x	x	x	AMI	A/D on chip, 31 I/O lines.	MC6805R2	Motorola	
x		x	x	x		4 channel 8-bit A/D converter.	MC6805R3	Motorola	
x		x	x	x		19 I/O, on chip PLL.	MC6805T2	Motorola	
		x	x	x	AMI	32 I/O lines, self check.	MC6805U2	Motorola	
x		x	x	x		24 bidirectional I/O, self check	MC6805U3	Motorola	
x	x	x	x	x	AMI, Fairchild, Hitachi, Fujitsu		MC6808	**Motorola (1351)**	
x	x	x	x	x	AMI, Fairchild, Hitachi	On chip oscillator enhanced 6800 command set.	MC6809	**Motorola (1352)**	10
x	x	x	x	x	AMI, Fairchild, Hitachi	External clocking for synchronization of multiprocessor systems.	MC6809E	**Motorola (1352)**	
x multilevel	x	x	x	x		128 bytes of dual port RAM.	MC68120	**Motorola (1352,1357,1730)**	
x	x	x	x	x		128 bytes of dual port RAM.	MC68120-1	**Motorola (1352,1357,1730)**	
x	x	x	x	x		128 bytes of dual port RAM.	MC68121	**Motorola (1357)**	
x	x	x	x	x		128 bytes of dual port RAM.	MC68121-1	**Motorola (1357)**	
x multilevel	x	x	x	x		2K bytes of EPROM.	MC68701	**Motorola (1351,1730)**	
x	x	x	x	x		2K bytes of EPROM.	MC68701-1	**Motorola (1351,1730)**	
x	x	x	x	x		Serial I/O, timer, 4K EPROM on chip.	MC68701U4	Motorola	
x	x	x	x	x		Serial I/O timer, 4K EPROM on chip.	MC68701U4-1	Motorola	
x		x	x	x		20 programmable bidirectional I/O lines. Self programming bootstrap, EPROM.	MC68705P3	Motorola	20
x		x	x	x		4 channel A/D, 31 I/O lines (24 programmable), EPROM.	MC68705R3	Motorola	
x		x	x	x		32 I/O lines (24 programmable) EPROM.	MC68705U3	Motorola	
x	x	x	x	x			MC68A01	**Motorola (1351)**	
x	x	x	x	x		Serial I/O, timer, expansion bus.	MC68A03	**Motorola (1351)**	
x	x	x	x	x			MC68B01	**Motorola (1351)**	
x	x	x	x	x		Serial I/O, timer, expansion bus.	MC68B03	**Motorola (1351)**	
x		x	x	x	Intel, NEC-Micro, AMD	ROMless version of INS8048.	INS8035	National	
x		x	x	x	Intel	Lowpower version of INS8035.	INS8035L	National	
x		x	x	x	Intel, NEC-Micro, AMD	ROMless version of INS8049.	INS8039	National	
x		x	x	x		Low power version of INS8039.	INS8039L	National	30
x		x	x	x	Intel	ROMless version of INS8050.	INS8040	National	
x		x	x	x	Intel	ROMless version of INS8050L.	INS8040L	National	
x		x	x	x	Intel, NEC-Micro, AMD		INS8048	National	
x		x	x	x	Intel	Lowpower version of INS8048.	INS8048L	National	
x		x	x	x	Intel, NEC-Micro, AMD	Lowpower standby mode, on-chip bettery charging.	INS8049	National	
x		x	x	x		Low power version of INS8049.	INS8049L	National	
x		x	x	x	Intel		INS8050	National	
x		x	x	x	Intel		INS8050L	National	
x	x	x	x	x		DMA logic.	INS8060	National	
x	x	x	x	x		Hardware 16x16 bit multiply (37μs) and divide (42μs).	INS8070	National	40
x	x	x	x	x		Hardware 16x16 bit multiply (37μs) and divide (42μs).	INS8072	National	
x	x	x	x	x		Tiny Basic microinterpreter, basic 8070 architecture allows high level program with minimum system.	INS8073	National	
x	x	x	x	x	AMD, Intel, NEC-Micro, Signetics, TI, Mitsubishi	Slower speeds available.	INS8080A	National	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
8	CMOS	5	8,16	4K	64	1K	6/	yes	vectored	x	x
8	NMOS	5	8,16	4K	64		6/1	yes	vectored	x	x
8	P2CMOS	5	8,16	4K	64	1K	6/1	yes	vectored	x	x
8	P2CMOS	5	8,16	4K	64		6/1	yes	vectored		x
8	XMOS	5	8,16	4K	256	See comments	11/1	yes	vectored		x
8	P2CMOS	5	8,16	4K	64		6/1	yes	vectored	x	x
8	P2CMOS	5	8-32	65K			4/1	yes	vectored	x	x
8	P2CMOS	5		64K			1/1	yes	vectored	x	
8	P2CMOS	5		64K			2.5/1	yes	vectored	x	
8	P2CMOS	5		64K			4/1	yes	vectored	x	
8	XMOS	5	8-200	16M			10/2	yes	vectored	x	
8	NMOS	5	8-32	65K	26		4/1	yes	vectored		
8	NMOS	5	8-32	65K	128	4K	4/1	yes	vectored	x	
8	NMOS	5	8-16	1K	64	1K	3/0			x	x
8	NMOS	5	8-16	2K	64	2K	3/0	yes	vectored	x	x
8	NMOS	5	8-16	4K	64		6/0	yes	vectored		
8	NMOS	5	8-16	4K	128		11/0	yes	vectored	x	x
8	NMOS	5	8-16	4K	64	1K	6/0	yes	vectored		
8	NMOS	5	8-16	4K	128	2K	11/0	yes	vectored	x	x
8	NMOS	5,12	8,16,24	65K			3/2	yes	vectored	x	
8	NMOS	5	8,16,24	65K			5/0	yes	vectored		
8	NMOS	5	8-48	1M	64		5/1	yes	vectored		
8	CMOS	2.5-6	8-16	4K	64		6/0	yes	vectored	x	
8	CMOS		8-16	4K	64	1K	6/0	yes	vectored	x	
8	NMOS	5	8-16	4K	64	1K	6/0	yes	vectored		
8	NMOS	5	8-16	4K	64		6 or 11/0	yes	vectored	x	
8	NMOS	5	8-16	4K	128		6 or 11/0	yes	vectored	x	x
8	NMOS	5	8-16	4K	64	1K	6 or 11/0	yes	vectored	x	
8	NMOS	5	8-16	4K	128	2K	6 or 11/0	yes	vectored	x	x
8	NMOS	5	8,16,24	65K			5/1	yes	vectored		
8	CMOS	3-6	8-16	4K	64		6/1	yes	vectored	x	x
8	CMOS	3-6	8-16	4K	128		11/1	yes	vectored	x	x
8	CMOS	3-6	8-16	4K	64	1K	6/1	yes	vectored	x	x
8	CMOS	3-6	8-16	4K	128	2K	11/1	yes	vectored	x	x
8	CMOS	3-6	8,16,24	65K			3/1	yes	vectored		
8	CMOS	4-10.5	8,16,24	65K			5.0/0	yes	vectored	x	x
8	CMOS	4-10.5	8,16,24	65K			6.4/0	yes	vectored	x	x
8	CMOS	4-6.5	8,16,24	65K			3.2/0	yes	vectored	x	x

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
x		x	x	x	Intel	CMOS version of INS8048.	NS80C48	National	
x		x	x	x	NEC-Micro	CMOS INS8035.	NS80CX35	**National**	**(1448)**
x		x	x	x	NEC-Micro, OKI	CMOS INS8048 with additional instruction for counter-timer and power-down features.	NS80CX48	**National**	**(1448)**
x		x	x	x		Piggy-back microcomputer, emulates 80C48 and 80CX48, socket for 27C16 58A 2K EPROM.	NS877C48	National	
x		x	x	x		Piggy-back microcomputer, emulates 8048/49/50, socket for program module and EPROM.	NS87P50	National	
x		x	x	x		Piggy-back microcomputer, emulates 80C48 and 80CX48, socket for 27C16 or 27C58A 2K EPROM.	NS87PC48	**National**	**(1451)**
x	x	x	x	x	Eurotechnique	Z80 compatible instruction set, slower speeds available, full and extended temp range available.	NSC800	**National**	**(1367)**
						Fully compatible with Z80 instruction set, on chip bus controller and clock generator. NSC888 evaluation board available.	NSC800-1	**National**	**(1367)**
						Fully compatible with Z80 instruction set, on chip bus controller and clock generator. NSC888 evaluation board available.	NSC800-2	**National**	**(1367)**
						Fully compatible with Z80 instruction set, on chip bus controller and clock generator. NSC888 evaluation board available.	NSC800-4	**National**	**(1367)**
x	x	x		x	Fairchild, Synertec, Eurotechnique	8 bit version of NS16032 16 bit CPU. 32 bit internal architecture. Software upward compatible with NS16032. NS16081 floating point unit available as support chip.	SC16008	**National**	
x	x			x	Mostek, Zilog	Z80 compatible, 158 instructions, 8080A software compatible, 26 bytes R/W memory, on chip dynamic RAM refresh circuitry.	uPD780	NEC	
x						8080A compatible expanded bus 48 I/O lines, programmable timer, 140 instructions.	uPD7801	NEC	
		x	x	x	Intel, Signetics	Software subset of 8048.	uPD8021	NEC	
		x	x	x	Intel, Signetics	On board A/D, software subset of 8048.	uPD8022	NEC	
x				x	AMD, Intel, Signetics, Siemens	Can be used with external RAM and ROM, 27 I/O lines, 8 bit interval timer/counter.	uPD8035L	NEC	
		x	x	x	Fujitsu, Intel, Signetics	Can be used with external RAM and ROM, 27 I/O lines, programmable, interval timer. Pin compatible with 8039.	uPD8039L	NEC	
x				x	AMD, Intel, Signetics, Siemens	27 I/O lines, 8 bit interval timer/events counter.	uPD8048	NEC	
		x	x	x	Fujitsu, Intel, Signetics	Same as PD8039L but with 2K ROM.	uPD8049	NEC	
x	x	x	x	x	AMD, Intel, National, Signetics, TI	uPD753 is 42 pin version, slower CPU speeds available.	uPD8080AF	NEC-Micro	
x	x		x		AMD, Mitsubishi, Intel	8080A compatible.	uPD8085A-2	NEC-Micro	
					AMD, Intel		uPD8088	NEC-Micro	
x		x	x	x	Intersil	CMOS version of PD8035L.	uPD80C35	NEC-Micro	
x			x		Intersil, Intel	CMOS version of PD8048.	uPD80C48	NEC-Micro	
x				x	AMD, Intel, Signetics, Siemens	Same as PD8048 but with 1K EPROM.	uPD8748	NEC-Micro	
x	x	x	x	x	AMD, Fujitsu, Intel, NEC-Micro, Signetics		MSM8035	OKI	
x	x	x	x	x	Intel, National, NEC-Micro, Signetics		MSM8039	OKI	
x	x	x	x	x	AMD, Fujitsu, Intel, NEC-Micro, Signetics		MSM8048	OKI	
x	x	x	x	x	Intel, National, NEC-Micro, Signetics		MSM8049	OKI	
					Intel, AMD, Mitsubishi		MSM8085A	**OKI**	**(3873)**
x		x	x	x	NEC-Micro, National	CMOS version of MSM8035, low stand by power mode.	MSM80C35	**OKI**	**(3873)**
x		x	x	x	NEC-Micro, National	CMOS version of MSM8039, low standby power mode.	MSM80C39	**OKI**	**(3873)**
x		x	x	x	NEC-Micro, National	CMOS version of MSM8048, low stand by power mode.	MSM80C48	**OKI**	**(3873)**
x		x	x	x	NEC-Micro, National	CMOS version of MSM8049, low standby power mode.	MSM80C49	**OKI**	**(3873)**
						CMOS version of MSM8085A.	MSM80C85A	**OKI**	**(3873)**
	x	x	x	x	Hughes		CDP1802	**RCA**	**(1459)**
x	x	x	x	x	Hughes		CDP1802A	**RCA**	**(1459)**
x	x	x	x	x	Hughes		CDP1802AC	**RCA**	**(1459)**

10 20 30

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
8	CMOS	4-6.5	8,16,24	65K			5/0	yes	vectored	x	x
8	CMOS	4-6.5	8,16,24	65K			2.5/0	yes	vectored	x	x
8	CMOS	3-6.5	8,16,24	65K			3.2/0	yes	vectored	x	x
8	CMOS	4-6.5	8,16,24	65K	64	2048	5/1	yes	vectored	x	x
8	CMOS	4-6.5	8,16,24	65K	64		5/1	yes	vectored	x	x
8	CMOS	4-6.5	8,16,24	65K	64		4/0	yes	vectored	x	x
8	CMOS	4-6	8,16,24	65K			5/1	yes	vectored	x	x
8	CMOS	4-6.5	8,16,24	65K			4/0	yes	vectored	x	x
8	CMOS	3-6	8	8K	112		5/1	yes	vectored	x	x
8	CMOS	3-6	8	1089	64	1089	5/1	yes	vectored	x	x
8	CMOS	3-6	8	2106	112	2106	5/1	yes	vectored	x	x
8	PMOS	17	8,16,24	16K			0.256/2	yes		x	x
8	PMOS	17	8,16,24	16K			0.189/0	yes		x	x
8	NMOS	5	8,16,24	65K			2/2	yes		x	x
8	NMOS	5	8,16,24	8K	64	2K	2/1	yes		x	x
8	NMOS	5	8,16,24	16K	192	3072	2/	yes		x	
8	NMOS	5	8,16,24	16K	192	3072	2/	yes		x	
8	NMOS	5	8,16,24	65K	192	256	2/	yes		x	
8	NMOS	5	8,16,24	65K			2/1	yes		x	x
8	NMOS	5	8-24		192		2/	yes	3	x	
8	NMOS	5	8,16,24	65K	192	—	2/	yes		x	
8	NMOS	5	8-32	65K			2.5/1	yes	vectored		
8	NMOS	5	8-32	65K			2.5/2	yes	vectored	x	x
8	NMOS	5	8,16,24	32K			1.25/1	yes	vectored	x	x
8	NMOS	5	8,16,24	32K			2/1	yes	vectored	x	x
8	NMOS	5	8-16	1K	64	1K	3/0	no		x	x
8	NMOS	5	8-16	4K	64		6/0	yes	1		
8	NMOS	5	8-16	4K	128		11/0	yes	1		
8	NMOS	5	8-16	4K	256		11/0	yes	1		
8	NMOS	5	8-16	4K	64	1K	6/0	yes	1		
8	NMOS	5	8-16	4K	128	2K	11/0	yes	1		
8	NMOS	5	8-16	4K	256	4K	11/0	yes	1		
8	TTL	5	16	8K			8/1	yes	polled	x	x
8	TTL	5	16	8K			10/1	yes	vectored	x	x
8	NMOS	5	8-200	16M			10/2	yes	vectored		
8	NMOS	5	8,16,24	65K			2/1	yes	vectored	x	x
8	NMOS	5	8,16,32	64K			4/1	yes	vectored		
8	NMOS	5	8,16,32	4K			2/1	yes	vectored		
8	NMOS	5	8,16,32	8K			2/1	yes	vectored		
8	NMOS	5	8,16,32	4K			2/1	yes	vectored		
8	NMOS	5	8,16,32	4K			2/1	yes	vectored		
8	NMOS	5	8,16,32	8K			2/1	no			
8	NMOS	5	8,16,32	64K			4/1	yes	vectored		
8	NMOS	5	8,16,32	4K			2/1	yes	vectored		

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
	x	x	x		Hughes		CDP1802BC	**RCA (1459)**	
	x	x	x	x	Hughes		CDP1802C	**RCA (1459)**	
x	x	x	x	x			CDP1802M	**RCA (1459)**	
x	x					8-bit counter on board.	CDP1804AC	**RCA (1461)**	
x	x					8-bit counter on board.	CDP1805AC	**RCA (1461)**	
x	x	x	x	x		8-bit counter-timer on-board.	CDP1805C	**RCA (1461)**	
x	x					8-bit counter on board.	CDP1806AC	**RCA (1461)**	
x	x					8-bit counter-timer on-board.	CDP1806C	**RCA (1461)**	
x	x				Motorola	Single chip CMOS CPU, 16 programmable bi-directional I/O lines.	CDP6805E2	RCA	
x	x				Motorola	Single chip CMOS CPU, 20 programmable bi-directional I/O lines, self check mode.	CDP6805F2	RCA	10
x	x				Motorola	Single chip CMOS CPU, 32 programmable bi-directional I/O lines, self check mode.	CDP6805G2	RCA	
x		x	x	x		Optional supply voltage -12,5.	PPS-8	Rockwell	
x		x	x	x		Optional supply voltage -12,5.	PPS-8/2	Rockwell	
x	x	x	x	x	MOS Technology, Synertek	Bus compatible with 6800.	R6500	Rockwell	
x	x	x	x	x		Software compatible with R6502, 32 I/O lines. Other models available with various features.	R6500/1	Rockwell	
						On board USART, two 16 bit counters, 32 I/O lines.	R6500/11	Rockwell	
						On board USART, two 16 bit counters, 56 I/O lines.	R6500/12	Rockwell	
						On board USART, two 16 bit counters, 32 I/O lines.	R6500/13	Rockwell	
x	x	x	x	x		Bus compatible with 6800, 68000.	R6502	Rockwell	
							R6511	Rockwell	20
						Enhanced R6502.	R6511Q	Rockwell	
x	x	x	x	x		4 MHz optional.	Z80/A	SGS	
x	x	x	x	x	Mostek, Zilog	8080A software compatible.	LH0080	Sharp	
x		x	x	x		Any of the general purpose registers can be used as an index register.	2650A	Signetics	
x		x	x	x		Any of the general purpose registers can be used as an index register.	2650A-1	Signetics	
		x	x	x	Intel		8021	Signetics	
					AMD, Fujitsu, Intel, NEC		8035	Signetics	
							8039	Signetics	
							8040	Signetics	
					AMD, Fujitsu, Intel, NEC-Micro		8048	Signetics	30
							8049	Signetics	
							8050	Signetics	
x			x			Bipolar with fixed instructions.	8X300	Signetics	
x		x	x	x	AMD		8X305	Signetics	
					National, Fairchild, Eurotechnique	8 bit version of F16032 16 bit CPU. 32 bit internal architecture. Software upward compatible with F16016 and F16032.	SY16008	Synertek	
	x	x	x		MOSTechnology, Rockwell	DMA based on a stopping CPU, address bus connections are not 3 state.	SY6500	**Synertek (1526)**	
					GTE, CSG	On chip clock, IRQ, NMI, RYD bus compatible with MC6800.	SY6502	Synertek	
					GTE Micro, CSG	On chip clock, IRQ, NMI, bus compatible with MC6800.	SY6503	Synertek	
					GTE Micro, CSG	On chip clock, IRQ bus compatible with MC6800.	SY6504	Synertek	
					GTE Micro, CSG	On chip clock, IRQ, RYD bus compatible with MC6800.	SY6505	Synertek	40
					GTE Micro, CSG	On chip clock, IRQ bus compatible with MC6800.	SY6506	Synertek	
					GTE Micro, CSG	On chip clock, RYD bus compatible with MC6800.	SY6507	Synertek	
					GTE Micro, CSG	External clock, IRQ, NMI, RYD, bus compatible with MC6800.	SY6512	Synertek	
					GTE Micro, CSG	External clock, IRQ, NMI, bus compatible with MC6800.	SY6513	Synertek	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
8	NMOS	5	8,16,32	8K			2/1	yes	vectored		
8	NMOS	5	8,16,32	4K			2/1	yes	vectored		
8	NMOS	5	8,16,24	126K	128	2K	8/1	yes	vectored	x	x
8	HMOS	5	8,16,32	120K	128	2K	/1	yes	vectored		
8	HMOS	5	8,16,32	120K	128	2K	/1	yes	vectored		
8	NMOS	5	8,16,32	120K	128		/1	yes	vectored		
8	NMOS	5	8,16,32	120K	128		/1	yes	vectored		
8	NMOS	5	8,16,32	128K	128		/1	yes	vectored		
8	NMOS	5	8,16,32	128K	128		/1	yes	vectored		
8	NMOS	5	8,16,32	120K	128	4K		yes	vectored		
8	NMOS	5	8,16,32	120K	128	4K		yes	vectored		
8	NMOS	5	8,16,32	120K	128			yes	vectored		
8	NMOS	5	8,16,32	120K	128			yes	vectored		
8	NMOS	5	8,16,32	120K	128			yes	vectored		
8	NMOS	5	8,16,32	120K	128			yes	vectored		
8	NMOS	5	8,16,32	128K	144						
8	CMOS	5	8,16,32	120K	128	2K	/1	yes	vectored		
8	NMOS	5	8,16,32	6K	64K	1K		yes	vectored		
8	SMOS	5	8	64K	128		8/1			x	x
8	SMOS	5	8	64K	128	2K	5/1			x	x
8	SMOS	5	8	64K	128	4K	5/1			x	x
8	SMOS	5	8	64K	128	4K	8/1	yes		x	x
8	SMOS	5	8	64K	128	4K	5/1	yes		x	x
8	NMOS	4.5-10.5	8	64K	128	2K	4/1	yes		x	x
8	NMOS	5	8-16	4K	64		6/0	yes	vectored	x	x
8	NMOS	5	8-16	4K	128		11/0	yes	vectored	x	x
8	NMOS	5	8-16	4K	64	1K	6/0	yes	vectored	x	x
8	NMOS	5	8-16	4K		2K	11/0	yes	vectored	x	x
8	NMOS	5	8,16,24	65K			3/0	yes	vectored	x	x
8	NMOS	5	8,16,24	65K			5/0	yes	vectored	x	x
8	CMOS	5	8-16	4K	128		11/0	yes	vectored	x	x
8	CMOS	5	8-16	4K	128	2K	11/0	yes	vectored	x	x
8	NMOS	5,12	16	65K			3.3/4	std.	4	x	x
8	NMOS	5	8-32	65K			2.5/1	yes	vectored	x	x
8	NMOS	5	8-32	65K			4/1	yes	vectored	x	x
8	NMOS	5	8-32	65K			6/1	yes	vectored	x	x
8	NMOS	5	8-32	65K			8/1	yes	vectored	x	x
8	NMOS	5	8-32	65K			2.5/1	yes	vectored	x	x
8	NMOS	5	8-32	500K			25/2	yes	vectored		

© IC MASTER 1983

Software Support									
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit	Alternate Sources	Comments	Model	Source	Line
					GTE Micro, CSG	External clock, IRQ, bus compatible with MC6800.	SY6514	Synertek	
					GTE Micro, CSG	External clock, IRQ, RYD, bus compatible with MC6800.	SY6515	Synertek	
	x	x	x	x		4 external interrupts, on-chip UART, 2 counter/timers, 32 I/O lines. 64-pin prototype version also Zbus compatible.	Z8	Synertek	
					SGS, Sharp, Zilog	On-chip UART, 2 counter/timers, 32 I/O lines.	Z8601	**Synertek (1540)**	
					SGS, Sharp, Zilog	On-chip UART, 2 counter/timers, 32 I/O lines, faster version of Z8601.	Z8601A	**Synertek (1540)**	
					GTE Micro	Development device simular to Z8601 but has memory control and interface lines for 4K bytes of memory.	Z8602	**Synertek (1541)**	
					GTE Micro	Same as Z8601 but faster CPU speed.	Z8602A	**Synertek (1541)**	
					SGS, Sharp, Zilog, GTE Micro	Phototyping Z8601 with socket for external 2716 EPROM.	Z8603	**Synertek (1542)**	
					SGS, Sharp, Zilog, GTE Micro	Same as Z8603 but faster CPU speed.	Z8603A	**Synertek (1542)**	
					SGS, Sharp, Zilog, GTE Micro	On chip UART, 2 programmable counter/timers, 32 I/O lines. Simular to Z8601.	Z8611	**Synertek (1543)**	10
					SGS, Sharp, Zilog, GTE Micro	Same as Z8611 but faster CPU speed.	Z8611A	**Synertek (1543)**	
					SGS, Sharp, Zilog, GTE Micro	Development device simular to Z8611 but has memory counter and interface lines for 4K bytes of memory.	Z8612	**Synertek (1544)**	
					SGS, Sharp, Zilog, GTE Micro	Same as Z8612 but has faster CPU speed.	Z8612A	**Synertek (1544)**	
					SGS, Sharp, Zilog, GTE Micro	Prototyping Z8611 with socket for external 2716 EPROM.	Z8613	**Synertek (1545)**	
					SGS, Sharp, Zilog, GTE Micro	Same as Z8613 but faster CPU speed.	Z8613A	**Synertek (1545)**	
					Zilog	ROMless version of Z8601.	Z8681	**Synertek (1546)**	
						CMOS version of Z8601.	Z86C01	**Synertek (1548)**	
						Subset of Z8 instruction set. Programmable 8 bit counter/timer.	Z8S	Synertek	
	x					8 bit timer/event counter, optional memory expansion modules available to complement on chip ROM.	TMS7000	TI (1556)	
	x					8 bit timer/event counter, optional memory expansion modules available to complement on chip ROM.	TMS7020	TI (1556)	20
	x					8 bit timer/event counter, optional memory expansion modules available to complement on chip ROM.	TMS7040	TI (1556)	
	x					On chip UART serial port, 2 8-bit timer/counters, optional memory expansion modules available to complement on chip ROM.	TMS7041	TI (1556)	
	x					8 bit timer/event counter, 4K EPROM, optional memory expansion modules available to complement on chip EPROM.	TMS70E40	TI (1556)	
	x					Low power: 35 MW, power down feature, 8-bit interval timer/event counter, optional memory expansion module available to complement on-chip ROM.	TMS70L22	TI	
		x	x	x	AMD, Intel, NEC-Micro, Fujitsu, Signetics		TMP8035	Toshiba	
		x	x	x	NEC-Micro, Fujitsu, Signetics		TMP8039	Toshiba	
		x	x	x	AMD, Intel, NEC-Micro, Fujitsu, Signetics	8748 has U.V. PROM.	TMP8048	Toshiba	
		x	x	x	NEC-Micro, Fujitsu, Signetics		TMP8049	Toshiba	
x	x	x	x	x	AMD, Mitsubishi, NEC-Micro	8080A compatible with multiplexed bus operation.	TMP8085A	Toshiba	
x	x	x	x	x	AMD, Mitsubishi, NEC-Micro		TMP8085A-2	Toshiba	30
x		x	x	x	NEC-Micro, National, OKI		TMP80C39	Toshiba	
x		x	x	x	NEC-Micro, National, OKI		TMP80C49	Toshiba	
x			x			Can cross assemble and simulate with DEC PDP-11.	CP1600	Western	
x	x	x	x	x	Mostek, NEC-Micro, SGS, Sharp	8080A software compatible.	Z80	**Zilog (1581)**	
x	x	x	x	x	Mostek, NEC-Micro, SGS, Sharp	8080A software compatible.	Z80A	**Zilog (1581)**	
x	x	x	x	x	Mostek, NEC-Micro, SGS, Sharp	8080A software compatible.	Z80B	**Zilog (1581)**	
x	x	x	x	x	Mostek, NEC-Micro, SGS, Sharp	High speed version of Z80.	Z80H	**Zilog (1581)**	
x	x	x	x	x	Mostek, NEC-Micro, SGS, Sharp	Low power version of Z80, slower speeds available.	Z80L	**Zilog (1581)**	
						The first of a series of processors. The devices are binary code compatible with the Z80 CPU. 8 and 16 bit multiple and divide.	Z8108	**Zilog (1584)**	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
8	NMOS	5	8,16,24	124K	128	2K	12/1	yes	vectored	x	x
8	NMOS	5	8,16,24	124K	128		12/1	yes	vectored	x	x
8	NMOS	5	8,16,24	124K	128	4K	12/1	yes	vectored	x	x
8	NMOS	5	8-24	124K	128		12/1	yes	vectored	x	x
8	NMOS	5	8-24	124K	128		12/1	yes	vectored	x	x
8	NMOS	5	8-24	124K	128		12/1	yes	vectored	x	x
8	NMOS	5	8-24	124K	128		12/1	yes	vectored	x	x
8	NMOS	5	8-24	128K	128		12/1	yes	vectored	x	x
8/16	HMOS	5	8-48	1M			5/1	yes	see comments		
12	CMOS	5	12	64K			5/0	yes	vectored		
12	CMOS	5	12	32K			4/0	yes	vectored		
12	CMOS	5-10	12	4K			4/0	std.	1	x	
12	PMOS	5	12,24	4K			1.2/0	yes		x	
16	TTL	5	8,16	User defined			10/1	optional	vectored	x	
16	HMOS	5	8-48	1M			10/1	yes	vectored		
16	NMOS	5	16,32	48M			4/1	yes	vectored	x	x
16	NMOS	5	16,32	384K			4/1	yes	vectored	x	x
16	HMOS	5	8-48	1M			8/1	yes	vectored		
16	HMOS	5	8-48	16M			8/1	yes	vectored		
16	HMOS	5	8-48	1M			10/1	yes	vectored		
16	HMOS	5	8-48	1M			10/1	yes	vectored		
16	CMOS	5	16-48	65K	128	2K	3/1	yes	vectored		
16	NMOS	5,12	16-48	65K			3.3/4	yes	vectored	x	
16	CMOS	5	16-48	65K			5/1	yes	vectored		
16	NMOS	5,12	16	32K			8.3/2	yes	vectored	x	
16	NMOS	5	8-200	64K			6/2	yes	vectored		
16	NMOS	5	8-200	16M			6/2	yes	vectored		
16	I^3L	5	16	32K			10/0	yes	vectored	x	
16	I^3L	5	16	64			/0	yes	vectored	x	x
16	NMOS	5	8-48	1M			8/1	yes	vectored	x	x
16	NMOS	5	8-48	1M			10/1	yes	vectored	x	x

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
x	x	x	x	x	Synertek, SGS, Sharp, GTE Micro	On-chip UART, and 2 counter/timers. 4 external interrupts, 32 I/O lines.	Z8601-MCU	**Zilog (1596)**	
x	x	x	x	x	Synertek, SGS, Sharp, GTE Micro	Program storage in separate 2716 EPROM, 4 external interrupts. Has piggyback 24-pin socket to program memory.	Z8603-MCU	**Zilog (1596)**	
x	x	x	x	x	Synertek, SGS, Sharp, GTE Micro	On-Chip UART and 3 counter/timers, 32 I/O lines. 4 external interrupts.	Z8611-MCU	**Zilog (1597)**	
x	x	x	x	x	Synertek, SGS, Sharp, GTE Micro	64 pin development version. 4 external interrupts. ROMless Z8601.	Z8612-MCU	**Zilog (1597)**	
x	x	x	x	x	Synertek, SGS, Sharp, GTE Micro	ROMless Z8. Has piggyback 24-pin socket for direct interface to program memory. Permits program storage in separate EPROMs.	Z8613-MCU	**Zilog (1597)**	
x	x	x	x	x		Single chip basic interpreter with Tiny Basic in ROM.	Z8671-MCU	**Zilog (1597)**	
x	x	x	x	x		Single chip basic interpreter with Tiny Basic in ROM, power down bonding option.	Z8675-MCU	Zilog	
x	x	x	x	x	Synertek	ROMless Z8.	Z8681-MCU	**Zilog (1597)**	
					Intel	I/O processor, concentrator and intelligent DMA controller. 4 special purpose input interrupts, 2 DMA requests interrups, 2 general purpose interrupt outputs.	AM8089	AMD	
						PDP-8 software compatible, high performance upgrade of HM6100 CPU.	HD6120	**Harris (669,1333,1341)**	10
					Intersil	PDP-8 instruction set compatible Fortrar, Basic, Focal, Pascal, available from outside vendors.	HM6100	Harris	
x	x		x		Harris	Executive PDP-8, instruction set.	IM6100	Intersil	
x	x		x				TLCS-12A	Toshiba	
x						Interrupt requires AM2914 interrupt controller chip.	AM29116	**AMD (1224)**	
					Intel, Fujitsu	Same part as iAPX86/10.	AM8086	AMD	
x	x	x	x	x	Zilog	Segmented, single step mode.	AMZ8001	AMD	
x	x	x	x	x	Zilog	Non-segmented, single step mode.	AMZ8002	AMD	
					Intel	High performance-provides two times the performance of iAPX86. Upward compatible with iAPX86/88 software. 10 additional instruction types.	iAPX186	**AMD (1231)**	
					Intel	High performance 80286 processor with memory management. Upward compatible with iAPX86, 88 and IAPX186 software.	iAPX286	**AMD (1231)**	
					Mitsubishi, NEC-Micro, Mostek, Siemens, Intel, Fujitsu	Same part as AM8086.	iAPX86/10	**AMD (1229)**	20
					Intel	Two chip set using iAPX86/10 plus AM8087 numeric data processor.	iAPX86/20	**AMD (1229)**	
					TI	Comments same as S99C91. Protyping chip for AMI Alterable Microcomputer Family.	AMU/PR	**AMI (1251)**	
					TI	Instructions include hardware multiply, divide, software compatible with 990 minicomputers.	S9900	AMI	
					TI	Development tools available from Gould-Millennium. TMS9900 compatible.	S99C91	**AMI (1252)**	
x	x		x			Software compatible with NOVA 3.	mN602	Data Gen	
					National, Synertek, Eurotechnique	All features of F16032 plus 8080 code software compatible, 16 bit interval architecture.	F16016	Fairchild	
					National, Synertek, Eurotechnique	32 bit interval architecture, software multiply and divide.	F16032	**Fairchild (1298)**	
x	x	x	x	x		Microcomputer performance. Multifunction instructions process several steps e.g. add/shift/check and skip.	F9440	Fairchild	
x	x	x	x	x		Second generation Microframe microprocessor with enhanced instructions improved speed and multiprocessing capabilities using I^3L bipolar tech. 16x16 bit multiply in 3.5 μsec.	F9445	**Fairchild (1285,1288)**	
	x	x	x	x	Mitsubishi, Mostek, Intel, Siemens, NEC-Micro	Assembly language compatible with 8080/8085.	MBL8086	**Fujitsu (1305)**	30
	x	x	x	x	Mitsubishi, Mostek, Intel, Siemens, NEC-Micro	Assembly language compatible with 8080/8085.	MBL8086-1	**Fujitsu (1305)**	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
16	NMOS	5	8-48	1M			5/1	yes	vectored	x	x
16	NMOS	-3,5,12	10,20,30	65K			4/2	yes	vectored	x	x
16	CMOS	5	8-48	1M			8/1				
16	NMOS	5	16-80	16K			10/1	yes	vectored		
16	NMOS	5	16-80	16K			4/1	yes	vectored		
16	NMOS	5	16-80	16K			6/1	yes	vectored		
16	NMOS	5	16-80	16K			8/1	yes	vectored		
16	HMOS	5	8-48	1M			8/1	yes	vectored		x
16											
16	HMOS	5	8-48	16M			8/1	yes	vectored		x
16	HMOS	5	8,16,24,32,40,48	16M			8/1	yes	vectored		x
16	HMOS	5	8-48	16M			8/1	yes	vectored		x
16	HMOS	5	8-80	16M physical, 1000M virtual	4Kx16		8/2			x	
16	HMOS	5		16M physical, 1000M virtual			8/2			x	
16	HMOS	5	8-48	1M			10/1	yes	vectored	x	x
16	HMOS	5	8-48	1M			10/1	yes	vectored	x	x
16	HMOS	5	8-48	1M			10/1	yes	vectored	x	x
16											
16		5	8-48	1M			5/1	yes	vectored		
16		5	16,32,48,64,80	16M			4/1	yes	vectored		
16	NMOS	5	8-48	1M			5/1	yes	vectored		
16	—	5	16-80	16M			4/1	yes	vectored		
16	HMOS	5	16-80	16M			10/1	yes	vectored	x	x
16	HMOS	5	16-80	16M			12.5/1	yes	vectored	x	x
16	HMOS	5	16-80	16M			4/1	yes	vectored, multilevel	x	x
16	HMOS	5	16-80	16M			6/1	yes	vectored	x	x
16	HMOS	5	16-80	16M			8/1	yes	vectored	x	x
16	HMOS	5	16-80	16M			10/	yes	vectored	x	x

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
	x	x	x	x	Mitsubishi, Mostek, Intel, Siemens, NEC-Micro	Assembly language compatible with 8080/8085.	MBL8086-2	**Fujitsu (1305)**	
x		x	x	x		3.6 μsec add time with 3.3 MHz clock.	CP-1600	GI	
						Multiply and divide, multibus system compatible, 3 MHz version available, available in industrial or military temperature ranges, pin compatible with Intel 8086.	80C86	**Harris (669,1333)**	
							HD68000R-10	Hitachi	
							HD68000R-4	Hitachi	
							HD68000R-6	Hitachi	
							HD68000R-8	Hitachi	
	x	x	x	x	AMD	High-performance provides two times the performance of iAPX85. Upward compatible with iAPX86/88 software to additional instruction types.	iAPX186	**Intel (1347)**	
						Two chip CP/M-86 operating system processor. Standard on-chip BIOS. Compatible with 8086/87/88/186 up to 8 MHz with out wait states.	iAPX186/50	**Intel (1347,1349)**	
	x	x	x		AMD	High performance 80286 processor with memory management. Upward compatible with iAPX86, 88 software.	iAPX268/10	Intel	10
	x	x	x		AMD	High performance 80286 processor with memory management. Upward compatible with iAPX86, 88 software.	iAPX286/10	**Intel (1348)**	
	x	x	x			Two chip set using iAPX286/10 plus 80287 numeric data processor.	iAPX286/20	Intel	
		x	x			The GDP is a two chip set, IP is a single chip. Together (GDP & IP) form a system that is designed for complex, high level information management. It includes software transparent performance extensibility, multiple independent I/O subsystems, memory protection, hardware process dispatching, hardware interprocess communications, hardware dynamic storage allocation, virtual memory support and floating point.	iAPX432GDP	Intel	
		x	x			The GDP is a two chip set, IP is a single chip. Together (GDP & IP) form a system that is designed for complex, high level information management. It includes software transparent performance extensibility, multiple independent I/O subsystems, memory protection, hardware process dispatching, hardware interprocess communications, hardware dynamic storage allocation, virtual memory support and floating point.	iAPX432IP	Intel	
	x	x	x	x	Mitsubishi, NEC-Micro, Mostek, Siemens, AMD	8086 runs 5 MHz, -1 runs 10 MHz, -2 runs 8 MHz.	iAPX86/10	**Intel (1347)**	
	x	x	x	x	AMD	Two chip set using iAPX86/10 plus 8087 numeric data processor.	iAPX86/20	**Intel (1348)**	
	x	x	x	x		Two chip set using iAPX86/10 plus 80130-3 operating system processor.	iAPX86/30	**Intel (1349)**	
						Two chip CP/M-86 operating system processor. Standard on-chip BIOS. Compatible with 8086/87/88/186 up to 8 MHz with out wait states.	iAPX86/50	**Intel (1349)**	
					Intel	97 instructions.	M5L8086S	Mitsubishi	
						MKB68000 available screened to MIL-STD883.	MK68000	Mostek	20
					Mitsubishi, NEC	Extended temperature range.	MK8086	Mostek	
						68000 screened to MIL-STD-883.	MKB68000	Mostek	
x	x	x	x	x	Hitachi, Mostek, Phillips, Rockwell, Signetics	General purpose register machine, supports memory to memory operations.	MC68000L10	Motorola	
x	x	x	x	x	Hitachi, Mostek, Phillips, Rockwell, Signetics	General purpose register machine, supports memory to memory operations.	MC68000L12	Motorola	
x	x	x	x	x	Hitachi, Mostek, Phillips, Rockwell, Signetics	General purpose register machine, supports memory to memory ops. Available i MIL-STD-883B.	MC68000L4	Motorola	
x	x	x	x	x	Hitachi, Mostek, Phillips, Rockwell, Signetics	General purpose register machine, supports memory to memory operations.	MC68000L6	Motorola	
x	x	x	x	x	Hitachi, Mostek, Phillips, Rockwell, Signetics	General purpose register machine, supports memory to memory operations.	MC68000L8	Motorola	
x	x	x	x	x	Hitachi, Mostek, Phillips, Rockwell, Signetics	General purpose register machine, supports virtual memory ops.	MC68010	**Motorola (1356)**	

Bold face indicates additional data is provided on the page noted.

MICROPROCESSORS (Cont'd)

General			Architecture							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
16	HMOS	5	16-80	64K		4K	6/	yes	vectored		
16	XMOS	5	8-200	16M			6/2	yes	vectored	x	
16	XMOS	5	8-200	16M			10/2	yes	vectored	x	
16	XMOS	5	8-200	16M			6/2	yes	vectored	x	
16	NMOS	5	8-48	1M			5/1		vectored	x	x
16	NMOS	12,5,-3	16	65K			4/2	yes	vectored	x	
16	NMOS	5	16	65K			3/2	yes	vectored	x	
16	NMOS	5	8-48	1M			10/1				
16	HMOS	5	16-80	16M			10/0	yes	vectored		
16	NMOS	5,12	16,32,48	16K			3/1	yes	vectored		
16	NMOS	5	8-200	16M			10/2	256			
16	NMOS	5	8-200	64K			6/2	yes	vectored		
16	NMOS	5	8-200	64K			6/2	yes	vectored		
16	I^2L	5	16,32,48	65K			2/1	yes	vectored	x	x
16	I^2L	5	16,32,48	128K			4.4/	yes		x	
16	NMOS	5,12	16,32,48	65K			3.3/4	yes	vectored priority	x	x
16	NMOS	5	16,32,48	65K			4.0/4	yes	vectored	x	x
16	NMOS	5	16,32,48	256K	32	1K	24/1	yes			
16	NMOS	5	16,32,48	256K	32	1K	24/1	yes			
16	NMOS	5	16,32,48	256K	32	1K	24/1	yes			
16	NMOS	5	16,32,48	2K	128	2K	5/1	yes	vectored masked priority	x	x
16	NMOS	5	16	2K	128	2K	5/1				
16	NMOS	5,12	16,32,48	16K			4/4	yes	vectored priority	x	x
16	NMOS	5,12	16,32,48	16K			10/4	yes	vectored	x	x
16	NMOS	5	16,32,48	65K	256 Bits			yes	vectored priority	x	x
16	NMOS	5	16	32K	256		12/1	yes		x	
16	NMOS	5,12	16	64K			3/4	std.	4	x	
16	NMOS	5,12	16	65K			3.3/4	std.		x	
16	NMOS	5	16-64	48M			10/1	yes	vectored	x	x
16	NMOS	5	16-64	384K			10/1	yes	vectored	x	x
16	NMOS	5	16-64	48M			4/1	yes	vectored	x	x
16	NMOS	5	16-64	48M			6/1	yes	vectored	x	x

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
					Hitachi, Mostek, Phillips, Rockwell, Signetics	Single chip microcomputer, 4K Bytes of ROM, 3 16 Bit timers full duplex, USART.	MC68200	Motorola	
x	x	x		x	Fairchild, Synertek, Eurotechnique	All features of NS10632 plus 8080 code software compatible. Available 3Q 1983.	NS16016	National	
x	x	x		x	Fairchild, Synertek, Eurotechnique	32 bit internal architecture, software multiply and divide, BCD arithmetic. Hardware 32x32 bit multiply in gusec with NS16081 floating point unit. Supports demand-paged virtual memory and virtual machine capability with NS16082 memory management unit.	NS16032-10	**National (1383,1397)**	
x	x	x		x	Fairchild, Synertek, Eurotechnique	32 bit internal architecture, software multiply and divide, BCD arithmetic. Hardware 32x32 bit multiply in gusec with NS16081 floating point unit. Supports demand-paged virtual memory and virtual machine capability with NS16082 memory management unit.	NS16032-6	**National (1381,1383,1397)**	
	x	x	x	x	Intel, Mostek, Siemens		uPD8086-2	NEC-Micro	
x	x	x	x	x	Panafacom	Five accumulator, 345 instructions, capable of addressing 256 I/O devices.	MN1610	Panasonic	
x	x	x	x	x	Panafacom	Five accumulator, 345 instructions, capable of addressing 256 I/O devices. Single supply version of MN1610.	MN1611	Panasonic	
					Intel, AMD, Fujitsu, NEC-Micro, Mostek, Mitsubishi	Assemble language compatible with 8080/8085. 4, 5 and 8 MHz versions available.	SAB8086	Siemens	
					Motorola, Hitachi, Mostek, Rockwell, Phillips	General purpose register machine, supports memory to memory operations.	SCN68000	**Signetics (1524)**	
					AMI	8-bit data bus, 16-bit internal op. Software compatible TM9900.	SMC9980	SMC	10
					Fairchild, National		SY16000	Synertek	
					National, Fairchild, Eurotechnique	All features of SY16032 plus 8080 code. Software compatible, 16 bit internal architecture.	SY16016	Synertek	
					National, Fairchild, Eurotechnique	32 bit interval architecture, software multiply and divide.	SY16032	Synertek	
x	x	x	x	x		Instructions include hardware multiply and divide software compatible with 990 minicomputer.	SBP9900A	TI	
	x	x	x	x		Extended temperature range TMS9989.	SBP9989	**TI (1553)**	
x	x	x	x	x	AMI	Instructions include hardware multiply and divide software compatible with 990 minicomputers.	TMS9900	**TI (1552)**	
x	x	x	x	x		Same as TMS9900 except higher frequency version.	TMS9900-40	**TI (1552)**	
	x	x	x	x		Instruction set compatible with TMS9900.	TMS99105	**TI (1555)**	
	x	x	x	x		Instruction set compatible with TMS9900.	TMS9910SA	TI	
	x	x	x	x		Single precision floating point arithmetic capability. 96 instructions, 7 address modes.	TMS99110	**TI (1555)**	20
	x	x	x	x		Single precision floating point arithmetic capability. 96 instructions, 7 address modes.	TMS99110A	**TI (1553,1555)**	
x	x	x	x	x	AMI	Compatible with TMS9900 instruction set, 2K EPROM.	TMS9940E	**TI (1552)**	
		x	x	x		Same as TMS9940E, except has 2K mask ROM.	TMS9940M	**TI (1552)**	
x	x	x	x	x	AMI, SMC	8 bit data bus, 16 bit internal operation, software compatible with TMS9900.	TMS9980A	**TI (1552)**	
x	x	x	x	x		Same as TMS9980, except has internal clock and requires only +5 and +12 power.	TMS9981	**TI (1553)**	
x	x	x	x	x	AMI		TMS998S	TI	
	x	x	x	x			TMS999S	TI	
	x		x			Directly executes Pascal P-code.	CP9008	Western	
			x				MP1600	Western	
x	x	x	x	x	AMD, SGS, Sharp	Segmented. 16 8-bit, 8 32-bit, 4 64-bit or 16 16-bit registers.	Z2001B	Zilog	30
x	x	x	x	x	AMD, SGS, Sharp	Non-segmented. 16 8-bit, 8 32-bit, 4 64-bit or 16 16-bit registers.	Z2002B	Zilog	
x	x	x	x	x	AMD, SGS, Sharp	Segmented. 16 8-bit, 8 32-bit, 4 64-bit or 16 16-bit registers.	Z8001	**Zilog (1587)**	
x	x	x	x	x	AMD, SGS, Sharp	Segmented. 16 8-bit, 8 32-bit, 4 64-bit or 16 16-bit registers.	Z8001A	**Zilog (1587)**	

Bold face indicates additional data is provided on the page noted.

MICROPROCESSORS (Cont'd)

General			Architectural							Hardware Support	
					(For uC Only)						
Data Word Size, or Structure	Process Type	Supply Voltage (V)	Instruction Word Size (bits)	Directly Address. Memory (Words)	On-Chip RAM (bytes)	On-Chip (P)ROM (bytes)	Clock Freq. (MHz/ Phases)	Interrupts	Levels	Prototyping System	In-Circuit Emulator
16	NMOS	5	16-64	384K			4/1	yes	vectored	x	x
16	NMOS	5	16-64	384K			6/1	yes	vectored	x	x
16	NMOS	5	16-64	384K			10/1	yes	vectored	x	x
16	NMOS	5	16-64	384K			10/1	yes	vectored	x	x
16B	CMOS	+5V	16	2M			20/	yes			
18/16B	NMOS	+5V	16	32K			7.5/	yes		x	x
32	HMOS	5	16-80	4G						x	
32	XMOS	5	8-200	16M							

© IC MASTER 1983

Software Support					Alternate Sources	Comments	Model	Source	Line
		Programs							
Cross Assembler	High Level Language	Debug	Diagnostic	Edit					
x	x	x	x	x	AMD, SGS, Sharp	Non-segmented. 16 8-bit, 8 32-bit, 4 64-bit or 16 16-bit registers.	Z8002	**Zilog**	**(1587)**
x	x	x	x	x	AMD, SGS, Sharp	Non-segmented. 16 8-bit, 8 32-bit, 4 64-bit or 16 16-bit registers.	Z8002A	**Zilog**	**(1587)**
x	x	x	x	x	AMD, SGS, Sharp	Virtual memory, segmented addresses.	Z8003	**Zilog**	**(1588)**
x	x	x	x	x	AMD, SGS, Sharp	Virtual memory, binary compatible with Z8001/Z8002, non-segmented.	Z8004	**Zilog**	**(1588)**
Not required	x	x	x	x		PDP-11 compatible, floating point & MMU std.	DCJH1-AA	DEC	
Not required	x	x	x	x		PDP-11 compatible on chip DRAM control & clock.	DCT11-AA	DEC	
					Hitachi, Mostek, Phillips, Rockwell, Signetics	Instruction cache, 32 bit co-processor, 4 QTR 83.	MC68020	**Motorola**	**(1356)**
						32 bit internal/external architecture. Error correction (ECC) bus handling. NS16032 compatability. Available 2Q 1983.	NS32032	National	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

ABBREVIATIONS OF COMPANY NAMES

Action Ins	Action Instruments
AD	Analog Devices
ADT	Advanced Digital Technology
Adapt Sci	Adaptive Science Corp.
Advent	Advent Products, Inc.
Alphatron	Alphatron
AMA	American Automation
AMD	Advanced Micro Devices
AMI	American Microsystems, Inc.
Amperex	Amperex Electronic Corp.
Analogic	Analogic
Analog Sys	Analog Systems
APC	Applied Micro Circuits
Apex	Apex Microtechnology
APM	Applied Microsystems Corp.
Appl Sys	Applied Systems Corp.
APT	Applied Microtechnology
Aptek	Aptek Microsystems
Array Tech	Array Technology
AWI	Analog West
Bedford	Bedford Computer Systems Inc.
Burr-Brown	Burr-Brown Research
CAE	Computer Aided Engineering
Cal Devices	California Devices
Cent Data	Central Data Corp.
Cermetek	Cermetek
CGRS	CGRS Microtech Inc.
Cherry	Cherry Semiconductor
CIC	Custom Integrated Circuits
Citel	Citel, Inc.
Comlinear	Comlinear Corporation
CMA	Custom MOS Arrays
Comark	Comark Corp.
Comdial	Comdial Semiconductor
Comp Auto	Computer Automation
Compas	Compas Microsystems
Cont Logic	Control Logic Inc.
Control Sys	Control Systems Microsystems Div.
CreMicro	Creative Micro Systems
Cromemco	Cromemco, Inc.
CSG	Commodore Semiconductor Group
Cubit	Cubit Inc.
Curtis	Curtis Electro Devices, Inc.
Cybernetic	Cybernetic Micro Systems
Cybersys	Cybersystems
Cybertek	Cybertek Inc.
Data General	Data General
Data I/O	Data I/O
Data Trans	Data Translation
Datel	Datel-Intersil
Datricon	Datricon Corporation
DDC	Data Devices Corporation
DEC	Digital Equipment Corporation
Delco	Delco Electronics
DGM	Digital Microsystems
Digelec	Digelec Corp.
Digitek	Digitek, Inc.
Dionics	Dionics Inc.
Dist Comp	Distributed Computer Systems
Divers Tech	Diversified Technology
E-H	E-H International, Inc.
Elind	Elind Elettronica Industriale
EL Instr	E & L Instruments
EMM	EMM
Emulogic	Emulogic Inc.
Epson	Epson America, Inc.
ETI Micro	ETI Micro
Exar	Exar Integrated Systems
Fairchild	Fairchild
Ferranti	Ferranti Electric
Fujitsu A	Fujitsu America
Fujitsu	Fujitsu Microelectronics, Inc.
GI	General Instrument
GMS	General Microsystems
GTE Micro	GTE Microcircuits
Harris	Harris Semiconductor
Heurikon	Heurikon Corp.
Hilevel	Hilevel Technology, Inc.
Hitachi	Hitachi America, Ltd.
Holt	Holt Inc.
HP	Hewlett-Packard
Hughes	Hughes Aircraft, Solid State Products
Hybrid Sys	Hybrid Systems
Hycom	Hycom Incorporated
IDT	Integrated Device Technology
IMI	International Microcircuits, Inc.
IMP	International Microelectronic Products
IMS	Industrial Micro-systems Inc.
Inconix	Inconix Corporation
Ind Tech	Inductive Technology
Inmos	Inmos
IntCirEng	Integrated Circuit Engineering
IntCirSys	Integrated Circuit Systems
IntCompSys	Integrated Computer Systems
IntCyber	International Cybernetics
Int Micro	International Microsystems
Int Tech	Integrated Technology Corp.
Intech/FMI	Intech/Function Modules Inc.
Intel	Intel
Interdesign	Interdesign
Intersil	Intersil
Intronics	Intronics
IPI	Integrated Photomatrix Inc.
ITT	ITT Semiconductors
Kinetic Sys	Kinetic Systems
Kontron	Kontron Electronics
Lambda	Lambda Semiconductor
Laserdyne	Laserdyne
LSI Comp	LSI Computer Systems
LSI Logic	LSI Logic Corporation
Master Logic	Master Logic Corporation
Matrix	Matrix Corp.
Matrox	Matrox Electronic Systems
MCC	Microcomputer Control
Micrel	Micrel
Micro Eng	Micro Circuit Engineering
Micro Innov	Micro Innovators
Micropac	Micropac Industries
Micro Net	Micro Networks
Micro Pwr	Micro Power Systems
Micro Sci	Micro Sciences Corp.
Micro Tech	Microcircuits Technology
Micro-Link	Micro-Link Corporation
Micron	Micron Technology
MilerTron	MilerTronics
Miller	Miller Technology
Mitel	Mitel Semiconductor
Mitsubishi	Mitsubishi Electronics
MMI	Monolithic Memories, Inc.
Monosil	Monosil
MonSys	Monolithic Systems Corp.
Mostek	Mostek
Motorola	Motorola Semiconductor
MRC	MRC Systems
Murray	Murray Consulting
National	National Semiconductor
NCR	NCR Corp., Microelectronics Division
NEC-EA	NEC/Electronic Arrays Division
NEC Electron	NEC/Electron Division
NEC Micro	NEC/Microcomputer Division
Nitron	Nitron
Nortek	Nortek
OAE	Oliver Advanced Engineering
Octagon	Octagon Systems Corp.
OEI	Optical Electronics Inc.
Ohio Sci	Ohio Scientific
OKI	OKI Semiconductor
Omnibyte	Omnibyte Corp.
Oscar	I. S. Oscar Assoc.
Panasonic	Panasonic
PC/M	Pacific/Cyber Metrix
Percom	Percom Data Co.
Phoenix	Phoenix Digital Corp.
Pico Design	Pico Design
Polycore	Polycore Electronics
Plessey	Plessy Semiconductors
PMI	Precision Monolithics, Inc.
PragDes	Pragmatic Design Inc.
PREMA	PREMA GmbH
Pro-Log	Pro-Log Corp.
Quay	Quay Corp.
Raytheon	Raytheon Semiconductor
RCA	RCA Solid State Division
RCI Data	RCI Data
RELMS	Relational Memory Systems
Reticon	Reticon
RIFA	RFIA
Rockwell	Rockwell, Microelectronic Devices
RTC	Riehl Time Corporation
Sanken	Sanken Electric
Sanyo	Sanyo
SEEQ	SEEQ Technology, Inc.
Semi Proc	Semi Processes
Siemens	Siemens
Signetics	Signetics
SGS	SGS-ATES Semiconductor
Sharp	Sharp
Silicon G	Silicon General
Siliconix	Siliconix
Silicon Sys	Silicon Systems Inc.
Siltronics	Siltronics
SMC	Standard Microsystems Corp.
Solarise	Solarise Enterprises
Solitron	Solitron Devices
Sprague	Sprague Electric Company
SSM	Solid State Micro Technology for Music
SSS	Solid State Scientific
Stag	Stag Microsystems
Struc. Des.	Structured Design Inc.
Stynetic	Stynetic Systems
Sunrise	Sunrise Electronics
Sunshine	Sunshine Semiconductor
Supertex	Supertex Inc.
Symtek	Symtek Corp.
Synapse	Synapse Corp.
Synertek	Synertek
Sys Innov	Systems Innovations
Tau Zero	Tau Zero Inc.
Tektronix	Tektronix
Telaris	(See Laserdyne)
Teledyne C	Teledyne Crystalonics
Teledyne P	Teledyne Philbrick
Teledyne S	Teledyne Semiconductor
Telefunken	Telefunken
Telephonics	Telephonics LSI
Telmos	Telmos
Teltone	Teltone Corporation
TI	Texas Instruments
Thomson-CSF	Thompson-CSF Components Corp.
TMX	TMX
Topanga	Topanga Data Systems
Toshiba	Toshiba America
Trans-Data	Trans-Data
TRW	TRW-LSI Products
Unitrode	Unitrode
Universal	Universal Semiconductor, Inc.
Vantage	Vantage Data Products
VTI	VLSI Technology, Inc.
Votrax	Votrax
Weitek	Weitek Corporation
Western	Western Digital
Wintek	Wintek Corp.
Xicor	Xicor, Inc.
Xycom	Xycom
Zendex	Zendex Corp.
Zilog	Zilog
Zymos	Zymos Corporation

© IC MASTER 1983

MICROPROCESSOR–System Components

This section presents the major microprocessor system devices organized into system groups, ie F8, 6800, 8080, etc. It includes those RAM's, ROM's and PROM's which are unique to a system. It omits most general purpose memories as they are listed in the Memory section. Similarly, buffers, line drivers, transceivers, UART's, etc. are covered briefly here as they are presented in depth in the Digital and Interface sections.

Bit Slice

Macrologic Bipolar

Function	Device	Source		Line
Arithmetic Logic Register-Stack	9405AC	Fairchild		
	9405AM	† Fairchild		
Buffer (16x4 First-in first-out memory. See also Memory-FIFO's)	9403AC	Fairchild		
	9403AM	† Fairchild		
	N9403	**Signetics**	**(1515)**	
Buffer (64x4 First-in first-out memory. See also Memory-FIFO's)	9402C	Fairchild		
	9402M	† Fairchild		
	9423C	Fairchild		
	9423M	† Fairchild		10
CRC Generator/Checker (See also Interface-Error Checking Circuits)	9401C	Fairchild		
	9401M	† Fairchild		
	9411C	Fairchild		
	9411M	† Fairchild		
	N9401	**Signetics**	**(1514)**	
Data Access Register (performs memory address arithmetic)	9407C	Fairchild		
	9407M	† Fairchild		
Data Encryption, 4 Device Set	9414STC	Fairchild		
	9414STM	Fairchild		
Data Path Switch (for closing data path loops around arithmetic/logic networks such as 9405)	9404C	Fairchild		20
Microprogram Sequencer	9408AC	Fairchild		
	9408AM	† Fairchild		
	9408C	Fairchild		
	9408M	† Fairchild		
Program Stack (16x4 LIFO memory)	9406C	Fairchild		
	9406M	† Fairchild		
RAM (16x4) Write-While-Read (See also Digital-TTL-Memories)	9410C	Fairchild		
	9410M	† Fairchild		

Macrologic CMOS

Function	Device	Source		Line
Arithmetic Logic Register Stack	F4705BC	Fairchild		
	F4705BM	† Fairchild		30
Data Access Register (performs memory address arithmetic)	F4707BC	Fairchild		
	F4707BM	† Fairchild		
Data Path Switch (for closing data path loops around arithmetic/logic networks such as the F4705)	F4704BC	Fairchild		
	F4704BM	† Fairchild		
Microprogram Sequencer	F4708C	Fairchild		
	F4708M	† Fairchild		
Parallel/Serial First-In First-Out Memory (FIFO) (See also Memory-FIFO's)	F4703BC	Fairchild		
	F4703BM	† Fairchild		
Program Stack (16x4 LIFO Memory)	F4706BC	Fairchild		
	F4706BM	† Fairchild		40
Programmable Bit Rate Generator (See also Digital-CMOS-Miscellaneous-Bit Rate Generator)	F4702BC	Fairchild		
	F4702BM	† Fairchild		
	HD4702-2	**† Harris**	**(669.1333)**	
	HD4702-9	**Harris**	**(669.1333)**	
	HD4702A-2	**† Harris**	**(669.1333)**	
	HD4702A-9	**Harris**	**(669.1333)**	
RAM (16x4, clocked) Write-While-Read (See also Digital-CMOS-Memories)	F4710BC	Fairchild		
	F4710BM	† Fairchild		
RAM (16x4) (See also Memory-RAM's)	F4725BC	Fairchild		
	F4725BM	† Fairchild		50
RAM (256x1) (See also Memory-RAM's)	F4720C	Fairchild		
	F4720M	† Fairchild		
RAM (256x4) (See also Memory-RAM's)	F4726BC	Fairchild		
	F4726BM	† Fairchild		
ROM (256x8) (See also Memory-ROMS)	F4735BC	Fairchild		
	F4735BM	† Fairchild		

2 Bit Slice

3000

Function	Device	Source		Line
Central Processing Element	N3002	Signetics		
	S3002	† Signetics		
Microprogram Control Unit	N3001	Signetics		
	S3001	† Signetics		60

4 Bit Slice

10800

Function	Device	Source		Line
Arithmetic Logic Unit	MC10800	Motorola		
Bidirectional Translator with Latch	MC10804	Motorola		
	MC10805	Motorola		
ECL Transceiver with Latch	MC10807	Motorola		
Memories (See Digital-ECL-Memories and Memory-PROMs/ROMs)				
Memory Interface	MC10803	Motorola		
Microprogram Control Function	MC10801	Motorola		
Multibit Shifter (16-Bit programmable shifter)	MC10808	Motorola		
Timing Function, 4 Phase	MC10802	Motorola		
Dual Address Register (32x9 stack)	MC10806	Motorola		70

2900

Function	Device	Source		Line
Microprocessor, 4-Bit Slice, Cascadable	**AM2901AC**	**AMD**	**(1201)**	
	AM2901AM	**† AMD**	**(1201)**	
	AM2901BC	**AMD**	**(1201)**	
	AM2901BM	**† AMD**	**(1201)**	
	AM2901C	**AMD**	**(1201)**	
	AM2901M	**† AMD**	**(1201)**	
	AM2903AC	**AMD**	**(1203)**	
			(Continued)	
Microprocessor, 4-Bit Slice, Cascadable (Cont'd)	**AM2903AM**	**† AMD**	**(1203)**	
	AM2903C	**AMD**	**(1203)**	
	AM2903M	**† AMD**	**(1203)**	80
	AM29203	**AMD**	**(1203)**	
	F2901AC	Fairchild		
	F2901AM	† Fairchild		
	F2903C	Fairchild		
	F2903M	† Fairchild		
	MC2903	Motorola		
	IDM2901A-2	**National**	**(3856)**	
	IDM2901AC	**National**	**(3856)**	
	IDM2901AM	**† National**	**(3856)**	
	2900	Raytheon		90
Bus Transceivers (See also Interface-Line Transceivers)	**AM2905C**	**AMD**	**(1205)**	
	AM2905M	**† AMD**	**(1205)**	
	AM2906C	**AMD**	**(1205)**	
	AM2906M	**† AMD**	**(1205)**	
	AM2907C	**AMD**	**(1206)**	
	AM2907M	**† AMD**	**(1206)**	
	AM2912C	**AMD**	**(1209)**	
	AM2915AC	**AMD**	**(1211)**	
	AM2915AM	**† AMD**	**(1211)**	
	AM2916AC	**AMD**	**(1211)**	100
	AM2916AM	**† AMD**	**(1211)**	
	AM2917AC	**AMD**	**(1212)**	
	AM2917AM	**† AMD**	**(1212)**	
	AM2927C	**AMD**	**(1217)**	
	AM2928C	**AMD**	**(1217)**	
	AM2946C	**AMD**	**(1220)**	
	AM2947C	**AMD**	**(1220)**	
	AM2948C	**AMD**	**(1220)**	
	AM2949C	**AMD**	**(1220)**	
Clock Generator and Driver	**AM2925C**	**AMD**	**(1216)**	110
	AM2925M	**† AMD**	**(1216)**	
Control Store Sequencer	N8X02	Signetics		
Decoder/Demultiplexer	**AM2924C**	**AMD**	**(1216)**	
DMA Address Generator	**AM2940C**	**AMD**	**(1218)**	
	AM2940M	**† AMD**	**(1218)**	
DMA Address Generator/Programmable Timer/Counter	**AM2942C**	**AMD**	**(1219)**	
	AM2942M	**† AMD**	**(1219)**	
Dynamic Memory Controller	AM2964B	AMD		
Error Correction and Detection Circuit, 16-Bit	AM2960C	AMD		
	AM2960M	† AMD		120
Error Correction Circuit	9428	Fairchild		
Error Correction Multiple Bus Buffer, 4-Bit (datapath interface between AM2960, data bus, and RAM)	**AM2904C**	**AMD**	**(1204)**	
	AM2904M	**† AMD**	**(1204)**	
	AM2961C	AMD		
	AM2961M	† AMD		
	AM2962C	AMD		
Look-Ahead Carry Generator	**AM2902AC**	**AMD**	**(1202)**	
	AM2902AM	**† AMD**	**(1202)**	
	MC2902AC	Motorola		
	MC2902AM	† Motorola		130
	IDM2902C	National		
	IDM2902M	† National		

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR-System Components (Cont'd)

4 Bit Slice

2900 (Cont'd)

Function	Device	Source		Line
Microprogram Sequencer, 4-Bit				
	AM2909A	**AMD**	**(1207)**	
	AM2909C	**AMD**	**(1207)**	
	AM2909M	**† AMD**	**(1207)**	
	AM2911A	**AMD**	**(1207)**	
	AM2911C	**AMD**	**(1207)**	
	AM2911M	**† AMD**	**(1207)**	
	IDM2909AC	National		
	IDM2909AM	† National		
	IDM2911AC	National		
	IDM2911AM	† National		10
Next Address Control Unit (use with 2911)				
	AM29811AC	AMD		
	AM29811AM	† AMD		
	IDM29811C	National		
	IDM29811M	† National		
Priority Encoder				
	IDM29902C	National		
	IDM29902M	† National		
Priority Interrupt Encoder, Vectored				
	AM2914C	**AMD**	**(1210)**	
	AM2914M	**† AMD**	**(1210)**	
Priority Interrupt Expander (for 2914)				
	AM2913C	**AMD**	**(1209)**	
	AM2913M	**† AMD**	**(1209)**	20
Programmable Multiplexer, 10-Inputs, Four 10x8 Field Programmable Arrays, Four 8:1 Addressable Multiplexers, Four Outputs				
	29693C	Raytheon		
	29693M	† Raytheon		
PROM(256x4). See 29760/1 series in PART NUMBER INDEX and also MEMORY-PROMs				
PROM(32x8). See 29750/1 series in PART NUMBER INDEX and also MEMORY-PROMs				
RAM (16x4) Two Outputs Ports				
	AM29704C	AMD		
	AM29704M	† AMD		
	AM29705C	**AMD**	**(1225)**	
	AM29705M	**† AMD**	**(1225)**	
	AM29707	**AMD**	**(1225)**	
	F29704C	Fairchild		30
	F29704M	† Fairchild		
	F29705C	Fairchild		
	F29705M	† Fairchild		
	IDM29705AC	National		
	IDM29705AM	† National		
RAM(16x1). See 29700/1/2/3 series in PART NUMBER INDEX and also MEMORY-RAMs, Static				
RAM(256x1), See 29720/1 series in PART NUMBER INDEX and also MEMORY-RAMs, Static				
Quad Bus Driver/Receiver				
	AM2926C	**AMD**	**(1217)**	
	AM2929C	**AMD**	**(1217)**	
Quad D Flip-Flop with Two Output Ports				
	AM2919C	**AMD**	**(1213)**	40
	AM2919M	**† AMD**	**(1213)**	
Quad D Register with Both Standard and Three-State Outputs (See also Digital-TTL-Flip-Flops)				
	AM25LS18C	AMD		
	AM25LS18M	† AMD		
	AM2918C	**AMD**	**(1213)**	
	AM2918M	**† AMD**	**(1213)**	
	AM2918C	Raytheon		
	AM2918M	† Raytheon		
Quad-Gated Flip-Flop				
	IDM29908C	National		
	IDM29908M	† National		
Octal Buffer/Line Driver/Line Receiver				
	AM2958C	**AMD**	**(1223)**	50
	AM2959C	**AMD**	**(1223)**	
Octal D-Type Flip-Flip, Clear and Clock Enable, Three-State	**AM2920C**	**AMD**	**(1214)**	
	AM2920M	**† AMD**	**(1214)**	
Octal D-Type Flip-Flop, Three State				
	IDM29901C	National		
	IDM29901M	† National		
Octal Latch, Three State				
	AM2956C	**AMD**	**(1222)**	
	AM2957C	**AMD**	**(1222)**	
Octal Memory Driver, Three-State				
	AM2965C	AMD		
	AM2965M	† AMD		
	AM2966C	AMD		60
	AM2966M	† AMD		
Octal Register, Three State				
	AM2954C	**AMD**	**(1222)**	
	AM2955C	**AMD**	**(1222)**	
One-of-Eight Decoder, with Polarity Control, Three-State				
	AM2921C	**AMD**	**(1214)**	
	AM2921M	**† AMD**	**(1214)**	
8-Bit Bidirectional I/O Port				
	AM2952C	AMD		
	AM2952M	† AMD		
	AM2953C	AMD		
	AM2953M	† AMD		
8-Bit Parallel I/O Port				
	AM2950C	**AMD**	**(1221)**	70
	AM2950M	**† AMD**	**(1221)**	
	AM2951C	**AMD**	**(1221)**	
	AM2951M	**† AMD**	**(1221)**	
8-Input Multiplexer, with Control Storage				
	AM2922C	**AMD**	**(1215)**	
	AM2922M	**AMD**	**(1215)**	
	AM2923C	**AMD**	**(1215)**	
16-Way Branch Control Unit (use with 2909)				
	AM29803AC	AMD		
	AM29803AM	† AMD		
	IDM29803C	National		
	IDM29803M	† National		80
64-Bit (16x4) Edge-Triggered Register, Three-State				
	IDM29903C	National		

74S481/74LS481

Microprocessor				
	SN74LS481	**TI**	**(953)**	
	SN74S481	TI		
Control Element (for next address generators)				
	SN54S482	**† TI**	**(954)**	
	SN74S482	**TI**	**(954)**	
Erasable PROM(512x8), See 54S/74S472 series in PART NUMBER INDEX and also MEMORY-PROMs				
Field Programmable Logic Array				
	SN74S330	TI		
	SN74S331	TI		
FIFO (See also Memory-FIFO's)				
	SN74S225	**TI**	**(908)**	90
RAM(256x4), See 54S/74S208 series in PART NUMBER INDEX and also MEMORY-RAMs, Static				

8 Bit Slice

Microprocessor, CMOS				
	GP001	**RCA**	**(409)**	
Address Select Unit				
	GP504	**RCA**	**(409)**	
Emulating Controller				
	GP501	**RCA**	**(409)**	
Interrupt Control Unit				
	GP507	**RCA**	**(409)**	
RAM (1024x4)	**GP201**	**RCA**	**(409)**	
Register Select Unit				
	GP505	**RCA**	**(409)**	
ROM (4096 bit)	**GP301**	**RCA**	**(409)**	
	GP302	**RCA**	**(409)**	100

1 Bit

14500

Microprocessor, Industrial Control Unit			
	MC14500B	**Motorola**	**(729)**
Latch, 8-Bit	MC14597BA	† Motorola	
	MC14597BC	Motorola	
	MC14598BA	† Motorola	
	MC14598BC	Motorola	
	MC14599BA	† Motorola	
	MC14599BC	Motorola	

4 Bit

10800

Memories (See Digital-ECL-Memories and Memory-PROMs/ROMs)			

1400

Microcomputer, CMOS			
	MN1450	Panasonic	
	MN1453	Panasonic	110
	MN1454	Panasonic	
	MN1455	Panasonic	
Microcomputer, Evaluator			
	MN1499	Panasonic	
	MN1499A	Panasonic	
Microcomputer, External Memory			
	MN1498	Panasonic	
Microcomputer	MN1400	Panasonic	
	MN1402	Panasonic	
	MN1403	Panasonic	
	MN1404	Panasonic	
	MN1405	Panasonic	120
	MN1430	Panasonic	
	MN1432	Panasonic	
	MN1435	Panasonic	
Clock Circuit	MN1206	Panasonic	
CRT Interface	MN1207	Panasonic	
D/A Converter	MN1204A	Panasonic	
	MN1204B	Panasonic	
I/O Expander, Three-State			
	MN1202	Panasonic	
Dual 4-Bit Data Latch			
	MN1201	Panasonic	

141000

Microprocessor, CMOS, External ROM/PROM			
	MC141000	Motorola	130
	MC141200	Motorola	

1500

Microcomputer	MN1541	Panasonic	
	MN1542	Panasonic	
	MN1544	Panasonic	
	MN1562	Panasonic	
	MN1564	Panasonic	
Evaluator	MN1599	Panasonic	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

4 Bit

1500 (Cont'd)

Function	Device	Source	
I/O Expander	MN1591	Panasonic	

2100

Function	Device	Source	
Microcomputer, Low Power	TMS2240	TI	
Microcomputer with On-Board Complex Sound Generator	**TMS2132**	**TI**	**(1558)**
Program Development Device	**SE2100P**	**TI**	**(1560)**
	SE2130P	**TI**	**(1560)**
	SE2400P	**TI**	**(1560)**

5781/82

Function	Device	Source	
Shift Register Memory (1024-Bit)	MM57126	National	

5799

Function	Device	Source	
Microprocessor	MM57109	National	
	MM57140	National	
	MM5781	National	
	MM5782	National	
	MM5799	National	
Oscillator, Decoder, Driver	DS8664	National	

6000

Function	Device	Source	
Microcomputer	SAA6000	ITT	

6400

Function	Device	Source	
Microcomputer	LM6402	Sanyo	
	LM6405	Sanyo	

88200

Function	Device	Source	
Microcomputer, CMOS, Clock, RAM, ROM, I/O	**MB88201**	**Fujitsu**	**(1306)**
	MB88202	**Fujitsu**	**(1306)**

8840/50

Function	Device	Source	
Microcomputer, CMOS, Clock, RAM, ROM, I/O	**MB8851**	**Fujitsu**	**(1306)**
	MB8851A	**Fujitsu**	**(1306)**
	MB8851L	**Fujitsu**	**(1306)**
	MB8853	**Fujitsu**	**(1306)**
	MB8854A	**Fujitsu**	**(1306)**
	MB8854L	**Fujitsu**	**(1306)**
	MB8855	Fujitsu	
	MB8857	Fujitsu	
	MB8858	Fujitsu	
Microcomputer, NMOS, Clock, RAM, ROM, I/O	**MB8841**	**Fujitsu**	**(1306)**
	MB8842	**Fujitsu**	**(1306)**
	MB8843	**Fujitsu**	**(1306)**
	MB8844	**Fujitsu**	**(1306)**
	MB8845	Fujitsu	
	MB8846	Fujitsu	
	MB8847	Fujitsu	
	MB8848	Fujitsu	
	MB8849	Fujitsu	

88400

Function	Device	Source	
Microcomputer, NMOS, Clock, RAM, ROM, I/O	**MB88401**	**Fujitsu**	**(1306)**
	MB88411	**Fujitsu**	**(1306)**
	MB88413	**Fujitsu**	**(1306)**
	MB88421	**Fujitsu**	**(1306)**
	MB88423	**Fujitsu**	**(1306)**

88500

Function	Device	Source	
Microcomputer, CMOS, Clock, RAM, ROM, I/O	**MB88501**	**Fujitsu**	**(1306)**
	MB88503	**Fujitsu**	**(1306)**
	MB88535	**Fujitsu**	**(1306)**
	MB88536	**Fujitsu**	**(1306)**
	MB88541	**Fujitsu**	**(1306)**

COP400

Function	Device	Source	
Microprocessor, COP2440 without ROM	COP2404	National	
Microcontroller, Piggyback EPROM	COP2440R	National	
	COP2441R	National	
	COP402M	National	
	COP404L	National	
	COP420R	National	
	COP440R	National	
	COP441R	National	
	COP444LR	National	
Microcontroller, ROMless, Dual CPU	COP2404	National	
Microcontroller, ROMless	COP402	National	
	COP402L	National	
	COP404	National	
Microcontroller (with ROM)	COP210C	† National	
	COP211C	† National	
	COP310C	**National**	**(1361,1364)**
	COP310L	**National**	**(1361,1364)**
	COP311C	**National**	**(1361,1364)**
	COP311L	**National**	**(1361,1364)**
	COP320	National	
	COP320C	National	
	COP320L	National	
	COP321	National	
	COP321C	National	
	COP321L	National	
	COP340	† National	
	COP341	† National	
	COP410C	**National**	**(1361)**
	COP410L	**National**	**(1361)**
	COP411C	**National**	**(1361)**
	COP411L	**National**	**(1361)**
	COP420	National	
	COP420C	National	
	COP420L	National	
	COP421	National	
	COP421C	National	
	COP421L	National	
	COP440	National	
	COP441	National	
	COP442	National	
	COP444L	National	
	COP445L	National	

Function	Device	Source	
Microcontroller, Single-Chip, Dual CPU	COP2340	National	
	COP2341	National	
	COP2342	National	
	COP2440	National	
	COP2441	National	
	COP2442	National	
Frequency Generator/Counter Peripheral	COP352	National	
	COP353	National	
	COP452	National	
	COP453	National	
Liquid Crystal Display Controller	COP472	National	
Piggyback Microcontroller with EPROM Socket	COP2440R	National	
	COP2441R	National	
	COP420R	National	
	COP440R	National	
	COP441R	National	
	COP444LR	National	
RAM (4x64) and Timer	COP398	National	
	COP498	National	
Vacuum Fluorescent Display Driver	COP370	National	
	COP470	National	
4x64 Serial RAM (CMOS)	COP399	National	
	COP499	National	
8-Bit A/D Converter	COP430	National	
	COP431	**National**	**(3322)**
	COP432	**National**	**(3322)**
	COP434	**National**	**(3322)**
	COP438	**National**	**(3322)**

HD4470

Function	Device	Source	
Microcomputer, 4-Bit	HD4470	Hitachi	
	HD44790	Hitachi	

HMCS-40

Function	Device	Source	
Microcomputer, 4-Bit	HMCS42	Hitachi	
	HMCS43	Hitachi	
	HMCS43C	Hitachi	
	HMCS44A	Hitachi	
	HMCS44C	Hitachi	
	HMCS45A	Hitachi	
	HMCS45C	Hitachi	
	HMCS46C	Hitachi	
	HMCS47C	Hitachi	
	HMSC42C	Hitachi	

OLMS40

Function	Device	Source	
Microcomputer (CMOS), I/O, Display Outputs, Timer	**MSM58421**	**OKI**	**(3873)**
	MSM58422	**OKI**	**(3873)**
Microcomputer (CMOS), ROM, RAM, Timer	**MSM5840**	**OKI**	**(3873)**
Microcomputer (CMOS), ROM, RAM, Timer/Counter, I/O	**MSM5840R**	**OKI**	**(3873)**
	MSM5842R	**OKI**	**(3873)**
	MSM5845R	**OKI**	**(3873)**
Microprocessor, Real-Time Clock Calendar	**MSM5832**	**OKI**	**(3873)**
	MSM58321	OKI	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR-System Components (Cont'd)

Function	Device	Source		Line
4 Bit				
OLMS40 (Cont'd)				
Analog Display Driver for Radio	MSM5201	OKI		
Column Data Register for LCD	**MSM5839**	**OKI**	**(3873)**	
Row Scanning Controller for LCD DOT Matrix Driver	**MSM5838**	**OKI**	**(3873)**	
Serial to Parallel Converter and LED Driver	MSM5837	OKI		
Four Digit LED Driver	**MSM58282**	**OKI**	**(3873)**	
Four Digit VF Driver	**MSM58283**	**OKI**	**(3873)**	
Five Digit LCD Driver	**MSM58292**	**OKI**	**(3873)**	
Five Digit VF Driver	**MSM58293**	**OKI**	**(3873)**	
16 Line Output Expander	MSM5870	OKI		
SM-4				
Microcomputer	SM-4	Sharp		10
	SM-5	Sharp		
Evaluation Device	LI3010	Sharp		
TLCS-43				
Microcomputer	TLCS-43	Toshiba		
TLCS-46				
Microcomputer	TLCS-46	Toshiba		
TMS1000				
Microcomputer (CMOS)	MC141000	Motorola		
	MC141200	Motorola		
	TMS1000C	**TI**	**(1557)**	
	TMS1004C	**TI**	**(1558)**	
	TMS1070C	**TI**	**(1557)**	
	TMS1100C	**TI**	**(1557)**	20
	TMS1200C	**TI**	**(1557)**	
	TMS1270C	**TI**	**(1557)**	
	TMS1300C	**TI**	**(1557)**	
Microcomputer	**TMS1000**	**TI**	**(1557)**	
	TMS1070	**TI**	**(1557)**	
	TMS1100	**TI**	**(1557)**	
	TMS1200	**TI**	**(1557)**	
	TMS1270	**TI**	**(1557)**	
	TMS1300	**TI**	**(1557)**	
Arithmetic Processor	**TMS0117NLP**	**TI**	**(1559)**	30
	TMS1018	**TI**	**(1559)**	
Capacitive Input	TMS1976	TI		
I/O Expander	TMS1024	TI		
	TMS1025	TI		
Program Development Device	SE1000C	TI		
	SE1000P	TI		
	SE1004C	**TI**	**(1560)**	
	SE1100C	**TI**	**(1560)**	
	SE1400P	**TI**	**(1560)**	
	SE2200P	**TI**	**(1560)**	40
Program Development Device (uses external memory)	TMS1098	TI		
	TMS1099	TI		
Program Development Device (uses external memory), CMOS	MC141099	Motorola		
	TMS1099C	TI		
Programmable Timer Controller	**TMS1020NLL**	**TI**	**(1559)**	
ROMless TMS1000 Family Evaluator	SE1000C	TI		
	SE1000P	TI		
	SE1004C	TI		
	SE1100C	TI		
	SE1400P	TI		50
	SE2200P	TI		
Timer/Controller	TMS1121	TI		
User Programmable Climate Controller	TMS2732NLL	TI		
TMS2000				
Microcomputer, Low Power	**TMS2220**	**TI**	**(1558)**	
Microcomputer	**TMS2100**	**TI**	**(1558)**	
	TMS2170	**TI**	**(1558)**	
	TMS2240	TI		
	TMS2300	**TI**	**(1558)**	
	TMS2370	**TI**	**(1558)**	
	TMS2400	**TI**	**(1558)**	60
	TMS2470	**TI**	**(1558)**	
	TMS2600	**TI**	**(1558)**	
	TMS2670	**TI**	**(1558)**	
	TMS3132	TI		
ROMless TMS2000 Family Evaluator	SE2100P	TI		
	SE2130P	TI		
	SE2400P	TI		
WD40				
Microcontroller	CR1872	Western		
Prototyping Device	CR2872	Western		
uCOM-4				
Microcomputer	μPD546	NEC-Micro		70
	μPD547	NEC-Micro		
	μPD547L	NEC-Micro		
	μPD548	NEC-Micro		
	μPD550	NEC-Micro		
	μPD550L	NEC-Micro		
	μPD552	NEC-Micro		
	μPD553	NEC-Micro		
	μPD554	NEC-Micro		
	μPD554L	NEC-Micro		
	μPD557L	NEC-Micro		80
	μPD650	NEC-Micro		
	μPD651	NEC-Micro		
	μPD652	NEC-Micro		
uCOM-75				
Microcomputer	μCOM-75	NEC-Micro		
	μPD7502	NEC-Micro		
	μPD7520	NEC-Micro		
4/8 Bit				
PPS-4, PPS-8				
Microcomputer (PPS-4/1)	MM75	Rockwell		
	MM76EL	Rockwell		
	MM78	Rockwell		
	MM7899	Rockwell		90

(Continued)

Function	Device	Source	Line
Microcomputer (PPS-4/1)			(Cont'd)
	MM78L	Rockwell	
	MM78LA	Rockwell	
	MM78LS	Rockwell	
	MM79LS	Rockwell	
	MM89LS	Rockwell	
Microprocessor Evaluation Circuit (for PPS-4/1)	A7699	Rockwell	
Microprocessor (for PPS-4/2)	11660	Rockwell	
Microprocessor (for PPS-4)	12660	Rockwell	
Microprocessor (for PPS-8/2)	12806	Rockwell	
Microprocessor (for PPS-8)	11806	Rockwell	100
Bus Interface Circuit (BIC)	10738	Rockwell	
Clock Generator (CLK) (for PPS-4, PPS-8)	10706	Rockwell	
Direct Memory Access Controller (DMA) (for PPS-8)	10817	Rockwell	
Display Controller (DC)	10814	Rockwell	
Floppy Disk Controller (FDC) (for PPS-8)	10936	Rockwell	
General Purpose Input/Output (GPI/O)	10696	Rockwell	
	11696	Rockwell	
General Purpose Keyboard and Display Control (GPKD)	10788	Rockwell	
Interval Timer	11049	Rockwell	
Keyboard/Printer Controller (KPC)	10815	Rockwell	110
Parallel Data Controller (PDC) (for PPS-8, PPS-8/12)	10453	Rockwell	
Printer Controller (PC)	10789	Rockwell	
	RC7000	Rockwell	
RAM (256x4) (for PPS-4, PPS-4/2)	10432	Rockwell	
RAM (256x8) (for PPS-8, PPS-8/2)	10809	Rockwell	
RAM (512x4) (for PPS-4, PPS-4/2)	10932	Rockwell	
RAM (4K) Interface	10929	Rockwell	
ROM (1024x8)	A05XX	Rockwell	
ROM (2048x8)	A52XX	Rockwell	
ROM (4096x8)	A66XX	Rockwell	120
ROM (8192x8)	A88XX	Rockwell	
ROM-RAM (for PPS 8/2)	A21XX	Rockwell	
ROM-RAM (for PPS-4)	A07XX	Rockwell	
	A08XX	Rockwell	
	A20XX	Rockwell	
ROM-RAM (for PPS-4/2)	A17XX	Rockwell	
Serial Data Controller (SDC)	10930	Rockwell	
Telecommunications Data Interface (includes modem)	10371	Rockwell	
Victor Dot Matrix Printer Controller (VPC)	10736	Rockwell	
	15380	Rockwell	130

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

8 Bit

1600

Function	Device	Source		Line
Microprocessor				
	CP1600	GI		
ROM (2048x10), Graphics				
	RO3-9502	GI		
ROM (2048x8), Graphics				
	RO3-9503	GI		

1650

Function	Device	Source		Line
Microcomputer	**PIC1650A**	**GI**	**(1319)**	
	PIC1654	**GI**	**(1319)**	
	PIC1655A	**GI**	**(1319)**	
	PIC1656	**GI**	**(1319)**	
	PIC1670	**GI**	**(1309,1319)**	
	PIC1672	**GI**	**(1319)**	
	PIC16C55	**GI**	**(1319)**	10

1800

Note: 1800 series devices generally are available in 4-12 V and 4-6 V versions. Consult manufacturers for availability.

Function	Device	Source		Line
Microcomputer, RAM, ROM, Counter/Timer				
	CDP1804AC	**† RCA**	**(1461)**	
Microprocessor, Counter/Timer				
	CDP1806AC	**† RCA**	**(1461)**	
Microprocessor, RAM, Counter/Timer				
	CDP1805AC	**† RCA**	**(1461)**	
Microprocessor				
	HCMP1802A	Hughes		
	HCMP1802AC	Hughes		
	HMMP1802A	† Hughes		
	HMMP1802AC	† Hughes		
	CDP1802A	**† RCA**	**(1459)**	
	CDP1802AC	**† RCA**	**(1459)**	20
Color Generator Controller				
	CDP1862	**† RCA**	**(1486)**	
	CDP1862C	**† RCA**	**(1486)**	
Keyboard Encoder				
	CDP1871	**† RCA**	**(1484)**	
	CDP1871C	**† RCA**	**(1484)**	
Latch/Decoder Memory Interface				
	CDP1866	**† RCA**	**(1469)**	
	CDP1866C	**† RCA**	**(1469)**	
	CDP1867	**† RCA**	**(1469)**	
	CDP1867C	**† RCA**	**(1469)**	
	CDP1868	**† RCA**	**(1469)**	
	CDP1868C	**† RCA**	**(1469)**	30
Multiply-Divide Circuit				
	HCMP1855	Hughes		
	HCMP1855C	Hughes		
	HMMP1855	† Hughes		
	HMMP1855C	† Hughes		
	CDP1855	**† RCA**	**(1478)**	
	CDP1855C	**† RCA**	**(1478)**	
N-Bit Decoder (for I/O interface)				
	HCMP1853	Hughes		
	HCMP1853C	Hughes		
	HMMP1853	† Hughes		
	HMMP1853C	† Hughes		40
	CDP1853	**† RCA**	**(1466)**	
	CDP1853C	**† RCA**	**(1466)**	
Programmable I/O Interface				
	HCMP1851	Hughes		
	HCMP1851C	Hughes		
	HMMP1851	† Hughes		
	HMMP1851C	† Hughes		
	CDP1851	**† RCA**	**(1475)**	
	CDP1851C	**† RCA**	**(1475)**	
Programmable Interrupt Controller				
	CDP1877	**RCA**	**(1479)**	
	CDP1877C	**RCA**	**(1479)**	50
	CDP1877CD	**† RCA**	**(1479)**	
	CDP1877D	**† RCA**	**(1479)**	
Programmable Tone Generator, 8-Bit				
	CDP1863	**† RCA**	**(1485)**	
	CDP1863C	**† RCA**	**(1485)**	
PROM, UV Erasable (256x8)				
	CDP18U42CD	RCA		
RAM (32x8) (See also Memory-RAM's)				
	HCMP1824	Hughes		
	HCMP1824C	Hughes		
	HMMP1824	† Hughes		
	HMMP1824C	† Hughes		
	CDP1824	**† RCA**	**(3874)**	60
	CDP1824C	**† RCA**	**(3874)**	
RAM (64x8) (See also Memory-RAM's)				
	CDP1860	† RCA		
RAM (128x8) (See also Memory-RAM's)				
	CDP1823	**† RCA**	**(3874)**	
	CDP1823C	**† RCA**	**(3874)**	
RAM (256x4) (See also Memory-RAM's)				
	HCMP1822C	Hughes		
	HMMP1822C	† Hughes		
	CDP1822	**† RCA**	**(3874)**	
	CDP1822C	**† RCA**	**(3874)**	
RAM (1024x1) (See also Memory-RAM's)				
	CDP1821	**† RCA**	**(3874)**	
	CDP1821C	**† RCA**	**(3874)**	70
RAM (1024x4) (see also: Memory-RAMs)				
	CDP1825	† RCA		
	CDP1825C	† RCA		
Real-Time Clock (time and calendar information in BCD format from seconds to months)		**† RCA**	**(1481)**	
	CDP1879	**† RCA**	**(1481)**	
ROM (512x8) (See also Memory-ROM's)				
	HCMP1831	Hughes		
	HCMP1831C	Hughes		
	HCMP1832	Hughes		
	HCMP1832C	Hughes		
	HMMP1831	† Hughes		
	HMMP1831C	† Hughes		80
	HMMP1832	† Hughes		
	HMMP1832C	† Hughes		
	CDP1831	**† RCA**	**(3876)**	
	CDP1831C	**† RCA**	**(3876)**	
	CDP1832	† RCA		
	CDP1832C	† RCA		
ROM (1024x8) (See also Memory-ROM's)				
	HCMP1833	Hughes		
	HCMP1833C	Hughes		
	HCMP1834	Hughes		
	HCMP1834C	Hughes		90
	HMMP1833	† Hughes		
	HMMP1833C	† Hughes		
	HMMP1834	† Hughes		
	HMMP1834C	† Hughes		
	CDP1833	**† RCA**	**(3876)**	
	CDP1833C	**† RCA**	**(3876)**	
	CDP1834	**† RCA**	**(3877)**	
	CDP1834C	**† RCA**	**(3877)**	
ROM (2048x8) (See also memory-ROMs)				
	HCMP1835	Hughes		
	HCMP1835C	Hughes		100
	HCMP1836	Hughes		
	HCMP1836C	Hughes		
	HMMP1835	† Hughes		
	HMMP1835C	† Hughes		
	HMMP1836	† Hughes		
	HMMP1836C	† Hughes		
	CDP1835	**† RCA**	**(3876)**	
	CDP1835C	**† RCA**	**(3876)**	
TV Interface (PAL)				
	CDP1864	**† RCA**	**(1486)**	
	CDP1864C	**† RCA**	**(1486)**	110
UART	HCMP1854A	Hughes		
	HCMP1854AC	Hughes		
	HMMP1854A	† Hughes		
	HMMP1854AC	† Hughes		
	CDP1854	**RCA**	**(1476)**	
	CDP1854A	**† RCA**	**(1476)**	
	CDP1854AC	**† RCA**	**(1476)**	
Video Display Controller				
	HCMP1861	Hughes		
	HCMP1861C	Hughes		
	HMMP1861	† Hughes		120
	HMMP1861C	† Hughes		
	CDP1861	**† RCA**	**(1486)**	
	CDP1861C	**† RCA**	**(1486)**	
Video Interface System (1869 is an address and sound generator	**CDP1869**	**†RCA**	**(1482)**	
	CDP1869C	**† RCA**	**(1482)**	
	CDP1870	**† RCA**	**(1482)**	
	CDP1870C	**† RCA**	**(1482)**	
	CDP1876	**† RCA**	**(1482)**	
	CDP1876C	**† RCA**	**(1482)**	
Dual Counter/Timer (two 16-bit programmable down counters independently controlled by separate control registers)	CD1878	† RCA		130
	CDP1878C	**† RCA**	**(1480)**	
1 of 8 Binary Decoder				
	CDP1873C	**† RCA**	**(1467)**	
4-Bit Buffer/Separator (for memory interface)				
	HCMP1856	Hughes		
	HCMP1856C	Hughes		
	HMMP1856	† Hughes		
	HMMP1856C	† Hughes		
	CDP1856	**† RCA**	**(1472)**	
	CDP1856C	**† RCA**	**(1472)**	
4-Bit Bus Buffer/Separator (for I/O interface)				
	HCMP1857	Hughes		
	HCMP1857C	Hughes		140
	HMMP1857	† Hughes		
	HMMP1857C	† Hughes		
	CDP1857	**† RCA**	**(1472)**	
	CDP1857C	**† RCA**	**(1472)**	
4-Bit Latch with Dual 1 of 4 Decoders				
	HCMP1858	Hughes		
	HCMP1858C	Hughes		
	HMMP1858	† Hughes		
	HMMP1858C	† Hughes		
	CDP1858	**† RCA**	**(1468)**	
	CDP1858C	**† RCA**	**(1468)**	150
4-Bit Latch with 1 of 4 Decoder				
	HCMP1859	Hughes		
	HCMP1859C	Hughes		
	HMMP1859	† Hughes		
	HMMP1859C	† Hughes		
	CDP1859	**† RCA**	**(1468)**	
	CDP1859C	**† RCA**	**(1468)**	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

8 Bit

1800 (Cont'd)

Function	Device	Source	Line
8-Bit Input/Output Port			
	HCMP1852	Hughes	
	HCMP1852C	Hughes	
	HMMP1852	† Hughes	
	HMMP1852C	† Hughes	
	CDP1852	**† RCA**	**(1471)**
	CDP1872C	**† RCA**	**(1473)**
	CDP1874C	**† RCA**	**(1473)**
	CDP1875C	**† RCA**	**(1473)**

2650

Function	Device	Source	Line
Microprocessor			
	SCN2650A	Signetics	
Display Character and Graphics Generator			
	SC2670AC3	Signetics	10
	SC2670BC3	Signetics	
Multi-Protocol Communications Circuit (includes SDLC, BiSync)	**SCN2652A**	**Signetics**	**(1520)**
Polynomial Generator/Checker			
	SCN2653A	**Signetics**	**(1520)**
Programmable Communication Interface			
	SCN2651C	**Signetics**	**(1520)**
	SCN2661A	**Signetics**	**(1521)**
	SCN2661B	**Signetics**	**(1521)**
	SCN2661C	**Signetics**	**(1521)**
	COM2651	SMC	
	COM2661	SMC	
	SY2661	**Synertek**	**(1539)** 20
Programmable Keyboard and Communications Controller			
	SCN2671A	**Signetics**	**(1522)**
Programmable Video Timing Controller			
	SCN2672A	**Signetics**	**(1522)**
Video Attributes Controller			
	SCN2673A	**Signetics**	**(1522)**
	SCN2673B	**Signetics**	**(1522)**
Dual Universal Asynchronous Receiver/Transmitter			
	SCN2681	**Signetics**	**(1521)**
Quad Transceivers (See also Interface-Line Transceivers)			
	N8T26	AMD	
	MC8T26A	Motorola	
	MC8T28	Motorola	
	DS8T26A	National	
	DS8T28	National	30
Hex Buffers/Inverters (See also Digital-TTL-Buffers/Inverters 8T95, 8T96, 8T97, 8T98)			
	MC8T95	Motorola	
	MC8T96	Motorola	
	MC8T97	Motorola	
	MC8T98	Motorola	
	N8T95	Signetics	
	N8T96	Signetics	
	N8T97	Signetics	
	N8T98	Signetics	
	S8T95	† Signetics	
	S8T97	† Signetics	40
	S8T98	† Signetics	

3807

Function	Device	Source	Line
Programmable CRT Video Control Unit			
	MK3807	Mostek	

3870

Function	Device	Source	Line
Microcomputer, EPROM, 64-Byte Scratchpad RAM, Timer, I/O	**F38E70**	**Fairchild**	**(1258)**
Microcomputer, Piggyback EPROM, Emulates all MK3870 Devices	MK38P70/02	Mostek	
Microcomputer, Piggyback EPROM, USART, Emulates all MK3870 Devices	MK38P73/02	Mostek	
Microcomputer, Piggyback EPROM	MK38P70	Mostek	
Microcomputer, ROM, 64-Byte Executable RAM, 64-Byte Scratchpad RAM, Timer I/O			
	F3872	**Fairchild**	**(1254)**
	F38L72	Fairchild	
	F38L76	Fairchild	50
	MK3870/12	Mostek	
	MK3870/22	Mostek	
	MK3870/32	Mostek	
	MK3870/42	Mostek	
	MC3870	Motorola	
	M3872	SGS	
Microcomputer, ROM, 64-Byte Scratchpad RAM, Timer, I/O			
	F3870	**Fairchild**	**(1253)**
	F3878	Fairchild	
	F38C70	**Fairchild**	**(1257)**
Microcomputer, ROM 64-Byte Scratchpad RAM, Timer, I/O	F38E70	Fairchild	60
Microcomputer, ROM, 64-Byte Scratchpad RAM, Timer, I/O			
	MK3870/10	Mostek	
	MK3870/20	Mostek	
	MK3870/30	Mostek	
	MK3870/40	Mostek	
	M3870	SGS	
	MPU3870	SMC	
Microcomputer, ROM, 64-Byte Scratchpad RAM, Timer, I/O, USART	MK3873/10	Mostek	
	MK3873/20	Mostek	
Microcomputer, ROM, 64-Byte Scratchpad RAM, 64-Byte Executable RAM, Timer, I/O, USART			
	MK3873/12	Mostek	
	MK3873/22	Mostek	70
Microcomputer, ROM, 64-Byte Scratchpad RAM, 64-Byte Executable RAM, Timer, I/O, USART, Battery Backup			
	MK3875/22	Mostek	
	MK3875/42	Mostek	
Microcomputer, 28-pin version of 3870	MK2870	Mostek	
Clock, RAM, Serial I/O			
	MK3805	Mostek	
	MK3806	Mostek	
Serial Control Unit	SCU20	Mostek	

General Purpose

Function	Device	Source	Line
Arithmetic Processor			
	8231A	Intel	

6500

Function	Device	Source	Line
Note: The 6500 series is bus compatible with 6800 series devices			
Microcomputer	MPS6500/1	CSG	
	MPS6500/1A	CSG	80
	R6500/1-10	Rockwell	
Microprocessor, Clock, RAM, IO			
	R6500/11	Rockwell	
	R6500/12	Rockwell	
	R6500/13	Rockwell	
Microprocessor, I/O			
	MPS6510	CSG	
Microprocessor, RAM, I/O			
	MPS6508	CSG	
Microprocessor			
	MPS6502	CSG	
	MPS6502A	CSG	
	MPS6502B	CSG	
	MPS6503	CSG	90
	MPS6503A	CSG	
	MPS6503B	CSG	
	MPS6504	CSG	
	MPS6504A	CSG	
	MPS6504B	CSG	
	MPS6505	CSG	
	MPS6505A	CSG	
	MPS6505B	CSG	
	MPS6506	CSG	
	MPS6506A	CSG	100
	MPS6506B	CSG	
	MPS6507	CSG	
	MPS6512	CSG	
	MPS6512A	CSG	
	MPS6512B	CSG	
	MPS6513	CSG	
	MPS6514	CSG	
	MPS6514A	CSG	
	MPS6514B	CSG	
	MPS6515	CSG	110
	MPS6515A	CSG	
	MPS6515B	CSG	
	MPS65C02	CSG	
	G65SC02	GTE Micro	
	G65SC03	GTE Micro	
	G65SC04	GTE Micro	
	G65SC05	GTE Micro	
	G65SC06	GTE Micro	
	G65SC07	GTE Micro	
	G65SC102	GTE Micro	120
	G65SC103	GTE Micro	
	G65SC104	GTE Micro	
	G65SC105	GTE Micro	
	G65SC106	GTE Micro	
	G65SC107	GTE Micro	
	G65SC112	GTE Micro	
	G65SC115	GTE Micro	
	G65SC12	GTE Micro	
	G65SC13	GTE Micro	
	G65SC14	GTE Micro	130
	G65SC15	GTE Micro	
	R6500	Rockwell	
	R6502	Rockwell	
	R6503	Rockwell	
	R6504	Rockwell	
	R6505	Rockwell	
	R6506	Rockwell	
	R6507	Rockwell	
	R6512	Rockwell	
	R6513	Rockwell	140
	R6514	Rockwell	
	R6515	Rockwell	
	SY6502	Synertek	
	SY6502A	Synertek	
	SY6502B	Synertek	
	SY6502C	Synertek	
	SY6503	Synertek	
	SY6503A	Synertek	
	SY6504	Synertek	
	SY6504A	Synertek	150
	SY6505	Synertek	
	SY6505A	Synertek	
	SY6506	Synertek	
	SY6506A	Synertek	
	SY6507	Synertek	
	SY6507A	Synertek	
	SY6512	Synertek	
	SY6512A	Synertek	

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

8 Bit

6500 (Cont'd)

Function	Device	Source		Line
Microprocessor				
			(Cont'd)	
	SY6513	Synertek		
	SY6513A	Synertek		
	SY6514	Synertek		
	SY6514A	Synertek		
	SY6515	Synertek		
	SY6515A	Synertek		
Analog Input, Multiplexer, A/D Converter				
	MP21	Burr-Brown		
Asynchronous Communications Interface Adapter				
	MPS6551	CSG		
	R6551	Rockwell		
	SY6551	**Synertek**	**(1536)**	10
	SY6551A	**Synertek**	**(1536)**	
Asynchronous Communications Interface Adaptor				
	MD65SC51	Mitel		
CRT Controller	MPS6545-1	CSG		
	R6545	Rockwell		
	SY6545-1	**Synertek**	**(1533)**	
	SY6545E	**Synertek**	**(1533)**	
	SY6545R	**Synertek**	**(1532)**	
	SY6545RA	**Synertek**	**(1533)**	
Dot-Matrix Printer Controller				
	R6592	Rockwell		
Emulator Device				
	R6500/1E	Rockwell		20
Mini-Floppy Disc Controller				
	MB8876A	Fujitsu		
	MB8877A	Fujitsu		
	SY1791-01	**Synertek**	**(1538)**	
	SY1793-01	**Synertek**	**(1538)**	
	SY6591	**Synertek**	**(1537)**	
	SY6591A	**Synertek**	**(1537)**	
	SY6593	Synertek		
Note: The 6500 series is bus compatible with 6800 series devices				
Peripheral Interface Adapter				
	MPS6522	CSG		
	MPS6526	CSG		30
	R6520	Rockwell		
	R6522	Rockwell		
	SY6520A	**Synertek**	**(1527)**	
	SY6521	Synertek		
	SY6521A	Synertek		
	SY6522	**Synertek**	**(1529)**	
	SY6522A	**Synertek**	**(1529)**	
Peripheral Interface Adaptor				
	MD65SC22	Mitel		
RAM, ROM, I/O and Interval Timer				
	MPS6530	CSG		
	R6530	Rockwell		40
	SY6530	**Synertek**	**(1530)**	
RAM(128x8), I/O, and Timer				
	MPS6532	CSG		
	SY6532	**Synertek**	**(1531)**	
	SY6532A	**Synertek**	**(1531)**	
RAM(128x8), ROM, I/O, and Counter/Timer				
	R6531	Rockwell		
ROM (2048x8) (See Memory-ROM's)				
ROM(2048x8) (See Memory-ROM's)				
Tri-Port Interface				
	MPS6523	CSG		
	MPS6525	CSG		
Single Port Interface				
	MPS6529	CSG		50

6800

Function	Device	Source		Line
Microcomputer, Clock, Timer, RAM, ROM, PLL, I/O				
	MC6805T2	Motorola		
Microcomputer (CMOS), RAM, ROM, Clock, Timer, I/O				
	MC146805F2	Motorola		
	MC14680G2	Motorola		
Microcomputer, (EPROM), ROM, Clock, Timer, A/D, I/O				
	MC68705R3	Motorola		
Microcomputer (EPROM)				
	MC68701	**Motorola**	**(1351,1730)**	
	MC68701-1	**Motorola**	**(1351,1730)**	
	MC68701C	**Motorola**	**(1351,1730)**	
	MC68701C-1	**Motorola**	**(1351,1730)**	
	MC68705P3	Motorola		
	MC68705U3	Motorola		60
Microcomputer (external clock)				
	F6801E	**Fairchild**	**(1270)**	
Microcomputer (external ROM), RAM, Clock, Timer, I/O				
	HD6803	**Hitachi**	**(1345)**	
Microcomputer (external ROM)				
	S6803	AMI		
	S6803N/R	AMI		
	F6803	**Fairchild**	**(1270)**	
	MC6803	**Motorola**	**(1351)**	
	MC6803-1	**Motorola**	**(1351)**	
	MC6803C	**Motorola**	**(1351)**	
	MC68A03	**Motorola**	**(1351)**	
	MC68B03	**Motorola**	**(1351)**	70
Microcomputer, RAM, ROM, Clock, Timer, A/D, I/O				
	MC6805R2	Motorola		
Microcomputer	S6801	AMI		
	S6805	**AMI**	**(1248)**	
	F6801	**Fairchild**	**(1270)**	
	HD6801	Hitachi		
	HD6805	Hitachi		
	MC6801	**Motorola**	**(1351,1730)**	
	MC6801-1	**Motorola**	**(1351,1730)**	
	MC6801C	**Motorola**	**(1351,1730)**	
	MC6801U4	Motorola		80
	MC6803U4	Motorola		
	MC6805P2	Motorola		
	MC6805P4	Motorola		
	MC6805U2	Motorola		
	MC68A01	**Motorola**	**(1351)**	
	MC68B01	**Motorola**	**(1351)**	
Microprocessor (CMOS, internal clock, 128x8 RAM)				
	MD68SC02	† Mitel		
Microprocessor (CMOS), RAM, Timer, I/O				
	MC146805E2	Motorola		
Microprocessor (external clock)				
	S6809(E)	**AMI**	**(1247)**	
	S68A09(E)	**AMI**	**(1247)**	90
	S68B09(E)	**AMI**	**(1247)**	
	F6809E	**Fairchild**	**(1272,1274)**	
	F68A09E	**Fairchild**	**(1272,1274)**	
	F68B09E	**Fairchild**	**(1272,1274)**	
	MC6809E	**Motorola**	**(1352)**	
	MC68A09E	Motorola		
	MC68B09E	Motorola		

Function	Device	Source		Line
Microprocessor (internal clock, 128x8 RAM)				
	S6802	AMI		
	S68A02	AMI		
	S68B02	AMI		100
	F6802	**Fairchild**	**(1278)**	
	F6882	**Fairchild**	**(1278)**	
	F68A02	Fairchild		
	MBL6802	Fujitsu		
	HD6303	**Hitachi**	**(1345)**	
	HD6802	**Hitachi**	**(1345)**	
	MC6802	**Motorola**	**(1351)**	
	MC68A02	Motorola		
	MC68B02	Motorola		
Microprocessor (internal clock)				
	S6809	**AMI**	**(1247)**	110
	S68A09	**AMI**	**(1247)**	
	S68B09	**AMI**	**(1247)**	
	F6809	**Fairchild**	**(1272)**	
	F68A09	**Fairchild**	**(1272)**	
	F68B09	**Fairchild**	**(1272)**	
	MBL6809	Fujitsu		
	MBL68A09	Fujitsu		
	MBL68B09	Fujitsu		
	HD6809	**Hitachi**	**(1345)**	
	HD68A09	**Hitachi**	**(1345)**	120
	HD68B09	**Hitachi**	**(1345)**	
	MC6809	**Motorola**	**(1352)**	
	MC68A09	Motorola		
	MC68B09	Motorola		
Microprocessor (6800 plus internal clock)				
	S6808	AMI		
	S68A08	AMI		
	S68B08	AMI		
	F6808	**Fairchild**	**(1278)**	
	HD6808	Hitachi		
	MC6808	**Motorola**	**(1351)**	130
	MC68A08	Motorola		
	MC68B08	Motorola		
Microprocessor				
	S6800	AMI		
	S68A00	AMI		
	S68B00	AMI		
	F6800	**Fairchild**	**(1253,1269,1278)**	
	F68A00	Fairchild		
	F68B00	Fairchild		
	MBL6800	Fujitsu		
	HD6800	**Hitachi**	**(1345)**	140
	HD68A00	**Hitachi**	**(1345)**	
	HD68B00	**Hitachi**	**(1345)**	
	MC6800	**Motorola**	**(1351)**	
	MC6800M	**† Motorola**	**(1351)**	
	MC6800NS	**Motorola**	**(1351)**	
	MC68A00	Motorola		
	MC68B00	Motorola		
Advanced Data Link Controller				
	S6854	AMI		
	S68A54	AMI		
	S68B54	AMI		150
	F3864	Fairchild		
	F6854	**Fairchild**	**(1281)**	
	F6856	**Fairchild**	**(1277)**	
	F68A54	Fairchild		
	F68B54	Fairchild		
	MC6854	**Motorola**	**(1351)**	
	MC68A54	Motorola		
	MC68B54	Motorola		
Asynchronous Communications Interface Adapter (ACIA)				
	S6850	AMI		
	S68A50	AMI		160
	S68B50	AMI		
	MPS6551	CSG		
	F6850	**Fairchild**	**(1280)**	

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

8 Bit
6800 (Cont'd)

Function	Device	Source		Line
Asynchronous Communications Interface Adapter (ACIA) (Cont'd)				
	F68A50	Fairchild		
	F68B50	Fairchild		
	HD6850	**Hitachi**	**(1345)**	
	HD68A50	**Hitachi**	**(1345)**	
	MC6850	**Motorola**	**(1351)**	
	MC6850M	**† Motorola**	**(1351)**	
	MC68A50	Motorola		
	MC68B50	Motorola		
Bus Monitor	MD68SC49	Mitel		
Bus Transceiver, (The 6880 is also called 8T26 and the 6889 the 8T28, See Interface-Transceivers)				
	MC6880A	Motorola		10
	MC6889	Motorola		
Clock Buffer	MPQ6842	Motorola		
Clock Generator, 2 Phase				
	MC6875	Motorola		
	MC6875A	Motorola		
Clock (real time) Plus RAM				
	MC146818	**Motorola**	**(1352)**	
Clock, 2 Phase (MC6870/71 from Motorola Component Products Dept., Franklin Park, IL)				
	HD26501	Hitachi		
	MC6871	Motorola		
Cluster Terminal Controller				
	MC68122	Motorola		
	MC68122-1	Motorola		20
CRT Controller	**S68045**	**AMI**	**(1250)**	
	S68A045	**AMI**	**(1250)**	
	S68B045	**AMI**	**(1250)**	
	MPS6545-1	CSG		
	F6845	**Fairchild**	**(1276)**	
	HD6845	**Hitachi**	**(1345)**	
	HD68A45	**Hitachi**	**(1345)**	
	HD68B45	**Hitachi**	**(1345)**	
	MC6835	**Motorola**	**(1351)**	
	MC6845	**Motorola**	**(1351)**	30
	MC6845M	**† Motorola**	**(1351)**	
	MC68A35	Motorola		
	MC68A45	Motorola		
	MC68B35	Motorola		
	MC68B45	Motorola		
	SY68045	**Synertek**	**(1535)**	
	SY6845R	**Synertek**	**(1532)**	
D/A Converter	**MC6890**	**Motorola**	**(2758)**	
	MC6890A	**† Motorola**	**(2758)**	
Data Security Device (data encryption standard)				
	MC6859	**Motorola**	**(1351)**	40
Digital Modulator (for differential phase shift keying system)	**MC6862**	**Motorola**	**(1351)**	
DMA Controller				
	F6844	**Fairchild**	**(1279)**	
	HD6844	**Hitachi**	**(1345)**	
	HD68A44	**Hitachi**	**(1345)**	
	HD68B44	**Hitachi**	**(1345)**	
	MC6844	**Motorola**	**(1351)**	
	MC6844M	**† Motorola**	**(1351)**	
	MC68A44	Motorola		
	MC68B44	Motorola		
DMA Processor (serial)				
	MC6855	Motorola		50
Erasable PROM (1024x8) See Memory-PROMs, 1024x8				
Floating Point ROM (for MC6809)				
	MC6839	**Motorola**	**(1351)**	
	MC68A39	Motorola		
	MC68B39	Motorola		
Floppy Disc Controller				
	MB8877	**Fujitsu**	**(1308)**	
	HD6843	**Hitachi**	**(1345)**	
	HD68A43	**Hitachi**	**(1345)**	
	MC6843	**Motorola**	**(1351)**	
	FD1793-02	**Western**	**(1574)**	60
	FD1797-02	**Western**	**(1574)**	
General Purpose Interface Adapter (IEEE 488 bus)				
	S68488	AMI		
	F68488	**Fairchild**	**(1280)**	
	MC68488	**Motorola**	**(1351)**	
	MC68488M	**† Motorola**	**(1351)**	
	MC68A488	Motorola		
	MC68B488	Motorola		
	HEF4738	Signetics		
Industrial Interface Adaptor				
	MC6822	**Motorola**	**(1351)**	
Memory Address Multiplexer for 16K RAMs				
	MC3442A	**Motorola**	**(2753)**	70
Memory Controller for 4K to 64K Dynamic RAMs				
	MC3480	Motorola		
Memory Management Unit				
	C68A29	Motorola		
	MC6829	**Motorola**	**(1351)**	
	MC68B29	Motorola		
Modem	**MC6860**	**Motorola**	**(1351,3298)**	
	MC6860L	**Motorola**	**(1351,3298)**	
Peripheral Interface Adapter				
	MPS6520	CSG		
Peripheral Interface Adapter, (PIA)				
	S6821	AMI		80
	S68A21	AMI		
	S68B21	AMI		
	F6820	Fairchild		
	F6821	**Fairchild**	**(1279)**	
	F68A21	Fairchild		
	F68B21	Fairchild		
	HD6821	**Hitachi**	**(1345)**	
	HD68A21	**Hitachi**	**(1345)**	
	HD68B21	**Hitachi**	**(1345)**	
	MC146823	**Motorola**	**(1352)**	90
	MC6821	**Motorola**	**(1351)**	
	MC68A21	Motorola		
	MC68B21	Motorola		
	SY6520	**Synertek**	**(1527)**	
	SY6820	**Synertek**	**(1527)**	
	SY6821	**Synertek**	**(1528)**	
	SY68B20	**Synertek**	**(1527)**	
	SY68B21	**Synertek**	**(1528)**	
Peripheral Interface Adaptor, (PIA)				
	MD68SC21	Mitel		
Priority Interrupt Controller				
	MC6828	**Motorola**	**(1351)**	100
	MC8507	Motorola		
Programmable Timer				
	S6840	AMI		
	S68A40	AMI		
	S68B40	AMI		
	F6840	**Fairchild**	**(1279)**	
	F68A40	Fairchild		
	F68B40	Fairchild		
	HD6840	**Hitachi**	**(1345)**	
Programmable Timer (Cont'd)				
	HD68A40	**Hitachi**	**(1345)**	
	HD68B40	**Hitachi**	**(1345)**	110
	MC6840	**Motorola**	**(1351)**	
	MC6840M	**† Motorola**	**(1351)**	
	MC68A40	Motorola		
	MC68B40	Motorola		
RAM(128x8), See 6810, 68A10, and 68B10 series in PART NUMBER INDEX and also MEMORY-RAMs Satic				
RAM(128x8), See 6810, 68A10, and 68B10 series in PART NUMBER INDEX and also MEMORY-RAMs Static				
ROM, I/O, Timer				
	S6846	AMI		
	F6846	**Fairchild**	**(1280)**	
	MC6846	**Motorola**	**(1351)**	
	MC6846M	**† Motorola**	**(1351)**	120
	MC68A46	Motorola		
	MC68B46	Motorola		
	TMS7040	TI		
ROM, Multiplexed Bus				
	MCM65516	**Motorola**	**(3840)**	
ROM (2048x8), See 6831, 68A31, 68B31 and 6832 series in PART NUMBER INDEX and also MEMORY-ROMs				
ROM (2048x8), See 6831, 68A316, 68B316 and 6832 series in PART NUMBER INDEX and also MEMORY-ROMs				
ROM(1024x8), See 6830, 68A30, 68B30, 68A308, and 68B308 series in PART NUMBER INDEX and also MEMORY-ROMs				
ROM(4096x8), See 68A332 listing in PART NUMBER INDEX and also MEMORY-ROMs.				130
Synchronous Address Multiplexer				
	MC6883	Motorola		
	SN74LS783	Motorola		
Synchronous Receiver/Transmitter (USRT, See also Interface-Serial Transmitters-Receivers)				
	S2350	AMI		
Synchronous Serial Data Adapter (SSDA)				
	S6852	AMI		
	S68A52	AMI		
	S68B52	AMI		
	F6852	**Fairchild**	**(1281)**	
	F68A52	Fairchild		
	F68B52	Fairchild		
	HD6852	**Hitachi**	**(1345)**	140
	HD68A52	**Hitachi**	**(1345)**	
	MC6852	**Motorola**	**(1351)**	
	MC6852M	**† Motorola**	**(1351)**	
	MC68A52	Motorola		
	MC68B52	Motorola		
Video Display Generator				
	S68047	AMI		
	MC6847	**Motorola**	**(1351)**	
	MC68478	Motorola		
Triple Bidirectional Bus Switch (also MC3449)				
	MC6881	Motorola		
Triple Timer	MD68SC40	Mitel		150
Hex Buffers/Inverters (See also Digital-TTL-Buffers/Inverters 8T95, 8T96, 8T97, 8T98)				
	MC6885	Motorola		
	MC6886	Motorola		
	MC6887	Motorola		
	MC6888	Motorola		
Octal Buffer/Latch, Three-State				
	MC3482A	**Motorola**	**(2752)**	
	MC3482B	**Motorola**	**(2752)**	
	MC6882A	**Motorola**	**(2752)**	
	MC6882B	**Motorola**	**(2752)**	

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

Note: The 6800 series is bus compatible with 6500 series devices.

8 Bit

7000

Function	Device	Source	Line
Microcomputer, RAM, EPROM, I/O			
	TMS70E40	**TI**	**(1556)**
Microcomputer, RAM, I/O (microlanguage processor)			
	TMS7000	**TI**	**(1556)**
Microcomputer, RAM, ROM, I/O (microlanguage processor)			
	TMS7020	**TI**	**(1556)**
	TMS7040	**TI**	**(1556)**
	TMS70L22	TI	
Microcomputer, RAM, ROM, Serial I/O			
	TMS7041	**TI**	**(1556)**

8008

Function	Device	Source	Line
Programmable Communication Interface (See listing under 8080)	8251	Intel	

8048

Function	Device	Source	Line
Microcomputer, CMOS (mask programmed ROM)			
	NS80CX48	**National**	**(1448)**
	μPD80C48	NEC-Micro	
Microcomputer (erasable PROM)			
	AM8748	AMD	10
	8748-8	Intel	
	8748H	Intel	
	8749H	Intel	
	8749H-8	Intel	
	M8748	† Intel	
	M5L8748	Mitsubishi	
	NS87PC48	**National**	**(1451)**
	μPD8748	NEC-Micro	
Microcomputer (external ROM)			
	AM8035	**AMD**	**(1232)**
	AM8039	**AMD**	**(1232)** 20
	MBL8035	Fujitsu	
	MBL8039	Fujitsu	
	MBL80C39	**Fujitsu**	**(1307)**
	8035H	Intel	
	8039HL	Intel	
	8040AH	Intel	
	80C35	Intel	
	80C39	Intel	
	M5L8039	Mitsubishi	
	INS8035	National	30
	INS8035L	National	
	INS8039	National	
	INS8039L	National	
	INS8040	National	
	INS8040L	National	
	NS80CX35	**National**	**(1448)**
	μPD8035L	NEC-Micro	
	μPD8039L	NEC-Micro	
	MSM80C35	**OKI**	**(3873)**
	MSM80C39	**OKI**	**(3873)** 40
	SCN8035A	**Signetics**	**(1523)**
	SCN8039A	Signetics	
	TMP8035	Toshiba	
	TMP8039	Toshiba	
	TMP8039-6	Toshiba	
	TMP80C39P-6	Toshiba	
Microcomputer (mask programmed ROM)			
	8048	AMD	
	AM8048	**AMD**	**(1232)**
	AM8049	**AMD**	**(1232)**
	MBL8048	Fujitsu	50
	MBL8049	Fujitsu	
	MBL80C49	**Fujitsu**	**(1307)**

(Continued)

Function	Device	Source	Line
Microcomputer (mask programmed ROM)			(Cont'd)
	8048H	Intel	
	8048H-1	Intel	
	8049	Intel	
	8050AH	Intel	
	80C48	Intel	
	80C49	Intel	
	M8048	† Intel	
	M8049	Intel	60
	P80A48L	Intel	
	M5L8048	Mitsubishi	
	M5L8049	Mitsubishi	
	M5L80C49	Mitsubishi	
	INS8048	National	
	INS8048L	National	
	INS8049	National	
	INS8049L	National	
	INS8050	National	
	INS8050L	National	70
	NS80C48	National	
	μPD8048	NEC-Micro	
	μPD8049	NEC-Micro	
	MSM8048	OKI	
	MSM8049	OKI	
	MSM80C48	**OKI**	**(3873)**
	MSM80C49	**OKI**	**(3873)**
	SCN8048A	**Signetics**	**(1523)**
	SCN8049A	**Signetics**	**(1523)**
	TMP8048	Toshiba	80
	TMP8049	Toshiba	
	TMP80C49P-6	Toshiba	
Microcomputer, RAM, ROM, Tiny BASIC, Microinterpreter			
	INS8072	National	
	INS8073	National	
Microcomputer, RAM			
	INS8070	National	
Microcomputer, ROM, RAM, I/O			
	AM8021	AMD	
	8020H	Intel	
	8021	Intel	
	8021H	Intel	
	μPD8021	NEC-Micro	90
	SCN8021	Signetics	
Microcomputer (ROM, RAM, I/O, on-board A/D)			
	8022	Intel	
	8022H	Intel	
	μPD8022	NEC-Micro	
Analog Input, Multiplexer, A/D Converter			
	MP21	Burr-Brown	
	MP22	Burr-Brown	
	MP32	Burr-Brown	
Bidirectional Bus Driver. See 8216, 8226, etc. under 8080			
	8216	Intel	
	8226	Intel	
	μPB8216	NEC-Micro	100
	μPB8226	NEC-Micro	
Bidirectional Bus Driver. See 8216, 8266, etc. under 8080.			
	MB425	Fujitsu	
	MB426	Fujitsu	
CRT Controller. See 8275, etc. under 8080.			
	8275	Intel	
	μPD3301	NEC-Micro	
	2672	Signetics	
Decoder, 1 of 8. See 8205, etc. under 8080.			
	8205	Intel	
Floppy Disc Controller. See 8271, etc. under 8080.			
	MB8877	Fujitsu	
	8271	Intel	
	8271-6	Intel	110
	μPD765	NEC-Micro	

(Continued)

Function	Device	Source	Line
Floppy Disc Controller. See 8271, etc. under 8080.			(Cont'd)
	FD1793-02	Western	
	FD1797-02	Western	
GPIB Talker/Listener			
	8291	Intel	
I/O Expander for 8048 Family			
	MBL8243	Fujitsu	
	8243	Intel	
	M8243	† Intel	
	INS8243	National	
	μPD8243	NEC-Micro	
Keyboard/Display Controller, See 8279, etc. under 8080.			120
Priority Interrupt Control. See 8214, etc. under 8080.			
	8214	Intel	
	μPB8214	NEC-Micro	
Programmable Communication Interface (USART) See 8251, etc. under 8080.			
	AM8251A	**AMD**	**(1236)**
	8251A	Intel	
	μPD8251	NEC-Micro	
Programmable Interrupt Controller. See 8259, etc. under 8080.			
	8259	Intel	
	8259-5	Intel	
	8259A	Intel	
	8259A-2	Intel	130
	8259A-8	Intel	
	μPD8259	NEC-Micro	
	μPD8259-5	NEC-Micro	
Programmable Interval Timer. See 8253, etc. under 8080.			
	AM8253	**AMD**	**(1236)**
	8253	Intel	
	μPD8253	NEC-Micro	
	μPD8253-5	NEC-Micro	
Programmable Peripheral Interface. See 8255, etc. under 8080.			
	AM8255A	**AMD**	**(1237)**
	AM8255A-5	AMD	
	8255A	Intel	140
	M8259H	† Intel	
	μPD8255	NEC-Micro	
	μPD8255A-5	NEC-Micro	
PROM (erasable), I/O			
	8755A	Intel	
	μPD8755A	NEC-Micro	
	TMP8755A	Toshiba	
RAM, I/O, Timer			
	AM8155	**AMD**	**(1235)**
	AM8155-2	**AMD**	**(1235)**
	AM8156	**AMD**	**(1235)**
	AM8156-2	**AMD**	**(1235)** 150
	8155	Intel	
	8155-2	Intel	
	8155H	Intel	
	8155H-2	Intel	
	8156	Intel	
	8156-2	Intel	
	8156H	Intel	
	8156H-2	Intel	
	M8155H	† Intel	
	μPD8155	NEC-Micro	160
	μPD8156	NEC-Micro	
	TMP8155	Toshiba	
	TMP8156	Toshiba	
ROM, I/O	8355	Intel	
	8355-2	Intel	
	μPD8355	NEC-Micro	
SDLC/HDLC Protocol Controller. See 8273, etc. under 8080.			
	8273	Intel	
	μPD379	NEC-Micro	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

8 Bit

8048 (Cont'd)

Function	Device	Source	Line
Universal Peripheral Interface (slave microprocessor)			
	AM8041A	**AMD** (1235)	
	MBL8041A	Fujitsu	
	8041AH	Intel	
	8041AH-2	Intel	
	8042	Intel	
	8641A	Intel	
	8741A	Intel	
	8742	Intel	
	M8741A	† Intel	
	M5L8041A	Mitsubishi	10
	μPD8041	NEC-Micro	
	μPD8041A	NEC-Micro	
	μPD8741A	Signetics	
Octal Bus Transceiver			
	M8286	† Intel	
	M8287	† Intel	

8051

Function	Device	Source	Line
Microcomputer (erasable PROM)			
	8751	Intel	
	M8751	† Intel	
Microcomputer (external ROM)			
	AM8031	AMD	
	8031AH	Intel	
	80C31	Intel	20
	M8031	† Intel	
	80C31	Intersil	
	8031	Siemens	
Microcomputer (mask programmed ROM)			
	AM8051	AMD	
	8051AH	Intel	
	8052	Intel	
	80C51	Intel	
	M8051	† Intel	
	8051	Intersil	
	80C51	Intersil	30
	8051	Siemens	

8080

Function	Device	Source	Line
See also Z80.			
Microprocessor			
	8080A-1	AMD	
	8080A-2	AMD	
	8080A-4	AMD	
	AM8080A	**AMD** (1233)	
	AM9080AC	AMD	
	AM9080AM	† AMD	
	8080A	Intel	
	8080A-1	Intel	40
	8080A-2	Intel	
	M8080A	† Intel	
	iAPX 88/10	Intel	
	iAPX 88/20	Intel	
	INS8080A	National	
	INS8080A-1	National	
	INS8080A-2	National	
	μPD8080A	NEC-Micro	
	μPD8080A-1	NEC-Micro	
	μPD8080A-2	NEC-Micro	50
Analog Input, MUX, A/D Converter			
	MP20	Burr-Brown	
	MP22	Burr-Brown	
	MP32	Burr-Brown	
	ADC0816C	**National** (3319)	
	μPD7001	NEC-Micro	
	μPD7002	NEC-Micro	
Analog Input, 3 3/4 Digit DVM with Multiplexed Output			
	INS8294	National	
Arithmetic Processing Unit			
	AM9511A	**AMD** (1240)	
	AM9511A-1	AMD	
	AM9511A-5	AMD	60
	AM9511ADM	† AMD	
	8231A	Intel	
	M8231A	† Intel	
Asynchronous Communication Element			
	DP8250	National	
	INS8250	National	
	TR1983	Western	
Bidirectional Bus Driver (See also Digital-Miscellaneous-Bus Drivers, Interface-Line Transceivers.)			
	3216	AMD	
	3226	AMD	
	8216	AMD	
	8226	AMD	70
	M3216	† AMD	
	M3226	† AMD	
	M8216	† AMD	
	M8226	† AMD	
	8216	Intel	
	8226	Intel	
	M8216	† Intel	
	M8226	† Intel	
	M5L8216	Mitsubishi	
	DP3216	National	80
	DP3226	National	
	DP7304	† National	
	DP8216	National	
	DP8216M	† National	
	DP8226	National	
	DP8226M	† National	
	DP8304	National	
	DS8833	National	
	DS8835	National	
	INS8208	National	90
	INS8216	National	
	INS8226	National	
	μPB8216	NEC-Micro	
	μPB8226	NEC-Micro	
Bus Controller	8218	Intel	
Bus Driver (See also Digital-Misc., Bus Drivers			
	INS8202	National	
	INS8203	National	
Cassette Controller			
	μPD371	NEC-Micro	
Clock Generator and Driver			
	8224C	AMD	
	8224M	† AMD	100
	8224	Intel	
	M8224	† Intel	
	DP8224	National	
	INS8224	National	
	μPB8224	NEC-Micro	
	SN54ALS474	† TI	
	SN54LS424	† TI	
	SN74LS424	TI	
CRT Controller	8275	Intel	
	8276	Intel	110
	DP8350	**National** (2763)	
	DP8352	National	
	DP8353	National	
	μPD3301	NEC-Micro	
Data Acquisition System, 8 Channel, 8-Bit Conversion			
	AD7581A	AD	
	AD7581B	AD	
	AD7581C	AD	
	AD7581J	AD	
		(Continued)	
Data Acquisition System, 8 Channel, 8-Bit Conversion			
	AD7581K	AD (Cont'd)	
	AD7581L	AD	120
Data Ciphering Processor			
	AM9518	**AMD** (1244)	
Data-Encryption Device (encrypts and decrypts data according to NBS standard)			
	8294	Intel	
Decoder, 1 of 8 (See also Digital-TTL-Decoders, 3222, 74LS138, etc.)			
	AM25LS138C	AMD	
	AM25LS138M	† AMD	
	8205	Intel	
	DM74LS138	National	
	INS82LS05	National	
	SN74LS138	**TI** (880)	
Display Controller			
	INS8247	National	
	INS8248	National	130
Dynamic RAM Controller			
	8202A	Intel	
	8203	Intel	
Erasable PROMs. See Memory-PROMs and 8708 listing in PART NUMBER INDEX			
Erasable PROMs, See Memory-PROMs and 8708 listing in PART NUMBER INDEX			
Error Detection & Correction Chip			
	8206	Intel	
Floating Point Processor			
	8232	Intel	
Floppy Disc Controller			
	MB8877	Fujitsu	
	8271	Intel	
	μPD765	NEC-Micro	
	FD1793-02	Western	140
	FD1797-02	Western	
GPIB Controller			
	8292	Intel	
GPIB Talker/Listener Interface			
	8291A	Intel	
GPIB Transceiver			
	8293	Intel	
GPIB Universal Interface			
	μPD7201	NEC-Micro	
I/O Expander for 8041/8741, CMOS			
	MBL8243E	Fujitsu	
	MBL8243N	Fujitsu	
	IM82C43I	Intersil	
	IM82C43M	† Intersil	
I/O Expander for 8041A/8741A			
	8243	Intel	150
	TMP8243P	Toshiba	
I/O Latch (see also Digital-CMOS and TTL, Latches)			
	INS82C06	National	
I/O Port	3212	AMD	
	8212C	AMD	
	8212M	† AMD	
	M3212	† AMD	
	8212	Intel	
	M8212	† Intel	
	M5L8212	Mitsubishi	
	DP8212	National	160
	DP8212M	† National	
	INS8212	National	
	MM82PC12	National	
	μPB8212	NEC-Micro	
	SN54S412	**† TI** (945)	
	SN74S412	**TI** (945)	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

8 Bit

8080 (Cont'd)

Function	Device	Source	Line
Keyboard Display Controller			
	AM8279	**AMD** (1239)	
	AM8279-5	**AMD** (1239)	
	AM8279-8	**AMD** (1239)	
	8279	Intel	
	8279-5	Intel	
	M5L8279	Mitsubishi	
	M5L8279-5	Mitsubishi	
	μPD8279-5	NEC-Micro	
Keyboard Encoder (See also Interface-Keyboard Encoders)			
	INS8244	National	
	INS8245	National	10
	INS8246	National	
Multi-Protocol Communications Circuit			
	SCN2652A	Signetics	
Multi-Protocol Communications Controller (SDLC, ADDCP, BiSync, DDCMP)			
	SCN2652A	Signetics	
Multi-Universal Asynchronous Receiver Transmitter			
	8256	Intel	
	μPB8228	NEC-Micro	
	SN74S428	**TI** (946)	
	SN74S438	**TI** (946)	
	TIM8228	**TI** (3980)	
	TIM8238	**TI** (3980)	
Polynominal Generator/Checker			
	SCN2653A	Signetics	20
Programmable Communication Interface (USART) (See also Interface-Transmitters, Receivers)			
	AM8251	**AMD** (1236)	
	AM9551	**AMD** (1236)	
	8251A	Intel	
	M8251A	† Intel	
	INS2651	National	
	INS8251	National	
	μPD8251	NEC-Micro	
	μPD8251A	NEC-Micro	
	SCN2651C	Signetics	
	SCN2661A	Signetics	30
	SCN2661B	Signetics	
	SCN2661C	Signetics	
	COM2651	SMC	
	COM8251A	SMC	
	TMS5501	TI	
Programmable Counter			
	8254	Intel	
Programmable Direct Memory Access Controller			
	AM8257	**AMD** (1238)	
	AM9517A	**AMD** (1243)	
	AM9517A-5	AMD	
	AM9557	**AMD** (1238)	40
	8257	Intel	
	8257-5	Intel	
	M8257	† Intel	
	μPD8257	NEC-Micro	
	μPD8257-5	NEC-Micro	
Programmable Interrupt Controller			
	AM9519A	**AMD** (1245)	
	8259A	Intel	
	8259A-2	Intel	
	8259A-8	Intel	
	INS8259	National	50
	μPD8259	NEC-Micro	
	μPD8259-5	NEC-Micro	
Programmable Interval Timer			
	AM8253	AMD	
	8253	Intel	
	INS8253	National	
	INS8253-5	National	

(Continued)

Function	Device	Source	Line
Programmable Interval Timer (Cont'd)			
	μPD8253	NEC-Micro	
	μPD8253-5	NEC-Micro	
Programmable Peripheral Interface			
	AM8255A	AMD	
	AM8255A-5	AMD	60
	AM9555ADM	AMD	
	8255A	Intel	
	M8255A	† Intel	
	INS8254	National	
	INS8255	National	
	μPD8255	NEC-Micro	
	μPD8255A-5	NEC-Micro	
	MSM8255A	OKI	
RAM: See Memory—Static or Dynamic RAMS			70
RAM(128x8), ROM(2048x8), I/O			
	DP8356	National	
RAM(128x8) with 16-Bit I/O			
	INS8154	National	
RAM(1024x1): See 8102 listings in PART NUMBER INDEX and MEMORY-RAMs, Static			
RAM(1024x1), See 8102 listings in PART NUMBER INDEX and also MEMORY-RAMs, Static			
RAM(256x4): See 8101 and 8111 listings in PART NUMBER INDEX and also MEMORY-RAMs, Static			
RAM(256x4), See 8101 and 8111 listings in PART NUMBER INDEX and also MEMORY-RAMs, Static			
ROMs: See MEMORY-ROMs			
SDLC/HDLC Protocol Controller			
	8273	Intel	
	μPD379	NEC-Micro	
	WD1933	Western	80
See also Z80.			
Serial Data Communications Controller			
	8274	Intel	
Synchronous Receiver/Transmitter (BiSync, SDLC)			
	μPD379	NEC-Micro	
System Controller and Bus Driver			
	8228C	AMD	
	8228M	† AMD	
	8238C	AMD	
	8238M	† AMD	
	8228	Intel	
	8238	Intel	
	M8228	† Intel	90
	M5L8228	Mitsubishi	
	DP8228	National	
	DP8228M	† National	
	DP8238	National	
	DP8238M	† National	
	INS8228	National	
	INS8238	National	
System Timing Controller			
	AM9513	**AMD** (1242)	
Universal Peripheral Interface (slave microprocessor)			
	AM8041A	AMD	
	MBL8041A	Fujitsu	100
	8041AH	Intel	
	8041AH-2	Intel	
	8641A	Intel	
	8741A	Intel	
	μPD8041	NEC-Micro	
	μPD8741A	NEC-Micro	
Octal Bus Transceiver			
	M8286	† Intel	
	M8287	† Intel	

8085A

Function	Device	Source	Line
Many devices for the 8080 are also suitable for the 8085			
Microprocessor			
	AM8085A	**AMD** (1234)	110
	AM8085A-2	AMD	
	AM9085A	AMD	
	8085A	Intel	
	8085A-2	Intel	
	8085AH	Intel	
	8085AH-2	Intel	
	M8085A	† Intel	
	M8085AH	† Intel	
	M5L8085A	Mitsubishi	
	μPD8085A	NEC-Micro	120
	μPD8085A-2	NEC-Micro	
	MSM8085A	**OKI** (3873)	
	TMP8085A	Toshiba	
Analog Input, Multiplexer, A/D Converter			
	MP21	Burr-Brown	
Bidirectional Bus Dirver. See 8216, 8226, etc. under 8080.			
	8216	Intel	
	8226	Intel	
Bidirectional Bus Driver. See 8216, 8226, etc. under 8080.			
	μPB8216	NEC-Micro	
	μPB8226	NEC-Micro	
Bus Controller	8219	Intel	
Cassette Controller			
	μPD371	NEC-Micro	130
CRT Controller. See 8275, etc. under 8080.			
	8275	Intel	
	μPD3301	NEC-Micro	
Data Acquisition System, 8 Channel, 8-Bit Conversion			
	AD7581A	AD	
	AD7581B	AD	
	AD7581C	AD	
	AD7581J	AD	
	AD7581K	AD	
	AD7581L	AD	
Decoder, 1 of 8. See 8205, etc. under 8080.			
	8205	Intel	
Dynamic RAM Controller			
	8202A	Intel	140
	8203	Intel	
Erasable PROM, I/O			
	8755A	Intel	
	M8755A	† Intel	
	μPD8755A	NEC-Micro	
	MSM8755	OKI	
Floppy Disc Controller. See 8271, etc. under 8080.			
	MB8877	Fujitsu	
	8271	Intel	
	μPD765	NEC-Micro	
	FD1793-02	Western	150
	FD1797-02	Western	
GPIB Controller			
	8292	Intel	
GPIB Talker/Listener Interface			
	8291A	Intel	
I/O Expander	8243	Intel	
	M5L8243	Mitsubishi	
	μPD8243	NEC-Micro	
I/O Port. See 8212, etc. under 8080.			
Keyboard Display Controller—See listing under 8080			160
Priority Interrupt Control. See 8214, etc. under 8080.			

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

Function	Device	Source	Line
8 Bit			
8085A (Cont'd)			
Programmable Communication Interface (USART)			
	AM8251	AMD	
	8251A	Intel	
	M5L8251A	Mitsubishi	
	μPD8251	NEC-Micro	
Programmable Direct Memory Access Controller			
	8237A	Intel	
	8237A-4	Intel	
	8237A-5	Intel	
	M5L8257-5	Mitsubishi	
Programmable Direct Memory Access Controller.			
	AM8257	AMD	
	AM9557	AMD	10
	8257	Intel	
	8257-5	Intel	
	M8257	† Intel	
	μPD8257	NEC-Micro	
	μPD8257-5	NEC-Micro	
Programmable Interrupt Controller			
	8259A	Intel	
	8259A-2	Intel	
	8259A-8	Intel	
	M8259A	† Intel	
	M5L8259A	Mitsubishi	20
	μPD8259	NEC-Micro	
	μPD8259-5	NEC-Micro	
Programmable Interval Timer			
	M8253	† Intel	
	M5L8253-5	Mitsubishi	
Programmable Interval Timer			
	AM8253-5	**AMD**	**(1236)**
	8253-5	Intel	
	INS8253-5	National	
	μPD8253	NEC-Micro	
	μPD8253-5	NEC-Micro	
Programmable Peripheral Interface			
	M5L8255A-5	Mitsubishi	30
Programmable Peripheral Interface.			
	AM8255A-5	AMD	
	8255A-5	Intel	
	μPD8255A-5	NEC-Micro	
PROM (erasable), I/O			
	8755A	Intel	
	μPD8755A	NEC-Micro	
RAM, I/O, Timer			
	AM8155	AMD	
	AM8155-2	AMD	
	AM8156	AMD	
	AM8156-2	AMD	
	8155	Intel	40
	8155-2	Intel	
	8156	Intel	
	8156-2	Intel	
	M8155	† Intel	
	M5L8155	Mitsubishi	
	M5L8156	Mitsubishi	
	μPD8155	NEC-Micro	
	μPD8156	NEC-Micro	
	MSM8155	OKI	
RAM (1024x8) (See also: Memory-RAMs)			
	8185	Intel	50
	8185-2	Intel	
ROM, I/O	8355	Intel	
	8355-2	Intel	
	μPD8355	NEC-Micro	
	TMP8355	Toshiba	
ROM(2048x8) and I/O			
	μPD8355	NEC-Micro	

Function	Device	Source	Line
SDLC/HDLC Protocol Controller. See 8273, etc. under 8080.			
	8273	Intel	
	μPD7201	NEC-Micro	
Universal Peripheral Interface (slave microprocessor)			
	8041A	AMD	
	MBL8041A	Fujitsu	60
	8041A	Intel	
	8741A	Intel	
	μPD8041	NEC-Micro	
	μPD8741A	NEC-Micro	
Octal Bus Transceiver			
	M8286	† Intel	
	M8287	† Intel	
8X300			
Microprocessor			
	N8X300	**Signetics**	**(1501,1511)**
	N8X305	**Signetics**	**(1501)**
	S8X300-1	**† Signetics**	**(1501,1511)**
	S8X300-2	**† Signetics**	**(1501,1511)** 70
	S8X305	**† Signetics**	**(1501)**
Bus Expander, Addressable			
	N8T39	**Signetics**	**(1502,1504,1511)**
Floppy Disk Controller			
	N8X330	**Signetics**	**(1501,1507)**
I/O Port, Asynchronous, Field Programmable Address			
	N8T35	**Signetics**	**(1502,1504)**
	N8T36	**Signetics**	**(1502,1504)**
	N8X36	**Signetics**	**(1502,1504)**
	N8X376	**Signetics**	**(1501)**
	S8T35	**† Signetics**	**(1502,1504)**
	S8T36	**† Signetics**	**(1502,1504)**
	S8X376	**† Signetics**	**(1501)** 80
I/O Port, Latched Bidirectional			
	N8T31	**Signetics**	**(1502,1504)**
	N8X31	**Signetics**	**(1502,1504)**
	N8X371	**Signetics**	**(1501)**
	S8X371	**† Signetics**	**(1501)**
I/O Port, Synchronous, Field Programmable Address			
	N8T32	**Signetics**	**(1502,1504)**
	N8T33	**Signetics**	**(1502,1504)**
	N8X32	**Signetics**	**(1502,1504)**
	N8X372	**Signetics**	**(1501)**
	N8X382	**Signetics**	**(1501)**
	N8X42	**Signetics**	**(1502,1504,1511)** 90
	S8T32	**† Signetics**	**(1502,1504)**
	S8T33	**† Signetics**	**(1502,1504)**
	S8X372	**† Signetics**	**(1501)**
	S8X382	**† Signetics**	**(1501)**
I/O Port with Parity			
	N8X374	**Signetics**	**(1501,1510)**
	S8X374	† Signetics	

Function	Device	Source	Line
I/O Register Array (16x8 or 8x16)			
	N8X320	**Signetics**	**(1501,1506)**
Interrupt Controller			
	N8X310	**Signetics**	**(1501,1505)**
Memory Address Director			
	N8X360	**Signetics**	**(1501,1510)**
RAM, Static (256x8)			
	N8X350	**Signetics**	**(1501,1509)** 100
Transparent Bus Expander			
	N8T58	**Signetics**	**(1502,1504,1511)**
9008			
Microprocessor			
	CP9008	Western	
	WD9000	Western	
F8			
Microprocessor			
	3850	Fairchild	
	3850M	† Fairchild	
	F8	**Fairchild**	**(1253,1268)**
	MK3850	Mostek	
Analog Input, MUX, A/D Converter			
	MP21	Burr-Brown	
Direct Memory Access			
	3854	Fairchild	
	MK3854	Mostek	110
Dynamic Memory Interface			
	3852	Fairchild	
	MK3852	Mostek	
Peripheral Input/Output Interface			
	3861	Fairchild	
	3861M	† Fairchild	
	3871	Fairchild	
	MK3861	Mostek	
	MK3871	Mostek	
Program Storage Unit			
	3851	Fairchild	
	3851A	Fairchild	
	3851M	† Fairchild	120
	3856	Fairchild	
	3856A	Fairchild	
	3857	Fairchild	
	38T56	Fairchild	
	38T57	Fairchild	
	MK3851	Mostek	
Static Memory Interface			
	3853	Fairchild	
	3853M	† Fairchild	
	MK3853	Mostek	
INS8060			
Microprocessor			
	INS8060	National	130
Analog Input, Multiplexer, A/D Converter			
	MP20	Burr-Brown	
	MP22	Burr-Brown	
	MP32	Burr-Brown	
Bit Programmable I/O			
	INS8254	National	
Programmable Communication Interface (See also Interface Transmitter-Receivers)			
	INS8250	National	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

Function	Device	Source		Line
8 Bit				
INS8060 (Cont'd)				
Programmable Peripheral Interface	INS8255	National		
RAM(128x8) and I/O	INS8154	National		
4-Bit Latch	DM74LS175	National		
8-Bit I/O Port	DP8212	National		
	INS8212	National		
NSC800				
Microprocessor	**NSC800**	**National**	(1367)	
Bidirectional Transceiver	MM82PC08	National		
I/O, 3 Programmable Ports	NSC831	National		
RAM, I/O, Timer	MSC810	National		
ROM, I/O	**NSC830**	**National**	(1374)	10
Z8				
Microcomputer	**Z8601**	**Synertek**	(1540)	
	Z8601A	**Synertek**	(1540)	
	Z8602	**Synertek**	(1541)	
	Z8602A	**Synertek**	(1541)	
	Z8603	**Synertek**	(1542)	
	Z8603A	**Synertek**	(1542)	
	Z8611	**Synertek**	(1543)	
	Z8611A	**Synertek**	(1543)	
	Z8612	**Synertek**	(1544)	
	Z8612A	**Synertek**	(1544)	20
	Z8613	**Synertek**	(1545)	
	Z8681	**Synertek**	(1546)	
	Z86C01	**Synertek**	(1548)	
	Z8SMCU	**Synertek**	(1547)	
	Z8601	**Zilog**	(1596)	
	Z8602	Zilog		
	Z8603	**Zilog**	(1596)	
	Z8611	**Zilog**	(1597)	
	Z8612	**Zilog**	(1597)	
	Z8613	**Zilog**	(1597)	30
	Z8671	**Zilog**	(1597)	
	Z8675	Zilog		
	Z8681	**Zilog**	(1597)	
Z80				
Note: the 6500, 6800 and 8080 peripheral circuits are compatible with the Z80 series.				
Microprocessor	MK3880	Mostek		
	μPD780	NEC-Micro		
	μPD780-1	NEC-Micro		
	Z80-CPU	SGS		
	Z80A-CPU	SGS		
	LH0080	Sharp		40
	Z80	**Zilog**	(1581)	
	Z80A	**Zilog**	(1581)	
	Z80B	**Zilog**	(1581)	
	Z80L	**Zilog**	(1581)	
	Z8400H	**Zilog**	(1583)	
	Z8400L	**Zilog**	(1583)	
Analog Input, Multiplexer, A/D Converter	MP20	Burr-Brown		
	MP22	Burr-Brown		
	MP32	Burr-Brown		

Function	Device	Source		Line
Counter Timer Circuit	MK3882	Mostek		50
	Z80-CTC	SGS		
	Z80A-CTC	SGS		
	Z80-CTC	**Zilog**	(1581)	
	Z80A-CTC	**Zilog**	(1581)	
	Z80B-CTC	**Zilog**	(1581)	
	Z8430	**Zilog**	(1585)	
Data Acquisition System, 8 Channel, 8-Bit Conversion	**AD7581A**	**AD**	(3174)	
	AD7581B	**AD**	(3174)	
	AD7581C	**AD**	(3174)	
	AD7581J	**AD**	(3174)	60
	AD7581K	**AD**	(3174)	
	AD7581L	**AD**	(3174)	
	AD8581B	AD		
Direct Memory Access Controller	MK3883	Mostek		
	Z80-DMA	SGS		
	Z80A-DMA	SGS		
	Z80-DMA	**Zilog**	(1581)	
	Z80A-DMA	**Zilog**	(1581)	
	Z8410	**Zilog**	(1585)	
Parallel Input/Output Controller	MK3881	Mostek		70
	Z80-PIO	SGS		
	Z80A-PIO	SGS		
	Z80-PIO	**Zilog**	(1581)	
	Z80A-PIO	**Zilog**	(1581)	
	Z80B-PIO	**Zilog**	(1581)	
	Z8420	**Zilog**	(1585)	
Serial Input/Output Controller	MK14007	Mostek		
	MK3884	Mostek		
	MK3885	Mostek		
	MK3887	Mostek		80
	Z80-SIO	SGS		
	Z80A-SIO	SGS		
	Z80-SIO	**Zilog**	(1581)	
	Z80-SIO/2	**Zilog**	(1581)	
	Z80-SIO/9	**Zilog**	(1581)	
	Z80A-SIO/1	**Zilog**	(1581)	
	Z80A-SIO/2	**Zilog**	(1581)	
	Z80A-SIO/9	**Zilog**	(1581)	
	Z80B-SIO/9	**Zilog**	(1581)	
	Z8440	**Zilog**	(1586)	90
	Z8441	Zilog		
	Z8442	Zilog		
	Z8449	Zilog		
Single Asynchronous Receiver/Transmitter	MK3886	Mostek		
Dual Asynchronous Receiver/Transmitter	Z80-DART	SGS		
	Z80A-DART	SGS		
	Z80-DART	**Zilog**	(1581)	
	Z80A-DART	**Zilog**	(1581)	
	Z8470	**Zilog**	(1586)	
Z800				
Note: Z80 peripheral circuits and Z8500 universal peripheral circuits are compatible with the Z800 series.				100
Microprocessor	**Z8108**	**Zilog**	(1584)	
8/16 Bit				
1600				
Microprocessor, 8-Bit	CP1651	Western		
	CP1661	Western		

Function	Device	Source		Line
Microprocessor, 16-Bit	MP1651	Western		
	MP1661	Western		
Asynchronous/Synchronous Transmitter/Receiver (ASTRO) (See also Interface-Serial Transmitters-Receivers)	COM1671	SMC		
	UC1671	**Western**	(2871)	
	UC1971	Western		
Direct Memory Access Controller	DM1881	Western		
	DM1883	Western		110
Floppy Disc Controller/Formatter	MB8866	Fujitsu		
	INS1771	National		
	FD1771-01	**Western**	(1578)	
	FD1781	Western		
	FD1781-01	Western		
	FD1791-02	**Western**	(1574)	
	FD1795-02	**Western**	(1574)	
General Purpose Input/Output	CP1851	Western		
16000				
Microprocessor, 8-bit	F16008	Fairchild		120
	F16016	Fairchild		
Bus Arbiter	F16204	Fairchild		
Channel Controller	F16203	Fairchild		
CRT Controller	F16413	Fairchild		
Floating-Point Slave Processor	F16081	Fairchild		
GPIB Controller	F16488	Fairchild		
Intelligent Peripheral Controller	F16105	Fairchild		
Interrupt Control Unit	F16202	Fairchild		
Local Area Network Controller	F16802	Fairchild		
Memory Management Unit	F16082	Fairchild		130
Multiple Protocol Communications Controller	F16456	Fairchild		
Packet Switching Frame Level Controller	F16425	Fairchild		
Timing Control Unit	F16201	Fairchild		
8086				
Microprocessor, High Integration	**iAPX186**	**Intel**	(1347)	
Microprocessor, Numeric Data	**iAPX86/20**	**Intel**	(1348)	
Microprocessor, Operating System	**iAPX86/30**	**Intel**	(1349)	
Microprocessor, 16-Bit with Memory Management	**iAPX286/10**	**Intel**	(1348)	
Microprocessor, 16-Bit	AM8086	AMD		
	AM8086-1	AMD		
	AM8086-2	AMD		140
	MBL8086	**Fujitsu**	(1305)	
	MBL8086-1	**Fujitsu**	(1305)	
	MBL8086-2	**Fujitsu**	(1305)	
	80286	Intel		
	8086	Intel		

(Continued)

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

8/16 Bit

8086 (Cont'd)

Function	Device	Source		Line
Microprocessor, 16-Bit				
			(Cont'd)	
	8086-2	Intel		
	M8086	† Intel		
	iAPX86/10	**Intel**	**(1347)**	
	M5L8086	Mitsubishi		
	μPD8086	NEC-Micro		
	SAB8086C	Siemens		
	SAB8086C-4C	Siemens		

8086/88

Function	Device	Source		Line
Many devices for the 8080 and 8085A are also suitable for the 8086 and 8088				
Microprocessor, I/O Preprocessor				
	MBL8089	**Fujitsu**	**(1305)**	
	8089	**Intel**	**(1349)**	10
Bus Arbiter	**MBL8289**	**Fujitsu**	**(1305)**	
	8289	Intel		
	M8289	† Intel		
	M5L8289	Mitsubishi		
Bus Controller	**MBL8288**	**Fujitsu**	**(1305)**	
	8288	Intel		
	M8288	† Intel		
	M5L8288	Mitsubishi		
	μPD8288	NEC-Micro		
Clock Generator and Driver				20
	MBL8284A	**Fujitsu**	**(1305)**	
	8284A	Intel		
	8284A-1	Intel		
	M8284	† Intel		
	M5L8284A	Mitsubishi		
	μPD8284	NEC-Micro		
Dynamic RAM Controller				
	8202A	Intel		
	8203	Intel		
GPIB Talker/Listener				
	8291A	Intel		
Multiprotocol Serial I/O Controller				
	μPD7201	NEC-Micro		30
Programmable Interrupt Controller				
	MBL8259A	**Fujitsu**	**(1305)**	
	8259A	Intel		
	μPD8259A	NEC-Micro		
Octal Bus Transceiver, Inverting				
	MBL8287	**Fujitsu**	**(1305)**	
	8287	Intel		
	M8287	† Intel		
	M5L8287	Mitsubishi		
	μPD8287	NEC-Micro		
Octal Bus Transceiver, Non-Inverting				
	MBL8286	**Fujitsu**	**(1305)**	
	HD82C86	Harris		
	8286	Intel		40
	M8286	† Intel		
	M5L8286	Mitsubishi		
	μPD8286	NEC-Micro		
Octal Latch, Inverting				
	MBL8283	**Fujitsu**	**(1305)**	
	8283	Intel		
	M8283	† Intel		
	M5L8283	Mitsubishi		
	μPD8283	NEC-Micro		
Octal Latch, Non-Inverting				
	MBL8282	**Fujitsu**	**(1305)**	50
	HD82C82	Harris		
	8282	Intel		
	M8282	† Intel		
	M5L8282	Mitsubishi		
	μPD8282	NEC-Micro		

8088

Function	Device	Source		Line
Microprocessor, Numeric Data				
	iAPX88/20	**Intel**	**(1348)**	
	iAPX88/30	**Intel**	**(1349)**	
Microprocessor, 8-Bit				
	AM8088	AMD		
	MBL8088	**Fujitsu**	**(1305)**	
	8088	Intel		60
	8088-2	Intel		
	iAPX88/10	**Intel**	**(1347)**	

9900

Function	Device	Source		Line
Microcomputer ROM-Less				
	TM9995	TI		
Microcomputer, 16 Bit, Alterable				
	S99C91	**AMI**	**(1252)**	
Microcomputer, 16 Bit (erasable PROM)				
	TMS9940E	**TI**	**(1552)**	
Microcomputer, 16 Bit				
	AMU/PR	**AMI**	**(1251)**	
	TMS9940M	**TI**	**(1552)**	
Microprocessor, 16-Bit				
	TMS99105A	**TI**	**(1553,1555)**	
	TMS99110A	**TI**	**(1553,1555)**	
Microprocessor				
	S9900	AMI		70
	S9980A	AMI		
	S9981	AMI		
	SMC9980	SMC		
	SBP9900AC	TI		
	SBP9900AE	TI		
	SBP9900AM	† TI		
	TMS9900	**TI**	**(1552)**	
	TMS9900-40	**TI**	**(1552)**	
	TMS9980A	**TI**	**(1552)**	
	TMS9981	**TI**	**(1553)**	80
	TMS9985	TI		
Addressable Latch, 8-Bit				
	SN54LS259	**† TI**	**(917)**	
	SN74LS259	**TI**	**(917)**	
	TIM9906	**TI**	**(1554,3980)**	
Asynchronous Communication Controller (UART) (See also Interface-Serial Transmitters-Receivers)				
	S9902	AMI		
	TMS9902A	**TI**	**(1554)**	
Bubble Memory Controller				
	TMS9916	TI		
	TMS9922	TI		
Byte Multiplier	SBP9708C	TI		
	SBP9708M	† TI		90
Clock Generator and Driver (4-phase for 9900)				
	SN54LS362	† TI		
	TIM9904	TI		
Color Graphics Video Display				
	TMS9918A	**TI**	**(1554)**	
CRT Controller	**TMS9927**	**TI**	**(1554)**	
	TMS9937	**TI**	**(1554)**	
Data Encrypton Unit				
	TMS99541	**TI**	**(1554)**	
Data Selector/Multiplexer (See also Digital-TTL-Multiplexers 74LS251)				
	SN54LS251	**† TI**	**(915)**	
	SN74LS251	**TI**	**(915)**	
	TIM9905	**TI**	**(3980,1554)**	
DMA Controller				
	TMS9911	TI		100
Floppy Disc Controller				
	TMS9909	**TI**	**(1554)**	
FSK Modem	TMS99532	TI		
General Purpose I/O Module				
	S99C922	AMI		
	S99C923	AMI		
GPIB Controller				
	TMS9914A	**TI**	**(1554)**	
Interrupt Controller/Timer				
	SBP9961C	TI		
	SBP9961M	† TI		
Memories: See Memory: PROMs, RAMs (Dynamic or Static), and ROMs				
Multi-Processor Interface				
	TMS99650	**TI**	**(1554)**	110
Peripheral Interface Adapter				
	SBP9965C	TI		
	SBP9965M	† TI		
Priority Encoder (See also Digital-TTLMiscellaneous, Priority Encoder, 74LS148)				
	SN74LS148	**TI**	**(883)**	
Priority Encoder, 8-Line to 3-Line, Three State				
	SN74LS348	**TI**	**(931)**	
	TIM9908	**TI**	**(3980)**	
Programmable Communications Register (CRU), I/O Expander	SBP9960C	TI		
	SBP9960M	† TI		
Programmable Systems Interface (interrupt prioritization, I/O control and interval timing)				
	S9901-4	AMI		
	TMS9901	**TI**	**(1554)**	120
Pulse DTMF Encoder				
	TMS99531	**TI**	**(1554)**	
Serial Fiber Optics Transmitter, with Expandable Octal Demultiplexer	SN74LS463	TI		
Synchronous Communication Controller (bi-sync and SDLC)	**TMS9903**	**TI**	**(1554)**	
Systems Timer (for SBP9900A)				
	SBP9964C	TI		
	SBP9964M	† TI		
Video Display Processor				
	TMS9928A	**TI**	**(1554)**	
	TMS9929A	**TI**	**(1554)**	
Octal Fiber-Optics Serial Transmitter, Expandable				
	SN74LS462	TI		

uCOM87

Function	Device	Source		Line
Microcomputer	μPD7801	NEC-Micro		
Evaluation Device				
	μPD7800	NEC-Micro		130

12 Bit

2900 Controller

Function	Device	Source		Line
Microprogram Controller, 12-Bit				
	AM2910C	**AMD**	**(1208)**	
	AM2910M	**† AMD**	**(1208)**	
	F2910C	Fairchild		
	F2910M	† Fairchild		
Microprogram Sequencer, 8-Bit				
	AM29112	**AMD**	**(1223)**	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

12 Bit

6100

Function	Device	Source		Line
Microprocessor	HM6100-2	† Harris		
	HM6100C-9	Harris		
	IM6100-1I	Intersil		
	IM6100-1M	† Intersil		
	IM6100AI	Intersil		
	IM6100AM	† Intersil		
	IM6100I	Intersil		
Bidirectional Bus Driver	**HD6432-2**	**† Harris**	**(1343)**	
	HD6432-9	**Harris**	**(1343)**	
Bus Driver	**HD6431-2**	**† Harris**	**(1343)**	10
	HD6431-9	**Harris**	**(1343)**	
Bus Driver, Hex	HD6435-2	† Harris		
	HD6435-9	Harris		
Bus Driver, Octal	**HD6434-2**	**† Harris**	**(1344)**	
	HD6434-9	**Harris**	**(1344)**	
Bus Separator/Driver (octal organized as 4 pairs of bus separators)	**HD6433-2**	**† Harris**	**(1343)**	
	HD6433-9	**Harris**	**(1343)**	
Memory Extension, DMA, Interval Timer, Controller (MEDIC)	IM6102-1I	Intersil		
	IM6102-1M	† Intersil		
	IM6102AI	Intersil		20
	IM6102AM	† Intersil		
	IM6102I	Intersil		
Peripheral Interface Element	HD6101-2	† Harris		
	HD6101-9	Harris		
	HD6101C-9	Harris		
	IM6101-1I	Intersil		
	IM6101-1M	† Intersil		
	IM6101AI	Intersil		
	IM6101AM	† Intersil		
	IM6101I	Intersil		30
Universal Asynchronous Receiver-Transmitter (UART) (See also Interface-Serial Transmitters-Receivers)	**HD6402-2**	**† Harris**	**(669,672,1333)**	
	HD6402-9	**Harris**	**(669,672,1333)**	
	HD6402C-9	**Harris**	**(669,672,1333)**	
	IM6402	Intersil		
	IM6402-1I	Intersil		
	IM6402-1M	† Intersil		
	IM6402AI	Intersil		
	IM6402AM	† Intersil		
	IM6403	Intersil		
	IM6403-1I	Intersil		40
	IM6403AI	Intersil		
	IM6403AM	† Intersil		
Hex Buffer/Driver, Three-State	**HD6495-2**	**† Harris**	**(1344)**	
	HD6495-9	**Harris**	**(1344)**	
Octal Bus Buffer/Driver	**HD6436-2**	**† Harris**	**(1344)**	
	HD6436-9	**Harris**	**(1344)**	
One-of-Eight Decoder/Driver, Latched	**HD6440-2**	**† Harris**	**(1344)**	
	HD6440-9	**Harris**	**(1344)**	
20-Bit I/O Port	IM6103AI	Intersil		
	IM6103AM	† Intersil		50
	IM6103C	Intersil		

(Continued)

Function	Device	Source		Line
20-Bit I/O Port				(Cont'd)
	IM6103I	Intersil		
	IM6103M	† Intersil		

TLCS-12

Function	Device	Source		Line
Microprocessor	T3190	Toshiba		
Input/Output Control Unit	T3418	Toshiba		
Memory Control Unit	T3416	Toshiba		

16 Bit

1610

Function	Device	Source		Line
Microprocessor, 16-Bit	MN1610	Panasonic		
	MN1611	Panasonic		
DMA(direct memory access) Controller	MN1650	Panasonic		
Realtime System Controller	MN1640	Panasonic		60
SCA(sub-channel adaptor)	MN1630	Panasonic		
	MN1631	Panasonic		

8000

Function	Device	Source		Line
Microprocessor, Non-Segmented	AMZ8002	AMD		
	Z8002	SGS		
	Z8002	**Zilog**	**(1587)**	
	Z8002A	**Zilog**	**(1587)**	
	Z8002B	**Zilog**	**(1587)**	
Microprocessor, Segmented	AMZ8001	AMD		
	Z8001	SGS		
	Z8000	**Zilog**	**(1581,1601)**	70
	Z8001	**Zilog**	**(1587)**	
	Z8001A	**Zilog**	**(1587)**	
	Z8001B	**Zilog**	**(1587)**	
Microprocessor, Virtual Memory	**Z8003**	**Zilog**	**(1588)**	
	Z8003A	**Zilog**	**(1588)**	
	Z8003B	**Zilog**	**(1588)**	
	Z8004	**Zilog**	**(1588)**	
	Z8004A	**Zilog**	**(1588)**	
	Z8004B	**Zilog**	**(1588)**	
Burst Error Processor	AMZ8065	AMD		
	Z8065-Z-BEP	Zilog		80
Clock Generator	AMZ8127	AMD		
Counter Timer I/O	AMZ8036	AMD		
	Z8036-CIO	SGS		
	Z8036-Z-CIO	**Zilog**	**(1591)**	
	Z8036A-Z-CIO	**Zilog**	**(1591)**	
CRT Controller	AMZ8052	AMD		
Data Cyphering Processor	AMZ8068	AMD		
	Z8068-Z-DCP	**Zilog**	**(1593)**	
Direct Memory Access	AMZ8016	AMD		
	Z8016-Z-DTC	**Zilog**	**(1590)**	90
Dynamic Memory Controller	AMZ8164B	AMD		
Error Detection and Correction Circuit	AMZ8160	AMD		
First In/First Out Buffer	AMZ8060	AMD		
	Z8060-FIFO	SGS		
	Z8060-Z-FIFO	**Zilog**	**(1592)**	
First In/First Out I/O	AMZ8038	AMD		
	Z8038-FIO	SGS		
	Z8038-Z-FIO	**Zilog**	**(1592)**	
Floppy Disc Controller	MB8877	Fujitsu		100
	FD1793-02	Western		
	FD1797-02	Western		
Intelligent Peripheral Controller	**Z8090-Z-UPC**	**Zilog**	**(1593)**	
Memory Driver	AMZ8161	AMD		
	AMZ8162	AMD		
Memory Interface Controller	AMZ8163	AMD		
Memory Management Unit	Z8010-MMU	SGS		
	Z8010-Z-MMU	**Zilog**	**(1589)**	
	Z8010A-Z-MMU	**Zilog**	**(1589)**	
	Z8010B-Z-MMU	**Zilog**	**(1589)**	110
Paged Memory Management Unit	**Z8015-PMMU**	**Zilog**	**(1589)**	
RAM Driver, Three-State Outputs	AMZ8165	AMD		
	AMZ8166	AMD		
Serial Input/Output	AMZ8030	AMD		
	Z8030-SCC	SGS		
	Z8030-Z-SCC	**Zilog**	**(1590)**	
	Z8030A-Z-SCC	**Zilog**	**(1590)**	
System Timing Controller	AMZ8073	AMD		
Universal Peripheral Controller	Z8034-UPC	SGS		
Octal Bus Driver	AMZ8140	AMD		120
	AMZ8144	AMD		
Octal Bus Transceiver	AMZ8103	AMD		
	AMZ8104	AMD		
	AMZ8107	AMD		
	AMZ8108	AMD		
Octal Latch	AMZ8133	AMD		
	AMZ8173	AMD		
Octal Register	AMZ8120	AMD		
3 to 8 Chip Select Decoder	AMZ8148	AMD		
3 to 8 Decoder	AMZ8136	AMD		130
8-Bit Equal-to Comparator	AMZ8121	AMD		

9440

Function	Device	Source		Line
Microprocessor	F9440C	Fairchild		
	F9440M	† Fairchild		
	F9445	**Fairchild**	**(1285,1288)**	
	F9448	**Fairchild**	**(1285,1294)**	
	F9449	**Fairchild**	**(1285,1295)**	
Advanced Data Link Controller	F9454	Fairchild		
Communication and Console Controller	**F9470**	**Fairchild**	**(1285,1296)**	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

16 Bit

9440 (Cont'd)

Function	Device	Source	Line
Floating-Point Processor	**F9443**	**Fairchild (1286)**	
I/O Control Unit	9442C	Fairchild	
Memory Control Unit	9441C	Fairchild	
Memory Management and Protection Unit	**F9444**	**Fairchild (1285,1287)**	
ROM, I/O, Timer	**F9446**	**Fairchild (1285,1292)**	
Video Display Generator	**F9447**	**Fairchild (1285,1293)**	

16000

Function	Device	Source	Line
Microprocessor	**F16032**	**Fairchild (1298)**	
	NS16032-6	**National (1381,1383,1397)**	
	SY16000	Synertek	
Floating-Point Slave Processor	**NS16081**	**National (1426)**	10
GPIB Controller	**F16488**	**Fairchild (1303)**	
Interrupt Control Unit	**NS16201-6**	**National (1397,1409,1444,1446)**	
Memory Management Unit	**NS16082**	**National (1428)**	
Multiple Protocol Communications Controller	**F16456**	**Fairchild (1302)**	

68000

Function	Device	Source	Line
6800 devices are suitable for the 68000			
Microcomputer, RAM, ROM, Timers, I/O	MK6800	Mostek	
Microprocessor 8-Bit (bus interface version of MC68000)	**MC68008**	**Motorola (1356)**	
Microprocessor 16-Bit (virtual machine version of MC68000)	**MC68010**	**Motorola (1356)**	
Microprocessor	HD68000	Hitachi	
	HD68000-10	**Hitachi (1345)**	20
	HD68000-4	**Hitachi (1345)**	
	HD68000-6	**Hitachi (1345)**	
	HD68000-8	**Hitachi (1345)**	
	MK68000-10	Mostek	
	MK68000-4	Mostek	
	MK68000-6	Mostek	
	MK68000-8	Mostek	
	MC68000-10	**Motorola (1355,1730)**	
	MC68000-12	**Motorola (1355,1730)**	
	MC68000-4	**Motorola (1355,1730)**	30
	MC68000-6	**Motorola (1355,1730)**	
	MC68000-8	**Motorola (1355,1730)**	
	R68000	Rockwell	
Cluster Terminal Controller	MC68122	Motorola	
	MC68122-1	Motorola	
DMA Controller	**HD68450**	**Hitachi (1345)**	
Intelligent Peripheral Controller	**MC68120**	**Motorola (1352,1357,1730)**	
	MC68121	**Motorola (1357)**	
	SCN68120C	**Signetics (1524)**	
Local Area Network Controller for Ethernet	MK68590	Mostek	40
Memory Management Unit	**MC68451**	**Motorola (1358)**	
Multi-Function Peripheral	MK68901	Mostek	
Parallel Interface/Timer	MK68230P10	Mostek	
	MK68230P8	Mostek	
	MC68230L10	Motorola	
	MC68230L8	Motorola	
	SCN68230C	**Signetics (1524)**	
Serial Input Output	MK68564	Mostek	
Video Display Generator	MC6847	Motorola	
	MC6847Y	**Motorola (1351)**	50
Single-Step Circuit (allows step-by-step interruption of sequential programming steps)	SSC680	AWI	
Dual UART	**SCN68681C**	**Signetics (1525)**	
6800 devices are suitable for the 68000			

MicroNOVA

Function	Device	Source	Line
Microprocessor	MN602	Data Gen	
	MicroNOVA	Data Gen	
I/O Transceiver	MN629	Data Gen	
I/O Transceiver Buffer	MN636	Data Gen	

32 Bit

iAPX432

Function	Device	Source	Line
Microprocessor	iAPX43201	Intel	
	iAPX43202	Intel	
Interface Processor	iAPX43203	Intel	60

Peripheral Controllers

Function	Device	Source	Line
Devices in this category are intended for use with any microprocessor			
Advanced Dynamic RAM Controller	8207	Intel	
Advanced Video Display Controller	**SCN2674**	**Signetics (1523)**	
Asynchronous Serial Communications Controller	**Z8031-Z-ASCC**	**Zilog (1591)**	
Bubble Memory Controller	7220	Intel	
	TMS9923	TI	
Cassette/Cartridge Data Handler	CCC3500	SMC	
Cassette Controller	μPD371	NEC-Micro	
	T3444B	Toshiba	
CCITT Protocol Controller	**WD2520**	**Western (2870)**	
Clock Generator and Controller	**Z8581-CGC**	**Zilog (1595)**	70
Color/Monochrome Attributes Controller	SCB2675	Signetics	
Counter/Timer, Parallel I/O	**Z8536CIO**	**Zilog (1594)**	
CRT Controller	**WD8276**	**Western (2878)**	
CRT Controller, Mask-Programmable, Internal Dotclock, Cursor, and Row Start Address Registers, 50/60 Hz Refresh Rate	DP8350	National	
CRT Data Row Buffer	CRT9006-135	SMC	
	CRT9006-83	SMC	
CRT Video Attributes Controller (graphic logic, attributes logic, data and attributes latches, cusor control and shift register)	CRT9021B	SMC	
CRT Video Attributes Controller/Video Generator (video shift register, horizontal and vertical retrace blanking, graphics generation, attributes buffer)	CRT8021	SMC	
	CRT8021-003	SMC	
CRT Video Display-Controller Video Generator	SND8002	SSS	80
	CRT8002	SMC	
CRT Video Timer-Controller	SND5027	SSS	
	SND5037	SSS	
	CRT5027	SMC	
CRT Video Timer-Controller, Line Lock Feature	CRT5057	SMC	
CRT Video Timer-Controller, Preprogrammed	CRT5047	SMC	
CRT Video Timer-Controller, ROM Programmed	CRT5037	SMC	
CRT Video Timer-Controller, User Programmable, Generates timing signals for presentation and formatting of video data on CRT	TMS9927	TI	
Display Character and Graphics Generator	**SCN2670A**	**Signetics (1521)**	90
	SCN2670B	**Signetics (1521)**	
Display Controller (Dot), LED and Keyboard Interface	MTX-A1	Matrox	
Display Controller (Segment), Keyboard Interface	MTX-B1	Matrox	
Display Controller, 4-Character Alphanumeric	MM74C956	National	
Display Controller, 14 to 18 Segment Vacuum Flourescent Displays (16 characters)	10937	Rockwell	
Dot Matrix Printer Controller	8295	Intel	
	μPD781	NEC-Micro	
	μPD782	NEC-Micro	
Double Row Buffer (RAM-based buffer that appears to the system as two octal shift registers of dynamically variable length)	CRT9212	SMC	100
Enhanced Programmable Communications Interface (EPCI)	**MC2661A**	**Motorola (1360)**	
	MC2661B	**Motorola (1360)**	
	MC2661C	**Motorola (1360)**	
	MC68661A	**Motorola (1360)**	
	MC68661B	**Motorola (1360)**	
	MC68661C	**Motorola (1360)**	
Error Detection and Support Logic (Winchester)	**WD1014**	**Western (1566)**	
Ethernet Data Link Controller	**8001**	**SEEQ (1492)**	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROPROCESSOR–System Components (Cont'd)

32 Bit Peripheral Controllers (Cont'd)

Function	Device	Source	Line
Floppy Disc Controller/Formatter (single and double density)	M5W1791-02	Mitsubishi	
	FDC1761-02	SMC	
	FDC1763-02	SMC	
	FDC1765-02	SMC	
	FDC1767-02	SMC	
	FDC1791	SMC	
	FDC1792	SMC	
	FDC1793	SMC	
	FDC1794	SMC	
	FDC1795	SMC	10
	FDC1797	SMC	
	SY1791-02	**Synertek (1538)**	
	SY1793-02	**Synertek (1538)**	
	T3444A	Toshiba	
	FD1761	Western	
	FD1771-01	**Western (1578)**	
	FD1781-01	Western	
	FD1791-02	Western	
	FD1792-02	**Western (1574)**	
	FD1793-02	Western	20
	FD1794-02	**Western (1574)**	
	FD1795-02	Western	
	FD1797-02	Western	
	WD1770	**Western (1579)**	
	WD2791-02	**Western (1572)**	
Floppy Disc Controller/Transmitter (IBM 3740 compatible)	MB8866	Fujitsu	
	MB8876A	**Fujitsu (1308)**	
	MB8877A	**Fujitsu (1308)**	
	INS1771	National	
	μPD765	NEC-Micro	30
	SAB1791-02	Siemens	
Floppy Disc Controller, Two-Sided	μPD765	NEC-Micro	
	T3444D	Toshiba	
Floppy Disc Data Separator	FDC9216	SMC	
Floppy Disc Hard Sector Data Handler	μPD372	NEC-Micro	
	FDC3400	SMC	
Floppy Disk Controller, Programmable	8271	Intel	
Floppy Disk Data Separator	**WD9216-00**	**Western (1570)**	
	WD9216-01	**Western (1570)**	
Floppy Disk Interface Circuit	FDC9229	SMC	40
Floppy Disk-Programmable Formatter/Controllers	INS82891	National	
	INS82893	National	
Floppy Support Logic	**WD1691**	**Western (1569)**	
Function Generator, Peripheral Controller	CY360	Cybernetic	
Graphics Display Controller	**82720**	**Intel (1350)**	
Intelligent Stepper Motor Controller	CY500	Cybernetic	
	CY512	Cybernetic	
Keyboard/Display Interface	8279	Intel	
LCD/Console Controller for Alphanumeric 5x7 Dot Matrix Display	CY300	Cybernetic	
Local Area Network Communications	82501	Intel	
	82586	**Intel (1350)**	50
Local Area Network Controller	MK68590	Mostek	
	COM9026	SMC	
Local Network Token Access Controller	WD2840	Western	
Microprogram Controller	**IDM2910A**	**National (3857)**	
Mini Floppy Disc Controller	FD1761-02	Western	
	FD1763-02	Western	
	FD1765-02	Western	
	FD1767-02	Western	
Multi-Protocol Communications Circuit (includes SDLC, BiSync)	SCN2652A	Signetics	60
Multi-Protocol Serial Controller	μPD7201	NEC-Micro	
	Z8530SCC	**Zilog (1594)**	
Multi-System Control Chip. Interfaces any two CYxxx Devices to a Computer, Keyboard or RS232 Terminal	CY250	Cybernetic	
Parallel to Serial Interface	CY232	Cybernetic	
Polynomial Generator Checker	SCN2653A	Signetics	
Printer Controller, for 5x7 Dot Matrix Printer	CY480	Cybernetic	
Programmable Communication Interface	SCN2661B	Signetics	
	SCN2661C	Signetics	
Programmable Communication Intreface	SCN2661A	Signetics	
Programmable Controller	**9519A**	**AMD (1231)**	70
	CY750	Cybernetic	
Programmable CRT Controller	8275	Intel	
	WD8275	**Western (2879)**	
Programmable DMA Controller	8237	Intel	
	8257	Intel	
Programmable Interval Timer	8253	Intel	
Programmable Interval Timer, High Performance	8254	Intel	
Programmable Keyboard and Communications Controller	SCN2671A	Signetics	
Programmable Peripheral Interface	8255A	Intel	
Programmable Video Interface	SCN2636A	Signetics	80
Programmable Video Timing Controller	SCN2672A	Signetics	
Remote Universal Peripheral Interface, 4K ROM	8044	Intel	
Serial Interface Adapter (Ethernet Controller Interface)	MK3891	Mostek	
Serial Timer Interrupt Controller	MK3801	Mostek	
Small System CRT Controller	8276	Intel	
SMD Controller/Formatter	**WD1050**	**Western (1571)**	
Sound Generator	**AY3-8910**	**GI (1325)**	
	AY3-8912	**GI (1325)**	
	SN76477	TI	
	SN76488	TI	90
TV Sync Generator (NTSC)	SCN2622A	Signetics	
TV Sync Generator (PAL)	SCN2621A	Signetics	
TV-CRT Processor	CRT96364	SMC	
	SFF96364	Thomson-CSF	
	SFF96366	Thomson-CSF	
Universal Peripheral Controller	Z-UPC	Synertek	
	Z8590	**Zilog (1595)**	
	Z8590UPC	**Zilog (1595)**	
Universal Peripheral Interface, 1k EPROM	8741A	Intel	
Universal Peripheral Interface, 1K ROM	8041AH	Intel	100
Universal Peripheral Interface, 2K EPROM	8742	Intel	
Universal Peripheral Interface, 2K ROM	8042	Intel	
Universal Video Interface	SCN2637A	Signetics	
Video Attributes Controller	SCN2673A	Signetics	
	SCN2673B	Signetics	
Video Display Generator, Reads Data from Memory to Produce Composite Video Signal, Internal Display Memory Mux	S68047	AMI	
	F6847	Fairchild	
	M5C6847-1	Mitsubishi	
	MC6847	Motorola	
Video Interface Controller (reads μP formatted data, supplies graphic signals to modulator)	MPS6560	CSG	110
	MPS6561	CSG	
Video Processor and Controller	CRT9007	SMC	
Winchester Controller/Formatter	**WD1010**	**Western (1573)**	
Winchester Controller with Error Correcting Codes	WD1001	Western	
Winchester Data Separator	**WD1011**	**Western (1575)**	
Winchester Disc Controller Chip Set	WD1000	Western	
	WD1100	**Western (1567)**	
Winchester/Floppy Disk Controller	**WD1002**	**Western (1577)**	
Write Precompensation Device	**WD1012**	**Western (1576)**	
Single Chip-Floppy Disc Controller/Transmitter	**WD2791**	**Western (1572)**	120
	WD2793-02	**Western (1572)**	
	WD2795-02	**Western (1572)**	
	WD2797-02	**Western (1572)**	
Single/Double Density Floppy Disc Controller	**MB8876**	**Fujitsu (1308)**	
	MB8877	Fujitsu	
	8272A	Intel	
	μPD765	NEC-Micro	
Dual Direct Memory Access Controller	**MC68440**	**Motorola (1358)**	
Dual-Channel Multiprotocol Controller	8274	Intel	
Four Phase Clock Generator	**WD2143-03**	**Western (1568)**	130

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

MICROPROCESSOR–System Components (Cont'd)

General Purpose

Function	Device	Source	Line
Microprocessor Compatible D/A Converter			
	DAC-808A	† PMI	
	DAC-808B	† PMI	
	DAC-808E	PMI	
	DAC-808F	PMI	
	DAC-808G	PMI	
Addressable Peripheral Driver			
	NE590	Signetics	
	NE591	Signetics	
Analog Input Data Acquisition Controller for A/D Converter			
	CY600	Cybernetic	
Analog Input, Multiplexer, A/D (analog to pulse width output)	μA9708	Fairchild	
Analog Input, Multiplexer, A/D Converter			
	MP20	Burr-Brown	10
	MP21	Burr-Brown	
	MP22	Burr-Brown	
	MP32	Burr-Brown	
	μPD7001	NEC-Micro	
	μPD7002	NEC-Micro	
Analog Output, D/A Converter, Latched Input			
	NE5018	Signetics	
Analog Output, Dual D/A Converter			
	MP10	Burr-Brown	
	MP11	Burr-Brown	
Arithmetic Processor			
	9511	AMD	
	9511A	**AMD**	**(1231)** 20
	9511A-5	AMD	
	9512	**AMD**	**(1231)**
	TMS1018	TI	
Asynchronous Bidirectional Bus Extender and Repeater			
	N8X41	Signetics	
Asynchronous Communication Interface Adapter			
	S6850	AMI	
	S68A50	AMI	
	S68B50	AMI	
	F6850	Fairchild	
	F68A50	Fairchild	
	MC6850	Motorola	30
	MC68A50	Motorola	
	MC68B50	Motorola	
Burst Error Processor			
	AM9520	**AMD**	**(1246)**
	AMZ8065	AMD	
Control Sequencer (to control fetch sequence of microinstructions)			
	N8X02	Signetics	
Data Encryption Unit			
	8294	Intel	
Direct Memory Access Controller			
	9517A	**AMD**	**(1231)**
Direct Memory Access (16-Bit)			
	DM1883	Western	
Error Detection & Correction Unit			
	8206	Intel	
Fast Fourier Transformer			
	S28214A	AMI	40
Floating Point Processing Unit			
	8232	Intel	
Function Generator, D/A Controller			
	CY360	Cybernetic	
General Purpose Interface Adapter (IEEE 488 bus)			
	S68488	AMI	
	96LS488DC	Fairchild	
	96LS488DM	† Fairchild	
	μPD7210	NEC-Micro	
	HEF4738	Signetics	
Peripheral Interface Adapter			
	S6821	AMI	
	S68A21	AMI	
	S68B21	AMI	50
	MPS6520	CSG	
	MPS6522	CSG	
	F6820	Fairchild	
	F6821	Fairchild	
	F68A21	Fairchild	
	F68B21	Fairchild	
	MC6821	Motorola	
	MC68A21	Motorola	
	MC68B21	Motorola	
	SY6520	Synertek	60
	SY6522	Synertek	
	SY6522A	Synertek	
Priority Interrupt Controller			
	AM25LS2513C	**AMD**	**(1227)**
	AM2914C	AMD	
	AM2914M	† AMD	
	M8214	† Intel	
	MC6828	Motorola	
	MC8507	Motorola	
	μPB8214	NEC-Micro	
Programmable Integrated Controller/Sequencer			
	LS7270	LSI Comp	70
Real-Time Clock Interface (allows time of day info to be retreived over μP bus)			
	HI8000	Holt	
	NC8000	Nitron	
Real-Time Clock/μP Interface			
	MSM5832	OKI	
	MSM58321R	OKI	
See also Interface-Error Checking Circuits Keyboard Encoders, Line Circuits, Memory and Peripheral Drivers, Serial Transmitters/Receivers, Memory-EAROMs, FIFOs, LIFOs, PLAs, PROMs, RAMs, ROMs			
Speech Synthesis System			
	Digitalker	National	
Synchronous Serial Data Adapter			
	F6852	Fairchild	
	MC6852	Motorola	
System Timing Controller			
	9513	AMD	80
Tri-Port Interface			
	MPS6525	CSG	

† Military Temperature Range (−55° to 125°C)

* Typical Value

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

Advanced Micro Devices

BIPOLAR MICROPROCESSOR PRODUCTS

The Am2900 Bipolar Microprocessor Family offers a full line of LSI and support products optimized for high performance CPU and controller applications.

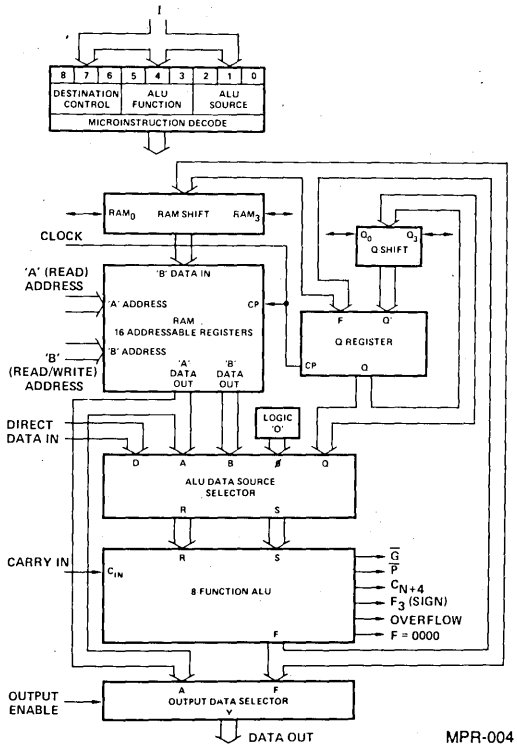
The devices use Schottky and low-power Schottky process technologies to implement LSI functions of up to 750 gates per chip. Newer techniques are in development to achieve complexities of up to 3000 gates.

The LSI members of the Am2900 family represent new kinds of building blocks for designers of high performance systems. They may be considered as a third generation of TTL functions (the first generation being SSI and the second MSI). At this level of complexity each part is specialized for a particular section of the system, such as the arithmetic unit or memory control. Many lower complexity support devices have been added to the family. Each one has been carefully selected to provide optimum interface between the LSI blocks, minimizing package count and delay.

Since the introduction of the Am2901 in 1975, new circuit design and process techniques have been applied to improve the speed and reduce the power requirements of successive generations of elements. These improved designs are designated by alpha suffixes to the device type number.

Am2901B 4-Bit Bipolar Microprocessor Slice

- 2-Address Architecture
  Independent simultaneous access to two working registers saves machine cycles
- 8-Function ALU
  Performs addition, two subtraction operations and five logic functions on two source operands
- Flexible Data Source Selection
  ALU data selected from five source ports
  203 source operand pairs for every ALU function
- Left/Right Shift Independent of ALU
  Add and shift operations take only one cycle
- Four Status Flags
  Carry, overflow, zero and negative
- Expandable
  Connect any number of Am2901s together for longer word lengths
- Microprogrammable
  Three groups of three bits each for source operand, ALU function and destination control
- Fast
  115ns for 16-bit addition
  Am2901C targeted to be 25% faster
- 40-Pin DIP

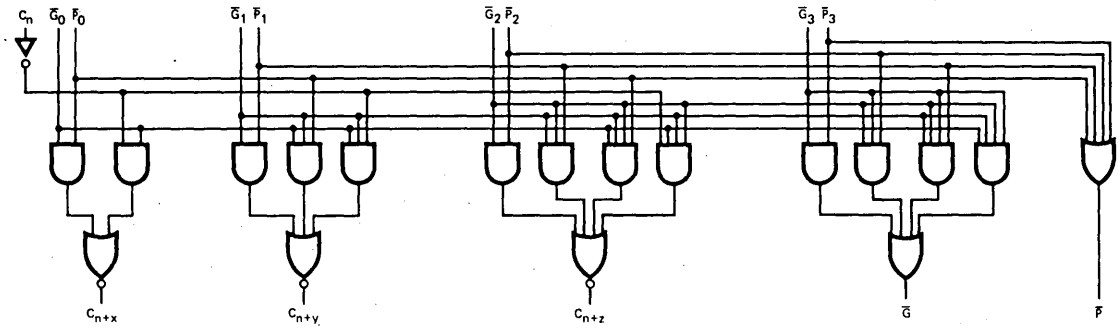


MPR-004

© IC MASTER 1983

Am2902A High-Speed Lookahead Carry Generator

- Provides Lookahead Carries across a Group of Four Am2901B or Am2903 Microprocessor ALUs
- Capable of Multilevel Lookahead for High-Speed Arithmetic Operation over Large Word Lengths
- Carry Propagation Delay – 4.5ns (Typ)
- C_{IN} to C_{OUT} – 7.0ns (Typ)
- 16-Pin DIP



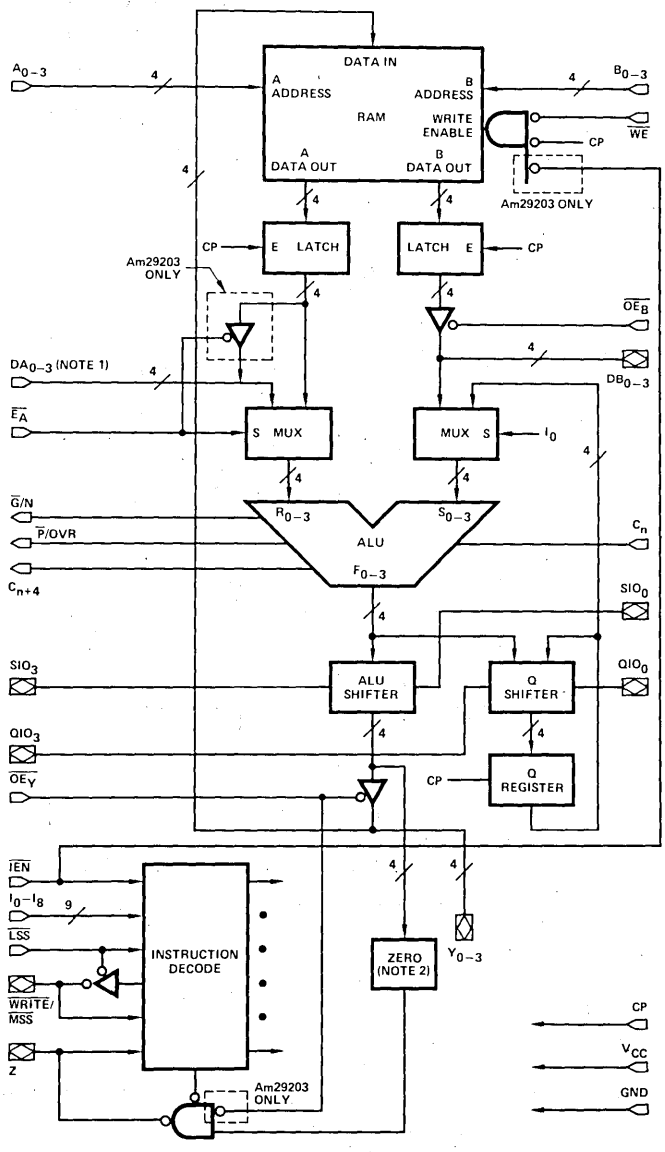
MPR-026

Am2903/Am29203 Superslice®

- Expandable Register File
  Like the Am2901B, the Am2903/Am29203 contains 16 internal working registers arranged in a 2-address architecture. But the Am2903/Am29203 includes the necessary "hooks" to expand the register file externally to any number of registers.
- Built-in Normalization Logic
  Performing multiplication with the Am2901B requires a few external gates; these gates are contained on-chip in the Am2903/Am29203. Three special instructions are used for unsigned multiplication, twos complement multiplication and the last cycle of a twos complement multiplication.
- Built-in Division Logic
  The Am2903/Am29203 contains all logic and interconnects for execution of a non-restoring, multiple-length division with correction of the quotient.
- Built-in Normalization Logic
  The Am2903/Am29203 can simultaneously shift the Q Register and count in a working register. Thus, the mantissa and exponent of a floating-point number can be developed using a single microcycle per shift. Status flags indicate when the operation is complete.
- Built-in Parity Generation Circuitry
  The Am2903/Am29203 can supply parity across the entire ALU output for use in error detection.
- Built-in Sign Extension Circuitry
  To facilitate operation on different length twos complement numbers, the Am2903/Am29203 provides the capability to extend the sign at any slice boundary.
- BCD Arithmetic (Am29203 only)
  Automatic BCD add and subtract and conversion between binary and BCD.
- Improved Byte Handling (Am29203 only)
  Zero detection and register writing can be performed on a single byte rather than the whole word.
- Two Bidirectional Data Lines (Am29203 only)
- Fast
  174ns for 16-bit addition; Am2903A is targeted to be 30% faster.
- 48-Pin DIP

© IC MASTER 1983

Am2903/Am29203 Superslice® (Cont.)



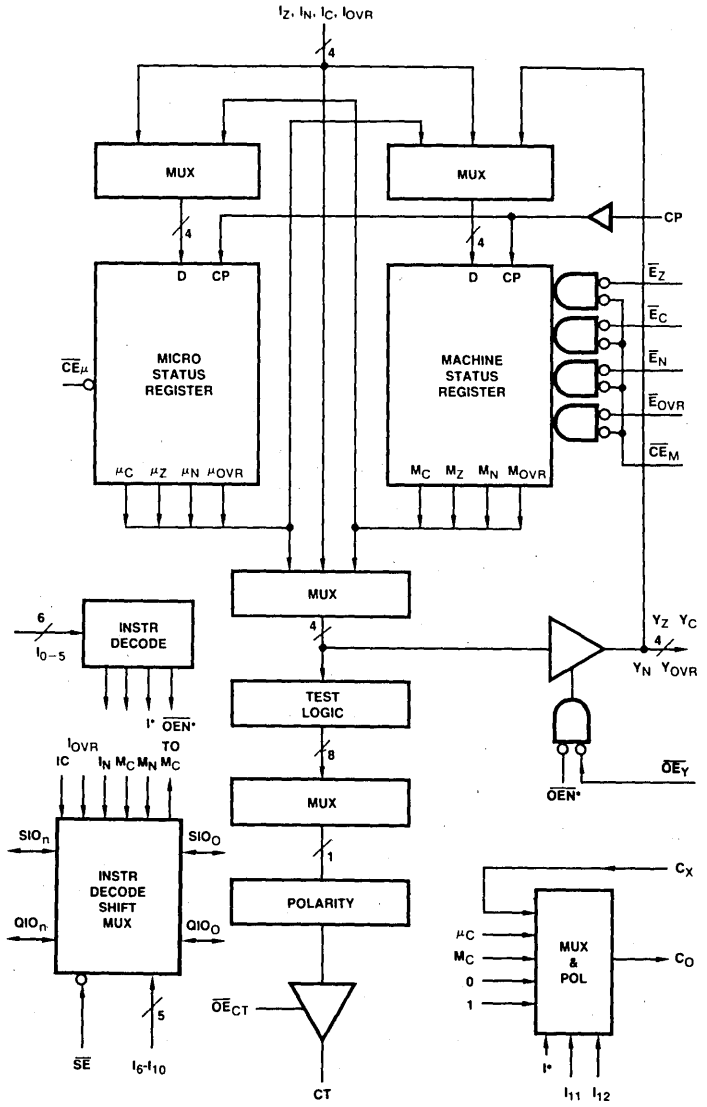
Notes: 1. DA_{0-3} is input only on Am2903, but is I/O port on Am29203.
2. On Am2903, zero logic is connected to Y, after the $\overline{OE_Y}$ buffer.

MPR-030

© IC MASTER 1983

Am2904 Status and Shift Control Unit

- Replaces Most MSI Used around any ALU (including the Am2901B, Am2903 and MSI ALUs)
- Generates Carry-in to the ALU
  Carry signal selectable from seven different sources
- Contains Shift Linkage Multiplexers
  Connects to shift lines at the ends of an Am2901B or Am2903 array to implement single and double length arithmetic and logical shifts
  Rotates 32 different modes
- Contains Two Edge-Triggered Status Registers
  Use for foreground/background registers in controllers or as microlevel and machine level status registers
  Bit manipulating instructions provided
- Condition Code Multiplexer On-Chip
  Single cycle tests for any of 16 different conditions
  Tests performed on either of the two status registers or directly on the ALU output
- 40-Pin DIP



*INTERNAL

MPR-060

© IC MASTER 1983

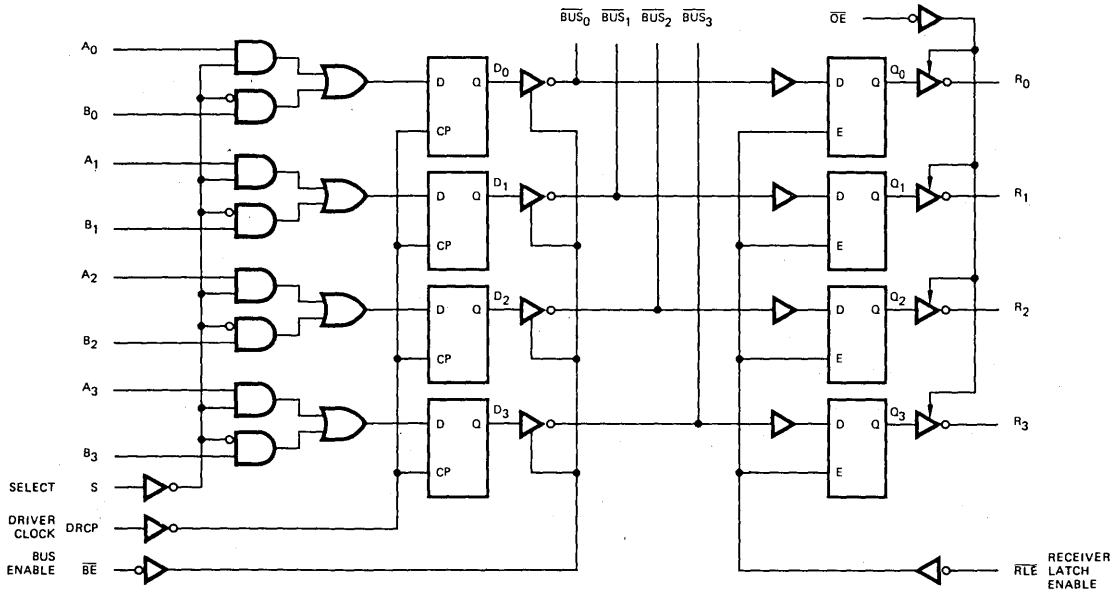
Am2905 Quad 2-Input OC Bus Transceiver (with 3-State Receiver)

- Quad High-Speed LSI Bus Transceiver
- Open-Collector Bus Driver
- 2-Port Input to D-Type Register on Driver
- Bus Driver Output Sinks 100mA at 0.8V (Max)
- Driver Clock to Bus in 21ns (Typ)
- Receiver Has Output Latch for Pipeline Operation
- 3-State Receiver Outputs Sink 12mA
- 24-Pin DIP

Am2906 Quad 2-Input OC Bus Transceiver (with Parity)

- Quad High-Speed LSI Bus Transceiver
- Open-Collector Bus Driver
- 2-Port Input to D-Type Register on Driver
- Bus Driver Output Sinks 100mA at 0.8V (Max)
- Internal Odd 4-Bit Parity Checker/Generator
- Driver Clock to Bus in 21ns (Typ)
- Receiver Has Output Latch for Pipeline Operation
- Receiver Outputs Sink 12mA
- 24-Pin DIP

Am2905*



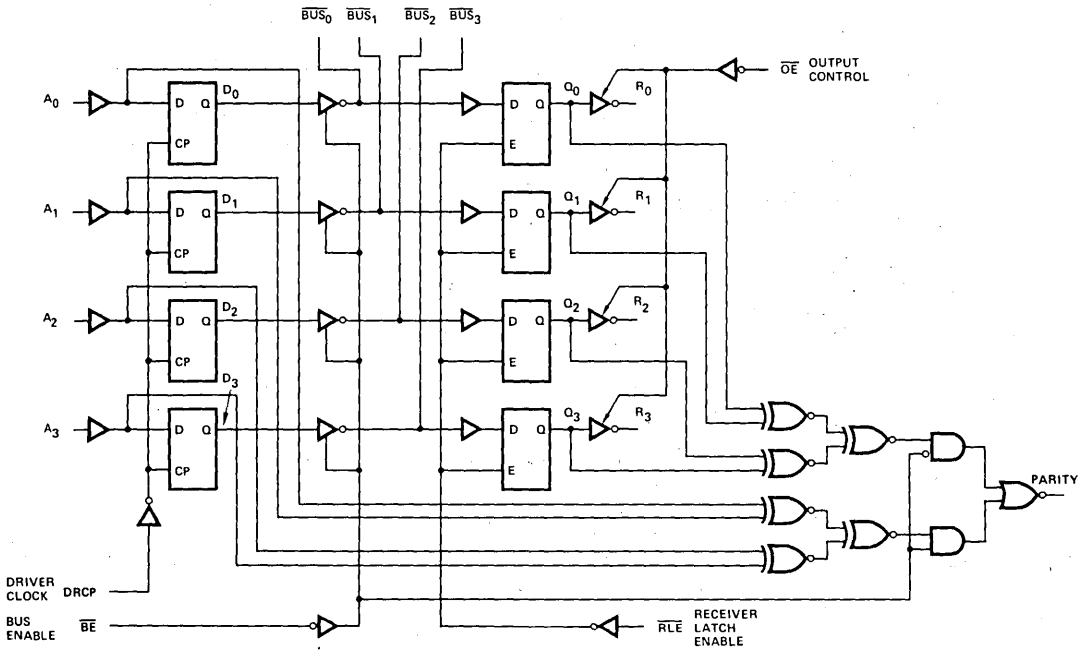
MPR-065

*Am2906 logic diagram is similar to Am2905 except the $\overline{OE}$ input is replaced with a parity output.

© IC MASTER 1983

Am2907/Am2908 Quad Bus Transceivers (with Interface Logic)

- Quad High-Speed LSI Bus Transceiver
- Open-Collector Bus Driver
- D-Type Register on Driver
- Bus Driver Output Sinks 100mA at 0.8V (Max)
- Internal Odd 4-Bit Parity Checker/Generator
- Input Receiver Threshold Voltage
  2.0V for Am2907
  1.5V for Am2908 (DEC Q or LSI-11 Bus Compatible)
- Driver Clock to Bus in 21ns (Typ)
- Receiver Has Output Latch for Pipeline Operation
- 3-State Receiver Outputs Sink 12mA
- 20-Pin DIP



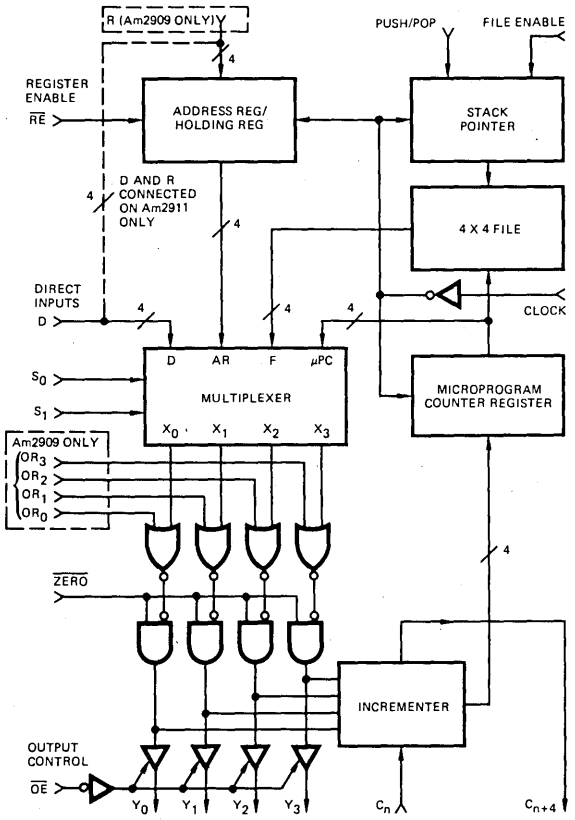
MPR-085

© IC MASTER 1983

BIPOLAR MICROPROCESSOR PRODUCTS

Am2909/Am2911, Am2909A/Am2911A
4-Bit Microprogram Sequencers

- 4-Bit Slice Cascadable to any Number of Microwords
- Internal Address Register
- Branch Input for N-Way Branches
- Cascadable 4-Bit Microprogram Counter
- 4 x 4 File with Stack Pointer and Push/Pop Control for Nesting Microsubroutines
- Zero Input for Returning to the Zero Microcode Word
- Individual OR Input for each Bit for Branching to Higher Microinstructions (Am2909/Am2909A only)
- 3-State Outputs
- All Internal Registers Change State on the LOW-to-HIGH transition of the Clock
- High-Speed Versions (Am2909A and Am2911A) are Plug-in Replacements for Am2909 and Am2911 Critical Path Speeds Improved by about 25%
- 177ns (Max) for Conditional Jump Sequence (includes delay through PROM and registers)
- Am2909/Am2909A in 28-Pin DIP
- Am2911/Am2911A in 20-Pin DIP

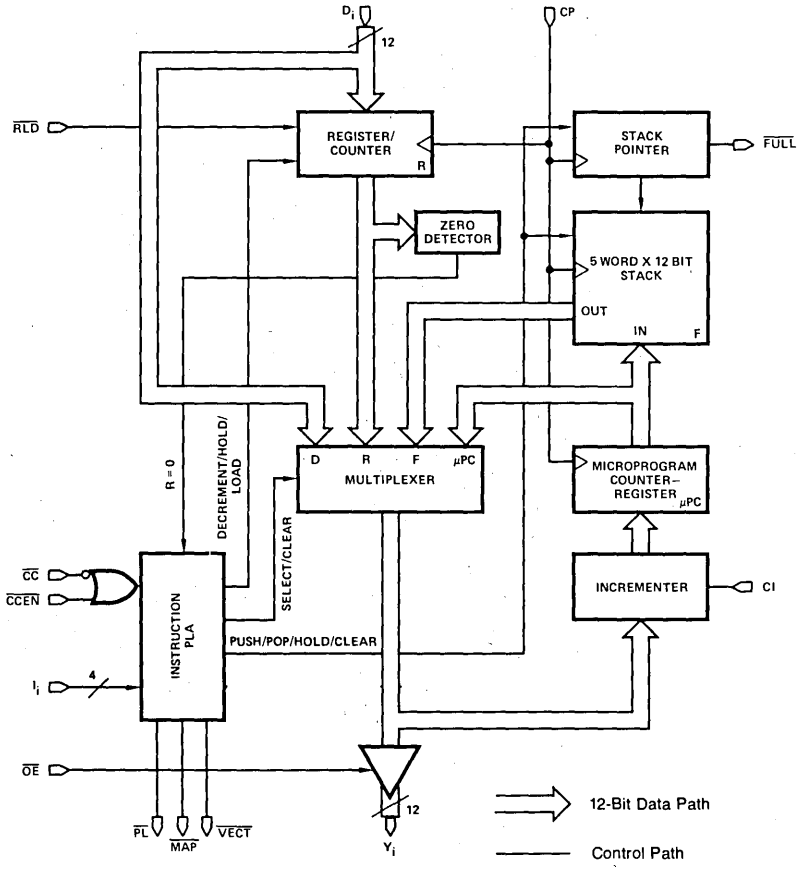


MPR-093

© IC MASTER 1983

Am2910 12-Bit Microprogram Controller

- 12 Bits Wide
  Address up to 4096 words of microcode with one chip
  All internal elements a full 12 bits wide
- Internal Loop Counter
  Presettable 12-bit down-counter for repeating instructions and counting loop iterations
- Four Address Sources
  Microprogram Address can be selected from microprogram counter, branch address bus, 5-level push/pop stack or internal holding register
- 16 Powerful Microinstructions
  Executes 16 sequence control instructions, most conditional on external condition input and/or state of internal loop counter
- Output Enable Controls for Three Branch-Address Sources
  Built-in decoder function enables external devices onto branch address bus, eliminates external decoder
- All Registers Positive Edge-Triggered
  Simplifies timing problems
  Eliminates long set-up times
- Fast Control from Condition Input
  Delay from condition code input to address output 21ns (Typ)
- 166ns (Max) for Conditional Jump Sequence (includes delay through PROM and registers)
- 40-Pin DIP



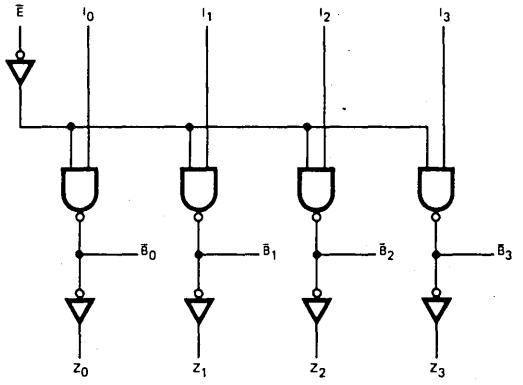
MPR-106

© IC MASTER 1983

BIPOLAR MICROPROCESSOR PRODUCTS

Am2912 Quad Bus Transceiver

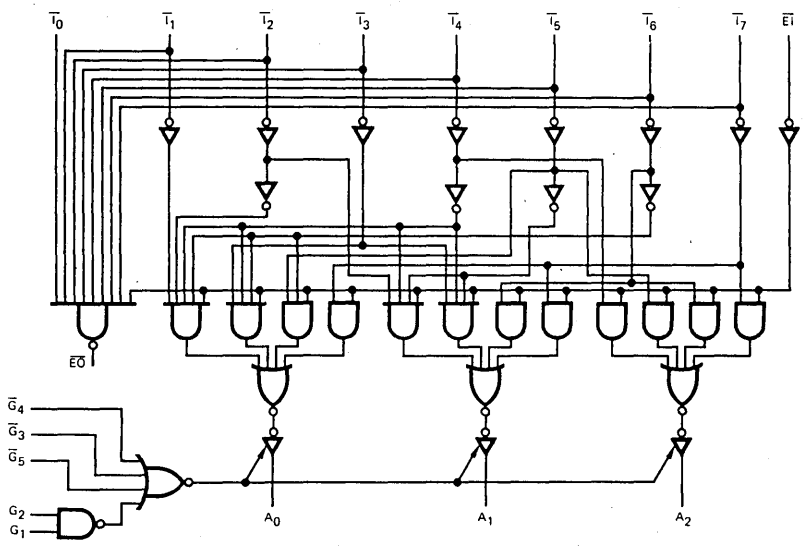
- Input to Bus Is Inverting
- Quad High-Speed Open-Collector Bus Transceiver
- Driver Outputs Sink 100mA at 0.8V (Max)
- Bus Compatible with Am2905, Am2906, Am2907
- Enable to Bus in 14ns (Typ)
- PNP Inputs to Reduce Input Loading
- 16-Pin DIP



BLI-061

Am2913 Priority Interrupt Expander

- Encodes Eight Lines to 3-Line Binary
- Expands Use of Am2914
- Cascadable
- Input to Output in 17ns (Typ)
- Gated 3-State Output
- 20-Pin DIP

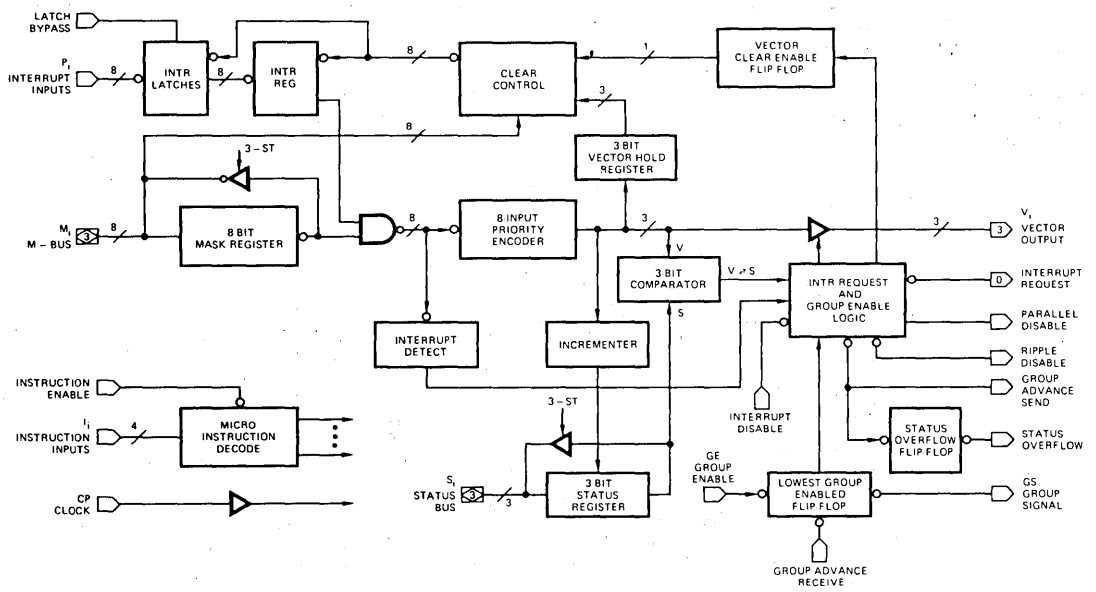


MPR-119

© IC MASTER 1983

Am2914 Vectored Priority Interrupt Controller

- Accepts Eight Interrupt Inputs
  Pulse or level interrupts
  Interrupts stored internally
- Built-in Mask Register
  Six different operations performed on mask register
- Built-in Status Register
  Holds code for lowest allowed interrupt
- Vectored Output
  Output is binary code for highest priority unmasked interrupt
- Expandable
  Any number of Am2914s can be stacked for large interrupt systems
- Microprogrammable
  Executes 16 different microinstructions
  Instruction enable pin aids in vertical microprogramming
- High-Speed Operation
  Delay from interrupt clocked into interrupt register to interrupt request output 97ns (Typ)
- 40-Pin DIP



MPR-124

© IC MASTER 1983

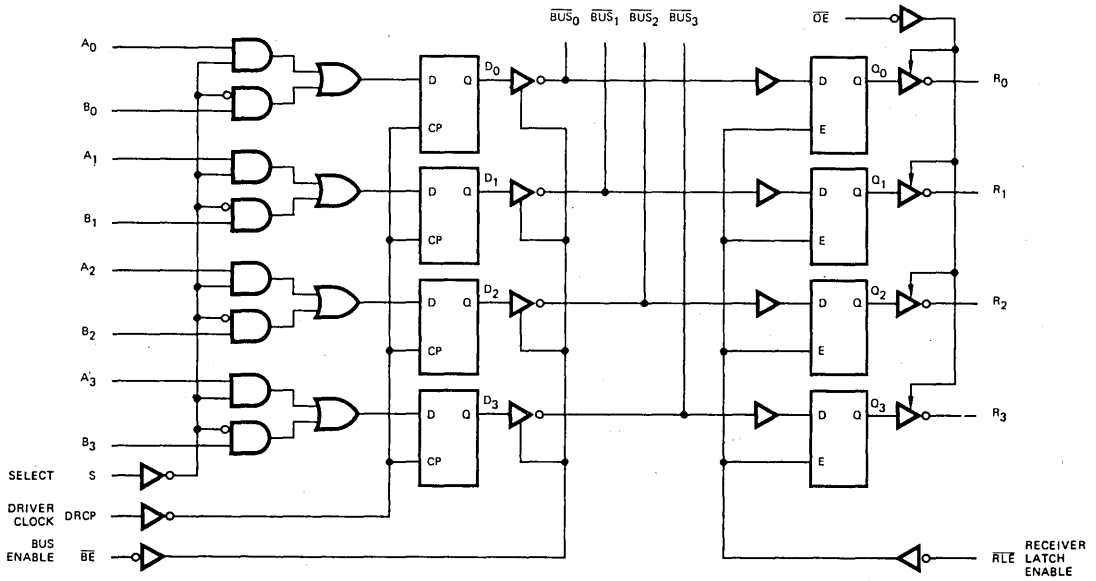
Am2915A Quad 3-State Bus Transceiver (with Interface Logic)

- Quad High-Speed LSI Bus Transceiver
- 3-State Bus Driver
- 2-Port Input to D-Type Register on Driver
- Bus Driver Output Sinks 48mA at 0.5V (Max)
- Receiver Has Output Latch for Pipeline Operation
- Driver Clock to Bus in 21ns (Typ)
- 3-State Receiver Outputs Sink 12mA
- V_{OH} = 3.5V (Min) for Direct MOS Microprocessor Interface
- 24-Pin DIP

Am2916A Quad 3-State Bus Transceiver (with Interface Logic)

- Quad High-Speed LSI Bus Transceiver
- 3-State Bus Driver
- 2-Port Input to D-Type Register on Driver
- Bus Driver Output Sinks 48mA at 0.5V (Max)
- Internal Odd 4-Bit Parity Checker/Generator
- Receiver Has Output Latch for Pipeline Operation
- Driver Clock to Bus in 21ns (Typ)
- Receiver Outputs Sink 12mA
- V_{OH} = 3.5V (Min) for Direct MOS Microprocessor Interface
- 24-Pin DIP

Am2915A*



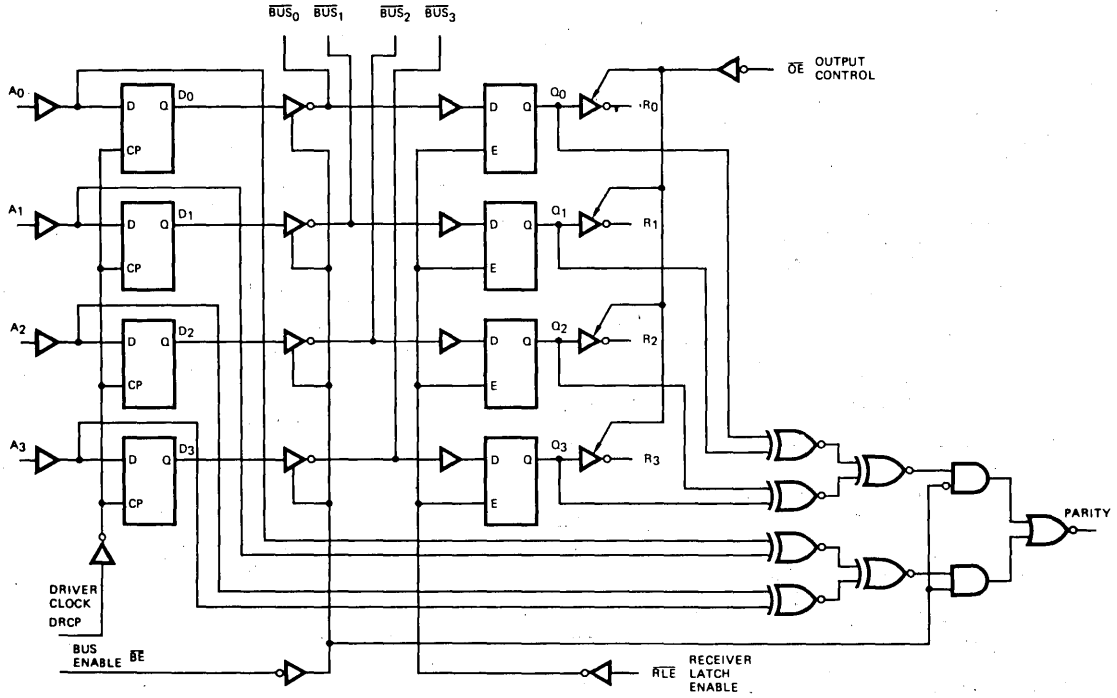
*Am2916A logic diagram is similar to Am2915A except that $\overline{OE}$ input is replaced by parity output.

MPR-161

© IC MASTER 1983

Am2917A Quad 3-State Bus Transceiver (with Interface Logic)

- Quad High-Speed LSI Bus Transceiver
- 3-State Bus Driver
- D-Type Register on Driver
- Bus Driver Output Sinks 48mA at 0.5V (Max)
- Internal Odd 4-Bit Parity Checker/Generator
- Receiver Has Output Latch for Pipeline Operation
- Driver Clock to Bus in 21ns (Typ)
- 3-State Receiver Outputs Sink 12mA
- V_{OH} = 3.5V (Min) for Direct MOS Microprocessor Interface
- 20-Pin DIP

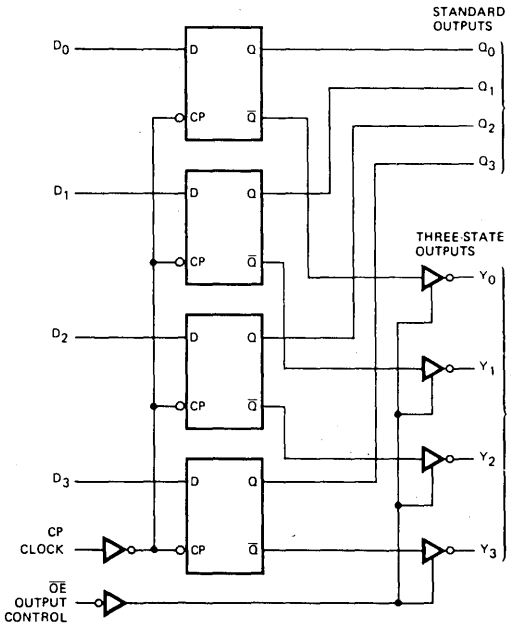


MPR-177

© IC MASTER 1983

Am2918/Am29LS18 Quad D Registers (with Standard and 3-State Outputs)

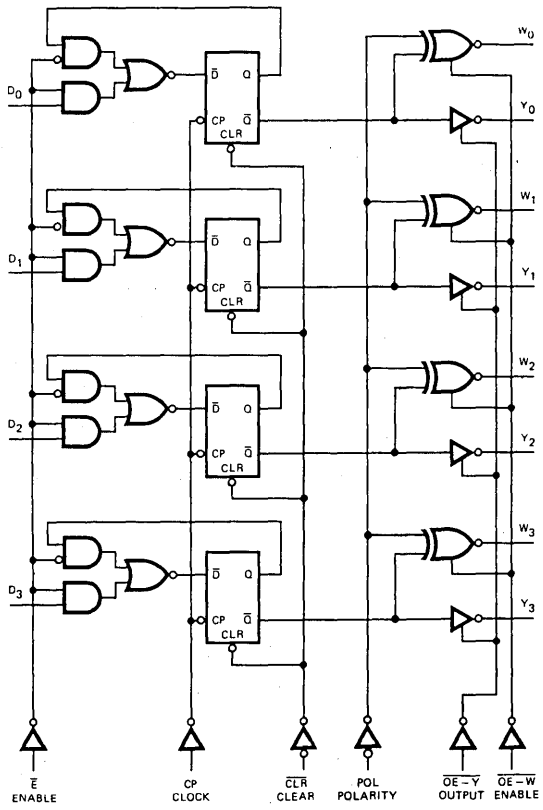
- Four D-Type Flip-Flops
- Four Standard Totem-Pole Outputs
- Four 3-State Outputs
- Clock to Output Time (Typ)
  8.5ns for Am2918
  18ns for Am29LS18
- 16-Pin DIP



MPR-183

Am2919 Quad Register (with Dual 3-State Outputs)

- Two Sets of 3-State Outputs
- Four D-Type Flip-Flops
- Polarity Control on One Set of Outputs
- Buffered Common Clock Enable
- Buffered Common Asynchronous Clear
- Separate Buffered Common Output Enable for each Set of Outputs
- Clock to Output in 22ns (Typ)
- 20-Pin DIP

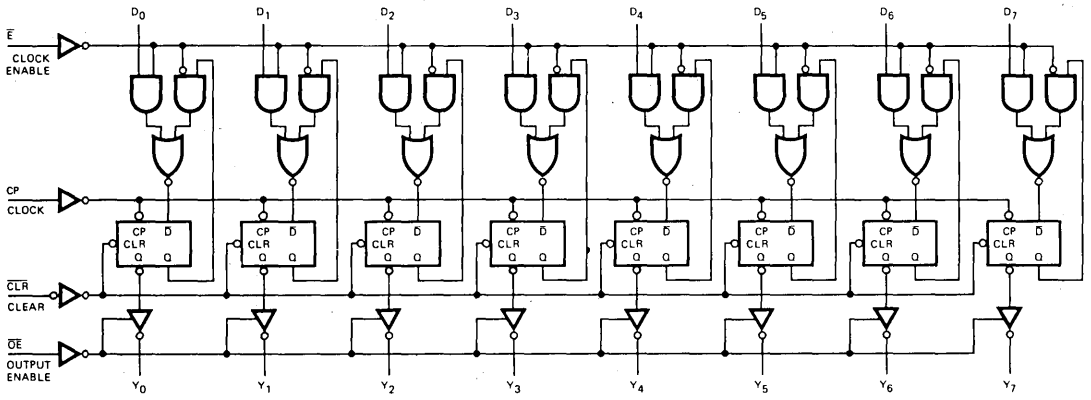


MPR-196

© IC MASTER 1983

Am2920 Octal D-Type Flip-Flop
(with Clear, Clock Enable and 3-State Control)

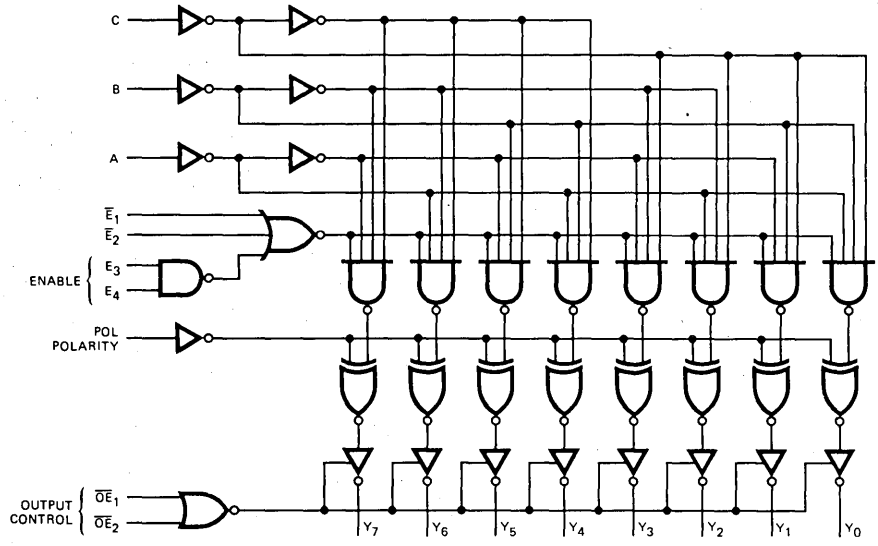
- Buffered Common Clock Enable Input
- Buffered Common Asynchronous Clear Input
- 3-State Outputs
- 8-Bit High-Speed Parallel Register with Positive Edge-Triggered, D-Type Flip-Flops
- Clock to Output in 24ns (Typ)
- 22-Pin DIP



MPR-201

Am2921 One-of-Eight Decoder
(with 3-State Outputs and Polarity Control)

- 3-State Decoder Outputs
- Buffered Common Output Polarity Control
- Inverting and Non-inverting Enable Inputs
- Input to Output in 20ns (Typ)
- 20-Pin DIP

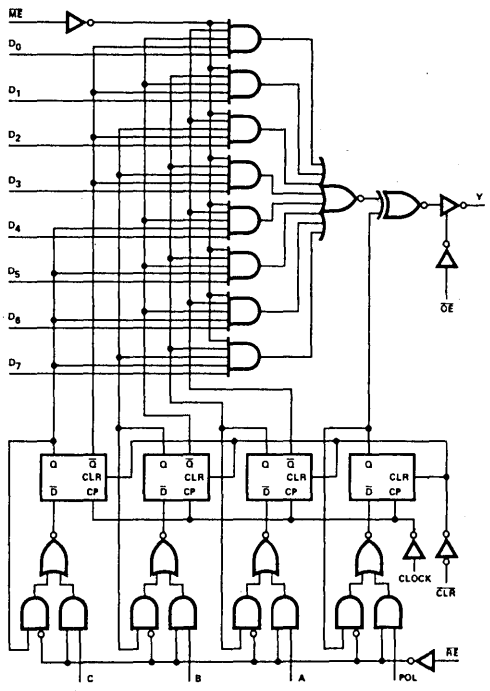


MPR-207

© IC MASTER 1983

Am2922 8-Input Multiplexer (with Control Register)

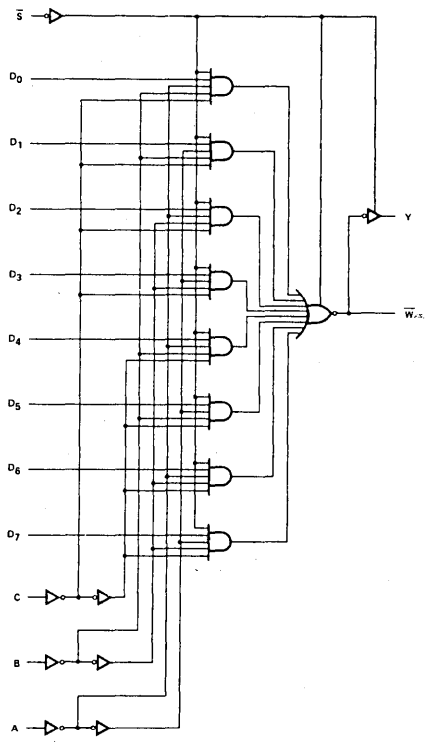
- High-Speed 8-Input Multiplexer
- On-Chip Multiplexer Select and Polarity Control Register
- Output Polarity Control for Inverting or Non-inverting Output
- Common Register Enable
- Asynchronous Register Clear
- 3-State Output for Expansion
- Clock to Output in 21ns (Typ)
- 20-Pin DIP



MPR-213

Am2923 8-Input Multiplexer

- Switches One of Eight Inputs to Two Complementary Outputs
- Input to Output in 13ns (Typ)
- 3-State Output for Bus Organized Systems
- 16-Pin DIP

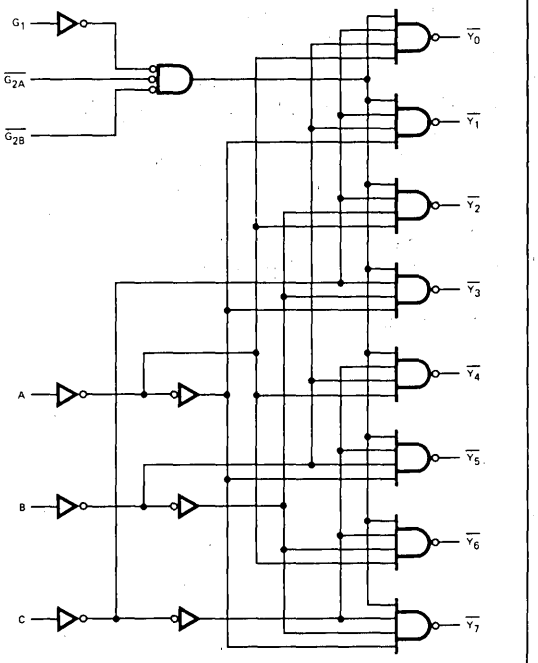


BLI-069

© IC MASTER 1983

Am2924 3-Line to 8-Line Decoder/Demultiplexer

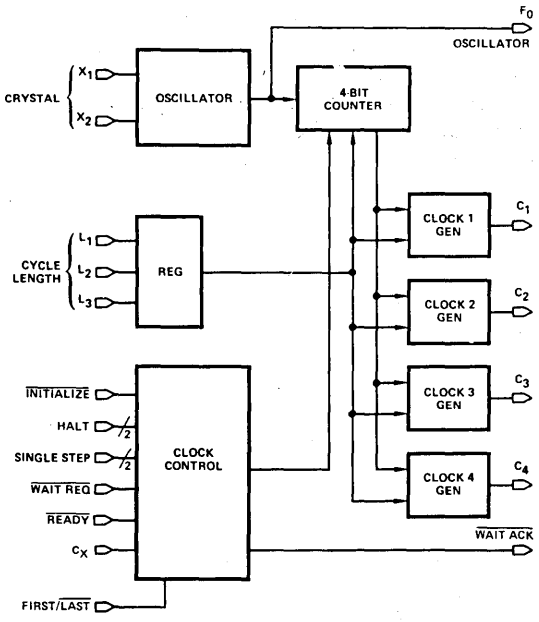
- Inverting and Non-inverting Enable Inputs
- Select to Output in 8.0ns (Typ)
- 16-Pin DIP



BLI-075

Am2925 System Clock Generator and Driver

- Single-Chip Clock Generator and Driver
- Four Different Clock Output Waveforms for Am2900 and Other Bipolar and MOS Systems
- Crystal Controlled for Stable System Operation
- Oscillator to 31MHz
  Oscillator output for external system timing
- Clock Halt, Single-Step and Wait Controls
- Variable Cycle Lengths
  One of eight different cycle lengths can be micro-programmed to boost CPU throughput up to 25%
- Slim 0.3" 24-Pin DIP



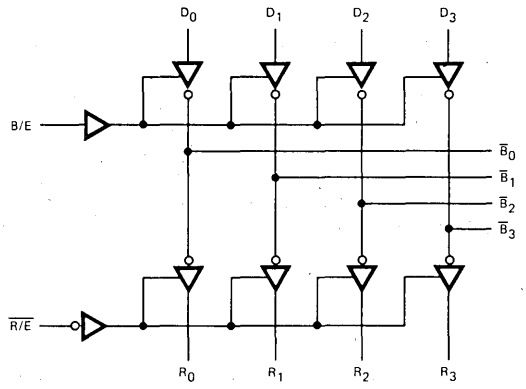
MPR-217

© IC MASTER 1983

Am2926/Am2929 Schottky 3-State Quad Bus Driver/Receiver

- 48mA Driver Sink Current
- 3-State Outputs on Driver and Receiver
- PNP Inputs
- Am2926 Has Inverting Outputs
- Am2929 Has Non-inverting Outputs
- Driver/Receiver Propagation Delay (Typ)
  10ns for Am2926
  13ns for Am2929
- 16-Pin DIP

Am2926*



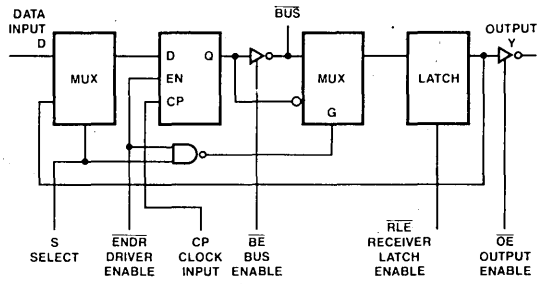
*Outputs B_0-B_3 are not inverted for Am2929.

BLI-080

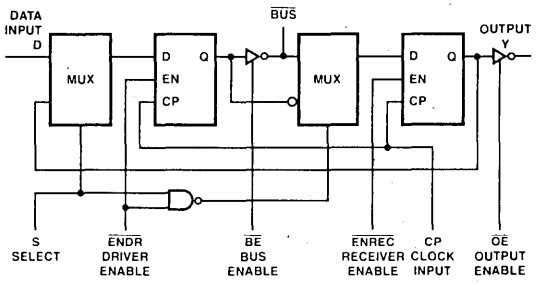
Am2927/Am2928 Quad 3-State Bus Transceivers (with Clock Enable)

- Quad High-Speed LSI Bus Transceivers
- 3-State Bus Driver and Receiver Outputs
- D-Type Register on Drivers
- Latched Output on Am2927
- Registered Output on Am2928
- Output Data to Input Wraparound Gating
- Input Register to Output Transfer Gating with or without Driving Data Bus
- Clock Enabled Registers
- Bus Driver Outputs Sink 48mA at 0.5V (Max)
- 3-State Receiver Outputs Sink 20mA at 0.5V (Max)
- V_{OH} = 3.5V (Min) for Direct MOS Microprocessor Interface
- 20-Pin DIP

Am2927



Am2928

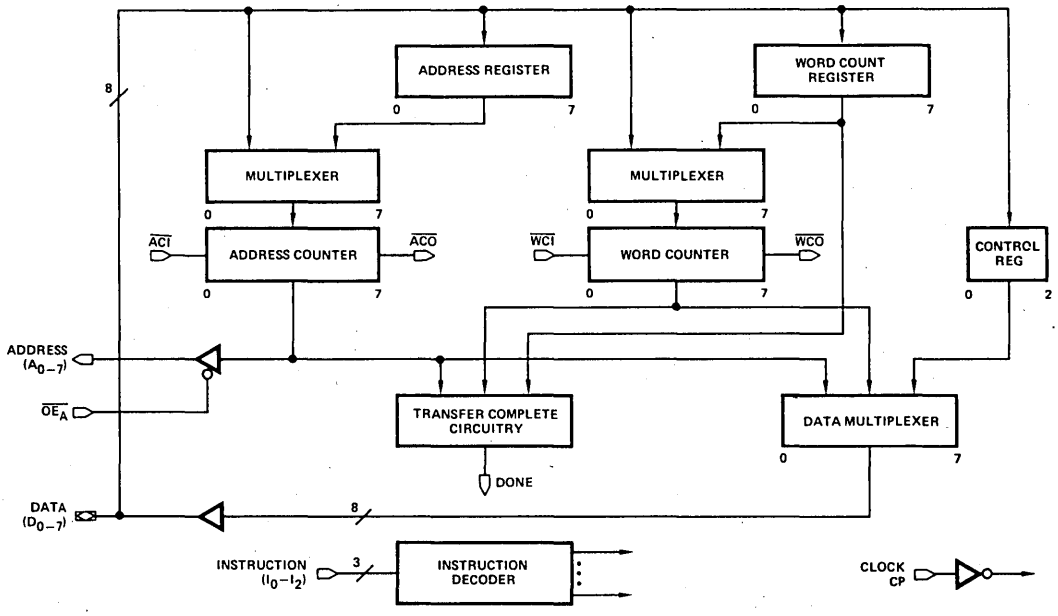


BLI-088

© IC MASTER 1983

Am2940 DMA Address Generator

- DMA Address Generation
  Generates memory address, word count and DONE signal for DMA transfer operation
- Expandable 8-Bit Slice
  Any number of Am2940s can be cascaded to form larger memory addresses
  Three devices address 16 megawords
- Repeat Data Transfer Capability
  Initial memory address and word count saved so data transfer can be repeated
- Programmable Control Modes
  Provides four types of DMA transfer control plus memory address increment/decrement
- 24mA Output Current Sink Capability
- Microprogrammable
  Executes eight different instructions
- 109ns (Max) Cycle Time for 16-Bit Configuration
  Allows up to nine million words/second DMA
- 28-Pin DIP



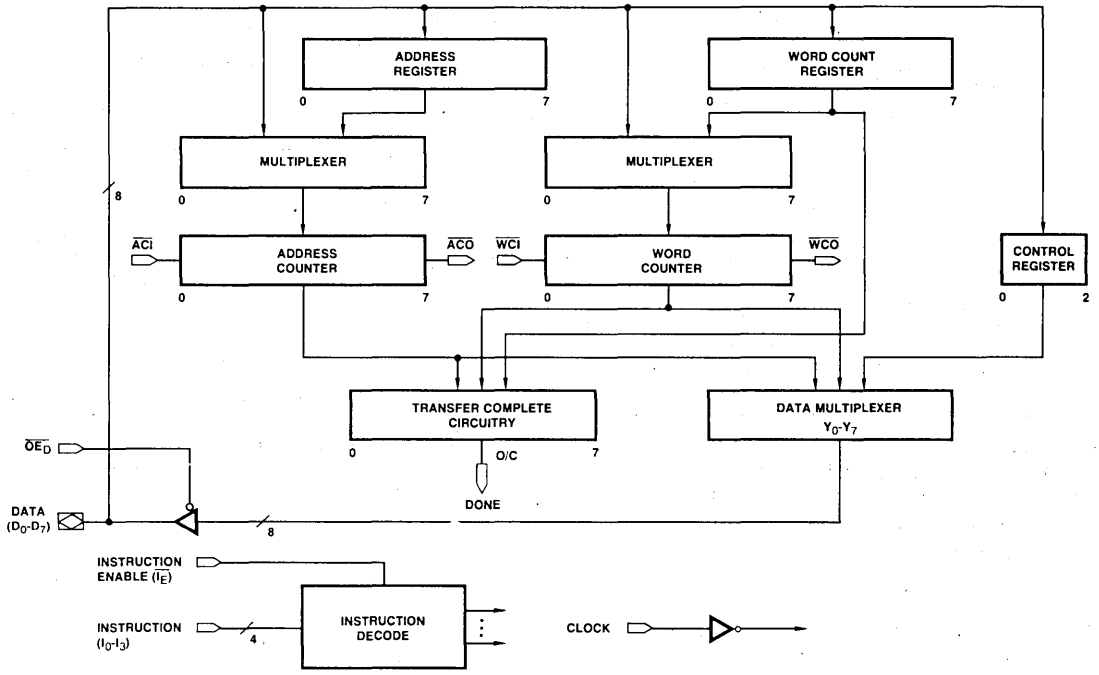
MPR-226

© IC MASTER 1983

BIPOLAR MICROPROCESSOR PRODUCTS

Am2942 Programmable Timer/Counter, DMA Address Generator

- 22-Pin Version of Am2940
  Provides multiplexed address and data lines plus additional instruction input and instruction enable pins
- Used as DMA Address Generator or Programmable Timer Counter
- Executes 16 Instructions
  Eight DMA instructions
  Eight Timer/Counter instructions
- Provides Two Independent Programmable 8-Bit Up/Down Counters
  Counters can be cascaded to form single-chip 16-bit up/down counter
- Reinitialize Capability
  Counters reinitialized from on-chip registers
- Expandable 8-Bit Slice
  Any number of Am2942s can be cascaded
  Three devices provide a 48-bit counter
- Programmable Control Modes
  Four types of control
- 24mA Output Current Sink Capability
- 109ns (Max) Cycle Time for 16-Bit Configuration
- 22-Pin DIP



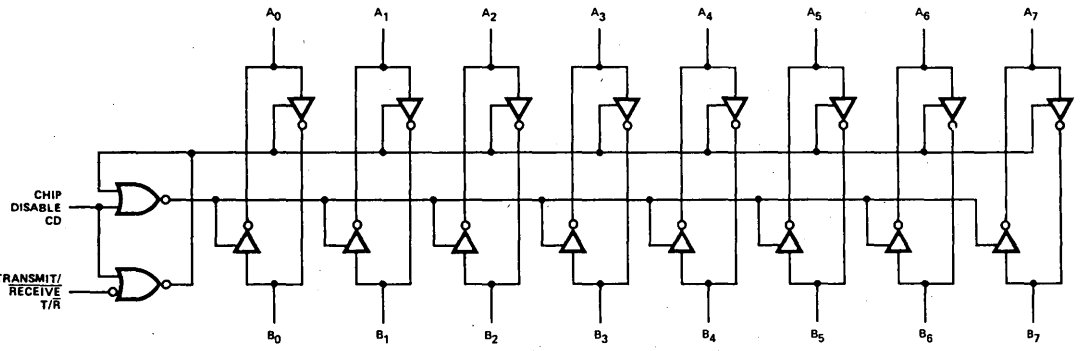
MPR-231

© IC MASTER 1983

Am2946/Am2947 Octal 3-State Bidirectional Bus Transceivers

- 8-Bit Bidirectional Data Flow Reduces System Package Count
- 3-State Inputs/Outputs for Bus-Oriented System Interface
- PNP Inputs Reduce Input Loading
- $V_{OH} = V_{CC} - 1.15V$ for TTL, MOS, CMOS Interface
- 48mA, 300pF Bus Drive Capability
- Am2946 Has Inverting Transceivers
- Am2947 Has Non-inverting Transceivers
- Transmit/$\overline{\text{Receive}}$ and Chip Disable Simplify Control Logic
- Low-Power
  8.0mA per bidirectional bit
- Bus Port Stays in High-Impedance State during Power Up/Down
- A Port to B Port Delay Time – 11ns (Typ)
- 20-Pin DIP

Am2946*

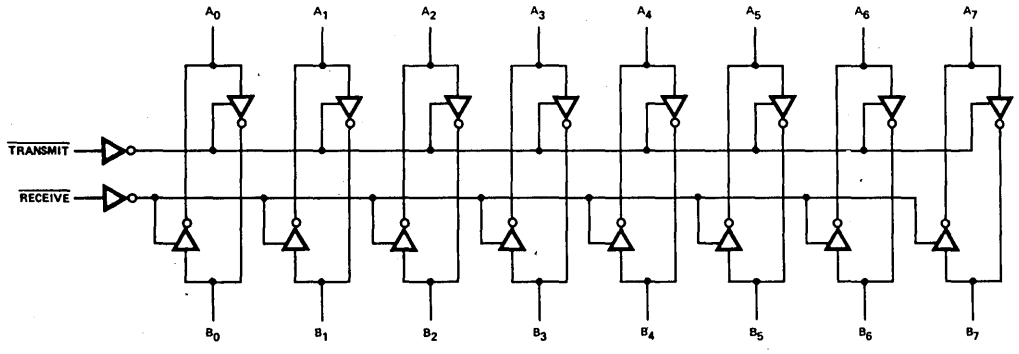


*Am2947 has non-inverting transceivers. BLI-101

Am2948/Am2949 Octal 3-State Bidirectional Bus Transceivers

- 8-Bit Bidirectional Data Flow Reduces System Package Count
- 3-State Inputs/Outputs for Bus-Oriented System Interface
- PNP Inputs Reduce Input Loading
- $V_{OH} = V_{CC} - 1.15V$ for TTL, MOS, CMOS Interface
- 48mA, 300pF Bus Drive Capability
- Am2948 Has Inverting Transceivers
- Am2949 Has Non-inverting Transceivers
- Separate $\overline{\text{Transmit}}$ and $\overline{\text{Receive}}$ Enables
- Low-Power
  8.0mA per bidirectional bit
- Bus Port Stays in High-Impedance State during Power Up/Down
- 20-Pin DIP

Am2949*



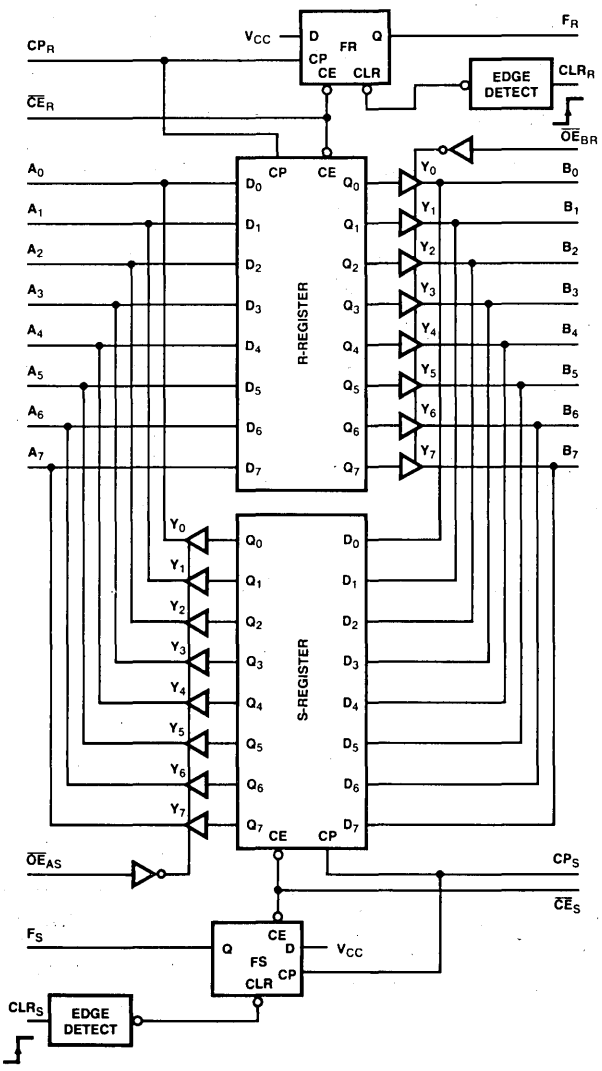
*Am2948 has inverting transceivers. BLI-107

© IC MASTER 1983

Am2950/Am2951 8-Bit Bidirectional I/O Ports

- 8-Bit, Bidirectional I/O Port with Handshake
  Two 8-bit, back-to-back registers store data moving in both directions between two bidirectional busses
- Register Full/Empty
  On-chip flag flip-flops provide data transfer handshaking signals
- Separate Clock, Clock Enable and 3-State Output Enable for each Register
- Separate, Edge-Sensitive Clear Control for each Flag Flip-Flop
- Inverting and Non-inverting Versions
  Am2950 provides non-inverting data outputs
  Am2951 provides inverting data outputs
- 24mA Output Current Sink Capability
- 20ns Clock to Flag, 27ns (Max) for Output Enable
  Allows up to 8 million words/second data transfer rate
- 28-Pin DIP

Am2950*



*Outputs B_0-B_7 are inverted on the Am2951.

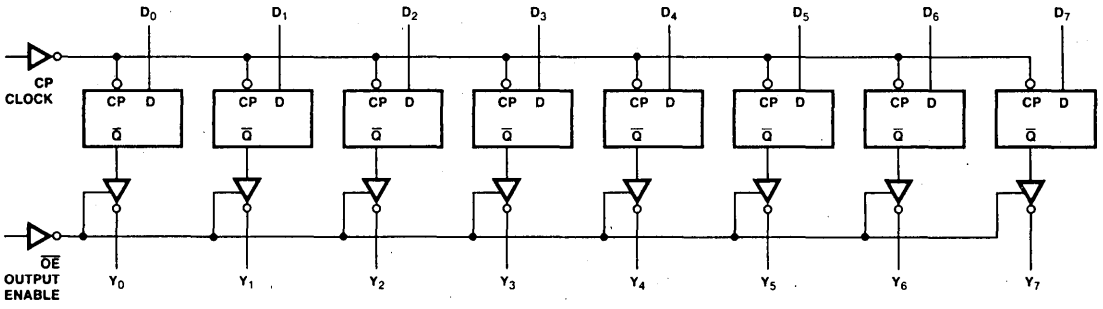
MPR-573

© IC MASTER 1983

Am2954/Am2955 Octal Registers (with 3-State Outputs)

- 8-Bit High-Speed Parallel Registers
- Am2954 Has Non-inverting Inputs
- Am2955 Has Inverting Inputs
- Positive Edge-Triggered D-Type Flip-Flops
- Buffered Common 3-State Control and Clock
- V_{OL} = 0.5V (Max) at I_{OL} = 32mA
- Clock to Output 11ns (Typ)
- 20-Pin DIP

Am2954*

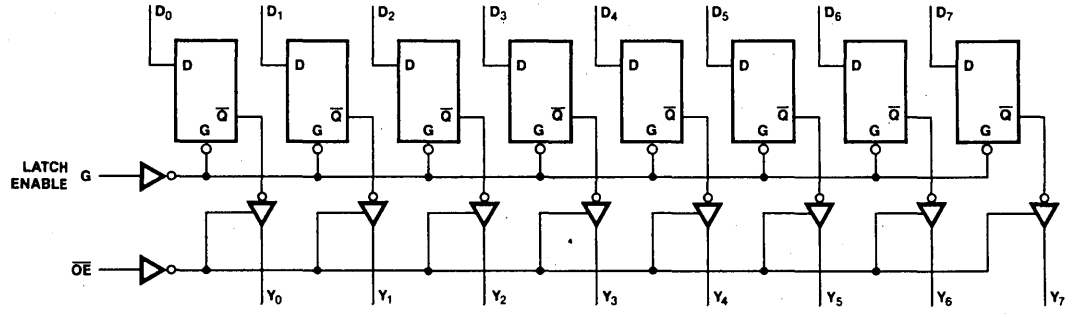


*Inputs D_0 through D_7 are inverted on the Am2955. BLI-110

Am2956/Am2957 Octal Latches (with 3-State Outputs)

- Eight Latches in a Single Package
- Am2956 Has Non-inverting Outputs
- Am2957 Has Inverting Outputs
- V_{OL} = 0.5V (Max) at I_{OL} = 32mA
- 3-State Outputs for Bus-Oriented System Interface
- Hysteresis on Latch Enable Input for Improved Noise Margin
- Clock to Output 12ns (Typ)
- 20-Pin DIP

Am2956*



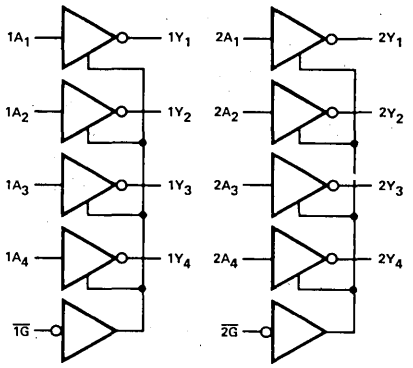
*Inputs D_0 through D_7 are inverted on the Am2957. MPR-360

© IC MASTER 1983

Am2958/Am2959 Octal Buffers/Line Drivers/Line Receivers (with 3-State Outputs)

- 3-State Outputs Drive Bus Lines Directly
- Hysteresis at Inputs Improve Noise Margin
- PNP Inputs Reduce dc Loading on Bus Lines
- V_{OL} = 0.55V
  at I_{OL} = 65mA for commercial product
  at I_{OL} = 48mA for military product
- Data-to-Output Propagation Delay
  Am2958 Inverting – 4.5ns (Max)
  Am2959 Non-inverting – 6.0ns (Max)
- Enable-to-Output 15ns (Max)
- 20-Pin DIP

Am2958*



*Outputs Y_1 through Y_4 are not inverted on the Am2959.

BLI-115

Am29112 Interruptable 8-Bit Microprogram Sequencer

- Fast
  Designed to operate in 10MHz microprogrammed systems
- Expandable
  One Am29112 directly addresses up to 256 words of microcode
  Two Am29112s can directly address up to 64K words of microcode
- Interruptable at Microcycle Completion
  Internal states saved on the stack
  Branches automatically to the interrupt service routine
- Many Addressing Modes
  Immediate, relative and n-way addressing
- 31-Level Stack
  On-chip 31-level stack used for subroutines, interrupts and loops
- Single or Double Pipeline
- 40-Pin DIP

IN DEVELOPMENT

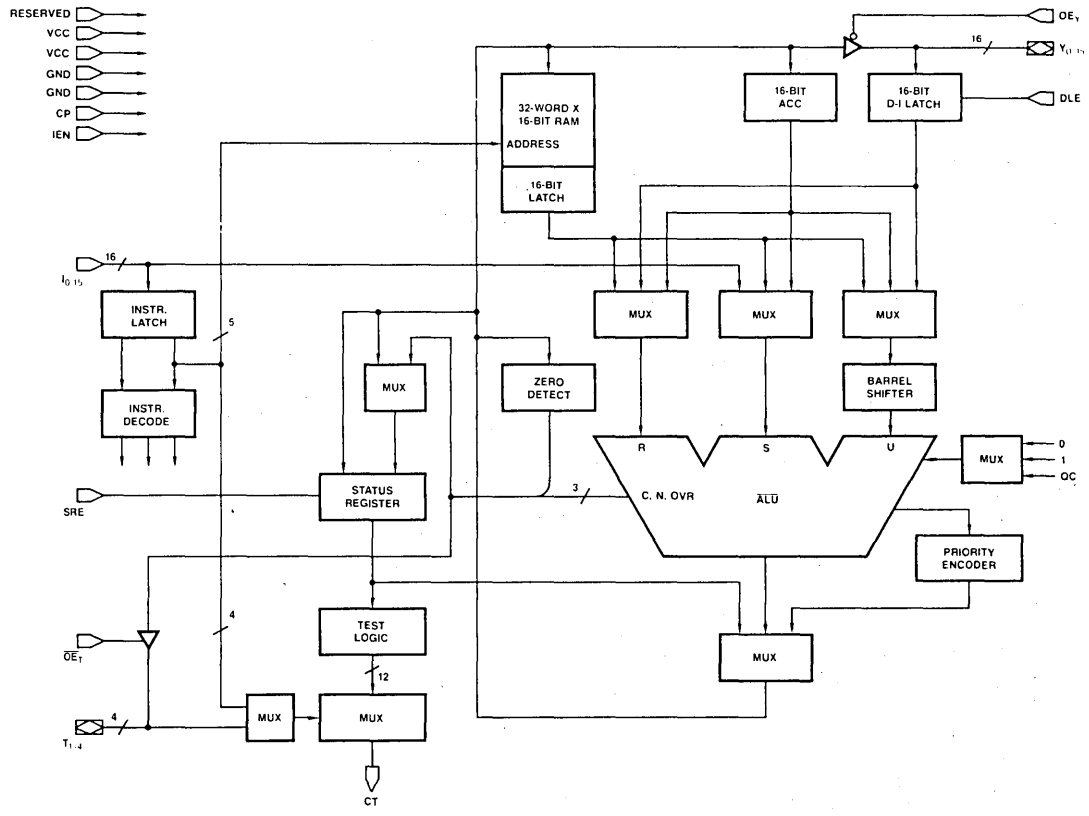
© IC MASTER 1983

Am29116 16-Bit Bipolar Microprocessor

- Designed for Controller Applications
  Instruction set designed for high performance peripheral controllers, communications controllers, industrial controllers and digital modems . . . but general purpose too.
  Excellent solution for applications requiring speed and bit-manipulation power
- Fast
  Design objective of 100ns (Max) microcycle time for all instructions
  Allows a 10MHz clock rate
- Powerful Instruction Set
  All instructions executable in single cycle on full 16-bit word or on 8-bit byte:

Add, Subtract	Rotate and Merge
n-Bit Rotate	Rotate and Compare
Shift-Up/Shift-Down	CRC Generation
Set-Bit/Reset-Bit	Priority Encode
Add/Subtract 2^n	

- Powerful Data Manipulation
  Full 16-bit data path
  32 registers on-chip
  Direct data input for immediate mode instructions
- 52-Pin DIP



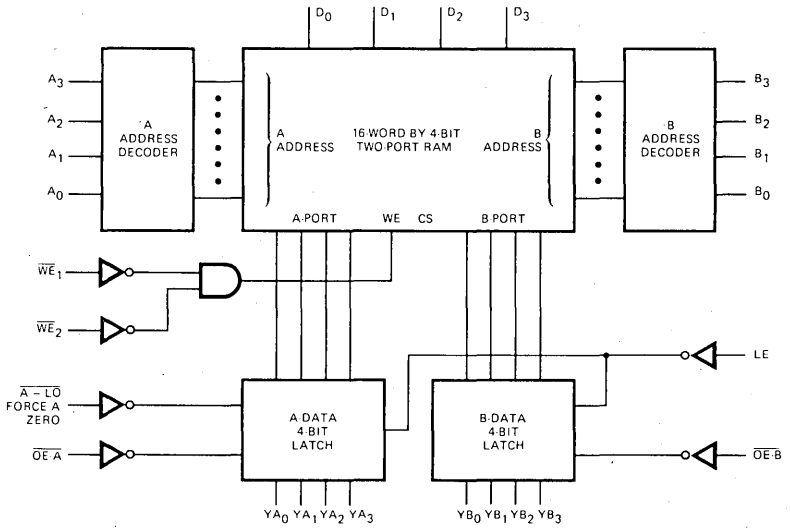
MPR-740

© IC MASTER 1983

BIPOLAR MICROPROCESSOR PRODUCTS

Am29705 16-Word by 4-Bit 2-Port RAM

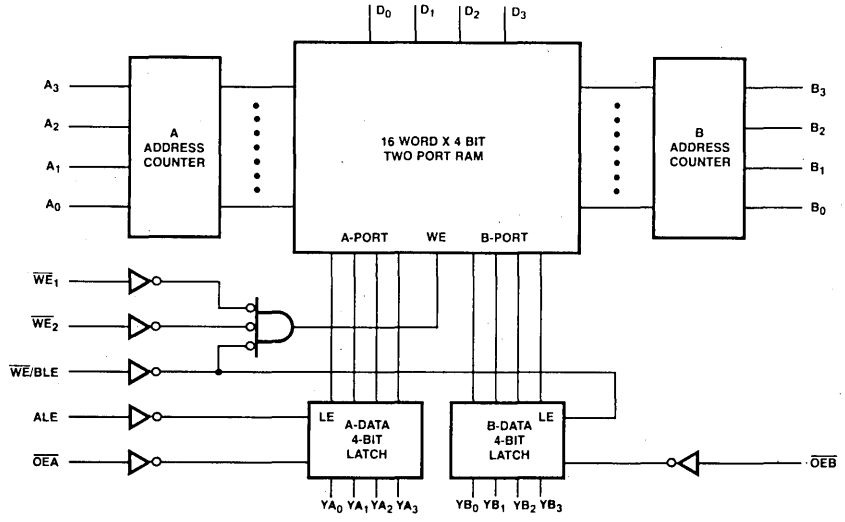
- 16 Word x 4-Bit 2-Port RAM
- Two Output Ports
  Each with separate output control
  Separate 4-bit latches on each
- Data Output Non-inverting with Respect to Data Input
- Chip Select and Write Enable Inputs for Ease in Cascading
- 53ns (Max) Access Time
- 28-Pin DIP



MPR-251

Am29707 16-Word by 4-Bit 2-Port RAM

- 16-Word by 4-Bit 2-Port RAM
- Use to Extend the Directly Accessible Register File of the Am29203 Microprocessor Slice
- Separate 4-Bit Latches on each Output Port
- Data Output Non-inverting with Respect to Data Input
- Chip Select and Write Enable Inputs for Ease in Cascading
- 28-Pin DIP

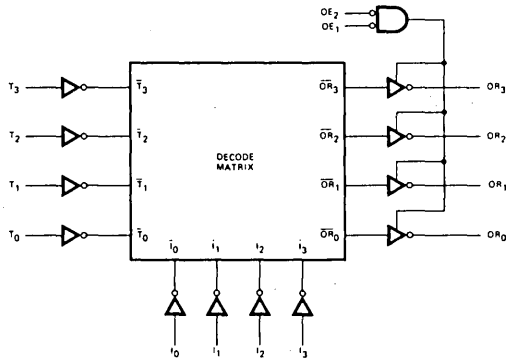


MPR-757

© IC MASTER 1983

Am29803A 16-Way Branch Control Unit

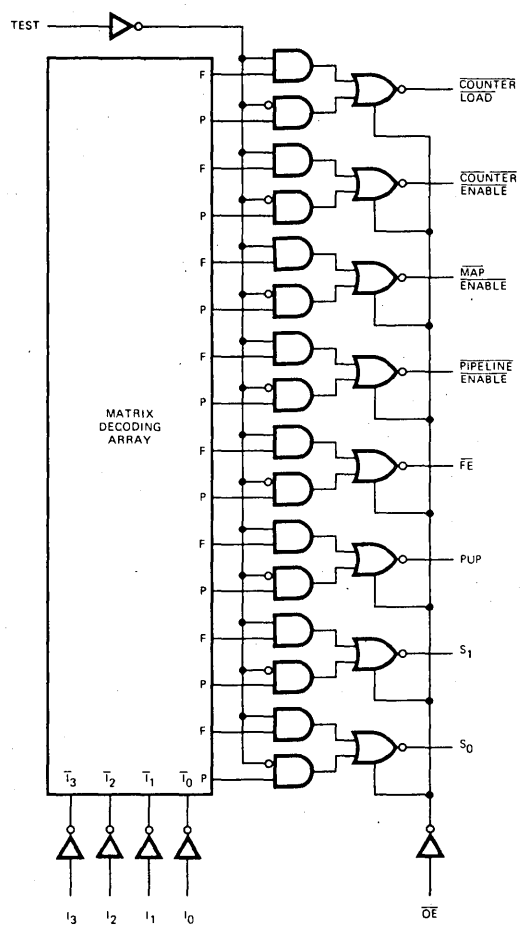
- 16 Separate Instructions
  2, 4, 8 or 16-way branch in one microprogram execution cycle
- Four Individual Test Inputs
- Four Individual Outputs for Driving the Four OR Inputs on Am2909 Microprogram Sequencer
- Provides Maximum Branch Capability in a Microprogram Control Unit Using Am2909
- 16-Pin DIP



MPR-309

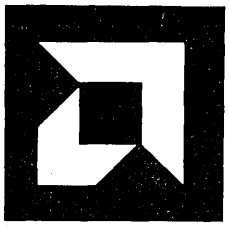
Am29811A Next Address Control Unit

- Next Address Control Unit for Am2911 Microprogram Sequencer
- 16 Next Address Instructions
- Test Input for Conditional Instructions
- Separate Outputs to Control Am2911
- Independent Event Counter
- Mapping PROM/Branch Address Interface
- 16-Pin DIP



MPR-314

© IC MASTER 1983



BIPOLAR MICROPROCESSOR PRODUCTS

OTHER LOGIC DEVICES FOR HIGH-SPEED PROCESSOR APPLICATIONS

Operators	Low-Power Schottky	Schottky
4-Bit, 4-Way Shifter		25S10
4-Bit ALU, Function Generator (with carry out, overflow)	25LS2517	
4-Bit ALU, Function Generator (with generate, propagate)	25LS381*	
8-Bit, Equal-to Comparator	25LS2521	
Priority Encoder (with 3-state outputs)	25LS2513	
Decoders/Demultiplexers, Multiplexers		
1-of-10 Decoder/Demultiplexer (with polarity control)	25LS2537	
1-of-8 Decoder/Demultiplexer (with control storage)	25LS2536	
1-of-8 Decoder/Demultiplexer (with polarity control)	25LS2538	
Dual 1-of-4 Decoder/Demultiplexer (with polarity control)	25LS2539	
8-Input Multiplexer (with control storage)	25LS2535	
Registers		
4-Bit Register (with common clock enable)	25LS08	25S08
4-Bit Register (with 2-input multiplexers on inputs)	25LS09	25S09
4-Bit Register (with standard and 3-state outputs)	25LS2518	25S18
4-Bit, 2-Output 3-State Register	25LS2519	
6-Bit Register (with common clock enable)	25LS07	25S07
8-Bit Shift/Storage Register (with synchronous clear)	25LS23	
8-Bit Shift/Storage Register (with asynchronous clear)	25LS299*	
8-Bit Shift/Storage Register (with sign extend)	25LS22	
Octal D-Type Register (with common clear)	25LS273*	
Octal D-Type Register (with common clear, buffered outputs)	25LS273B	
Octal Transparent Latch (with 3-state outputs)	25LS373*	25S373*
Octal Transparent Latch (with inverting 3-state outputs)	25LS533*	25S533*
Octal D-Type Register (with 3-state outputs)	25LS374*	25S374*
Octal D-Type Register (with inverting 3-state outputs)	25LS534*	25S534*
Octal D-Type Register (with common enable)	25LS377*	
Octal D-Type Register (with common enable, buffered outputs)	25LS377B	
Octal D-Type Register (with common enable and clear, 3-state outputs)	25LS2520	
Counters		
BDC Decade Counter (with asynchronous clear)		93S10 54/74S160
Up-Down Decade Counter (with synchronous preset, 3-state outputs)	25LS2568	
Binary Counter (with asynchronous clear)		93S16 54/74S161
Up-Down Binary Counter (with synchronous preset, 3-state outputs)	25LS2569	
Parity Checker/Generator		
9-Input Parity Checker/Generator		82S62
12-Input Parity Checker/Generator		93S48

*Also available in 54/74 versions.

© IC MASTER 1983

DESIGN AIDS

AmSYS™29 Microprogram Development System

The AmSYS™29 is a complete development system for microprogrammed machines. It is a useful tool for designing initial hardware/firmware, for assembling and debugging microcode and for checking out hardware.

AmSYS™29 includes a CP/M compatible operating system, 2Kx64 bit words of high-speed Writable Control Store and high-speed Emulation Control Logic. The options and peripherals offer a high-speed trace, line printer, PROM programmer interface and CRT console.

Features:

- AMDASM meta-assembler language definition and source file assembly
- High-Speed Emulator integrating bipolar logic and microcode
- High-Speed Writable Control Store
- Optional 10-MHz High-Speed Microcode Trace
- AmDOS29 CP/M compatible disk operating system
- Dual single-density floppy disk drives upgradable to double density

Am2900 Learning and Evaluation Kit

The Am2900 Learning and Evaluation Kit provides a stripped-down model of a typical microprogrammed controller or computer for introducing engineers to the architecture of microprogrammed systems.

It contains a small but powerful microprogrammed control unit driving several data handling elements including an Am2901B 4-bit CPU slice. The microprogram memory in the kit is a read/write memory so that sequences of microinstructions can be entered by the user, then executed. The data control portion of each microinstruction controls all inputs to the Am2901B, shift and rotate logic and a status register that captures ALU conditions following each cycle. Each microinstruction also contains a 4-bit sequence control field, which is used to select one of 16 different sequence control instructions and a branch address. The instructions are decoded in a PROM that controls an Am2909 microprogram sequencer. Once entered, microinstructions may be executed using a single-step clock or a pulse generator.

The Am2900 Learning and Evaluation Kit includes 40 integrated circuits, 26 resistors, 16 capacitors, 15 switches, 12 LEDs and the PC board. The only item not supplied is a 5V, 2A power supply. Also included is the user's manual, a 114-page book containing chapters on the theory of microprogramming, the assembly and testing of the kit and exercises that demonstrate the application of the architecture and operation of the Am2901B and Am2909.

Bit-Slice Microprocessor Design

This 384-page book is invaluable as a learning tool or reference manual. Authored by AMD, the text discusses in detail the design of a microprogrammed computer using the Am2900 Family. Application examples are used extensively and theory is pared to essentials. Chapters include:

I – Computer Architecture
II – Microprogrammed Design
III – The Data Path
IV – The Data Path, Part Two
V – Program Control Unit
VI – Interrupt
VII – Direct Memory Access
VIII – The HEX-29 Single-Board Computer
IX – The Super Sixteen Single-Board Computers

Bit-Slice Microprocessor Design by J. Mick and J. Brick, ISBN 0-07-041781-4, may be obtained from your local bookstore or ordered directly from McGraw-Hill Book Co., Suite 26-1, 1221 Avenue of Americas, New York, NY 10020.

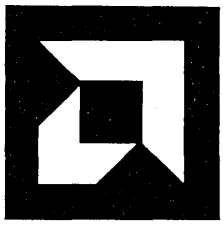
AMD School of Advanced Engineering

The AMD School of Advanced Engineering offers three courses for the Am2900 Family designer: Introduction to Designing with the Am2900 Family, Microprogrammable Computer Architecture and Introduction to Design with a Development System. Comprehensive course notes are available without course attendance for a fee of $175.00/set. For more information regarding course content, schedule or fees, or to order course notes, please contact:

AMD School of Advanced Engineering
430 Lakeside Drive
Sunnyvale, CA 94086
408/732-2400 Ext. 2325

© IC MASTER 1983

Advanced Micro Devices



MOS MICROPROCESSOR PRODUCTS

At Last. A True Alternate Source for the Complete iAPX86 Family.

The new ***AMD-Intel Alliance*** is finally bringing true alternate sourcing to the iAPX86 market. We are bringing you the full iAPX86 Family. The 8086 and 8088 CPUs. The 186 and 286 upgrades. The 8087 Coprocessor. The 8089 I/O Processor. Plus all the peripherals. All of them. At a competitive price, with competitive delivery. See our product line-up for details.

AMD's iAPX86 Parts are 100% Compatible with the Intel Series.

Fully compatible. Function for function, pin for pin. Intel provides us with the specs, the layouts, and the process "recipe". This includes all upgrades, on all parameters. It's in the contract, committed for 10 years. So no more sole-source anxieties. Now you always have a choice.

No More Incoming Test Problems. We have the Tapes.

There's added insurance that our AMD parts will fit your iAPX86 sockets. The ***AMD/Intel Alliance*** gives us the Intel test tapes. Which means that if ***their*** parts pass your incoming test, ours will. In fact, with the INT-STD-123 quality guarantee, the AMD parts should do even better. No QA hassles, no tape correlation problems, no failure analyses. We do it right the first time.

We Bring Something Else to the Party.

AMD's high-performance peripherals bring added punch to your microprocessor system. The Am9511A and Am9512 Arithmetic Processors, the Am9517A DMA Controller – these devices are so outstanding that Intel is second-sourcing them from us. You've seen our other Am9500 wizards on your parts lists before. The Am9513A System Timing Controller, the Am9518 Data Ciphering Processor, the Am9520 Burst Error Processor and the 9519A Priority Interrupt Controller. We also bring other sophisticated chips to the iAPX86 world. The 8036 Counter I/O Port, the 9516 DMA Transfer Controller, the 8030/8530 Serial Communications Controller, and the 8038 FIFO I/O. Superior parts. From the superior source.

Interface, Memory, and Bipolar Support. We Have It All.

AMD is a full-line semiconductor supplier. We will fill your entire iAPX86 system parts list, from a complete set of support parts. Our Am2900 Family, Am29800 series, and Am25LSXX bipolar parts for microprocessors are the fastest in the business. Bipolar memory? We have it! MOS RAMs, EPROMs? We have them! iAPX86 support, across the board. One-stop shopping for your whole microprocessor package.

© IC MASTER 1983

Advanced Micro Devices

MOS MICROPROCESSOR PRODUCTS

Co-Development on Advanced iAPX86 Parts.

AMD and Intel have combined their R&D talent to introduce a series of ever-more-advanced iAPX86 peripherals over the next few years. High-performance peripherals. Special purpose controllers. Software and firmware. The upward path to 32 bits and beyond. With AMD as your iAPX86 source, you can tell your design engineers that you've got guaranteed access to ***all*** of these advanced parts. Outside of the ***Alliance***, nobody else can offer you this. Nobody.

Delivery. When We Promise It. When You Need It.

We are building the iAPX86 Family parts in our ultra-modern fabrication plant in Austin, Texas. Our state-of-the-art process assures you of consistent, quality parts. Our new wafer line ensures high yields in the quantities you need. If you're concerned about stable long-term supply, we are the only iAPX86 alternate source that produces in the USA. We compete by keeping our delivery commitments. We serve just one master in this market – our customers.

Outstanding Field and Factory Support.

One of the benefits of real competition is a responsive sales force. When you call, we answer you. You have a problem, we scramble to find a solution. On ***your*** terms. Our salesmen and field engineers are experienced in iAPX86-based designs. Our reps and our distributors fill out the AMD service network, giving on-the-spot stocking and delivery, wherever you need it. We figure that tough competition is the only way to ensure superior service. After all, you remember that we're the people who introduced a choice to the 8080 and 8085 markets. Now it's time to bring it to the iAPX86 market.

International Standard 123: AMD Quality That Nobody Can Touch.

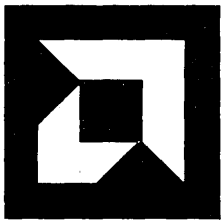
You get the finest product assurance in the industry. All of our parts are tested to MIL-STD-883. We guarantee AQLs of 0.3% or better on all our microprocessor parts, all package types. Nobody else can touch these quality guarantees. AMD spent millions last year to be able to guarantee you these quality levels on every shipment. That's ***serious*** competition.

We Want Your Business.

Competition means we hustle to serve you in the new iAPX86 world. An alternate source for the entire iAPX86 Family of parts. 100% compatible. Competitive price and delivery. First class quality and outstanding field service. We compete on all these dimensions because we want your business. Advanced Micro Devices. ***We offer you a choice.***

© IC MASTER 1983

Advanced Micro Devices



MOS MICROPROCESSOR PRODUCTS

8086 Family Microprocessor Part Numbers

8086	16-Bit CPU
iAPX186	High-Integration 16-Bit Microprocessor***
iAPX286	High-Performance 16-Bit Microprocessor with Memory Management***
8088	8-Bit CPU
8087	Arithmetic Processor**
8089	I/O Processor**
8231A/9511A	Arithmetic Processor
8232/9512	Arithmetic Processor
8237A/9517A	DMA Controller
8251A	Serial I/O USART*
8253	Counter/Timer
8255A	Programmable Peripheral Interface
8259A	Interrupt Controller*
8275	CRT Controller*
8279	Keyboard/Display Interface
8284A	Clock Generator**
8286	Octal Transceiver
8287	Octal Transceiver
8288	Bus Arbiter**
8289	Bus Controller**
8530	Serial Communications Controller
9513A	System Timing Controller
9516	Data Transfer Controller
9518	Data Cyphering Processor
9520/21	Burst Error Processor
9519A	Universal Interrupt Controller
8036	Counter I/O
8038	FIFO

*Q3-4 1982 Introduction
**1983 Introduction
***1984 Introduction

The AMD/INTEL Alliance.

In September, 1981, Advanced Micro Devices and Intel reached an agreement to work together supporting Intel's iAPX Family of microprocessors, beginning with the 8086. A milestone in semiconductor history, the agreement, like many "cross license" pacts in the industry, calls for mask exchanges between the two companies. However, unlike many agreements, it also calls for a process technology and test program exchange. And, unlike anything that has preceded it, the alliance defines the exchange not only in terms of products but in terms of time.

For the next decade, every microprocessor product designed by AMD or Intel will be available to the other party, guaranteeing two US-based suppliers for the iAPX86 product family. To ensure the widest variety of peripherals, the two companies will combine resources to develop new product definitions. Rarely is an agreement struck between two companies that offers so much to so many: two coordinated design centers, two suppliers of exactly identical parts, and all upgrades and extensions automatically included.

During the ten-year lifetime of the technology exchange, AMD and Intel will continue to supply iAPX microprocessor users with more effective and more efficient tools to satisfy their increasingly sophisticated applications.

Advanced Micro Devices and Intel make the iAPX processors the most thoroughly supported microprocessor family in the world.

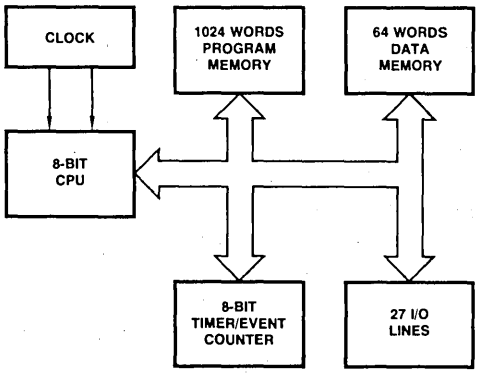
© IC MASTER 1983

MICROCOMPUTERS

Am8048/Am8035 Single-Chip 8-Bit Microcomputers

The Am8048 and Am8035 are single-chip, 8-bit microcomputers designed for use as efficient controllers. The Am8048 contains an 8-bit CPU, a 1K x 8 ROM Program Memory, a 64 x 8 RAM Data Memory, 27 I/O lines, an 8-bit Timer/Event Counter and on-board oscillator and clock circuits. Standard memory devices and Am8080A/Am9080A peripherals can be added for systems requiring expanded memory and I/O capability. The Am8035 is the equivalent of the Am8048 except that it has no internal program memory.

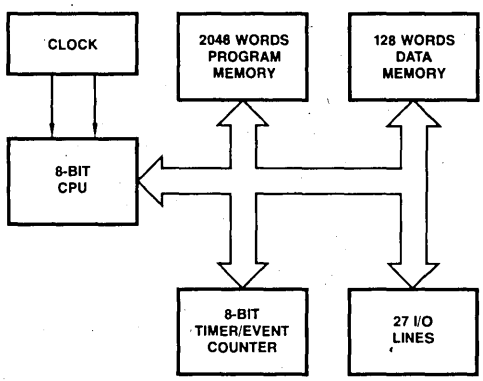
Both microcomputers have extensive bit-handling capability as well as facilities for both binary and BCD arithmetic. The instruction set contains over 90 instructions: 70% are single byte, the balance are two bytes. All instructions can be executed in one or two cycles; both 2.5μs and 4.17μs cycle versions are available. The Am8048 and Am8035 require a single, 5V supply and are available in either a plastic or hermetic 40-pin DIP.



Am8049/Am8039 Single-Chip 8-Bit Microcomputers

The Am8049 and Am8039 are single-chip, 8-bit microcomputers designed for use as efficient controllers. The Am8049 contains an 8-bit CPU, a 2K x 8 ROM Program Memory, a 128 x 8 RAM Data Memory, 27 I/O lines, an 8-bit Timer/Event Counter and on-board oscillator and clock circuits. Standard memory devices and Am8080A/Am9080A peripherals can be added for systems requiring expanded memory and I/O capability. The Am8039 is the equivalent of the Am8049 except that is has no internal program memory.

Both microcomputers have extensive bit-handling capability as well as facilities for both binary and BCD arithmetic. The instruction set contains over 90 instructions: 70% are single byte, the balance are two bytes. All instructions can be executed in one or two cycles; both 1.36μs and 2.5μs cycle versions are available. The Am8049 and Am8039 require a single, 5V supply and are available in either a plastic or hermetic 40-pin DIP.



© IC MASTER 1983

CENTRAL PROCESSING UNITS

Am8080A/Am9080A 8-Bit Central Processing Unit (CPU)

The Am8080A/Am9080A is an 8-bit parallel central processing unit designed to perform a wide variety of operations, ranging from complex arithmetic calculations to character handling to bit control. Various speed options, including a high speed version with a 1.0μs instruction cycle time, are available.

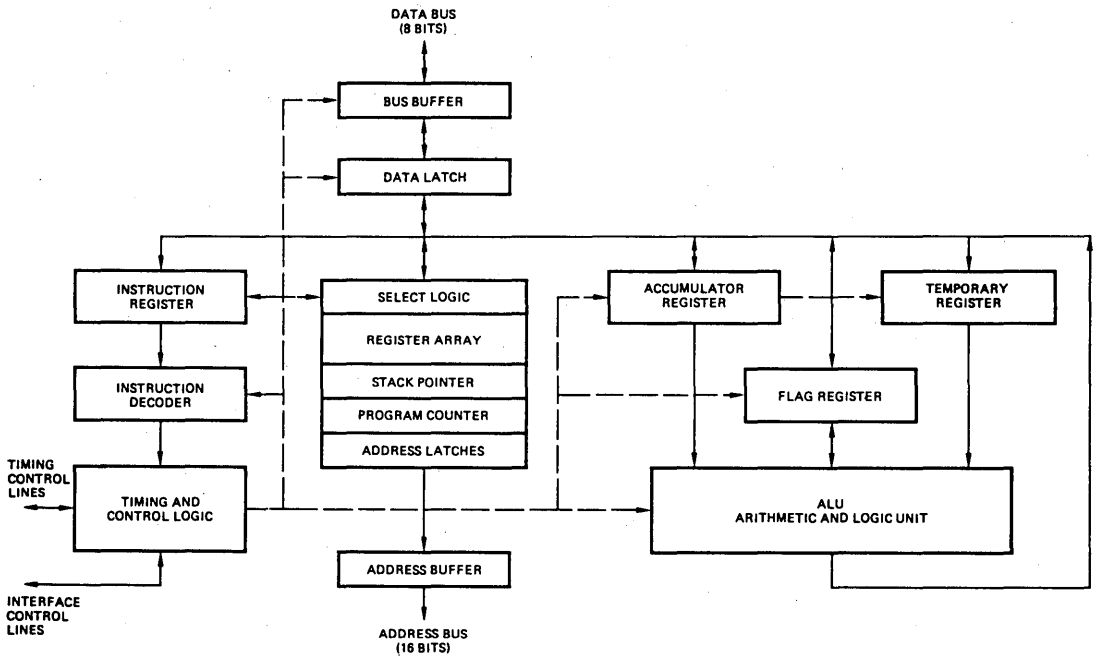
The CPU contains a 16-bit Program Counter which can directly address up to 64K bytes of memory through the 16-line address bus. The addressed memory may be any combination of read/write and read-only. A separate 8-line bidirectional data bus transfers instructions, data and status information between system devices. All transfers are handled using asynchronous handshaking controls so that any speed memory or I/O device is easily accommodated. Data and address busses may be OR-tied with other controlling devices for direct memory access or multiprocessor operation.

An accumulator plus six general-purpose registers are available to the programmer. The six registers are each eight bits long and may be used singly or in pairs for both 8 and 16-bit operations. The accumulator forms the primary working register and is the destination for many of the arithmetic and logic operations.

A general-purpose push-down stack is an important part of the microprocessor system architecture. The contents of the stack reside in R/W memory; an on-chip 16-bit Stack Pointer controls the addressing of this external stack. Subroutine call and return instructions automatically use the stack to store and retrieve the contents of the accumulator, flags, program counter and all of the six general-purpose registers. Push and Pop instructions allow direct use of the stack for storing operands, passing parameters and saving machine state.

An asynchronous vectored interrupt capability is included to allow external signals to modify the instruction stream. The interrupting device may specify an interrupt instruction to be executed and may thus vector the program to a particular service location, or to perform some other direct function.

The Am8080A/Am9080A is available in either a plastic or hermetic 40-pin DIP.

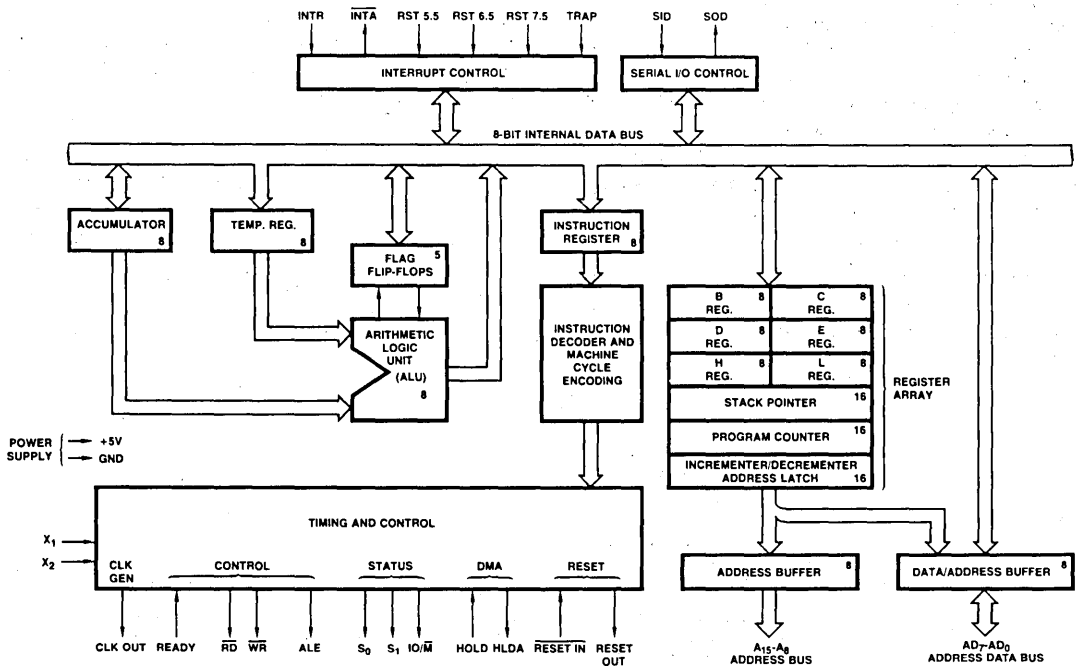


© IC MASTER 1983

Am8085A 8-Bit Central Processing Unit (CPU)

The Am8085A is an advanced, complete 8-bit parallel central processing unit. It is available with either 1.3μs or 0.8μs instruction cycle time and is 100% software compatible with the Am8080A/Am9080A.

The Am8085A incorporates a clock generator and system controller on-chip, thereby offering a high level of system integration. Additional enhancements include interrupt control logic, consisting of four vectored interrupts, and serial I/O lines. The Am8085A uses a multiplexed data bus. The address is split between the 8-bit address bus and the 8-bit data bus. Up to 64K bytes of memory can be directly addressed. The CPU requires a single, 5V supply and is available in either a plastic or hermetic 40-pin DIP.



© IC MASTER 1983

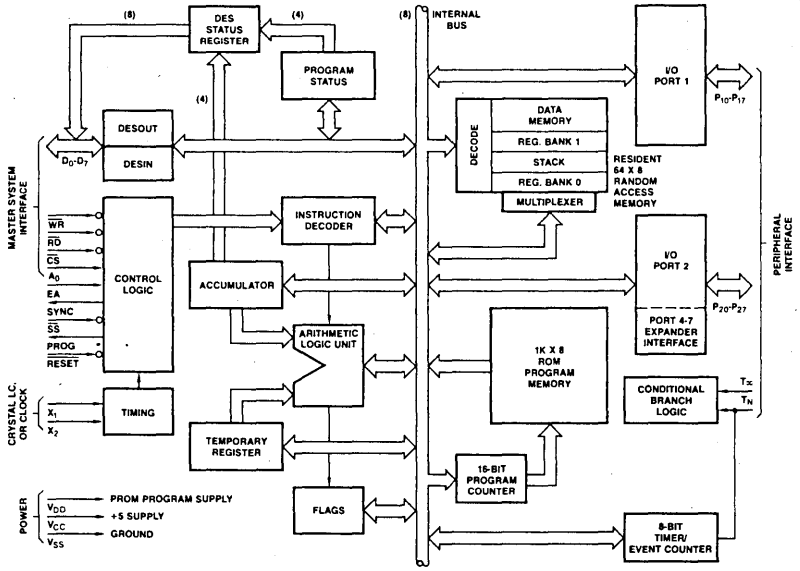
PERIPHERAL DEVICES

Am8041A Universal Peripheral Interface

The Am8085A is an advanced, complete 8-bit parallel central processing unit. It is available with either 1.3μs or 0.8μs instruction cycle time and is 100% software compatible with the Am8080A/Am9080A.
than conventional LSI interface devices.

The Am8041A contains 1K x 8 ROM Program Memory, 64 x 8 RAM Data Memory, an 8-bit CPU, 16 I/O lines, an 8-bit programmable Timer/Event Counter, clock and interface registers. The UPI has two 8-bit I/O ports and two test inputs. Individual port lines can function as either inputs or outputs under software control. The timer/event counter generates timing sequences or counts external inputs.

The Am8041A requires a single, 5V supply and is available in either a plastic or hermetic 40-pin DIP.

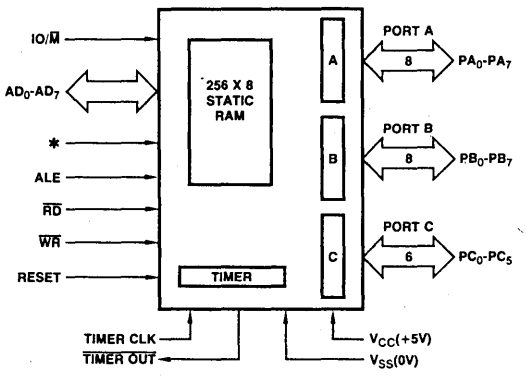


Am8155/Am8156 RAM with I/O Ports and Timer

The Am8155 and Am8156 static RAMs with I/O ports and timer are designed to directly interface with the Am8085A CPU in an 8-bit microprocessor system. They differ only in the polarity of the Chip Enable (CE) input: active-LOW for the Am8155, active-HIGH for the Am8156.

The RAM portion, 2K-bit static cells organized as 256 x 8, has a maximum access time of 400ns, thus requiring no wait states in the Am8085A CPU. The I/O portion consists of three general-purpose I/O ports. One port can be programmed to act as status pins, thus allowing the other two ports to operate in a handshake mode. An on-chip, programmable counter/timer provides either a square wave or terminal count pulse for the CPU, depending on the timer mode.

The Am8155 and Am8156 are also available in a higher speed version. Both require a single, 5V supply and are packaged in a plastic or hermetic 40-pin DIP.



*Am8155 = $\overline{CE}$, Am8156 = CE.

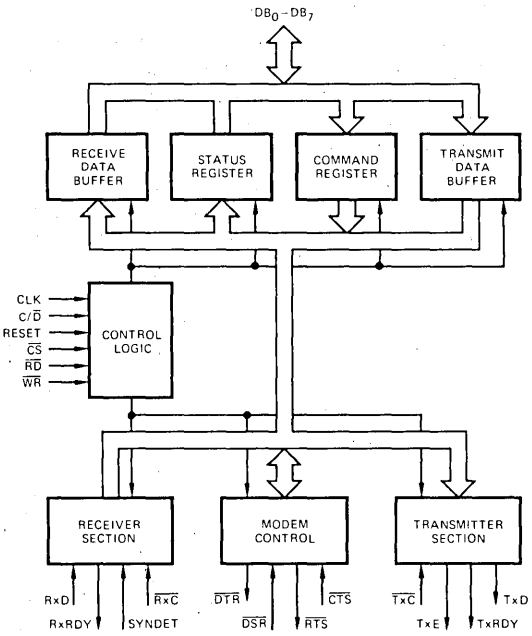
© IC MASTER 1983

Am8251/Am9551 Universal Synchronous/ Asynchronous Receiver/Transmitter (USART)

The Am8251/Am9551 is a programmable serial data communications interface that provides a universal synchronous/asynchronous receiver/transmitter function. It is normally used as a peripheral device for an 8-bit microprocessor system and may be programmed by the CPU to operate in a variety of standard serial communication formats.

Data, control, operation and format options are all selected by commands from the CPU. The USART can operate in an independent full duplex mode. It accepts parallel data from the CPU, formats and serializes the information based on its current operating mode, and then transmits the data as a serial bit stream. Simultaneously, serial data can be received, converted into parallel form, de-formatted, and then presented to the CPU. The Am8251/Am9551 is doubled buffered and can operate at clock frequencies of up to 2.8MHz.

The USART requires a single, 5V supply and is available in a 28-pin plastic or hermetic DIP.

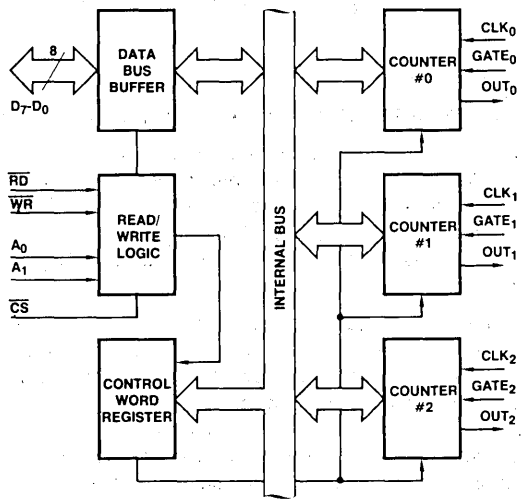


Am8253 Programmable Interval Timer

The Am8253 programmable interval timer/counter functions as a general-purpose, multitiming element in Am8080A/Am9080A and Am8085A microprocessor systems.

It is organized as three independent 16-bit counters, each with a count rate of up to 2.5MHz. A faster device, Am8253-5, allows full compatibility with the Am8085A. All modes of operation are software programmable.

The Am8253 requires a single, 5V supply and is available in a plastic or hermetic 24-pin DIP. For improved performance, see the Am9513 System Timing Controller.



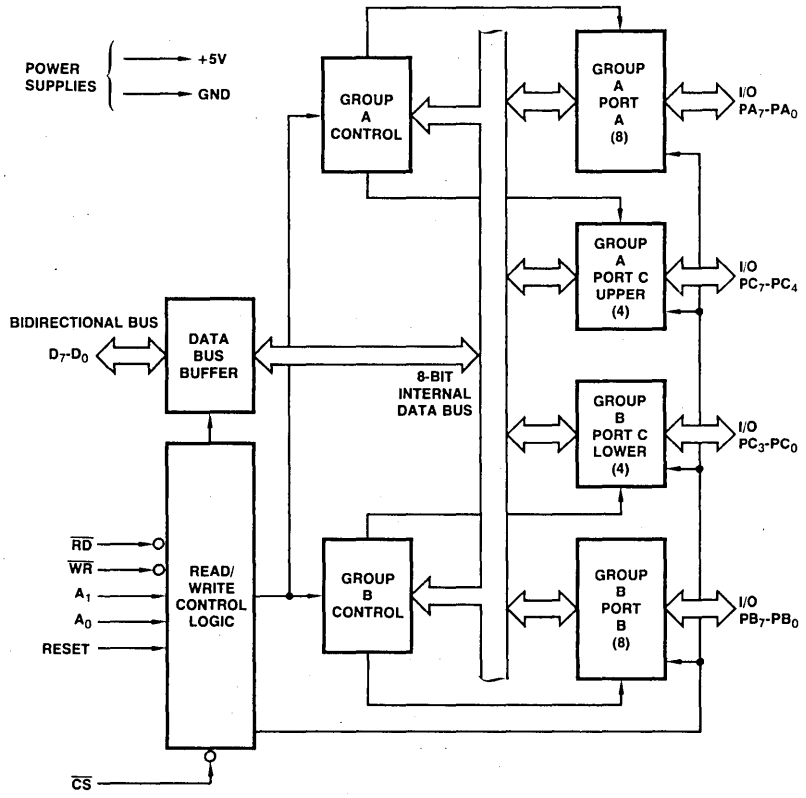
© IC MASTER 1983

Am8255A Programmable Peripheral Interface (PPI)

The Am8255A programmable peripheral interface functions as a general-purpose I/O component to interface peripheral equipment to the microcomputer data bus in Am8080A/Am9080A and Am8085A microprocessor systems. The functional configuration of the Am8255A is programmed by the system software so that generally no external logic is necessary.

The PPI has 24 I/O pins which may be individually programmed in two groups of 12 and used in three major modes of operation. In the first mode, each group of I/O pins may be programmed in sets of four and eight to be inputs or outputs. In the second mode, each group may be programmed to have eight input or output lines. Three of the remaining four pins are used for handshaking and interrupt control signals. The third mode is the bidirectional bus mode; it uses eight lines for a bidirectional data bus and five lines, borrowing one from the other group, for handshaking.

The Am8255A is available in two speed versions, requires a single 5V supply and is packaged in either a plastic or hermetic 40-pin DIP.



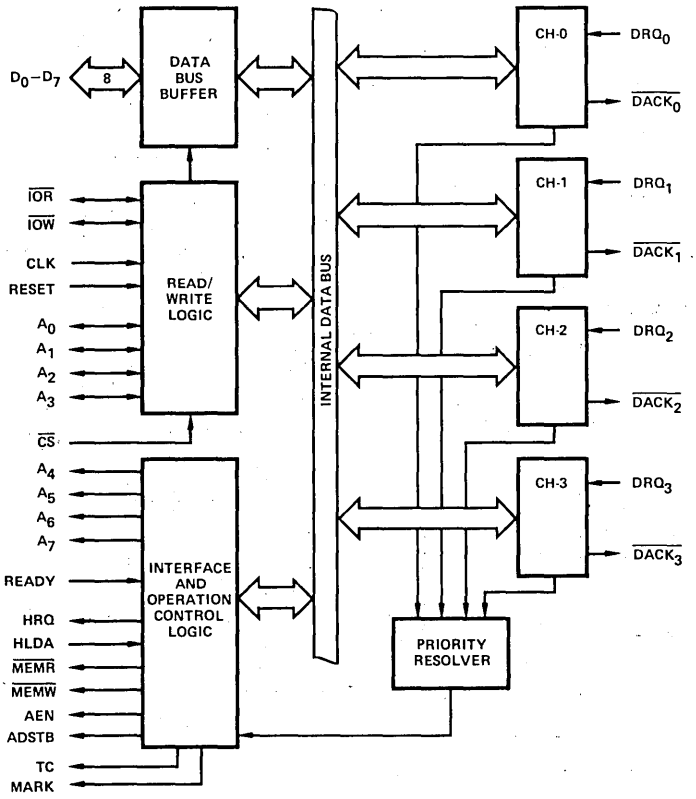
© IC MASTER 1983

Am8257/Am9557 Direct Memory Access (DMA) Controller

The Am8257/Am9557 is a 4-channel direct memory access controller which permits the high-speed transfer of data directly between peripherals and memory in microcomputer systems.

When peripheral requests are received, the Am8257/Am9557 issues a HOLD signal to the host CPU, assumes control of the system busses, selects the highest priority peripheral for servicing, and generates the necessary control signals and memory address required for the data transfer. It maintains a byte count for each channel and issues a terminal count signal upon completion of the programmed number of transfers.

The Am8257/Am9557 requires a single, 5V supply and is available in either a plastic or hermetic 40-pin DIP. For improved functional and performance characteristics, see the Am9517A Multimode DMA controller.



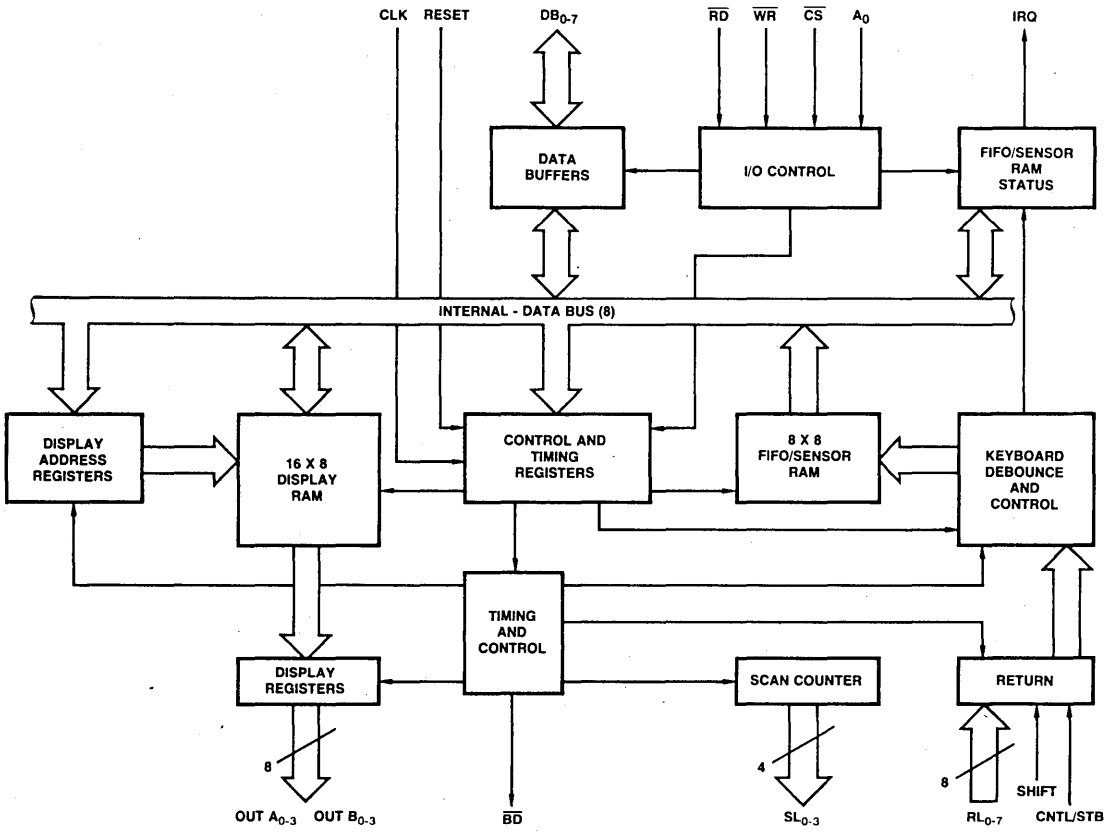
© IC MASTER 1983

Am8279 Keyboard/Display

The Am8279 programmable keyboard/display I/O interface controls data input and display functions in microprocessor systems. It connects directly to the microcomputer data bus and all operating modes are CPU programmable.

The Am8279 has two sections: keyboard and display. The keyboard portion can provide a scanned interface to a 64-contact key matrix, a sensor array or a strobed interface keyboard. Key depressions can be 2-key lockout or N-key rollover. Keyboard entries are debounced and strobed in an 8-character FIFO. The display portion contains a 16 x 8 Display RAM which can be organized into dual 16 x 4. It provides a scanned display interface for LED, incandescent and other popular display technologies. Both right-entry calculator and left-entry typewriter display formats are possible.

Available in two speed versions, the Am8279 requires a single, 5V supply and is packaged in either a plastic or hermetic 40-pin DIP.



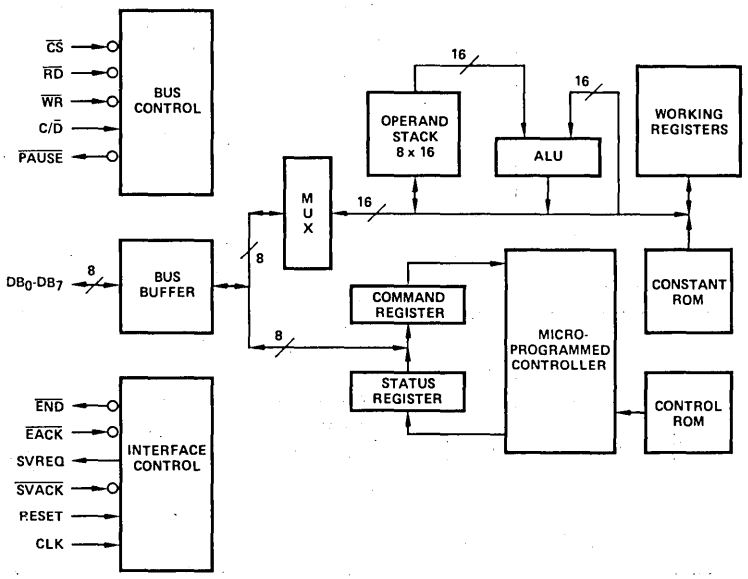
© IC MASTER 1983

Am9511A Arithmetic Processing Unit (APU)

The Am9511A arithmetic processing unit is used to enhance the computational capability of a wide variety of 8-bit microprocessor systems. It provides high performance 16 and 32-bit fixed-point and 32-bit floating-point arithmetic operations, performs trigonometric and inverse trigonometric functions, and executes a variety of mathematical operations such as square root, logarithm and exponentiation.

Data are transferred to and from the APU via a CPU by using conventional programmed I/O, or by a direct memory access device if higher transfer speeds are required. All transfers, including operand, result, status and command information, take place over an 8-bit bidirectional data bus. Operands are pushed onto an internal stack and a command is issued to perform operations on the data in the stack. Results are then available to be retrieved from the stack or additional commands may be entered. Upon completion of each command, the APU issues an end of execution signal; this signal may be used as an interrupt by the CPU to help coordinate program execution.

The Am9511A is available with a 2MHz, 3MHz or 4MHz maximum clock frequency in a hermetic 24-pin DIP.



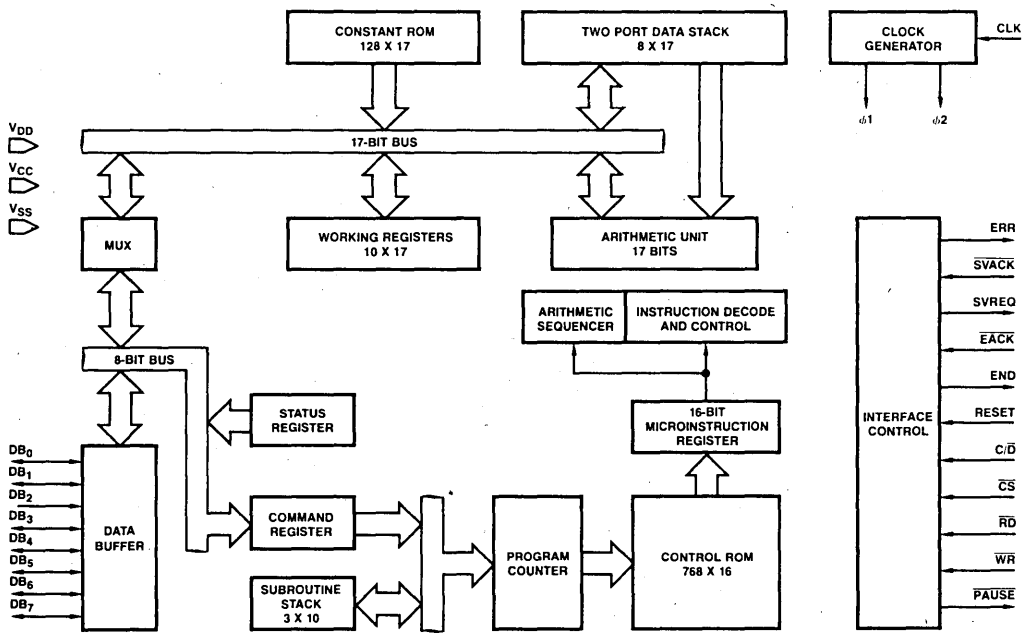
© IC MASTER 1983

Am9512 Floating-Point Processing Unit (FPU)

The Am9512 floating-point processing unit enhances the computational capability of the CPU in 8-bit microprocessor systems. It provides single precision (32-bit) and double precision (64-bit) add, subtract, multiply and divide operations.

Data are transferred between the Am9512 and the CPU by using programmed I/O or direct memory access techniques. The operand, result, status and command information transfers occur over an 8-bit bidirectional data bus. Operands are pushed onto an internal stack by the CPU and a command is issued to perform an operation on the data stack. The results of this operation are available to the CPU by popping the stack. Upon completion of an operation, the Am9512 issues an end of execution signal; this signal can be used to interrupt the CPU.

The FPU is available in two speed versions and is packaged in a hermetic 24-pin DIP.



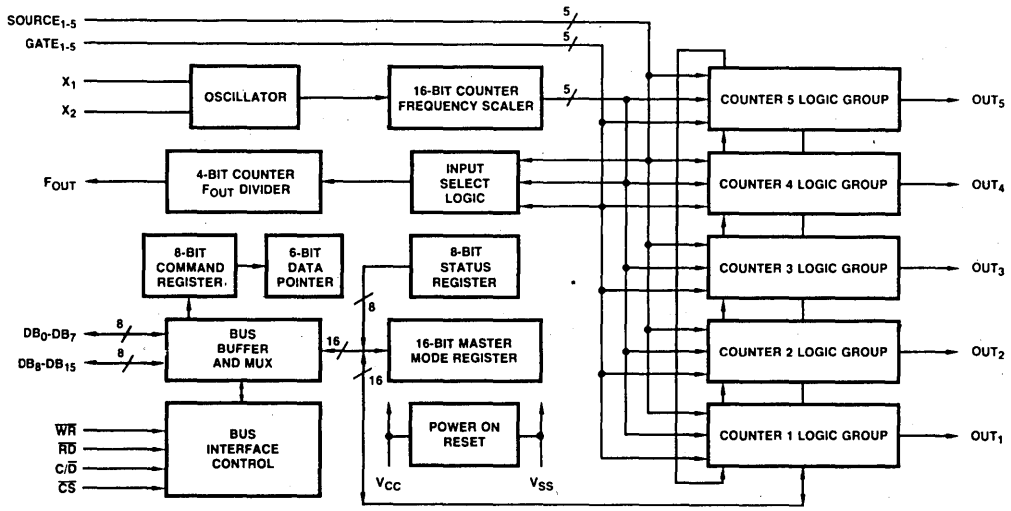
© IC MASTER 1983

Am9513 System Timing Controller (STC)

The Am9513 system timing controller performs many types of counting, sequencing and timing operations in 8-bit or 16-bit microprocessor systems. It provides the capability for programmable frequency synthesis, high-resolution programmable duty-cycle waveforms, retriggerable digital timing functions, time-of-day clocking, coincidence alarms, complex pulse generation, high-resolution baud-rate generation, frequency shift keying, stopwatch timing, event-count accumulation, waveform analysis and many more. A variety of programmable operating modes and control features allows the Am9513 to be personalized for specific applications as well as dynamically reconfigured under program control.

The STC includes five general-purpose 16-bit counters. A variety of internal frequency sources and external pins may be selected as inputs for individual counters with software selectable active-HIGH or active-LOW input polarity. Both hardware and software gating of each counter are available. Three-state outputs for each counter provide pulses or levels and can be active-HIGH or active-LOW. The counters can be programmed to count up or down in either binary or BCD. The CPU may read an accumulated count at any time without disturbing the counting process. Any of the counters my be internally concatenated to form an effective counter length of up to 80 bits.

The Am9513 requires a single, 5V supply and is available in either a plastic or hermetic 40-pin DIP.



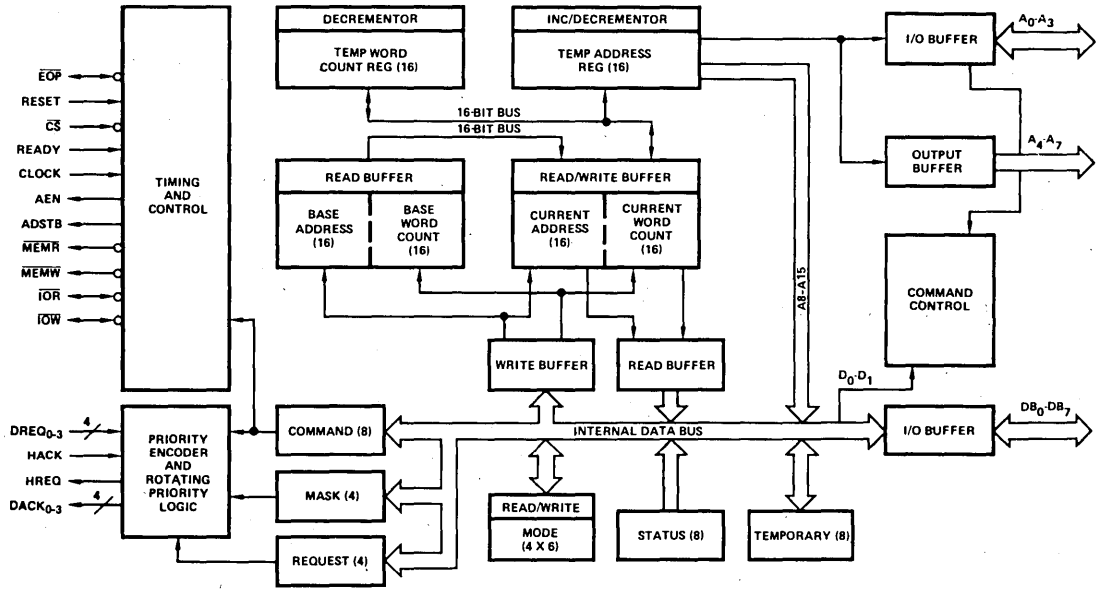
© IC MASTER 1983

Am9517A Direct Memory Access (DMA) Controller

The Am9517A multimode direct memory access controller improves microprocessor system performance by allowing external devices to directly transfer information to or from the system memory or from memory to memory. It offers a wide variety of programmable control features to enhance data throughput and allow dynamic reconfiguration under program control.

The Am9517A contains four independent DMA channels and can be expanded to any number of channels by cascading additional controller chips. Each channel has 64K address and word count capability and can be individually programmed to autoinitialize to its original condition following an End of Process (EOP). Each of the three active transfer modes – Single Word, Block and Demand – can perform Read, Write and Verify transfers. A memory-to-memory option is provided in addition to the standard memory-peripheral DMA transfer capability.

The DMA controller requires a single, 5V supply and is available in either a plastic or hermetic 40-pin DIP.



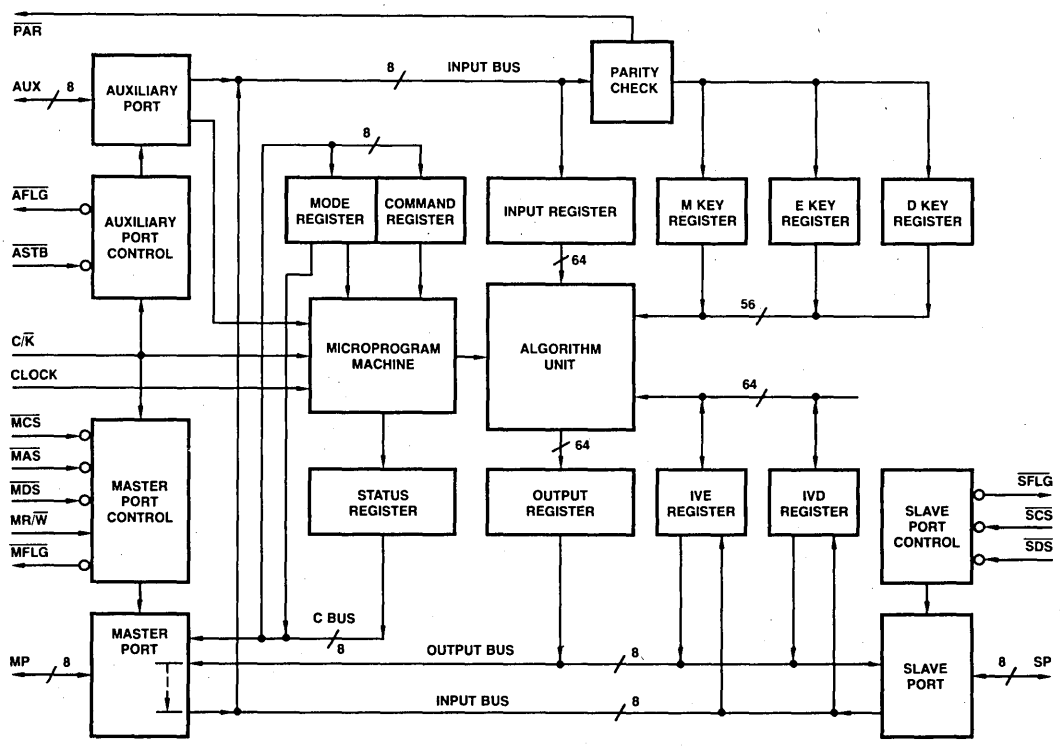
© IC MASTER 1983

Am9518 Data Ciphering Processor (DCP)

The Am9518 data ciphering processor encrypts and decrypts data using the National Bureau of Standards encryption algorithm. It can be used in a variety of environments including dedicated controllers, communication concentrators, terminals and peripheral task processors in general microprocessor systems. The DCP provides throughput rates greater than one megabyte per second using the Cipher Feedback, Electronic Code Book or Chain Block Cipher operating modes. Separate ports are provided for key input, clear data and enciphered data to enhance security.

The Am9518 can be used in 8 or 16-bit microprocessor systems with the CPU programming the DCP through the master port. The DCP can also be configured to accept control information on dedicated control lines, allowing it to be used in 2900 based bit-slice designs, with the control information derived directly from microcode memory. In either configuration, once set up data can flow through the DCP at high rates because input, output and ciphering activities are performed concurrently. Control lines are provided for interfacing to external DMA devices.

The Am9518 requires a single, 5V supply and is available in either a plastic or hermetic 40-pin DIP.



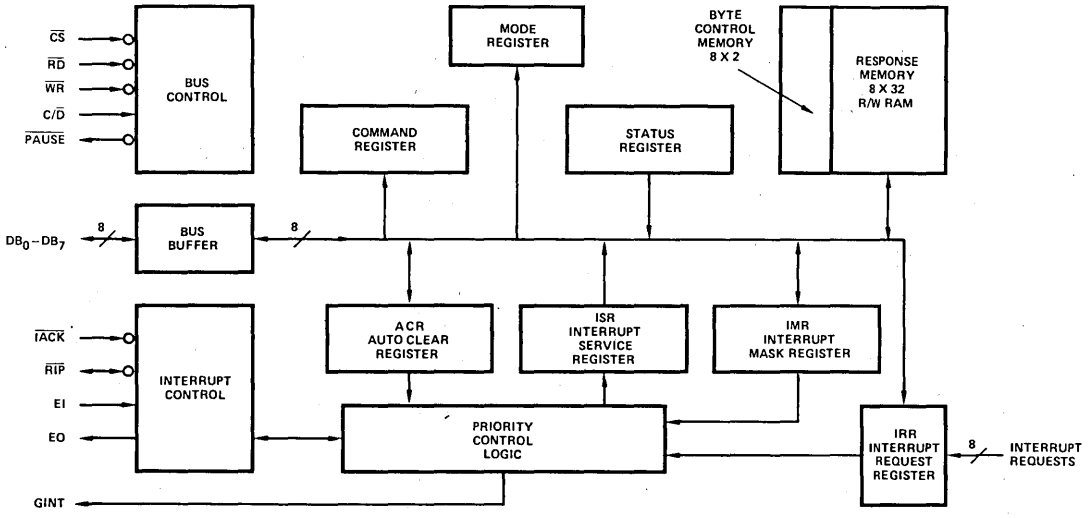
© IC MASTER 1983

Am9519A Interrupt Controller

The Am9519A universal interrupt controller provides a powerful interrupt structure to increase the efficiency and versatility of microcomputer systems. It contains, on one chip, all of the circuitry necessary to detect, prioritize and manage eight vectored interrupts. Its simple expansion structure allows many units to be cascaded for the control of large numbers of interrupts.

When the Am9519A receives an unmasked Interrupt Request, it issues a Group Interrupt output to the CPU. When the interrupt is acknowledged, the controller outputs the one-to-four byte response associated with the highest priority unmasked interrupt request. Since the response bytes are fully programmable, any instruction or vectoring protocol appropriate for the CPU may be used. The ability of the CPU to set interrupt requests under software control permits hardware prioritization of software tasks and aids system diagnostic and maintenance procedures.

The Am9519A requires a single, 5V supply and is available in either a plastic or hermetic 28-pin DIP.



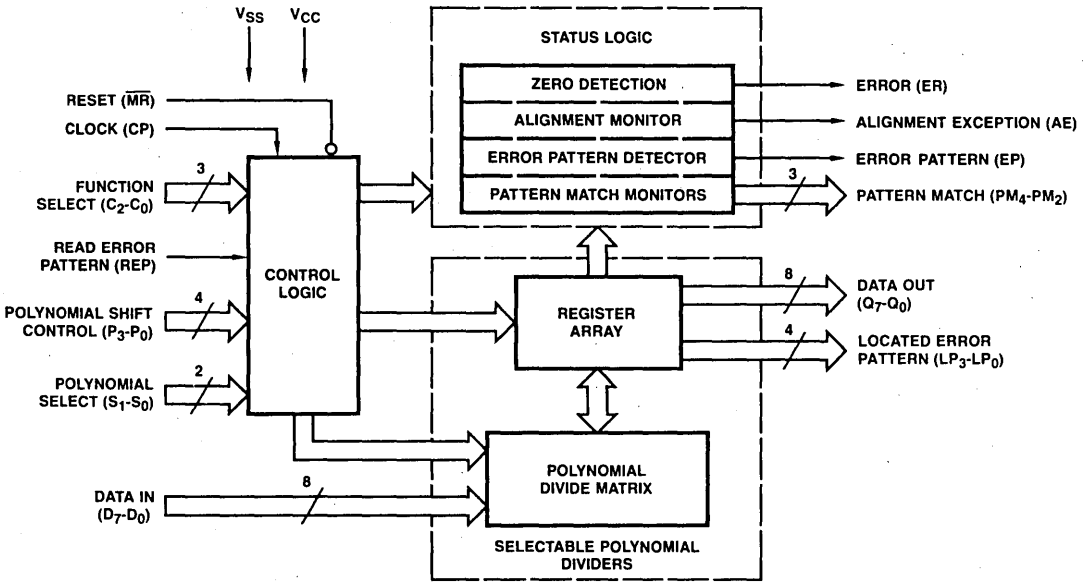
© IC MASTER 1983

Am9520 Burst Error Processor (BEP)

The Am9520 burst error processor provides a tool for implementing the most common error detection and correction schemes in microprocessor-based digital data-handling systems. Because modern disks use high data recording densities, the probability of errors occuring during data recovery is increased. Burst error detection and correction schemes based on Fire codes are used to correct such errors and to enhance the overall disk system performance.

The Am9520 provides four standard polynomials, including the popular 56-bit and 48-bit versions; logic levels on two inputs select the desired polynomial. For encoding, the data stream is divided by a selected polynomial using rules of algebra in polynomial fields. This division results in a remainder which is appended to the data as check bits. For error checking, the bit stream containing both data and check bits is divided by the same selected polynomial. If there are no detectable errors, this division results in a zero remainder. If an error is detected, the Am9520 will extract the burst error pattern and the location of the burst in the data stream.

The Am9520 requires a single-phase clock and a 5V supply. It is packaged in either a plastic or hermetic 40-pin DIP.



© IC MASTER 1983

AMERICAN MICROSYSTEMS, INC.

S6809/S68A09/S68B09

8-BIT MICROPROCESSING UNIT

Features

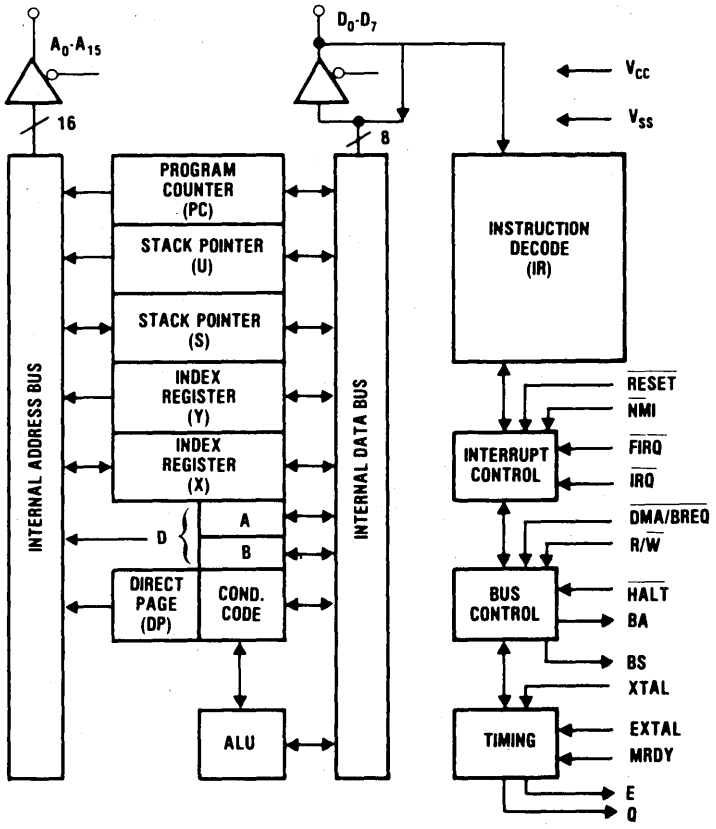
- ☐ Interfaces With All S6800 Peripherals
- ☐ Upward Compatible Instruction Set and Addressing Modes
- ☐ Upward Source Compatible Instruction Set and Addressing Modes
- ☐ Two 8-Bit Accumulators Can Be Concatenated Into One 16-Bit Accumulator
- ☐ On-Chip Crystal Oscillator (4 times XTAL)

General Description

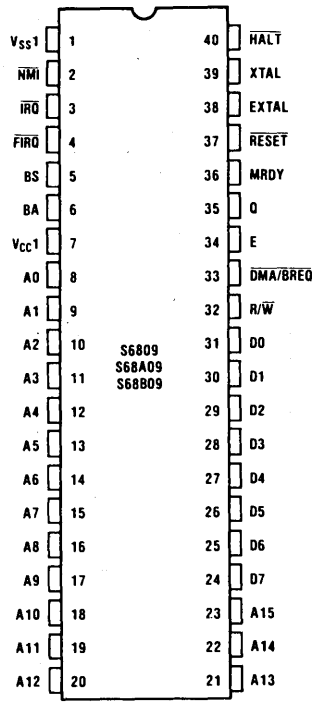
The S6809 is an advanced processor within the S6800 family offering greater throughput, improved byte efficiency, and increased adaptability to various software disciplines. These include position independence, reentrancy, recursion, block structuring, and high level language generation.

Because the S6809 generates *position-independent* code, software can be written in modular form for easy user expansion as system requirements increase. The S6809 is hardware compatible with all S6800 peripherals, and any assembly language code prepared for the S6800 can be passed through the S6809 assembler to produce code which will run on the S6809.

Block Diagram



Pin Configuration



© IC MASTER 1983

AMI

AMERICAN MICROSYSTEMS, INC.

S6805

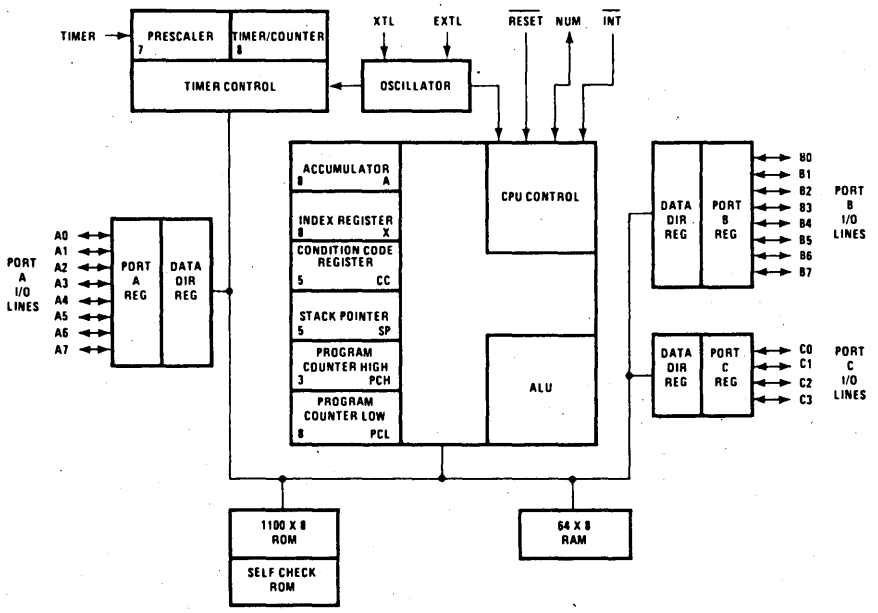
MICROCOMPUTER

Features

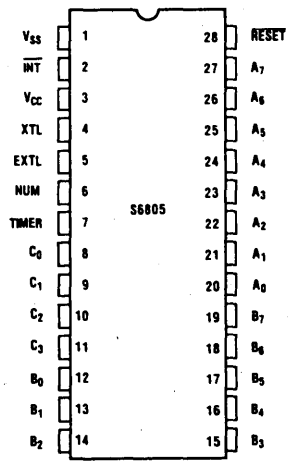
☐ **Hardware**
- 8-Bit Architecture
- 64 Bytes RAM
- 1100 Bytes ROM
- 116 Bytes of Self Check ROM
- 28 Pin Package
- Memory Mapped I/O
- Internal 8-Bit Timer with 7-Bit Prescaler
- Vectored Interrupts — External, Timer, Software, Reset
- 20 TTL/CMOS Compatible I/O Line 8 Lines LED Compatible
- On-Chip Clock Circuit
- Self-Check Capability
- Low Voltage Inhibit
- 5 Vdc Single Supply

☐ **Software**
- Similar to 6800
- Byte Efficient Instruction Set
- Versatile Interrupt Handling
- True Bit Manipulation
- Bit Test and Branch Instruction
- Indexed Addressing for Tables
- Memory Usable as Registers/Flags
- 10 Addressing Modes
- Powerful Instruction Set
  - — All 6800 Arithmetic Instructions
  - — All 6800 Logical Instructions
  - — All 6800 Shift Instructions
  - — Single Instruction Memory Examine/Change
  - — Full Set of Conditional Branches

Block Diagram



Pin Configuration



© IC MASTER 1983

AMERICAN MICROSYSTEMS, INC.

S6551/S68051

ASYNCHRONOUS COMMUNICATION INTERFACE ADAPTER

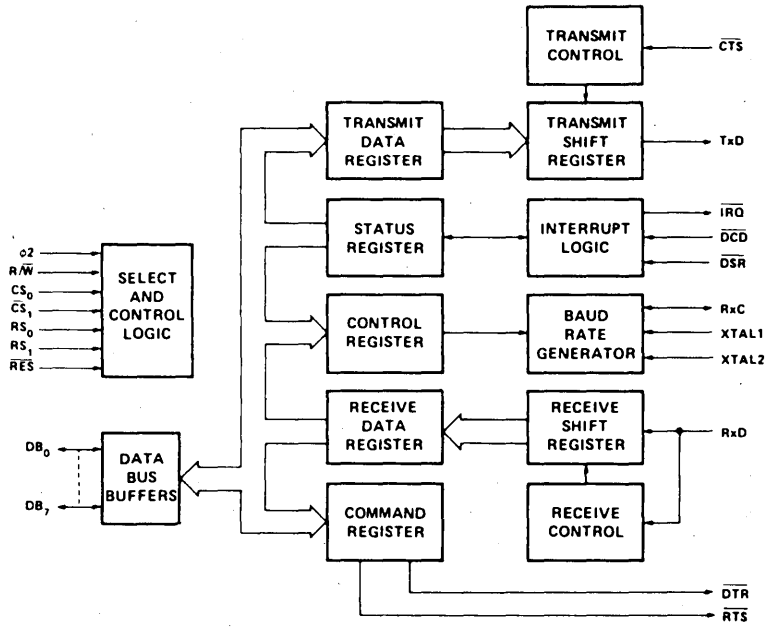
Features

- ☐ On-Chip Baud Rate Generator: 15 Programmable Baud Rates Derived from a Standard 1.8432MHz External Crystal (50 to 19,200 Baud)
- ☐ Programmable Interrupt and Status Register to Simplify Software Design
- ☐ Single +5 Volt Power Supply
- ☐ Serial Echo Mode
- ☐ False Start Bit Detection
- ☐ 8-Bit Bi-Directional Data Bus for Direct Communication With the Microprocessor
- ☐ External 16× Clock Input for Non-Standard Baud Rates (Up to 125K Baud)
- ☐ Programmable: Word Lengths; Number of Stop Bits; and Parity Bit Generation and Detection
- ☐ Data Set and Modem Control Signals Provided
- ☐ Parity: (Odd, Even, None, Mark, Space)
- ☐ Full-Duplex or Half-Duplex Operation
- ☐ 5, 6, 7, 8 and 9-Bit Transmission

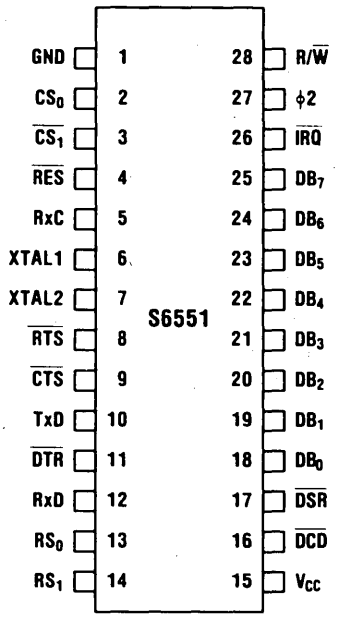
General Description

The S6551/S68051 is an Asynchronous Communication Adapter (ACIA) intended to provide for interfacing the 6500/6800 microprocessor families to serial communication data sets and modems. A unique feature is the inclusion of an on-chip programmable baud rate generator, with a crystal being the only external component required.

Block Diagram



Pin Configuration



© IC MASTER 1983

AMERICAN MICROSYSTEMS, INC.

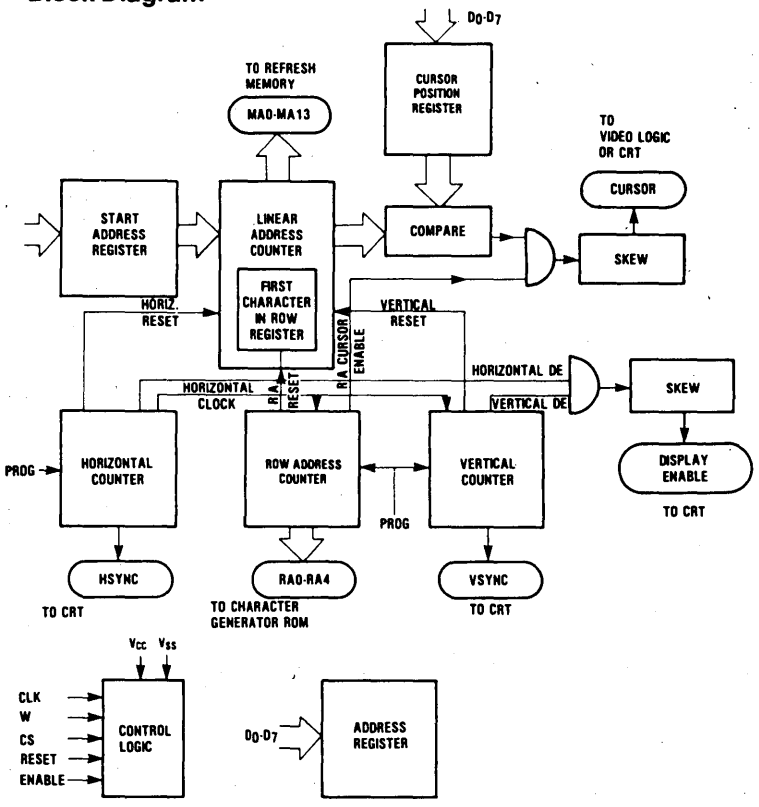
S68045/S68A045/S68B045

CRT CONTROLLER (CRTC)

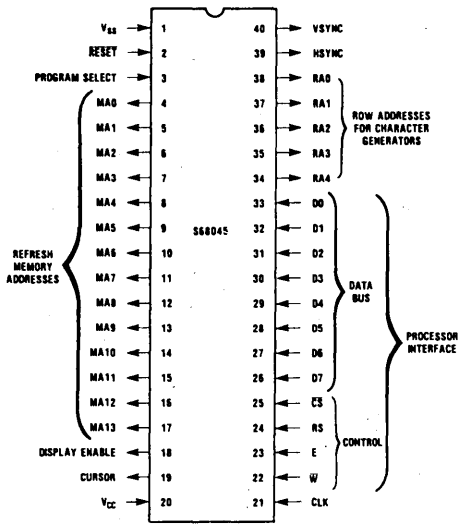
Features

- ☐ Generates Refresh Addresses and Row Selects
- ☐ Generates Video Monitor Inputs: Horizontal and Vertical Sync and Display Enable
- ☐ Low Cost; MC6845/SY6545 Pin Compatible
- ☐ Text Can Be Scrolled on a Character, Line or Page Basis
- ☐ Addresses 16K Bytes of Memory
- ☐ Screen Can Be Up to 128 Characters Tall By 256 Wide
- ☐ Character Font Can Be 32 Lines High With Any Width
- ☐ Two Complete ROM Programs
- ☐ Cursor and/or Display Can Be Delayed 0, 1 or 2 Clock Cycles
- ☐ Four Cursor Modes:
  - Non-Blink
  - Slow Blink
  - Fast Blink
  - Reverse Video With Addition of a Single TTL Gate
- ☐ Three Interlace Modes
  - Normal Sync
  - Interlace Sync
  - Interlace Sync and Video
- ☐ Full Hardware Scrolling
- ☐ NMOS Silicon Gate Technology
- ☐ TTL-Compatible, Single +5 Volt Supply

Block Diagram



Pin Configuration



© IC MASTER 1983

AMERICAN MICROSYSTEMS, INC.

AMU/PR

CMOS 16-BIT MICROPROCESSOR

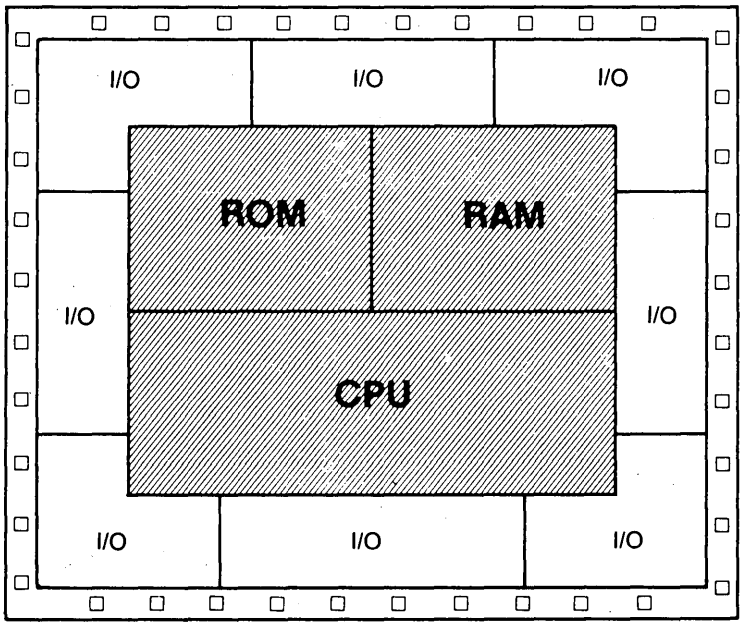
Features

- ☐ CMOS Silicon-Gate Technology
- ☐ 16-Bit Instruction Word
- ☐ Full Minicomputer Instruction Set Capability Including Multiply and Divide
- ☐ Up to 64K Bytes of Addressable Memory
- ☐ 8-Bit Memory Data Bus
- ☐ Advanced Memory-to-Memory Architecture
- ☐ Separate Memory, I/O, and Interrupt-Bus Structures
- ☐ 16 General Registers
- ☐ 5 Prioritized Interrupts
- ☐ Programmed and DMA I/O Capability
- ☐ On-Chip Clock Generator
- ☐ Single 5V Supply
- ☐ 16 General Purpose Flags
- ☐ Power Down State (IDLE)
- ☐ Compatible With All S9900 Peripherals
- ☐ 48-Pin Package

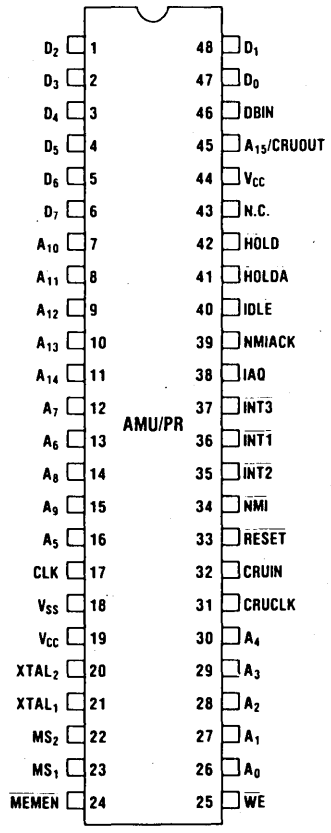
General Description

The AMU/PR is a single-chip 16-bit central processing unit (CPU) produced using an advanced dual-poly CMOS silicon-gate technology. The instruction set includes capabilities offered by full minicomputers and is 9940 compatible. The unique memory-to-memory architecture features multiple register files (resident in memory) which allow faster response to interrupts and increase programming flexibility. The separate bus structure simplifies the system design. AMI provides a compatible set of CMOS memory and support circuits to be used with the AMU/PR system. The AMU Family system is fully supported by software and hardware development systems. The AMU/PR is the prototyping chip for the AMI Alterable Microcomputer Family.

Block Diagram



Pin Configuration



© IC MASTER 1983

AMERICAN MICROSYSTEMS, INC.

S99C91

CMOS 16-BIT MICROPROCESSOR ALTERABLE MICROCOMPUTER FAMILY

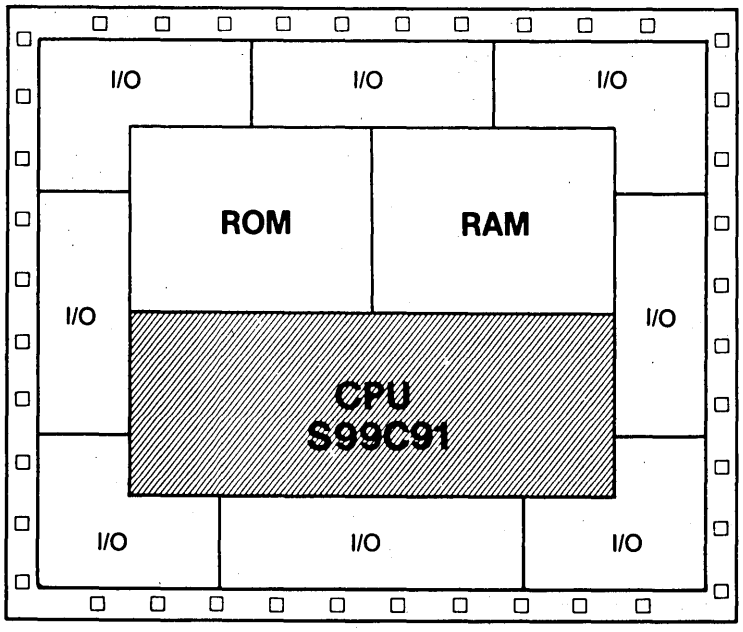
Features

- ☐ CMOS Silicon-Gate Technology
- ☐ 16-Bit Instruction Word
- ☐ Full Minicomputer Instruction Set Capability Including Multiply and Divide
- ☐ Up to 64K Bytes of Addressable Memory
- ☐ 8-Bit Memory Data Bus
- ☐ Advanced Memory-to-Memory Architecture
- ☐ Separate Memory, I/O, and Interrupt-Bus Structures
- ☐ 16 General Registers
- ☐ 4 Prioritized Interrupts
- ☐ Programmed and DMA I/O Capability
- ☐ On-Chip Clock Generator
- ☐ Single 5V Supply
- ☐ 16 General Purpose Flags
- ☐ Power Down State (IDLE)
- ☐ Compatible With All S9900 Peripherals
- ☐ 40-Pin Package

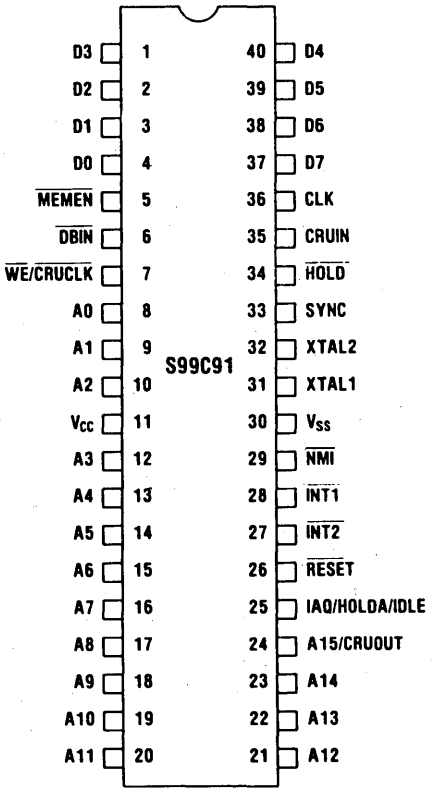
General Description

The S99C91 is a single-chip 16-bit central processing unit (CPU) produced using an advanced dual-poly CMOS silicon-gate technology. The instruction set includes capabilities offered by full minicomputers and is S9940 compatible. The unique memory-to-memory architecture features multiple register files (resident in memory) which allow faster response to interrupts and increase programming flexibility. The separate bus structure simplifies the system design. AMI provides a compatible set of CMOS memory and support circuits to be used with the S99C91 system. The S99C91 is a member of AMI's Alterable Microcomputer Family.

Alterable Microcomputer Functional Block Diagram



Pin Configuration



© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F8 • F3870 • F6800 • F16000
Fairchild Microprocessors

Fairchild microcomputers cover the spectrum from 8-bit MOS to 16-bit bipolar microprocessors:

- **1-chip F387X microcomputer multi-chip F8 family with software and compatibility.**
- **2-chip F6802/6846 combination plus a powerful bus-oriented F6800 family well-supported by a large variety of peripheral devices.**
- **16-bit F9445 bipolar microprocessor.**
- **16-bit F16000 microprocessor family with 32-bit architecture.**
- **I^3L® logic family.**

These products are supported by training courses for the design engineer who must learn to design the microprocessor into a working system and those designers who need to complement their hardware capabilities with software experience or those software types who must gain an intimate knowledge of the hardware. All courses emphasize lots of hands-on time backed by examples to enhance students' working familiarity with each microprocessor.

Courses are offered at Santa Clara, California, or on-site courses may be arranged with a local Fairchild sales office or distributor.

HOW TO ENROLL—Call or write the Microprocessor Division at (408) 773-1000; 3420 Central Expressway, Santa Clara, CA 95051.

FAIRCHILD F3870—The 8-bit single-chip F3870 microcomputer is ideal for high-volume, low-cost applications, featuring a single +5 V power supply, 2048 bytes of ROM, 64 bytes of scratchpad RAM, 32 bits of I/O, and a programmable timer and interrupt.

FAIRCHILD F6800—The 8-bit MOS F6800 family offers a complete and continuously expanding range of microprocessor devices with a powerful instruction set. On the low end there is the F6802/6846 2-chip combination that features a processor chip combination with 128 bytes of on-board RAM, of which 32 bytes have a power-down feature.

The F6800 family is supported by a large array of peripheral devices, which include: ROM, RAM, EPROM, synchronous and asynchronous controller for data communications, timers, direct memory access (DMA), CRT controller, and the F68488 for the IEEE Standard Bus Controller.

FAIRCHILD F9445—The 16-bit F9445 is particularly well-suited to use in high-performance microprocessor systems. Implemented using Fairchild's I^3L bipolar technology and a sophisticated pipeline architecture, it offers very fast execution times, and operates at full speed over the military temperature and voltage ranges.

FAIRCHILD F16000—The 16-bit F16000 family, the CPU of which has a 32-bit internal structure, is designed to significantly reduce software costs while improving software quality.

FAIRCHILD I^3L LOGIC FAMILY—The F9414 four-chip data encryption set implements the data encryption standard (DES) algorithm (FIPS-46) with a data throughput of 75 ns per bit.

© IC MASTER 1983

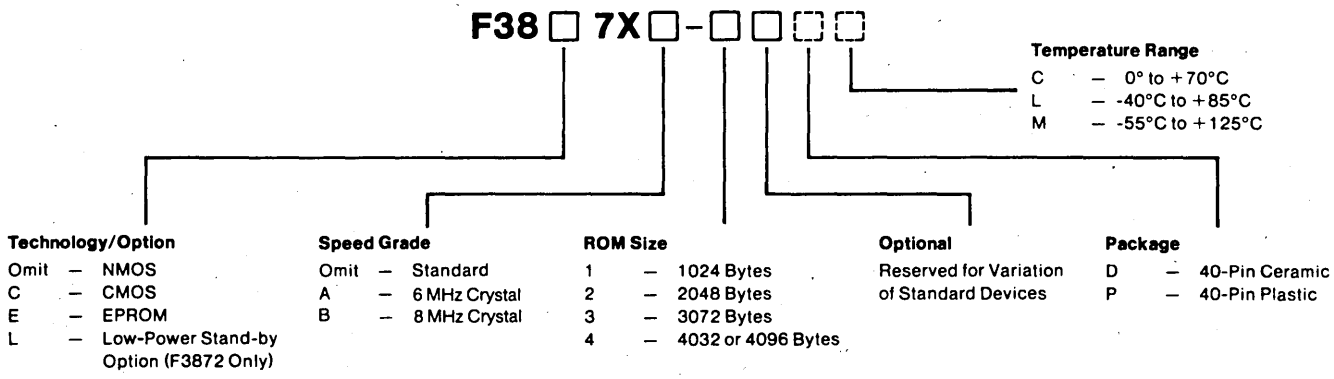
F3870 Single-Chip Microcomputer Series

64-Byte Scratchpad, 32 I/O Lines			
Device	**ROM**	**Power Supply**	**Comment**
F3870-1	1024 x 8	5V ± 10%	—
F3870-2	2048 x 8	5V ± 10%	—
F3870-3	3072 x 8	5V ± 10%	—
F3870-4	4096 x 8	5V ± 10%	—
F38C70-2	2048 x 8	5V	CMOS Version (Available Soon)
F38E70-2	2048 x 8	5V ± 10%	EPROM Version of F3870
F38E70-21	2048 x 8	5V ± 10%	Programming Voltage = 23.5V, Typical
F38E70-22	2048 x 8	5V ± 5%	

F 3872 Single-Chip Microcomputer Series

64-Byte Scratchpad, 32 I/O Lines, 64-Byte Executable RAM			
Device	**ROM**	**Power Supply ±10%**	**Comment**
F3872-1	1024 × 8	5V	—
F3872-2	2048 × 8	5V	—
F3872-3	3072 × 8	5V	—
F3872-4	4032 × 8	5V	—
F38L72-2	2048 × 8	5V	With Low-Power Stand-by RAM Option
F38L72-4	4032 × 8	5V	

Numbering System for Fairchild Single-Chip Microcomputers



Cross Reference

Mostek	Fairchild	Mostek	Fairchild	Mostek	Fairchild	Mostek	Fairchild
MK 3870/10	F3870-1	MK 3870/22	F3872-2	MK 3870/40	F3870-4	MK 2875/42	F38L72-4
MK 3870/12	F3872-1	MK 3870/30	F3870-3	MK 3870/42	F3872-4	MK 38C70/20	F38C70-2
MK 3870/20	F3870-2	MK 3870/32	F3872-3	MK 3875/22	F38L72-2	MK 38P70/02	F38E70-2

Development Board

PEP 38—F38E70, F3872 Prototyping Module

F38E70 Programming Board—Allows programming of F38E70 on commercial PROM programmers that can program 2716-type EPROMs.

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F3870
Single-Chip Microcomputer

Microprocessor Product

Description

The Fairchild single-chip microcomputer series offers a variety of circuits to serve the high-volume, cost-sensitive controller market. The F3870 is a complete 8-bit microcomputer on a single MOS integrated circuit. The F3870 can execute the F8 instruction set of more than 70 commands, allowing expansion into multi-chip configurations with software compatibility. The device features 64 bytes of scratchpad RAM, a programmable binary timer, 32 bits of I/O, a single +5 V power supply requirement, and a choice of 1K, 2K, 3K, or 4K of ROM.

Utilizing Fairchild's double-ion-implanted, N-channel silicon-gate technology and advanced circuit design techniques, the single-chip F3870 offers maximum cost effectiveness in a wide range of control and logic replacement applications.

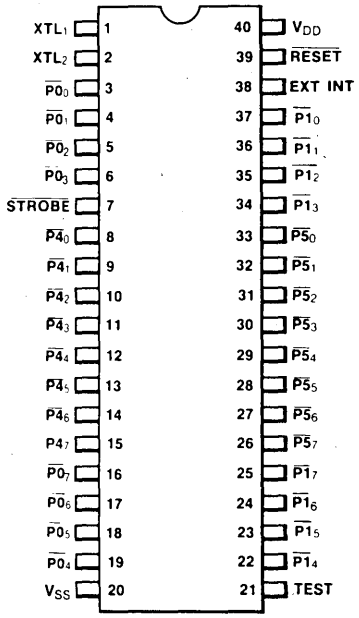
- **Single-Chip Microcomputer**
- **Software-Compatible with F8 Family**
- **1024-, 2048-, 3072-, or 4096-Byte Programmable ROM**
- **64-Byte Scratchpad RAM**
- **32-Bit (4-Port) TTL-Compatible I/O**
- **Programmable Binary Timer:**
  - **Interval Timer Mode**
  - **Pulse Width Measurement Mode**
  - **Event Counter Mode**
- **External Interrupt**
- **Crystal, LC, RC, or External Time Base**
- **Low Power (275 mW, Typical)**
- **Single +5 V ± 10% Power Supply**

Signal Functions

The functions of the F3870 inputs and outputs are described in *Table 1.*

Connection Diagram

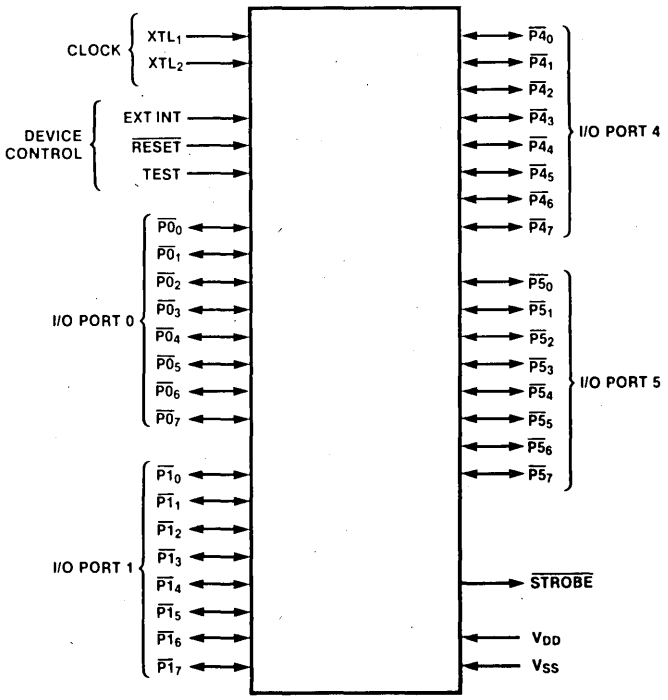
40-Pin DIP



(Top View)

© IC MASTER 1983

Signal Functions



F3870 Architecture

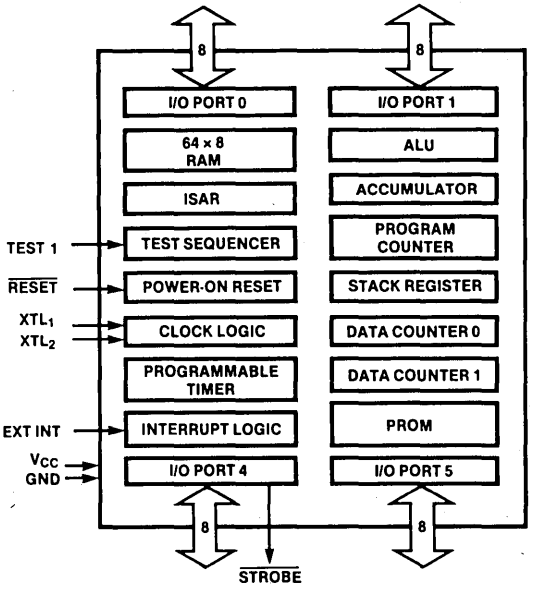


Table 1 Signal Functions

Mnemonic	Pin No.	Name	Description
Device Control			
EXT INT	38	External Interrupt	Software-programmable input that is also used in conjunction with the timer for pulse width measurement and event counting.
$\overline{\text{RESET}}$	39	External Reset	Input that may be used to externally reset the F3870. When pulled low, the F3870 resets; when then allowed to go high, the F3870 begins program execution at program location H'0000'.
TEST	21	Test Line	An input used only in testing the F3870. For normal circuit operation, TEST is left unconnected or grounded.
Clock			
$\overline{\text{STROBE}}$	7	Ready Strobe	Normally high output that provides a single low pulse after valid data is present on the $\overline{P4_0}$-$\overline{P4_7}$ pins during an output instruction.
XTL_1, XTL_2	1, 2	Time Base	Inputs to which a crystal (1 MHz to 4 MHz), LC network, RC network, or external single-phase clock may be connected.
I/O Ports			
$\overline{P0_0}$-$\overline{P0_7}$ $\overline{P1_0}$-$\overline{P1_7}$ $\overline{P4_0}$-$\overline{P4_7}$ $\overline{P5_5}$-$\overline{P5_7}$	3-6, 8-19, 22-37	I/O Ports	Thirty-two bidirectional lines that can be individually used as either TTL-compatible inputs or latched outputs.
Power			
V_{DD}	40	Power Input	+5 V ± 10% power supply
V_{SS}	20	Ground	Signal and power ground

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F38C70 Single-Chip Microcomputer

Microprocessor Product

Description

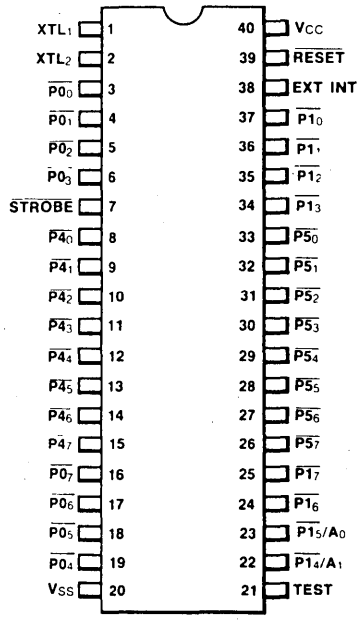
The Fairchild F38C70 8-bit single-chip microcomputer is a member of the F387X series; it executes all of the F8 instruction set and is software-compatible with the F3870. Additional power-save instructions provide two different power-save modes.

Implemented in ion-implanted CMOS doublepoly silicon-gate technology, the F38C70 offers maximum cost effectiveness in a wide range of applications requiring very low power consumption.

More than 70 commands of the F8 instruction set are executed by the single-chip microcomputer, which features 2048 bytes of ROM, 64 bytes of scratchpad RAM, a programmable timer, 32 bits of I/O, and a single +5 V power supply.

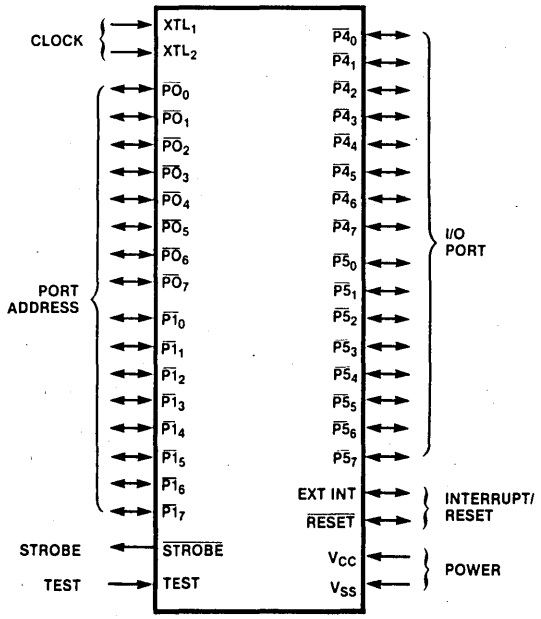
- **Single CMOS Integrated Circuit**
- **Software-Compatible with F8 and F3870**
- **2048-Byte Mask Programmable ROM**
- **64-Byte Scratchpad RAM**
- **32-Bit I/O with Four Options**
- **8-Bit Programmable Timer with 16-Bit Programmable Prescaler**
- **External Interrupt**
- **Crystal, LC, RC, or External Clock**
- **Single +5 V (±10%) Power Supply**
- **Power-Save (PS) and Power-Save All (PSA) Modes**
- **Option for all Short Machine Cycles**
- **Direct Replacement for F3870**
- **Low Power (50 mW typ., 5 mW in PS mode, 0.5 mW in PSA mode)**

Connection Diagram
40-Pin DIP



(Top View)

Signal Functions



© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F38E70
Single-Chip Microcomputer

Microprocessor Product

Description

The Fairchild single-chip microcomputer series offers a variety of circuits for the high-volume, cost-sensitive markets. The F38E70 is a complete 8-bit microcomputer on a single MOS integrated circuit. The F38E70 is functionally identical to the F3870, except the F38E70 has 2K bytes of EPROM in place of 2K bytes of ROM. The F38E70 can execute the F8 instruction set of more than 70 commands. The device features 2048 bytes of EPROM, 64 bytes of scratchpad RAM, a programmable binary timer, 32 bits of I/O, and a single +5 V power supply requirement.

Utilizing Fairchild's double-ion-implant, N-channel technology and advanced circuit design techniques, the single-chip F38E70 offers maximum cost-effectiveness in many low-to-medium volume systems. When production volume requires large quantities, the transition to the mask-programmed F3870 is very straightforward, with no circuit design changes.

- **Single-Chip Microcomputer**
- **Software-Compatible with F8 Family**
- **2048-Byte EPROM (F38E70-2)**
- **64-Byte Scratchpad RAM**
- **32-Bit (4-Port) TTL-Compatible I/O**
- **Programmable Binary Timer**
  - **Interval Timer Mode**
  - **Pulse Width Measurement Mode**
  - **Event Counter Mode**
- **External Interrupt**
- **Crystal, LC, RC, External, or Internal Time Base**
- **Low Power (375 mW Typical)**
- **Single +5 V ±10% Power Supply**
- **Simple EPROM Programming**

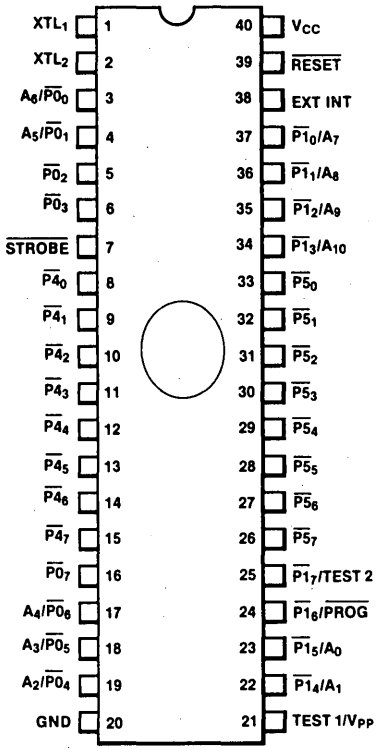
Pin Names

$\overline{P0_0}$-$\overline{P0_7}$	Bidirectional I/O Port 0/Address*
$\overline{P1_0}$-$\overline{P1_7}$	Bidirectional I/O Port 1/Address*
$\overline{P4_0}$-$\overline{P4_7}$	Bidirectional I/O Port 4/Data Out*
$\overline{P5_0}$-$\overline{P5_7}$	Bidirectional I/O Port 5/Data In*
$\overline{STROBE}$	Ready Strobe Output
EXT INT	External Interrupt Input
$\overline{RESET}$	External Reset Input
TEST 1/V_{PP}	Test Line/PROG Voltage Input**
XTL_1, XTL_2	Time Base Input
V_{CC}, GND	Power Supply Lines

*As shown in the connection diagram, some port 0 and port 1 pins are address inputs for programming the F38E70 EPROM section. Ports 4 and 5, Data Out and In, refer to the programming and test modes.

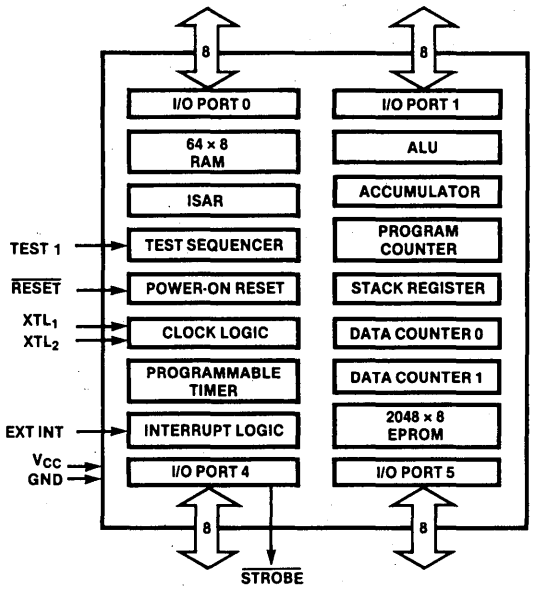
**Caution: applying +25 V to the V_{PP} pin without the presence of V_{CC} will damage the device.

Connection Diagram
40-Pin DIP



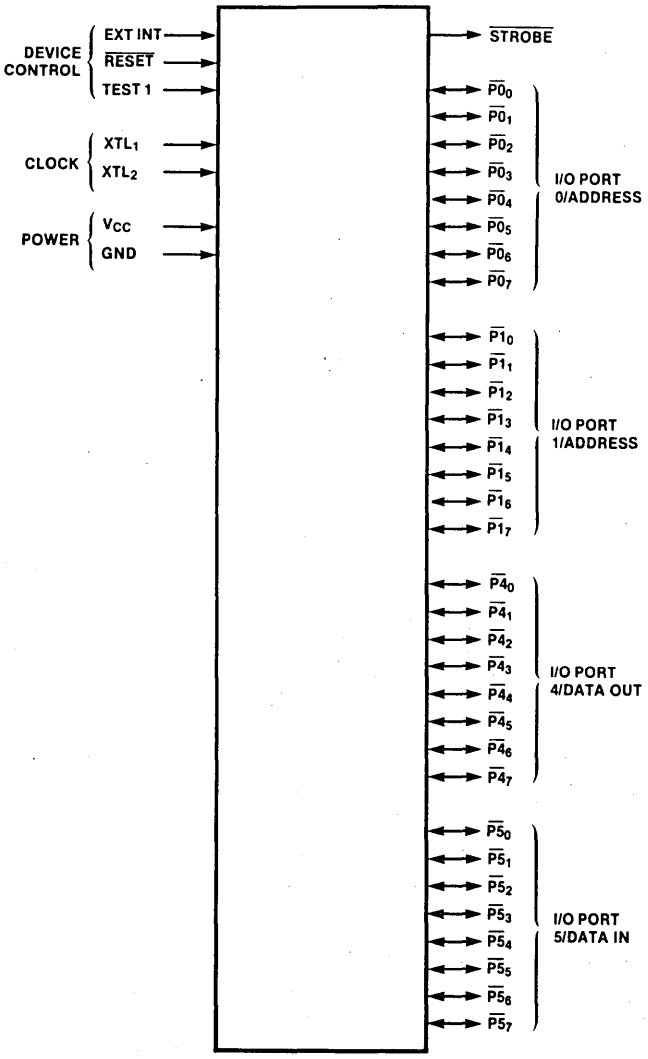
(Top View)

F38E70 Architecture



© IC MASTER 1983

Signal Functions



Device Organization

This section describes the basic functional elements of the F38E70 as shown in *Figure 1*.

Main Control Logic
The instruction register (IR) receives the operation code (OP code) of the instruction to be executed from the program EPROM via the data bus. During all OP code fetches, eight bits are latched into the IR. Some instructions are completely specified by the upper four bits of the OP code. In those instructions, the lower four bits are an immediate register address or an immediate 4-bit operand. Once latched into the IR, the main control logic decodes the instruction and provides the necessary control gating signals to all circuit elements.

EPROM Address Registers
There are four 11-bit registers associated with the 2K x 8 EPROM. These are the program counter (P0), the stack register (P), the data counter (DC), and the auxiliary data counter (DC1). The program counter is used to address instructions or immediate operands. The stack register is used to save the contents of P0 during an interrupt or subroutine cell. Thus, P contains the return address at which processing is to resume upon completion of the subroutine or the interrupt routine.

The data counter (DC) is used to address data tables. This register is auto-incrementing. Of the two data counters, only DC can access the EPROM. However, the XDC instruction allows DC and DC1 to be exchanged.

Associated with the address registers is an 11-bit adder/incrementer. This logic element is used to increment P0 or DC when required, and is also used to add displacements to P0 on relative branches or to add the accumulator contents to DC1 with the ADC (add data counter) instruction.

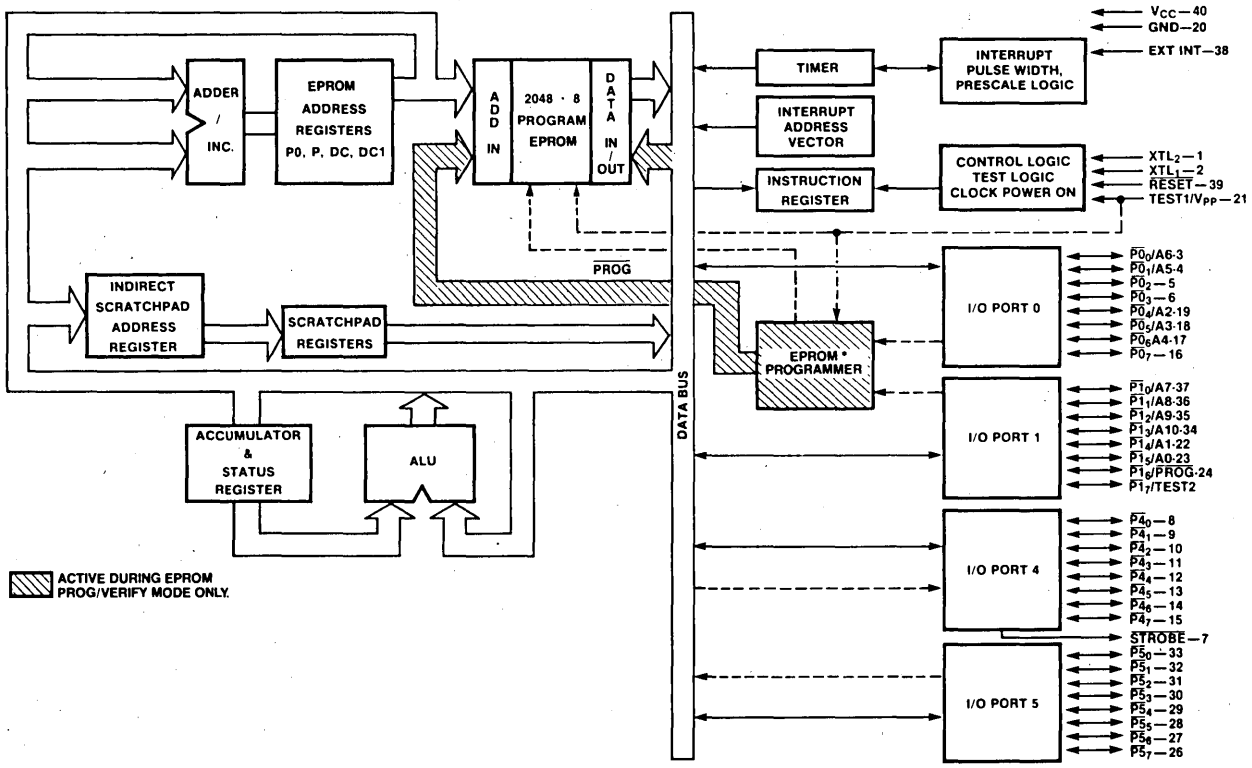
2048 x 8 EPROM
The microcomputer program and data constants are stored in the program EPROM. When an EPROM access is required, the appropriate address register (P0 or DC) is gated onto the EPROM address bus and the EPROM output is gated onto the main data bus. The first byte in the EPROM is location zero.

Scratchpad and ISAR
The scratchpad provides 64 8-bit registers that may be used as general-purpose read/write data memory. The indirect scratchpad address register (ISAR) is a 6-bit register used to address the 64 registers. All 64 registers may be accessed using ISAR. In addition, the lower order 12 registers may also be directly addressed.

The ISAR can be visualized as holding two octal digits. This division of ISAR is important, since a number of instructions increment or decrement only the least significant three bits of ISAR when referencing scratchpad bytes via ISAR. This makes it easy to reference a buffer consisting of up to eight contiguous scratchpad bytes. For example, when the low-order octal digit is incremented or decremented, ISAR is incremented from 27_8 to 20_8 or is decremented from 20_8 to 27_8. This feature of the ISAR is very useful in many

© IC MASTER 1983

Fig. 1 Block Diagram



Pin Functions

Pin Name	Type	Description
$\overline{P0}_0$-$\overline{P0}_7$ $\overline{P1}_0$-$\overline{P1}_7$ $\overline{P4}_0$-$\overline{P4}_7$ $\overline{P5}_0$-$\overline{P5}_7$	Input/Output	Thirty-two lines that can be individually used as either TTL-compatible inputs or as latched outputs. For EPROM programming, 11 lines of ports 0 and 1 are used as address inputs and one line of port 1 is a program control. Port 5 is EPROM data input, and port 4 is EPROM output for verification.
$\overline{STROBE}$	Output	This pin, which is normally HIGH, provides a single LOW pulse after valid data is present on the $\overline{P4}_0$-$\overline{P4}_7$ pins during an output instruction.
$\overline{RESET}$	Input	$\overline{RESET}$ may be used to externally reset the F38E70. When pulled LOW, the F38E70 resets. When then allowed to go HIGH, the F38E70 begins program execution at the program location H '0000'. RESET is held LOW during EPROM programming.
EXT INT	Input	The external interrupt input. Its active state is software-programmable. This input is also used in conjunction with the timer for pulse width measurement and event counting.
XTL_1, XTL_2	Input	The time base inputs to which a crystal (1 to 4 MHz), LC network, RC network, or an external single-phase clock may be connected. If timing is not critical, the F38E70 operates from its internal oscillator with no external components.
TEST 1/V_{PP}	Input	An input used only in testing and programming the F38E70. For normal circuit functionality, this pin is left unconnected or may be grounded. For EPROM programming, the test pin is connected to the programming voltage (typically 23 V).
$P1_7$/TEST 2	Input	I/O during normal operation; must be HIGH when in verify mode.
V_{CC}	Power	V_{CC} is the power supply input (+5 V ± 10%).

© IC MASTER 1983

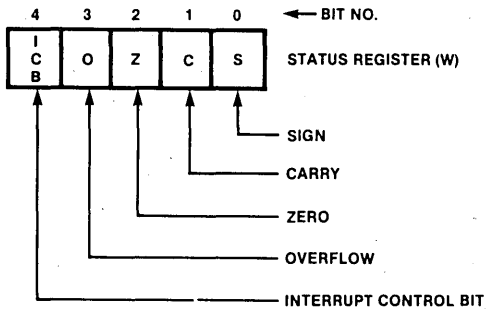
program sequences. All six bits of ISAR may be loaded at one time, or either half may be loaded independently.

Scratchpad registers 9 through 15 (decimal) are given mnemonic names (J, H, K, and Q) because of special linkages between these registers and other registers, such as a stack register. These special linkages facilitate the implementation of multi-level interrupts and subroutine nesting. For example, the instruction LR K, P stores the lower eight bits of the stack register into register 13 (K lower, or KL) and stores the upper three bits of P into the three least significant bits of register 12 (K upper, or KU).

Arithmetic and Logic Unit (ALU)
After receiving commands from the main control logic, the ALU performs the required arithmetic or logic operations (using the data presented on the two input busses) and provides the result on the result bus. The arithmetic operations that can be performed in the ALU are binary add, decimal adjust, add with carry, decrement, and increment. The logic operations that can be performed are AND, OR, exclusive-OR, ones complement, shift right, and shift left. Besides providing the result on the result bus, the ALU also provides four signals representing the status of the result. These signals, stored in the status register (W), represent the CARRY, OVERFLOW, SIGN, and ZERO condition of the result of the operation.

Accumulator
The accumulator (ACC) is the principal register for data manipulation within the F38E70. The ACC serves as one input to the ALU for arithmetic or logical operations. The results of ALU operations are stored back into the ACC.

Status Register
The status register (W) holds five status flags, as follows:



Summary of Status Bits

$$\text{OVERFLOW} = \text{CARRY}_7 \oplus \text{CARRY}_6$$

$$\text{ZERO} = \overline{ALU_7} \wedge \overline{ALU_6} \wedge \overline{ALU_5} \wedge \overline{ALU_4} \wedge \overline{ALU_3} \wedge \overline{ALU_2} \wedge \overline{ALU_1} \wedge \overline{ALU_0}$$

$$\text{CARRY} = \text{CARRY}_7$$

$$\text{SIGN} = \overline{ALU_7}$$

Interrupt Control Bit—The ICB may be used to allow or disallow interrupts in the F38E70. This bit is not the same as the two interrupt enable bits in the interrupt control port (ICP). If the ICB is set and the F38E70 interrupt logic communicates an interrupt request to the CPU section, the interrupt is acknowledged and processed upon completion of the first non-privileged instruction. If the ICB is cleared, an interrupt request is not acknowledged or processed until the ICB is set again.

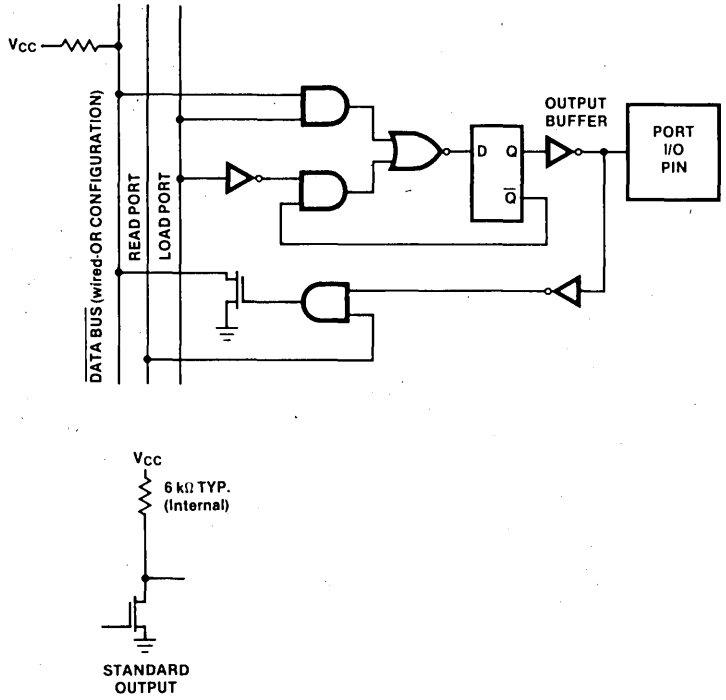
I/O Ports
The F38E70 provides four complete bidirectional input/output ports: these are ports 0, 1, 4, and 5. An output instruction (OUT or OUTS) causes the contents of the ACC to be latched into the addressed port. An input instruction (IN or INS) transfers the contents of the port to the ACC (port 6 is an exception, which is described later). The I/O buffers on the F38E70 are logically inverted. The schematic of an I/O port is shown in *Figure 2*.

An output ready strobe is associated with port 4. This flag may be used to signal a peripheral device that the F38E70 has just completed an output of new data to port 4. The strobe provides a single low pulse shortly after the output operation is completed, so either edge may be used to signal the peripheral. The $\overline{\text{STROBE}}$ signal may also be used to request new input information from a peripheral simply by doing a dummy output of H '00' to port 4 after completing the input operation.

Timer and Interrupt Control Port
The timer is an 8-bit binary down counter that is software-programmable to operate in one of three modes: the interval timer mode, the pulse width measurement mode, or the event counter mode (the timer characteristics are described in *Table 1*). As shown in *Figure 3*, associated with the timer are an 8-bit register called the interrupt control port, a programmable prescaler, and an 8-bit modulo-N register; *Figure 4* illustrates the timer/interrupt function.

© IC MASTER 1983

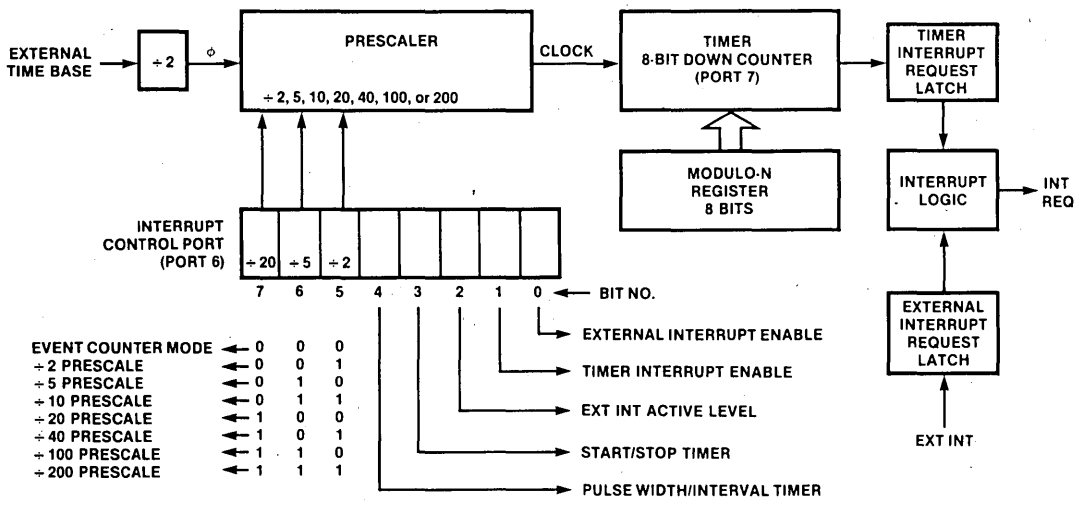
Fig. 2 I/O Port Diagram



All ports are standard output type only.

The $\overline{\text{STROBE}}$ output is always configured similar to a standard output, except that it is capable of driving three TTL loads.

Fig. 3 Timer and Interrupt Control Port Block Diagram



See *Figure 4* for a more detailed functional diagram.

© IC MASTER 1983

Table 1 Timer Characteristics

Definitions	
Error = indicated time value – actual time value	
tpsc = tϕ × prescale value	
Interval Timer Mode	
Single interval error, free-running (note 3)	± 6tϕ
Cumulative interval error, free-running (note 3)	0
Error between two timer reads (note 2)	± (tpsc + tϕ)
Start timer to stop timer error (notes 1, 4)	+ tϕ to – (tpsc + tϕ)
Start timer to read timer error (notes 1, 2)	– 5tϕ to – (tpsc + 7tϕ)
Start timer to interrupt request error (notes 1, 3)	– 2tϕ to – 8tϕ
Load timer to stop timer error (note 1)	+ tϕ to – (tpsc + 2tϕ)
Load timer to read timer error (notes 1, 2)	– 5tϕ to – (tpsc + 8tϕ)
Load timer to interrupt request error (notes 1, 3)	– 2tϕ to – 9tϕ
Pulse Width Measurement Mode	
Measurement accuracy (note 4)	+ tϕ to – (tpsc + 2tϕ)
Minimum pulse width of EXT INT pin	2tϕ
Event Counter Mode	
Minimum active time of EXT INT pin	2tϕ
Minimum inactive time of EXT INT pin	2tϕ

Notes
1. All times that entail loading, starting, or stopping the timer are referenced from the end of the last machine cycle of the OUT or OUTS instruction.
2. All times that entail reading the timer are referenced from the end of the last machine cycle of the IN or INS instruction.
3. All times that entail the generation of an interrupt request are referenced from the start of the machine cycle in which the appropriate interrupt request latch is set. Additional time may elapse if the interrupt request occurs during a privileged or multi-cycle instruction.
4. Error may be cumulative if operation is repetitively performed.

The desired timer mode, prescale value, starting and stopping the timer, active level of EXT INT pin, and local enabling or disabling of interrupts are selected by outputting the proper bit configuration from the accumulator to the interrupt control port (port 6) with an OUT or OUTS instruction. Bits within the interrupt control port are defined as follows:

Interrupt Control Port (Port 6)
Bit 0 — External Interrupt Enable
Bit 1 — Timer Interrupt Enable
Bit 2 — EXT INT Active Level
Bit 3 — Start/Stop Timer
Bit 4 — Pulse Width/Interval Timer
Bit 5 — ÷ 2 Timer Prescale Values
Bit 6 — ÷ 5 Timer Prescale Values
Bit 7 — ÷ 20 Timer Prescale Values

A special situation exists when reading the interrupt control port (with an IN or INS instruction). The accumulator is **not** loaded with the content of the ICP; instead, accumulator bits 0 through 6 are loaded with 0s, while bit 7 is loaded with the logic level being applied to the EXT INT pin, thus allowing the status of EXT INT to be determined without the necessity of servicing an external interrupt request. This capability is useful in establishing a high-speed polled handshake procedure or for using EXT INT as an extra input pin if external interrupts are not required and the timer is used only in the interval timer mode.

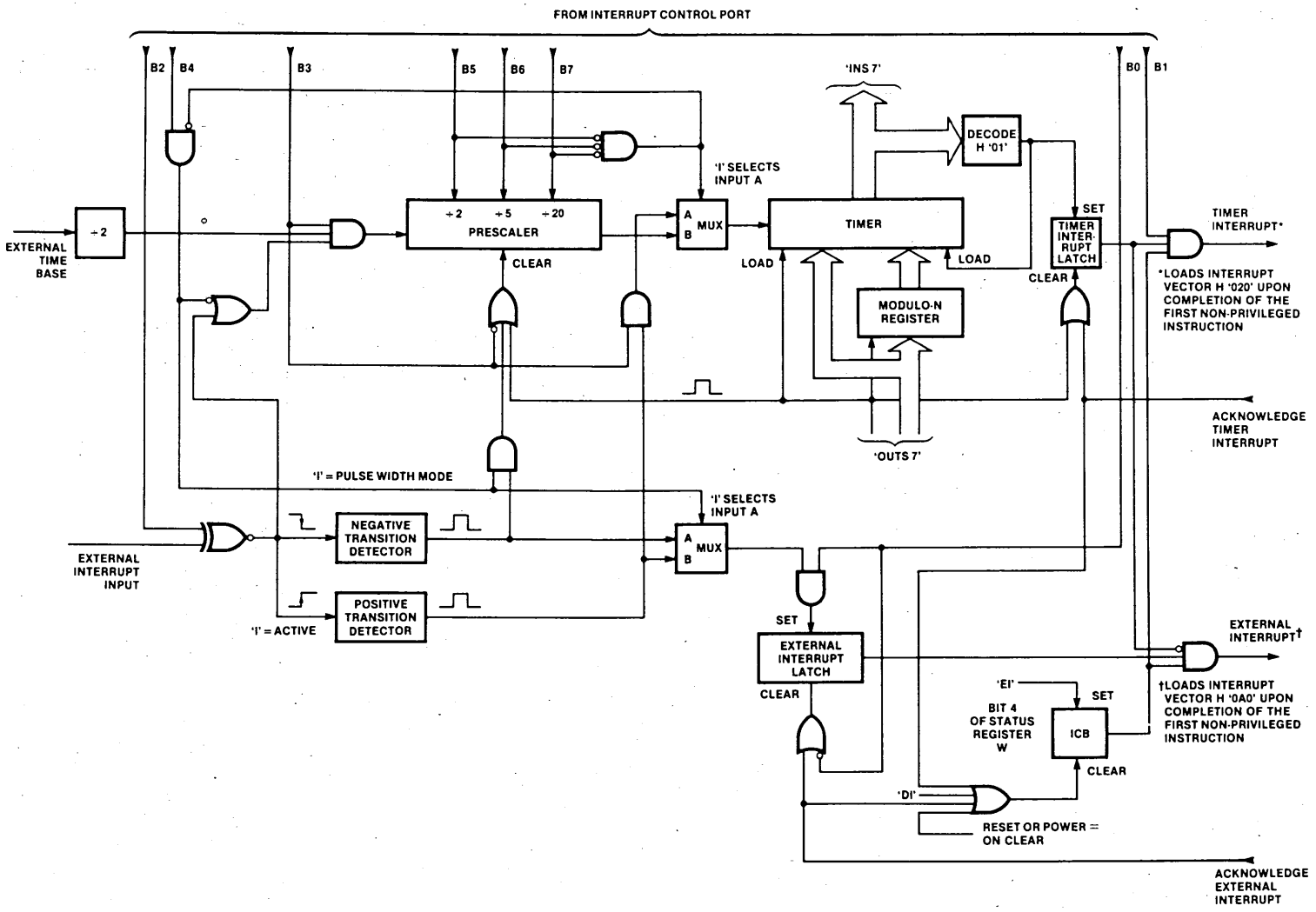
The rate at which the timer is clocked in the interval timer mode is determined by the frequency of an internal ϕ clock and by the division value selected for the prescaler. (The internal ϕ clock operates at one-half the external time base frequency.) If ICP bit 5 is set and bits 6 and 7 are cleared, the prescaler divides ϕ by two. Likewise, if bit 6 or 7 is individually set, the prescaler divides ϕ by 5 or 20, respectively. Combinations of bits 5, 6, and 7 may also be selected. For example, if bits 5 and 7 are set while 6 is cleared, the prescaler divides by 40. Thus, possible prescaler values are ÷ 2, ÷ 5, ÷ 10, ÷ 20, ÷ 40, ÷ 100, and ÷ 200.

Any of three conditions causes the prescaler to be reset: when the timer is stopped by clearing the ICP bit 3, on execution of an output instruction to port 7 (the timer is assigned port address 7), or on the trailing edge transition of the EXT INT pin when in the pulse width measurement mode. These last two conditions are explained in more detail below.

An OUT or OUTS instruction to port 7 loads the content of the accumulator to both the timer and the 8-bit modulo-N register, resets the prescaler, and clears any previously stored timer interrupt request. As previously noted, the timer is an 8-bit down counter that is clocked by the prescaler in the interval timer mode and in the pulse width measurement mode. The prescaler is not used in the event counter mode. The modulo-N register is a buffer whose function is to save the value that was most recently output to port 7. The modulo-N register is used in all three timer modes.

© IC MASTER 1983

Fig. 4 Timer/Interrupt Functional Diagram



© IC MASTER 1983

Interval Timer Mode—When ICP bit 4 is cleared (logic 0) and at least one prescale bit is set, the timer operates in the interval timer mode. When bit 3 of the ICP is set, the timer starts counting down from the modulo-N value. After counting down to H '01', the timer returns to the modulo-N value at the next count. On the transition from H '01' to H 'N', the timer sets a timer interrupt request latch. Note that the interrupt request latch is set by the transition of H 'N' in the timer, thus allowing a full 256 counts if the modulo-N register is preset to H '00'. If bit 1 of the ICP is set, the interrupt request is passed on to the CPU section of the F38E70. However, if bit 1 of the ICP is a logic 0, the interrupt request is not passed on to the CPU section but the interrupt request latch remains set. If ICP bit 1 is subsequently set, the interrupt request is then passed on to the CPU section. (Recall from the discussion of the status register interrupt control bit that the interrupt request is acknowledged by the CPU section only if ICB is set.) Only two events can reset the timer interrupt request latch: when the timer interrupt request is acknowledged by the CPU section, or when a new load of the modulo-N register is performed.

Consider an example in which the modulo-N register is loaded with H '64' (decimal 100). The timer interrupt request latch is set at the 100th count following the timer start, and the timer interrupt request latch is repeatedly set on precise 100-count intervals. If the prescaler is set at ÷40, the timer interrupt request latch is set every 4000 ϕ clock periods. For a 2 MHz ϕ clock (4 MHz time base frequency), this produces 2 ms intervals.

The range of possible intervals is from 2 to 51,200 ϕ clock periods (1 μs to 25.6 ms for a 2 MHz ϕ clock). However, approximately 50 ϕ periods is a practical minimum because the time between setting the interrupt request latch and the execution of the first instruction of the interrupt service routine is at least 29 ϕ periods (the response time is dependent upon how many privileged instructions are encountered when the request occurs). To establish time intervals greater than 51,200 ϕ clock periods is simply a matter of using the timer interrupt service routine to count the number of interrupts, saving the result in one or more of the scratchpad registers until the desired interval is achieved. With this technique, virtually any time interval, or several time intervals, may be generated.

The timer may be read at any time and in any mode using an input instruction (IN 7 or INS 7) and may take place "on-the-fly" without interfering with normal timer operation. Also, the timer may be stopped at any time by clearing bit 3 of the ICP. The timer holds its current contents indefinitely and resumes counting when bit 3 is again set. Recall, however, that the prescaler is reset whenever the timer is stopped; thus, a series of starting and stopping results in a cumulative truncation error.

A summary of other timer errors is given in the timing section. For a free-running timer in the interval timer mode, the time interval between any two interrupt requests may be in error by ± 6 ϕ clock periods, although the cumulative error over many intervals is zero. The prescaler and timer generate precise intervals for setting the timer interrupt request latch, but the time-out may occur at any time within a machine cycle. (There are two types of machine cycles: short cycles, which consist of 4 ϕ clock periods, and long cycles, which consist of 6 ϕ clock periods.) In the multi-chip F8 family, there is a signal called the write clock that corresponds to a machine cycle. Interrupt requests are synchronized with the internal write clock, thus giving rise to the possible ± 6 ϕ error. Additional errors may arise due to the interrupt request occurring while a privileged instruction or multi-cycle instruction is being executed. Nevertheless, for most applications all of the above errors are negligible, especially if the desired time interval is greater than 1 ms.

Pulse Width Measurement Mode—When ICP bit 4 is set (logic 1) and at least one prescale bit is set, the timer operates in the pulse width measurement mode. This mode is used for accurately measuring the duration of a pulse applied to the EXT INT pin. The timer is stopped and the prescaler is reset whenever EXT INT is at its inactive level. The active level of EXT INT is defined by ICP bit 2: if cleared, EXT INT is active LOW; if set, EXT INT is active high. If ICP bit 3 is set, the prescaler and timer start counting when EXT INT transitions to the active level. When EXT INT returns to the inactive level, the timer stops, the prescaler resets, and, if ICP bit 0 is set, an external interrupt request latch is set. (Unlike timer interrupts, external interrupts are not latched if the ICP interrupt enable bit is not set.)

As in the interval timer mode, the timer may be read at any time and may be stopped at any time by clearing ICP bit 3; the prescaler and ICP bit 1 function as previously described, and the timer still functions as an 8-bit binary down counter, with the timer interrupt request latch being set on the timer transition from H '01' to H 'N'. Note that the EXT INT pin has nothing to do with loading the timer; its action is that of automatically starting and stopping the timer and of generating external interrupts. Pulse widths longer than the prescale value times the modulo-N value are easily measured by using the timer interrupt service routine to store the number of timer interrupts in one or more scratchpad registers.

© IC MASTER 1983

As for accuracy, the actual pulse duration is typically slightly longer than the measured value because the status of the prescaler is not readable and is reset when the timer is stopped. Thus, for maximum accuracy, it is advisable to use a small division setting for the prescaler.

Event Counter Mode—When ICP bit 4 is cleared and all prescale bits (ICP bits 5, 6, and 7) are cleared, the timer operates in the event counter mode. This mode is used for counting pulses applied to the EXT INT pin. If ICP bit 3 is set, the timer decrements on each transition from the inactive level to the active level of the EXT INT pin. The prescaler is not used in this mode, but, as in the other two timer modes, the timer may be read at any time and may be stopped at any time by clearing ICP bit 3; ICP bit 1 functions as previously described, and the timer interrupt request latch is set on the timer transition from H '01' to H 'N'.

Normally, ICP bit 0 should be kept cleared in the event counter mode; otherwise, external interrupts are generated on the transition from the inactive level to the active level of the EXT INT pin.

For the event counter mode, the minimum pulse width required on EXT INT is 2 ϕ clock periods and the minimum inactive time is 2 ϕ clock periods; therefore, the maximum repetition rate is 500 Hz.

External Interrupts
When the timer is in the interval timer mode, the EXT INT pin is available for non-timer-related interrupts. If ICP bit 0 is set, an external interrupt request latch is set when there is a transition from the inactive level to the active level of EXT INT. (EXT INT is an edge-triggered input.) The interrupt request is latched either until acknowleged by the CPU section or until ICP bit 0 is cleared (unlike timer interrupt requests, which remain latched even when ICP bit 1 is cleared). External interrupts are handled in the same fashion when the timer is in the pulse width measurement mode or in the event counter mode, except that only in the pulse width measurement mode is the external interrupt request latch set on the trailing edge of EXT INT, that is, on the transition from the active level to the inactive level.

Interrupt Handling
When either a timer or an external interrupt request is communicated to the CPU section of the F38E70, it is acknowledged and processed at the completion of the first non-privileged instruction if the interrupt control bit of the status register is set. If the interrupt control bit is not set, the interrupt request continues until either the interrupt control bit is set and the CPU section acknowledges the interrupt or the interrupt request is cleared as previously described.

If there are both a timer interrupt request and an external interrupt request when the CPU section starts to process the requests, the timer interrupt is handled first.

When an interrupt is allowed, the CPU section requests that the interrupting element pass its interrupt vector address to the program counter via the data bus. The vector address for a timer interrupt is H '020'. The vector address for external interrupts is H '0A0'. After the vector address is passed to the program counter, the CPU section sends an acknowledge signal to the appropriate interrupt request latch, which clears that latch. The execution of the interrupt service routine then commences. The return address of the original program is automatically saved in the stack register, P.

Power-on Clear
When power is applied to the F38E70, the program counter and the ICB bit of the status register are cleared. Ports 4, 5, 6, and 7 are loaded with H '00' (thus, the I/O pins for ports 4 and 5 are at V_{OH}). The contents of other registers and ports are undefined. The first program instruction is then fetched from EPROM location H '000'.

External Reset
When $\overline{\text{RESET}}$ is taken LOW, the content of the program counter is pushed to the stack register, and the program counter and the ICB bit of the status register are then cleared. The original stack register content is lost. As with power-on clear, ports 4, 5, 6, and 7 are loaded with H '00'. The contents of all other registers and ports are unchanged. When $\overline{\text{RESET}}$ is taken HIGH, the first program instruction is fetched from EPROM location H '000'.

Test Logic
Special test logic is implemented to allow access to the internal main data bus for test purposes.

In normal operation, the TEST pin is unconnected or is connected to GND. When TEST is placed at a TTL level (2.0 V to 2.6 V), port 4 becomes an output of the internal data bus and port 5 becomes a wired-OR input to the internal data bus. The data appearing on the port 4 pins is logically true, whereas input data forced on port 5 must be logically false. When TEST is placed at a HIGH level (6.0 V to 7.0 V), the ports act as above and, additionally, the 2K x 8 program ROM is prevented from driving the data bus. In this mode, operands and

© IC MASTER 1983

instructions may be forced externally through port 5 instead of being accessed from the program ROM. When TEST is in either the TTL state or the HIGH state, STROBE ceases its normal function and becomes a cycle clock (identical to the F8 multi-chip system write clock, except inverted).

Timing complexities render the capabilities associated with the TEST pin impractical for use in a user's application, but these capabilities are sufficient to enable Fairchild to implement a rapid method for thoroughly testing the F38E70.

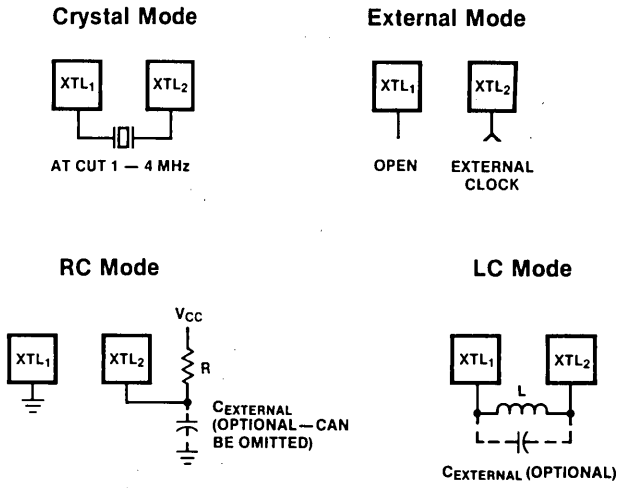
F38E70 Clocks

The time base for the F38E70 may originate in one of four external sources. The four external configurations are shown in *Figure 5*. There is an internal 20 pF capacitor between XTL_1 and GND, and also between XTL_2 and GND. Thus, external capacitors are not required. In all external clock modes, the external time base frequency is divided by two to form the internal ϕ clock.

Instruction Set

The F38E70 executes the entire instruction set of the multi-chip F8 family (F3850 family). Of course, the STORE instruction is of little use in the F38E70 because only read-only memory exists in the addressing range of the data counter (the data counter, however, is incremented if STORE is executed).

Fig. 5 Clock Configurations



Minimum $R = 4k\Omega$

$C = 20.5\ pF \pm 2.5\ pF + C_{EXTERNAL}$

$f_{MIN} \cong \frac{1}{1.1\,RC + 65\ ns}$

$f_{MAX} \cong \frac{1}{1.0\,RC + 15\ ns}$

Example with $C_{EXTERNAL} = 0$

$R = 15\ k\Omega \pm 5\%$

$f \cong 2.9\ MHz \pm 26\%$

Minimum $L = 0.1$ mH

Minimum $Q = 40$

Maximum $C_{EXTERNAL} = 30$ pF

$C = 10\ pF \pm 1.3\ pF + C_{EXTERNAL}$

$f \cong \frac{1}{2\pi\sqrt{LC}}$

Example with $C_{EXTERNAL} = 0$

$L = 0.3\ mH \pm 10\%$

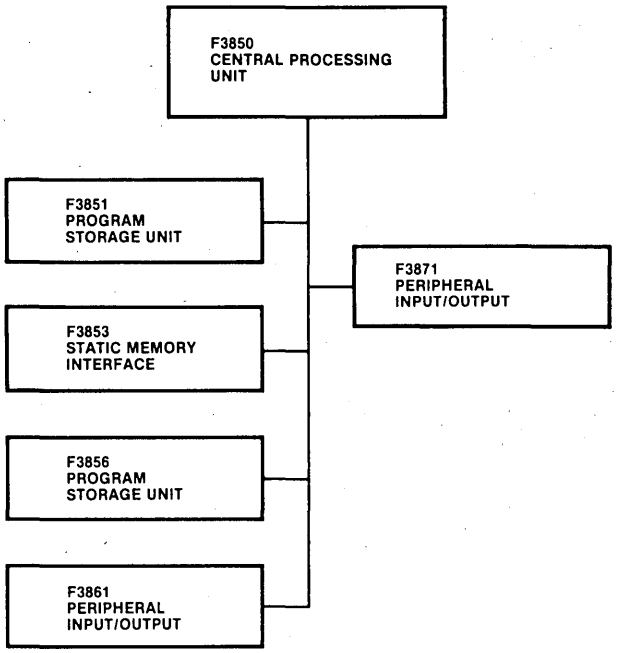
$f \cong 3.0\ MHz \pm 10\%$

© IC MASTER 1983

Controller Products

F3850	CPU with 64 bytes of RAM and two 8-bit bidirectional I/O ports
F3851A	PSU with two 8-bit bidirectional I/O ports and 1K bytes of FAIRBUG bootstrap debugging program
F3851	PSU with two 8-bit bidirectional I/O ports and 1K bytes of user-programmable mask ROM
F3853	Memory interface for static RAM or ROM
F3856	PSU with two 8-bit bidirectional I/O ports and 2K bytes of user-programmable mask ROM, and an on-board binary timer
F3856A	PSU with two 8-bit bidirectional I/O ports and 2K bytes of KD-BUG monitor program ROM
F3861A F3861B F3861C F3861D F3861E	PIO with two 8-bit bidirectional I/O ports and a software-programmable polynomial timer
F3871E F3871F F3871G F3871H	PIO with two 8-bit bidirectional I/O ports and an F3870-type, software-programmable binary timer

F8 FAMILY ORGANIZATION



© IC MASTER 1983

Product Listing

Device No.	Description	Device No.	Description	Device No.	Description
F6800P	MPU	F6820S	PIA	F6847P	VDG
F6800CP	MPU	F6821P	PIA	F6847S	VDG
F6800S	MPU	F6821S	PIA	F6850P	ACIA
F6800CS	MPU	F68A21P	PIA	F6850S	ACIA
F68A00P	MPU	F68A21S	PIA	F68A50P	ACIA
F68A00S	MPU	F68B21P	PIA	F68A50S	ACIA
F68B00P	MPU	F68B21S	PIA	F68B50P	ACIA
F68B00S	MPU	F6840P	PIM	F68B50S	ACIA
F6802P	MPU	F6840S	PIM	F6852P	SSDA
F6802S	MPU	F68A40P	PIM	F6852S	SSDA
F6882P	MPU	F68A40S	PIM	F68A52P	SSDA
F6882S	MPU	F68B40P	PIM	F68A52S	SSDA
F6808P	MPU	F68B40S	PIM	F68B52P	SSDA
F6808S	MPU	F6844P	DMAC	F68B52S	SSDA
F6809P	MPU	F68A44P	DMAC	F6854P	ADLC
F68A09P	MPU			F6854S	ADLC
F68B09P	MPU	F6845P	CRT Controller	F68A54P	ADLC
F6809E	MPU	F68A45P	CRT Controller	F68A54S	ADLC
F68A09E	MPU	F68B45P	CRT Controller	F68B54P	ADLC
F68B09E	MPU	F6845AP	CRT Controller	F68B54S	ADLC
F6810P	RAM				
F6810S	RAM				
F68A10P	RAM				
F68A10S	RAM	F68A45AP	CRT Controller	F6856P	SPCC
F68B10P	RAM	F68B45AP	CRT Controller	F6856S	SPCC
F68B10S	RAM	F6846P	COMBO	F3846P	SPCC
F6820P	PIA	F6846S	COMBO	F3846S	SPCC
				F68456P	SPCC
				F68456S	SPCC
				F68488P	GPIA
				F68488S	GPIA

Development Board

PEP 68—F6802, F6809 Prototyping Module

ROM Family

Fairchild	Equivalent EPROM	Fairchild	Equivalent EPROM
16K ROM	16K EPROM	64K ROM 24-Pin	64K ROM 24-Pin
F35316	2716	F3564	68764
F68316	2716	F3565	68764
		F3566	68766
32K ROM	32K EPROM	64K ROM 28-Pin	64K ROM 28-Pin
F3533	2732	F3568	2764
F68332	2732	F3569	2764
F3532	2732	F3570	2764

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F6801/F6803
Single-Chip Microcomputer

Microprocessor Product

Description

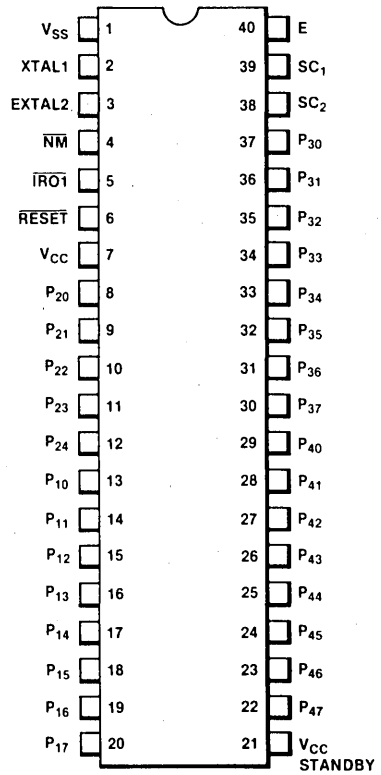
The Fairchild F6801/F6803 is an 8-bit single-chip microcomputer unit (MCU) which significantly enhances the capabilities of the F6800 family. It includes an upgraded F6800 microprocessor unit (MPU) with upward-source and object-code compatibility. The F6801/F6803 MCU can function as a monolithic microcomputer or can be expanded to a 64K byte address space. Features of the F6801/F6803 MCU include:

- **Enhanced F6800 Instruction Set**
- **8 × 8 Multiply Instruction**
- **Serial Communications Interface (SCI)**
- **16-bit Three-Function Programmable Timer**
- **Bus Compatibility with the F6800 Family**
- **2048 Bytes of ROM (F6801 Only)**
- **128 Bytes of RAM**
- **64 Bytes of RAM, Retainable During Powerdown**
- **29 Parallel I/O and Two Handshake Control Lines**
- **Internal Clock Generator With Divide-by-Four Output**
- **Interrupt Capability**
- **TTL compatible**
- **40-Pin Ceramic or Plastic Package**
- **+5V Power Supply**

The F6801/F6803 MCU can be configured to function in a wide variety of applications. This flexibility is provided by its ability to be hardware-programmed into eight different operating modes. The operating mode controls the configuration of 18 of the 40 MCU pins, available on-chip resources, memory map, location of interrupt vectors, and type of external bus. Configuration of the remaining 22 pins is not dependent on the operating mode.

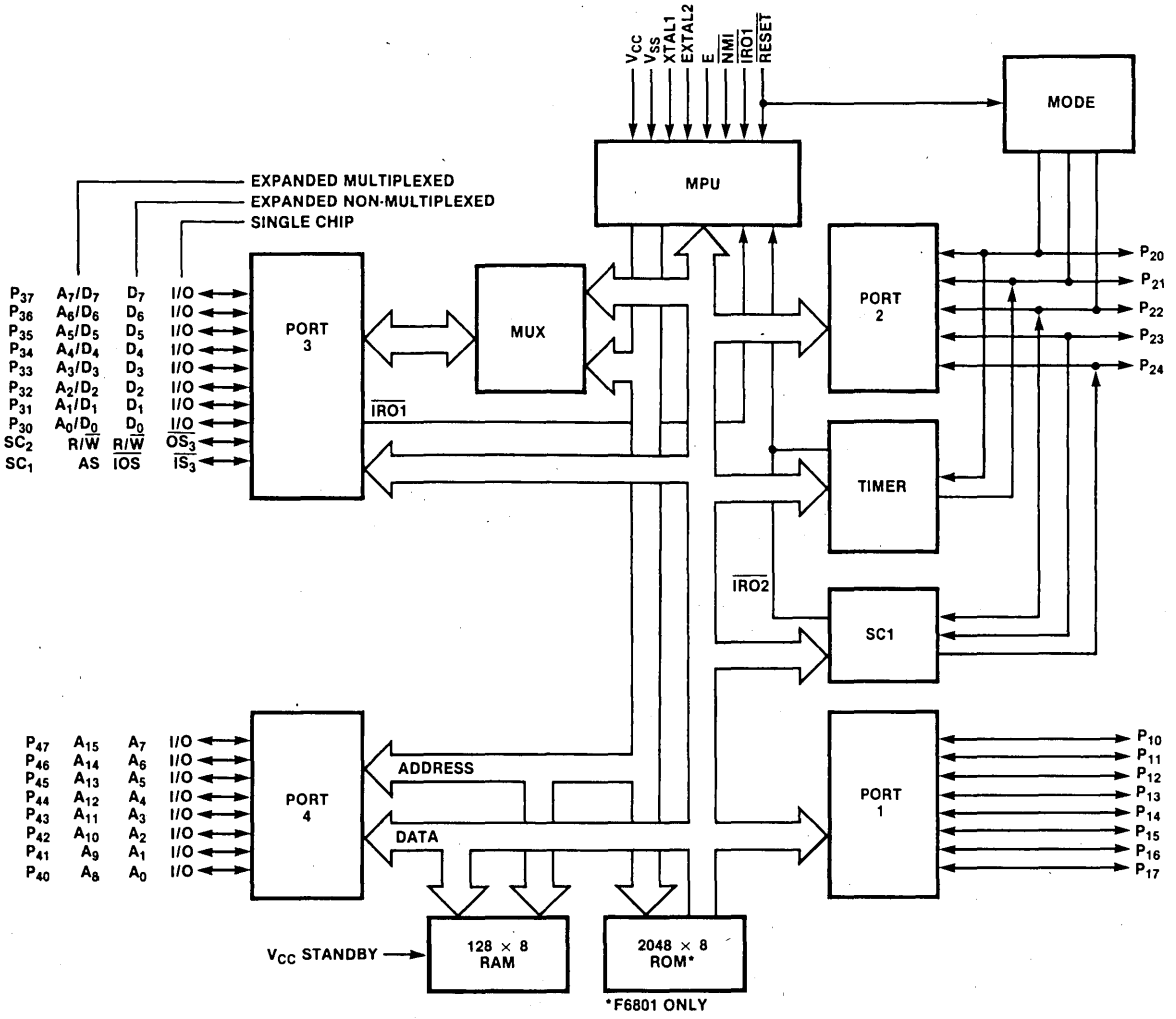
The F6803 can be considered an F6801 that operates in Modes 2 and 3 only (either internal RAM with no ROM, or no internal RAM or ROM, respectively).

Connection Diagram



© IC MASTER 1983

Block Diagram



© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F6809/F68A09/F68B09
Central Processing Unit

Microprocessor Product

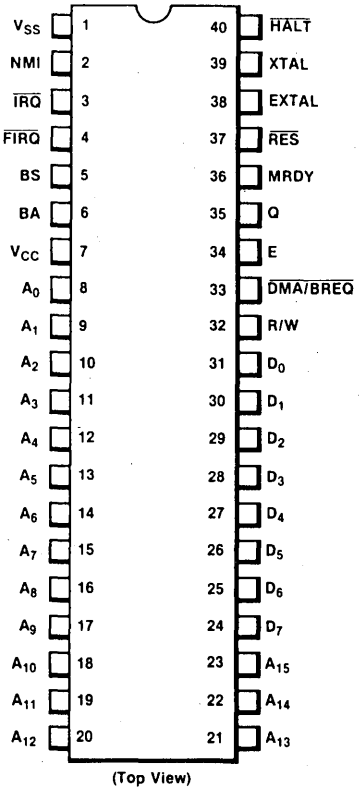
Description

The Fairchild F6809 8-bit Microprocessor is an advanced, high-performance member of the F6800 family. It offers greater throughput, improved byte efficiency, and increased adaptability to various software disciplines, including position-independent code, re-entrancy, recursion, block structuring, and high-level language generation. The F6809 is compatible with all F6800 peripheral devices and is upward source code compatible with F6800-series microprocessors. The device is available in three frequency ranges: 1.0 MHz (F6809), 1.5 MHz (F68A09), and 2.0 MHz (F68B09).

Architectural improvements, such as additional 16-bit registers and dual 8-bit data paths, allow for powerful enhancements to the instruction set and addressing capabilities.

- **Compatible with Entire F6800 Family**
  - **—Hardware Interfaces with all F6800 Peripherals**
  - **—Software Has Upward-Compatible Instruction Set and Addressing Modes**
- **Two 16-Bit Index Registers**
- **Two Indexable 16-Bit Stack Pointers**
- **Two 8-Bit Accumulators Can Be Concatenated to Form One 16-Bit Accumulator**
- **Direct Page Register Allows Direct Addressing Throughout Memory Map**
- **Single +5 V Supply**
- **On-Chip Oscillator**
- **MRDY Input Extends Data Access Time for Use with Slow Memory**
- **DMA/BREQ Allows Access to Bus for DMA and Memory Refresh**
- **Fast Interrupt Request ($\overline{FIRQ}$) Stacks Only Program Counter and Condition Code Register**
- **Interrupt Acknowledge Output Allows Vectoring by Device**
- **Sync Acknowledge Output Allows for Synchronization to External Event**
- **16-Bit Arithmetic (ADD, SUBTRACT, COMPARE, LOAD, STORE)**
- **8 × 8 Unsigned Multiply**
- **Transfer/Exchange all Registers**
- **Push/Pull all Registers**
- **Ten Addressing Modes**
- **Expanded Indexed Addressing, Accumulator or up to 16-Bit Offset, Auto-Increment/Decrement by One or Two**
- **True Indirect Addressing**
- **Load-Effective Address**

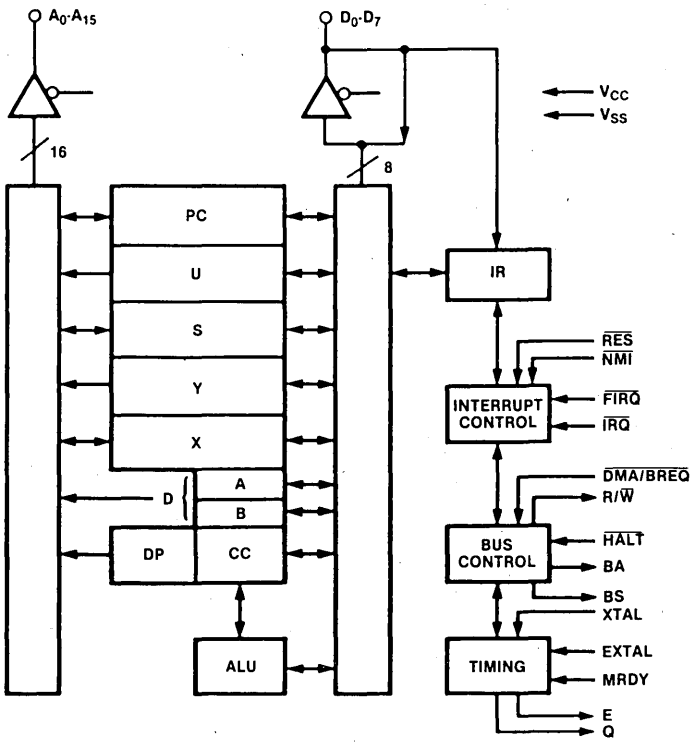
Connection Diagram



(Top View)

© IC MASTER 1983

Block Diagram



© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F6809E/F68A09E/F68B09E
Central Processing Unit

Microprocessor Product

Description

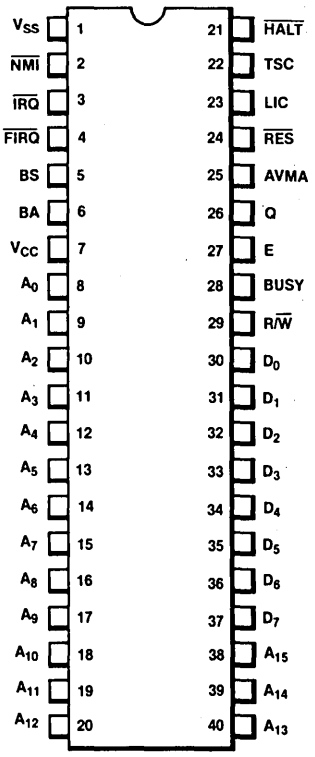
The Fairchild F6809E 8-bit microprocessor is an advanced, high-performance member of the F6800 family. It offers greater throughput, improved byte efficiency, and increased adjustability to various software disciplines, including position-independent code, re-entrancy, recursion, block structuring, and high-level language generation. The F6809E is compatible with all F6800 peripheral devices and is upward source code compatible with F6800-series microprocessors. It is available in three frequency ranges: 1.0 MHz (F6809E); 1.5 MHz (F68A09E); 2.0MHz (F68B09E).

Architectural improvements, such as additional 16-bit registers and dual 8-bit data paths, allow for powerful enhancements to the instruction set and addressing capabilities.

External clock inputs are provided on the F6809E to allow synchronization with peripherals, systems, or other MPUs.

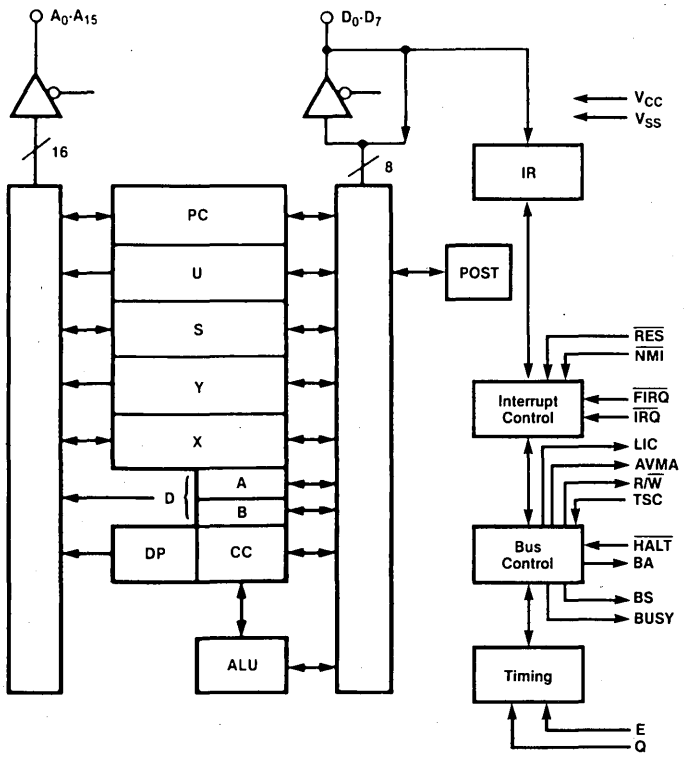
- **Compatible with Entire F6800 Family**
  - **Hardware Interfaces with All F6800 Peripherals**
  - **Software Has Upward-Compatible Instruction Set and Addressing Modes**
- **Two 16-Bit Index Registers**
- **Two Indexable 16-Bit Stack Registers**
- **Two 8-bit Accumulators Can Be Connected to Form One 16-Bit Accumulator**
- **Direct Page Register Allows Direct Addressing Throughout Memory Map**
- **External E and Q Clock Inputs Allow Synchronization**
- **TSC Input Controls Internal Bus Buffers**
- **LIC Output Indicates Opcode Fetch**
- **AVMA Output Allows Efficient use of Common Resources in a Microprocessor System**
- **Fast Interrupt Request Input Stacks Only Program Counter and Condition Code Register**
- **Interrupt Acknowledge Output Allows Vectoring by Device**
- **Sync Acknowledge Output Allows for Synchronization to External Event**
- **Single Bus-Cycle Reset**
- **Single + 5 V Supply**
- **Early Address Valid Allows Use with Slower Memories**
- **Early Write-Data for Dynamic Memories**
- **10 Addressing Modes**
- **True Indirect Addressing**
- **Expanded Indexed Addressing**
- **1464 Instructions with Unique Addressing Modes**
- **Recognizes 8x8 Unsigned Multiply**
- **16-Bit Arithmetic**

Connection Diagram



© IC MASTER 1983

Block Diagram



© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F6845/F6845A
CRT Controller

Microprocessor Product

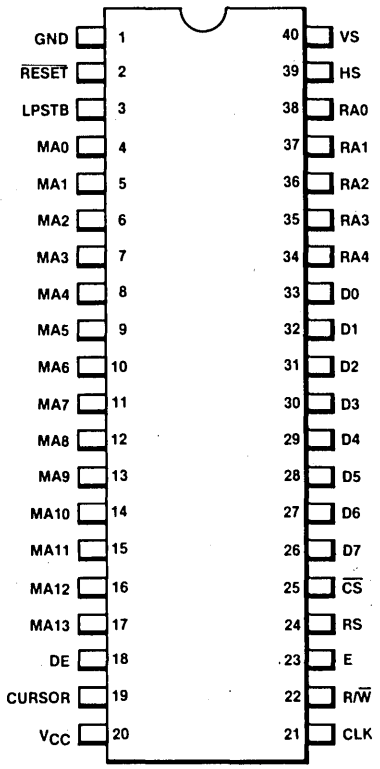
Description

The Fairchild F6845 CRT Controller (CRTC) provides an interface between a microprocessor (MPU) and a raster scan CRT device. The CRTC is used in microprocessor-based controller systems for CRT terminals in stand-alone or multiterminal configurations, including smart, programmable CRT terminals, video games, and information displays.

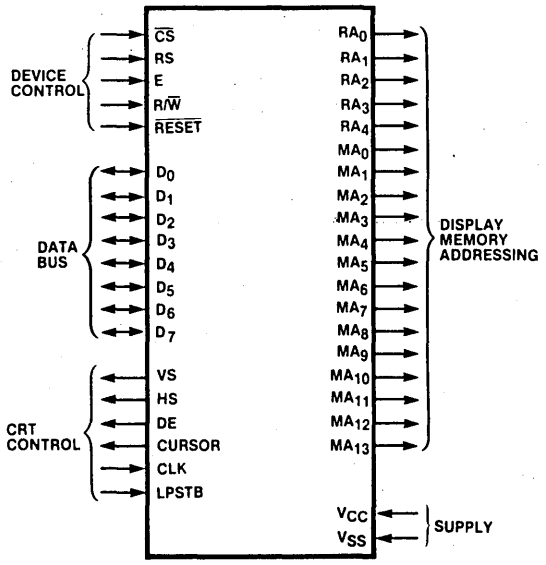
The F6845 CRTC is designed with an optimum hardware/software balance that achieves integration of all key functions and maintains flexibility. All keyboard functions, read/write operations, cursor movements, and editing are under microprocessor control. The F6845 provides video timing and refresh memory addressing.

- **Monochrome or Color CRT Applications**
- **Used with "Glass-Teletype", Smart, Programmable, Intelligent CRT Terminals; Video Games; Information Displays**
- **Alphanumeric, Semigraphic, and Full Graphic Capability**
- **Fully Programmable via Processor Data Bus; Timing can be Generated for Almost Any Alphanumeric Screen Format (e.g., 80 x 24, 72 x 64, and 132 x 20)**
- **Single +5 V Supply**
- **F6800-Compatible Bus Interface**
- **TTL-Compatible Inputs and Outputs**
- **Start Address Register Provides Hardware Scroll (By Page, Line, or Character)**
- **Programmable Cursor Register Allows Control of Cursor Format and Blink Rate**
- **Light Pen Register**
- **Refresh (Screen) Memory Can Be Multiplexed Between the CRTC and the MPU, Thus Removing the Requirements for Line Buffers or External DMA Devices**
- **Programmable Interlace or Non-Interlace Scan Modes**
- **14-Bit Refresh Address Allows up to 16K of Refresh Memory for Use in Character or Semigraphic Displays**
- **5-Bit Row Address Allows up to 32 Scan-Line Character Blocks**
- **512K Address Space is Available for Graphics System by Using Both the Refresh and Row Addresses**
- **Refresh Addresses are Provided During Retrace, Allowing the CRTC to Provide Row Addresses to Refresh Dynamic RAM**
- **Programmable Skew for Cursor and Display Enable (DE)**

Connection Diagram



Signal Functions



MICROPROCESSOR Fairchild

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F6856
Synchronous Protocol Communications Controller

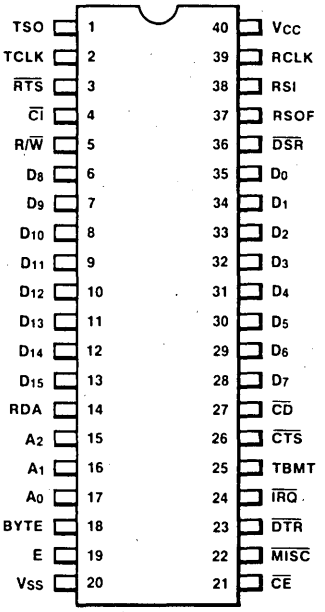
Microprocessor Product

Description

The F6856 Synchronous Protocol Communications Controller (SPCC) is a monolithic n-channel MOS LSI circuit designed to satisfy the major interface requirements of the bit-oriented protocol (BOP) and byte-control protocol (BCP). The SPCC converts parallel data from the CPU into a continuous serial data stream for transmission. Simultaneously, it converts received serial data to parallel data for the CPU. The SPCC is organized to interface with either an 8- or 16-bit bidirectional data bus, is fully TTL-compatible, and operates from a single +5 V supply.

- F6800 and 8080 Bus Compatible
- Data Rate From DC to 1M BPS
- Bit-Oriented Line Control Protocols: SDLC, ADCCP, HDLC
  - Automatic Detection and Generation of Special Control Sequences (e.g., Flag, Abort, Go-Ahead)
  - Zero Insertion and Deletion
  - Primary or Secondary Station Select
  - Global Address
  - Automatic Extended Address
  - One or Two Control Bytes
  - Data Character Length From Five to Eight Bits with 1- to 8-Bit Residual Last Character
  - CCITT-CRC Error Detection
  - Interrupt on End of Message
  - IBM Retail Store Loop Mode
- Byte Control Protocol: IBM BISYNC
  - Special Character Generation: DLE, SYNC
  - Special Character Detection: DLE, SYNC, SOH, STX, ITB, ETB, ETX
  - ASCII or EBCDIC
  - Non-Transparent Mode and Transparent Mode
  - 8-Bit Character Length
  - Automatic Fill Character Insertion with Selectable Stripping
  - CCITT or CRC-16 Error Detection
  - Interrupt on End of Message
- Byte Control Protocols: DDCMP and Other Programmable SYNC Characters
  - 5- to 8-Bit Character Length
  - Selectable CRC Error Detection
  - Automatic Fill Character Insertion with Selectable Stripping
- Directly Addressable Parameter Control Registers: Mode, SYNC/Address, Transmitter Control, and Receiver Control
- Separate Addressable Status and Data Registers for Receiver and Transmitter
- Modem Handshake Signals: $\overline{RTS}$, $\overline{CTS}$, $\overline{DTR}$, $\overline{DSR}$, and $\overline{CD}$
- NRZ or NRZI (Zero-Complementing)
- Full- or Half-Duplex Operation
- Self-Test Loop Mode
- 8- or 16-Bit Bidirectional 3-State Data Bus
- TTL-Compatible
- Single +5 V Supply
- 40-Pin Package

Connection Diagram
40-Pin DIP



(Top View)

Fairchild
MICROPROCESSOR

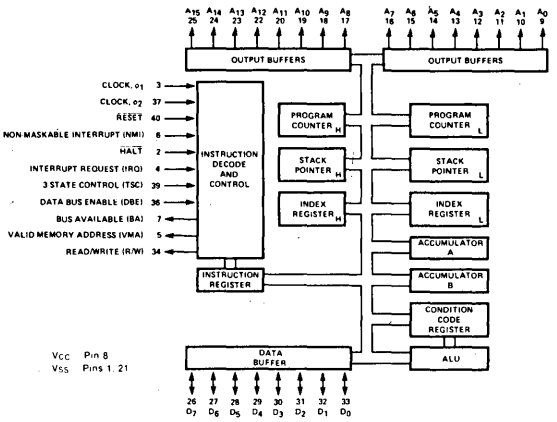
© IC MASTER 1983

F6800 MICROPROCESSING UNIT (MPU)

GENERAL DESCRIPTION – The F6800 is a monolithic 8-bit microprocessor forming the central control function for Fairchild's F6800 family. Compatible with TTL, the F6800, as with all F6800 system parts, requires only one 5.0 V power supply and no external TTL devices for bus interface.

The F6800 is capable of addressing 65K bytes of memory with its 16-bit address lines. The 8-bit data bus is bi-directional as well as 3-state, making direct memory addressing and multiprocessing applications possible. Two temperature ranges are available. The F6800 is 0°C to 70°C and the F6800C is –40°C to +85°C.

- 8-BIT PARALLEL PROCESSING
- BI-DIRECTIONAL DATA BUS
- 16-BIT ADDRESS BUS – 65K BYTES OF ADDRESSING
- 72 INSTRUCTIONS – VARIABLE LENGTH
- SEVEN ADDRESSING MODES – DIRECT, RELATIVE, IMMEDIATE, INDEXED, EXTENDED, IMPLIED AND ACCUMULATOR
- VARIABLE LENGTH STACK
- VECTORED RESTART
- MASKABLE INTERRUPT VECTOR
- SEPARATE NON-MASKABLE INTERRUPT – INTERNAL REGISTERS SAVED IN STACK
- SIX INTERNAL REGISTERS – TWO ACCUMULATORS, INDEX REGISTER, PROGRAM COUNTER, STACK POINTER AND CONDITION CODE REGISTER
- DIRECT MEMORY ADDRESSING (DMA) AND MULTIPLE PROCESSOR CAPABILITY
- CLOCK RATES 1 MHz, 1.5 MHz, 2 MHz
- SIMPLE BUS INTERFACE WITHOUT TTL
- HALT AND SINGLE INSTRUCTION EXECUTION CAPABILITY
- TWO TEMPERATURE RANGES – F6800 0°C TO 70°C
  F6800C –40°C TO +85°C



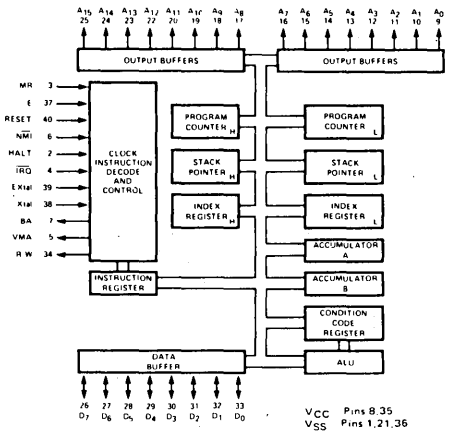
F6800 MPU

F6802/F6882 WITH CLOCK AND RAM

GENERAL DESCRIPTION — The F6802/F6882 is a monolithic 8-bit microprocessor that contains all the registers and accumulators of the F6800, plus an interval clock oscillator and driver on the same chip. It also has 128 bytes of RAM on-board, located at hex addresses $0000 to $007F.

The F6802/F6882 is completely software-compatible with the F6800 microprocessor and the entire F6800 family of parts.

- ON-CHIP CLOCK CIRCUIT
- 128 x 8-BIT ON-CHIP RAM
- 8 BYTES OF RAM ARE RETAINABLE ON THE F6882
- 32 BYTES OF RAM ARE RETAINABLE ON THE F6802
- SOFTWARE-COMPATIBLE WITH THE F6800
- STANDARD TTL-COMPATIBLE INPUTS AND OUTPUTS
- 8-BIT BIDIRECTIONAL DATA BUS
- 16-BIT MEMORY ADDRESSING
- INTERRUPT CAPABILITY



F6802/F6882 MPU

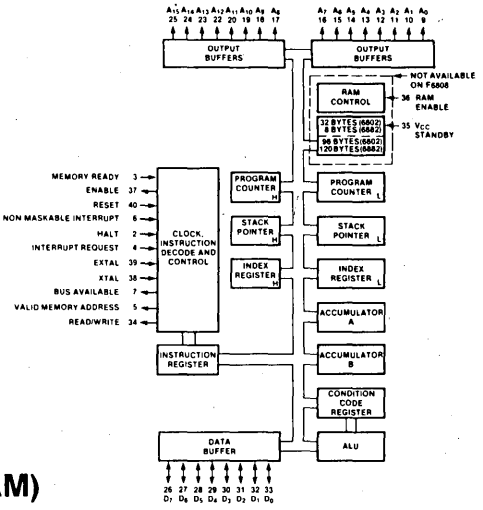
F6808 MPU WITH CLOCK

GENERAL DESCRIPTION – The F6808 is a monolithic 8-bit microprocessor that contains all the registers and accumulators of the present F6800 plus an internal clock oscillator and driver on the same chip.

The F6808 is completely software compatible with the F6800 as well as the entire F6800 family of parts. The F6808 is expandable to 65K words.

This very cost-effective MPU allows the designer to use the F6808 in consumer as well as industrial applications without sacrificing industrial specifications.

- ON-CHIP CLOCK CIRCUIT
- SOFTWARE COMPATIBLE WITH THE F6800
- EXPANDABLE TO 65K WORDS
- STANDARD TTL COMPATIBLE INPUTS AND OUTPUTS
- 8-BIT WORD SIZE
- 16-BIT MEMORY ADDRESSING
- INTERRUPT CAPABILITY



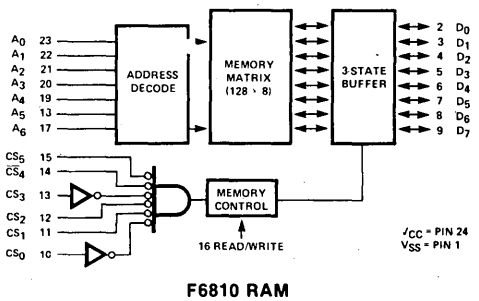
F6808 MPU

F6810 128 x 8-BIT RANDOM ACCESS MEMORY (RAM)

GENERAL DESCRIPTION – F6810 is a byte-organized memory designed for use in bus-organized systems. It is fabricated with N-channel silicon-gate technology. For ease of use, the device operates from a single power supply, has compatibility with TTL and DTL, and needs no clocks or refreshing because of static operation.

The memory is compatible with the F6800 Microcomputer Family, providing random storage in byte increments. Memory expansion is provided through multiple Chip Select inputs.

- ORGANIZED AS 128 BYTES OF EIGHT BITS
- STATIC OPERATION
- BI-DIRECTIONAL 3-STATE DATA INPUT/OUTPUT
- SIX CHIP SELECT INPUTS (FOUR ACTIVE LOW, TWO ACTIVE HIGH)
- SINGLE 5 V POWER SUPPLY
- TTL COMPATIBLE
- MAXIMUM ACCESS TIME = 350 ns – F6810-1
  450 ns – F6810



F6810 RAM

© IC MASTER 1983

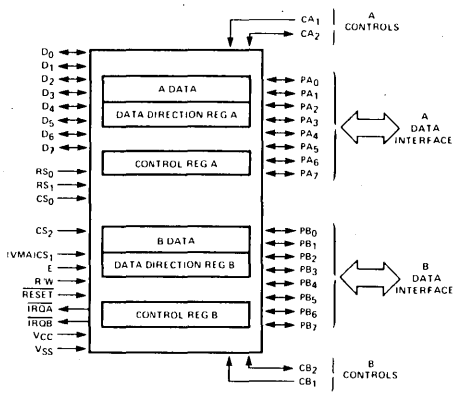
FAIRCHILD
A Schlumberger Company

F6821 PERIPHERAL INTERFACE ADAPTER (PIA)

GENERAL DESCRIPTION – The F6821 Peripheral Interface Adapter provides the universal means of interfacing peripheral equipment to the F6800 Microprocessing Unit (MPU). This device is capable of interfacing the MPU to peripherals through two 8-bit bi-directional peripheral data buses and four control lines. No external logic is required for interfacing to most peripheral devices.

The functional configuration of the PIA is programmed by the MPU during system initialization. Each of the peripheral data lines can be programmed to act as an input or output, and each of the four control/interrupt lines may be programmed for one of several control modes. This allows a high degree of flexibility in the overall operation of the interface.

- 8-BIT BI-DIRECTIONAL DATA BUS FOR COMMUNICATION WITH THE MPU
- TWO BI-DIRECTIONAL 8-BIT BUSES FOR INTERFACE TO PERIPHERALS
- TWO PROGRAMMABLE CONTROL REGISTERS
- TWO PROGRAMMABLE DATA DIRECTION REGISTERS
- FOUR INDIVIDUALLY-CONTROLLED INTERRUPT INPUT LINES; TWO USABLE AS PERIPHERAL CONTROL OUTPUTS
- HANDSHAKE CONTROL LOGIC FOR INPUT AND OUTPUT PERIPHERAL OPERATION
- HIGH IMPEDANCE 3-STATE AND DIRECT TRANSISTOR DRIVE PERIPHERAL LINES
- PROGRAM CONTROLLED INTERRUPT AND INTERRUPT DISABLE CAPABILITY
- CMOS DRIVE CAPABILITY ON SIDE A PERIPHERAL LINES



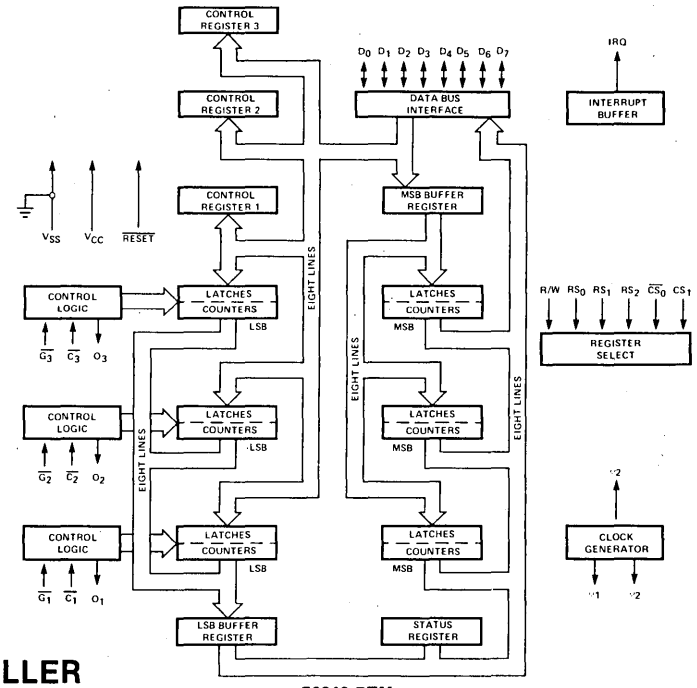
F6821 PIA

F6840 PROGRAMMABLE TIMER (PTM)

GENERAL DESCRIPTION—The F6840 is a programmable subsystem component of the F6800 family designed to provide variable system time intervals.

The F6840 has three 16-bit binary counters, three corresponding control registers and a status register. These counters are under software control and may be used to cause system interrupts and/or generate output signals. The F6840 may be utilized for such tasks as frequency measurements, event counting, interval measuring and similar tasks. The device may be used for square wave generation, gated delay signals, single pulses of controlled duration, and pulse width modulation as well as system interrupts.

- OPERATES FROM A SINGLE 5 VOLT POWER SUPPLY
- FULLY TTL COMPATIBLE
- SINGLE SYSTEM CLOCK REQUIRED (ENABLE)
- SELECTABLE PRESCALER ON TIMER 3 CAPABLE OF A 4 MHz INPUT
- PROGRAMMABLE INTERRUPTS ($\overline{IRQ}$) OUTPUTS TO MPU
- READABLE DOWN COUNTER INDICATES COUNTS TO GO TO TIME-OUT
- SELECTABLE GATING FOR FREQUENCY OR PULSE-WIDTH COMPARISON
- $\overline{RESET}$ INPUT
- THREE ASYNCHRONOUS EXTERNAL CLOCK AND GATE/TRIGGER INPUTS INTERNALLY SYNCHRONIZED
- THREE MASKABLE OUTPUTS



F6840 PTM

F6844 DIRECT MEMORY ACCESS CONTROLLER

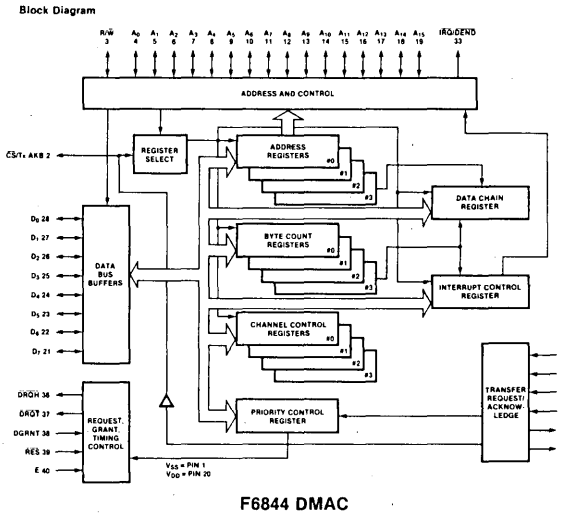
GENERAL DESCRIPTION — The F6844 Direct Memory Access Controller (DMAC) transfers data directly between memory and peripheral device controllers. In bus-organized systems, such as those based on the F6800 microprocessor, the DMAC, rather than the MPU, controls the address and data buses.

The DMAC bus interface includes select, read/write interrupt, transfer request/grant, and bus interface logic to permit data transfer over an 8-bit bidirectional data bus. The F6844 functional configuration is programmed through the data bus. The internal structure provides for control and handling of four individual channels, each of which is separately configured. Programmable control registers provide control for the transfer location and length, individual channel control and transfer mode configuration, priority of servicing, data chaining, and interrupt control. Status and control lines serve the peripheral controllers.

The mode of transfer for each channel can be programmed as cycle-stealing or burst transfer.

Typical applications include use with the F6856 Synchronous Protocol Communications Controller, the F6854 Advanced Data Link Controller, and the F68488 IEEE-488 Bus Controller.

- FOUR DMA CHANNELS, EACH HAVING A 16-BIT ADDRESS REGISTER AND A 16-BIT BYTE COUNT REGISTER
- 2M BYTE/SEC MAXIMUM DATA TRANSFER RATE
- SELECTION OF FIXED OR ROTATING PRIORITY SERVICE CONTROL
- SEPARATE CONTROL BITS FOR EACH CHANNEL
- DATA CHAIN FUNCTION
- ADDRESS INCREMENT OR DECREMENT UPDATE
- PROGRAMMABLE INTERRUPTS AND DMA END TO PERIPHERAL CONTROLLERS



F6844 DMAC

© IC MASTER 1983

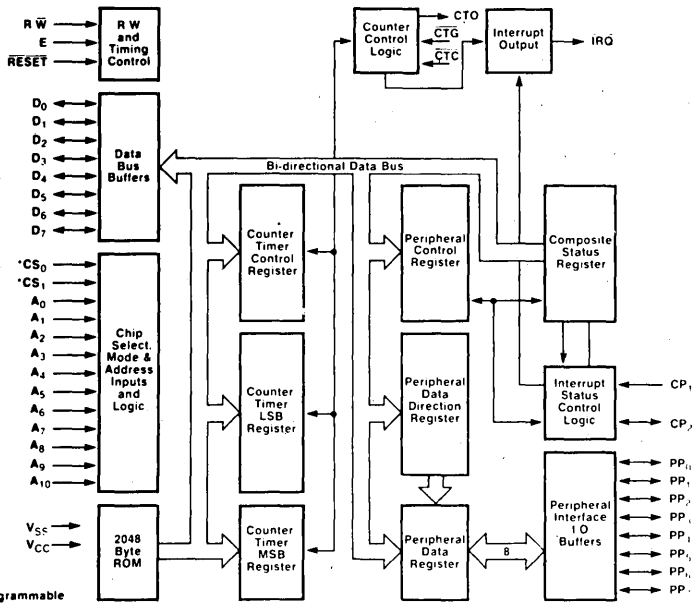
FAIRCHILD
A Schlumberger Company

F6846 ROM-I/O-TIMER

GENERAL DESCRIPTION–The F6846 combination chip provides the means, in conjunction with the F6802, to develop a basic 2-chip microcomputer system. The F6846 consists of 2048 bytes of mask programmable ROM, an 8-bit bi-directional data port with control lines, and a 16-bit programmable timer-counter.

This device is capable of interfacing with the F6802 (basic F6800 clock and 128 bytes of RAM) as well as the F6800 if desired. No external logic is required to interface with most peripheral devices.

- 2048 8-BIT BYTES OF MASK-PROGRAMMABLE ROM
- 8-BIT BI-DIRECTIONAL DATA PORT FOR PARALLEL INTERFACE PLUS TWO CONTROL LINES
- PROGRAMMABLE INTERVAL TIMER-COUNTER FUNCTIONS
- PROGRAMMABLE I/O PERIPHERAL DATA, CONTROL AND DIRECTION REGISTERS
- COMPATIBLE WITH THE COMPLETE F6800 MICROCOMPUTER PRODUCT FAMILY
- TTL-COMPATIBLE DATA AND PERIPHERAL LINES
- SINGLE 5 VOLT POWER SUPPLY



*Mask Programmable

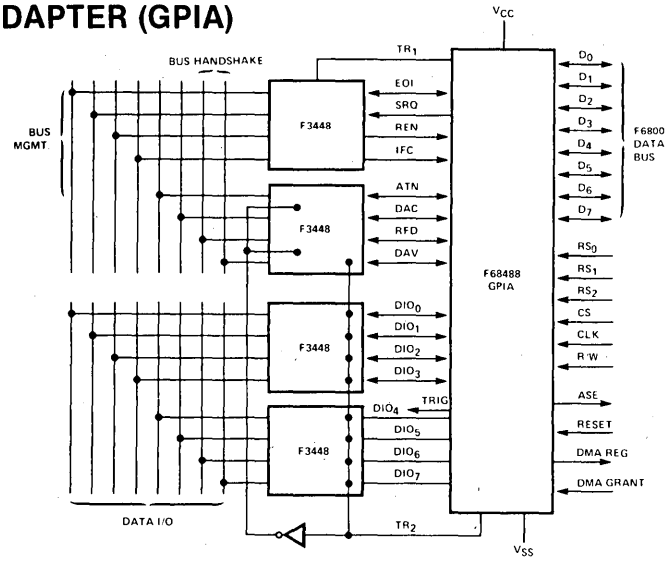
F6846 RIOT

F68488 GENERAL PURPOSE INTERFACE ADAPTER (GPIA)

GENERAL DESCRIPTION—The F68488 GPIA provides the means to interface between the IEEE 488 standard instrument bus and the F6800. The 488 instrument bus provides a means for controlling and moving data from complex systems of multiple instruments.

The F68488 will automatically handle all handshake protocol needed on the instrument bus.

- SINGLE OR DUAL PRIMARY ADDRESS RECOGNITION
- SECONDARY ADDRESS CAPABILITY
- COMPLETE SOURCE AND ACCEPTOR HANDSHAKES
- PROGRAMMABLE INTERRUPTS
- RFD HOLD-OFF TO PREVENT DATA OVERRUN
- OPERATES WITH DMA CONTROLLER
- SERIAL AND PARALLEL POLLING CAPABILITY
- TALK-ONLY OR LISTEN-ONLY CAPABILITY
- SELECTABLE AUTOMATIC FEATURES TO MINIMIZE SOFTWARE
- SYNCHRONIZATION TRIGGER OUTPUT
- F6800 BUS COMPATIBLE



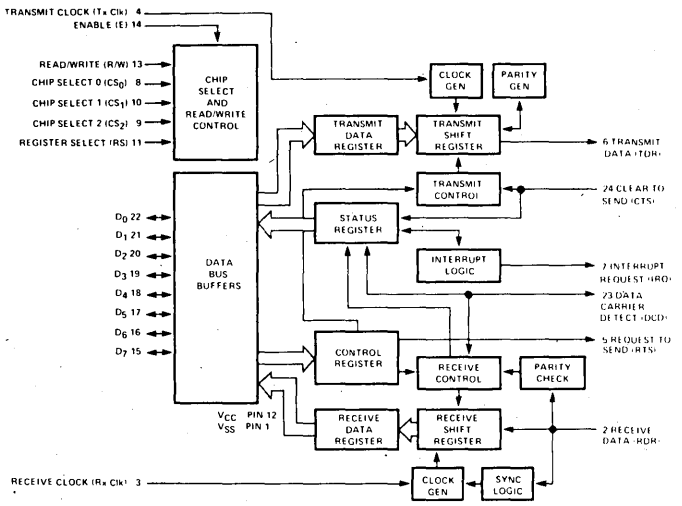
F68488 GPIA INTERFACE

F6850 ASYNCHRONOUS COMMUNICATIONS INTERFACE ADAPTER (ACIA)

GENERAL DESCRIPTION – The F6850 Asynchronous Communications Interface Adapter (ACIA) provides the data formatting and control to interface serial asynchronous data communications information to bus organized systems such as the F6800 Microprocessing Unit.

The bus interface of the F6850 includes select, enable, read/write, interrupt and bus interface logic to allow data transfer over an 8-bit bi-directional data bus. The parallel data of the bus system is serially transmitted and received by the asynchronous data interface, with proper formatting and error checking. The functional configuration of the ACIA is programmed via the data bus during system initialization. A programmable Control Register provides variable word lengths, clock division ratios, transmit control, receive control, and interrupt control. For peripheral or modem operation, three control lines are provided. These lines allow the ACIA to interface directly with the F6860 0-600 bps digital modem.

- 8 AND 9-BIT TRANSMISSION
- OPTIONAL EVEN AND ODD PARITY
- PARITY, OVERRUN AND FRAMING ERROR CHECKING
- PROGRAMMABLE CONTROL REGISTER
- OPTIONAL ÷1, ÷16, AND ÷64 CLOCK MODES
- UP TO 500 kbps TRANSMISSION
- FALSE-START BIT DELETION
- PERIPHERAL/MODEM CONTROL FUNCTIONS
- DOUBLE BUFFERED
- ONE OR TWO STOP BIT OPERATION



F6850 ACIA

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

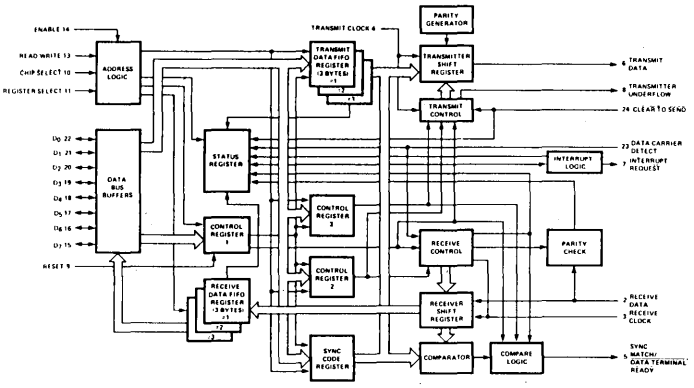
F6852 SYNCHRONOUS SERIAL DATA ADAPTER (SSDA)

GENERAL DESCRIPTION – The F6852 Synchronous Serial Data Adapter provides a bi-directional serial interface for synchronous data information interchange. It contains interface logic for simultaneously transmitting and receiving standard synchronous communications characters in bus organized systems such as the F6800 Microprocessor systems.

The bus interface of the F6852 includes Select, Enable, Read/Write, Interrupt, and bus interface logic to allow data transfer over an 8-bit bi-directional data bus. The parallel data of the bus system is serially transmitted and received by the synchronous data interface with synchronization, fill character insertion/deletion, and error checking. The functional configuration of the SSDA is programmed via the data bus during system initialization. Programmable control registers provide control for variable word lengths, transmit control, receive control, synchronization control, and interrupt control. Status, timing and control lines provide peripheral or modem control.

Typical applications include floppy disk controllers, cassette or cartridge tape controllers, data communications terminals, and numerical control systems.

- PROGRAMMABLE INTERRUPTS FROM TRANSMITTER, RECEIVER, AND ERROR DETECTION LOGIC
- CHARACTER SYNCHRONIZATION ON ONE OR TWO SYNC CODES
- EXTERNAL SYNCHRONIZATION AVAILABLE FOR PARALLEL-SERIAL OPERATION
- PROGRAMMABLE SYNC CODE REGISTER
- UP TO 600 KBPS TRANSMISSION
- PERIPHERAL/MODEM CONTROL FUNCTIONS
- THREE BYTES OF FIFO BUFFERING ON BOTH TRANSMIT AND RECEIVE
- SEVEN, EIGHT, OR NINE BIT TRANSMISSION
- OPTIONAL EVEN AND ODD PARITY
- PARITY, OVERRUN, AND UNDERFLOW STATUS



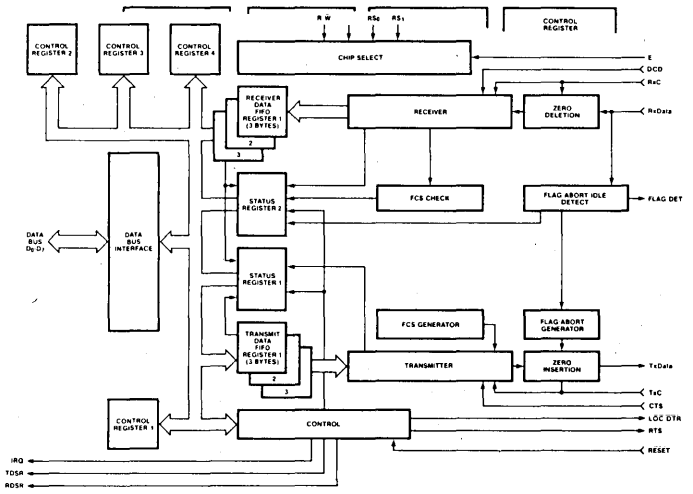
Vcc Pin 12
Vss Pin 1

F6852 SSDA

F6854 ADVANCED DATA LINK CONTROLLER (ADLC)

GENERAL DESCRIPTION — The F6854/F68A54 Advanced Data Link Controllers (ADLCs) perform the complex MPU/data communication link function for the Advanced Data Communication Control Procedure (ADCCP), High-level Data Link Control (HDLC) and Synchronous Data Link Control (SDLC) standards. The ADLC provides key interface requirements with improved software efficiency. The ADLC is designed to provide the data communications interface for both primary and secondary stations in stand-alone, polling and loop configurations.

- F6800 COMPATIBLE
- PROTOCOL FEATURES
  - AUTOMATIC FLAG DETECTION AND SYNCHRONIZATION
  - ZERO INSERTION AND DELECTION
  - AUTOMATIC ADDRESS FIELD EXTENSION (OPTIONAL)
  - EXTENDED CONTROL FIELD (OPTIONAL)
  - AUTO EXTENDABLE LOGIC CONTROL FIELD (OPTIONAL)
  - VARIABLE WORD LENGTH INFORMATION FIELD (5-, 6-, 7-, OR 8-BIT)
  - AUTOMATIC FRAME CHECK SEQUENCE GENERATION AND CHECK
  - ABORT DETECTION AND TRANSMISSION
  - IDLE DETECTION AND TRANSMISSION
- MODEM/DATA CHANNEL CONTROL LINES
- LOOP MODE
- SINGLE 5 V POWER SUPPLY
- ENHANCED SPEED OPTIONS



F6854 ADLC

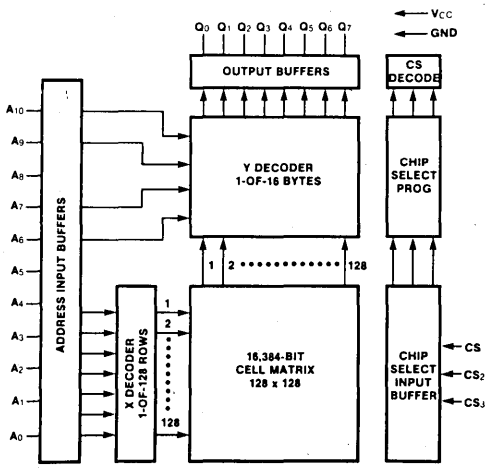
F35316/F68316 2048 × 8 ROM

GENERAL DESCRIPTION — The F35316/F68316 is a mask-programmable byte-organized MOS Read Only Memory (ROM) designed for use in bus-organized systems requiring non-volatile data storage. It is fabricated with n-channel silicon-gate technology. For ease of use, the F35316/F68316 operates from a single +5 V power supply, inputs and outputs are TTL and DTL compatible, and the device needs no clocks or refreshing because of its static operation.

The F35316/F68316 is compatible with the F6800, F8 and other microcomputer families providing read only storage in byte increments. To facilitate memory expansion, the device contains three programmable Chip Select inputs providing any combination of active HIGH or LOW or an optional DON'T CARE state coupled with output wired-OR capability. Chip select code and memory content are user defined and are fixed during the masking process.

The F35316/F68316 provides maximum circuit density, reliability and performance yet maintains low power dissipation and yields significant cost advantages over an EPROM approach.

- 2048 × 8-BIT BUS-COMPATIBLE ORGANIZATION
- FULLY STATIC OPERATION
- 3-STATE DATA OUTPUTS FOR WIRED-OR CAPABILITY
- MASK-PROGRAMMABLE CHIP SELECTS FOR SIMPLIFIED MEMORY EXPANSION
- SINGLE +5 V ±10% POWER SUPPLY
- TTL AND DTL-COMPATIBLE INPUTS
- MULTIPLE SPEED GRADES
  t_{ACC} = 250 ns, 300 ns (F35316)
  t_{ACC} = 350 ns, 450 ns, 500 ns (F68316)
- DIRECTLY COMPATIBLE WITH 2316E
- PIN COMPATIBLE WITH F2708 and F2716 EPROMs



F35316/F68316 ROM

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

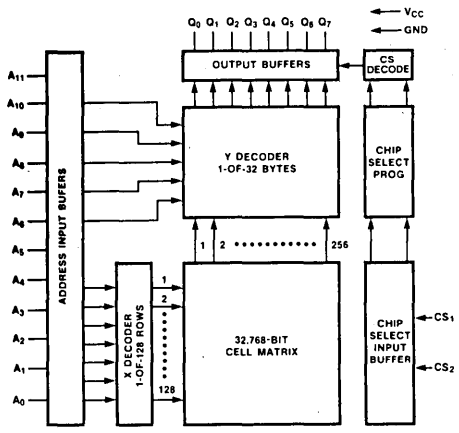
F3532/F68332/F3533 4096 × 8-BIT READ ONLY MEMORY (ROM)

GENERAL DESCRIPTION — The F3532/F68332 and F3533 are 4096 × 8-bit mask-programmable read only memories (ROMs), fabricated with n-channel silicon gate technology. They are designed for use in bus-organized systems requiring non-volatile data storage. For ease of use, the F3532/F68332 and F3533 require only a single +5 V power supply, have TTL-compatible inputs and outputs, and, due to their static operation, need no clocking or refreshing.

Electrically identical, the F3532/F68332 and F3533 represent both JEDEC standard pinouts, thus providing compatibility with other available 32K ROMs and EPROMs. To facilitate memory expansion, these devices offer two programmable Chip Select inputs whose active levels are user defined.

The F3523-30/F3533-30 and F3532/F3533-35 are high speed devices, allowing interface with faster generations of NMOS microprocessors.

- COMPLETELY STATIC OPERATION
- 8-BIT BUS COMPATIBLE ORGANIZATION
- 3-STATE OUTPUTS
- TWO-PROGRAMMABLE CHIP SELECT INPUTS
- SINGLE +5 V ± 10% SUPPLY
- FULLY TTL COMPATIBLE
- 3 SPEED GRADES—t_{ACC} = 300, 350, 450 ns
- BOTH JEDEC STANDARD PINOUTS
- PIN COMPATIBLE WITH OTHER 32K ROMs AND EPROMs



F3532/F68332/F3533 ROM

F3564 8192 × 8-BIT READ ONLY MEMORY (ROM)

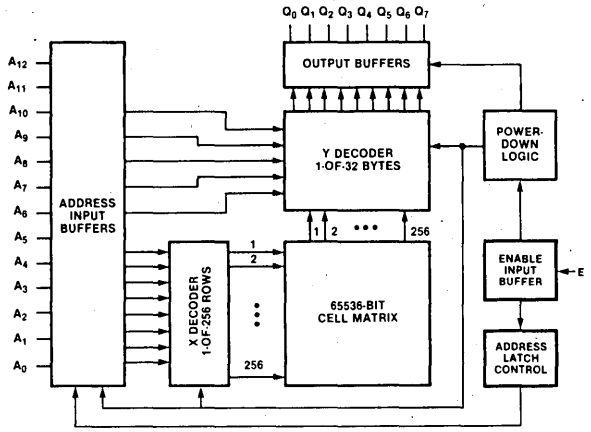
GENERAL DESCRIPTION — The F3564 8192 × 8-bit (64K) mask-programmable read-only memory (ROM) is designed for use in bus-organized systems requiring non-volatile memory storage. Because of its high speed, it readily interfaces with all generations of NMOS microprocessors.

Fabricated with n-channel silicon-gate technology, the F3564 has industry-standard pinouts and is compatible with other available 24-pin 16K, 32K, and 64K ROMs and EPROMs.

- ADDRESS LATCH FEATURE
- SINGLE 5 V POWER SUPPLY
- AUTOMATIC POWER-DOWN
- ACCESS TIME (t_{AA}) OF 250 ns FOR F3564-25 AND 350 ns FOR F3564-35
- LOW POWER DISSIPATION (440 mW, MAXIMUM, ACTIVE; 55 mW, MAXIMUM, STANDBY)
- FULLY TTL-COMPATIBLE
- THREE-STATE OUTPUT
- MASK-PROGRAMMABLE ENABLE FUNCTION
- PIN—COMPATIBLE WITH OTHER STANDARD 24-PIN 16K, 32K, AND 64K ROMs AND EPROMs

The programmable enable (E) input of the F3564 controls the output and the active-standby modes of operation. The active level of the E input and the memory contents are user-defined.

The F3564 requires only a single +5 V power supply, has TTL-compatible inputs and outputs, and, due to its static operation, requires no clocking or refreshing.



F3564 ROM

F3565 8192 × 8-BIT READ ONLY MEMORY (ROM)

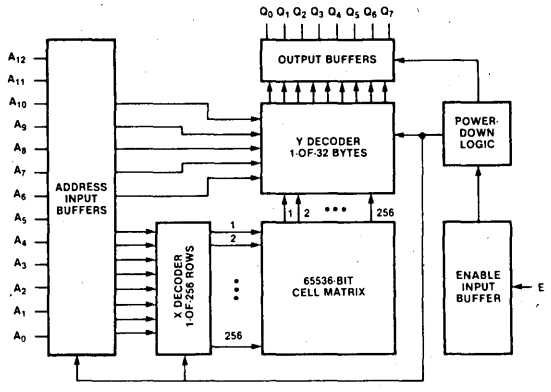
GENERAL DESCRIPTION — The F3565 8192 × 8-bit (64K) mask-programmable read-only memory (ROM) is designed for use in bus-organized systems requiring non-volatile memory storage. Because of its high speed, it readily interfaces with all generations of NMOS microprocessors.

Fabricated with n-channel silicon-gate technology, the F3565 has industry-standard pinouts and is compatible with other available 24-pin 16K, 32K, and 64K ROMs and EPROMs.

- COMPLETELY STATIC OPERATION
- SINGLE 5 V POWER SUPPLY
- AUTOMATIC POWER-DOWN
- ACCESS TIME (t_{AA}) of 250 ns FOR F3565-25 AND 350 ns FOR F3565-35
- LOW POWER DISSIPATION (440 mW, MAXIMUM, ACTIVE; 55 mW, MAXIMUM, STANDBY)
- FULLY TTL-COMPATIBLE
- THREE-STATE OUTPUT
- MASK-PROGRAMMABLE ENABLE FUNCTION
- PIN-COMPATIBLE WITH OTHER STANDARD 24-PIN 16K, 32K, AND 64K ROMs AND EPROMs

The programmable enable (E) input of the F3565 controls the output and the active/standby modes of operation. The active level of the E input and the memory contents are user-defined.

The F3565 requires only a single +5 V power supply, has TTL-compatible inputs and outputs, and, due to its static operation, requires no clocking or refreshing.



F3565 ROM

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

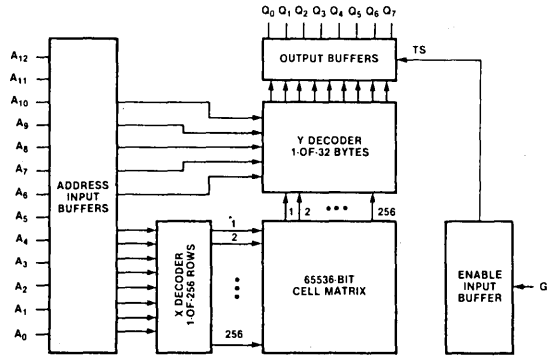
F3566 8192 × 8-BIT READ ONLY MEMORY (ROM)

GENERAL DESCRIPTION — The F3566 8192 × 8-bit (64K) read-only memory (ROM) is designed for use in bus-organized systems requiring non-volatile memory storage. Because of its high speed, it readily interfaces with all generations of NMOS microprocessors.

Fabricated with n-channel silicon-gate technology, the F3566 has industry-standard pinouts and is compatible with other available 24-pin 16K, 32K, and 64K ROMs and EPROMs.

- **COMPLETELY STATIC OPERATION**
- **SINGLE 5 V POWER SUPPLY**
- **HIGH-SPEED DATA VALID TIME OF 120 ns**
- **ACCESS TIME (t_{AA}) OF 250 ns for F3566-25 AND 350 ns F3566-35**
- **LOW POWER DISSIPATION (440 mW, MAXIMUM, ACTIVE)**
- **FULLY TTL-COMPATIBLE**
- **THREE-STATE OUTPUT**
- **MASK-PROGRAMMABLE ENABLE FUNCTION**
- **PIN-COMPATIBLE WITH OTHER STANDARD 24-PIN 16K, 32K, and 64K ROMs AND EPROMs**

The output enable (G) input controls the output and provides test data and valid time for high-speed microprocessor applications. The G input and the memory are user-defined.



F3566 ROM

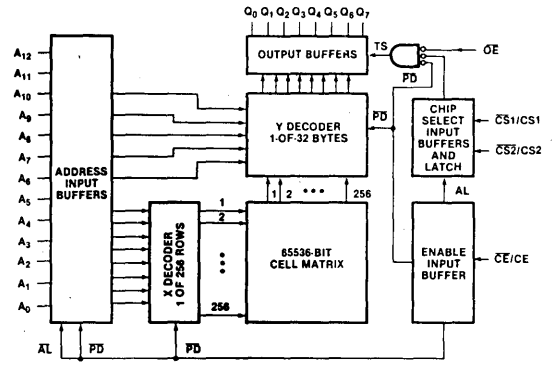
F3568 8192 × 8-BIT READ ONLY MEMORY (ROM)

GENERAL DESCRIPTION — The F3568 8192 × 8-bit (64K) mask-programmable, read-only memory (ROM) is designed for use in bus-organized systems requiring non-volatile memory storage. Because of its high speed, it readily interfaces with all generations of NMOS-microprocessors.

Fabricated with n-channel silicon-gate technology, the F3568 has industry-standard pinouts and is compatible with other available 64K ROMs and EPROMs.

- **ADDRESS LATCH FEATURE**
- **AUTOMATIC POWER-DOWN**
- **ACCESS TIME (t_{AA}) OF 250 ns FOR F3568-25 AND 350 ns FOR F3568-35**
- **LOW POWER DISSIPATION (440 mW, MAXIMUM, ACTIVE; 55 mW, MAXIMUM, STANDBY)**
- **FULLY TTL-COMPATIBLE**
- **THREE-STATE OUTPUTS**
- **MASK-PROGRAMMABLE ENABLE FUNCTION**
- **SINGLE 5 V POWER SUPPLY**
- **PIN-COMPATIBLE WITH OTHER STANDARD 28-PIN 64K PROMs AND EPROMs**

The chip enable (CE) input of the F3568 latches the addresses and controls the active and standby modes of operation; the output enable (OE) input controls the chip outputs and provides fast data valid time for high-speed microcomputer applications. Two chip select (CS) inputs are provided for memory expansion. The active levels of the CE and CS inputs, and the memory contents, are user-defined.



F3568 ROM

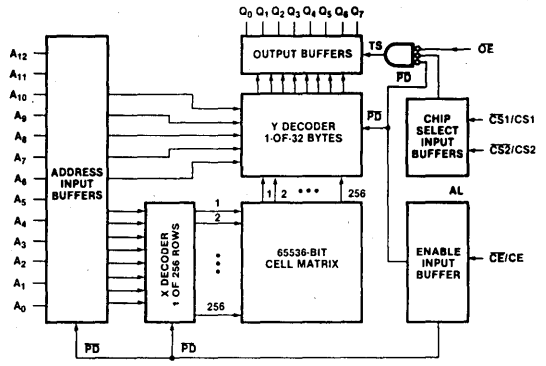
F3569 8192 × 8-BIT READ ONLY MEMORY (ROM)

GENERAL DESCRIPTION — The F3569 8192 × 8-bit (64K) mask-programmable read-only memory (ROM) is designed for use in bus-organized systems requiring non-volatile memory storage. Because of its high speed, it readily interfaces with all generations of NMOS microprocessors.

Fabricated with n-channel silicon-gate technology, the F3569 has industry-standard pinouts and is compatible with other available 28-pin 64K ROMs and EPROMs.

- **AUTOMATIC POWER-DOWN**
- **ACCESS TIME (t_{AA}) OF 250 ns FOR F3569-25 AND 350 ns FOR F3569-35**
- **LOW POWER DISSIPATION (440 mW, MAXIMUM, ACTIVE; 55 mW, MAXIMUM, STANDBY)**
- **FULLY TTL-COMPATIBLE**
- **THREE-STATE OUTPUTS**
- **MASK-PROGRAMMABLE ENABLE FUNCTION**
- **SINGLE 5 V POWER SUPPLY**
- **COMPLETELY STATIC OPERATION**
- **PIN-COMPATIBLE WITH OTHER STANDARD 28-PIN 64K ROMs and PROMs**

The chip enable (CE) input of the F3569 controls and acive and standby modes of operation; the output enable (OE) input controls the chip output and provides fast data available time for high-speed microcomputer applications. Two chip select (CS) inputs are provided for memory expansion. The active levels of the CE and CS inputs, and the memory contents, are user-defined.



F3569 ROM

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F3570
64K ROM

Microprocessor Product

Description

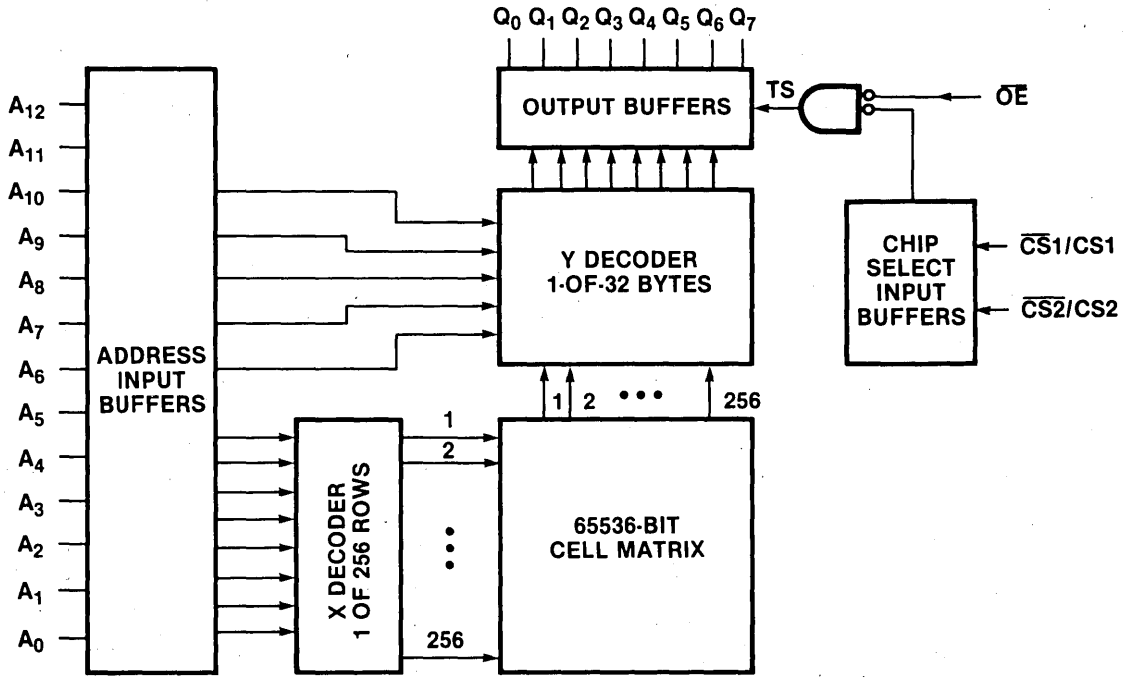
The Fairchild F3570 8192 × 8-bit (64K) mask-programmable, read-only memory (ROM) is designed for use in bus-organized systems requiring non-volatile memory storage. Because of its high speed, it readily interfaces with all generations of NMOS microprocessors.

Fabricated with n-channel silicon-gate technology, the F3570 has industry-standard pinouts and is compatible with other available 28-pin 64K ROMs and EPROMs.

- **Access Time (t_{AA}) of 250 ns for F3570-25 and 350 ns for F3570-35**
- **High-Speed Data Valid Time of 120 ns**
- **Low Power Dissipation (440 mW, Maximum, Active)**
- **Fully TTL-Compatible**
- **Three-State Outputs**
- **Mask-Programmable Chip Select Active Levels**
- **Single 5 V Power Supply**
- **Completely Static Operation**
- **Pin-Compatible with Other Standard 28-Pin 64K ROMs and EPROMs**

The output enable (OE) input controls the chip output and provides fast data valid time for high-speed microprocessor applications. Two chip select ($\overline{CS}$) inputs are provided for memory expansion. The active levels of the CS inputs, and the memory contents, are user-defined.

The F3570 requires only a single +5 V power supply, has TTL-compatible inputs and outputs, and, due to its static operation, requires no clocking or refreshing.



© IC MASTER 1983

16-Bit High-Speed Microprocessor
$I^3L^®$ Bipolar VLSI Technology

Device	Pkg Type	Features
F9445CPU Clock Speed 16 MHz 20 MHz 24 MHz	40-Pin DIP or Chip Carrier	• Advanced Parallel Architecture • Fast Execution Times —16 × 16 Bit Multiply: 3.5 μs (20 MHz Clock) • Operating Temperature Range: -55° C to + 125° C
I/O Interface		
F9447	64-Pin, 50-Mil DIP or Chip Carrier	• I/O Controller — Provides All Timing and Decode Signals for IB Access for Peripheral Devices — F9445 I/O and Data Channel Timing • Operating Temperature Range: -55° C to + 125° C
F9448	64-Pin, 50-Mil DIP or Chip Carrier	• Programmable Multiport Interface — Four Independent I/O Ports Provide Interface Between F9445 and Industry-Standard I/O Devices. — Memory-Mapped and Programmed I/O — Interfaces With Serial, Parallel DMA, and Other Special-Purpose Devices — Programmable Peripheral Timing • Operating Temperature Range: -55° C to + 125° C
F9449	64-Pin, 50-Mil DIP or Chip Carrier	• Multiple Data Channel Controller • — Provides Control of Four Independent Data Channels — Internal Priority Arbitration — Supports Memory-to-Memory Transfers • Operating Temperature Range: -55° C to + 125° C
Memory Interface		
F9444	64-Pin, 50-Mil DIP or Chip Carrier	• Memory Management and Protection Unit — Expands Memory Addressing to 4M Bytes — I/O Protection — Validity Protection — Runaway Defer Protection — Auto Increment/Decrement Protection • Operating Temperature Range: -55° C to + 125° C
F9446	64-Pin, 50-Mil DIP or Chip Carrier	• Dynamic Memory Controller — 16K or 64K Memories — Automatic Page Mode — Complete Memory Timing Signals — 3-State Outputs for Multiport Memories — Internal Refresh Rate Timer • Operating Temperature Range: -55° C to + 125° C
Console		
F9470	40-Pin DIP	• Console and Communication Controller — Provides Console Control for F9445 System • Operating Temperature Range:-55° C to + 125° C • NMOS Technology

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F9443
Floating-Point Processor

Microprocessor Product

Description

The F9443 Floating-Point Processor is designed to provide enhancement to the numeric capabilities of 16-bit microprocessors by providing a set of floating-point instructions. It can interface with the F9445, F9450 or any other standard 16-bit microprocessor, and it uses the microprocessor memory to directly fetch the required operands. It has eight general-purpose registers on-chip and supports all the basic functions with on-chip microcode. Use of additional off-chip microcode read-only memories (ROMs) provides extended capabilities. Figure 1 is a block diagram of the F9443.

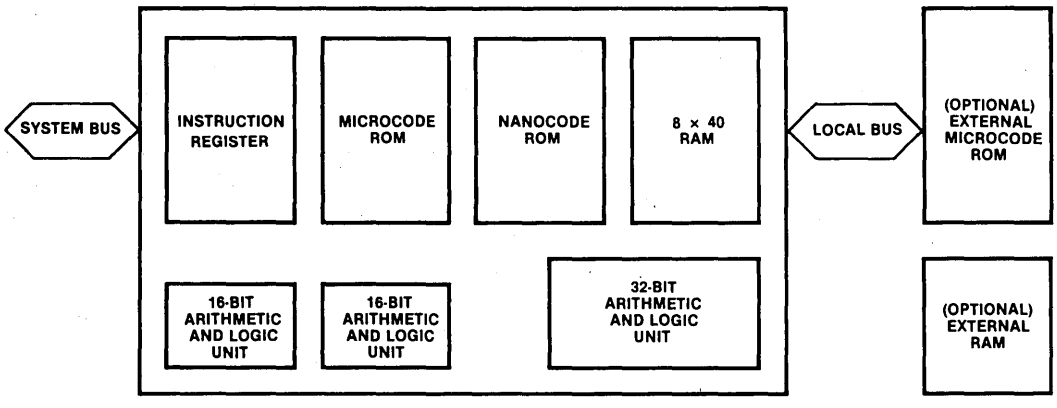
Circuit Description

The F9443 includes special hardware to provide fast algorithms for the basic functions. This hardware includes full-carry look-ahead for add and subtract (ADD/SUB) functions, recoding logic for multiply and square root functions, and partial-remainder-prediction logic for divide functions. An advanced control scheme provides a 2-level microcode/nanocode control with off-chip microcode expansion. The off-chip microcode can be programmable ROM (PROM) or random-access memory (RAM), with easy expansion for fast implementation of user algorithms.

Operation of the F9443 can proceed in parallel with the host processor to maximize throughput. Multiple F9443s can be connected to the host processor for array processing or other high-speed applications.

- **Full IEEE SP D DX Floating-Point Standard Support (80 Bits)**
- **Fast Algorithms for Add, Subtract, Multiply, Square Root, and Divide Functions**
- **Support for Full Set of Trigonometric Exponential and Logarithmic Functions**
- **Expandable Instruction Set That Can Include Macro Operations (e.g., Vector rotate, Fourier Transform, Array and Matrix Applications)**
- **User-Alterable Microcode for User Functions**
- **Support of Integer Decimal and Logical Functions**
- **Standard 64-Pin Package**
- **I^3L® High Speed Bipolar Logic**
- **Low-Power Schottky-Compatible I/O**
- **Very Fast Execution Times**
- **Interface to Any 16-Bit Microprocessor**

Figure 1 9443 Block Diagram



® I^3L is a registered trademark of Fairchild Camera and Instrument Corp.

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F9444
Memory Management and Protection Unit

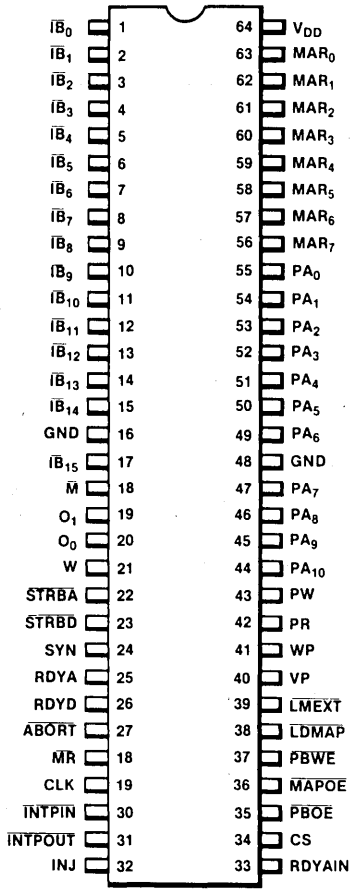
Microprocessor Product

Description

The Fairchild F9444 programmable Memory Management and Protection Unit (MMPU) is designed to support complex multi-user and large single-user environments. With four F93422 bipolar static random-access memories (RAMs) serving as map memory, the F9444 expands the physical address space of the F9445 16-bit microprocessor to 2M words by performing logical-to-physical address translation. That is, the six most significant bits (MSBs) of the logical address are translated into 11 physical address bits, leaving the 10 least significant bits (LSBs) of the logical address unchanged. The memory thus consists of 21 bits (10 LSB and 11 MSB), or 4 megabytes. System integrity is maintained by access protection bits associated with each page. Any violation causes non-maskable interrupt to the F9445 central processing unit. Page-written (PW) and page-referenced (PR) bits permit the implementation of demand-paging algorithms. Figure 1 is a functional diagram of the MMPU.

- **Standard Input/Output (I/O) Instruction Format**
- **Ability to Implement Demand-Paged Virtual Memory System**
- **Ability to Access Up to 2M Words of Memory**
- **2K Pages, With 1K Words for Each Page**
- **Memory Expansion Through Mapping and Demand Paging**
- **Controls for Memory Mapping**
- **Separate RAMs for Storing Maps**
- **Access and I/O Protection to Maintain System Integrity**
- **Special Status Bits for Read/Write Protection, Demand Paging, and I/O Protection**
- **Support for Two User and Two Data Channel Maps**
- **Low-Power Schottky-Compatible I/O**
- **Single +5 V Power Supply**
- **64 Pin Dual-in-Line Package (DIP)**
- **I^3L® Technology**

Connection Diagram



® I^3L is a registered trademark of Fairchild Camera and Instrument Corp.

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F9445
16-Bit Bipolar Microprocessor

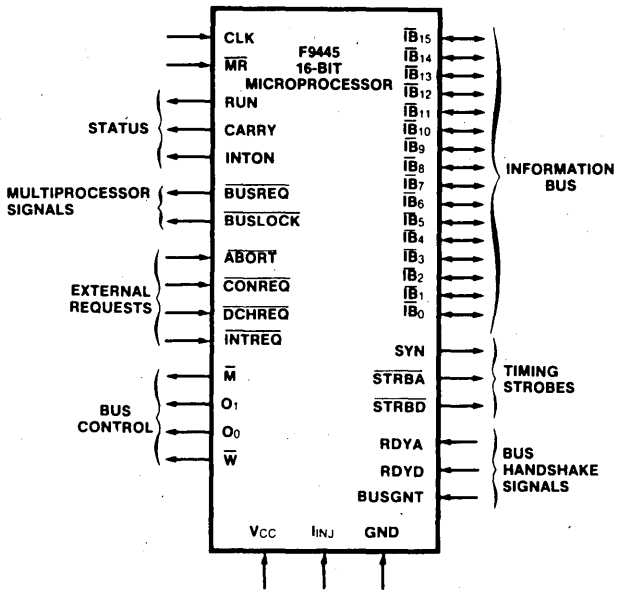
Microprocessor Products

Description

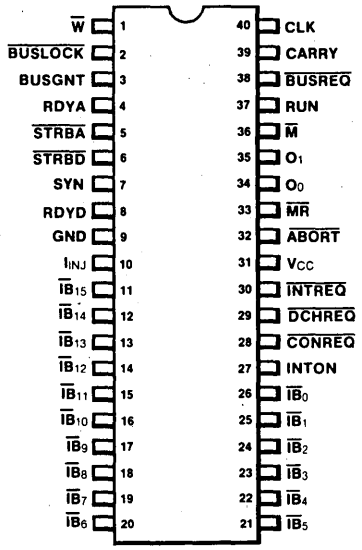
The F9445 is a 16-bit microprocessor implemented using Fairchild's Isoplanar Integrated Injection Logic ($I^3L^{®}$) technology. This bipolar technology and a sophisticated pipeline architecture combine to give the F9445 very fast execution times. The processor has eight program-accessible registers and the capability of directly addressing 128K bytes (64K words) of memory. Up to 4M bytes of physical memory may be accessed using the F9444 memory management unit. The F9445 can address 62 I/O devices, handle 16 levels of priority interrupt, and perform fast direct memory access. It has control lines to provide operator-console functions and has an on-chip self-test program. The F9445 CPU is supported with a comprehensive family of LSI support circuits to permit cost and performance effective usage in high-performance microcomputer systems. The support circuits include the F9446 Dynamic Memory Controller, F9447 I/O Controller, F9448 Programmable Multiport Interface, F9449 Multiple Data Channel Controller, F9444 Memory Management Unit and F9470 Console Controller. It is also supported with a library of software packages, including editors, debuggers, macro-assembler, relocating loader, real-time executive, interactive multi-user disk operating system and utilities, as well as high-level languages: FORTRAN, BASIC and PASCAL.

- **Advanced Parallel Architecture Leading to Very Fast Execution Times—250 ns Register to Register, 2.9 μs 16 × 16 Bit Multiply**
- **Directly Addresses up to 128K Bytes of Memory with 11 Addressing Modes**
- **Eight Program-Accessible Registers (AC0, AC1, AC2, AC3, SP, FP, PC, PSW)**
- **Versatile Instruction Set Including Memory Reference, ALU, I/O, Stack, Multiply/Divide, and Floating Point Assist (Scale/Normalize) Instructions with 8-Bit Byte, 16-Bit Word or 32-Bit Double-Word Data**
- **Multi-Processing Capabilities**
- **Flexible Operator-Control Functions and Self-Test**
- **Static Operation with Single Clock up to 24 MHz**
- **LS TTL Input/Output Structure with I^3L Internal Circuits**
- **40-Pin DIP Needing a Single +5 V Power Supply**
- **Full Military Temperature and Voltage Ranges**
- **Radiation-Tolerant Technology**
- **Comprehensive Family of Support Circuits**

Pin Functions

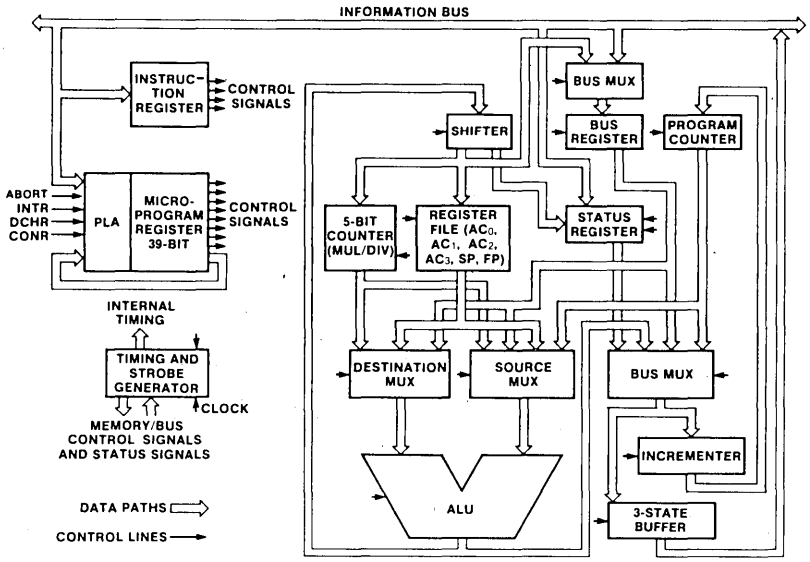


Connection Diagram
40-Pin DIP



© IC MASTER 1983

Fig. 1 F9445 Functional Diagram



Architecture

The F9445 microprocessor comprises three main blocks: the data path, the control unit, and the timing generator.

Data Path

The data path is 16 bits wide and is responsible for all the processing of data and address in the system. In many cases, data and address may be processed simultaneously.

The data path includes the following blocks (see *Figure 1*):
Register File (AC0, AC1, AC2, AC3, SP, FP)
Program Counter (PC)
Program Status Word or Status Register (PSW containing: Carry, Overflow, 32KW, ETRP flags)
Interrupt-On Flip-Flop (INTON)
Destination Mux
Source Mux
16-Bit ALU
17-Bit Shifter
5-Bit Counter (for multicycle instructions)
Bus Register Mux
Bus Register
Bus Mux and Buffer
Incrementer

Control Unit

The operations of the data path components are governed by the pipelined, microprogrammed control unit. This unit comprises three main elements (see *Figure 1*): the PLA (control store) to contain the microprogram, the pipeline register (microprogram register) to latch the microinstruction executed in the current cycle, and the instruction register to supply additional control bits during certain instructions. In addition, the control unit has a machine instruction pre-fetch mechanism which overlaps the fetching of the next instruction from memory during execution of short-cycle instructions, such as arithmetic-and-logic (ALU) instructions. This pre-fetch capability and the microprogram pipeline give the F9445 very fast and efficient instruction execution.

Timing Generator

The timing generator produces the system timings for the F9445 internal registers, memory, I/O, and console.

The clock is divided on-chip using a 3-bit twisted ring counter. The divide ratio is 6:1 or 4:1, depending on whether a short or long cycle is required. The long cycle can be extended indefinitely by lowering the inputs BUSGNT, RDYA, or RDYD. These signals hold the processor in state S1 (using BUSGNT or RDYA) or S3 (using RDYD) until the inputs are raised.

The twisted ring counter is also used to generate all the strobes by a combinational decode of its outputs and certain bits of the microprogram register.

Signal Descriptions

All F9445 inputs and outputs are TTL.

Information Bus

$\overline{IB}_0$ through $\overline{IB}_{15}$, Pins 11 through 26 — 16-bit Bus — Active LOW bidirectional; $\overline{IB}_0$ is most significant bit; address valid

© IC MASTER 1983

with $\overline{STRBA}$ strobe; data valid with $\overline{STRBD}$ strobe; 3-state during data-channel and non-bus cycles.

Timing and Status

SYN, Pin 7 — Synchronize Output — Active every cycle; may be used for external synchronization of memory and I/O control.

$\overline{STRBD}$, Pin 6 — Data Strobe — Active LOW output; active only during memory, I/O, console, or data-channel cycles; used as strobe for data.

$\overline{STRBA}$, Pin 5 — Strobe Memory Address Register — Active LOW output; active only during normal memory cycles; not active during write portion of read-modify-write cycles (DSZ, ISZ, STB instructions and auto-increment/decrement addressing modes); used as strobe for external address register; active on I/O cycles when I/O instruction is output onto bus.

$\overline{M}$, Pin 36 — Memory or I/O Function — Active LOW output.
O_1, Pin 35 — Memory or I/O Function — Active HIGH output.
O_0, Pin 34 — Memory or I/O Function — Active HIGH output; these pins indicate the type of bus transfer as shown in the following table.

	$\overline{M}$	O_1	O_0	Function
Memory	0	0	0	Instruction Fetch
	0	0	1	Operand
	0	1	0	Indirect Address
	0	1	1	Address Save on interrupt, abort, and trap
I/O	1	0	0	Input or Output
	1	0	1	Data Channel Acknowledge
	1	1	0	Read Console Code
	1	1	1	Console Data

If a skip is taken on an arithmetic-and-logic (ALU) instruction, the next instruction is fetched but not executed. In such fetches, the $\overline{M}$ and O lines will indicate the following states.

$\overline{M}$	O_1	O_0	State Indicated
0	0	0	S0 through S4
0	0	1	S5

During machine cycles that do not use the bus, the $\overline{M}$ and O lines will be "111". $\overline{BUSREQ}$ and the bus strobes are inactive in these cycles.

$\overline{W}$, Pin 1 — Write Output — Indicates direction of data flow; HIGH indicates a read or input operation; LOW indicates a write or output operation; 3-state during data-channel cycles and short cycles ($\overline{BUSREQ}$ is HIGH).

RDYD, Pin 8 — Data Ready — Active HIGH input; used to synchronize external devices with the F9445 during data transfer; a LOW level halts the processor.

RDYA, Pin 4 — Address Ready — Active HIGH input; maintains address on bus when LOW.

RUN, Pin 37 — Run Status — Active HIGH output; LOW when in halt state.

CARRY, Pin 39 — Carry Status — Active HIGH output; copy of carry bit.

INTON, Pin 27 — Interrupt-On Status — Active HIGH output; copy of Interrupt-On flag; HIGH when interrupts enabled.

CLK, Pin 40 — Clock Input — Single-phase clock; positive-edge triggered.

Arbitration

$\overline{BUSREQ}$, Pin 38 — Bus Request — Active LOW output; indicates that a bus cycle is required; useful in multi-microprocessor system.

$\overline{BUSLOCK}$, Pin 2 — Bus Lock — Active LOW open collector output; set during read portion of read-modify-write cycles (on DSZ, ISZ, STB, and auto-increment/decrement), reset during write portion of those cycles; used in multi-microprocessor system.

BUSGNT, Pin 3 — Bus Grant — Active HIGH input; used for multi-microprocessor operation; a LOW level inhibits address output and halts the processor.

Service Request

The order of priority of requests and interrupts, from highest to lowest, is as follows: $\overline{MR}$, $\overline{ABORT}$, $\overline{DCHREQ}$, Stack Overflow Interrupt, $\overline{INTREQ}$, and $\overline{CONREQ}$.

$\overline{MR}$, Pin 33 — Master Reset — Active LOW input; a LOW level causes the processor to enter a wait state after completing the next full cycle; if that cycle is a write, it is inhibited (changed to read); sets the F9445 to 32K mode with trap enabled.

$\overline{DCHREQ}$, Pin 29 — Data Channel Request — Active LOW input; initiates data-channel cycles while LOW after current instruction.

$\overline{CONREQ}$, Pin 28 — Console Request — Active LOW input; initiates a console operation after current instruction.

© IC MASTER 1983

$\overline{\text{INTREQ}}$, Pin 30 — Interrupt Request — Active LOW input; initiates entry to interrupt procedure, if interrupts are enabled, after the current instruction.

$\overline{\text{ABORT}}$, Pin 32 — Abort — Active LOW input; initiates abort sequence in the current microcycle.

Power

V_{CC}, Pin 31 — Power Supply — Requires +5 V.

GND, Pin 9 — Ground.

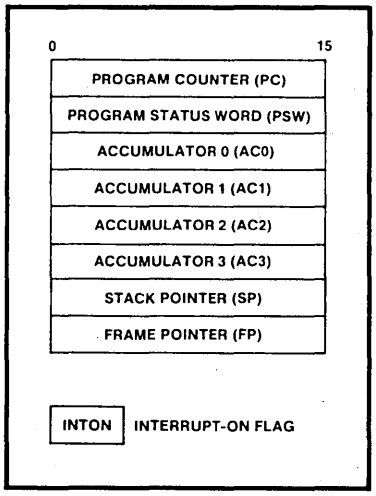
I_{INJ}, Pin 10 — Injection Current Input — Operates in 200-400 mA range at approximately 1 V; requires > 350 mA for maximum speed.

Register Set

The F9445 has eight user-accessible registers (see Figure 2), including seven 16-bit registers and a program status word (PSW) containing the following four flags: carry (bit 0), 32KW (bit 1), trap enable (bit 2), and overflow (bit 15). The carry flag (C) indicates the state of the carry bit during arithmetic and logic operations. The 32KW flag indicates whether the processor is operating in the 32K-word ("1") or 64K-word ("0") mode. The trap enable/disable flag (ETRP) indicates whether the trap instruction is enabled ("1") or disabled ("0"). The overflow flag (V) indicates twos-complement overflow in arithmetic operations.

In addition, there is an interrupt-on (INTON) flag. The CPU responds to interrupt requests from external I/O devices when the flag is set ("1"). When it is clear ("0"), all interrupt requests are ignored by the CPU. The state of the flag can be altered by the Interrupt-Enable or Interrupt-Disable instruction.

Fig. 2 F9445 Register Model



© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F9446
Dynamic Memory Controller

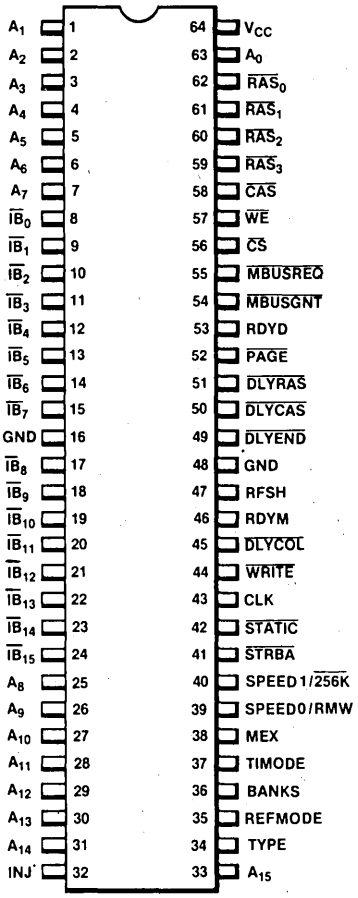
Microprocessor Product

Description

The Fairchild F9446 Dynamic Memory Controller (DMC) is designed to support a variety of memory configurations and provide an interface between 16K and 64K memory chips and the F9445 central processing unit (CPU). It provides a 16-bit memory address register (MAR), an address multiplexer for the row, column, and refresh addresses, a timing generator for the row and column strobe signals and the write enable signal (RAS-CAS-WE), mode arbitration, and page mode logic. It is implemented in I^3L® bipolar technology with low-power Schottky-compatible inputs and outputs.

- **16-bit Memory Address Register**
- **Ability to Accommodate a Variety of Memory Speeds**
- **16K or 64K DRAMs**
- **Automatic Page Mode**
- **Internal Refresh Address Counter**
- **Row/Column/Refresh Multiplexer**
- **Complete Memory Timing Signals**
- **Three-state Outputs for Multiport Memories**
- **Internal Refresh Rate Timer**
- **Low-power Schottky-compatible I/0**
- **I^3L Bipolar Technology**
- **64-Pin DIP**
- **Operating Temperature Range of from −55°C to +125°C**

Connection Diagram



© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F9447
I/O Bus Controller

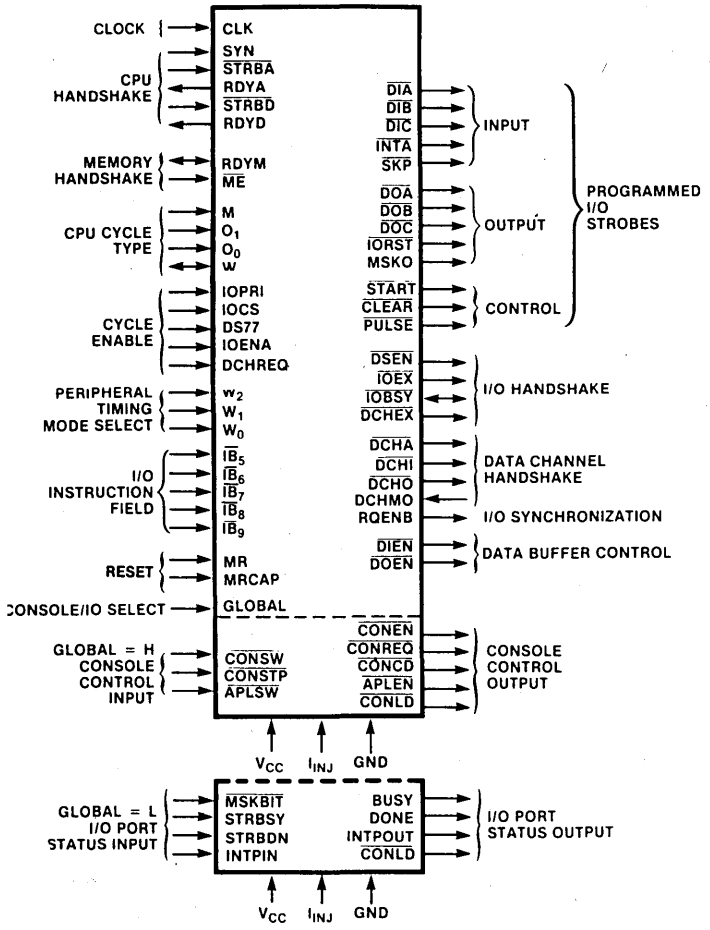
Microprocessor Product

Description

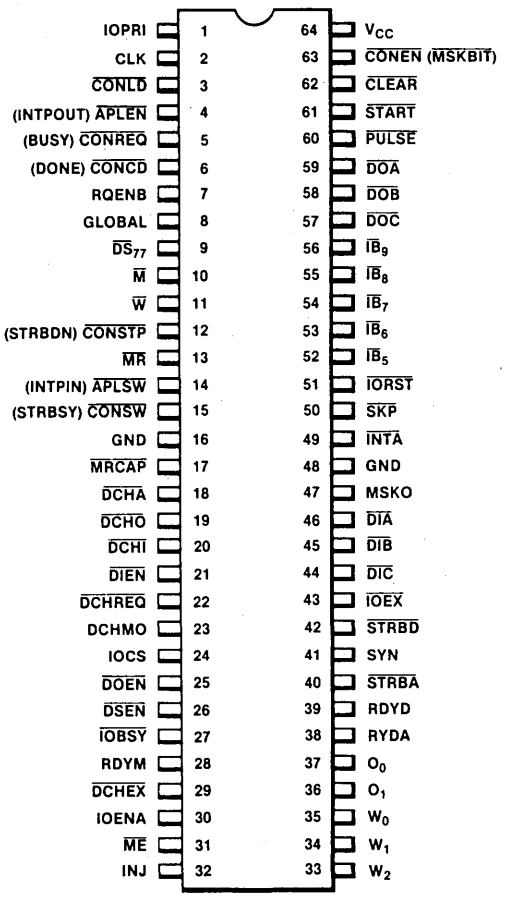
The F9447 I/O Bus Controller (IOC) is used with the F9445 I^3L® 16-Bit Bipolar Microprocessor to demultiplex the I/O instruction and data of the information bus (IB). It provides all the timing and decode signals required for programmed or data channel (DCH) input/output to peripheral device controllers. In the NOVA® -compatible mode, the F9447 provides all the timing and signals required by that I/O bus. For DCH transfers, address generation and handshake can be handled by the F9449 Multiple Data Channel Controller.

- **Interfaces Directly to the F9445**
- **Controls Standard and High-Speed NOVA-Compatible Data Channels**
- **NOVA-Compatible or F9445 I/O and Data Channel Timing**
- **Complete NOVA-Compatible I/O Bus Interface**
- **Automatic Program Load**
- **Power-Up Reset Delay**
- **Console Interface**
- **Local Busy/Done/Interrupt Logic**
- **Low-Power Schottky-Compatible I/O**
- **64-Pin DIP or Optional Chip Carrier Package**
- **I^3L Technology**
- **Operating Temperature Range of from −55°C to +125°C**

Signal Functions



Connection Diagram



® I^3L is a registered trademark of Fairchild Camera and Instrument Corp.

® NOVA is a trademark of Data General Corporation.

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F9448
Programmable Multiport Interface

Microprocessor Product

Description

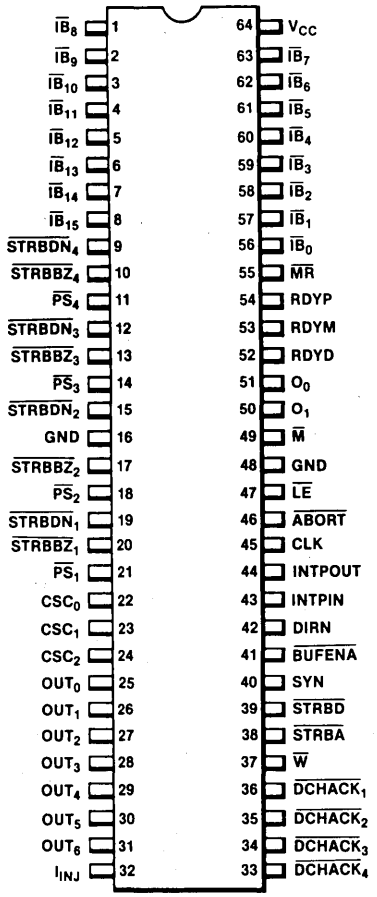
The F9448 Programmable Multiport Interface (PMI) is 64 pin bipolar I^3L device that facilitates the interface between an F9445 16-bit bipolar microprocessor and many industry-standard input/output (I/O) devices. It decodes I/O instructions and memory addresses from the central processing unit (CPU) to communicate with devices tied to its four external ports. When used with the F9449 Multiple Data Channel Controller, it handles peripheral selection and timing during data channel cycles. Some of the features of the F9448 are:

- **Four Independent I/O Ports**
- **Memory-Mapped and Programmed I/O**
- **Interface with Serial, Parallel, DMA, and Other Special-Purpose Devices**
- **Programmable Peripheral Timing**
- **Compatibility with Many Industry-Standard Interfaces**
- **Ability to Implement F9445-Programmed I/O Flags**
- **Interrupt Arbitration and Response Handling**
- **Fabricated in I^3L® Bipolar VLSI Technology**
- **Operating Temperature Range −55° to +125°C**
- **64-Pin Package**
- **Low-Power Schottky Compatible I/O**

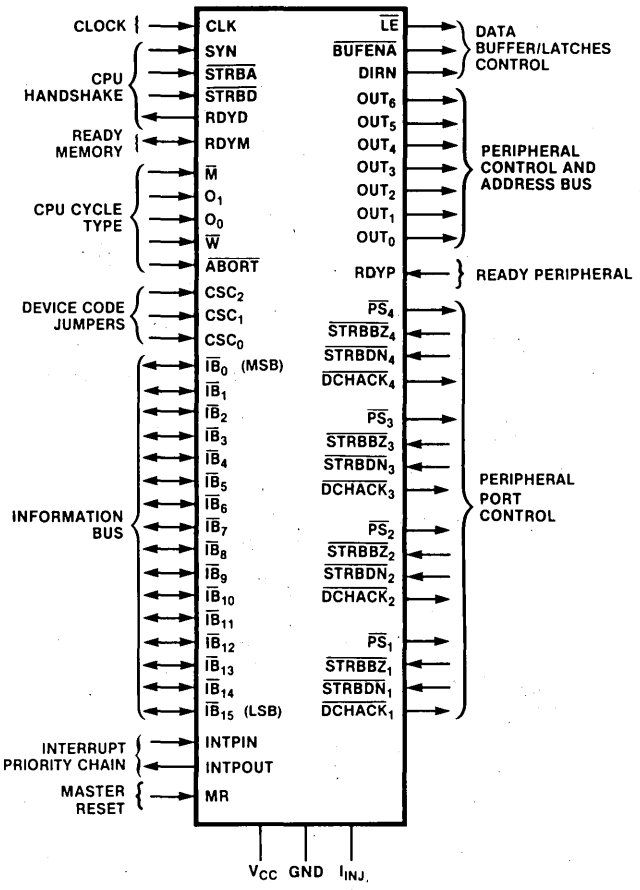
The F9448 PMI ties the F9445 CPU to many industry-standard microprocessor interfaces. It easily links I/O devices designed for the F6800 or 8080 buses and those directly suitable for the F9445 I/O bus. The system configuration in figure 1 shows how the F9448 can be used to interface F6800, 8086 family I/O devices or the F3870 to the F9445 system.

* I^3L is a registered trademark of Fairchild Camera and Instrument Corp.

Connection Diagram



Signal Functions



© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F9449

Multiple Data Channel Controller

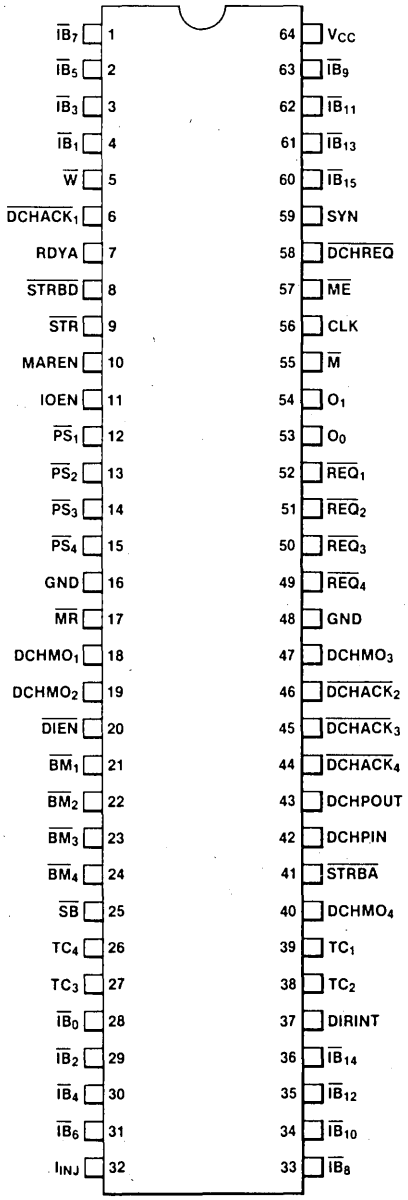
Microprocessor Product

Description

The F9449 Multiple Data Channel Controller is a 4-port controller that is used with the Fairchild F9445 16-Bit Bipolar Microprocessor, and either an F9447 I/O Bus Controller or an F9448 Programmable Multiport Interface, to control direct data transfer to and from memory by peripheral devices. It contains four pairs of program-controlled address and word count registers that are multiplexed to control four fully independent data channels (DCHs) through which data transfers can occur. Data channel transfers are similar to direct memory access (DMA) channel transfers, except that the F9445 architecture time-shares its information bus (IB).

- **Provides Control of Four Independent Channels**
- **Has Separate Word Count and Memory Address Registers for Each Channel**
- **Supports Byte- or Word-mode Operation on Each Channel**
- **Performs Internal Priority Arbitration**
- **Supports Memory-to-Memory Transfers**
- **Implemented in I^3L® Technology, with Low-power Schottky TTL-compatible Input and Output**
- **Available in a 64-Pin Package.**
- **Operating Temperature Range of from −55°C to +125°C**

Connection Diagram



® I^3L is a registered trademark of Fairchild Camera & Instrument Corp.

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F9470
Communication and Console Controller

Description

The Fairchild F9470 Communication and Console Controller is an LSI MOS device that provides the Fairchild F9445 16-bit I³L® microprocessor with virtual console control and programmed serial I/O via a pair of asynchronous communication ports.

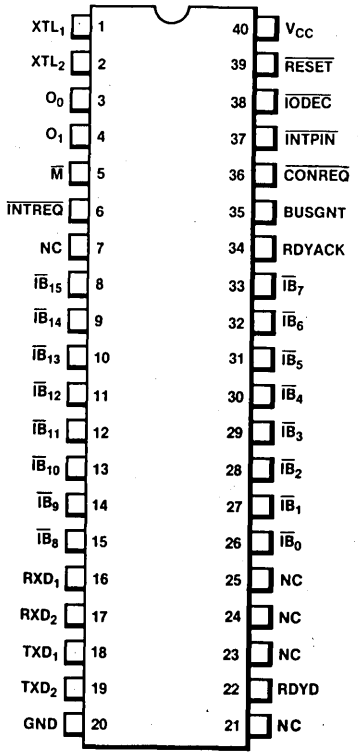
The F9470 provides a variety of useful console functions, including examine and deposit to memory and accumulators, jump to a specified location, and trace the F9445 instruction execution.

The F9470 operates in two modes: console control and I/O service. In the console mode, all communication with the F9445 is controlled by the F9470, which interprets user commands, requests the appropriate information from the F9445, and then outputs it to the operator's terminal.

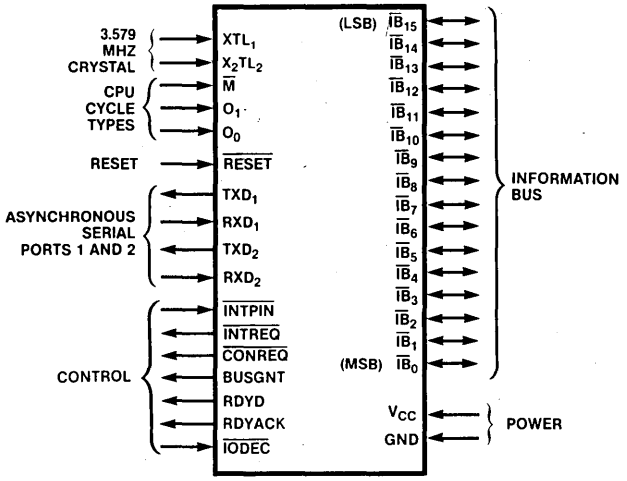
In the I/O service mode, the F9470 acts as a serial I/O controller, interfacing the serial I/O devices to the F9445 through device codes 10-13 and 77. The console commands are not available while in the I/O service mode; all I/O in this mode is programmed through the F9445.

- **Accesses Microprocessor Internal Registers**
- **Two Asynchronous Serial Ports**
- **Allows CRT Terminal to Operate as a Console for an F9445 System**
- **40-Pin DIP Requiring Single +5 V Power Supply**
- **NMOS Technology.**

Connection Diagram



Signal Functions



© IC MASTER 1983

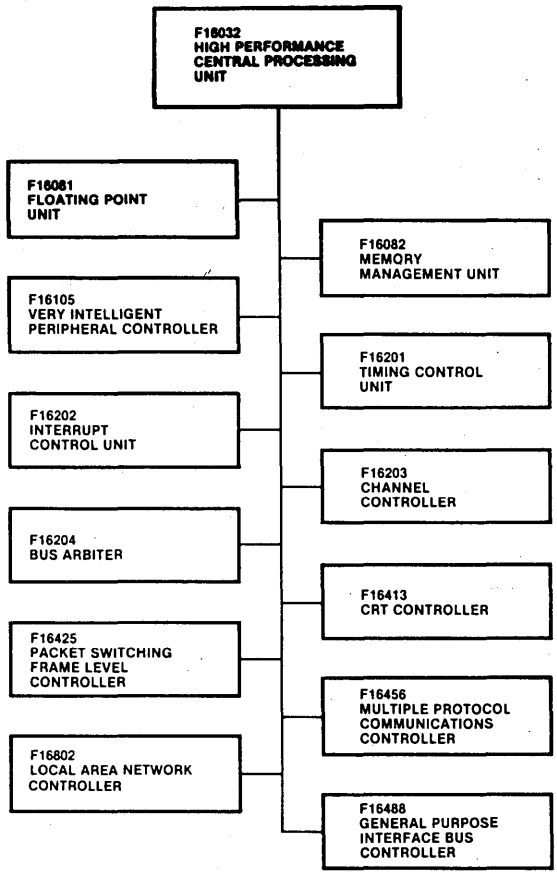
F16000 Family

Features

- True 32-Bit Internal Architecture
- 16M Bytes of Uniform, Unsegmented Address Space
- Eleven Addressing Modes
- Demand-Paged Virtual Memory Management
- Totally Symmetric Architecture in Terms of Instructions, Addressing, Registers, and Data-Type Handling
- Efficient Use of High-Level Language Processing and Compilation
- Provides for Absolute Software Modularity
- Open-Ended Architecture Provides for Future Expansion

Device	Description
F16008	8-Bit Processor Unit
F16016	16-Bit Bilingual Processor Unit
F16032	32-Bit Processor Unit
F16081	Floating-Point Processor Unit
F16082	Memory Management Unit
F16105	Very Intelligent Programmable Controller
F16201	Clock Generator
F16202	Interrupt Control Unit
F16203	Direct Memory Access Unit
F16204	Bus Arbiter
F16413	CRT Controller
F16425	Packet Switching Frame Level Controller
F16456	Multiple Protocol Controller
F16488	General-Purpose Interface Bus Controller

F16000 MICROPROCESSOR FAMILY ORGANIZATION



© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F16032
High-Performance CPU

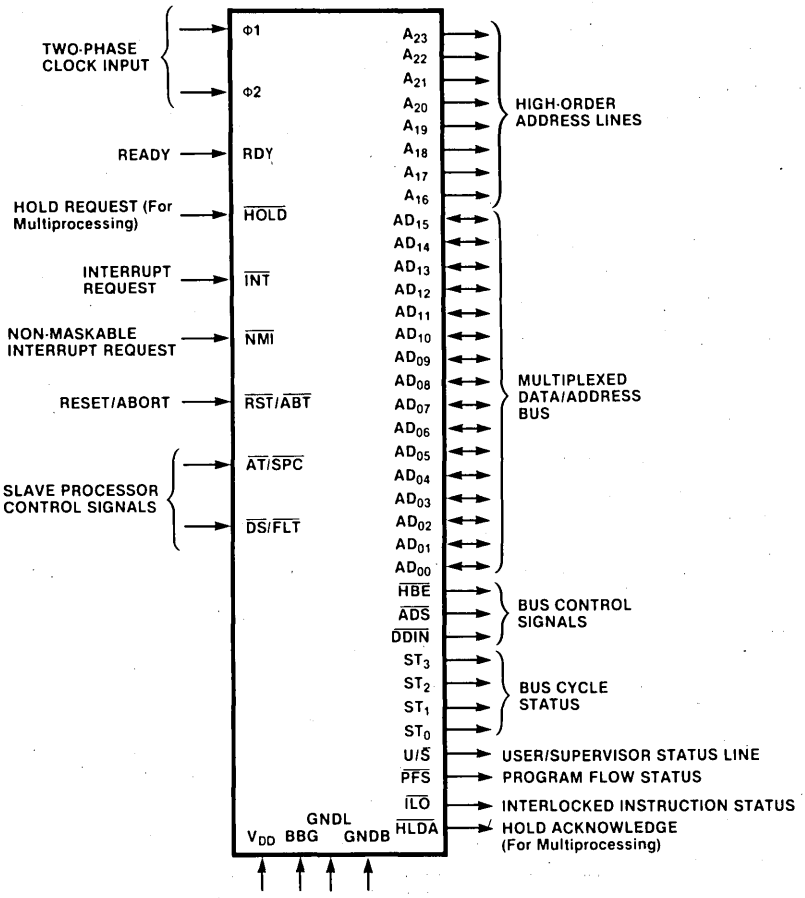
Microprocessor Product

Description

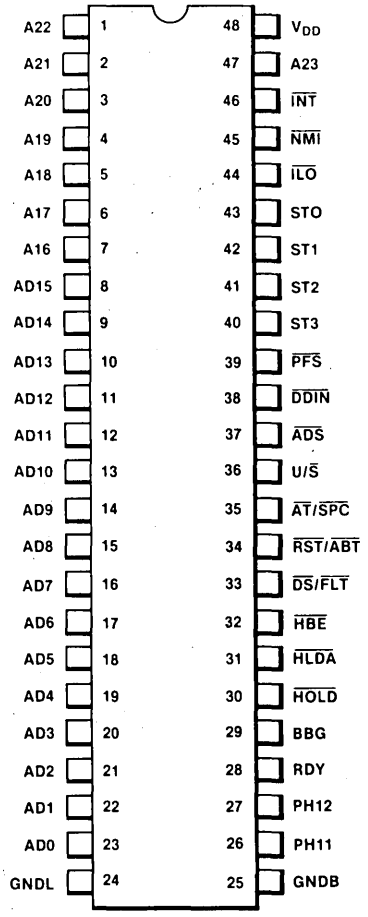
The F16032 central processing unit (CPU) acts as the highest performance CPU for the F16000 microprocessor family. It is designed to provide optimal support to microprocessor users who need a large addressing space for large programs or data structures. The F16000 architecture allows very efficient compilation for large programs generated and maintained in high-level languages, while remaining easy to program at the assembler level for optimizations. Figure 1 is a block diagram of the F16032 CPU.

- **32-Bit Architecture and Implementation**
- **16-Mb Uniform Addressing Space**
- **Two-Address Architecture**
- **High Degree of Symmetry in Instruction Set**
- **Addressing Modes Designed to Support High-Level Language Accesses to Variables**
- **High-Speed N-Channel MOS Technology**
- **Single +5 V Power Supply**
- **48-Pin Dual In-Line Package (DIP)**

Signal Functions

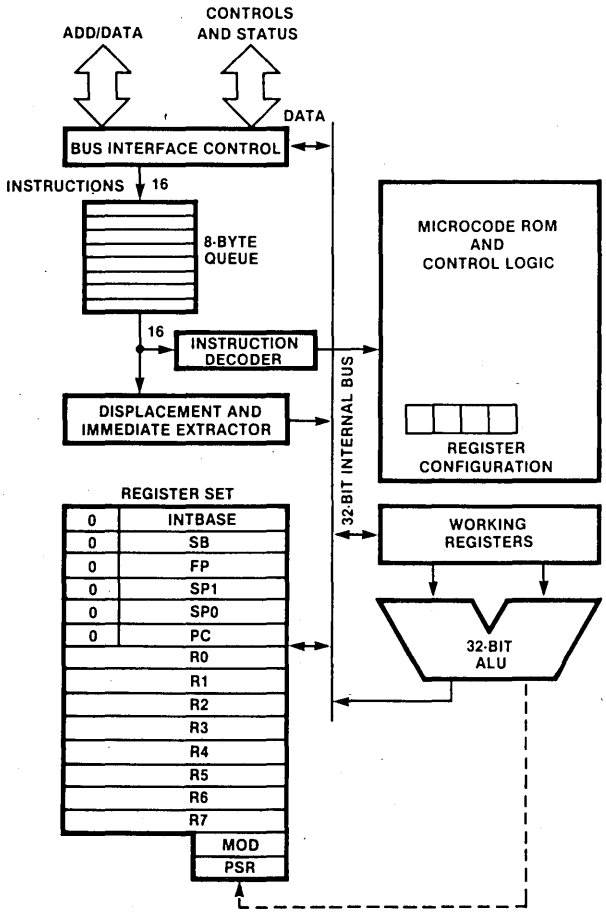


Connection Diagram



© IC MASTER 1983

Figure 1 F16032 Block Diagram



Registers

The eight dedicated and eight high-speed general storage registers of the F16032 are illustrated in figure 2.

Instruction Set

Table 1 is a summary of the instruction set for the F16032.

© IC MASTER 1983

Table 1 F16032 Instruction Summary (Cont'd.)

Mnemonic	Meaning
NEG	Negate
NOP	No Operation
NOT	Not
OR	Or
QUO	Quotient
RDVAL	Read Address Validate
REM	Remainder
RESTORE	Restore General Registers
RET	Return from Subroutine
RETI	Return from Interrupt
RETT	Return from Trap
ROT	Rotate
RXP	Return from External Procedure
S	Set on Condition
SAVE	Save General Registers
SBIT	Set Bit
SETCFG	Set Configuration
SKPS	Skip String
SMR	Store MMU Register
SPR	Store Processor Register
SUB	Subtract
SUBC	Subtract with Borrow
SUBP	Subtract Packed Decimal
SVC	Supervisor Call
TBIT	Test Bit
WAIT	Wait
WRVAL	Write Address Validate
XOR	Exclusive OR

© IC MASTER 1983

Figure 2 F16032 Dedicated and General Storage Registers

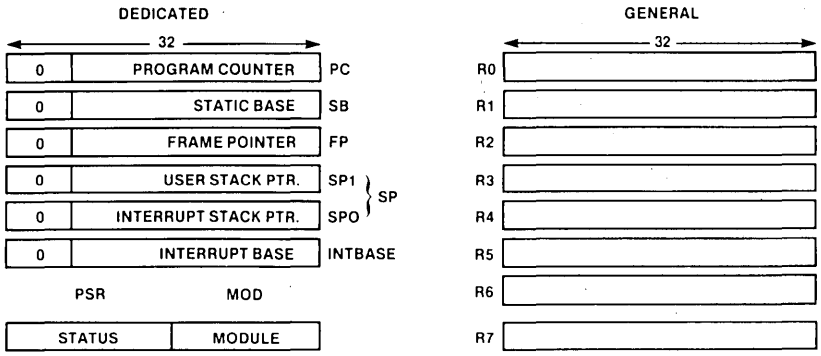


Table 1 F16032 Instruction Summary

Mnemonic	Meaning
ABS	Absolute Value
ACB	Add Compare and Branch
ADD	Add
ADDC	Add with Carry
ADDP	Add Packed Decimal
ADDQ	Add Quick Integer
ADDR	Calculate Address
ADJSP	Adjust Stack Pointer
AND	And
ASH	Arithmetic Shift
B	Conditional Branch
BIC	Bit Clear
BICPSR	Bit Clear in PSR
BISPSR	Bit Set in PSR
BPT	Breakpoint Trap
BSR	Branch to Subroutine
CASE	Case Branch
CBIT	Clear Bit
CHECK	Check Index
CMP	Compare
CMPM	Compare Multiple
CMPQ	Compare Quick Integer
CMPS	Compare String
COM	Complement
CVTP	Convert to Bit Pointer
CXP	Call External Procedure
CXPD	Call External Procedure with Descriptor
DFI	Divide Extended Integer
DIV	Divide
ENTER	Enter New Context
EXIT	Exit Context
EXT	Extract Field
EXTS	Extract Field Short
FFS	Find First Set Bit
FLAG	Flag Trap
IBIT	Invert Bit
INDEX	Calculate Index
INS	Insert Field
INSS	Insert Field Short
JSR	Jump to Subroutine
JUMP	Jump
LMR	Load MMU Register
LPR	Load Processor Register
LSH	Logical Shift
MEI	Multiply Extended Integer
MOD	Modulus of Periodic Function
MOV	Move
MOVM	Move Multiple
MOVQ	Move Quick Integer
MOVS	Move String
MOVSU	Mover Supervisor to User
MOVUS	Mover User to Supervisor
MOVX	Sign Extend
MOVZ	Zero Extend
MUL	Multiply

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F16456
Multiple Protocol Communications Controller

Microprocessor Product

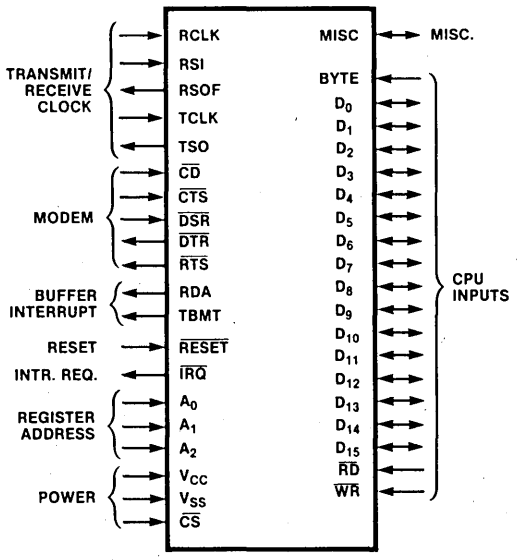
Description

The Fairchild F16456 Multiple Protocol Communications Controller (MPCC) is a programmable microprocessor peripheral device that interfaces a computer system to a serial data communication channel with minimum system overhead. It can be used in computer-to-computer or computer-to-terminal communications, or in control of network trunk lines with the F16000 family and other microprocessors.

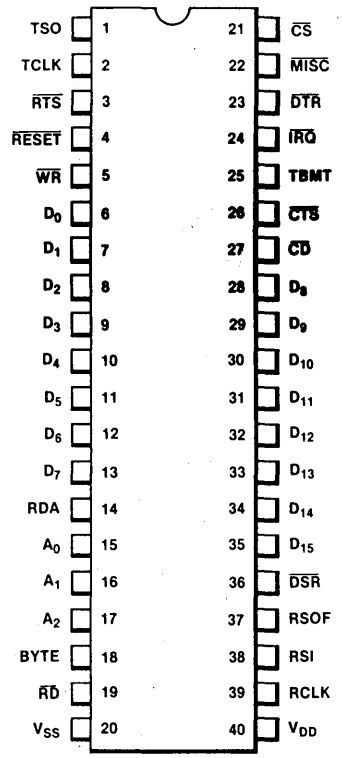
- **F16000 Family, 8080, 8086 Bus Compatible**
- **Satisfies Interface Requirements for Asynchronous Mode and for Synchronous Bit-Oriented Protocol (BOP) or Synchronous Byte-Control Protocol (BCP)**
- **Generates and Tests Error Detection Codes; Generates and Detects Special Characters**
- **Bidirectional Three-State Data Bus Interface (Selectable as 8-Bit or 16-Bit Bus)**
- **Full- or Half-Duplex Operation**
- **Modem Handshake Signals**
- **5- to 8-Bit Character Lengths**
- **Primary or Secondary Station Operation**
- **Normal and Transparent Text Modes**
- **Directly Addressable Registers**
- **Serial Data from dc to 2.0M bps**
- **NRZ or NRZI (Complemented on Zero) Serial Data**
- **Self-Tested Loop-Back Mode**
- **Maintains Data Transparency Through Automatic Manipulation of the Data Stream**
- **TTL-Compatible**
- **Single +5 V Power Supply**
- **40-Pin Plastic or Ceramic Dual-in-Line Package**

The F16456 MPCC is functionally divided into a serial data receiver, serial data transmitter, addressable registers, and data bus control logic. The receiver and transmitter operate at independent rates determined by their clocks. The eight registers contained in the MPCC are directly addressable when using an 8-bit data bus; they are addressed in pairs when a 16-bit data bus is used. The MPCC is manufactured using high-speed XMOS technology.

Signal Functions



Connection Diagram



Fairchild

MICROPROCESSOR

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

F16488
GPIB Controller

Microprocessor Product

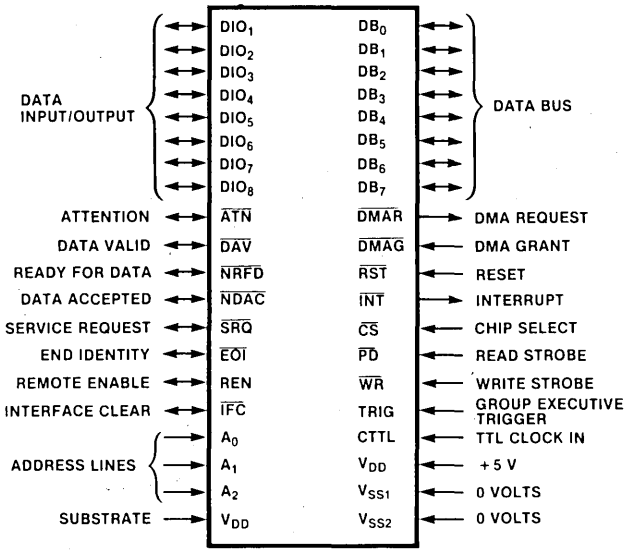
Description

The Fairchild F16488 General-Purpose Interface Bus (GPIB) controller serves as a general IEEE-488 compatible listener/talker and controller within the 16000 microprocessor family for applications in the interconnection of intelligent programmable instruments on the general-purpose interface bus. It is compatible with most MOS microprocessor families.

- **Handles All IEEE 488-1975/78 as Well as 1980 Supplement Functions**
- **Talker, Listener, and Controller Functions**
- **Compliance of All Bus Signals with IEEE 488 and IEC 625 Inputs, Threshold, Termination, and Output Specifications**
- **DMA Access Facilities (Compatible with F16203 and Most Other DMA Controllers)**
- **Single-Phase 10-MHz Maximum TTL Clock**
- **Pass Control Capabilities**
- **Stoppage of Transmission of Unwanted Data Possible Through NBAF Auxiliary Command**
- **On-Board Drivers**
- **Hold-Off on All Data and Hold-Off on Command**
- **End-of-String Recognition by EOS Byte or EOI Pin**
- **Programmable Counter for T1**
- **40-Pin Package**
- **Single 5 V + 10% Power Supply**
- **One-MHz Data Transfer Rate**

Figure 1 is a block diagram of the F16488.

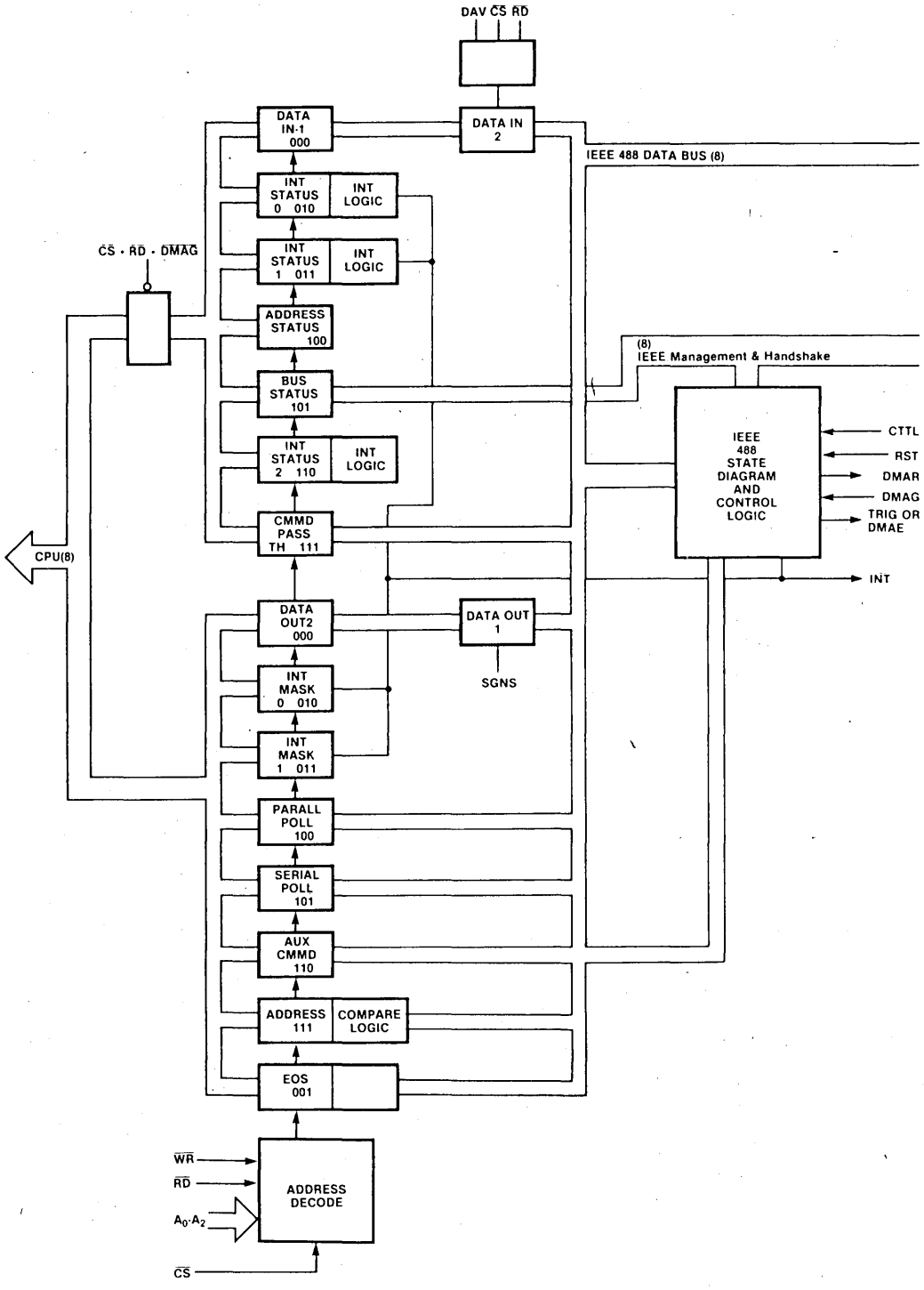
Signal Functions



Note: This is not a pin assignment.

© IC MASTER 1983

Figure 1 F16488 Block Diagram



© IC MASTER 1983

FUJITSU
MICROELECTRONICS

MBL8086

16-BIT GENERAL PURPOSE MICROPROCESSOR

GENERAL DESCRIPTION

The MBL8086 is a new high performance microprocessor fabricated using N-channel, depletion load, silicon gate technology and packaged in a 40-pin package. The processor has attributes of both 8-and 16-bit microprocessors. It addresses memory as a sequence of 8-bit bytes, but has a 16-bit wide physical path to memory for high performance.

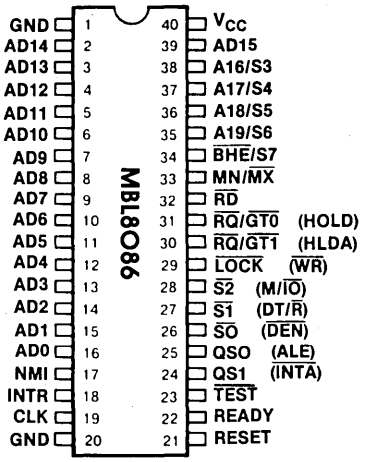
The MBL8086 is compatible with Intel 8086 microprocessor and will be supported with several peripheral devices, including the MBL8089 I/O processor device during 1982.

FEATURES

- Assembly language compatible with 8080/8085 microprocessors
- Bit, byte, word and block operations
- 24 Operand Addressing Modes
- 8-and 16-bit signed and unsigned arithmetic in binary or decimal, including multiply and divide
- 5 MHz Clock Rate
- 14 word, by 16-bit Register Set with Symmetrical Operations

MBL8086

PIN ASSIGNMENT



- Compatible with Intel 8086

MICROCOMPUTER AND PERIPHERAL GUIDE

Device Number	Description	Max. Power Dissipation (W)	Alternate Source (Intel)
MBL8086 MBL8086-2	High-Performance 16-Bit Microprocessor/ 1M-Byte Memory Direct Addressing Capability/14-Word, By 16-Bit Register Set with Symmetrical Operations/ 24 Operand Addressing Modes	2.5	8086 8086-2
*MBL8087	Numeric Processor Extension used with 8086 and 8088	—	8087
MBL8089	I/O Processor Extension used with 8086 and 8088	—	8089
MBL8088	8-Bit Microprocess/16-Bit Internal Architecture with 8-Bit Interface Direct Software Compatible with MBL8086	2.5	8088
MBL8259A	Programmable Interrupt Controller/ 8 Level Priority/Expandable to 64 Levels/ Programmable Interrupt Modes/ Indivisual Request Mask Capability	1	8259A
MBL8282	8-Bit Latch (Non-Inverting)	1	8282
MBL8283	8-Bit Latch (Inverting)	1	8283
MBL8284A	Clock Generator and Driver for MBL8086 Series	1	8284A
MBL8286	8-Bit Transceiver (Non-Inverting)	1	8286
MBL8287	8-Bit Bus Transceiver (Inverting)	1	8287
MBL8288	Bus Controller for MBL8086 Series Bipolar Driver Capability Advanced Commands/Wide System-Configuration Flexibility	1.5	8288
MBL8289	Bus Arbiter	1	8289

*Available soon

For complete data sheets contact: Fujitsu Microelectronics • 2985 Kifer Road • Santa Clara, CA 95051 • (408) 727-1700 • Telex I/II: 910-338-0190

© IC MASTER 1983

FUJITSU MICROELECTRONICS

MB8840/MB88400 Series
MB8850/MB88500 Series
MB88200 Series

SINGLE COMPONENT 4-BIT MICROCOMPUTER SERIES

GENERAL DESCRIPTION

This 4-bit series, available in both CMOS and NMOS, provides the user with a common architecture, instruction set and speed regardless of which device in the family is selected. As shown, various combinations of options are available so that a processor can specifically be tailored to an application and thereby be cost effective. On-board timers, LCD driver, A/D or D/A converter and power down options are available. To facilitate prototype development, devices with piggyback EPROMS are available for each subseries.

Devices are provided in standard DIP, skinny DIP (70 mil pin spacing) or flatpack.

FEATURES

- Various RAM and ROM levels available
- 57 I/O lines maximum
- 3 μS Instruction Cycle Time at 2 MHz clock rate
- TTL/CMOS compatible I/O level
- 70 powerful instructions for NMOS version
- 72 powerful instructions including power saving HALT and STOP modes for CMOS version

Technology	Device Number	Package	ROM	RAM	I/O Ports	VCC	Comments
NMOS	MB8841	42-pin DIP	2K x 8	128 x 4	37	+5V	—
	MB8842	28-pin DIP	2K x 8	128 x 4	23	+5V	—
	MB8843	42-pin DIP	1K x 8	64 x 4	37	+5V	—
	MB8844	28-pin DIP	1K x 8	64 x 4	23	+5V	—
	MB88401	42-pin DIP 42-pin SDIP	4K x 8	192 x 4	36	+5V	On-board PLA
	MB88411	42-pin DIP 42-pin SDIP	4K x 8	192 x 4	32	+5V	8-bit A/D converter
	MB88413	42-pin DIP 42-pin SDIP	2K x 8	192 x 4	32	+5V	8-bit A/D converter
	MB88421	64-pin SDIP	4K x 8	192 x 4	57	+5V	Watch-dog timer, Detect circuit for power down
	MB88423	64-pin SDIP	2K x 8	128 x 4	57	+5V	
CMOS	MB8851	42-pin DIP	1K x 8	64K x 4	37	+5V	
	MB8853	42-pin DIP	1K x 8	64K x 4	37	+5V	
	MB8854	28-pin DIP	1K x 8	64 x 4	23	+5V	
	MB8851A	42-pin DIP	2K x 8	128 x 4	37	V_{CC} = 6.0 ~ 3.5V	
	MB8854A	28-pin DIP	1K x 8	64 x 4	23		
	MB8851L	42-pin DIP	2K x 8	128 x 4	37	V_{CC} = 3.5 ~ 2.5V	
	MB8854L	28-pin DIP	1K x 8	64 x 4	23		
	MB88501	42-pin DIP 42-pin SDIP	4K x 8	192 x 4	36	-S: 5V -A: 3.5 ~ 6.0V -L: 2.5 ~ 4.0V	—
	MB88503	42-pin DIP 42-pin SDIP	2K x 8	128 x 4	36	-S: 5V -A: 3.5 ~ 6.0V -L: 2.5 ~ 4.0V	—
	MB88535	42-pin DIP 42-pin SDIP	2K x 8	128 x 4	34	+5V	6-bit, 3 CHL, D/A converter
	MB88536	42-pin DIP 42-pin SDIP	2K x 8	128 x 4	34	+5V	6-bit, 3 CHL, 13-bit 1 CHL, D/A converter
	MB88541	70-pin FLTPK	4K x 8	196 x 4	29	+5V	LCD Driver
	MB88201	16-pin DIP	512 x 8	16 x 4	12	+5V	Low cost series
	MB88202	16-pin DIP	1024 x 8	32 x 4	12	+5V	Low cost series

For complete data sheets contact: Fujitsu Microelectronics • 2985 Kifer Road • Santa Clara, CA 95051 • (408) 727-1700 • Telex I/II: 910-338-0190

© IC MASTER 1983

FUJITSU
MICROELECTRONICS
CMOS SINGLE CHIP 8-BIT MICROCOMPUTER

MBL80C49
MBL80C39

GENERAL DESCRIPTION

The Fujitsu MBL80C49/MB80C39 is a totally self-contained 8-bit single-chip microcomputer fabricated with silicon-gate CMOS technology. The MBL80C49 has a 2K x 8 ROM program memory, a 128 x 8 RAM data memory, 27 I/O ports, an 8-bit timer/counter, and clock generator on chip. The MBL80C39 is identical to the MBL80C49 except without program memory. It can be used with external memory for system prototyping and pre-production systems.

The design is optimized for low cost and high performance applications because the MBL80C49/ MB80C39 is fabricated on a single silicon chip and can be used for applications that require additional expansion of ROM, RAM, I/O ports, etc.

This microcomputer permits external program operation and single-step operation. Low power applications are possible by using the stand-by mode feature. The software is upward compatible with the MBL8049/ MBL8039 and Intel i8049/i8039.

The MBL80C49/MB80C39 uses a single power supply of +5V. It is packaged in a standard 40-pin DIP and operation is guaranteed over the range of −40°C to +85°C.

FEATURES

- **12-bit Addressing**
- **98 Instructions (232 Instruction Codes): 70% of Instructions are Single Byte**
- **2.5μs Instruction Cycle: All Instructions are 1 or 2 Cycles**
- **On-chip Clock Generator (or External Clock Source)**
- **2K x bit ROM**
- **128 x 8 bit RAM**
- **27 I/O Lines**
- **8-bit Interval Timer/Event Counter**
- **8-Level Stack**
- **8 pairs of Working Registers**
- **Low-power Standby Mode Capability by HALT and STOP Instructions**
- **External Program Mode Capability**
- **Single-step Operation Capability**
- **Easily Expandable Memory and I/O**
- **Single-level Interrupt Capability**
- **ALU Functions: Addition, Decimal Adjust Addition, and Logic Operations**

Device Number	Description	Max. Freq.	Power Supply (V)	Power Dissipation (mW Max.)	I/O Level	Package
MBL80C49 MBL80C39 (ROM-less)	CMOS/8-Bit Microcomputer/ 98 Instructions with Bit Operations/ On-chip clock generator/ Programmable 8-bit timer/27 I/O lines	6 MHz	+5	55	TTL 3-State	40-pin
MBL8051 MBL8031 (ROM-less)	NMOS/8-Bit Microcomputer/ 111 instructions with Bit Operations/ Boolean Processor/On-chip clock generator/Two 16-bit timers/Full-Duplex UART/32 I/O lines	12 Mhz	+5	840	TTL 3-State	40-pin

NMOS SINGLE CHIP MICROCOMPUTER

MBL8051
MBL8031

GENERAL DESCRIPTION

The Fujitsu MBL8051/MBL8031 is a totally self-contained, high performance single-chip microcomputer fabricated with silicon gate NMOS technology. It provides the hardware features, architectural enhancements and new instructions that are necessary to make it a powerful and cost effective controller for applications requiring up to 64K bytes of program memory and/or up to 64K bytes of data storage.

The MBL8051/MBL8031 is efficient both as a controller and as a arithmetic processor with extensive facilities for binary and BCD arithmetic along with bit-handling capabilities. Efficient use of program memory results from an instruction set consisting of 44% one-byte, 41% two-byte, and 15% three-byte instructions. With a 12 MHz crystal, 58% of the instructions execute in 1.0μS, 40% in 2.0μS and multiply and divide require only 4.0μS.

FEATURES

- **4K x 8 ROM**
- **128 x 8 RAM**
- **Four 8-Bit Ports, 32 I/O Lines**
- **Two 16-Bit Timer/Event Counters**
- **High Performance Full-Duplex Serial Channel**
- **External Memory Expandable to 128K**
- **Boolean Processor**
- **MBL8048 Architecture Enhanced with:**
  - **Non-paged Jumps**
  - **Direct Addressing**
  - **Four 8-Register Banks**
  - **Stack Depth up to 128-Bytes**
  - **Multiply, Divide, Add, Subtract, Compare**
- **Most Instructions Execute in 1μS**
- **4μS Multiply and Divide**

© IC MASTER 1983

FUJITSU MICROELECTRONICS

MB8876A MB8877A

FLOPPY DISK FORMATTER/CONTROLLER (FDC)

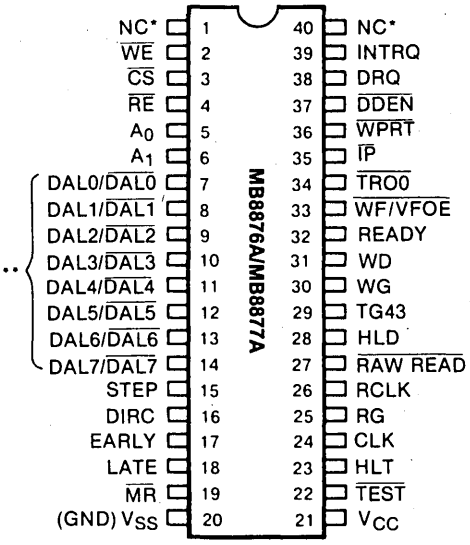
DESCRIPTION

The Fujitsu MB8876A and MB8877A are one-chip Floppy Disk Formatter/Controllers (FDC) which are fabricated with N-channel E/D MOS technology. They can be applied to any single density floppy disk, double density floppy disk and mini floppy disk.

The IBM3740 format and the frequency modulation (FM) recording are used for the single density storage, and the IBM System-34 format and the modified frequency modulation (MFM) recording are used for the double density storage.

The MB8867A and MB8877A interface with an 8-bit parallel microprocessor to control data transfer and mechanical operation. They are packaged in a standard 40-pin dual in-line package.

PIN ASSIGNMENT



FEATURES

- **Interface to 8-bit Microprocessor**
  - **MB8876A: Negative-logic 8-bit Data Bus**
  - **MB8877A: Positive-logic 8-bit Data Bus**
- **Single +5V Power Supply**
- **IBM Compatible Sector Format**
- **Automatic Track Seeking and Verification**
- **Both Single and Double Density Formats**
  - **a) Single Density in IBM3740 Format and FM Recording**
  - **b) Double Density in IBM System-34 Format and MFM Recording**
- **Programmable Single Sector/ Multiple Sectors/Entire Track Read Operation**
- **Programmable Single Sector/ Multiple Sectors/Entire Track Write Operation**
- **Programmable Side Compare Function**
- **Programmable Sector Length**
- **Programmable Head Step Rate**
- **Programmable Head Engage/Head Settle Time**
- **Double Buffered Data I/O**
- **DMA Data Transfer Capability**
- **Write Precompensation Capability**
- **All TTL Compatible I/O**
- **N-Channel E/D MOS Technology**
- **MB8876A Upward Compatible with Western Digital FD19971-02**
- **MB8877A Upward Compatible with Western Digital FD1793-02**

For complete data sheets contact: Fujitsu Microelectronics • 2985 Kifer Road • Santa Clara, CA 95051 • (408) 727-1700 • Telex I/II: 910-338-0190

© IC MASTER 1983

8 Bit Microcomputer

FEATURES

- 1024 x 13-bit Program ROM
- 64 x 8-bit RAM (16 special purpose registers)
- Arithmetic Logic Unit
- Sophisticated interrupt structure
- 6 level pushdown stack
- Versatile self contained oscillator
- 2.0μs instruction execution time
- Wide power supply operating range (4.5-5.5 volts)
- 4 sets of 8 user defined TTL compatible I/O lines
- Available in two temperature ranges: 0°C to 70°C and −40°C to 85°C.

DESCRIPTION

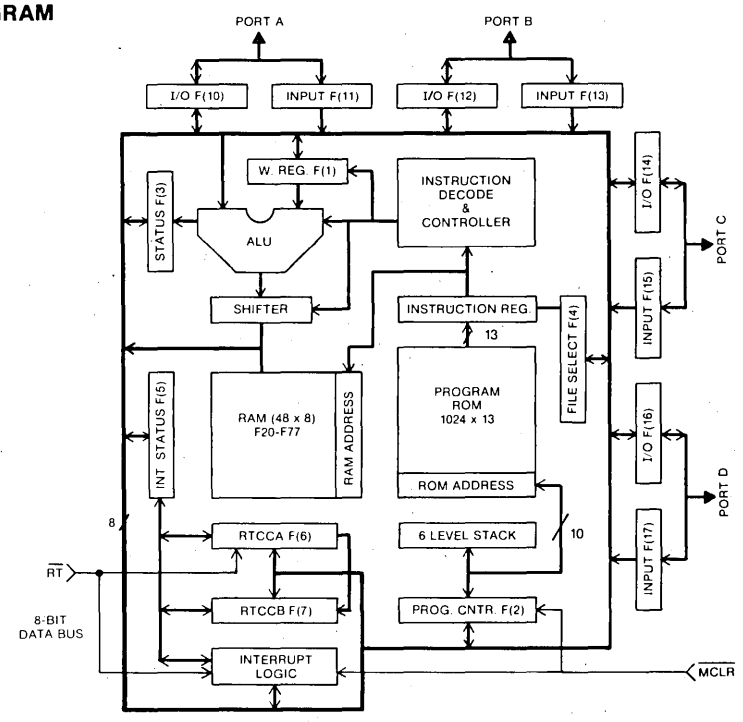
The PIC1670 microcomputer is an MOS/LSI device containing RAM, I/O, and a central processing unit as well as customer-defined ROM on a single chip. This combination produces a low cost solution for applications which require sensing individual inputs and controlling individual outputs. Keyboard scanning, display driving, and system control functions can be done at the same time due to the power of the 8-bit CPU.

The internal ROM contains a customer-defined program using the PIC's powerful instruction set to specify the overall functional characteristics of the device. The 8-bit input/output registers provide latched lines for interfacing to a limitless variety of applications. The PIC can be used to scan keyboards, drive displays, control electronic games and provide enhanced capabilities to vending machines, traffic lights, radios, television, consumer appliances, industrial timing and control applications. The 13-bit instruction word format provides a powerful yet easy to use instruction repertoire emphasizing single bit manipulation as well as logical and arithmetic operations using bytes.

The PIC1670 is fabricated with N-Channel Silicon Gate technology resulting in a high performance product. Only a single wide range power supply is required for operation. An on-chip oscillator provides the operating clock with either an external crystal or RC network to establish the frequency. Inputs and outputs are TTL-compatible, with open-drain option available.

Extensive hardware and software support is available to aid the user in developing an application program and to verify performance before committing to mask tooling. Programs can be assembled into machine language using PICAL, eliminating the burden of coding with ones and zeros. PICAL is available in a Fortran IV version that can be run on many popular computer systems. Once the application program is developed several options are available to insure proper performance. The PIC's operation can be verified in any hardware application by using the PIC1665. The PIC1665 is a ROM-less PIC1670 microcomputer with additional pins to connect external PROM or RAM and to accept HALT commands. The PFD 1020 Field Demo System is available containing a PIC1665 with sockets for erasable PROMs. Finally, the PICES II (PIC In-Circuit Emulation System) provides the user with emulation and debugging capability in either a stand-alone mode or operation as a peripheral to a larger computer system. Easy program debugging and changing is facilitated because the user's program is stored in RAM. With these development tools, the user can quickly and confidently order the masking of the PIC's ROM and bring his application into the market.

PIC1670 BLOCK DIAGRAM



© IC MASTER 1983

ARCHITECTURAL DESCRIPTION

The firmware architecture of the PIC1670 microcomputer is based on a register file concept with simple yet powerful instruction commands designed to optimize the code for bit, byte, and register transfer operations. The instruction set also supports computing functions as well as these control and interface functions.

Internally, the functional blocks of the PIC1670 are connected by an 8-bit bidirectional bus: the 64 8-bit registers of which the first 16 are special purpose, an Arithmetic Logic Unit, and a user defined program ROM composed of 1024 x 13 words. The register file is divided into two functional groups: operational registers and general purpose registers. The first sixteen are the operational registers and they include the Real Time Clock Counter A and B, four I/O registers, two Status registers, a Program Counter and a File Select Register. The general purpose registers are used for data and control information under command of the instructions.

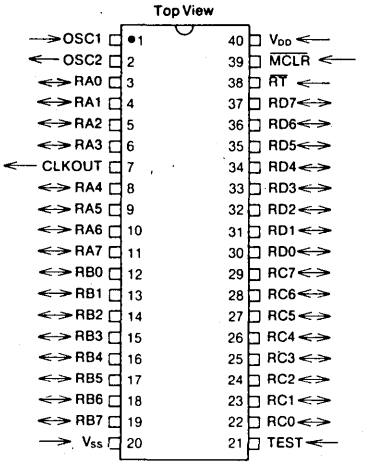
The Arithmetic Logic Unit contains one temporary working register (W Register), an adder, and hardware for decimal adjust. Manipulation between data in the working register and any other register can be performed.

The Program ROM contains the user defined application program and is supported by an instruction decoder and instruction register. Sequencing of microinstructions is controlled via the Program Counter (PC) which automatically increments to execute in-line programs. The Program Counter is modified by bit test, jump, call or branch instructions and the lower 8-bits can be modified for computed addresses by file register instructions. In addition, an on-chip six level stack is employed to push and pull the contents of the program counter. This provides easy to use subroutine nesting. Activating the MCLR input on power-up initializes the ROM program to address 1777_8.

PIN FUNCTIONS

Signal	Function
OSC1 (Input), OSC2 (output)	Oscillator pins. The on-board oscillator can be driven by an external crystal, ceramic resonator or LC network, or an external clock via these pins.
$\overline{RT}$ (Input)	Real Time Input. Negative transitions on this pin increment the RTCC (F6) register. This pin can also be used for an interrupt input. This pin uses a Schmitt trigger input. There is no internal active pull-up device.
RA0-7, RB0-7, RC0-7, RD0-7	User programmable input/output lines. These lines can be used as inputs and/or outputs and are under direct control of the program.
$\overline{MCLR}$ (Input)	Master Clear. Used to initialize the internal ROM program to address 1777_8, latch all I/O registers high, and disables the interrupts. This pin uses a Schmitt trigger input. There is no internal active pull-up device.
TEST	Test pin. This pin is used for testing purposes only. It must be grounded for normal operation.
V_{DD}	Power supply pin.
V_{SS}	Ground pin.
CLKOUT	Clock Output. A signal derived from the internal oscillator. May be used by external circuitry to synchronize with PIC1670 timing.

PIN CONFIGURATION
40 LEAD DUAL IN LINE



© IC MASTER 1983

REGISTER FILE ARRANGEMENT

File (Octal)	Function
F0	Not a physical register. F0 calls for contents of the FSR (F4) to be used to select a file register. F4 is used as an indirect address pointer.
F1	W Register — The working register.
F2	Program Counter — Points to the next program ROM address to be executed.
F3	Arithmetic Status Register 7 6 5 4 3 2 1 0 0 X A9 A8 OV Z DC C Bit 0 (C) — Bit 0 is the carry flag, and is usually the carry from the A.L.U., also used as a borrow in subtract instructions. Bit 1 (DC) — Bit 1 is the half carry (decimal carry) and is used to indicate a carry from bit 3 in the A.L.U. as the result of an addition (byte). This bit is used in the decimal adjust instruction to allow B.C.D. decimal addition. Bit 2 (Z) — Bit 2 is the zero flag and is set to a one if the results of the previous operation was identically zero. Bit 3 (OV) — Bit 3 is the overflow flag, and is set to a one by operations which cause a signed two's complement arithmetic overflow. The bit is set when the carry from the MSB in the A.L.U. is opposite to the carry from the MSB-1 bit. Bit 4 (A8) — Bit 4 is the 9th bit of the program counter. This bit is a read only bit. Bit 5 (A9) — Bit 5 is the 10th bit of the program counter. This bit is a read only bit.
F4	File Select Register — The FSR is used in generating effective file register addresses under program control.
F5	Interrupt Status Register X CNTE A/B CNTS RTCIR XIR RTCIE XIE — Used to control interrupts and registers F6 and F7.
F6,F7	RTCCA and RTCCB — Real Time Clock Counters A & B respectively can be configured as a single 16 bit counter, an 8 bit counter and an 8 bit general purpose register, or two general purpose registers when no external counting is required. The RTCC registers can be loaded and read by the program, as well as count negative transitions on the $\overline{RT}$ pin or count at 1/8 the frequency of the oscillator. If data are being stored into RTCCA simultaneous with a negative transition on the RT pin (and CNTE=1 and CNTS=1), RTCCA will contain the new stored value and the external transition will be ignored by the microcomputer. (See the section "Real Time Clock Interrupt" for further details about the RTCC.)
F10,11	I/O Port A
F12,13	I/O Port B
F14,15	I/O Port C
F16,17	I/O Port D
F20,77	General Purpose Registers—Used for temporary and general purpose storage during program execution time.

NOTE: F10, 12, 14 & 16 are the I/O registers and F11, 13, 15 & 17 are used for reading the actual pin levels.

© IC MASTER 1983

Basic Instruction Set Summary

Each PIC instruction is a 13-bit word divided into an OP code which specifies the instruction type and one or more operands which further specify the operation of the instruction. The following PIC instruction summary lists byte-oriented, bit-oriented, and literal and control operations.

For byte-oriented instructions, "f" represents a file register designator and "d" represents a destination designator. The file register designator specifies which one of the PIC file registers is to be utilized by the instruction. The destination designator specifies where the result of the operation performed by the instruction is to be placed. If "d" is zero, the result is placed in the PIC W register. If "d" is one, the result is returned to the file register specified in the instruction.

For bit-oriented instructions, "b" represents a bit field designator which selects the number of the bit affected by the operation, while "f" represents the number of the file in which the bit is located.

For literal and control operations, "k" represents an eight or nine bit constant or literal value.

For an oscillator frequency of 4MHz the instruction execution time is 2.0 μsec unless a conditional test is true or the program counter is changed as a result of an instruction. In these two cases, the instruction execution time is 4.0 μsec.

BYTE ORIENTED FILE REGISTER OPERATIONS

(12-7)	(6)	(5-0)
OP CODE	d	f (FILE #)

Instruction—Binary (Octal)	Name	Mnemonic, Operands		Operation	Status Affected
0 0 0 0 0 0 0 1 0 0 (00004)	Decimal adjust W	DAW	—	(Note 1)	C
0 0 0 0 0 1 f f f f f (00100)	Move W to file	MOVWF	f	W→f	—
0 0 0 0 1 d f f f f f (00200)	Subtract W from file w/borrow	SUBBWF	f,d	f+$\overline{W}$+c →d	OV,C,DC,Z
0 0 0 1 0 d f f f f f (00400)	Subtract W from file	SUBWF	f,d	f+$\overline{W}$ + 1→d	OV,C,DC,Z
0 0 0 1 1 d f f f f f (00600)	Decrement file	DECF	f,d	f - 1→d	OV,C,DC,Z
0 0 1 0 0 d f f f f f (01000)	Inclusive or W with file	IORWF	f,d	W∨f→d	Z
0 0 1 0 1 d f f f f f (01200)	And W with file	ANDWF	f,d	W•f→d	Z
0 0 1 1 0 d f f f f f (01400)	Exclusive OR W with file	XORWF	f,d	W⊕f→d	Z
0 0 1 1 1 d f f f f f (01600)	Add W with file	ADDWF	f,d	W+f→d	OV,C,DC,Z
0 1 0 0 0 d f f f f f (02000)	Add W to file with carry	ADCWF	f,d	W+f+c→d	OV,C,DC,Z
0 1 0 0 1 d f f f f f (02200)	Complement file	COMPF	f,d	$\overline{f}$→d	Z
0 1 0 1 0 d f f f f f (02400)	Increment file	INCF	f,d	f+1→d	OV,C,DC,Z
0 1 0 1 1 d f f f f f (02600)	Decrement file, skip if zero	DECFSZ	f,d	f - 1→ d, skip if zero	—
0 1 1 0 0 d f f f f f (03000)	Rotate file right thru carry	RRCF	f,d	f(n)→d(n−1), c→d(7), f(0)→c	C
0 1 1 0 1 d f f f f f (03200)	Rotate file left thru carry	RLCF	f,d	f(n)→d(n+1), c→d(0), f(7)→c	C
0 1 1 1 0 d f f f f f (03400)	Swap upper and lower nibble of file	SWAPF	f,d	f(0-3)⇌(4-7)→d	—
0 1 1 1 1 d f f f f f (03600)	Increment file, skip if zero	INCFSZ	f,d	f+1 →d, skip if zero	—

(12-6)	(5-0)
OP CODE	f (FILE #)

Instruction—Binary (Octal)	Name	Mnemonic, Operands		Operation	Status Affected
1 0 0 0 0 0 f f f f f (10000)	Move file to W	MOVFW	f	f→W	Z
1 0 0 0 0 1 f f f f f (10100)	Clear file	CLRF	f	0→f	Z
1 0 0 0 1 0 f f f f f (10200)	Rotate file right/no carry	RRNCF	f	f(n)→d(n−1), f(0), →f(7)	—
1 0 0 0 1 1 f f f f f (10300)	Rotate file left/no carry	RLNCF	f	f(n)→d(n+1), f(7), →f(0)	—
1 0 0 0 1 0 0 f f f f f (10400)	Compare file to W, skip if F < W	CPFSLT	f	f - W, Skip if C = 0	—
1 0 0 0 1 0 1 f f f f f (10500)	Compare file to W, skip if F = W	CPFSEQ	f	f - W, Skip if $\overline{Z}$ = 1	—
1 0 0 0 1 1 0 f f f f f (10600)	Compare file to W, skip if F > W	CPFSGT	f	f - W, Skip if $\overline{Z}$ • C = 1	—
1 0 0 0 1 1 1 f f f f f (10700)	Move file to itself	TESTF	—	f→f	Z

BIT ORIENTED FILE REGISTER OPERATIONS

(12-9)	(8-6)	(5-0)
OP CODE	b (BIT #)	f (FILE #)

Instruction—Binary (Octal)	Name	Mnemonic, Operands		Operation	Status Affected
0 1 0 0 b b b f f f f f (04000)	Bit clear file	BCF	f,b	0→f(b)	—
0 1 0 1 b b b f f f f f (05000)	Bit set file	BSF	f,b	1→f(b)	—
0 1 1 0 b b b f f f f f (06000)	Bit test, skip if clear	BTFSC	f,b	Bit Test f(b), skip if clear	—
0 1 1 1 b b b f f f f f (07000)	Bit test, skip if set	BTFSS	f,b	Bit Test f(b), skip if set	—

LITERAL AND CONTROL OPERATIONS

(12-8)	(7-0)
OP CODE	k (LITERAL)

Instruction—Binary (Octal)	Name	Mnemonic, Operands		Operation	Status Affected
0 0 0 0 0 0 0 0 0 0 0 (00000)	No Operation	NOP	—	—	—
0 0 0 0 0 0 0 0 0 0 1 (00001)	Halt in PIC1665	HALT	—	—	—
0 0 0 0 0 0 0 0 0 1 0 (00002)	Return from Interrupt	RETFI	—	Stack → PC	—
0 0 0 0 0 0 0 0 0 1 1 (00003)	Return from Subroutine	RETFS	—	Stack → PC	—
1 0 0 1 0 k k k k k k (11000)	Move Literal to W	MOVLW	k	k→W	—
1 0 0 1 1 k k k k k k (11400)	Add Literal to W	ADDLW	k	k+W→W	OV,C,DC,Z
1 0 1 0 0 k k k k k k (12000)	Inclusive OR Literal to W	IORLW	k	k∨W→W	Z
1 0 1 0 1 k k k k k k (12400)	And Literal and W	ANDLW	k	k•W→W	Z
1 0 1 1 0 k k k k k k (13000)	Exclusive OR Literal and W	XORLW	k	k⊕W→W	Z
1 0 1 1 1 k k k k k k (13400)	Return and load literal in W	RETLW	k	k→W, Stack →PC	—

(12-10)	(9-0)
OP CODE	k (LITERAL)

Instruction—Binary (Octal)	Name	Mnemonic, Operands		Operation	Status Affected
1 1 0 k k k k k k k k k (14000)	Go to address	GOTO	k	k→PC	—
1 1 1 k k k k k k k k k (16000)	Call Subroutine	CALL	k	PC+1→Stack, k→PC	—

NOTE:
DAW: Decimal Adjust W.
This instruction adjusts the eight bit number in the W register to form two valid BCD (binary coded decimal) digits, one in the lower and one in the upper nibble. (The results will only be meaningful if the number in W to be adjusted is the result of adding together two valid two digit BCD numbers.)

The adjustment obeys the following two step algorithm:
1. If the lower nibble is greater than 9 or the digit carry flag (DC) is set, 06 is added to the W register.
2. Then, if the upper nibble is greater than 9 or the carry from the original or step 1 addition is set, 60 is added to the W register. The carry bit is set if there is a carry from the original, step 1 or step 2 addition.

© IC MASTER 1983

INTERRUPT SYSTEM

The interrupt system of the PIC1670 is comprised of an external interrupt and a real-time clock counter interrupt. These have different interrupt vectors, enable bits and status bits. Both interrupts are controlled by the status register (F5)** shown below.

NOT USED	CNTE	A/B	CNTS	RTCIR	XIR	RTCIE	XIE
7*	6	5	4	3	2	1	0

*Bit 7 is unused and is read as zero.

**Register 5 will power up to all zeroes.

EXTERNAL INTERRUPT

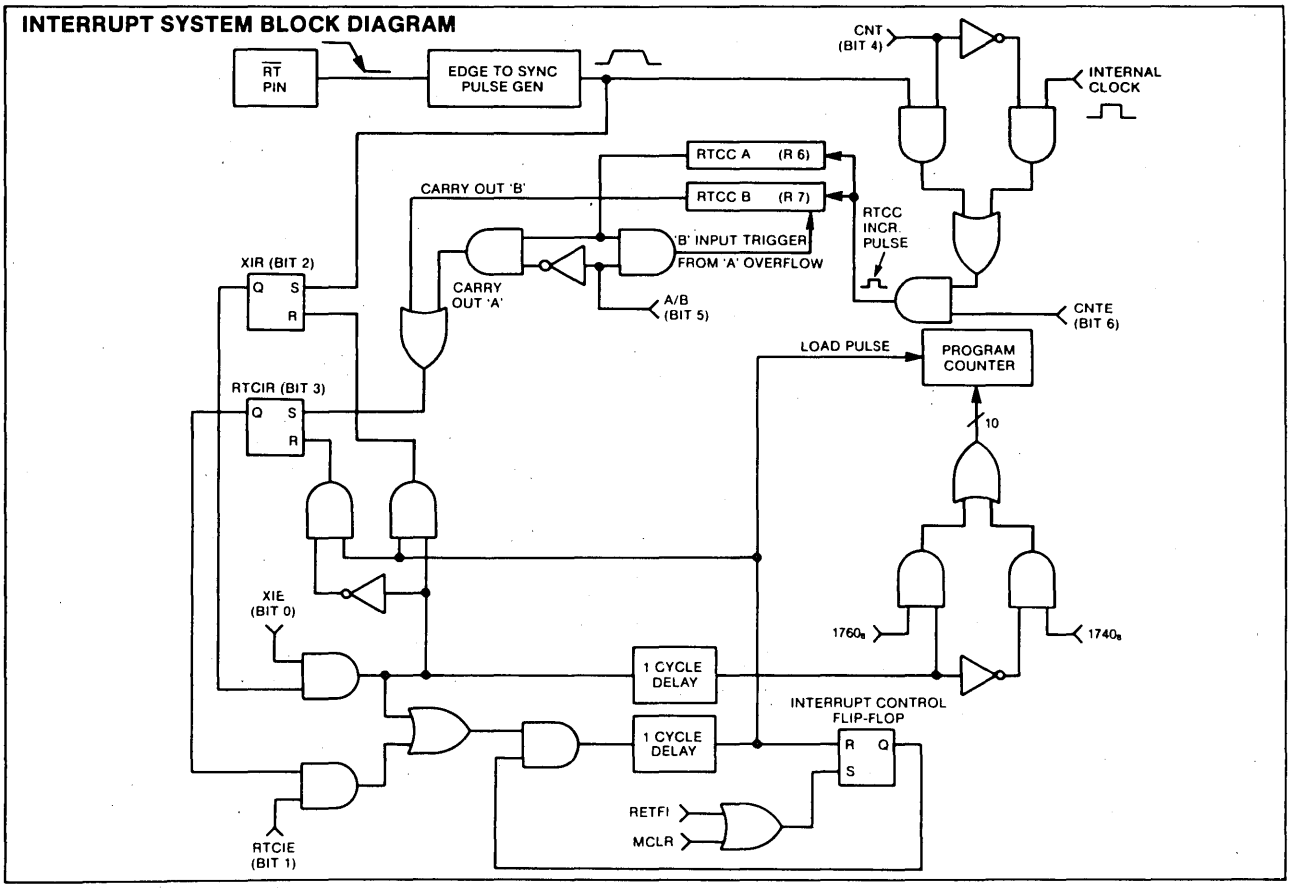
On any high to low transition of the $\overline{RT}$ pin the external interrupt request (XIR) bit will be set. This request will be serviced if the external interrupt enable (XIE) bit is set or if it is set at a later point in the program. The latter allows the processor to store a request (without interrupting) while a critical timing routine is being executed. Once external interrupt service is initiated, the processor will clear the XIR bit, delay one cycle (to execute the current instruction), then push the current program counter onto the stack and execute the instruction at location 1760_8. It takes three to four instruction cycles from the transition on the $\overline{RT}$ pin until the instruction at 1760_8 is executed. No new interrupts can be serviced until a return from interrupt (RETFI) instruction has been executed.

REAL-TIME CLOCK INTERRUPT

The real-time clock counter (RTCCA & RTCCB, file registers F6 and F7) have a similar mechanism of interrupt service. The RTCCA register will increment if the count enable (CNTE) bit is set. If this bit is not set the RTCCA & RTCCB will maintain their present contents and can therefore be used as general purpose RAM registers. The count source (CNTS) bit selects the clocking source for RTCCA. If CNTS is cleared to a '0', then RTCCA will use the internal instruction clock and increment at 1/8 the frequency present on the OSC pins. If CNTS is set to a '1', then RTCCA will increment on each high to low transition of the RT pin. RTCCB can only be incremented when RTCCA makes a transition from 377_8 to 0 and the A/B status bit is set. This condition links the two eight bit registers together to form one sixteen bit counter. An interrupt request under these conditions will occur when the combined registers make a transition from 177777_8 to 0. If, however, the A/B bit is not set, then RTCCA will be the only incrementing register and an interrupt request will occur when RTCCA makes a transition from 377_8 to 0. (In this setup the RTCCB register will not increment and can be used as a general purpose RAM register.) Once a request has come from the real-time clock counter, the real-time clock interrupt request (RTCIR) bit will be set. At this point, the request can either be serviced immediately if the real-time clock interrupt enable (RTCIE) bit is set or be stored if RTCIE is not set. The latter allows the processor to store a real-time clock interrupt while a critical timing routine is being executed. Once interrupt service is initiated, the processor will clear the RTCIR bit, delay one cycle (to execute the current instruction), then push the present program counter onto the stack and execute the instruction at location 1740_8 It takes three instruction cycles from when the RTCC (A or B) overflows until the instruction of 1740 is executed. No new interrupts can be serviced until a RETFI instruction has been executed.

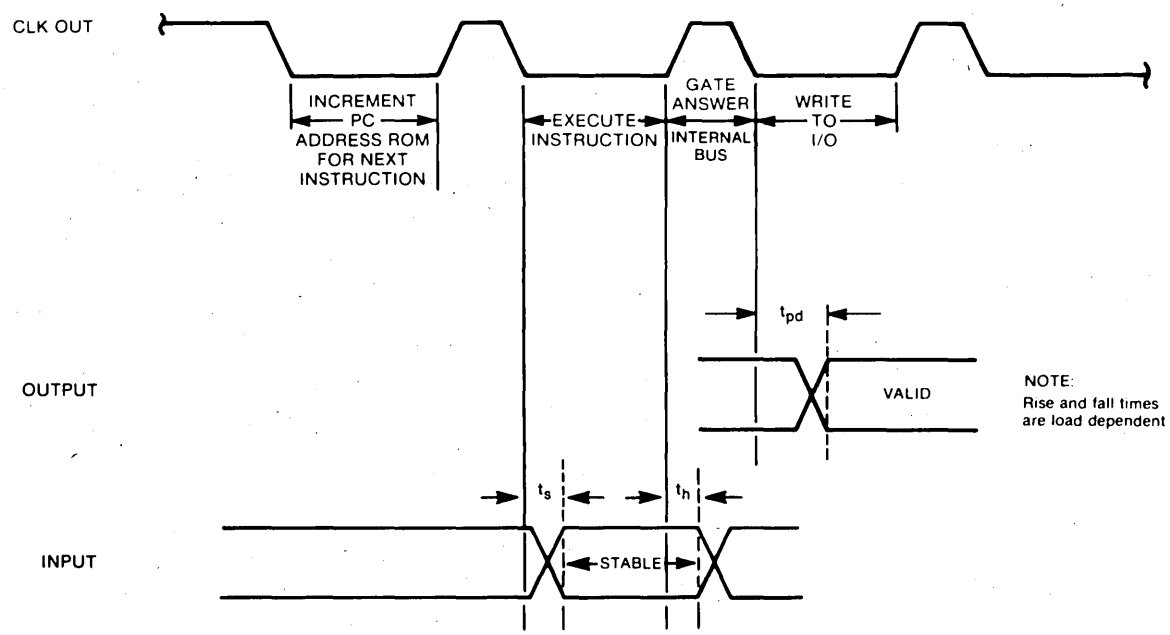
The RETFI instruction (00002_8) must be used to return from any interrupt service routine if any pending interrupts are to be serviced. External interrupts have priority over RTCC driven interrupt in the event both types occur simultaneously. Interrupts cannot be nested but will be serviced sequentially. The existence of any pending interrupts can be tested via the state of the XIR (bit 2) and RTCIR (bit 3) in the status word F5.

INTERRUPT SYSTEM BLOCK DIAGRAM

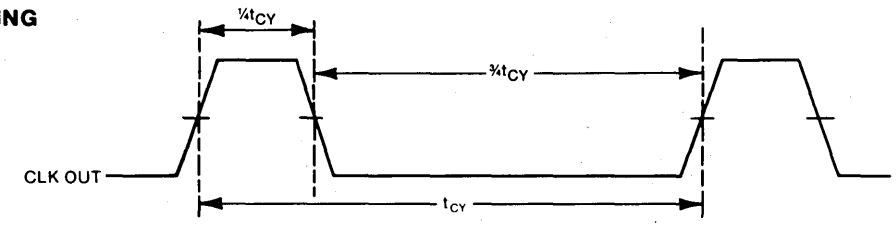


© IC MASTER 1983

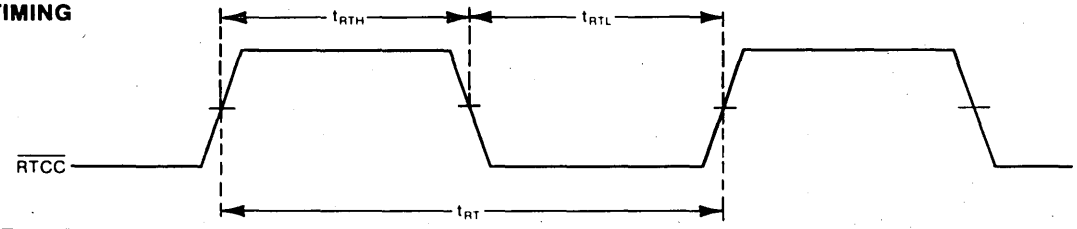
I/O TIMING



CLK OUT TIMING

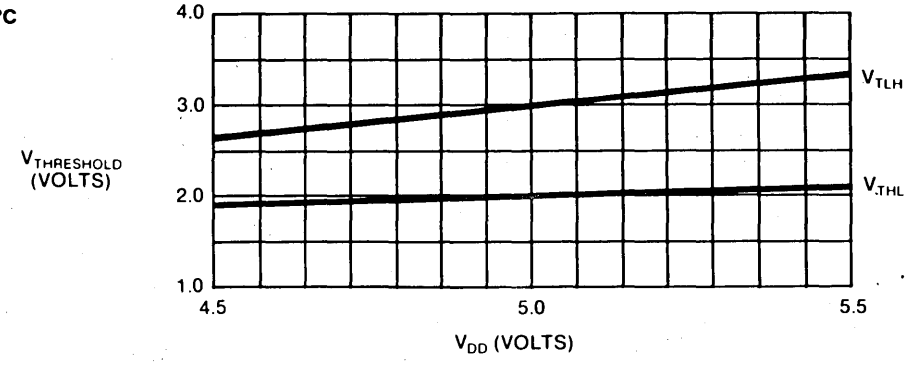


$\overline{\text{RTCC}}$ TIMING



SCHMITT TRIGGER CHARACTERISTICS (Typical)

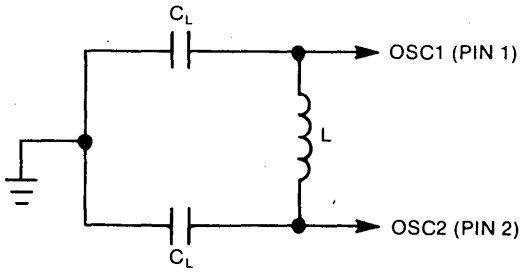
($\overline{\text{RT}}$, $\overline{\text{MCLR}}$) T_A = 25°C



© IC MASTER 1983

PIC1670 OSCILLATOR OPTIONS (TYPICAL CIRCUIT)

LC OPERATION

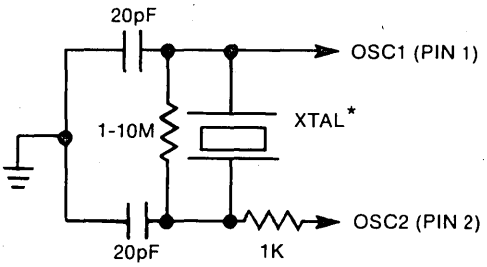


$$f_{OSC} \approx \frac{1}{2\pi\sqrt{L\,(C_L + C_{INT})}},$$

where $C_{INT} = 10pF$.

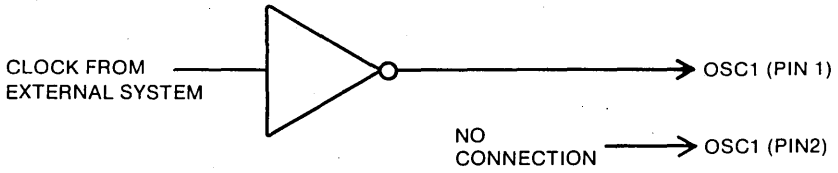
Typical values for 4MHz operation:
$L = 70\mu H$
$C_L = 10pF$

CRYSTAL INPUT OPERATION

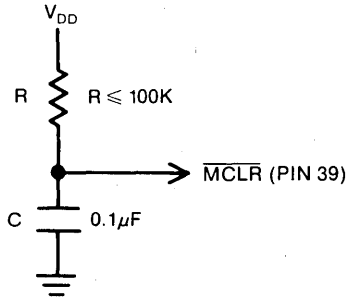


*or ceramic resonator, parallel resonant (0.8 - 5.0MHz)

EXTERNAL CLOCK INPUT OPERATION



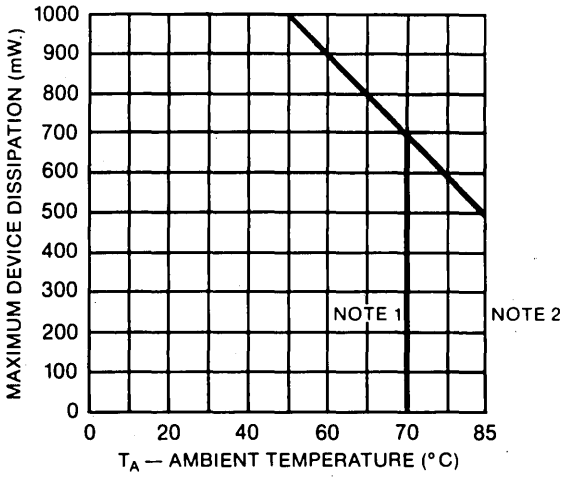
MASTER CLEAR (TYPICAL CIRCUIT)



Master Clear requires 10ms delay (assuming a 4MHz crystal) before activation after power is applied to the V_{DD} pin, for the crystal to start up. To achieve this, an external RC configuration as shown can be used (assuming V_{DD} is applied as a step function).

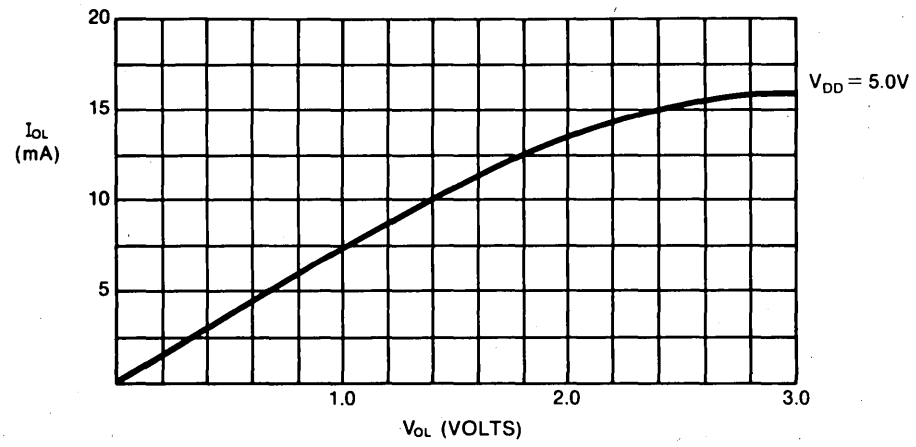
© IC MASTER 1983

POWER DISSIPATION DERATING GRAPH



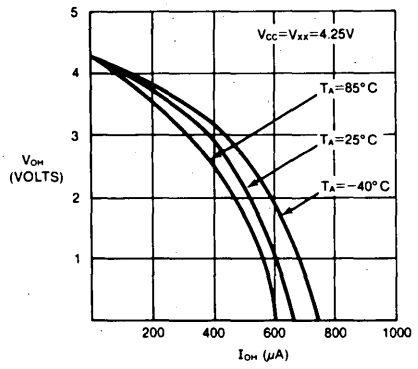
NOTES:
1. 70° C is the maximum operating temperature for standard parts.
2. 85° is the maximum operating temperature for "I" suffix parts.

OUTPUT SINK CURRENT GRAPH



The Output Sink Current is dependent on the output load. This chart shows the typical curve used to express the output drive capability.

V_{OH} VS I_{OH} (I/O PORTS) (Typical)



© IC MASTER 1983

ELECTRICAL CHARACTERISTICS

Maximum Ratings*

Ambient Temperature Under Bias .....−40°C to +85°C
Storage Temperature .....−55°C to +150°C
Voltage on any Pin with Respect to V_{SS} ..... −0.3V to +10.0V
Power Dissipation 1000mW

*Exceeding these ratings could cause permanent damage to the device. This is a stress rating only and functional operation of this device at these conditions is not implied—operating ranges are specified in Standard Conditions. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Data labeled "typical" is presented for design guidance only and is not guaranteed.

Standard Conditions (unless otherwise stated):

DC CHARACTERISTICS

Operating Temperature T_A = 0°C to +70°C

Characteristic	Sym	Min	Typ†	Max	Units	Conditions
Primary Supply Voltage	V_{DD}	4.5	—	5.5	V	
Primary Supply Current	I_{DD}	—	—	100	mA	All I/O pins high
Input Low Voltage (except $\overline{MCLR}$ & $\overline{RT}$)	V_{IL}	−0.2	—	0.8	V	
Input High Voltage (except $\overline{MCLR}$, $\overline{RT}$, OSC1)	V_{IH1}	2.4	—	V_{DD}	V	
Input High Voltage ($\overline{MCLR}$, $\overline{RT}$ OSC1)	V_{IH2}	V_{DD}−1	—	V_{DD}	V	
Output High Voltage	V_{OH}	2.4	—	V_{DD}	V	I_{OH} = −100μA provided by internal pullups (Note 2)
Output Low Voltage (I/O and CLK OUT)	V_{OL}	—	—	0.45	V	I_{OL} = 1.6mA
Input Leakage Current ($\overline{MCLR}$, $\overline{RT}$,OSC1)	I_{LC}	−5	—	+5	μA	$V_{SS} \leq V_{IN} \leq V_{DD}$
Input Low Current (all I/O ports)	I_{IL}	−0.2	−0.6	−2.0	mA	V_{IL} = 0.4V, internal pullup
Input High Current (all I/O ports)	I_{IH}	−0.1	−0.4	—	mA	V_{IH} = 2.4V

†Typical data is at T_A = 25°C, V_{DD} = 5.0V.

NOTES:
1. Total power dissipation for the package is calculated as follows:
   $P_D = (V_{DD})(I_{DD}) + \Sigma (V_{DD} - V_{IL})(|I_{IL}|) + \Sigma (V_{DD} - V_{OH})(|I_{OH}|) + \Sigma (V_{OL})(I_{OL})$.
2. Positive current indicates current into pin. Negative current indicates current out of pin.
3. Total I_{OL} for all output pin (I/O ports plus CLK OUT) must not exceed 175mA.

Standard Conditions (unless otherwise stated):

AC CHARACTERISTICS

Operating Temperature T_A = 0°C to +70°C

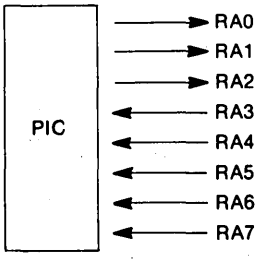
Characteristic	Sym	Min	Typ	Max	Units	Conditions
Instruction Cycle Time	t_{cy}	2.0	—	8	μs	4MHz — 1MHz external time base (Note 1)
$\overline{RT}$ Input						(Note 2)
Period	t_{RT}	t_{cy}	—	—	—	
High Pulse Width	t_{RTH}	½t_{cy}	—	—	—	
Low Pulse Width	t_{RTL}	½t_{cy}	—	—	—	
I/O Ports						
Data Input Setup Time	t_s	—	—	¼t_{cy}−125	ns	
Data Input Hold Time	t_h	0	—	—	ns	
Data Output Propagation Delay	t_{pd}	—	500	800	ns	Capacitive load = 50pF

NOTES:
1. Instruction cycle period (t_{CY}) equals eight times the input oscillator time base period.
2. Due to the synchronous timing nature between CLK OUT and the sampling circuit used on the $\overline{RT}$ input, CLK OUT may be directly tied to the $\overline{RT}$ input. The minimum times specified represent theoretical limits.

© IC MASTER 1983

INPUT/OUTPUT CAPABILITY

The PIC1670 provides four complete quasi-bidirectional input/output ports. A simplified schematic of an I/O pin is shown below. The ports occupy address locations in the register file space of the PIC1670. Thus, any instruction that can operate on a general purpose register can operate on an I/O port. Two locations in the register file space are allocated for each I/O port. Port RA0-7 is addressable as either F10 or F11. Port RB0-7 is addressable as either F12 or F13. Port RC0-7 is addressable as either F14 or F15 and Port RD0-7 is addressable as either F16 or F17. AnI/O port READ on its odd-numbered location will interrogate the chip pins while an I/O port READ on its even-numbered location will interrogate the internal latch in that I/O port. This simplifies programming in cases where a portion of a single port is used for inputting only, while the remainder is used for outputing as illustrated in the following example.



Here, the low 3 bits of port RA are used as output-only, while the high 5 bits are used as input-only. During power on reset ($\overline{MCLR}$ low), the latches in the I/O ports will be set high, turning off all pull down transistors as represented by Q_2 in Figure 1. During program execution if we wish to interrogate an input pin, then, for example,

```
BTFSS 11,6
```

will test pin RA6 and skip the next instruction if that pin is set. If we wish to modify a single output, then, for example,

```
BCF 10,2
```

will force RA2 to zero because its internal latch will be cleared to zero. This will turn on Q_2 and pull the pin to zero.

The way this instruction operates internally is the CPU reads file 10 into the A.L.U., modifies the bit and re-outputs the data to file 10. If the pins were read instead, any input which was grounded externally would cause a zero to be read on that bit. When the CPU re-outputted the data to the file, that bit would be cleared to zero, no longer useful as an input until set high again.

During program execution, the latches in bits 3-7 should remain in the high state. This will keep Q_2 off, allowing external circuitry full control of pins RA3-RA7, which are being used here as input.

BIDIRECTIONAL INPUT-OUTPUT PORT

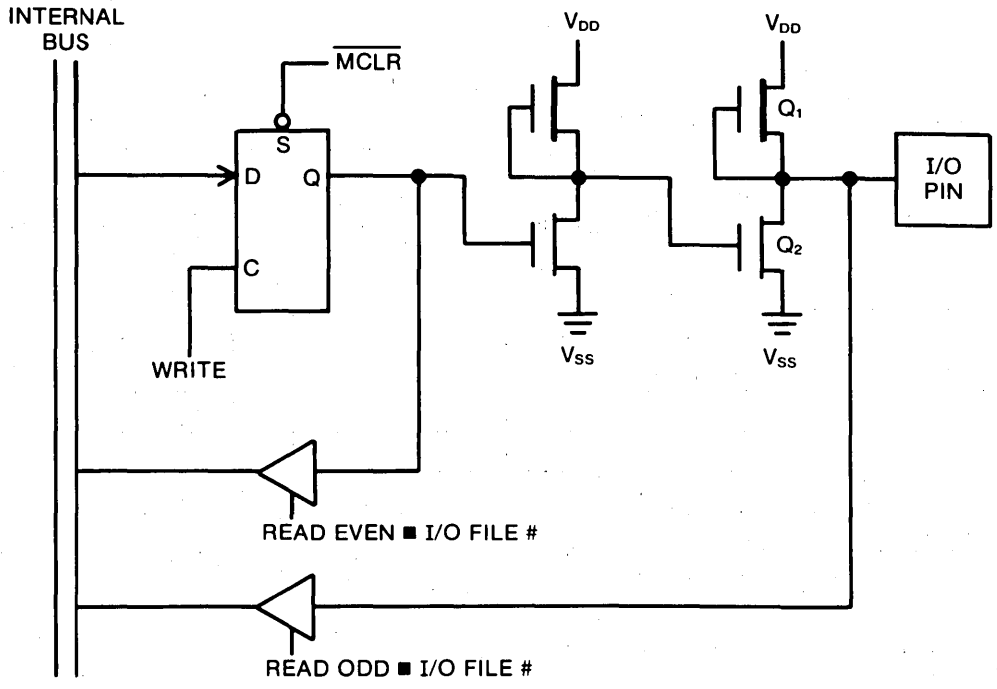


Figure 1

© IC MASTER 1983

THE PIC MICROCOMPUTER FAMILY

PART NUMBER	ROM SIZE	RAM (BYTES)	I/O LINES	DIP	INSTR. SPEED	INTER-RUPTS
PIC1650A	512 x 12	32	32	40	4μs	no
PIC1654	512 x 12	32	12	18	2μs	no
PIC1655A	512 x 12	32	20	28	4μs	no
PIC16C55	512 x 12	32	20	28	4μs	no
PIC1656	512 x 12	32	20	28	4μs	yes
PIC1670	1024 x 13	64	32	40	2μs	yes
PIC1672	2048 x 13	64	32	40	2μs	yes

Microelectronics Division/Worldwide Sales Offices

NORTH AMERICA

UNITED STATES:

MICROELECTRONICS DIVISION

NORTHEAST—600 West John Street
Hicksville, New York 11802
Tel: 516-733-3107, TWX: 510 221-1866

20th Century Plaza
Daniel Webster Highway
Merrimack, New Hampshire 03054
Tel: 603-424-3303, TWX: 710-366-0676

858 Welsh Road
Maple Glen, Pennsylvania 19002
Tel: 215-643-5326

SOUTHEAST—7901 4th Street N., Suite 208
St. Petersburg, Florida 33702
Tel: 813-577-4024, TWX: 810-863-0398

1616 Forest Drive
Annapolis, Maryland 21403
Tel: 301-269-6250, TWX: 710-867-8566

4921C Professional Court
Raleigh, North Carolina 27609
Tel: 919-876-7380

SOUTH CENTRAL—5520 LBJ Frwy., Suite 330
Dallas, Texas 75240
Tel: 214-934-1654, TWX: 910-860-9259

CENTRAL—4524 S. Michigan Street
South Bend, Indiana 46614
Tel: 219-291-0585, TWX: 810-299-2518

5820 West 85th Street, Suite 102
Indianapolis, Indiana 46278
Tel: 317-872-7740, TWX: 810-341-3145

2355 S. Arlington Hts. Road, Suite 408
Arlington Heights, Illinois 60005
Tel: 312-981-0040, TWX: 910-687-0254

32969 Hamilton Court, Suite 210
Farmington Hills, Michigan 48018
Tel: 313-391-4070

SOUTHWEST—201 Standard Street
El Segundo, California 90245
Tel: 213-322-7745, TWX: 910-348-6296

NORTHWEST—3080 Olcott Street, Suite 230C
Santa Clara, California 95051
Tel: 408-496-0844, TWX: 910-379-0010

EUROPE

EUROPEAN SALES HEADQUARTERS:
GENERAL INSTRUMENT MICROELECTRONICS LTD.
Times House, Ruislip, Middlesex. HA4 8LE
Tel: Ruislip 35700, Telex: 23272

NORTHERN EUROPEAN SALES OFFICE:
Times House, Ruislip, Middlesex. HA4 8LE
Tel: Ruislip 35700, Telex: 23272

Sandhamnsgatan 67, S-115 28, Stockholm
Tel: (08) 67 99 25, Telex: 17779

SOUTHERN EUROPEAN SALES OFFICE:
5-7 Rue De L'Amiral Courbet, 94160 Saint Mande, Paris
Tel: (1) 365 72 50, Telex: 213073

Piazza Novelli, 8, 20129 Milano
Tel: (02) 720914, Telex: 843-320348

CENTRAL EUROPEAN SALES OFFICE:
GENERAL INSTRUMENT DEUTSCHLAND GmbH
Nordendstrasse 3, 8000 Munchen 40
Tel: (089) 27 24 049, Telex: 528054

6070 Langen Bei Frankfurt A Main
Wilhelm-Leuschner Plaza 8, Postf. 1167
Tel: (6103) 23 051, Telex: 415000

ASIA

HONG KONG:

GENERAL INSTRUMENT HONG KONG LTD.
139 Connaught Road Central, 3/F, San-Toi Building
Tel: (5) 434360, Telex: 84606

JAPAN:

GENERAL INSTRUMENT INTERNATIONAL CORP.
Fukide Bldg. 8th Floor, 1-13 Toranomon 4-Chome
Minato-ku, Tokyo 105
Tel: (03) 437-0281, Telex: 2423413

TAIWAN:

GENERAL INSTRUMENT
MICROELECTRONICS TAIWAN
77 Pao Chiao Road, Hsin Tien
Taipei, Taiwan
Tel: (02) 914-6234, Telex: 785-3111

"The information in this publication, including schematics, is suggestive only. General Instrument Corporation does not warrant, nor will it be responsible or liable for, (a) the accuracy of such information, (b) its use or (c) any infringement of patents or other rights of third parties."

GENERAL INSTRUMENT

© IC MASTER 1983

Narrator™ Speech Processor

FEATURES

- Natural Speech
- Stand Alone Operation with Inexpensive Support Components
- Wide Operating Voltage
- Word, Phrase, or Sentence Library, ROM Expandable
- Expandable to 491K of ROM Directly
- Simple Interface to Most Microcomputers or Microprocessors
- Supports L.P.C. Synthesis: Formant Synthesis: Allophone Synthesis

GENERAL DESCRIPTION

The SP0256 (Speech Processor) is a single chip N-Channel MOS LSI device that is able, using its stored program, to synthesize speech or complex sounds.

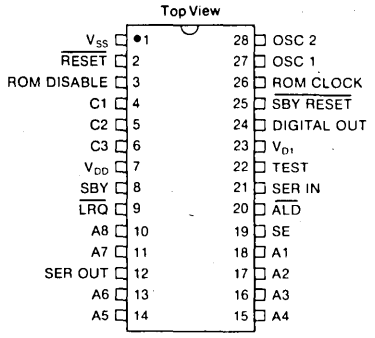
The achievable output is equivalent to a flat frequency response ranging from 0 to 5KHz, a dynamic range of 42dB, and a signal to noise ratio of approximately 35dB.

The SP0256 incorporates four basic functions:

- A software programmable digital filter that can be made to model a VOCAL TRACT.
- A 16K ROM which stores both data and instructions (THE PROGRAM).
- A MICROCONTROLLER which controls the data flow from the ROM to the digital filter, the assembly of the "word strings" necessary for linking speech elements together, and the amplitude and pitch information to excite the digital filter.
- A PULSE WIDTH MODULATOR that creates a digital output which is converted to an analog signal when filtered by an external low pass filter.

PIN CONFIGURATION

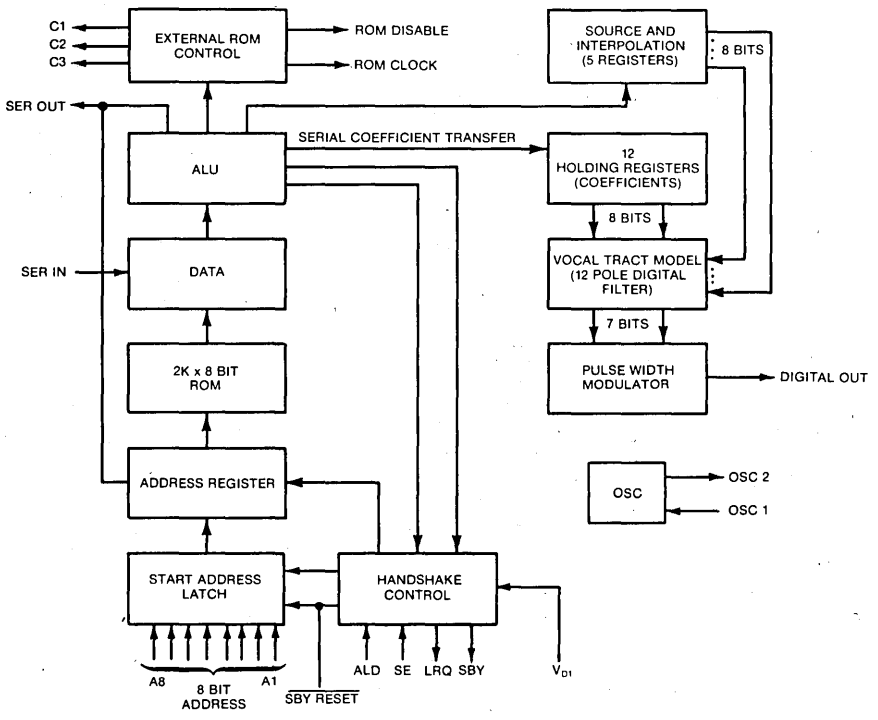
28 LEAD DUAL IN LINE



APPLICATIONS

- Telecommunications
- Appliances
- Computer Peripherals
- Automotive
- Personal Computers
- Toys/Games
- Educational Aids
- Warning Systems
- Security Systems
- Electronic Musical Instruments
- Aids to the Blind
- Narrow Bandwidth
- Communication Systems

SP0256 BLOCK DIAGRAM



© IC MASTER 1983

ELECTRICAL CHARACTERISTICS

Maximum Ratings*

V_{D1}, V_{DD} ..... −0.3V to +12V
Storage Temperature ..... −25°C to +125°C

Clock

Crystal Frequency 3.12MHz

*Exceeding these ratings could cause permanent damage to the device. This is a stress rating only and functional operation of this device at these conditions is not implied—operating ranges are specified in Standard Conditions. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Data labeled "typical" is presented for design guidance only and is not guaranteed.

DC CHARACTERISTICS

Operating Temperature T_A = 0°C to +70°C

Characteristics	Sym	Min	Typ	Max	Units	Conditions
Primary Supply Voltage	V_{DD}	4.6	—	7	V	
Standby Supply Voltage	V_{D1}	4.6	—	7	V	
Primary Supply Current	I_{DD}	—	—	90	mA	V_{D1}, V_{DD} = 7.0V, T_A = 25°C
Standby Supply Current	I_{D1}	—	—	21	mA	V_{SS} = 0.0V, T_A = 25°C
Inputs A1-A8, $\overline{ALD}$, SER IN, TEST, SE Logic 0	V_{IL}	0	—	0.6	V	
Logic 1	V_{IH}	2.4	—	V_{D1}	V	
Capacitance	C_{IN}	—	—	10	pf	
Leakage	I_{LC}	—	—	±10	μA	
$\overline{RESET}$, $\overline{SBY\ RESET}$ Logic 0	V_{IL1}	0	—	0.6	V	
Logic 1	V_{IH1}	3.6	—	V_{D1}	V	
Oscillator Leakage OSC 1	—	1.0	—	10	μA	No Load, OSC1 = 7.0V
Outputs SBY, DIGITAL OUT, C1, C2, C3, $\overline{LRQ}$, ROM DISABLE, ROM CLOCK, SER OUT Logic 0	V_{OL}	0	—	0.6	V	0.72mA (2 LS TTL Loads)
Logic 1	V_{OH}	3.5	—	V_{D1}	V	−50μA (2 LS TTL Loads)

AC CHARACTERISTICS

Operating Temperature: T_A = 0°C to +70°C

Characteristics	Sym	Min	Typ	Max	Units	Conditions
Clock Frequency	—	—	3.120	—	MHz	Crystal
$\overline{Reset}$, $\overline{SBY\ Reset}$	t_{pw1}	100	—	—	μs	
$\overline{ALD}$ (<800ns)	t_{pw2}	200	—	800	ns	
A1-A8 Set Up	t_{s2}	160	—	—	ns	
A1-A8 Hold	t_{h2}	160	—	—	ns	
$\overline{ALD}$ (≥800ns)	t_{pw3}	800	—	—	ns	
A1-A8 Set Up	t_{s3}	0	—	—	ns	
A1-A8 Hold	t_{h3}	1200	—	—	ns	
$\overline{LRQ}$	t_{pd0}	—	—	640	ns	
SBY	t_{pd0}	—	—	640	ns	

© IC MASTER 1983

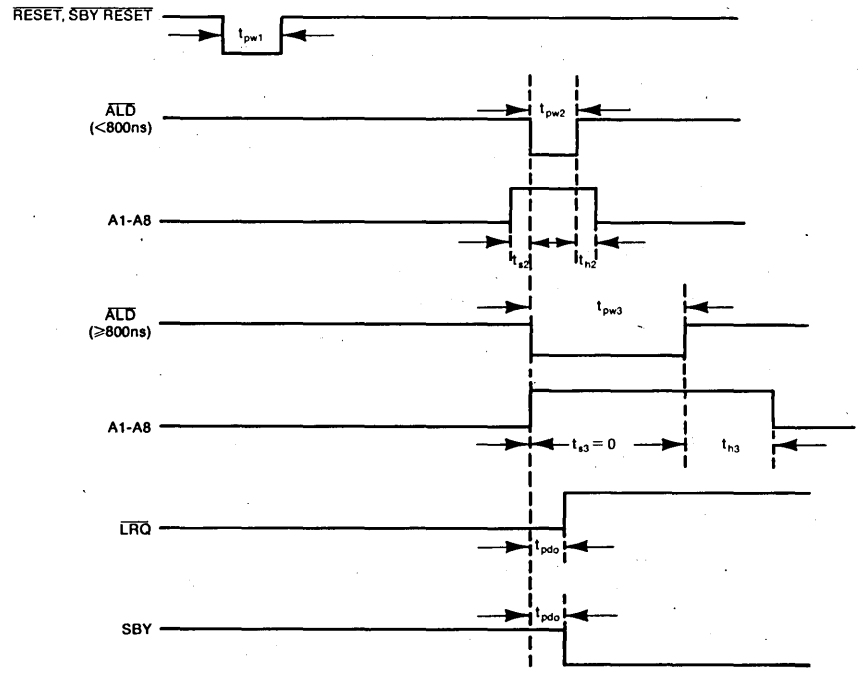


Fig. 1 TIMING DIAGRAM

PIN FUNCTIONS

Pin Number	Name	Function
1	V_{SS}	Ground
2	$\overline{\text{RESET}}$	A logic 0 resets the SP. Must be returned to a logic 1 for normal operation.
3	ROM DISABLE	For use with an external serial speech ROM. A logic 1 disables the external ROM.
4,5,6	C1,C2,C3	Output control lines used by an external serial speech ROM.
7	V_{DD}	Primary power supply.
8	SBY	STANDBY. A logic 1 output indicates that the SP is inactive (i.e., not talking) and V_{DD} can be powered down externally to conserve power. When the SP is reactivated by an address being loaded, SBY will go to a logic 0.
9	$\overline{\text{LRQ}}$	$\overline{\text{LOAD REQUEST}}$. $\overline{\text{LRQ}}$ is a logic 1 output whenever the input buffer is full. When $\overline{\text{LRQ}}$ goes to a logic 0, the input port is loaded by placing the 8 address bits on A1-A8 and pulsing the $\overline{\text{ALD}}$ input.
10,11,13,14, 15,16,17,18	A8,A7,A6,A5, A4,A3,A2,A1	8-bit address which defines any one of 256 speech entry points.
12	SER OUT	SERIAL ADDRESS OUT. This output transfers a 16-bit address serially to an external speech ROM.
19	SE	STROBE ENABLE. Normally held in a logic 1 state. When tied to ground, ALD is disabled and the SP will automatically latch in the address on the input bus approximately 1μs after detecting a logic 1 on any address line.
20	$\overline{\text{ALD}}$	$\overline{\text{ADDRESS LOAD}}$. A negative pulse on this input loads the 8 address bits into the input port. The leading edge of this pulse causes $\overline{\text{LRQ}}$ to go high.
21	SER IN	SERIAL IN. This is an 8-bit serial data input from an external speech ROM.
22	TEST	A logic 1 places the SP in test mode. This pin should normally be grounded.
23	V_{D1}	Standby power supply for the interface logic and controller.
24	DIGITAL OUT	Pulse width modulated digital speech output which, when filtered by a 5kHz low pass filter and amplified, will drive a loudspeaker.
25	$\overline{\text{SBY RESET}}$	$\overline{\text{STANDBY RESET}}$. A logic 0 resets the interface logic. Normally should be a logic 1.
26	ROM CLOCK	1.56MHz clock for an external serial speech ROM.
27	OSC 1	XTAL IN. Input connection for a 3.12MHz crystal.
28	OSC 2	XTAL OUT. Output connection for a 3.12MHz crystal.

© IC MASTER 1983

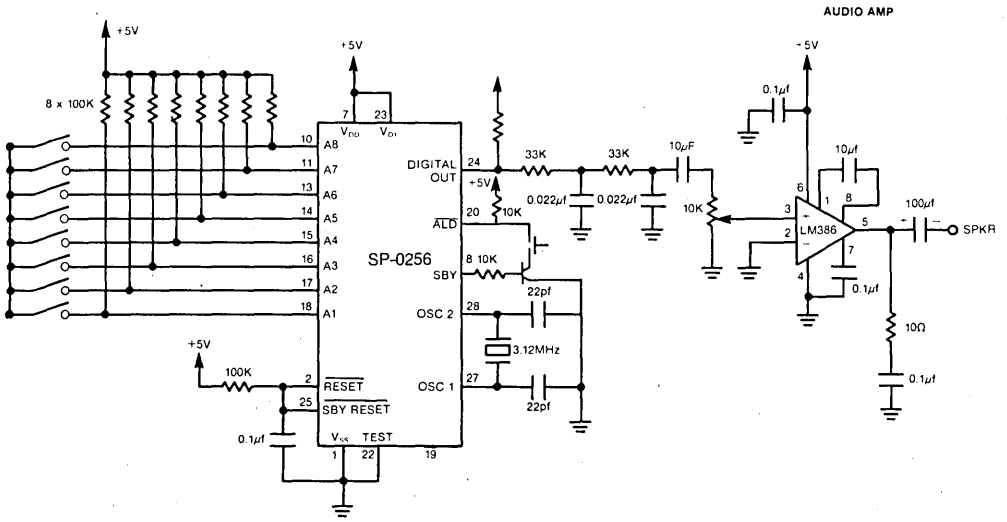


Fig. 2 TYPICAL APPLICATION STAND ALONE CONFIGURATION

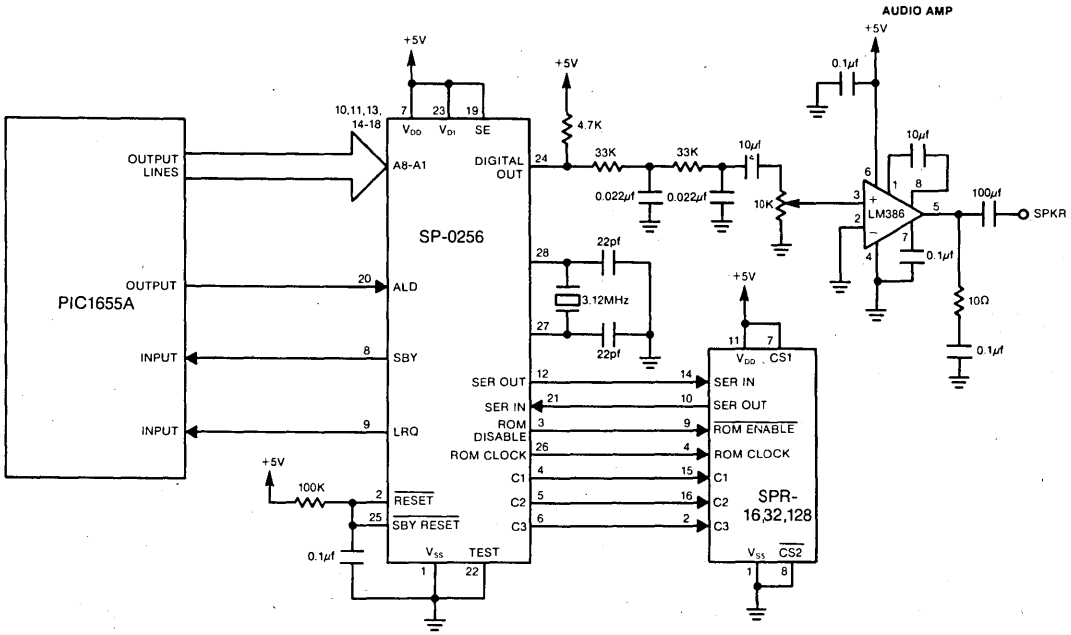


Fig. 3 TYPICAL APPLICATION MICROCOMPUTER INTERFACE

© IC MASTER 1983

GENERAL INSTRUMENT

SP0256-AL2

Allophone Based Speech Processor

DESCRIPTION

This product is the SP0256 Speech Processor preprogrammed with a standard ROM Pattern containing 64 allophones. Through the concatenation of selected allophones the user can construct any word in the English language, thereby providing an unlimited vocabulary at a data rate of less than 100 bits/second.

DATA MANUAL

A complete description of the SP0256-AL2 is contained in the Allophone Speech Synthesis Manual.

GENERAL INSTRUMENT

†SP0232

32K Speech Processor

DESCRIPTION

This product is pin for pin compatible with the SP0256 Speech Processor. This enhanced version of the SP0256 contains 32K of internal ROM.

†For future release.

GENERAL INSTRUMENT

SPR000

Speech Interface Chip

DESCRIPTION

The SPR000 is designed to interface a standard ROM, PROM, or EPROM to the SP0256 Speech Processor to provide a large amount of vocabulary expansion. This interface contains all the logic necessary to allow data communication under control of the Speech Processor. Two chip selects are provided, (CS1 and $\overline{CS2}$), for use in systems where it is desirable to bank blocks of memory under external control. With the capability of addressing 64K bytes of memory the SPR000 is ideal for applications such as SP0256 testing, and speech ROM emulation.

Microelectronics Division/Worldwide Sales Offices

NORTH AMERICA

UNITED STATES:

MICROELECTRONICS DIVISION

NORTHEAST—600 West John Street
Hicksville, New York 11802
Tel: 516-733-3107, TWX: 510-221-1866

20th Century Plaza
Daniel Webster Highway
Merrimack, New Hampshire 03054
Tel: 603-424-3303, TWX: 710-366-0676

858 Welsh Road
Maple Glen, Pennsylvania 19002
Tel: 215-643-5326

SOUTHEAST—7901 4th Street N., Suite 208
St. Petersburg, Florida 33702
Tel: 813-577-4024, TWX: 810-863-0398

1616 Forest Drive
Annapolis, Maryland 21403
Tel: 301-269-6250, TWX: 710-867-8566

4921C Professional Court
Raleigh, North Carolina 27609
Tel: 919-876-7380

SOUTH CENTRAL—5520 LBJ Frwy., Suite 330
Dallas, Texas 75240
Tel: 214-934-1654, TWX: 910-860-9259

CENTRAL—4524 S. Michigan Street
South Bend, Indiana 46614
Tel: 219-291-0585, TWX: 810-299-2518

5820 West 85th Street, Suite 102
Indianapolis, Indiana 46278
Tel: 317-872-7740, TWX: 810-341-3145

2355 S. Arlington Hts. Road, Suite 408
Arlington Heights, Illinois 60005
Tel: 312-981-0040, TWX: 910-687-0254

32969 Hamilton Court, Suite 210
Farmington Hills, Michigan 48018
Tel: 313-391-4070

SOUTHWEST—201 Standard Street
El Segundo, California 90245
Tel: 213-322-7745, TWX: 910-348-6296

NORTHWEST—3080 Olcott Street, Suite 230C
Santa Clara, California 95051
Tel: 408-496-0844, TWX: 910-379-0010

EUROPE

EUROPEAN SALES HEADQUARTERS:
GENERAL INSTRUMENT MICROELECTRONICS LTD.
Times House, Ruislip, Middlesex. HA4 8LE
Tel: Ruislip 35700, Telex: 23272

NORTHERN EUROPEAN SALES OFFICE:
Times House, Ruislip, Middlesex. HA4 8LE
Tel: Ruislip 35700, Telex: 23272

Sandhamnsgatan 67, S-115 28, Stockholm
Tel: (08) 67 99 25, Telex: 17779

SOUTHERN EUROPEAN SALES OFFICE:
5-7 Rue De L'Amiral Courbet, 94160 Saint Mande, Paris
Tel: (1) 365 72 50, Telex: 213073

Piazza Novelli, 8, 20129 Milano
Tel: (02) 720914, Telex: 843-320348

CENTRAL EUROPEAN SALES OFFICE:
GENERAL INSTRUMENT DEUTSCHLAND GmbH
Nordendstrasse 3, 8000 Munchen 40
Tel: (089) 27 24 049, Telex: 528054

6070 Langen Bei Frankfurt A Main
Wilhelm-Leuschner Plaza 8, Postf. 1167
Tel: (6103) 23 051, Telex: 415000

ASIA

HONG KONG:

GENERAL INSTRUMENT HONG KONG LTD.
139 Connaught Road Central, 3/F, San-Toi Building
Tel: (5) 434360, Telex: 84606

JAPAN:

GENERAL INSTRUMENT INTERNATIONAL CORP.
Fukide Bldg. 8th Floor, 1-13 Toranomon 4-Chome
Minato-ku, Tokyo 105
Tel: (03) 437-0281, Telex: 2423413

TAIWAN:

GENERAL INSTRUMENT
MICROELECTRONICS TAIWAN
77 Pao Chiao Road, Hsin Tien
Taipei, Taiwan
Tel: (02) 914-6234, Telex: 785-3111

"The information in this publication, including schematics, is suggestive only. General Instrument Corporation does not warrant, nor will it be responsible or liable for, (a) the accuracy of such information, (b) its use or (c) any infringement of patents or other rights of third parties."

GENERAL INSTRUMENT

© IC MASTER 1983

Programmable Sound Generator

FEATURES

- Full Software Control of Sound Generation
- Interfaces to Most 8-Bit and 16-Bit Microprocessors
- Three Independently Programmed Analog Outputs
- Two 8-Bit General Purpose I/O Ports (AY-3-8910)
- One 8-Bit General Purpose I/O Port (AY-3-8912)
- Single +5 Volt Supply

DESCRIPTION

The AY-3-8910/8912/8913 Programmable Sound Generator (PSG) is a LSI Circuit which can produce a wide variety of complex sounds under software control. The AY-3-8910/8912/8913 is manufactured in the General Instrument N-Channel Ion Implant Process. Operation requires a single +5V power supply, a TTL compatible clock, and a microprocessor controller such as the General Instrument 16-bit CP1610 or one of the PIC1650 series of 8-bit microcomputers.

The PSG is easily interfaced to any bus oriented system. Its flexibility makes it useful in applications such as music synthesis, sound effects generation, audible alarms, tone signalling and FSK modems. The analog sound outputs can each provide 4 bits of logarithmic digital to analog conversion, greatly enhancing the dynamic range of the sounds produced.

In order to perform sound effects while allowing the processor to continue its other tasks, the PSG can continue to produce sound after the initial commands have been given by the control processor. The fact that realistic sound production often involves more than one effect is satisfied by the three independently controllable channels available in the PSG.

All of the circuit control signals are digital in nature and intended to be provided directly by a microprocessor/microcomputer. This means that one PSG can produce the full range of required sounds with no change in external circuitry. Since the frequency response of the PSG ranges from sub-audible at its lowest frequency to post-audible at its highest frequency, there are few sounds which are beyond reproduction with only the simplest electrical connections.

Since most applications of a microprocessor/PSG system would also require interfacing between the outside world and the microprocessor, this facility has been designed into the PSG. The AY-3-8910 has two general purpose 8-bit I/O ports and is supplied in a 40 lead package: the AY-3-8912 has one port and 28 leads: the AY-3-8913 has no ports and 24 leads.

PIN FUNCTIONS

DA7--DA0 (input/output/high impedance): pins 30--37 (AY-3-8910)
Data/Address 7--0: pins 21--28 (AY-3-8912)
pins 4--11 (AY-3-8913)

These 8 lines comprise the 8-bit bidirectional bus used by the microprocessor to send both data and addresses to the PSG and to receive data from the PSG. In the data mode, DA7--DA0 correspond to Register Array bits B7--B0. In the address mode, DA3--DA0 select the register number ($0--17_8$) and a DA7--DA4 in conjunction with address inputs $\overline{A9}$ and A8 for the high order address (chip select).

A8 (input): pin 25 (AY-3-8910)
pin 17 (AY-3-8912)
pin 23 (AY-3-8913)

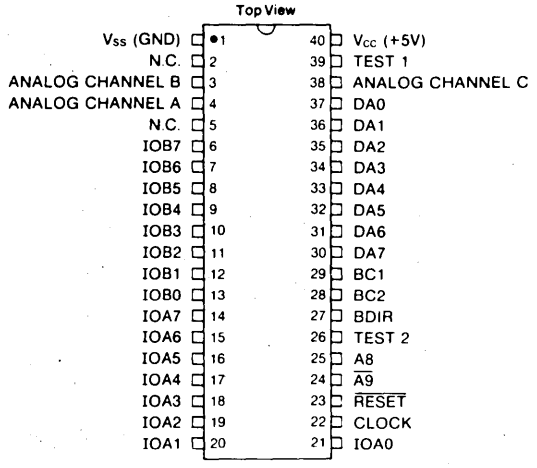
$\overline{A9}$ (input): pin 24 (AY-3-8910)
pin 22 (AY-3-8913)
(not provided on AY-3-8912)

Address 9, Address 8

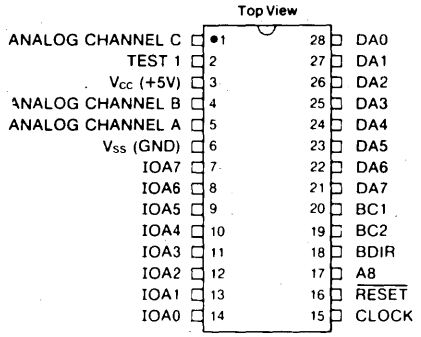
These "extra" address bits are made available to enable the positioning of the PSG (assigning a 16 word memory space) in a total 1,024 word memory area rather than in a 256 word memory area as defined by address bits DA7--DA0 alone. If the memory size does not require the use of these extra address lines they may be left unconnected as each is provided with either an on-chip pull down ($\overline{A9}$) or pull-up (A8) resistor. In "noisy" environments, however, it is recommended that $\overline{A9}$ and A8 be tied to an external ground and +5V, respectively, if they are not to be used.

PIN CONFIGURATIONS

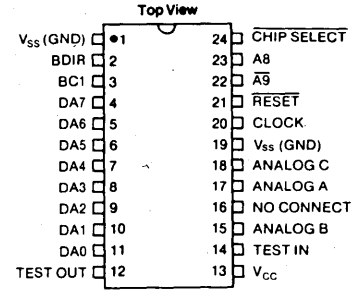
40 LEAD DUAL IN LINE
AY-3-8910



28 LEAD DUAL IN LINE
AY-3-8912



24 LEAD DUAL IN LINE



© IC MASTER 1983

RESET (input): pin 23 (AY-3-8910) pin 21 (AY-3-8913) pin 16 (AY-3-8912)

For initialization/power-on purposes, applying a logic "0" (ground) to the Reset pin will reset all registers to "0". The Reset pin is provided with an on-chip pull-up resistor.

CLOCK (input): pin 22 (AY-3-8910) pin 20 (AY-3-8913) pin 15 (AY-3-8912)

This TTL-compatible input supplies the timing reference for the Tone, Noise and Envelope Generators.

BDIR, BC2, BC1 (inputs): pins 27,28,29 (AY-3-8910) pins 18,19,20 (AY-3-8912) pins 2, 3 (No BC2 on AY-3-8913 see below).

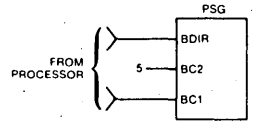
Bus DIRection, Bus Control 2,1

These bus control signals are generated directly by the CP1610 series of microprocessors to control all external and internal bus operations in the PSG. When using a processor other than the CP1610, these signals can be provided either by comparable bus signals or by simulating the signals on I/O lines of the processor. The PSG decodes these signals as illustrated in the following:

BDIR	BC2	BC1	CP1610 FUNCTION	PSG FUNCTION
0	0	0	NACT	INACTIVE. See 010 (IAB).
0	0	1	ADAR	LATCH ADDRESS. See 111 (INTAK).
0	1	0	IAB	INACTIVE. The PSG/CPU bus is inactive. DA7--DA0 are in a high impedance state.
0	1	1	DTB	READ FROM PSG. This signal causes the contents of the register which is currently addressed to appear on the PSG/CPU bus. DA7--DA0 are in the output mode.
1	0	0	BAR	LATCH ADDRESS. See 111 (INTAK).
1	0	1	DW	INACTIVE. See 010 (IAB).
1	1	0	DWS	WRITE TO PSG. This signal indicates that the bus contains register data which should be latched into the currently addressed register. DA7--DA0 are in the input mode.
1	1	1	INTAK	LATCH ADDRESS. This signal indicates that the bus contains a register address which should be latched in the PSG. DA7--DA0 are in the input mode.

While interfacing to a processor other than the CP1610 would simply require simulating the above decoding, the redundancies in the PSG functions vs. bus control signals can be used to advantage in that only four of the eight possible decoded bus functions are required by the PSG. This could simplify the programming of the bus control signals to the following, which would only require that the processor generate two bus control signals (BDIR and BC1, with BC2 tied to +5V). This is the case with the AY-3-8913 with BC2 pulled high internally.

BDIR	BC2	BC1	PSG FUNCTION
0	1	0	INACTIVE.
0	1	1	READ FROM PSG.
1	1	0	WRITE TO PSG.
1	1	1	LATCH ADDRESS.



ANALOG CHANNEL A, B, C (outputs): pins 4, 3, 38 (AY-3-8910) pins 5, 4, 1 (AY-3-8912) pins 17, 15, 18 (AY-3-8913)

Each of these signals is the output of its corresponding D/A Converter, and provides an up to 1V peak-peak signal representing the complex sound waveshape generated by the PSG.

IOA7--IOA0 (input/output): pins 14--21 (AY-3-8910) pins 7--14 (AY-3-8912) (not provided on AY-3-8913)

IOB7--IOB0 (input/output): pins 6--13 (AY-3-8910) (not provided on AY-3-8912) (not provided on AY-3-8913)

Input/Output A7--A0, B7--B0

Each of these two parallel input/output ports provides 8 bits of parallel data to/from the PSG/CPU bus from/to any external devices connected to the IOA or IOB pins. Each pin is provided with an on-chip pull-up resistor, so that when in the "input" mode, all pins will read normally high. Therefore, the recommended method for scanning external switches would be to ground the input bit.

TEST 1: pin 39 (AY-3-8910) pin 14 (AY-3-8913) pin 2 (AY-3-8912)
TEST 2: pin 26 (AY-3-8910) pin 12 (AY-3-8913) (not connected on AY-3-8912)

These pins are for General Instrument test purposes only and should be left open—do not use as tie-points.

V_{CC}: pin 40 (AY-3-8910) pin 13 (AY-3-8913) pin 3 (AY-3-8912)
Nominal +5Volt power supply to the PSG.

V_{SS}: pin 1 (AY-3-8910) pin 19 (AY-3-8913) pin 6 (AY-3-8912)
Ground reference for the PSG.

CHIP SELECT (Input) Pin 24 (AY-3-8913 only)

This input signal goes low to enable the PSG to read data on the data bus or write data from the data bus to one of the internal registers. For these above operations to occur, this signal must be true in addition to the current bus address being a valid PSG address. This signal must be valid for all read and write operations. The pin has an internal pull down to V_{SS}.

ARCHITECTURE

The AY-3-8910/8912/8913 is a register oriented Programmable Sound Generator (PSG). Communication between the processor and the PSG is based on the concept of memory-mapped I/O. Control commands are issued to the PSG by writing to 16 memory-mapped registers. Each of the 16 registers within the PSG is also readable so that the microprocessor can determine, as necessary, present states or stored data values.

All functions of the PSG are controlled through the 16 registers which once programmed, generate and sustain the sounds, thus freeing the system processor for other tasks.

REGISTER ARRAY

The principal element of the PSG is the array of 16 read/write control registers. These 16 registers look to the CPU as a block of memory and as such occupy a 16 word block out of 1,024 possible addresses. The 10 address bits (8 bits on the common data/address bus, and 2 separate address bits A8 and $\overline{A9}$) are decoded as follows:

* $\overline{A9}$	A8	DA7	DA6	DA5	DA4	DA3	DA2	DA1	DA0
0	1	0	0	0	0	0	0	0	0
THRU									
0	1	0	0	0	0	1	1	1	1
HIGH ORDER (Chip Select)						LOW ORDER (Register No.)			

* $\overline{A9}$ is not provided on the AY-3-8912.

The four low order address bits select one of the 16 registers (R0--$R17_8$). The six high order address bits function as "chip selects" to control the tri-state bidirectional buffers (when the high order address bits are "incorrect", the bidirectional buffers are forced to a high impedance state). High order address bits $\overline{A9}$, A8 are fixed in the PSG design to recognize a 01 code; high order address bits DA7--DA4 may be mask-programmed to any 4-bit code by a special order factory mask modification. Unless otherwise specified, address bits DA7--DA4 are programmed to recognize only a 0000 code. A valid high order address latches the register address (the low order 4 bits) in the Register Address Latch/Decoder block. A latched address will remain valid until the receipt of a new address, enabling multiple reads and writes of the same register contents without the need for redundant re-addressing.

Conditioning of the Register Address Latch/Decoder and the Bidirectional Buffers to recognize the bus function required (inactive, latch address, write data, or read data) is accomplished by the Bus Control Decode block.

SOUND GENERATING BLOCKS

The basic blocks in the PSG which produce the programmed sounds include:

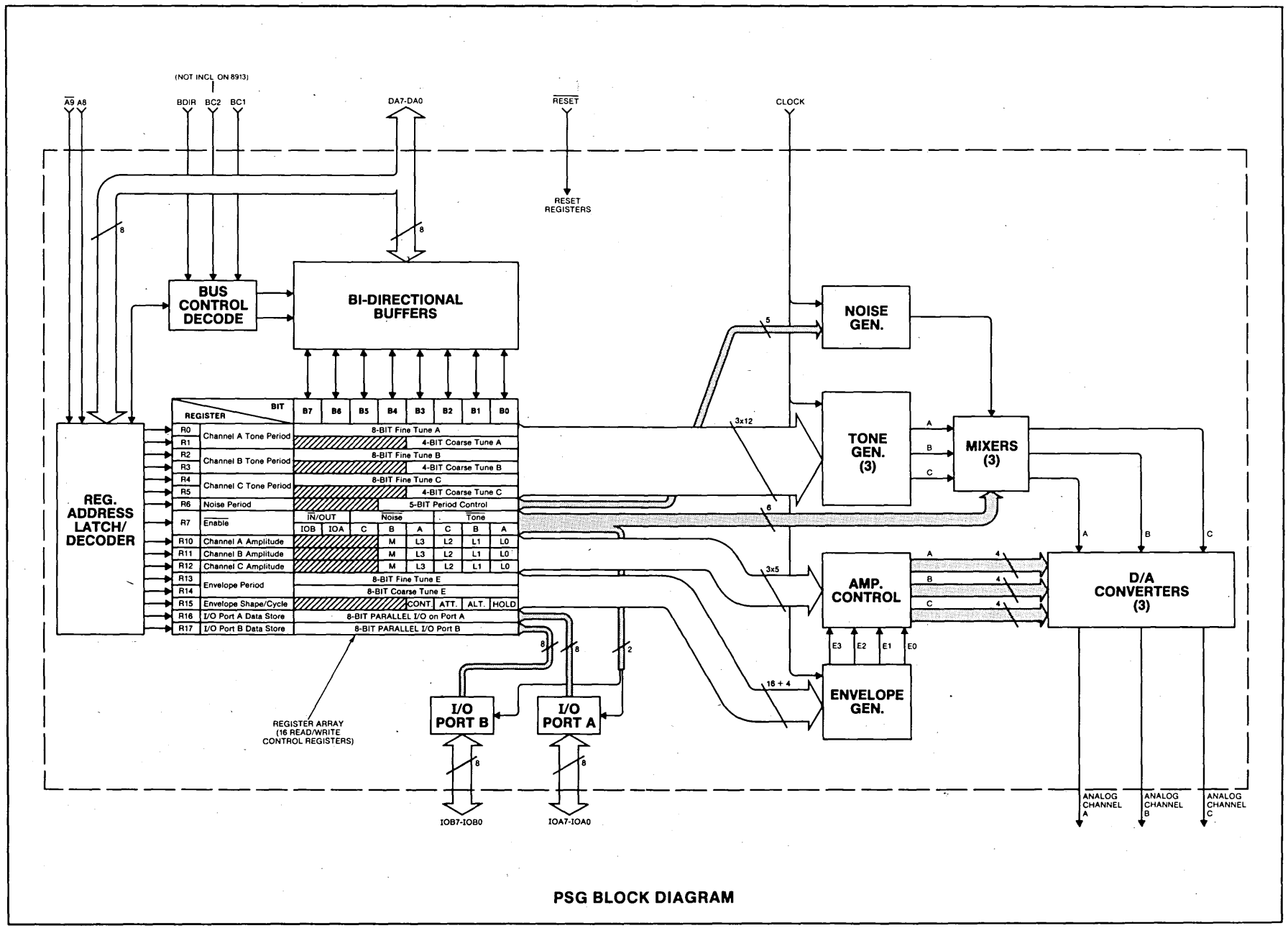
Tone Generators	produce the basic square wave tone frequencies for each channel (A,B,C)
Noise Generator	produces a frequency modulated pseudo random pulse width square wave output.
Mixers	combine the outputs of the Tone Generators and the Noise Generator. One for each channel (A,B,C).
Amplitude Control	provides the D/A Converters with either a fixed or variable amplitude pattern. The fixed amplitude is under direct CPU control; the variable amplitude is accomplished by using the output of the Envelope Generator.
Envelope Generator	produces an envelope pattern which can be used to amplitude modulate the output of each Mixer.
D/A Converters	the three D/A Converters each produce up to a 16 level output signal as determined by the Amplitude Control.

I/O PORTS

Two additional blocks are shown in the PSG Block Diagram which have nothing directly to do with the production of sound—these are the two I/O Ports (A and B). Since virtually all uses of microprocessor-based sound would require interfacing between the outside world and the processor, this facility has been included in the PSG. Data to/from the CPU bus may be read/written to either of two 8-bit I/O Ports without affecting any other function of the PSG. The I/O Ports are TTL-compatible and are provided with internal pull-ups on each pin. Both Ports are available on the AY-3-8910; only I/O Port A is available on the AY-3-8912; no ports are available on the AY-3-8913.

© IC MASTER 1983

© IC MASTER 1983



PSG BLOCK DIAGRAM

OPERATION

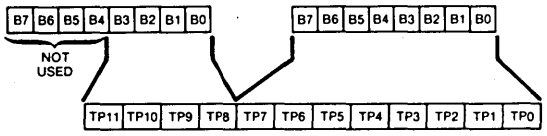
Since all functions of the PSG are controlled by the process, via a series of register loads, a detailed description of the PSG operation can best be accomplished by relating each PSG function to the control of its corresponding register. The function of creating or programming a specific sound or sound effect logically follows the control sequence listed:

Operation	Registers	Function
Tone Generator Control	R0--R5	Program tone periods.
Noise Generator Control	R6	Program noise period.
Mixer Control	R7	Enable tone and/or noise on selected channels.
Amplitude Control	R10--R12	Select "fixed" or "envelope-variable" amplitudes.
Envelope Generator Control	R13--R15	Program envelope period and select envelope pattern

Tone Generator Control
(Registers R0, R1, R2, R3, R4, R5)

The frequency of each square wave generated by the three Tone Generators (one each for Channels A, B, and C) is obtained in the PSG by first counting down the input clock by 16, then by further counting down the result by the programmed 12-bit Tone Period value. Each 12-bit value is obtained in the PSG by combining the contents of the relative Coarse and Fine Tune registers, as illustrated in the following:

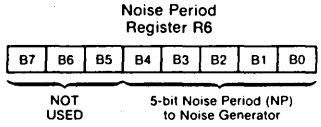
Coarse Tune Register	Channel	Fine Tune Register
R1	A	R0
R3	B	R2
R5	C	R4



12-bit Tone Period (TP) to Tone Generator

Noise Generator Control
(Register R6)

The frequency of the noise source is obtained in the PSG by first counting down the input clock by 16, then by further counting down the result by the programmed 5-bit Noise Period value. This 5-bit value consists of the lower 5 bits (B4--B0) of register R6, as illustrated in the following:



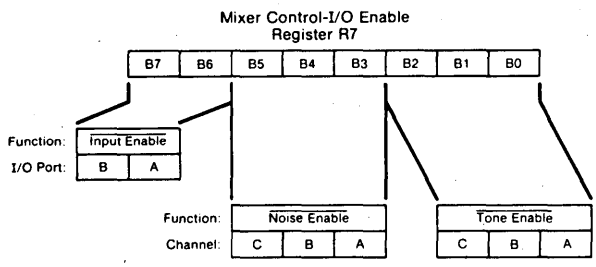
Mixer Control-I/O Enable
(Register R7)

Register R7 is a multi-function $\overline{\text{Enable}}$ register which controls the three Noise/Tone Mixers and the two general purpose I/O Ports.

The Mixers, as previously described, combine the noise and tone frequencies for each of the three channels. The determination of combining neither/either/both noise and tone frequencies on each channel is made by the state of bits B5--B0 of R7.

The direction (input or output) of the two general purpose I/O Ports (IOA and IOB) is determined by the state of bits B7 and B6 of R7.

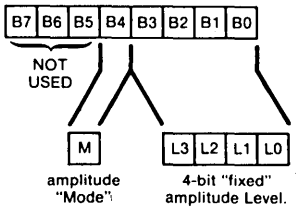
These functions are illustrated in the following:



Amplitude Control
(Registers R10, R11, R12)

The amplitudes of the signals generated by each of the three D/A Converters (one each for Channels A, B, and C) is determined by the contents of the lower 5 bits (B4--B0) of registers R10, R11, and R12 as illustrated in the following:

Amplitude Control Register	Channel
R10	A
R11	B
R12	C

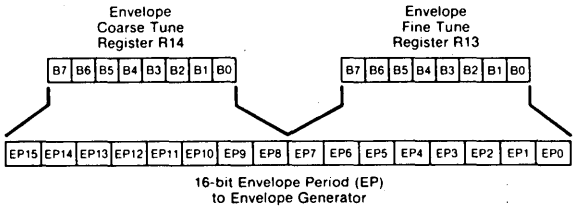


Envelope Generator Control
(Registers R13, R14, R15)

To accomplish the generation of fairly complex envelope patterns, two independent methods of control are provided in the PSG: first, it is possible to vary the frequency of the envelope using registers R13 and R14; and second, the relative shape and cycle pattern of the envelope can be varied using register R15. The following paragraphs explain the details of the envelope control functions, describing first the envelope period control and then the envelope shape/cycle control.

ENVELOPE PERIOD CONTROL (Registers R13, R14)

The frequency of the envelope is obtained in the PSG by first counting down the input clock by 256, then by further counting down the result by the programmed 16-bit Envelope Period value. This 16-bit value is obtained in the PSG by combining the contents of the Envelope Coarse and Fine Tune registers, as illustrated in the following:

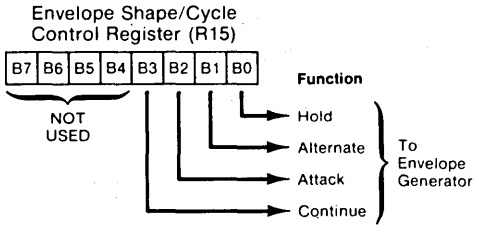


16-bit Envelope Period (EP) to Envelope Generator

ENVELOPE SHAPE/CYCLE CONTROL (Register R15)

The Envelope Generator further counts down the envelope frequency by 16, producing a 16-state per cycle envelope pattern as defined by its 4-bit counter output, E3 E2 E1 E0. The particular shape and cycle pattern of any desired envelope is accomplished by controlling the count pattern (count up/count down) of the 4-bit counter and by defining a single-cycle or repeat-cycle pattern.

This envelope shape/cycle control is contained in the lower 4 bits (B3--B0) of register R15. Each of these 4 bits controls a function in the envelope generator, as illustrated in the following:



© IC MASTER 1983

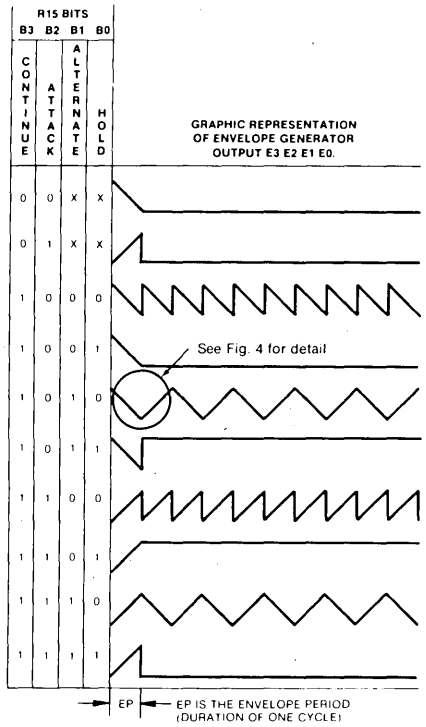


Fig. 1 ENVELOPE SHAPE/CYCLE OPERATION

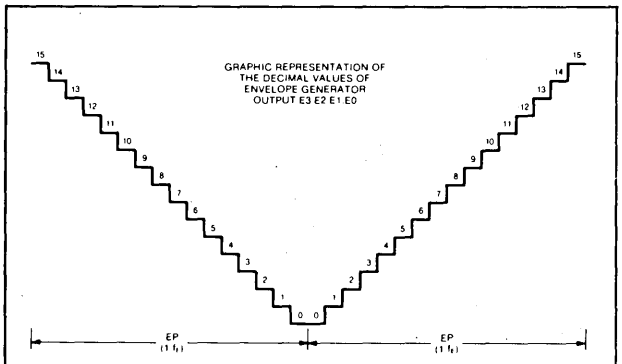


Fig. 2 DETAIL OF TWO CYCLES OF Fig. 1 (ref. waveform "1010" in Fig. 1)

I/O Port Data Store (Registers R16, R17)

Registers R16 and R17 function as intermediate data storage registers between the PSG/CPU data bus (DA0--DA7) and the two I/O ports (IOA7--IOA0 and IOB7--IOB0). Both ports are available in the AY-3-8910; only I/O Port A is available in the AY-3-8912; none are available on the AY-3-8913. Using registers R16 and R17 for the transfer of I/O data has no effect on sound generation.

D/A Converter Operation

Since the primary use of the PSG is to produce sound for the highly imperfect amplitude detection mechanism of the human ear, the D/A conversion is performed in logarithmic steps with a normalized voltage range of from 0 to 1 Volt. The specific amplitude control of each of the three D/A Converters is accomplished by the three sets of 4-bit outputs of the Amplitude Control block, while the Mixer outputs provide the base signal frequency (Noise and/or Tone).

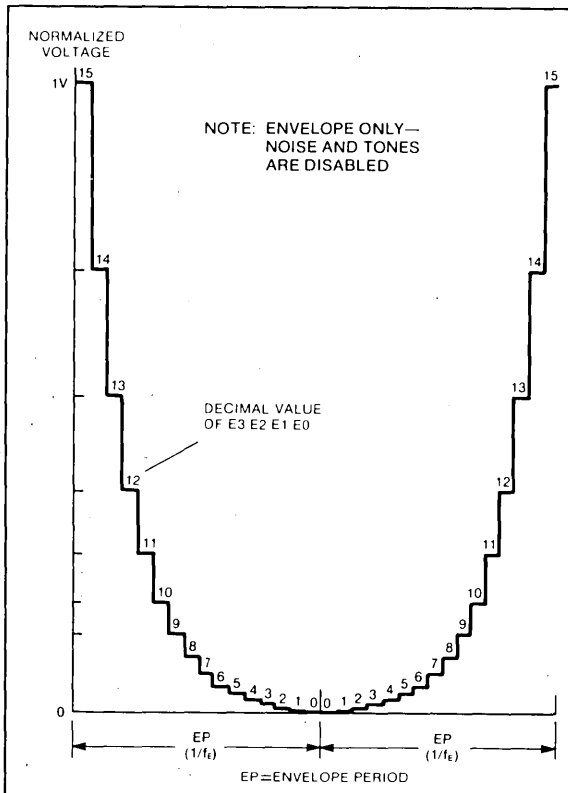


Fig. 3 D/A CONVERTER OUTPUT

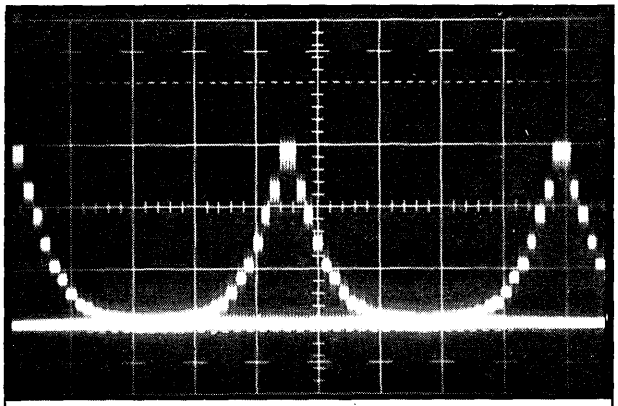


Fig. 4 SINGLE TONE WITH ENVELOPE SHAPE/CYCLE PATTERN 1010

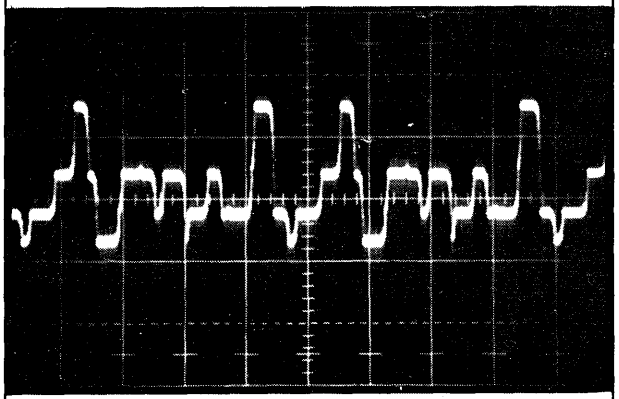


Fig. 5 MIXTURE OF THREE TONES WITH FIXED AMPLITUDES

© IC MASTER 1983

ELECTRICAL CHARACTERISTICS (AY-3-8910, AY-3-8912)

Maximum Ratings*

Storage Temperature ..... −55°C to +150°C
Operating Temperature ..... 0°C to +40°C
V_{CC} and all other Input/Output
Voltages with Respect to V_{SS} ..... −0.3V to +8.0V

*Exceeding these ratings could cause permanent damage to the device. This is a stress rating only and functional operation of this device at these conditions is not implied—operating ranges are specified in Standard Conditions. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Data labeled "typical" is presented for design guidance only and is not guaranteed.

Standard Conditions (unless otherwise noted):

V_{CC} = +5V ±5%
V_{SS} = GND
Operating Temperature = 0°C to +40°C

Characteristics	Sym	Min	Typ**	Max	Units	Conditions
DC CHARACTERISTICS						
All Inputs						
Low Level	V_{IL}	0	—	0.6	V	
High Level	V_{IH}	2.4	—	V_{CC}	V	
All Outputs (except Analog Channel Outputs)						
Low Level	V_{OL}	0	—	0.5	V	I_{OL} = 1.6mA, 20pf
High Level	V_{OH}	2.4	—	V_{CC}	V	I_{OH} = 100μA, 20pf
Analog Channel Outputs	V_o	0	—	60	dB	Test Circuit: Fig. 6
Power Supply Current	I_{CC}	—	45	85	mA	
AC CHARACTERISTICS						
Clock Input						
Frequency	f_C	1	—	2	MHz	Fig. 7
Rise Time	t_r	—	—	50	ns	
Fall Time	t_f	—	—	50	ns	
Duty Cycle	—	25	50	85	%	
Bus Signals (BDIR, BC2, BC1)						
Associative Delay Time	t_{BD}	—	—	50	ns	
Reset						
Reset Pulse Width	t_{RW}	500	—	—	ns	Fig. 8
Reset to Bus Control Delay Time	t_{RB}	100	—	—	ns	
A9, A8, DA7--DA0 (Address Mode)						
Address Setup Time	t_{AS}	400	—	—	ns	Fig. 9
Address Hold Time	t_{AH}	100	—	—	ns	
DA7--DA0 (Write Mode)						
Write Data Pulse Width	t_{DW}	500	—	10,000	ns	Fig. 10
Write Data Setup Time	t_{DS}	50	—	—	ns	
Write Data Hold Time	t_{DH}	100	—	—	ns	
DA7--DA0 (Read Mode)						
Read Data Access Time	t_{DA}	—	250	500	ns	Fig. 11
DA7--DA0 (Inactive Mode)						
Tristate Delay Time	t_{TS}	—	100	200	ns	

**Typical values are at +25°C and nominal voltages.

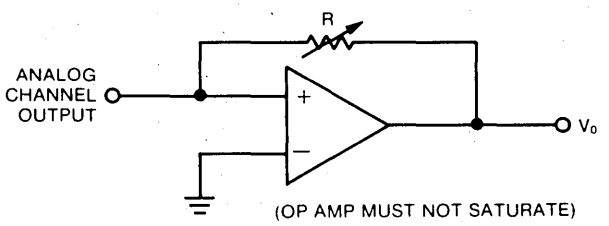


Fig. 6 ANALOG CHANNEL OUTPUT TEST CIRCUIT

© IC MASTER 1983

ELECTRICAL CHARACTERISTICS (AY-3-8913)

Maximum Ratings*

Storage Temperature ..... −55°C to +150°C
Operating Temperature ..... 0°C to +70°C
V_{CC} and all other Input/Output Voltages with Respect to V_{SS} ..... −0.3V to +8.0V

*Exceeding these ratings could cause permanent damage to the device. This is a stress rating only and functional operation of this device at these conditions is not implied—operating ranges are specified in Standard Conditions. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Data labeled "typical" is presented for design guidance only and is not guaranteed.

Standard Conditions (unless otherwise noted):

V_{CC} = +5V ±5%
V_{SS} = GND
Operating Temperature = 0°C to +70°C

Characteristics	Sym	Min	Max	Units	Conditions
DC CHARACTERISTICS					
Input Voltage Levels					
Low Level	V_{IL}	0	0.7	V	
High Level	V_{IH}	2.2	V_{CC}	V	
Output Voltage Levels (except Analog Channel Outputs)					
Low Level	V_{OL}	0	0.4	V	1 TTL Load
High Level	V_{OH}	2.4	V_{CC}	V	+100pf
Analog Channel Outputs	V_O	0	2000	μA	Test Circuit: Fig. 6
Power Supply Current	I_{CC}	—	85	mA	
AC CHARACTERISTICS					
Clock Input					
Frequency	f_c	1	2.5	MHz	Fig. 7
Rise Time	t_r	—	50	ns	Fig. 7
Fall Time	t_f	—	50	ns	Fig. 7
Duty Cycle	—	40	60	%	Fig. 7
Bus Signals (BDIR, BC2, BC1)					
Associative Delay Time	t_{BD}	—	50	ns	Fig. 7
Reset					
Reset Pulse Width	t_{RW}	5	—	μs	Fig. 8
Reset to Bus Control Delay Time	t_{RB}	100	—	ns	Fig. 8
A9, A8, DA7--DA0 (Address Mode)					
Address Setup Time	t_{AS}	300	—	ns	Fig. 9
Address Hold Time	t_{AH}	50	—	ns	Fig. 9
DA7--DA0 (Write Mode)					
Write Data Pulse Width	t_{DW}	1800	—	ns	Fig. 10
Write Data Setup Time	t_{DS}	50	—	ns	Fig. 10
Write Data Hold Time	t_{DH}	100	—	ns	Fig. 10
DA7--DA0 (Read Mode)					
Read Data Access Time	t_{DA}	—	350	ns	Fig. 11
DA7--DA0 (Inactive Mode)					
Tristate Delay Time	t_{TS}	—	400	ns	Fig. 11

TIMING DIAGRAMS

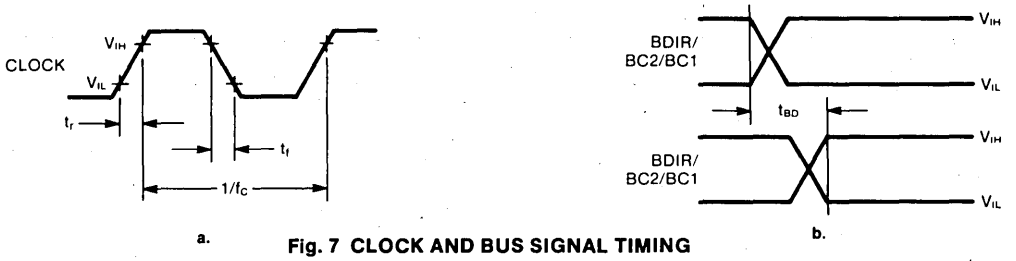


Fig. 7 CLOCK AND BUS SIGNAL TIMING

© IC MASTER 1983

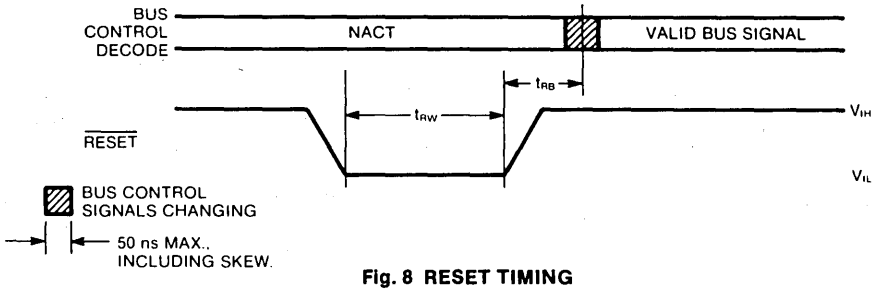
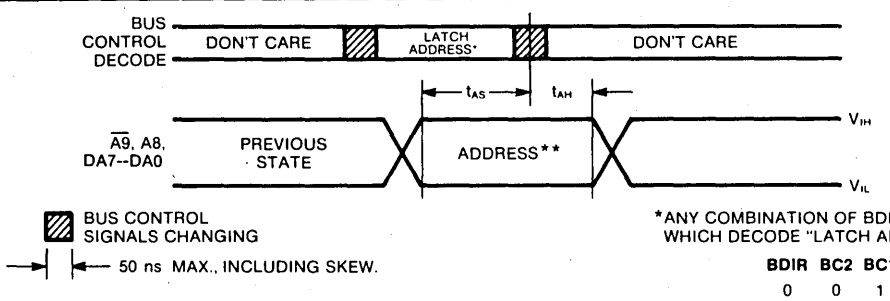


Fig. 8 RESET TIMING

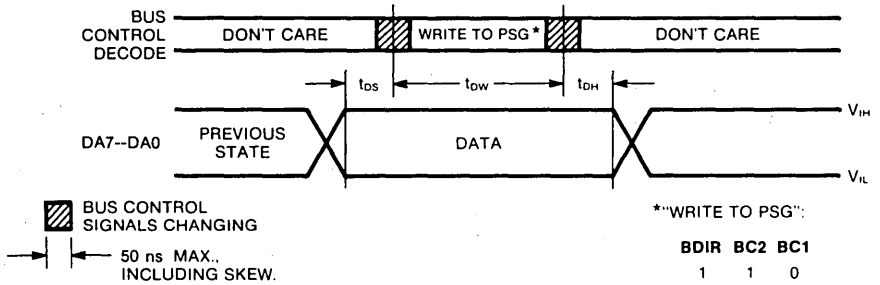


*ANY COMBINATION OF BDIR, BC2, BC1 WHICH DECODE "LATCH ADDRESS":

BDIR	BC2	BC1
0	0	1
or 1	0	0
or 1	1	1

**REFER TO PARAGRAPH 2.1.1 FOR A DESCRIPTION OF "VALID" PSG ADDRESSING.

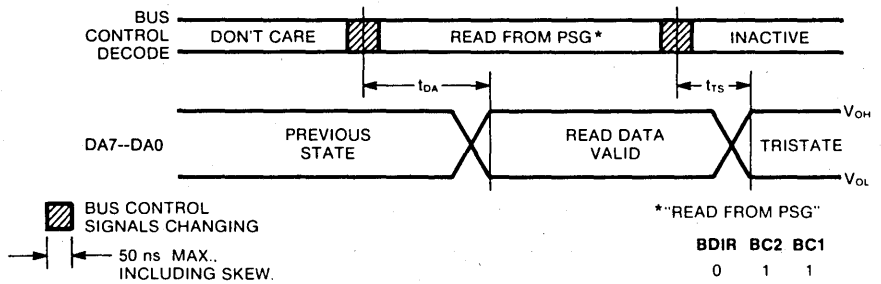
Fig. 9 LATCH ADDRESS TIMING



*"WRITE TO PSG":

BDIR	BC2	BC1
1	1	0

Fig. 10 WRITE DATA TIMING



*"READ FROM PSG"

BDIR	BC2	BC1
0	1	1

Fig. 11 READ DATA TIMING

Microelectronics Division/Worldwide Sales Offices

NORTH AMERICA

UNITED STATES:

MICROELECTRONICS DIVISION

NORTHEAST—600 West John Street
Hicksville, New York 11802
Tel: 516-733-3107, TWX: 510-221-1866

20th Century Plaza
Daniel Webster Highway
Merrimack, New Hampshire 03054
Tel: 603-424-3303, TWX: 710-366-0676

858 Welsh Road
Maple Glen, Pennsylvania 19002
Tel: 215-643-5326

SOUTHEAST—7901 4th Street N., Suite 208
St. Petersburg, Florida 33702
Tel: 813-577-4024, TWX: 810-863-0398

1616 Forest Drive
Annapolis, Maryland 21403
Tel: 301-269-6250, TWX: 710-867-8566

4921C Professional Court
Raleigh, North Carolina 27609
Tel: 919-876-7380

SOUTH CENTRAL—5520 LBJ Frwy., Suite 330
Dallas, Texas 75240
Tel: 214-934-1654, TWX: 910-860-9259

CENTRAL—4524 S. Michigan Street
South Bend, Indiana 46614
Tel: 219-291-0585, TWX: 810-299-2518

5820 West 85th Street, Suite 102
Indianapolis, Indiana 46278
Tel: 317-872-7740, TWX: 810-341-3145

2355 S. Arlington Hts. Road, Suite 408
Arlington Heights, Illinois 60005
Tel: 312-981-0040, TWX: 910-687-0254

32969 Hamilton Court, Suite 210
Farmington Hills, Michigan 48018
Tel: 313-391-4070

SOUTHWEST—201 Standard Street
El Segundo, California 90245
Tel: 213-322-7745, TWX: 910-348-6296

NORTHWEST—3080 Olcott Street, Suite 230C
Santa Clara, California 95051
Tel: 408-496-0844, TWX: 910-379-0010

EUROPE

EUROPEAN SALES HEADQUARTERS:
GENERAL INSTRUMENT MICROELECTRONICS LTD.
Times House, Ruislip, Middlesex. HA4 8LE
Tel: Ruislip 35700, Telex: 23272

NORTHERN EUROPEAN SALES OFFICE:
Times House, Ruislip, Middlesex. HA4 8LE
Tel: Ruislip 35700, Telex: 23272

Sandhamnsgatan 67, S-115 28, Stockholm
Tel: (08) 67 99 25, Telex: 17779

SOUTHERN EUROPEAN SALES OFFICE:
5-7 Rue De L'Amiral Courbet, 94160 Saint Mande, Paris
Tel: (1) 365 72 50, Telex: 213073

Piazza Novelli, 8, 20129 Milano
Tel: (02) 720914, Telex: 843-320348

CENTRAL EUROPEAN SALES OFFICE:
GENERAL INSTRUMENT DEUTSCHLAND GmbH
Nordendstrasse 3, 8000 Munchen 40
Tel: (089) 27 24 049, Telex: 528054

6070 Langen Bei Frankfurt A Main
Wilhelm-Leuschner Plaza 8, Postf. 1167
Tel: (6103) 23 051, Telex: 415000

ASIA

HONG KONG:

GENERAL INSTRUMENT HONG KONG LTD.
139 Connaught Road Central, 3/F, San-Toi Building
Tel: (5) 434360, Telex: 84606

JAPAN:

GENERAL INSTRUMENT INTERNATIONAL CORP.
Fukide Bldg. 8th Floor, 1-13 Toranomon 4-Chome
Minato-ku, Tokyo 105
Tel: (03) 437-0281, Telex: 2423413

TAIWAN:

GENERAL INSTRUMENT MICROELECTRONICS TAIWAN
77 Pao Chiao Road, Hsin Tien
Taipei, Taiwan
Tel: (02) 914-6234, Telex: 785-3111

GENERAL INSTRUMENT

"The information in this publication, including schematics, is suggestive only. General Instrument Corporation does not warrant, nor will it be responsible or liable for, (a) the accuracy of such information, (b) its use or (c) any infringement of patents or other rights of third parties."

© IC MASTER 1983

HARRIS

HARRIS CMOS MICROPROCESSOR, PERIPHERAL & MEMORY PRODUCTS

CMOS MICROPROCESSOR AND SUPPORT CIRCUITS*

80C86	CMOS 16 BIT MICROPROCESSOR
82C54	CMOS PROGRAMMABLE INTERVAL TIMER
82C55A	CMOS PROGRAMMABLE PERIPHERAL INTERFACE
82C59A	CMOS PRIORITY INTERRUPT CONTROLLER
82C82	CMOS OCTAL LATCH
82C84A	CMOS CLOCK GENERATOR/DRIVER
82C88	CMOS BUS CONTROLLER
HD-6120	CMOS 12 BIT HIGH PERFORMANCE MICROPROCESSOR
HD-6121	CMOS I/O CONTROLLER
HD-64XX	CMOS BUS DRIVER FAMILY

CMOS RANDOM ACCESS MEMORY**

1K	HM-6508	1K X 1 CMOS SYNCHRONOUS RAM
	HM-6518	1K X 1 CMOS SYNCHRONOUS RAM
	HM-6551	256 X 4 CMOS SYNCHRONOUS RAM
	HM-6561	256 X 4 CMOS SYNCHRONOUS RAM
4K	HM-6504	4K X 1 CMOS SYNCHRONOUS RAM
	HM-6514	1K X 4 CMOS SYNCHRONOUS RAM
16K	HM-6516	2K X 8 CMOS SYNCHRONOUS RAM
	HM-65161	2K X 8 CMOS ASYNCHRONOUS RAM
	HM-6116	2K X 8 CMOS ASYNCHRONOUS RAM
	HM-6564	64K CMOS RAM MODULE
	HM-92560	256K CMOS RAM MODULE

CMOS FUSE LINK PROMS**

4K	HM-6641	512 X 8 CMOS PROM
16K	HM-6616	2K X 8 CMOS PROM

CMOS SERIAL INTERFACE***

HD-4702	CMOS PROGRAMMABLE BIT RATE GENERATOR
HD-6402	UART
HD-6408	CMOS ASYNCHRONOUS MANCHESTER ADAPTER
HD-6409	CMOS MANCHESTER ENCODER-DECODER
HD-15530	CMOS MANCHESTER ENCODER-DECODER
HD-15531	CMOS MANCHESTER ENCODER-DECODER

* ADDITIONAL INFORMATION IN THE MICROPROCESSOR SECTION
** ADDITIONAL INFORMATION IN THE MEMORY SECTION
*** ADDITIONAL INFORMATION IN THIS SECTION

© IC MASTER 1983

HARRIS

80C86

PRODUCT BRIEF

CMOS 16 BIT MICROPROCESSOR

Features

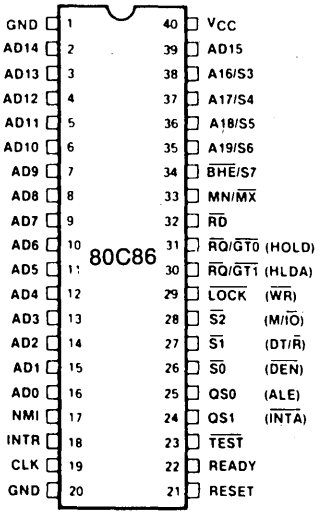
- 1 MBYTE OF DIRECT MEMORY ADDRESSING CAPABILITY
- 24 OPERAND ADDRESSING MODES
- BIT, BYTE, WORD, AND BLOCK OPERATIONS
- 8 and 16 BIT SIGNED/UNSIGNED ARITHMETIC
  - BINARY or DECIMAL
  - MULTIPLY and DIVIDE
- BUS-HOLD CIRCUITRY ELIMINATES PULL-UP RESISTORS
- ARCHITECTURE DESIGNED FOR EFFICIENT HIGH LEVEL LANGUAGE OPERATION
- MULTIBUS® SYSTEM COMPATIBLE INTERFACE
- SCALED SAJI IV CMOS PROCESS – LOW POWER OPERATION
- SINGLE 5V POWER SUPPLY
- INDUSTRIAL and MILITARY TEMPERATURE RANGES

Description

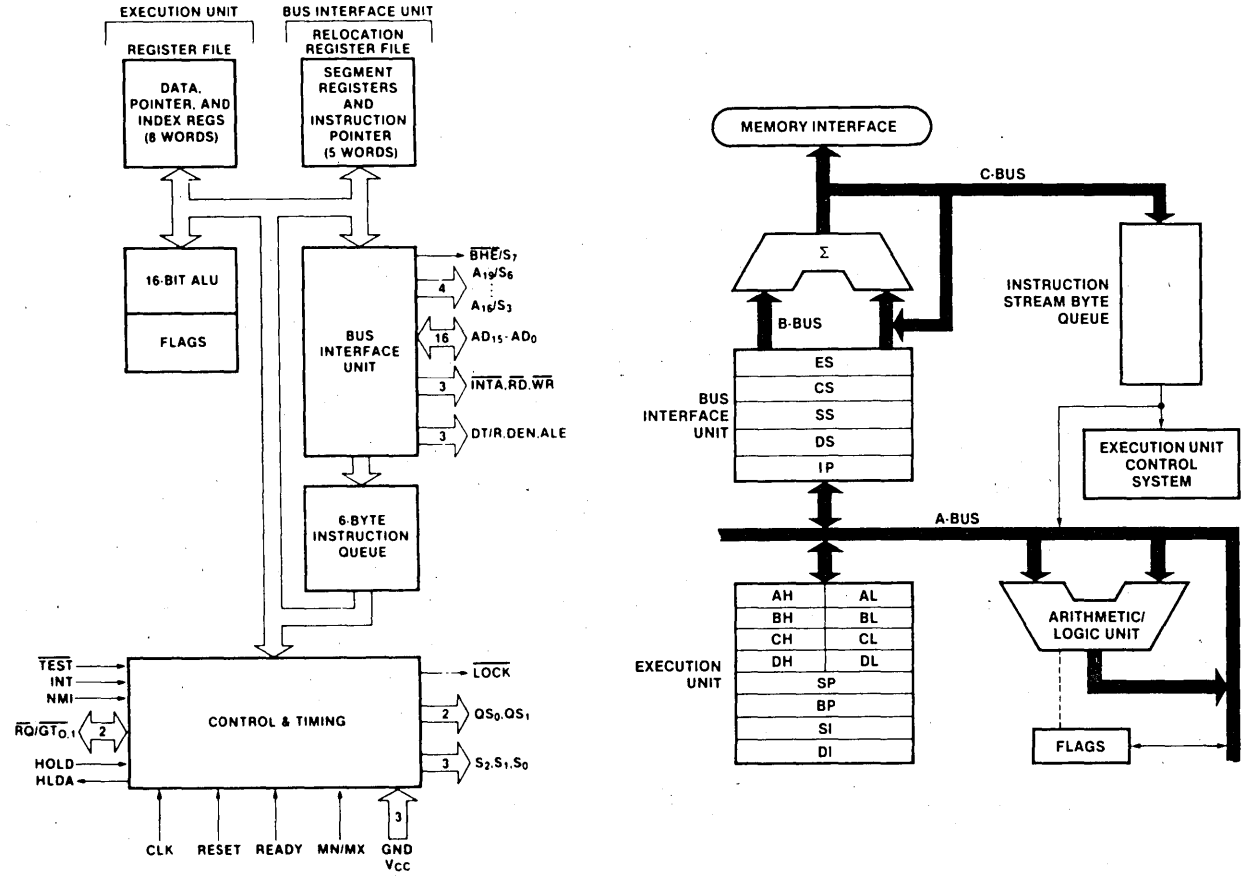
The Harris 80C86 high performance 16 bit CMOS CPU is manufactured using a self-aligned silicon gate CMOS process (Scaled SAJI IV). Two modes of operation, MINimum for small systems and MAXimum for larger applications such as multi-processing, allow user configuration to achieve the highest performance level. The Harris 80C86 is available in a 40 pin industry standard ceramic DIP package and two operating frequencies: 5 MHz and 8 MHz.

*MULTIBUS IS A TRADEMARK OF INTEL CORPORATION

Pinout



Functional Diagram



CAUTION: Electronic devices are sensitive to electrostatic discharge. Proper I.C. handling procedures should be followed.

Copyright © Harris Corporation 1982

© IC MASTER 1983

HARRIS

82C54

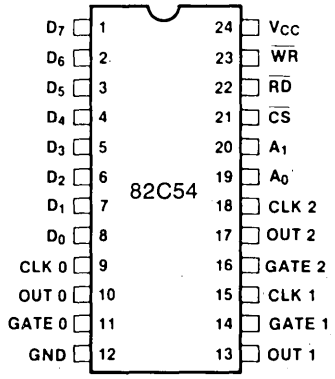
CMOS PROGRAMMABLE INTERVAL TIMER

PRODUCT BRIEF

Features

- THREE INDEPENDENT 16 BIT COUNTERS
- SIX PROGRAMMABLE COUNTER MODES
- STATUS READ-BACK COMMAND
- BINARY OR BCD COUNTING
- FULLY TTL COMPATIBLE
- HIGH SPEED, NO "WAIT STATE" OPERATION WITH 8 MHz 80C86
- PIN COMPATIBLE WITH NMOS 8254
- ENHANCED VERSION OF NMOS 8253
- SCALED SAJI IV CMOS PROCESS
- SINGLE 5V POWER SUPPLY
- LOW STANDBY POWER
- INDUSTRIAL and MILITARY TEMPERATURE RANGES

Pinout



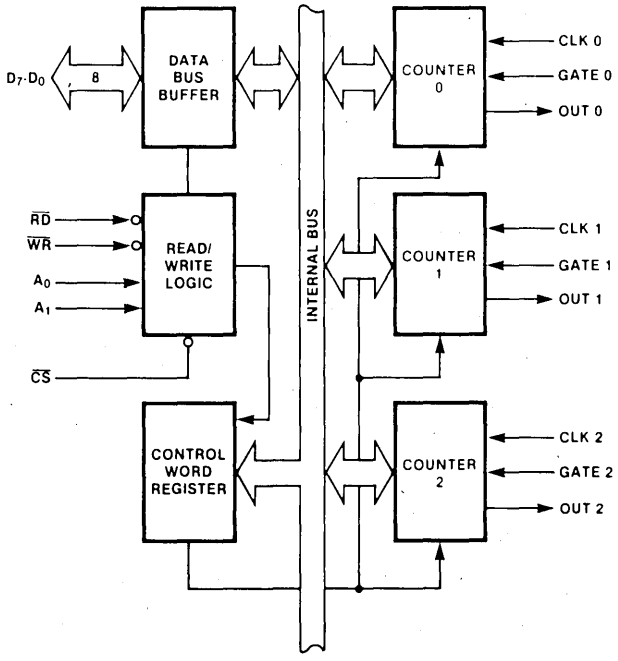
Description

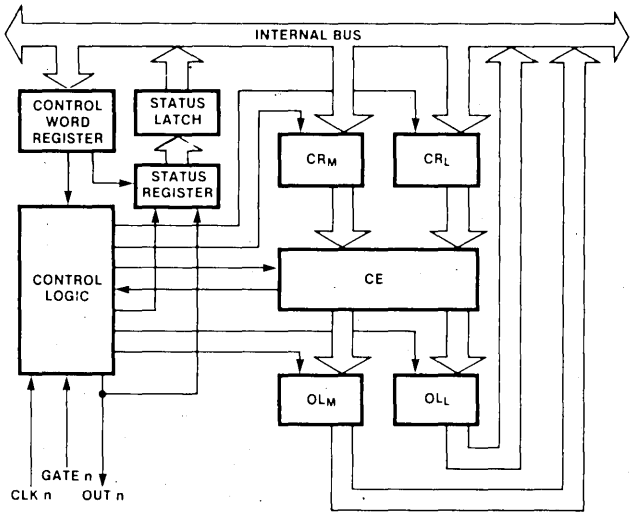
The Harris 82C54 is a high performance CMOS Programmable Interval Timer manufactured using a self-aligned silicon gate CMOS process (Scaled SAJI IV). The 82C54 has three independently programmable and functional 16 bit counters with each capable of handling clock input frequencies of up to 10 MHZ. The high speed and industry standard configuration of the 82C54 make it compatible with microprocessors such as the 80C86, 8048, 8051, and NSC800.

Six programmable timer modes allow the 82C54 to be used as an event counter, elapsed time indicator, programmable one-shot along with many other applications.

Static CMOS circuit design insures low operating power. Harris's advanced SAJI process results in performance equal to or greater than existing equivalent products with a significant reduction in power.

Functional Diagram





Internal Block Diagram of a Counter

CAUTION: Electronic devices are sensitive to electrostatic discharge. Proper I.C. handling procedures should be followed.

Copyright © Harris Corporation 1982.

HARRIS

82C55A

CMOS PROGRAMMABLE PERIPHERAL INTERFACE

PRODUCT BRIEF

Features

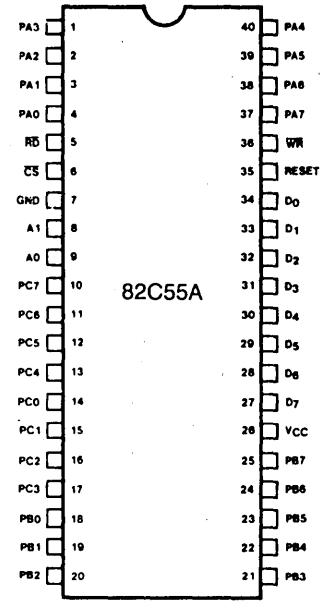
- 24 PROGRAMMABLE I/O PINS
- FULLY TTL COMPATIBLE
- BUS-HOLD CIRCUITRY ON ALL I/O PORTS ELIMINATES PULL-UP RESISTORS
- HIGH SPEED, NO "WAIT STATE" OPERATION WITH 8MHz 80C86
- DIRECT BIT SET/RESET CAPABILITY
- PIN COMPATIBLE WITH NMOS 8255A
- ENHANCED CONTROL WORD READ CAPABILITY
- SCALED SAJI IV CMOS PROCESS
- SINGLE 5V POWER SUPPLY
- 2.5 mA DRIVE CAPABILITY ON ALL I/O PORT OUTPUTS
- LOW STANDBY POWER
- INDUSTRIAL AND MILITARY TEMPERATURE RANGES

Description

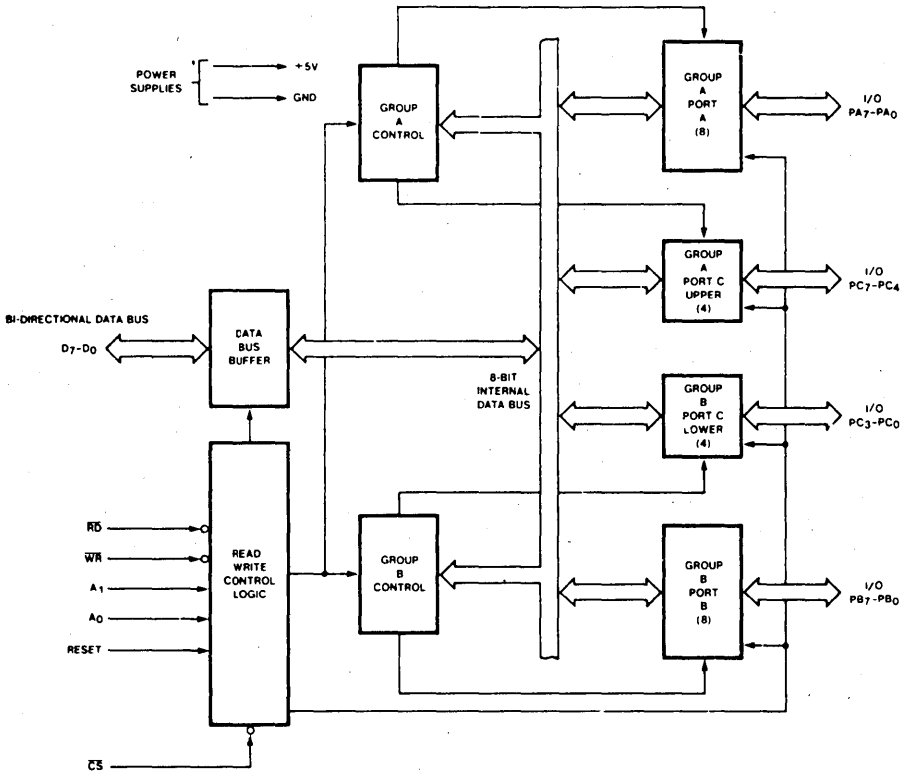
The Harris 82C55A is a high performance CMOS version of the industry standard 8255A and is manufactured using a self-aligned silicon gate CMOS process (Scaled SAJI IV). It is a general purpose programmable I/O device which may be used with many different microprocessors. There are 24 I/O pins which may be individually programmed in 2 groups of 12 and used in 3 major modes of operation. The high performance and industry standard configuration of the 82C55A make it compatible with microprocessors such as the 80C86, 8048, 8051, and NSC800.

Static CMOS circuit design insures low operating power. TTL compatibility of VIH = 2.0 volts over the industrial temperature range and bus hold circuitry eliminate the need for pull-up resistors. Harris's advanced SAJI process results in performance equal to or greater than existing equivalent products at a fraction of the power.

Pinout



Functional Diagram



CAUTION: Electronic devices are sensitive to electrostatic discharge. Proper I.C. handling procedures should be followed.

Copyright © Harris Corporation 1982

© IC MASTER 1983

HARRIS

82C59A

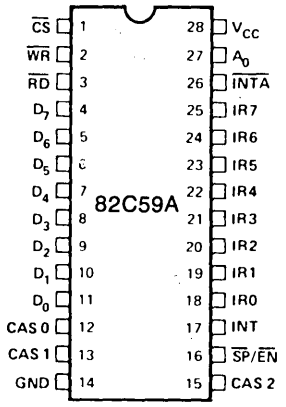
CMOS PROGRAMMABLE INTERRUPT CONTROLLER

PRODUCT BRIEF

Features

- EIGHT LEVEL PRIORITY CONTROLLER
- EXPANDABLE TO 64 LEVELS
- FULLY TTL COMPATIBLE
- HIGH SPEED, NO "WAIT STATE" OPERATION WITH 8 MHz 80C86
- PIN COMPATIBLE WITH NMOS 8259A
- PROGRAMMABLE INTERRUPT MODES
- INDIVIDUAL REQUEST MASK CAPABILITY
- FULLY STATIC DESIGN
- SCALED SAJI IV CMOS PROCESS
- SINGLE 5V POWER SUPPLY
- LOW STANDBY POWER
- INDUSTRIAL and MILITARY TEMPERATURE RANGES

Pinout



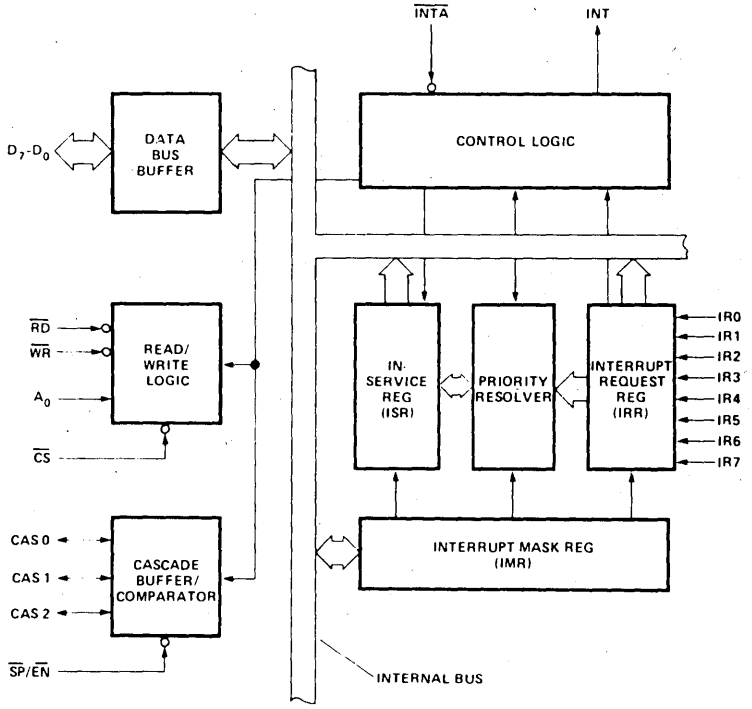
Description

The Harris 82C59A is a high performance CMOS Priority Interrupt Controller manufactured using a self-aligned silicon gate CMOS process (Scaled SAJI IV). The 82C59A is designed to relieve the system CPU from the task of polling in a multi-level priority interrupt system. The high speed and industry standard configuration of the 82C59A make it compatible with microprocessors such as the 80C86, 8048, 8051, and NSC800.

The 82C59A can handle up to eight vectored priority interrupting sources and is cascadable to 64 without additional circuitry. Individual interrupting sources can be masked or prioritized to allow custom system configuration.

Static CMOS circuit design insures low operating power. Harris's advanced SAJI process results in performance equal to or greater than existing equivalent products at a fraction of the power.

Functional Diagram



D_7 - D_0	DATA BUS (BI-DIRECTIONAL)
$\overline{RD}$	READ INPUT
$\overline{WR}$	WRITE INPUT
A_0	COMMAND SELECT ADDRESS
$\overline{CS}$	CHIP SELECT
CAS2-CAS0	CASCADE LINES
$\overline{SP}/\overline{EN}$	SLAVE PROGRAM INPUT/ENABLE
INT	INTERRUPT OUTPUT
$\overline{INTA}$	INTERRUPT ACKNOWLEDGE INPUT
IR0 - IR7	INTERRUPT REQUEST INPUTS

CAUTION: Electronic devices are sensitive to electrostatic discharge. Proper I.C. handling procedures should be followed.

Copyright © Harris Corporation 1982

HARRIS

82C82

CMOS OCTAL LATCHING BUS DRIVER

JUNE 1982 **Advance Information**

Features

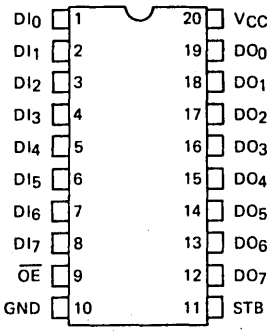
- FULL EIGHT BIT PARALLEL LATCHING BUFFER
- BIPOLAR 8282 COMPATIBLE
- THREE STATE NON-INVERTING OUTPUTS
- PROPAGATION DELAY – 35nsec MAX.
- A.C. CHARACTERISTICS GUARANTEED FOR:
  - ▶ FULL TEMPERATURE RANGE
  - ▶ 10% POWER SUPPLY TOLERANCE
  - ▶ C_L = 300pF
- SINGLE 5V POWER SUPPLY
- POWER SUPPLY CURRENT – 10μA MAX. STANDBY
- OUTPUTS GUARANTEED VALID AT V_{CC} = 2.0 VOLTS
- INDUSTRIAL AND MILITARY TEMPERATURE RANGES
- 20 PIN PACKAGE ON 0.3" CENTERS

Description

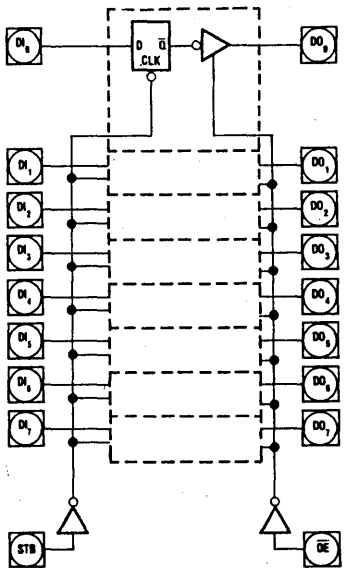
The Harris 82C82 is an octal latching buffer manufactured using a self-aligned silicon gate CMOS process. This circuit provides an eight bit parallel latch/buffer in a 20 pin package. The active high strobe (STB) input allows transparent transfer of data and latches data on the negative transition of this signal. The active low output enable ($\overline{OE}$) permits simple interface to state-of-the-art microprocessor systems.

Pinout

TOP VIEW



Functional Diagram



PIN NAMES

DI_0 - DI_7	Data Input Pins
DO_0 - DO_7	Data Output Pins
STB	Active High Strobe Input
$\overline{OE}$	Active Low Output Enable

Truth Table

STB	$\overline{OE}$	DI	DO
X	H	X	Hi-Z
H	L	L	L
H	L	H	H
↓	L	X	*

H = Logic One Hi-Z = High Impedance
L = Logic Zero ↓ = Negative Transition
X = Don't Care * = Latched to value of last data

CAUTION: Electronic devices are sensitive to electrostatic discharge. Proper I.C. handling procedures should be followed.

Copyright © Harris Corporation 1982

© IC MASTER 1983

HARRIS

82C84A

CMOS Clock Generator Driver

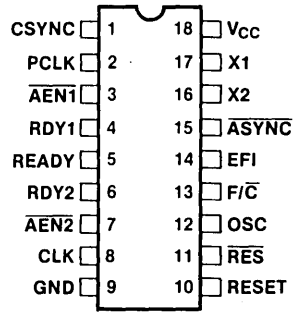
AUGUST 1982

Advance Information

Features

- GENERATES THE SYSTEM CLOCK FOR CMOS OR NMOS MICROPROCESSORS
- UP TO 25 MHZ OPERATION
- USES A PARALLEL MODE CRYSTAL CIRCUIT OR EXTERNAL FREQUENCY SOURCE
- PROVIDES READY SYNCHRONIZATION
- GENERATES SYSTEM RESET OUTPUT FROM SCHMITT TRIGGER INPUT
- CAPABLE OF CLOCK SYNCHRONIZATION WITH OTHER 82C84As
- TTL COMPATIBLE INPUTS/OUTPUTS
- VERY LOW POWER CONSUMPTION
- 18 PIN PACKAGE
- SINGLE +5V POWER SUPPLY
- INDUSTRIAL AND MILITARY TEMPERATURE RANGES AVAILABLE

Pinout



Description

The Harris 82C84A is a high performance CMOS clock generator-driver which is designed to service the requirements of both CMOS and NMOS microprocessors such as the 80C86, 80C88, 8086 and the 8088. The chip contains a crystal controlled oscillator, a divide-by-three counter and complete "Ready" synchronization and reset logic.

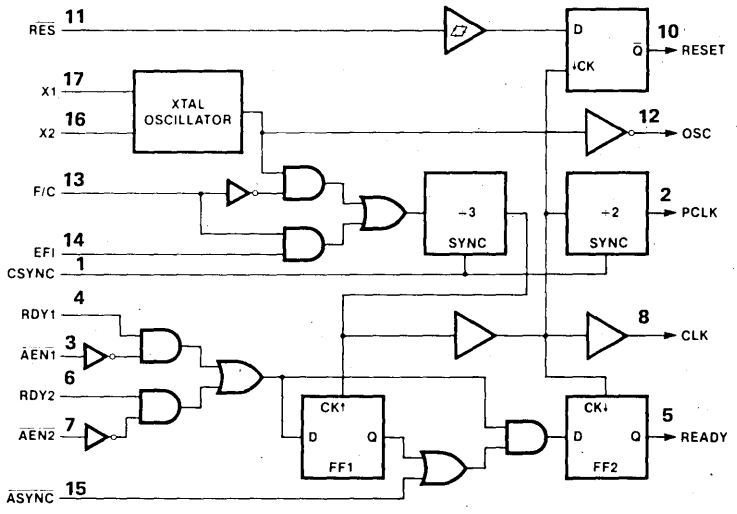
Static CMOS circuit design permits operation with an external frequency source from DC to 25MHz. Crystal controlled operation to 25MHz is guaranteed with the use of a parallel, fundamental mode crystal and two small load capacitors.

All inputs (except X1, X2 and $\overline{RES}$) are TTL compatible with a V_{IH} of 2.0 volts over the industrial temperature and voltage ranges.

Power consumption is a fraction of that of the equivalent bipolar circuits. This speed-power characteristic of CMOS permits the designer to custom tailor his system design with respect to power and/or speed requirements.

CONTROL PIN	LOGICAL 1	LOGICAL 0
F/$\overline{C}$	External Clock	Crystal Drive
$\overline{RES}$	Normal	Reset
RDY1 RDY2	Bus Ready	Bus not ready
$\overline{AEN1}$ $\overline{AEN2}$	Address Disabled	Address Enabled
ASYNC	2 Stage Ready Synchronization	1 Stage Ready Synchronization

Block Diagram



Copyright © Harris Corporation 1982

HARRIS

82C88

PRODUCT BRIEF

CMOS BUS CONTROLLER

Features

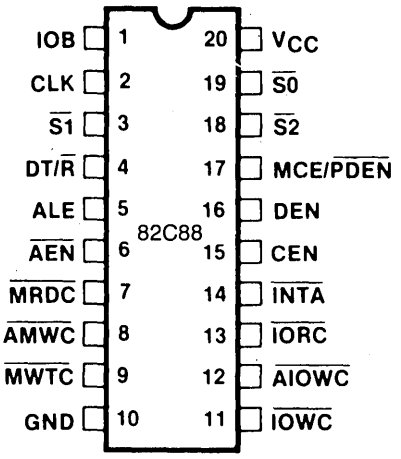
- PROVIDES ADVANCED COMMANDS FOR MULTI-MASTER BUSSES
- 3-STATE COMMAND OUTPUTS
- BIPOLAR DRIVE CAPABILITY
- FULLY TTL COMPATIBLE
- PIN COMPATIBLE WITH BIPOLAR 8288
- SCALED SAJI IV CMOS PROCESS
- SINGLE 5V POWER SUPPLY
- LOW STANDBY POWER
- INDUSTRIAL and MILITARY TEMPERATURE RANGES

Description

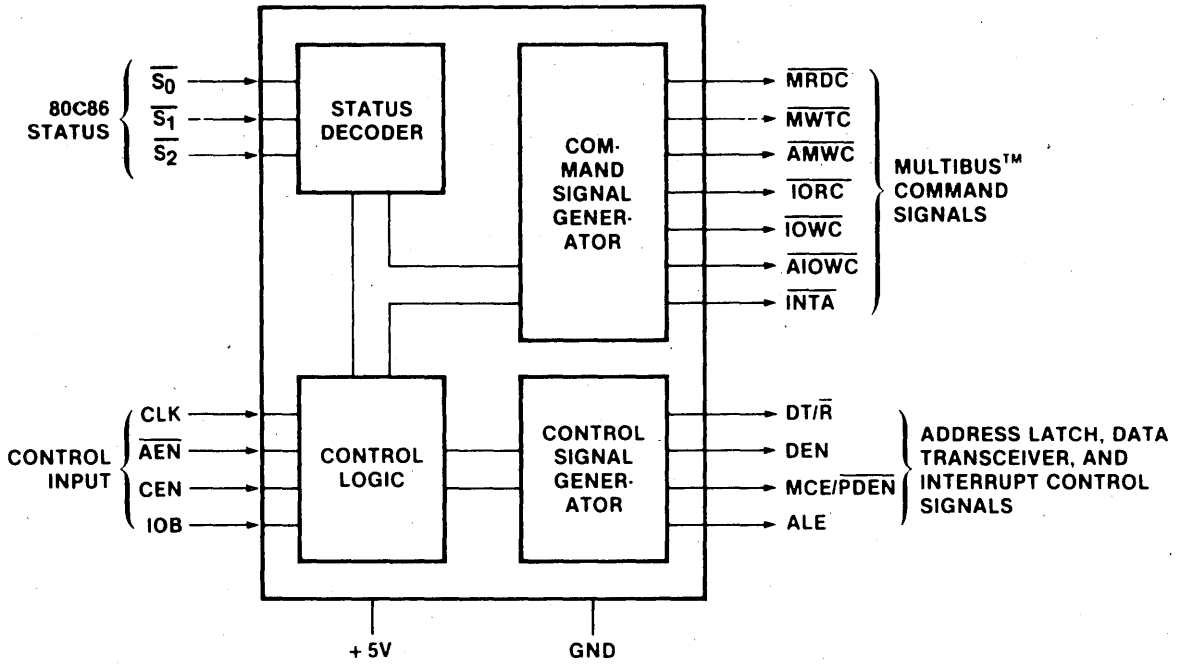
The Harris 82C88 is a high performance CMOS Bus Controller manufactured using a self-aligned silicon gate CMOS process (Scaled SAJI IV). The 82C88 provides the control and command timing signals for 80C86 and 8086/88 systems. The high output drive capability of the 82C88 eliminates the need for additional bus drivers. High speed and industry standard configuration make the 82C88 compatible with microprocessors such as the 80C86, 8086, and 8088.

Static CMOS circuit design insures low operating power. Harris's advanced SAJI process results in performance equal to or greater than existing equivalent products at a significant power savings.

Pinout



Functional Diagram



CAUTION: Electronic devices are sensitive to electrostatic discharge. Proper I.C. handling procedures should be followed.

Copyright © Harris Corporation 1982

© IC MASTER 1983

HD-6120

CMOS HIGH SPEED 12 BIT MICROPROCESSOR

Advance Information

Features

- Low power, 50 mw operating, 2 mw static
- Single Supply – 5v
- Operation from DC to 5.1 Mhz
- Industrial and Military temperature ranges
- On-chip crystal oscillator circuitry
- On-chip extended memory addressing – 32k main memory, 32k control panel
- Optimized micro-code minimizes the number of clock cycles required for all instructions
- Two on-chip stack pointers
- Simplified memory and I/O control signals for easy hardware interfacing
- Vectored interrupt capability
- Software is page relocatable

Description

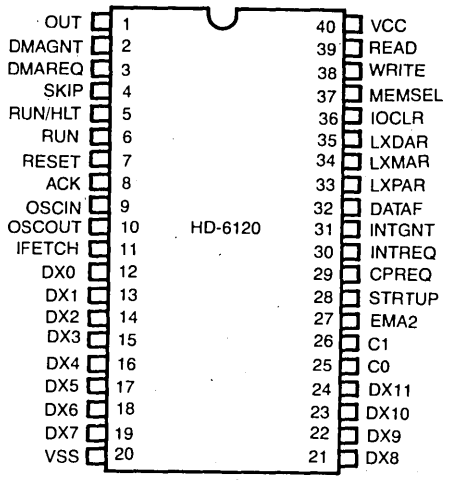
The HD-6120 is a general purpose high speed, CMOS 12 bit microprocessor. It is designed to recognize the instruction set of Digital Equipment Corporations PDP-8/E* minicomputer.

Many architectural, functional and processing enhancements have been designed into the 6120 such that it can provide much higher system performance than its predecessor, the 6100.

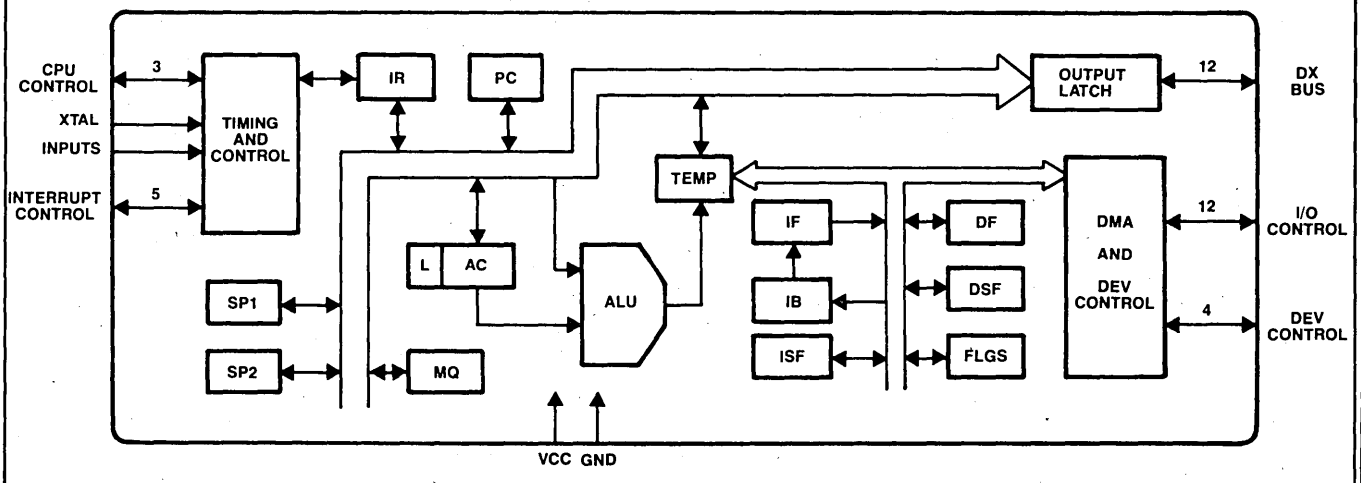
The 6120 is targeted toward the experienced PDP-8* or 6100 user. Twelve bit accuracy, rapid interrupt response, battery backup and low power (sealed enclosure) capability all equate to a processor ideally suited to real time control applications such as data acquisition, industrial control and harsh environment military systems.

* *TRADEMARK OF DIGITAL EQUIPMENT CORP.*

Pinout



Functional Diagrams



CAUTION: Electronic devices are sensitive to electrostatic discharge. Proper I.C. handling procedures should be followed.

Copyright © Harris Corporation 1982

© IC MASTER 1983

HARRIS

HD-6121

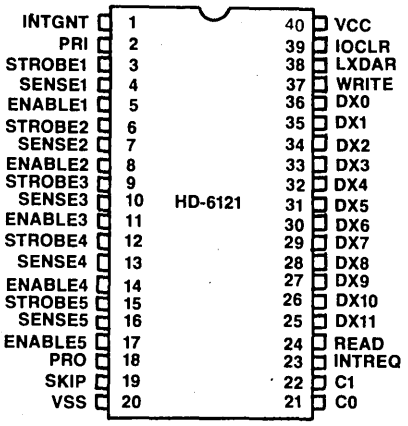
Advance Information

CMOS I/O CONTROLLER

Features

- Low power, Typ. < 2 mw
- Single Supply – 5v
- Industrial and Military temperature ranges
- 6120 compatible interface
- Controls any combination of five input or output ports with handshaking
- Eliminates gated Read and Write signals through the controller
- Conforms to DEC* conventions regarding device addressing and commands
- Independent programming of each device's address and data direction
- Complete interrupt and skip logic for each device including priority interrupt vectoring
- STROBE outputs are programmable high or low true
- SENSE inputs are programmable for level or edge sensitivity
- ENABLE outputs function as user programmable chip selects

Pinout



Description

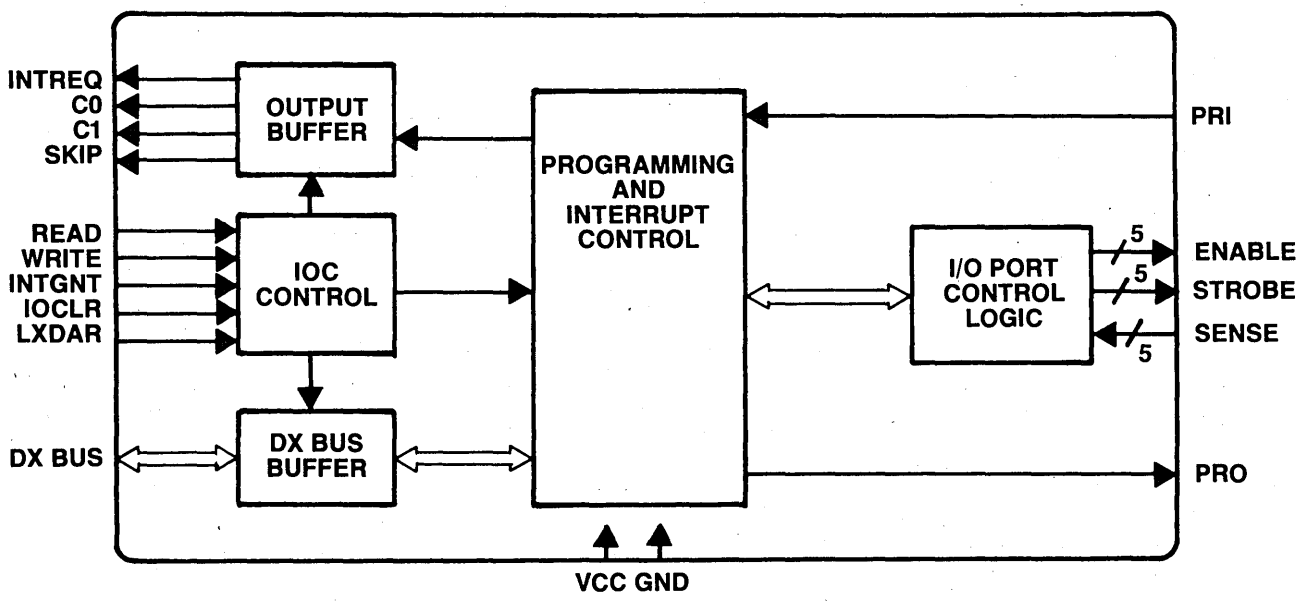
The HD-6121 Input/Output Controller (IOC) is a high performance, CMOS support circuit for the 6120 microprocessor. Fully programmable, this device offers independent control of any combination of five, 12 bit input or output ports.

Used in conjunction with the 6120 microprocessor, the 6121 provides user programmable chip select decoding, priority vectored interrupt control, software readable status and I/O port handshaking signals.

The Priority In (PRI) and Priority Out (PRO) control signals permit up to eleven 6121s to be used without any additional hardware. Industrial control and other I/O intensive systems can profit greatly from the highly hardware/software efficient capability provided by the 6120/6121 chip set.

* *TRADEMARK of Digital Equipment Corp.*

Functional Diagram



CAUTION: Electronic devices are sensitive to electrostatic discharge. Proper I.C. handling procedures should be followed.

Copyright © Harris Corporation 1982

© IC MASTER 1983

CMOS Bus Driver Family

HD-6431 CMOS HEX LATCHING BUS DRIVER

FEATURES

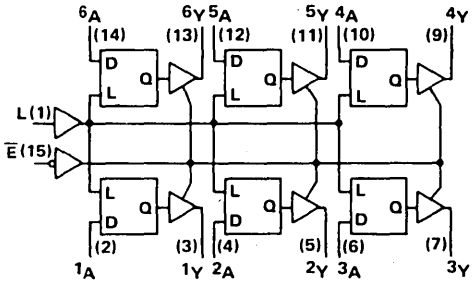
- SINGLE POWER SUPPLY
- HIGH NOISE IMMUNITY
- INDUSTRIAL AND MILITARY GRADES
- DRIVE CAPACITY 300pF
- SOURCE CURRENT 4mA
- SINK CURRENT 6mA
- PROPAGATION DELAY: 30nsec @ 5V

TRUTH TABLE

CONTROL INPUTS		DATA PORT STATUS	
$\overline{E}$	L	A	Y
H	L	X	HI-Z*
H	H	X	HI-Z
L	↓	X	*
L	H	L	L
L	H	H	H

* Data is latched to the value of the last input
X = Don't Care
HI-Z = High Impedance
↓ = Transition from High to Low Level

FUNCTIONAL DIAGRAM



HD-6432 CMOS HEX BI-DIRECTIONAL BUS DRIVER

FEATURES

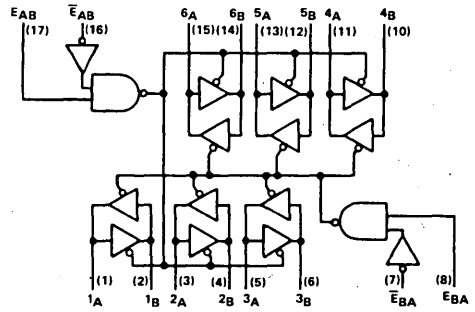
- SINGLE POWER SUPPLY
- HIGH NOISE IMMUNITY
- INDUSTRIAL AND MILITARY GRADES
- DRIVE CAPACITY . . 300pF
- SOURCE CURRENT 4mA
- SINK CURRENT 6mA
- PROPAGATION DELAY: 20nsec @ 5V

TRUTH TABLE

CONTROL INPUTS				DATA PORT STATUS	
E_{AB}	$\overline{E}_{AB}$	E_{BA}	$\overline{E}_{BA}$	A	B
L	X	H	L	O	I
X	H	H	L	O	I
H	L	X	H	I	O
H	L	L	X	I	O
L	X	L	X	ISOLATED	
X	H	X	H	ISOLATED	
L	X	X	H	ISOLATED	
X	H	L	X	ISOLATED	
H	L	H	L	NOT ALLOWED	

I = Input, O = Output, X = Don't Care

FUNCTIONAL DIAGRAM



HD-6433 CMOS QUAD BUS SEPARATOR/DRIVER

FEATURES

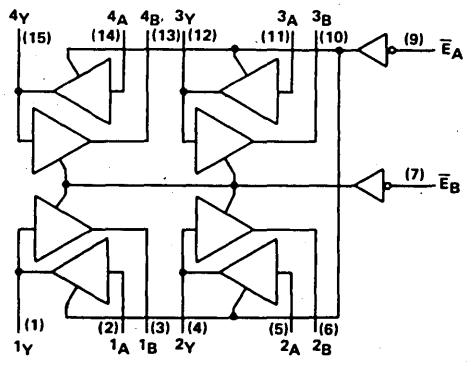
- SINGLE POWER SUPPLY
- HIGH NOISE IMMUNITY
- INDUSTRIAL AND MILITARY GRADES
- DRIVE CAPACITY 300pF
- SOURCE CURRENT 4mA
- SINK CURRENT 6mA
- PROPAGATION DELAY: 20nsec @ 5V

TRUTH TABLE

CONTROL INPUTS		FUNCTION		
$\overline{E}_A$	$\overline{E}_B$	A	B	Y
L	L	I	O	O
L	H	I	D	O
H	L	D	O	I
H	H	ISOLATED		

I = Input, O = Output,
D = Disconnected

FUNCTIONAL DIAGRAM



© IC MASTER 1983

HD-6434 CMOS OCTAL RESETTABLE LATCHED BUS DRIVER

FEATURES

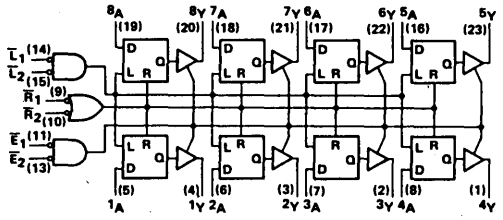
- SINGLE POWER SUPPLY
- HIGH NOISE IMMUNITY
- INDUSTRIAL AND MILITARY GRADES
- DRIVE CAPACITY 300pF
- SOURCE CURRENT 6mA
- SINK CURRENT 9mA
- PROPAGATION DELAY: 30nsec @ 5V

TRUTH TABLE

CONTROL INPUTS						DATA	
$\overline{R}_1$	$\overline{R}_2$	$\overline{E}_1$	$\overline{E}_2$	$\overline{L}_1$	$\overline{L}_2$	A	Y
X	X	H	X	X	X	X	HI-Z
X	X	X	H	X	X	X	HI-Z
L	X	L	L	X	X	X	L
X	L	L	L	X	X	X	L
H	H	L	L	L	L	L	L
H	H	L	L	L	L	H	H
H	H	L	L	↑	L	X	*
H	H	L	L	L	↑	X	*

X = Don't Care HI-Z = High Impedance
L = Low H = High
* Data is latched to the value of the last input
↑ = Transition from a Low to High level

FUNCTIONAL DIAGRAM



HD-6436 CMOS OCTAL BUS BUFFER/DRIVER

FEATURES

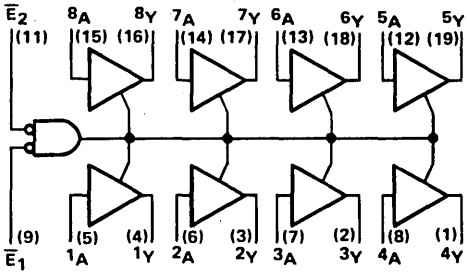
- SINGLE POWER SUPPLY
- HIGH NOISE IMMUNITY
- INDUSTRIAL AND MILITARY GRADES
- DRIVE CAPACITY 300pF
- SOURCE CURRENT 6mA
- SINK CURRENT 9mA
- PROPAGATION DELAY: 20nsec @ 5V

TRUTH TABLE

CONTROL		INPUT	OUTPUT
$\overline{E}_1$	$\overline{E}_2$	A	Y
L	L	L	L
L	L	H	H
L	H	X	HI-Z
H	L	X	HI-Z
H	H	X	HI-Z

L = Low, H = High X = Don't Care
HI-Z = High Impedance

FUNCTIONAL DIAGRAM



HD-6440 CMOS LATCHED 3 TO 8 LINE DECODER-DRIVER

FEATURES

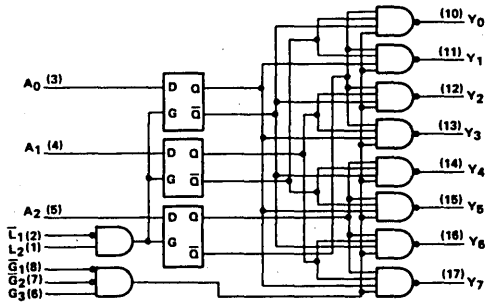
- HIGH SPEED DECODING FOR MEMORY ARRAYS
- SINGLE POWER SUPPLY
- HIGH NOISE IMMUNITY
- INDUSTRIAL AND MILITARY GRADES
- DRIVE CAPACITY 200pF
- SOURCE CURRENT . . . . 2 mA
- SINK CURRENT . . . . . 2.4 mA
- PROPAGATION DELAY . 65nsec @ 5V

TRUTH TABLE

INPUTS				OUTPUTS								
ENABLE			ADDRESS									FUNCTION
$\overline{G}_1\overline{G}_2G_3$		$\overline{L}_1L_2$	$A_2A_1A_0$	Y_0	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7	
X	X	L	X X X	H	H	H	H	H	H	H	H	DISABLE
X	H	X	X X X	H	H	H	H	H	H	H	H	
H	X	X	X X X	H	H	H	H	H	H	H	H	
L	L	H	L H L	L	H	H	H	H	H	H	H	DECODE
L	L	H	L H L	H	L	H	H	H	H	H	H	
L	L	H	L H L	H	H	L	H	H	H	H	H	
L	L	H	L H L	H	H	H	L	H	H	H	H	
L	L	H	L H L	H	H	H	H	L	H	H	H	
L	L	H	L H L	H	H	H	H	H	L	H	H	
L	L	H	L H L	H	H	H	H	H	H	L	H	
L	L	H	L H L	H	H	H	H	H	H	H	L	
L	L	H	X X X	Y_0	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7	LATCHED
L	L	H	H X	X X X	Y_0	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7

L = Low, H = High, X = Don't Care
Y_n Data is latched to the value of the last input

FUNCTIONAL DIAGRAM



HD-6495 CMOS HEX BUS DRIVER

FEATURES

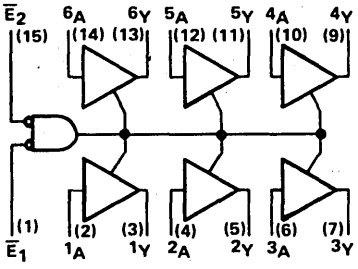
- SINGLE POWER SUPPLY
- HIGH NOISE IMMUNITY
- INDUSTRIAL AND MILITARY GRADES
- DRIVE CAPACITY 300pF
- SOURCE CURRENT 4mA
- SINK CURRENT 6mA
- PROPAGATION DELAY: 20nsec @ 5V

TRUTH TABLE

CONTROL		INPUT	OUTPUT
$\overline{E}_1$	$\overline{E}_2$	A	Y
L	L	L	L
L	L	H	H
L	H	X	HI-Z
H	L	X	HI-Z
H	H	X	HI-Z

X = Don't Care HI-Z = High Impedance

FUNCTIONAL DIAGRAM



© IC MASTER 1983

Hitachi 8 and 16 Bit Microcomputers

Family Type	Type No.	Function	Package*			
			Pin No.	C	P	F
8-bit Single-chip	HD6801S0	Microcomputer Unit	40	●	●	
	HD6801S5		40		●	
	HD6801V0		40		●	
	HD6801V5		40		●	
	HD6803	Micro Processing Unit	40	●	●	
	HD6803-1		40		●	
	HD6805S1	Microcomputer Unit	28		●	
	HD6805U1		40		●	
	HD6805V1		40		●	
	HD6805W0		40		●	
	HD6805X0		64		●	
	HD6301V0		40		●	
	HD63A01V0		40		●	
	HD63B01V0		40		●	
	HD6303	Micro Processing Unit	40		●	
	HD63A03		40		●	
	HD63B03		40		●	
	HD6333		40		●	
	HD63A33		40		●	
	HD63B33		40		●	
	HD63L05	Microcomputer Unit	60			●
	HD68P01S0		40**	●		
	HD68P01V05		40**	●		
	HD68P01V07		40**	●		
	HD68P05V05		40**	●		
	HD68P05V07		40**	●		
8-bit Multi-chip	HD6800	Micro Processing Unit	40	●	●	
	HD68A00		40	●	●	
	HD68B00		40	●	●	
	HD6802	Microprocessor with Clock and RAM	40	●	●	
	HD6802W		40		●	
	HD6809	Micro Processing Unit	40	●	●	
	HD68A09		40	●	●	
	HD68B09		40	●	●	
	HD6809E		40	●	●	
	HD68A09E		40	●	●	
	HD68B09E		40	●	●	
	HD6821	Peripheral Interface Adapter	40	●		
	HD68A21		40	●	●	
	HD68B21		40	●	●	
	HD6840	Programmable Timer Module	28	●	●	
	HD68A40		28	●	●	
	HD68B40		28	●	●	
	HD6843	Floppy Disk Controller	40	●	●	
	HD68A43		40	●	●	
	HD6844	Direct Memory Access Controller	40	●	●	
	HD68A44		40	●	●	
	HD68B44		40	●	●	
	HD6845S	CRT Controller	40	●	●	
	HD68A45S		40	●	●	
	HD68B45S		40	●	●	
	HD6846	Combination ROM I/O Timer	40	●	●	
	HD6850	Asynchronous Communications Interface Adapter	24	●	●	
	HD68A50		24	●	●	
	HD6852	Synchronous Serial Data Adapter	24	●	●	
	HD68A52		24	●	●	
	HD46508	Analog Data Acquisition Unit	40		●	
	HD46508-1		40		●	
	HD46508A		40		●	
	HD46508A-1		40		●	
	HD146818	Real Time Clock Plus RAM	24		●	
16-bit Multi-chip	HD68000-4	Micro Processing Unit	64	●		
	HD68000-6		64	●		
	HD68000-8		64	●		
	HD68000-10		64	●		
	HD68450	Direct Memory Access Controller	64	●		

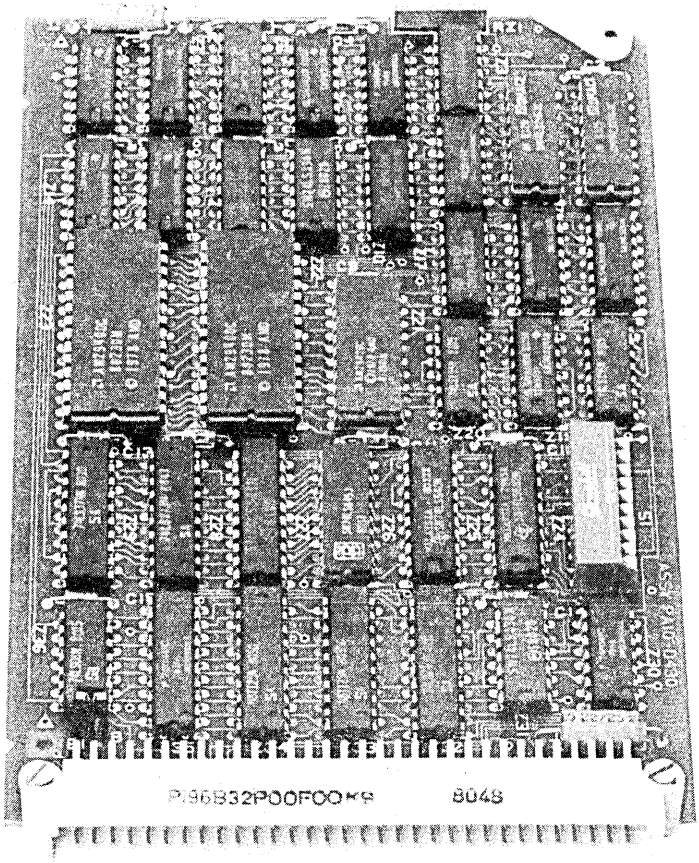
*The package codes of C, P, and F are applied to the package materials as follows.
C: Side-brazed Ceramic DIP, P: Plastic DIP, F: Flat Package.
**EPROM on the package.

HITACHI

Hitachi America Ltd., Semiconductor and IC Sales and Service Division
1800 Bering Drive, San Jose, CA 95112 (408) 292-6404

© IC MASTER 1983

For Key Data On Every IC On This Board, The Place To Look Is...



This Rockwell RM65-5104(E) card is used to transfer data between memory and peripheral circuits.

Device No.	Description
74LS08	Quad 2-Input AND Gate
74F244	Octal Buffer/Line Driver
74LS240	Octal Bus Driver (Schmitt Trigger)
74LS136	Quad 2-Input Exclusive-OR Gate
74F04	Hex Inverter
74LS374	Octal D-Type Edge-Triggered Flip-Flop, 3-State
74LS273	Octal Edge-Triggered Flip-Flop with Clear
74LS541	Octal Bus Driver, Noninverting
74LS645	Octal Bus Transceiver
74LS540	Octal Bus Driver, Inverting

Device No.	Description
74LS682	8-Bit Magnitude Comparitor
AM2940	DMA Address Generator
AM2942	Programmable Timer
74LS155	Decoder/Demultiplexer
74LS148	Priority Encoder
74LS74	Dual D-Type Edge-Triggered Flip-Flop
74LS32	Quadruple 2-Input OR Gate
74LS112	Dual J-K Flip-Flop
74LS126	Quadruple Bus Buffer Gate
74LS00	Quadruple 2-Input NAND Gate
PAL12H6	Field Programmable Array

Representative list of ICs on Rockwell Direct Memory Access Card.
Key specifications for all of these ICs can be found in IC MASTER.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

iAPX 86/10
16-BIT HMOS MICROPROCESSOR

8086/8086-2/8086-1

- Direct Addressing Capability to 1 MByte of Memory
- Architecture Designed for Powerful Assembly Language and Efficient High Level Languages.
- 14 Word, by 16-Bit Register Set with Symmetrical Operations
- 24 Operand Addressing Modes
- Bit, Byte, Word, and Block Operations
- 8 and 16-Bit Signed and Unsigned Arithmetic in Binary or Decimal Including Multiply and Divide
- Range of Clock Rates:
  5 MHz for 8086,
  8 MHz for 8086-2,
  10 MHz for 8086-1
- MULTIBUS® System Compatible Interface

ORDER NUMBER: 205025-001

iAPX 88/10
8-BIT HMOS MICROPROCESSOR
8088/8088-2

- 8-Bit Data Bus Interface
- 16-Bit Internal Architecture
- Direct Addressing Capability to 1 Mbyte of Memory
- Direct Software Compatibility with iAPX 86/10 (8086 CPU)
- 14-Word by 16-Bit Register Set with Symmetrical Operations
- 24 Operand Addressing Modes
- Byte, Word, and Block Operations
- 8-Bit and 16-Bit Signed and Unsigned Arithmetic in Binary or Decimal, Including Multiply and Divide
- Compatible with 8155-2, 8755A-2 and 8185-2 Multiplexed Peripherals
- Two Clock Rates:
  5 MHz for 8088
  8 MHz for 8088-2

ORDER NUMBER: 205880-001

iAPX 186
HIGH-INTEGRATION 16-BIT MICROPROCESSOR

- Integrated Feature Set
  - —Enhanced 8086-2 CPU
  - —Clock Generator
  - —2 Independent, High-Speed DMA Channels
  - —Programmable Interrupt Controller
  - —3 Programmable 16-bit Timers
  - —Programmable Memory and Peripheral Chip-Select Logic
  - —Programmable Wait State Generator
  - —Local Bus Controller
- High-Performance 8 MHz Processor
  - —2 Times the Performance of the Standard iAPX 86
  - —4 MByte/Sec Bus Bandwidth Interface
- Direct Addressing Capability to 1 MByte of Memory
- Completely Object Code Compatible with All Existing iAPX 86, 88 Software
  - —10 New Instruction Types
- Compatible with 8282/83/86/87, 8288, 8289 Bus Support Components
- Complete System Development Support
  - —Development Software: Assembler, PL/M, Pascal, Fortran, and System Utilities
  - —In-Circuit-Emulator (ICE™-186)
  - —iRMX™ 86, 88 Compatible (80130 OSF)
- Optional Numeric Processor Extension
  - —iAPX 186/20 High-Performance 80-bit Numeric Data Processor

ORDER NUMBER: 210451-001

© IC MASTER 1983

iAPX 286/10
HIGH PERFORMANCE MICROPROCESSOR WITH MEMORY MANAGEMENT AND PROTECTION

- High Performance 8 and 10 MHz Processor (Up to six times iAPX 86)
- Large Address Space:
  —16 Megabytes Physical
  —1 Gigabyte Virtual per Task
- Integrated Memory Management, Four-Level Memory Protection and Support for Virtual Memory and Operating Systems
- Two iAPX 86 Upward Compatible Operating Modes:
  —iAPX 86 Real Address Mode
  —Protected Virtual Address Mode
- Optional Processor Extension:
  —iAPX 286/20 High Performance 80-bit Numeric Data Processor
- Complete System Development Support:
  —Development Software: Assembler, PL/M, Pascal, FORTRAN, and System Utilities
  —In-Circuit-Emulator (ICE™-286)
- High Bandwidth Bus Interface (8 or 10 Megabyte/Sec)
- Available in EXPRESS:
  —Standard Temperature Range

ORDER NUMBER: 210253-001

iAPX 188
HIGH INTEGRATION 8-BIT MICROPROCESSOR

- Integrated Feature Set
  —Enhanced 8 MHz 8088-2 CPU
  —Clock Generator
  —2 Independent, High-Speed DMA Channels
  —Programmable Interrupt Controller
  —3 Programmable 16-bit Timers
  —Programmable Memory and Peripheral Chip-Select Logic
  —Programmable Wait State Generator
  —Local Bus Controller
- 8-Bit Data Bus Interface; 16-Bit Internal Architecture
- Completely Object Code Compatible with All Existing iAPX 86, 88 Software
  —10 New Instruction Types
- Direct Addressing Capability to 1 MByte of Memory
- Compatible with 8282/83/86/87, 8288, 8289 Bus Support Components
- Complete System Development Support
- Optional Numeric Processor Extension
  —iAPX 188/20 High-Performance 80-Bit Numeric Data Processor

ORDER NUMBER:210451-001

8 AND 16 BIT
COPROCESSORS

iAPX 86/20, iAPX 88/20
NUMERIC DATA PROCESSOR

- High Performance 2-Chip Numeric Data Processor
- Standard iAPX 86/10, 88/10 Instruction Set Plus Arithmetic, Trigonometric, Exponential, and Logarithmic Instructions For All Data Types
- All 24 iAPX 86/10, 88/10 Addressing Modes Available
- Conforms To Proposed IEEE Floating Point Standard
- Support 8 Data Types: 8-, 16-, 32-, 64-Bit Integers, 32-, 64-, 80-Bit Floating Point, and 18-Digit BCD Operands
- 8x80-Bit Individually Addressable Register Stack plus 14 General Purpose Registers
- 7 Built-in Exception Handling Functions
- MULTIBUS® System Compatible Interface

ORDER NUMBER: 205835-001

© IC MASTER 1983

iAPX 86/30
iAPX 88/30
OPERATING SYSTEM PROCESSORS

80130-3

- High-Performance 2-Chip Data Processors Containing Operating System Primitives
- Standard iAPX 86/10, 88/10 Instruction Set Plus Task Management, Interrupt Management, Message Passing, Synchronization and Memory Allocation Primitives
- Fully Extendable To and Compatible With iRMX™ 86
- Supports Five Operating System Data Types: Jobs, Tasks, Segments, Mailboxes, Regions
- 35 Operating System Primitives
- Built-In Operating System Timers and Interrupt Control Logic Expandable From 8 to 57 Interrupts
- 8086/8087/8088 Compatible At Up To 8 MHz Without Wait States
- MULTIBUS® System Compatible Interface

ORDER NUMBER: 210216-001

iAPX 86/50, 88/50, 186/50
CP/M-86* OPERATING SYSTEM PROCESSORS

(80150-2)

- High-Performance Two-Chip Data Processors Containing the Complete CP/M-86 Operating System
- Standard On-Chip BIOS (Basic Input/Output System) Contains Drivers for 8272A, 8275, 8274, 8255A, 8251A, 8237A
- BIOS Extensible with User-Supplied Peripheral Drivers
- User Intervention Points Allow Addition of New System Commands
- Memory Disk Makes Possible Diskless CP/M-86 Systems
- No License or Serialization Required
- Built-in Operating System Timers and Interrupt Controller
- 8086/8087/8088/80186 Compatible at Up to 8 MHz Without Wait States

*CP/M is a registered trademark of Digital Research

ORDER NUMBER: 210705-001

8089
8 & 16-BIT HMOS I/O PROCESSOR

- High Speed DMA Capabilities Including I/O to Memory, Memory to I/O, Memory to Memory, and I/O to I/O
- iAPX 86, 88 Compatible: Removes I/O Overhead from CPU in iAPX 86/11 or 88/11 Configuration
- Allows Mixed Interface of 8- & 16-Bit Peripherals, to 8- & 16-Bit Processor Busses
- 1 Mbyte Addressability
- Memory Based Communication with CPU
- Supports LOCAL or REMOTE I/O Processing
- Flexible, Intelligent DMA Functions Including Translation, Search, Word Assembly/Disassembly
- MULTIBUS® Compatible System Interface

ORDER NUMBER: 205965-001

© IC MASTER 1983

80287 80-Bit HMOS NUMERIC PROCESSOR EXTENSION

- Full Internal 80-Bit Architecture for High Performance
- Implements Proposed IEEE Floating Point Standard
- Total Numeric Support for iAPX 286/20 Systems
- Expands iAPX 286/10 Datatypes to Include 32-, 64-, 80-Bit Floating Point, and 18-Digit BCD Operands
- All iAPX 286/10 Addressing Modes and Protection Available
- Directly Extends iAPX 286/10 Instruction Set to Trigonometric, Logarithmic, Exponential and Arithmetic Instructions for All Datatypes
- 8x80-Bit, Individually Addressable, Numeric Register Stack
- Built-in Exception Handling Functions

ORDER NUMBER: 210704-001

ADVANCED PERIPHERAL CONTROLLERS

82586 LOCAL AREA NETWORK COMMUNICATIONS CONTROLLER

- Fully Implements the Ethernet* Specification
- Serial Transmission up to 10M Bits/Sec
- User Configurable
  - —From 1 to 6 Bytes of Address Generation/Checking
  - —16- or 32-Bit CRC Generation/Checking
  - —Prioritization of Frames
  - —Variable Preamble Length
  - —Serial Transmission from 500 KHz up to 10M Bits/Sec
  - —8- or 16-Bit Data Bus
- On-Chip Processor Executes Command Lists and Controls All Transmission and Reception
- On-Chip DMA for Efficient, High-Speed Transfer of Data, Status and Commands
- Complete Set of Diagnostics for Reliable Network Operation
- Fully Implements the CSMA/CD Access Method Including Retries and Random Backoff (Wait) Time

*Ethernet is a registered trademark of Xerox Corp.

ORDER NUMBER: 210783-001

82720 GRAPHICS DISPLAY CONTROLLER

- High-Performance Graphics for Siggraph Core-, N.A.P.L.P.S.- and ANSI VDI-Compatible or Custom Systems
- Displays Low-to-High Resolution Images
- Draws Characters, Points, Lines, Arcs and Rectangles
- Supports Monochrome, Greyscale or Color Displays
- Zooms, Pans and Windows Through a 1/2-Mbyte Display Memory
- Extremely Flexible Programmable Screen Display, Blanking and Sync Formats
- Compatible with Intel's MCS®-51 and iAPX 88/86/186 Microprocessor Families
- High-Level Commands Off Load the Master Processor from Bit Map Loading and Screen Refresh Tasks
- Supports Graphics, Character, and Mixed Display Modes

ORDER NUMBER: 210655-001

© IC MASTER 1983

MOTOROLA
SEMICONDUCTORS
3501 ED BLUESTEIN BLVD., AUSTIN, TEXAS 78721

8-Bit MPUs
8-Bit MCUs
8-Bit Peripherals

THE M6800 FAMILY

The MC6800 microprocessor was the first MPU of the M6800 Family and still remains a highly cost-effective processor for a great many process-control and data-communications applications. Seventy-two powerful instructions and six different addressing modes give it unexcelled capability, and a full range of compatible peripheral chips offer the widest possible lattitude in system implementation. After years of field experience, the MC6800 has earned an enviable reputation as one of the easiest-to-use processors available.

Moreover, to tailor the system to your specific needs at the lowest cost, the MC6800 (and its peripherals) is available in three different packages, two different temperature ranges and three speed ranges.

The table to the right lists devices in the M6800 Family. The following microprocessor and microcomputer families are derivations and enhancements of the MC6800 architecture to provide easy migration within the M6800 Family as processing-power requirements change.

Device	Function
MC6800	MPU
MC6802	MPU (with Clock, RAM)
MC6808	MPU (with Clock)
MCM6810	128 x 8 Static RAM
MC6821	Peripheral Interface Adapter
MC6822	Industrial Interface Adapter
MC6828*	Priority Interrupt Controller
MC6829	Memory Management Unit
MC6835	CRT Controller with ROM
MC6839	Floating Point ROM (IEEE Standard Draft 6.0)
MC6840	Programmable Timer
MC6843	Floppy-Disk Controller
MC6844	Direct Memory Access Controller
MC6845	CRT Controller
MC6846	ROM-I/O-Timer
MC6847, Y	Video Display Generator
MC6850	Asynchronous Interface Adapter
MC6852	Synchronous Serial Data Adapter
MC6854	Advanced Data Link Controller
MC6859	Data Security Device
MC6860**	Digital Modem
MC6862**	Digital Modulation
MC68488	General-Purpose Interface Adapter

* Motorola Digital Bipolar
** Motorola Logic and Special Functions

THE M6801 FAMILY PROCESSORS: HIGH-PERFORMANCE MCUs

Frequency				Memory
1 MHz	1.25 MHz	1.5 MHz	2 MHz	
MC6801	MC6801-1	MC68A01	MC68B01	2048 ROM, 128 Bytes RAM, Expansion Bus
MC68701	MC68701-1	–	–	2048 EPROM, 128 Bytes RAM, Expansion Bus
MC6803	MC6803-1	MC68A03	MC68B03	No ROM, 128 Bytes RAM, Expansion Bus
MC6803E	MC6803E-1	–	–	No ROM, 128 Bytes RAM, External Clock, Expansion Bus
MC6801U4	MC6801U4-1	–	–	4096 ROM, 192 Bytes RAM, Expansion Bus
MC68701U4	MC68701U4-1	–	–	4096 EPROM, 192 Bytes RAM, Expansion Bus
MC6803U4	MC6803U4-1	–	–	No ROM, 192 Bytes RAM, Expansion Bus
MC68120	MC68120-1	–	–	2048 ROM, 128 Bytes Dual-Port RAM, Expansion Bus
MC68121	MC68121-1	–	–	No ROM, 128 Bytes Dual-Port RAM, Expansion Bus

THE HMOS M6805 FAMILY PROCESSORS: MEDIUM-PERFORMANCE MCUs

Device	No. of	Memory (Bytes)			I/O Lines	Special
	Pins	ROM	EPROM	RAM		Features
MC6804P2	28	1024	–	32	20 Bidirectional	Self-Check, 64 Bytes Data ROM
MC6805P2	28	1100	–	64	20 Programmable Bidirectional	Self-Check
MC6805P4	28	1100	–	112	20 Programmable Bidirectional	Self-Check, Standby RAM
MC6805R2	40	2048	–	64	2 to 5 Inputs, 24 Programmable Bidirectional	1 to 4 Channel 8-Bit A/D, Self Check
MC6805T2	28	2508	–	64	2 Special Function, 19 Programmable Bidirectional	PLL, Self-Check
MC6805U2	40	2048	–	64	8 Inputs, 24 Programmable Bidirectional	Self-Check
MC68705P3	28	–	1804	112	20 Programmable Bidirectional	Self-Programming Bootstrap
MC6805P6	28	1804	–	64	20 Programmable Bidirectional	Self-Check
MC68705R3	40	–	3776	112	2 to 5 Inputs, 24 Programmable Bidirectional	1 to 4 Channel 8-Bit A/D, Self-Programming Bootstrap
MC68705U3	40	–	3776	112	8 Inputs, 24 Programmable Bidirectional	Self-Programming Bootstrap
MC6805U3	40	3776	–	112	8 Inputs, 24 Programmable Bidirectional	Self-Check
MC6805R3	40	3776	–	112	2 to 5 Inputs, 24 Programmable Bidirectional	1 to 4 Channel 8-Bit A/D, Self Check

© IC MASTER 1983

THE CMOS M146805 FAMILY PROCESSORS: MEDIUM-PERFORMANCE MCUs

Device	No. of Pins	Memory (Bytes)			I/O Lines	Special Features
		ROM	RAM	EPROM		
MC146805E2	40	–	112	–	16 Programmable Bidirectional	External Bus
MC146805F2	28	1089	64	–	16 Programmable Bidirectional	Self-Check
MC146805G2	40	2106	112	–	32 Programmable Bidirectional	Self-Check
MC1468705G2	40	–	–	2106	32 Programmable Bidirectional	Boot-Strap

SPECIAL PERIPHERALS

Device	Function
MC146818	CMOS Real-Time Clock
MC146823	CMOS Peripheral Interface Adapter (Similar to MC6821)

THE M6809 FAMILY PROCESSORS: HIGH-PERFORMANCE MPUs

PROCESSORS

Device	Features
MC6809	On-Chip Oscillator
MC6809E	External Clocking for Synchronization of Multiprocessor Systems

MPUs/EXPANDABLE MCUs SUPPORTED BY ALL M6800-FAMILY PERIPHERALS

MC6800
MC6802
MC6808
MC6809
MC6809E
MC6801
MC6801U4
MC68701
MC68701U4
MC6803
MC6803E
MC6803U4
MC68120
MC68121
MC146805E2

PRE-PROGRAMMED ROM-BASED MICROCOMPUTERS

Device	Source	Function
MC6801L1	MC6801	LILbug Monitor
MC6801G1	MC6801	LILbug Monitor
MC6805P2P2	MC6805P2	Monitor and Keyboard Encoder
MC6805P2P3	MC6805P2	Monitor and Game Plus
MC6805P2P4	MC6805P2	Monitor and Game (XTAL Osc)
MC6805R2L1	MC6805R2	Monitor and DVM
MC6805U2P2	MC6805U2	Monitor and Keyboard Encoder
MC6805P4P1*	MC6805P4	Mini-Monitor and Custom
MC6805T2P1	MC6805T2	Monitor and TV-Demo
MC6805T2P2	MC6805T2	Monitor and Ham Radio
MC146805G2P1	MC146805G2	Monitor and Bicycle Component
MC146805F2P1	MC146805F2	Monitor and Keyless Entry Demo.
MC68120L1	MC68120	UNICORN Monitor
MC6801U4L1	MC6801U4	UNICORN Monitor
MC6801U4G1	MC6801U4	UNICORN Monitor

*Mini-monitor has only two commands: execute and memory examine/charge.

PART MARKING

SPEED DESIGNATION – The following letters identify the speed of the corresponding device.

MC68XX	1.0 MHz
MC68AXX	1.5 MHz
MC68BXX	2.0 MHz

In cases where a –1 follows the package designator, the device operates at 1.25 MHz (example: MC68XXL-1).

PACKAGE DESIGNATION – The part is marked with the following descriptors to identify the package type.

MC68XXP	Plastic
G	Plastic
L	Ceramic
S	Cerdip
Z	Leadless Chip Carrier

For further information on higher-speed extended-temperature devices, please contact your local Motorola Sales Office.

BETTER LEVEL – The part is marked with a suffix letter(s) as shown to indicate the level of testing that the part received.

MC68XX	CP	S
Part Identification	Standard Package Suffix C = Ext. Temp. (–40°C to +85°C)	"BETTER" Processing Level I = Suffix S Level II = Suffix D Level III = Suffix DS

© IC MASTER 1983

THE "BETTER" PROGRAM

Motorola standard commercial integrated circuits are manufactured under stringent in-process controls and quality inspections combined with the industry's finest outgoing quality inspections. The "BETTER" program offers three levels of extra processing, each tailored to meet different user needs at nominal costs.

The program is designed to:

- Eliminate Incoming Electrical Inspection
- Eliminate Need for Independent Test Labs and Associated Extra Time and Costs
- Reduce Field Failures
- Reduce Service Calls
- Reduce Equipment Downtime
- Reduce Board and System Rework
- Reduce Infant Mortality
- Save Time and Money
- Increase End-Customer Satisfaction

BETTER PROCESSING — STANDARD PRODUCT PLUS:

Level I (Suffix S)

- 100% temperature cycling per MIL-STD-883B, Method 1010, ten cycles from −25°C to +150°C.
- 100% high temperature functional test at t_{max}.

Level II (Suffix D)

- 100% burn-in to MIL-STD-883B test conditions equivalent to 160 hours at +125°C.
- 100% post burn-in DC parametric test at 25°C.

Level III (Suffix DS)

- Combination of Levels I and II above.

Test	Condition	AQL Level I	AQL Level II	AQL Level III
High Temperature Functional	$T_A = t_{max}$	0.15	0.15*	0.10
DC Parametric	$T_A = 25°C$	0.28	0.28	0.28
AC Parametric	$T_A = 25°C$	0.65	0.65	0.65
External Visual and Mechanical	Major Minor	0.11 2.50	0.11 2.50	0.11 2.50
Hermeticity (Not applicable to plastic package)	Gross	0.46	0.46	0.46

t_{max} = Maximum Operating Temperature of Device Under Test
*25°C

NOTES: 1. Major Defects — Affects Form, Fit, or Function
Minor Defects — Cosmetic
2. General Inspection Level II

MIL-STD-883B SCREENED MICROPROCESSORS AND PERIPHERALS

Basic Numbering Parameters — Example: MC68XX YYYY

MC68XX Y Y Y Y

- Motorola Device Type
- MIL-STD-883B Class
  B = Processed per 883B method 5004, QCI per 5005
- Case Outline
  J = 24 pin
  Q = 40 pin
  T = 28 pin
- Operating Temperature Range
  A = −55°C to +125°C
  E = −40°C to +85°C
  S = 0°C to +70°C
- Lead Finish
  C = Gold Plate

Hi-Rel Offering			
Source Device	0°C to +70°C	−40°C to +85°C	−55°C to +125°C
MC6800	MC68B00BQCS	MC68A00BQCE	MC6800BQCA
*MC6801	MC68B01BQCS	MC68A01BQCE	No
MC68701	MC68701BQCS	No	No
MC6802	MC68B02BQCS	MC68A02BQCE	MC6802BQCA
MC6803	MC68B03BQCS	MC68A03BQCE	No
MC6809	MC68B09BQCS	MC68A09BQCE	MC6809BQCA
MC6809E	MC68B09EBQCS	MC68A09EBQCE	MC6809EBQCA
MCM6810	MCM68B10BJCS	MCM68A10BJCE	MCM6810BJCA
MC6821	MC68B21BQCS	MC68A21BQCE	MC6821BQCA
MC6840	MC68B40BTCS	MC68A40BTCE	MC6840BTCA
MC6845	MC68B45BQCS	MC68A45BQCE	MC6845BQCA
MC6850	MC68B50BJCS	MC68A50BJCE	MC6850BJCA
MC6852	MC68B52BJCS	MC68A52BJCE	MC6852BJCA
MC6854	MC68B54BTCS	MC68A54BTCE	MC6854BTCA
MC68488	MC68B488BQCS	MC68A488BQCE	MC68488BQCA
*MC6805P2	MC6805P2BTCE	MC6805P2BTCE	No
MC146805E2	MC146805E2BQCE	MC146805E2BQCE	No
*MC146805G2	MC146805G2BQCE	MC146805G2BQCE	No

*ROM base parts (source only)

© IC MASTER 1983

MOTOROLA
SEMICONDUCTORS
3501 ED BLUESTEIN BLVD., AUSTIN, TEXAS 78721

16-Bit Microprocessor Family

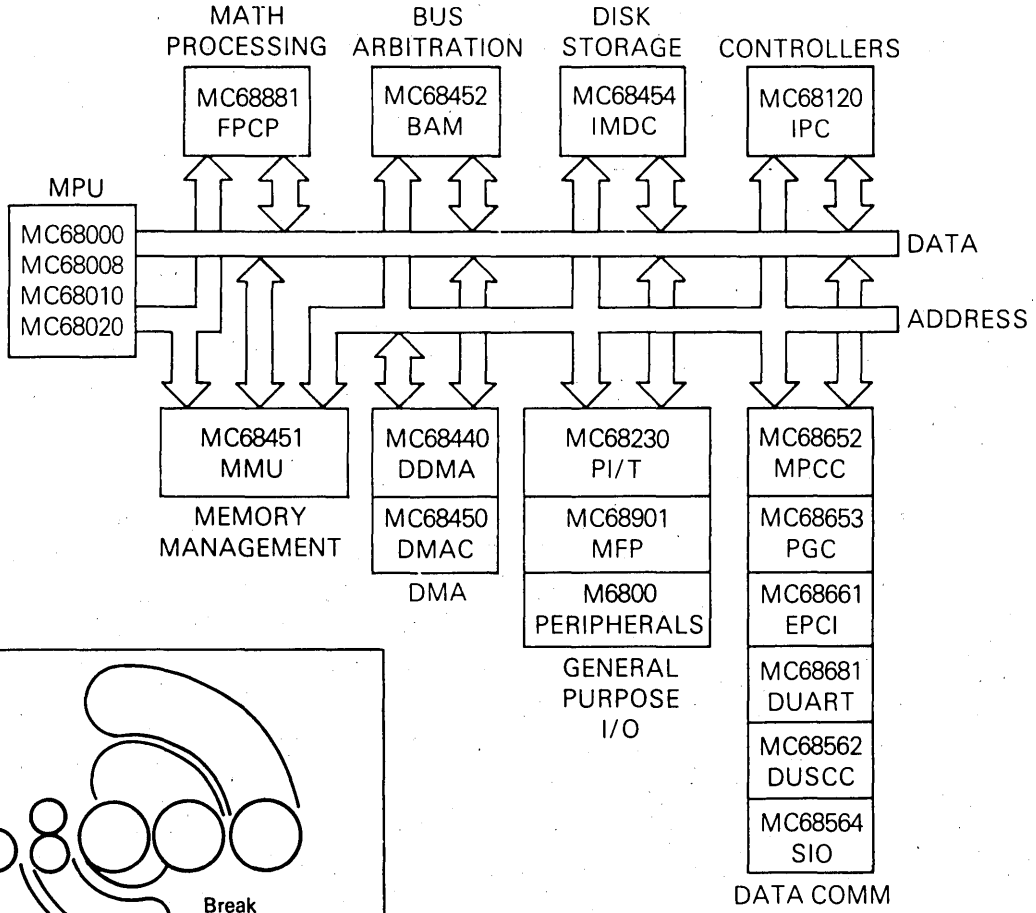
THE M68000 FAMILY — AN INVESTMENT IN THE FUTURE

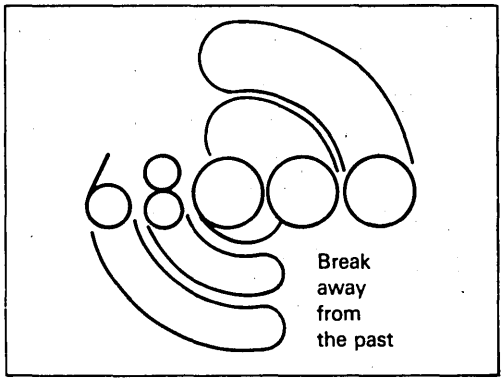
The family concept has been extremely popular in the Microprocessor industry. Motorola pioneered this family concept with the introduction of the M6800 Family in 1974. Led by the MC68000 Microprocessing Unit (MPU) in 1979 and followed by a host of peripherals, the M68000 Family offers the engineer a set of building blocks to construct cost-effective solutions to an ever-widening range of complex 16/32 bit applications. The tremendous popularity of the M68000 Family is not without warrant. HMOS technology, performance, and support are but a few of the many reasons why the M68000 Family continues to be the 16 bit industry leader.

It should be noted that the M68000 Family is a not-so-distant relative of the MC6800. All M6800 Family peripherals interface directly with the MC68000, so upward compatibility is built-in. Where low cost and medium performance are required, they present a very attractive alternative. The plan for the M68000 Family is a simple one. Provide the marketplace with the best 16-bit family and back it up with support that is second to none. And it's happening now.

What about expandability? The M68000 Family is designed with this in mind. All the way from an internally microcoded 32-bit architecture to the third-generation EXORmacs development system. Efficient high level language support provided by Pascal allows upward compatibility of software from 8-bit to 16-bit to 32-bit machines.

The majority of today's 16-bit microprocessor applications are quite complex, with long design times. Clearly, the required investment in design resources requires finished products to have increased longevity. Motorola understands this, and is committed to offering a family which will allow these products to remain state-of-the-art for years to come. Thus, the M68000 Family is an investment in the future.





EXORmacs is a trademark of Motorola Inc.

© IC MASTER 1983

16-BIT MICROPROCESSING UNIT

MC68000L4 (4 MHz) **MC68000L6** (6 MHz) **MC68000L8** (8 MHz) **MC68000L10** (10 MHz)

MC68000L12 (12.5 MHz)

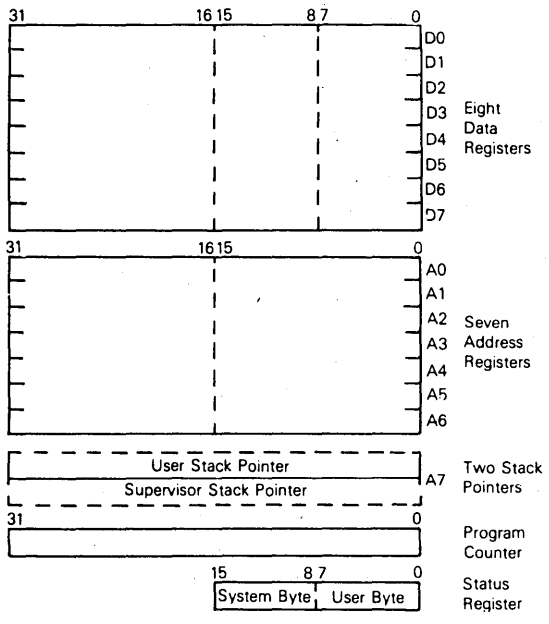
Advances in semiconductor technology have provided the capability to place on a single silicon chip a microprocessor at least an order of magnitude higher in performance and circuit complexity than has been previously available. The MC68000 is the first of a family of such VLSI microprocessors from Motorola. It combines state-of-the-art technology and advanced circuit design techniques with computer sciences to achieve an architecturally advanced 16-bit microprocessor.

The resources available to the MC68000 user consist of the following:

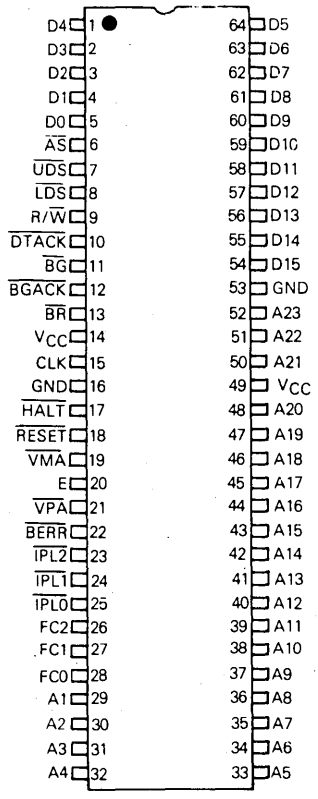
- 32-Bit Data and Address Registers
- 16 Megabyte Direct Addressing Range
- 56 Powerful Instruction Types
- Operations on Five Main Data Types
- Memory Mapped I/O
- 14 Addressing Modes

As shown in the programming model, the MC68000 offers seventeen 32-bit registers in addition to the 32-bit program counter and a 16-bit status register. The first eight registers (D0-D7) are used as data registers for byte (8-bit), word (16-bit), and long word (32-bit) data operations. The second set of seven registers (A0-A6) and the system stack pointer may be used as software stack pointers and base address registers. In addition, these registers may be used for word and long word address operations. All seventeen registers may be used as index registers.

PROGRAMMING MODEL



PIN ASSIGNMENT



© IC MASTER 1983

REDUCED DATA BUS MC68000

MC68008

Mainframe architecture is now available for 8-bit systems. The new MC68008 member of the M68000 Family allows the design of cost effective systems using 8-bit data buses while providing the benefits of a 32-bit microprocessor architecture. The performance of the MC68008 is greater than any 8-bit microprocessor and superior to several 16-bit microprocessors.

The MC68008 is completely code compatible with the MC68000. This means that programs developed for the MC68000 will run on the MC68008 and vice versa. This applies equally to either source code or object code.

A system implementation based on an 8-bit data bus reduces system cost in comparison to 16-bit systems due to a more effective use of components. Byte-wide memories and peripherals can be used much more effectively. In addition, the non-multiplexed address and data buses eliminate the need for external demultiplexers, thus further simplifying the system.

The general purpose architecture of the MC68008 can easily satisfy market requirements for many diverse applications. The MC68008 provides the user with seventeen 32-bit registers, 56 basic instruction types, allows an efficient hardware system implementation, extensive exception processing capabilities and a 1 megabyte linear address space.

VIRTUAL MEMORY PROCESSOR

MC68010

The MC68010 is an MC68000 with enhancements that make it an ideal processor for virtual memory and virtual machine systems. Many of these changes concern the operation of the processor when a faulty bus cycle takes place.

The most significant MC68010 enhancement is the facility for complete, controlled storing of the internal processor state upon receipt of a bus error signal. This state can later be recovered by the processor for continuation after the faulty condition has been corrected. Additionally, the MC68010 may be used as a virtual processor with one governing operating system handling the supervisory chores of any number of subordinate operating systems. This also allows virtual input/output to be supported. A third major change is the allowance for a delayed bus error signal to abort a bus cycle. This bus relaxation allows error detection and correction (EDAC) to be performed with the MC68010 without impacting the execution time of instructions when no error occurs.

ENHANCED M68000 MICROPROCESSOR

MC68020

The MC68020 is another in a series of M68000 high performance 16/32-bit microprocessors from Motorola. Motorola's original MC68000 is the basis for this processor. This processor retains software compatibility with the MC68008, MC68000, and the MC68010.

The MC68020 is the first true 32-bit microprocessor. The power of the MC68020 allows its use in any application; even those previously limited to mainframes. Just as the MC68000 set the industry standard for 16-bit microprocessor performance, the MC68020 will be the standard for all 32-bit systems.

Motorola did not stop at merely rounding out the 32-bit architecture, but added instruction set enhancements, coprocessor operations, improved operating system support, cache for performance advantages, and innovative techniques to improve bus efficiency.

The MC68020 is designed to accommodate M68000 coprocessors through a special co-processor interface and using new co-processor commands. Use of co-processors extends the capability of an M68000 system beyond the limits of a single processing element to numerous tightly-coupled processing units, each of which may be tailored to a particular data type, task, instruction set, etc. To further enhance special operations in an M68000 system, an instruction cache is included in the MC68020. This cache will allow repeated instruction streams to execute significantly faster while freeing the external bus for other processors.

© IC MASTER 1983

FLOATING-POINT CO-PROCESSOR
MC68881

The MC68881 is a high-performance HMOS floating-point processor designed to interface with the advanced MC68020 microprocessor. It can also be used as a peripheral in systems with other processors. The MC68881 is a comprehensive floating-point co-processor that provides a wide range of floating point capabilities seldom found even in a large main-frame computer. System performance with the MC68020 is the overriding design goal of the MC68881.

INTELLIGENT PERIPHERAL CONTROLLER
MC68120, MC68121

The MC68120/MC68121 Intelligent Peripheral Controller (IPC) is a general purpose, mask programmable peripheral controller. The IPC provides the interface between an M68000 or M6800 Family microprocessor and the final peripheral devices through a system bus and control lines. System bus data is transferred to and from the IPC via dual-port RAM while the software utilizes the semaphore registers to control RAM tasking or any other shared resource. Multiple operating modes range from a single chip mode with 21 I/O lines and 2 control lines to an expanded mode supporting an address space of 64K bytes. The MC68120 has 2K bytes of on-chip ROM to make full use of all operating modes. The MC68121 utilizes only the expanded address modes, due to the absence of on-chip ROM.

A serial communications interface, 16-bit timer, dual-ported RAM and semaphore registers are available for use by the IPC in all operating modes.

- Upward Compatible with MC6800 Source and Object Code
- 2048 Bytes of ROM (MC68120 Only)
- 128 Bytes of Dual-Ported RAM
- Multiple Operation Modes Ranging from Single Chip to Expanded, with 64K Byte Address Space
- Six Shared Semaphore Registers
- 21 Parallel I/O Lines and 2 Handshake Lines (5 I/O Lines on MC68121)
- Serial Communications Interface (SCI)
- 16-Bit Three-Function Timer
- 8-Bit CPU and Internal Bus
- Halt/Bus Available Capability Control
- 8 × 8 Multiply Instruction
- TTL Compatible Inputs and Outputs
- External and Internal Interrupts

PARALLEL INTERFACE/TIMER
MC68230

The MC68230 Parallel Interface/Timer provides versatile double buffered parallel interfaces and an operating system oriented timer to MC68000 systems. The parallel interfaces operate in unidirectional or bidirectional modes, either 8 or 16 bits wide. In the unidirectional modes, an associated data direction register determines whether the port pins are inputs or outputs. In the bidirectional modes the data direction regsiters are ignored and the direction is determined dynamically by the state of four handshake pins. These programmable handshake pins provide an interface flexible enough for connection to a wide variety of low, medium, or high speed peripherals or other computer systems. The PI/T ports allow use of vectored or autovectored interrupts, and also provide a DMA Request pin for connection to the MC68450 Direct Memory Access Controller or a similar circuit. The PIT timer contains a 24-bit wide counter and a 5-bit prescaler. The timer may be clocked by the system clock (PI/T CLK pin) or by an external clock (TIN pin), and a 5-bit prescaler can be used. It can generate periodic interrupts, a square wave, or a single interrupt after a programmed time period. Also it can be used for elapsed time measurement or as a device watchdog.

- 8 MHz Version: MC68230L8
- 10 MHz Version: MC68230L10
- Unidirectional 8-Bit and 16-Bit Mode
- Bidirectional 8-Bit and 16-Bit Mode
- Selectable Handshaking Options
- 24-Bit Programmable Timer
- Software Programmable Timer Modes
- Contains Interrupt Vector Generation Logic
- Separate Port and Timer Interrupt Service Requests
- Registers are Read/Write and Directly Addressable
- Registers are Addressed for MOVEP (Move Peripheral) and DMAC Compatibility

© IC MASTER 1983

DUAL DIRECT MEMORY ACCESS CONTROLLER

MC68440

DIRECT MEMORY ACCESS CONTROLLER

MC68450

The MC68440 and MC68450 are designed to complement the performance and architectural capabilities of M68000 Family microprocessors by moving blocks of data in quick, efficient manner with minimum intervention by the host processor. The DMA/DDMA performs memory-to-memory and peripheral-to-memory data transfers by utilizing the following features:

- Bus Compatible with the MC68000, MC68008, and MC68010
- Compatible with M68000 Peripherals
- On-Chip Registers allow Complete Software Control by the System MPU
- Auto Request or External Request
- Memory-to-Memory, Memory-to-Device, and Device-to-Memory Transfers
- Programmable Channel Prioritization
- Vectored Interrupt Capabilities with Two Vectors per Channel
- Two Independent Channels — MC68440
- Four Independent Channels — MC68450
- MC68440 a Subset of MC68450 — Pin for Pin Compatible with the MC68450

MEMORY MANAGEMENT UNIT

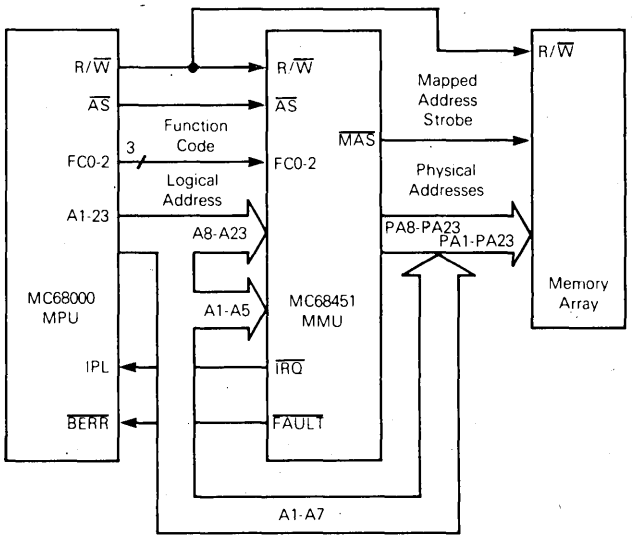
MC68451

The MC68451 Memory Management Unit (MMU) provides address translation and protection for the 16 megabyte addressing range of the MC68000 MPU. Each bus master (or processor) in the M68000 Family provides a function code and an address during each bus cycle. The function code specifies an address space and the address specifies a location within that address space. The function codes distinguish between User and Supervisor spaces and, within these, between Data and Program spaces. This separation of address spaces is the basis for memory management and protection by the operating system. Provision is also made for other bus masters, such as the MC68450 DMAC, to have separate address spaces for efficient DMA. A multitasking operating system is simplified and reliability is enhanced through the use of the MMU.

NEW TRANSLATION TIMES 125 ns at 8 MHz

- MC68000 Bus Compatible
- Provides Efficient Memory Allocation
- Separates Address Space of System and User Resources
- Provides Write Protection
- Supports Paging and Segmentation
- 32 Segments of Variable Size with Each MMU
- Multiple MMU Capability to Expand to Any Number of Segments
- Allows Inter-Task Communication through Shared Segments
- Quick Context Switching to Cut Operating System Overhead
- Simplifies Programming Model of Address Space
- Increases System Reliability
- DMA Compatible
- 6-MHz Version: MC68451L6
- 8-MHz Version: MC68451L8
- 10-MHz Version: MC68451L10

SINGLE-MMU SYSTEM BLOCK DIAGRAM



© IC MASTER 1983

BUS ARBITRATION MODULE

MC68452

The MC68452 bus arbitration module (BAM) is an asynchronous bus controller that allows multiple local buses to be multiplexed onto a common global bus enabling the local buses to share memory, I/O devices, and communicate with each other easily. A single BAM provides arbitration for up to eight local buses and can be expanded indefinitely to support more local buses.

DUAL UNIVERSAL SERIAL COMMUNICATIONS CONTROLLER

MC68562

The MC68562 Dual Universal Serial Communications Controller (DUSCC) is a single-chip MOS-LSI communications device that provides two independent, multiprotocol, full duplex receiver, transmitter channels in a single package. The DUSCC supports bit-oriented and character-oriented (byte count and byte control) synchronous data link controls as well as asynchronous protocols. The logic for both channels provides formats, synchronization, and validation for data transferred to and from the channel interface.

SERIAL INPUT/OUTPUT

MC68564

The MC68564 is a dual-channel serial input/output communication peripheral. It satisfies a wide variety of serial data communication requirements as it handles asynchronous, byte synchronous (bisync), and synchronous bit-oriented protocols (HDLC and SDLC). In addition, it is capable of supporting virtually any serial protocol used in an application other than data communication, such as a floppy disk interface.

MULTI-PROTOCOL COMMUNICATIONS CONTROLLER

MC68652/MC2652

The MC68652/MC2652 MPCC formats, transmits, and receives synchronous serial data while supporting Bit-Oriented (BOP) or Byte-Control (BCP) protocols. The parallel bus of the MPCC readily interfaces with M6800 and M68000 Microprocessor Families as well as many other 8- or 16-bit processors. Typical applications include intelligent terminals, front-end communications, remote-data concentrators, communication test equipment, and computer-to-computer links.

- DC to 2 Mbps Data Rate
- Bit-Oriented Protocols (BOP): SDLC, ADCCP, HDLC, X.25
  - Character Length — 1 to 8 Bits
  - Automatic Detection and Generation of Special Control Characters, i.e., FLAG, ABORT, GA
  - Automatic Zero Insertion and Deletion
  - Idle Transmission of FLAG or ABORT Characters
  - Automatic Generation and Checking of CRC-CCITT FCS
- Byte-Control Protocols (BCP): DDCMP, BISYNC External CRC)
  - Character Length — 5 to 8 Bits
  - SYNC Generation Detection and Stripping
  - Idle Transmission of SYNC or MARK Characters
  - Automatic Generation and Checking of CRC-16 or VRC
- Maintenance Mode for Self-Checking

© IC MASTER 1983

POLYNOMIAL GENERATOR CHECKER
MC68653/MC2653

The MC68653/MC2653 Polynomial Generator Checker (PGC) is a polynomial generator checker/character comparator circuit that complements a receiver/transmitter (R/T or USART/USRT/UART) in the support of character oriented data-link controls.

Parallel data characters transferred between the MPU and R/T are monitored by the PGC which performs block check character (BCC) and parity (VRC) generation/checking, single character detection, and two character sequence detection. Since the PGC operates on parallel characters, the data transmission format may be serial (synchronous or asynchronous) or parallel.

- Parallel Block Check Character Accumulation/Checking: CRC-16, CRC-12, LRC-8
- BISYNC Normal and Transparent Modes
- Automatic- or Single-Character Accumulation Modes
- Two Character Sequence Detection; Examples: DLE-STX, ACK 0, ACK 1, WACK, RVI, DISC, WBT
- 6-, 7-, or 8-Bit Characters
- VRC Generation/Checking on Data Bus
- Four Maskable Interrupt Conditions
- Maximum Character Accumulation Rate of 500 kHz (4 Mbps)
- No System Clock Required

ENHANCED PROGRAMMABLE COMMUNICATIONS INTERFACE
MC68661/MC2661

The MC2661/MC68661, Enhanced Programmable Communications Interface (EPCI), is a universal synchronous/asynchronous data communications controller chip that is an enhanced version of the Signetics 2651. The EPCI directly interfaces to most 8-bit MPUs and easily to the MC68000 MPU and other 16-bit MPUs. It may be used in either a polled or interrupt driven system. Programmed instructions can be accepted from the host MPU while supporting many synchronous or asynchronous serial-data communication protocols in a full or half-duplex mode. Special support for BISYNC is provided.

The EPCI converts parallel data characters, accepted from the microprocessor data bus, into transmit-serial data. Simultaneously, the EPCI can convert receive-serial data to parallel data characters for input to the microprocessor.

A baud rate generator in the EPCI can be programmed to either accept an external clock, or to generate internal transmit or receive clocks. Sixteen different baud rates can be selected under program control when operating in the internal clock mode. Each version of the EPCI (A, B, C) has a different set of baud rates.

- 3 Baud Rate Sets (A, B, C); 16 Internal Rates for Each Set
- 5- to 8-Bit Characters Plus Parity; Odd, Even, or No Parity
- Double Buffered Transmitter and Receiver
- Dynamic Character Length Switching
- Local or Remote Maintenance Loop-Back Mode
- RxC and TxC Pins and Short Circuit Protected

DUAL ASYNCHRONOUS RECEIVER/TRANSMITTER (DUART)
MC68681

The MC68681 Dual Universal Asynchronous Receiver/Transmitter (DUART) is a single-chip MOS-LSI communications device that provides two independent full-duplex asynchronous receiver/transmitter channels in a single package. It is compatible with other M68000 Family devices, and can also interface easily with other microprocessors. The DUART can be used in polled or interrupt driven systems.

- Quadruple Buffered Receiver Data Registers
- Programmable Data Format
  - 5 to 8 Data Bits Plus Parity
  - Odd, Even, No Parity, or Force Parity
  - 1, 1.5, or 2 Stop Bits Programmable in 1/16 Bit Increments
- Programmable Baud Rate for Each Receiver and Transmitter

MULTI-FUNCTION PERIPHERAL
MC68901

The MC68901 multi-function peripheral (MFP) is a combination of many of the necessary peripheral functions in a microprocessor system. Included are: four timers, interrupt controller for 16 sources, eight parallel I/O lines, and a single-channel USART. The use of the MFP in a system can significantly reduce chip count, thereby reducing system cost. The MFP is completely MC68000 bus compatible with 24 directly addressable internal registers that provide the necessary control and status interface to the programmer.

© IC MASTER 1983

National Semiconductor

ADVANCE INFORMATION
JULY 1981

COP410C/COP411C and COP310C/COP311C Fully Static, Single-Chip CMOS Microcontrollers

General Description

The COP410C, COP411C, COP310C, and COP311C fully static, single-chip CMOS microcontrollers are members of the COPS™ family, fabricated using double-poly, silicon gate complementary MOS technology. These microcontrollers are complete microcomputers containing all system timing, internal logic, ROM, RAM, and I/O necessary to implement dedicated control functions in a variety of output configuration options, with an instruction set, internal architecture, and I/O scheme designed to facilitate keyboard input, display output, and BCD data manipulation. The COP411C is identical to the COP410C but with 16 I/O lines instead of 19. They are an appropriate choice for use in numerous human interface control environments. Standard test procedures and reliable high-density fabrication techniques provide the medium to large volume customers with a customized Controller Oriented Processor at a low end product cost.

The COP310C/COP311C are exact functional equivalents, but extended temperature range versions of the COP410C/COP411C.

Features

- Lowest power dissipation (40 μW typical)
- Low cost
- Power saving HALT mode with Continue function
- Powerful instruction set
- 512 × 8 ROM, 32 × 4 RAM
- 19 I/O lines (COP410C)
- Two-level subroutine stack
- DC to 4 μs instruction time
- Single supply operation (2.4V to 5.5V)
- General purpose and TRI-STATE® outputs
- Internal binary counter register with serial I/O capability
- LSTTL/CMOS compatible in and out
- Software/hardware compatible with other members of the COP400 family
- MICROWIRE™ compatible serial I/O
- Extended temperature range device available (−40°C to +85°C)

COPS, TRI-STATE, and MICROWIRE are trademarks of National Semiconductor Corp.

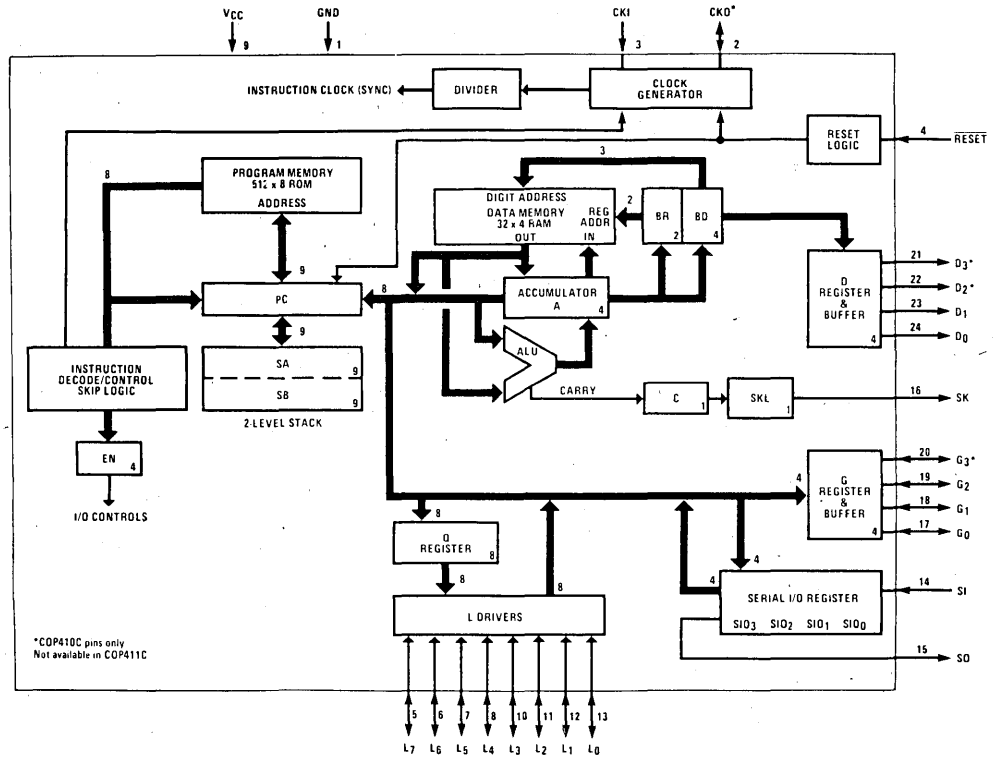


Figure 1. COP410C/COP411C Block Diagram

© 1981 National Semiconductor Corp. B-B-2255

DA-B25K71/Printed in U.S.A.

© IC MASTER 1983

COP410C/COP411C

Absolute Maximum Ratings

Voltage at any pin	−0.3V to V_{CC}+0.3V	Operating temperature range	0°C to +70°C
Total allowable source current	25mA	Storage temperature range	−65°C to +150°C
Total allowable sink current	25mA	Lead temperature (soldering, 10 sec.)	300°C

Absolute maximum ratings indicate limits beyond which damage to the device may occur. DC and AC electrical specifications are not ensured when operating the device at absolute maximum ratings.

DC Electrical Characteristics $0°C \leq T_A \leq 70°C$ unless otherwise specified

Parameter	Conditions	Min.	Max.	Units
Operating Voltage		2.4	5.5	V
Supply Current[1]	$V_{CC} = 2.4V$, $t_c = 125\mu s$ $V_{CC} = 5.0V$, $t_c = 16\mu s$ $V_{CC} = 5.0V$, $t_c = 4\mu s$ (t_c is instruction cycle time)		40 500 2000	μA μA μA
HALT Mode Current[2]	$V_{CC} = 5.0V$, $F_{IN} = 0kHz$, $T_A = 25°C$ $V_{CC} = 2.4V$, $F_{IN} = 0kHz$, $T_A = 25°C$		10 4	μA μA
Input Voltage Levels $\overline{RESET}$, CKI Logic High Logic Low All Other Inputs Logic High Logic Low		 0.9 V_{CC} 0.7 V_{CC} 	 0.1 V_{CC} 0.2 V_{CC}	 V V V V
SI Pull-up Current	$V_{CC} = 4.5V$, $V_{IN} = 0V$	30	330	μA
Hi-Z Input Leakage		−1	+1	μA
Input Capacitance			7	pF
Output Voltage Levels LSTTL Operation Logic High Logic Low CMOS Operation Logic High Logic Low	Standard Outputs $V_{CC} = 5.0V \pm 5\%$ $I_{OH} = 25\mu A$ $I_{OL} = 400\mu A$ $I_{OH} = -10\mu A$ $I_{OL} = 10\mu A$	 2.7 $V_{CC} - 0.2$ 	 0.4 0.2	 V V V V
Output Current Levels Sink Source (Standard Option) Source (Low Current Option) 	 $V_{CC} = 4.5V$, $V_{OUT} = V_{CC}$ $V_{CC} = 2.4V$, $V_{OUT} = V_{CC}$ $V_{CC} = 4.5V$, $V_{OUT} = 0V$ $V_{CC} = 2.4V$, $V_{OUT} = 0V$ $V_{CC} = 4.5V$, $V_{OUT} = 0V$ $V_{CC} = 2.4V$, $V_{OUT} = 0V$	 1.2 0.2 0.5 0.1 30 6	 330 80	 mA mA mA mA μA μA

© IC MASTER 1983

National Semiconductor

COP410C/COP411C

DC Electrical Characteristics (continued)

Parameter	Conditions	Min.	Max.	Units
CKO Current Levels (As Clock Out)				
Sink ÷4	$V_{CC} = 4.5V$, CKI = V_{CC}, $V_{OUT} = V_{CC}$	0.3		mA
÷8		0.6		mA
÷16		1.2		mA
Source ÷4	$V_{CC} = 4.5V$, CKI = 0V, $V_{OUT} = 0V$	0.3		mA
÷8		0.6		mA
÷16		1.2		mA
Allowable Loading on CKO (as HALT I/O pin)			100	pF
Current Needed to Override HALT[3]				
To Continue	$V_{CC} = 4.5V$, $V_{IN} = 0.2\ V_{CC}$		0.5	mA
To Halt	$V_{CC} = 4.5V$, $V_{IN} = 0.7\ V_{CC}$		1.5	mA
TRI-STATE® or Open Drain Leakage Current		−2	+2	μA

Note 1: Supply current is measured after running for 2000 cycle times with a square-wave clock on CKI, CKO open, and all other pins pulled up to V_{CC} with 20k resistors. See current drain equation on page 13.

Note 2: The HALT mode will stop CKI from oscillating in the RC and crystal configurations.

Note 3: When forcing HALT, current is only needed for a short time (approximately 200ns) to flip the HALT flip-flop.

COP410C/COP411C

AC Electrical Characteristics $0°C \leq T_A \leq 70°C$ unless otherwise specified

Parameter	Conditions	Min.	Max.	Units
Instruction Cycle Time (t_c)	$V_{CC} \geq 4.5V$	4	DC	μs
	$4.5V > V_{CC} \geq 2.4V$	16	DC	μs
Operating CKI ÷4 mode		DC	1.0	MHz
Frequency ÷8 mode	$V_{CC} \geq 4.5V$	DC	2.0	MHz
÷16 mode		DC	4.0	MHz
÷4 mode		DC	250	kHz
÷8 mode	$4.5V > V_{CC} \geq 2.4V$	DC	500	kHz
÷16 mode		DC	1.0	MHz
Instruction Cycle Time RC Oscillator	R = 30k ±5%, V_{CC} = 5V C = 82pF ±5% (÷4 Mode)	8	16	μs
Inputs (See Figure 3)				
t_{SETUP}	G Inputs	tc/4+0.7		μs
	SI Input $V_{CC} \geq 4.5V$	0.3		μs
	All Others	1.7		μs
t_{HOLD}	$V_{CC} \geq 4.5V$	0.25		μs
	$V_{CC} \geq 2.4V$	1.0		μs
Output Propagation Delay	$V_{OUT} = 1.5V$, $C_L = 100pF$, $R_L = 5k$			
t_{PD1}, t_{PD0}	$V_{CC} \geq 4.5V$		1.0	μs
t_{PD1}, t_{PD0}	$V_{CC} \geq 2.4V$		4.0	μs

© IC MASTER 1983

National Semiconductor

COP310C/COP311C

Absolute Maximum Ratings

Voltage at any pin	−0.3V to V_{CC}+0.3V	Operating temperature range	−40°C to +85°C
Total allowable source current	25mA	Storage temperature range	−65°C to +150°C
Total allowable sink current	25mA	Lead temperature (soldering, 10 sec.)	300°C

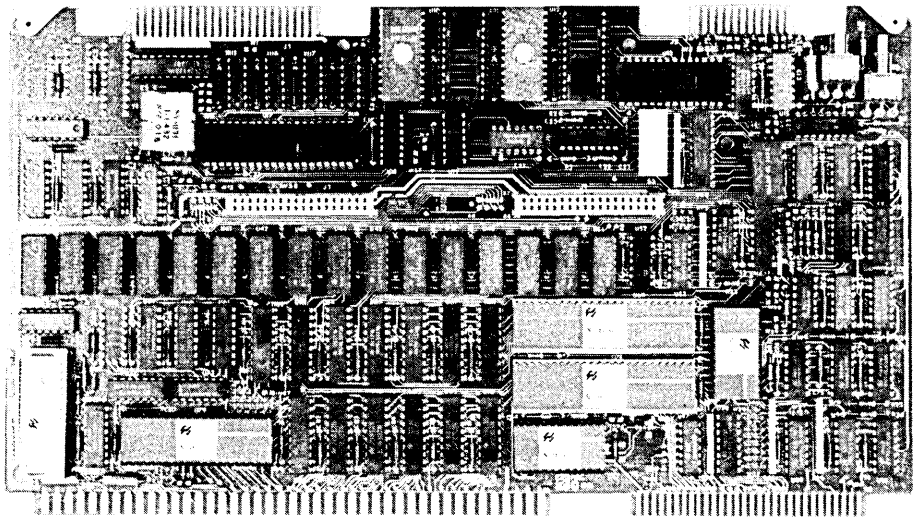
Absolute maximum ratings indicate limits beyond which damage to the device may occur. DC and AC electrical specifications are not ensured when operating the device at absolute maximum ratings.

DC Electrical Characteristics $-40°C \leq T_A \leq +85°C$ unless otherwise specified

Parameter	Conditions	Min.	Max.	Units
Operating Voltage		3.0	5.3	V
Supply Current[1]	$V_{CC} = 3.0V$, $t_c = 125\mu s$ $V_{CC} = 5.0V$, $t_c = 16\mu s$ $V_{CC} = 5.0V$, $t_c = 4\mu s$ (t_c is instruction cycle time)		60 600 2500	μA μA μA
HALT Mode Current[2]	$V_{CC} = 5.0V$, $F_{IN} = 0kHz$, $T_A = 25°C$ $V_{CC} = 3.0V$, $F_{IN} = 0kHz$, $T_A = 25°C$		10 6	μA μA
Input Voltage Levels $\overline{RESET}$, CKI Logic High Logic Low All Other Inputs Logic High Logic Low		 0.9 V_{CC} 0.7 V_{CC}	 0.1 V_{CC} 0.2 V_{CC}	 V V V V
SI Pull-up Current	$V_{CC} = 4.5V$, $V_{IN} = 0V$	30	330	μA
Hi-Z Input Leakage		−2	+2	μA
Input Capacitance			7	pF
Output Voltage Levels LSTTL Operation Logic High Logic Low CMOS Operation Logic High Logic Low	Standard Outputs $V_{CC} = 5.0V \pm 5\%$ $I_{OH} = 25\mu A$ $I_{OL} = 400\mu A$ $I_{OH} = -10\mu A$ $I_{OL} = 10\mu A$	 2.7 $V_{CC} - 0.2$ 	 0.4 0.2	 V V V V
Output Current Levels Sink Source (Standard Option) Source (Low Current Option) 	 $V_{CC} = 4.5V$, $V_{OUT} = V_{CC}$ $V_{CC} = 3.0V$, $V_{OUT} = V_{CC}$ $V_{CC} = 4.5V$, $V_{OUT} = 0V$ $V_{CC} = 3.0V$, $V_{OUT} = 0V$ $V_{CC} = 4.5V$, $V_{OUT} = 0V$ $V_{CC} = 3.0V$, $V_{OUT} = 0V$	 1.2 0.2 0.5 0.1 30 8	 330 200	 mA mA mA mA μA μA

© IC MASTER 1983

DB16000 Development Board



- **NS16032 microprocessor**
- **32K bytes RAM (expandable to 128K bytes)**
- **8K bytes PROM (expandable to 16K bytes)**
- **Sockets for NS16082 MMU, NS16081 FPU, NS16202 ICU**
- **24 programmable parallel I/O lines**
- **Comprehensive system monitor**
- **Cross software development using NSX16**
- **MULTIBUS™ compatibility for ease of evaluation**
- **RS-232 port for communication to host system and user applications**
- **2 BLX expansion module connectors for additional I/O capability**

Product Overview

The DB16000 Development Board is a complete microcomputer system using the National Semiconductor NS16000 family of advanced microprocessors. The board includes an CPU, support chips, on-board memory, and a wide range of both standard and optional I/O interface devices. A monitor program, residing in on-board PROM, completes the system.

The DB16000 is specifically designed for the development and evaluation of both hardware and software for the NS16032 CPU, related slave processors and support chips. With the DB16000, users can examine the architecture, instruction set, and bus interface of the NS16032.

As a development tool, the DB16000 is a powerful hardware and software debugging aid for the NS16032 CPU. Cross-development software packages allow the DB16000 to be used with the STARPLEX II™ development system or the VAX™ series running under the VMS operating system. The NSX16 cross-support package allows programmers to compile or assemble NS16032 programs, then download them to the DB16000 (via a serial data link) to be executed. High level symbolic debugging is then possible through the DBG16 source level symbolic debugger which is part of NSX16.

Shipped fully assembled, the DB16000 requires only suitable +5 VDC and +/−12 VDC power sources and a data terminal for operation. However, the inherent flexibility and compatibility of the DB16000 allows NS16000 family members to be used in a wide variety of development and evaluation configurations.

© National Semiconductor Corporation (OC1161)

BA-B30M22/Printed in U.S.A.

© IC MASTER 1983

In addition to the MULTIBUS interface, the DB16000 provides a complete pin-out of the CPU address, data and control functions. This permits custom interfacing to a wide range of computer systems.

The standard I/O interface includes an RS-232 compatible serial port and 24 parallel data lines. Also provided on the DB16000 are two connectors that allow BLX expansion modules to be used with the DB16000.

Sockets are provided for mounting optional additional members of the NS16000 family. These include the NS16081 Floating Point Unit, the NS16082 Memory Management Unit, and the NS16202 Interrupt Control Unit. All sockets are fully integrated into the DB16000's printed wiring.

Functional Description

Central Processor

The NS16032 is the central processor for the DB16000. It features a 32-bit internal/16-bit external structure with a very powerful instruction set and programming model designed for high level language support. Support for full virtual memory and high speed IEEE proposed standard floating point operations is available.

Memory

32K bytes of 16K dynamic RAM are provided. By replacing the 16K chips with NMC 4164 64K dynamic RAMs this can be expanded to 128K bytes.

In addition to the two EPROM sockets occupied by the system monitor, two more are provided for user applications programs. Either 2716 or 2732 EPROMs may be used.

Input/Output

Parallel I/O

24 parallel I/O lines are provided via an 8255A Programmable Peripheral Interface. These may be divided into two 8-bit ports and two 4-bit ports. Additional I/O may be obtained by using the BLX expansion connectors.

Serial I/O

The RS-232 serial link is provided via an 8251A Universal Synchronous/Asynchronous Receiver/Transmitter (USART). This link provides for communication with terminals or other computers. The data transmission clocks are generated by the ICU counter/timer if present, making the baud rate programmable. With only the ICU emulator installed, it is set at 9600 baud. Additional I/O may be obtained by using the BLX expansion connectors.

Timers

With the NS16202 Interrupt Control Unit installed there is one 16-bit timer available to the user and one dedicated to the USART. The emulator board, when installed, is dedicated to the USART.

Connectors

There are five connectors available;

1 System bus expansion (for custom boards) (P2)

1 RS-232 port (J2)

1 24 Parallel I/O lines (J1)

2 BLX sockets for I/O expansion (J3, J4)

DB16000 Monitor

The monitor program enables the user to load, execute and debug programs. It has the following features:

— Examine/Change Registers/Memory
— Block Move/Load/Print memory locations
— Search for/Fill block of data
— Insert multiple breakpoints
— Start program and break after a specified number of instructions
— Step for specified number of instructions
— Step until (while) a specified condition is reached

The following additional debug features may also be implemented with the Memory Management Unit (MMU) present:

— Break on memory read and/or write (virtual or physical)
— Break on non-sequential instruction fetch
— Show last 2 non-sequential instruction addresses fetched and the number of instructions executed after each nonsequential fetch

Modes of Operation

There are three main modes of operation; stand alone, stand aside and transparent. In the first mode debugging facilities are available through the monitor, while in the other two modes an assembler, debugger, linker, librarian and Pascal compiler resident on host system give the user a more efficient means of developing programs.

Additional memory and/or I/O may be added by using MULTIBUS compatible cards.

© IC MASTER 1983

National Semiconductor

May 1982

NSC800 High-Performance Low-Power Microprocessor

General Description

The NSC800 is an 8-bit microprocessor that functions as the central processing unit (CPU) in National Semiconductor's NSC800 microcomputer family. The device is fabricated using National's P²CMOS™ technology. This technology provides the system designer with devices that equal the performance levels of comparable NMOS products, combined with the low-power advantages of CMOS. Many system functions are incorporated on the device, such as: vectored priority interrupts, refresh control, power-save feature and interrupt acknowledge. The NSC800 is housed in a 40-pin, dual-in-line package. A ceramic leadless carrier (ED) package is also available.

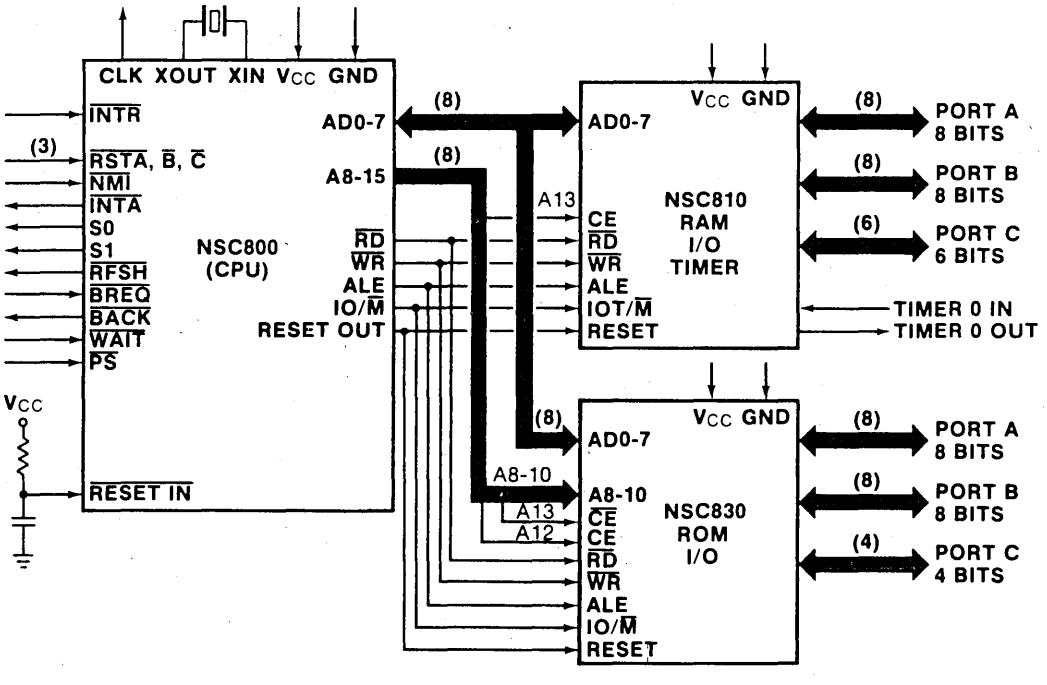
Dedicated memories (NSC810 RAM-I/O Timer and NSC830 ROM-I/O) have on-chip logic for direct interface to the NSC800. In addition, National also offers a full line of P²CMOS and CMOS components to allow a full low-power solution to system designs.

Z80™ is a registered trademark of Zilog Corp.
TRI-STATE is a registered trademark of National Semiconductor Corp.
P²CMOS is a trademark of National Semiconductor Corp.

Features

- Single 5V Power Supply
- Fully Compatible with Z80™ Instruction Set
- Powerful Set of 158 Instructions
- 10 Addressing Modes
- 22 Internal Registers
- Low Power: 50mW at 5V V_{CC}
- Multiplexed Bus Structure
- On-Chip Bus Controller and Clock Generator
- On-Chip 8-Bit Dynamic RAM Refresh Circuitry
- Speed: 1.6μs Instruction Cycle at 2.5MHz; NSC800-2 2MHz; NSC800-1 1MHz
- Fast Version (NSC800-4): 1μs Instruction Cycle at 4MHz (Availability to be Announced)
- Capable of Addressing 64K Bytes of Memory and 256 I/O devices
- Five Interrupt Request Lines On-Chip
- Schmitt Trigger Input on Reset
- Unique Standby-Current (Power Save) Feature

NSC800 Microcomputer Family Block Diagram



© IC MASTER 1983

National Semiconductor

NSC800

Absolute Maximum Ratings

Storage Temperature	-65°C to +150°C
Voltage on Any Pin with Respect to Ground	-0.3 to V_{CC} + 0.3V
Lead Temperature (Soldering 10 Seconds)	300°C
Power Dissipation	1 W
Maximum Voltage	7V

Operating Range

Component Type	Ambient Temperature	V_{CC}
Military	-55°C to +125°C	5V ± 10%
Industrial	-40°C to +85°C	5V ± 10%
Commercial	0°C to +70°C	5V ± 10%

NOTE: *Maximum ratings indicate limits beyond which permanent damage may occur. Continuous operation at these limits is not intended and should be limited to those conditions specified under DC Electrical Characteristics.*

DC Electrical Characteristics

T_A = 0 to 70°C,or -40 to +85°C (I) or -55 to +125°C (M), V_{CC} = 5V ± 10%, GND = 0V

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
V_{IH}	Logical 1 Input Voltage	0.8 V_{CC}		V_{CC}	V	
V_{IL}	Logical 0 Input Voltage	0		0.2 V_{CC}	V	
V_{HY}	Hysteresis at RESET IN Input		0.5		V	V_{CC} = 5V
V_{OH1}	Logical 1 Output Voltage	2.4			V	I_{OUT} = -1.0 mA
V_{OH2}	Logical 1 Output Voltage	V_{CC}-0.5			V	I_{OUT} = -10 μA
V_{OL1}	Logical 0 Output Voltage	0		0.4	V	I_{OL} = 2 mA
V_{OL2}	Logical 0 Output Voltage	0		0.1	V	I_{OUT} = 10 μA
I_{IL}	Input Leakage Current	-1.0		1.0	μA	$0 \le V_{IN} \le V_{CC}$
I_{OL}	Output Leakage Current	-1.0		1.0	μA	$0 \le V_{IN} \le V_{CC}$
I_{CC}	Active Supply Current		10	15	mA	I_{OUT} = 0; $f_{(XIN)}$ = 5MHz
I_{CC}	Active Supply Current		6	10	mA	I_{OUT} = 0; $f_{(XIN)}$ = 2MHz
I_{CC}	Quiescent Current		2	4	mA	I_{OUT} = 0; $f_{(XIN)}$ = 0

© IC MASTER 1983

AC Electrical Characteristics

National Semiconductor

T_A = 0 to 70°C,or -40 to +85°C (I) or -55 to +125°C (M), V_{CC} = 5V ± 10%, GND = 0V

Symbol	Parameter	Min	Max	Unit	Test Conditions (Note 1)
t_X	Period at XIN and XOUT Pins	0.2	31.25	μs	
t	Period at "CLK" Output (= 2 t_X)	0.4	62.5	μs	
$t_{S(AD)}$	Address Set Up Time	t - 120 2		ns	
$t_{H(ADL)}$	Address (0-7) Hold Time	t - 140 2		ns	
$t_{W(ALE)}$	ALE Width	t - 70 2		ns	
t_{DAR}	Falling Edge of ALE to Leading Edge of Read Strobe	t + 30 2		ns	
$t_{ACC(RD)}$	Read Access Time (Note 2)		3t - 125 2	ns	Add t/2 for Memory Read Cycles
$t_{W(RD)}$	Read Strobe Width During Op-code Fetch. (Note 2)	t		ns	Add t/2 for Memory Read Cycles
$t_{H(ADH)1}$	Address (8-15) Hold Time During Opcode Fetch.	0		ns	
$t_{S(WD)}$	Write Data Setup Time	t - 115 2		ns	
$t_{H(WD)}$	Write Data Hold Time	t - 100 2		ns	
t_{DAW}	Falling Edge of ALE to Leading Edge of WR	t - 10		ns	
$t_{W(WR)}$	Write Strobe Width (Note 2)	t		ns	
$t_{H(ADH)2}$	Address (8-15) Hold Time During Memory or I-O Read and Write	t - 100 2		ns	
$t_{D(RFSH)}$	Falling Edge of ALE to Leading Edge of Refresh Strobe (Note 2)	3t 2		ns	
$t_{W(RFSH)}$	Refresh Strobe Width	2t - 75		ns	
$t_{D(WAIT)}$	Falling Edge of ALE to Wait Input Valid		t + 50 2	ns	
$t_{W(WAIT)}$	Wait Input Width	t + 50 2			
$t_{D(I)}$	Falling Edge of ALE to INTR, NMI, RST A-C, PS & BREQ Inputs Valid (Note 2)		3t - 125 2	ns	Add t to Opcode Fetch Cycles
$t_{W(I)}$	Width of INTR, NMI, RST A-C, PS & BREQ Inputs	t 2		ns	
t_{DAI}	Falling Edge of ALE to Interrupt Acknowledge Strobe	t + 30 2		ns	
$t_{W(INTA)}$	Interrupt Acknowledge Strobe Width (Note 2)	3t		ns	(*Figure 10*)
$t_{D(BACK)1}$	Falling Edge of ALE to Falling Edge of BUS Acknowledge Output (Note 2)	5t 2		ns	Add t for Opcode Fetch Cycles
$t_{D(BACK)2}$	Rising Edge of Bus Request to Rising Edge of BUS Acknowledge	t 2	3t + 50 2	ns	(*Figure 6*)
t_{DPA}	Rising Edge of Power Save to Falling Edge of ALE	t 2	3t + 50 2	ns	(*Figure 12*)
$t_{S(ALE)}$	Setup Time	t - 100 2		ns	

Notes: **1.** Output Capacitive loading = 100pf; **2.** Add t for each WAIT state

© IC MASTER 1983

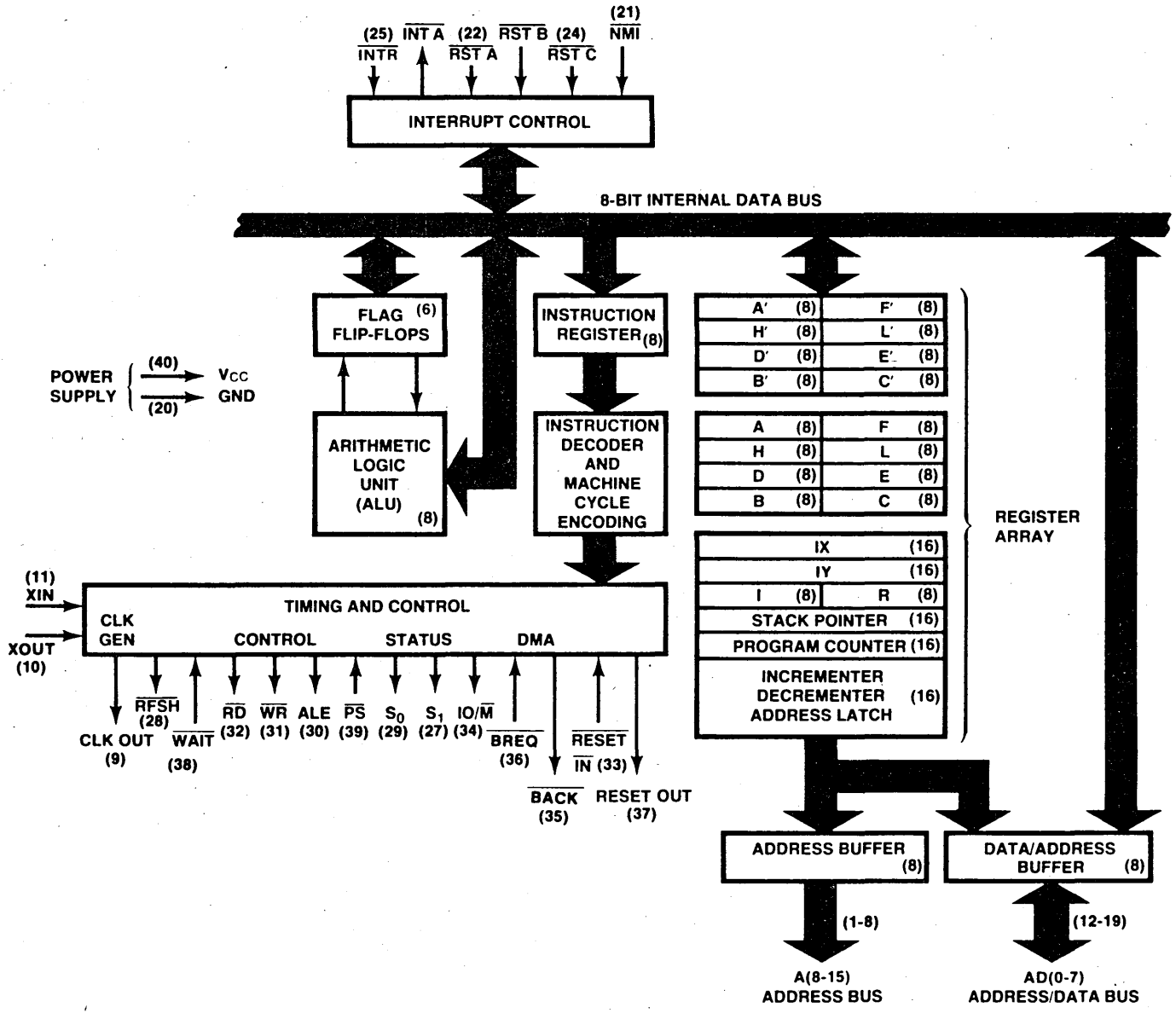


FIGURE 4-1. NSC800 CPU Functional Block Diagram

72-1

© IC MASTER 1983

National Semiconductor

July 1981

NSC810 RAM-I/O-Timer

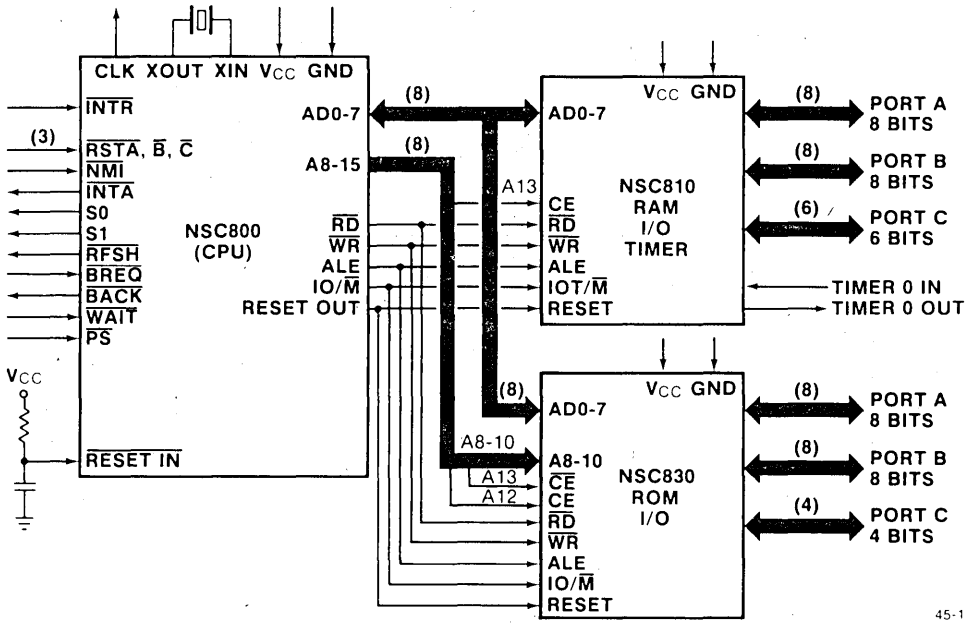
General Description

The NSC810 is a RAM-I/O-Timer device contained in a standard 40-pin, dual-in-line package. The chip, which is fabricated using P²CMOS silicon gate technology, functions as a memory, an input/output peripheral interface and a timing device. The memory is comprised of 1024 bits of static RAM organized as 128 x 8. The I/O portion consists of 22 programmable input/output bits arranged as three separate ports, with each bit individually definable as an input or output. The port bits can be set or cleared individually and can be written or read in bytes. Several types of strobed mode operations are available through Port A. The timer portion of the device consists of two programmable 16-bit binary down-counters each capable of operation in any one of six modes. Timer counts are extendable by one of the available prescale values.

Features

- 128 x 8 Random Access Memory
- Three Programmable I/O Ports
- Two 16-Bit Programmable Counter/Timers
- Single 5V Power Supply
- Very Low Power Consumption
- Fully Static Operation
- Single-Instruction I/O Bit Operations
- Timer Operation — DC to 4MHz
- Directly Compatible with NSC800 Family

NSC800 Microcomputer Family Block Diagram



© 1981 National Semiconductor Corp 0 C 1457 TRI-STATE® Registered National Semiconductor Corp

In-H B5M071 Printed in U S A

© IC MASTER 1983

National Semiconductor

NSC810

Absolute Maximum Ratings

Storage Temperature Range.....-65°C to 150°C
Voltage at Any Pin with Respect to Ground ....-0.3V to V_{CC} +0.3V
Lead Temperature (Soldering, 10 seconds).....300°C
Power Dissipation 1W

NOTE: *Absolute maximum ratings are those values beyond which the safety of the device cannot be guaranteed. Continuous operation at these limits is not intended; operation should be limited to those conditions specified under DC Electrical Characteristics.*

Operating Range

Component Type	Ambient Temperature*	V_{CC}**
Industrial	-40°C to +85°C	5V
Commercial	0°C to +70°C	5V

*Availability of Military temperature range components to be announced.
**Availability of extended operating voltage range components to be announced.

DC Electrical Characteristics

T_A = 0°C to + 70°C, V_{CC} = +5V ± 10%, GND = 0V

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
V_{IH}	Logical 1 Input Voltage	0.8 V_{CC}		V_{CC}	V	
V_{IL}	Logical 0 Input Voltage	0		0.2 V_{CC}	V	
V_{OH}	Logical 1 Output Voltage	2.4			V	I_{OH} = -1.0 mA
		V_{CC}-0.5			V	I_{OUT} = -10 μA
V_{OL}	Logical 0 Output Voltage	0		0.4	V	I_{OL} = 2 mA
		0		0.1	V	I_{OUT} = 10 μA
I_{IL}	Input Leakage Current	-1.0		1.0	μA	0 ≤ V_{IN} ≤ V_{CC}
I_{OL}	Output Leakage Current	-1.0		1.0	μA	0 ≤ V_{IN} ≤ V_{CC}
I_{CC}	Active Supply Current		5		mA	I_{OUT} = 0; $f_{(XIN)}$ = 5MHz NSC800

© IC MASTER 1983

National Semiconductor

NSC810

AC Electrical Characteristics

T_A = 0° C to + 70° C, V_{CC} = +5V ± 10%, GND = 0V

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
t_{ACC}	Access Time from ALE			250	ns	CL = 100 pF
t_{AS}	Address 0-7, CE, IOT/$\overline{M}$ Set-Up Time	50			ns	
t_{AH}	Address 0-7, CE, IOT/$\overline{M}$ Hold Time	50			ns	
t_{RDD}	Data Bus Disable	0		75	ns	CL = 100 pF
t_{ARW}	ALE to Read or Write Strobe	75			ns	
t_{RD}	Read Strobe Width	200			ns	
t_{WR}	Write Strobe Width	200			ns	
t_{ALE}	ALE Strobe Width (high)	100			ns	
t_{DS}	Data Set-up Time	50			ns	
t_{DH}	Data Hold Time	75			ns	
t_{RWA}	Read or Write to Next ALE Time	100			ns	
t_{PS}	Peripheral Data Set-up Time	100			ns	
t_{PH}	Peripheral Data Hold Time	100			ns	
t_{DO}	Port Data Output Valid			200	ns	Port Loading = 100 pF
t_{SB}	$\overline{STB}$ to Buffer Full Valid			250	ns	
t_{SW}	Minimum $\overline{STB}$ Width	200			ns	
t_{SS}	Peripheral Data Set-up Time	100			ns	
t_{SH}	Peripheral Data Hold with Respect to $\overline{STB}$	100			ns	
t_{SI}	$\overline{STB}$ to $\overline{INTR}$ Output			250	ns	
t_{RB}	$\overline{RD}$ to BF Output			250	ns	
t_{RI}	$\overline{RD}$ to $\overline{INTR}$ Output			250	ns	
t_{WB}	$\overline{WR}$ to BF Output			250	ns	
t_{WI}	$\overline{WR}$ to $\overline{INTR}$ Output			250	ns	
t_{PE}	Peripheral Bus Enable			200	ns	
t_{PZ}	Peripheral Bus Disable (TRI-STATE®)			150	ns	

Timer AC Electrical Characteristics (See Figure 5.)

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
F_C	Clock Frequency	dc		2.0	MHz	
F_{CP}	Clock Frequency	dc		4.0	MHz	Prescale selected
t_{CW}	Clock Pulse Width	200			ns	
t_{CWP}	Clock Pulse Width	100			ns	Prescale selected
t_{CW}	Gate Width	150			ns	High or low time
t_{GS}	Gate Set-up Time	100			ns	With respect to negative going clock edge
t_{GH}	Gate Hold Time	50			ns	With respect to negative going clock edge
t_{CO}	Clock to Output Delay			250	ns	CL = 100 pF

© IC MASTER 1983

National Semiconductor

NSC830 ROM-I/O; NSC831 I/O Only

General Description

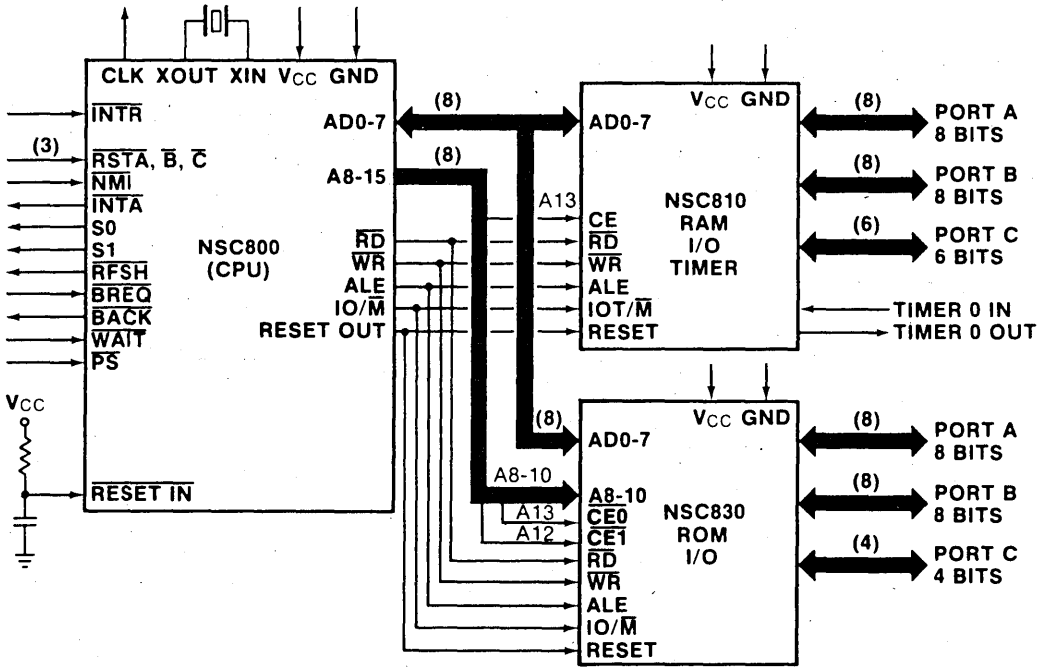
The NSC830 is a ROM-I/O device contained in a standard 40-pin, dual-in-line package. The chip, which is fabricated using P²CMOS silicon gate technology, functions as a memory, and an input/output peripheral interface device. The memory is comprised of 16,384 bits of ROM organized as 2048 x 8. The I/O portion consists of 20 programmable input/output bits arranged as three separate ports, with each bit individually definable as an input or output. The port bits can be set or cleared individually and can be written to or read from in bytes. Several types of strobed mode operations are available through Port A.

The NSC831 I/O Only is similar to the NSC830 except it has no ROM. The NSC831 is useful for prototyping work prior to ordering the NSC830, and when on-chip ROM is not required.

Features

- 2K x 8 Read Only Memory
- Three Programmable I/O Ports
- Single 5V Power Supply
- Very Low Power Consumption
- Fully Static Operation
- Single-Instruction I/O Bit Operations
- Directly Compatible with NSC800 Family
- Strobed Modes Available on Port A

NSC800 Microcomputer Family Block Diagram



© 1981 National Semiconductor Corp. O/C/1457 TRI-STATE® Registered Trademark of National Semiconductor Corp.

In-H/B5M071/Printed in U.S.A.

© IC MASTER 1983

National Semiconductor

NSC830
NSC831

Absolute Maximum Ratings

Storage Temperature Range.....-65°C to 150°C
Voltage on Any Pin with Respect to Ground...-0.3V to V_{CC} + 0.3V
Lead Temperature (Soldering, 10 seconds).....300°C
Power Dissipation 1W

NOTE: *Absolute maximum ratings are those values beyond which the safety of the device cannot be guaranteed. Continuous operation at these limits is not intended; operation should be limited to those conditions specified under DC Electrical Characteristics.*

Operating Range

Component Type	Ambient Temperature*	V_{CC}**
Industrial	-40°C to +85°C	5V
Commercial	0°C to +70°C	5V

*Availability of Military temperature range components to be announced.
**Availability of extended operating voltage range components to be announced.

DC Electrical Characteristics

T_A = 0°C to + 70°C, V_{CC} = +5V ± 10%, GND = 0V

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
V_{IH}	Logical 1 Input Voltage	0.8V_{CC}		V_{CC}	V	
V_{IL}	Logical 0 Input Voltage	0		0.2 V_{CC}	V	
V_{OH}	Logical 1 Output Voltage	2.4 V_{CC} -0.5			V	I_{OH} = -1.0mA I_{OUT} = -10μA
V_{OL}	Logical 0 Output Voltage	0 V_{CC} -0.5		0.4	V V	I_{OL} = 2mA I_{OUT} = 10μA
I_{IL}	Input Leakage Current	-1.0		1.0	μA	$0 \leq V_{IN} \leq V_{CC}$
I_{OL}	Output Leakage Current	-1.0		1.0	μA	$0 \leq V_{IN} \leq V_{CC}$
I_{CC}	Active Supply Current		5		mA	I_{OUT} = 0; $f_{(XIN)}$ = 5MHz

© IC MASTER 1983

National Semiconductor

NSC830 ; NSC831

AC Electrical Characteristics

T_A = 0° C to + 70° C, V_{CC} = +5V ± 10%, GND = 0V

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
t_{ACC}	Access Time from ALE (Note 1)			250	ns	CL = 100 pF
t_{AS}	Address Set-Up time	50			ns	
t_{AH}	Address Hold Time	50			ns	
t_{RDD}	Data Bus Disable	0		75	ns	CL = 100 pF
t_{ARW}	ALE to Read or Write Strobe	75			ns	
t_{RD}	Read Strobe Width	200			ns	
t_{WR}	Write Strobe Width	200			ns	
t_{ALE}	ALE Strobe Width (high)	100			ns	
t_{DS}	Data Set-up Time	50			ns	
t_{DH}	Data Hold Time	75			ns	
t_{RWA}	Read or Write to Next ALE Time	100			ns	
t_{PS}	Peripheral Data Set-up Time	100			ns	
t_{PH}	Peripheral Data Hold Time	100			ns	
t_{DO}	Port Data Output Valid			200	ns	Port Loading = 100 pF
t_{SB}	$\overline{STB}$ to Buffer Full Valid			250	ns	
t_{SW}	Minimum $\overline{STB}$ Width (Note 2)	200			ns	
t_{SS}	Peripheral Data Set-up Time	100			ns	
t_{SH}	Peripheral Data Hold with Respect to STB	100			ns	
t_{SI}	$\overline{STB}$ to $\overline{INTR}$ Output			250	ns	
t_{RB}	$\overline{RD}$ to BF Output			250	ns	
t_{RI}	$\overline{RD}$ to $\overline{INTR}$ Output			250	ns	
t_{WB}	$\overline{WR}$ to BF Output			250	ns	
t_{WI}	$\overline{WR}$ to $\overline{INTR}$ Output			250	ns	
t_{PE}	Peripheral Bus Enable			200	ns	
t_{PZ}	Peripheral Bus Disable (TRI-STATE)®			150	ns	

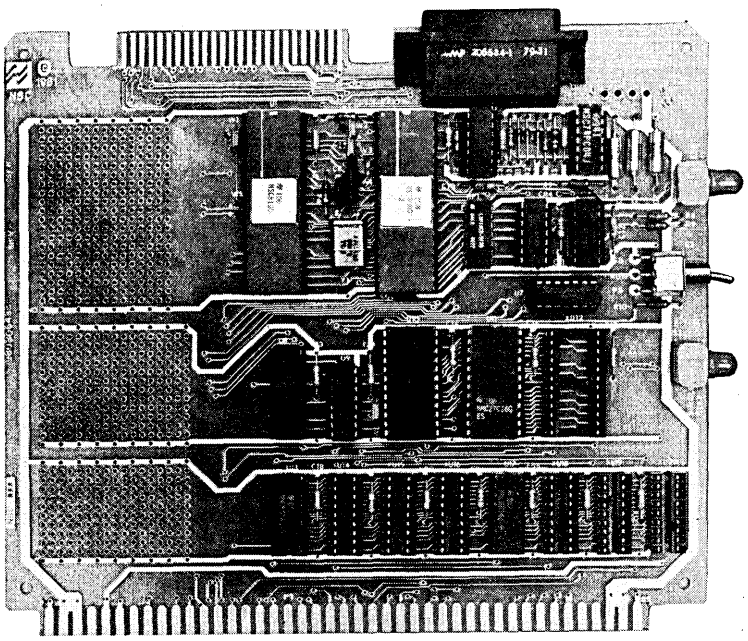
Note: 1 See Read and Write Waveforms.

Note: 2 See Strobe Mode Input and also Strobed Mode Output Waveforms.

© IC MASTER 1983

NSC888

NSC800 Evaluation Board



Features

- NSC800 8-Bit P²CMOS™ CPU
- Executes Z80™ Instruction Set
- 20 Programmable Parallel I/O Lines
- Two 16-Bit Programmable Counters/Timers
- Powerful 2K x 8 Monitor Program
- Five Levels of Vectored Prioritized Interrupts
- RS232 Interface
- 1K x 8 P²CMOS RAM with Sockets for up to 4K x 8 RAM
- Socket for additional 2K x 8, 2716 Compatible Memory Component
- Wire Wrap Area
- Edge Connectors for System Expansion
- Single-Step Operation Mode
- Fully Assembled and Tested

Product Overview

The NSC888 is a self-contained microprocessor board which enables the user to quickly evaluate the performance and features of the NSC800 product family. This fully assembled, tested board requires only the addition of a ±5V supply and an RS232 interface cable to the users terminal to begin NSC800 evaluation.

A powerful system monitor is provided on the board which controls serial communications via the RS232 port. The monitor also includes command functions to load, execute and debug NSC800 programs.

The board includes an NSC800 CPU plus RAM, EPROM, I/O, Timers and interface components yet draws only 30mA from the +5V supply and 3mA from the -5V supply.

Although designed primarily as an assessment vehicle, the NSC888 can be readily programmed and adapted to a variety of uses. Wire wrap area is provided on-board for the user to build up additional circuitry or interfaces, thus tailoring this high-performance, low-power microprocessor board to meet individual needs.

P²CMOS is a trademark of National Semiconductor Corp.

Z80 is a trademark of Zilog Corp.

© IC MASTER 1983

Functional Description

Figure 1 and *Figure 2* provide information on the organization of the NSC888 board. Please refer to these figures for the following discussion.

Central Processor

The powerful NSC800 is the central processor for the NSC888. It provides bus control, clock generation and extensive interrupt capability. Featuring a multiplicity of programmable registers and sophisticated addressing modes, the NSC800 executes the Z80 instruction set.

Memory

- 128 bytes of RAM are provided by the NSC810 RAM-I/O-Timer and are used by the monitor program for the system stack.
- 1024 bytes of RAM are provided by two 1K x 4 NMC6514's. Sockets are provided for six additional NMC6514's, for a total of 4K bytes of RAM.
- A 2K byte EPROM system monitor is provided on-board which includes facilities to load, execute and debug a users program.
- An additional EPROM socket is also on-board which accepts a 2K byte 2716 compatible memory component.

Input/Output

- **Parallel I/O**
  The NSC888 provides 20 programmable parallel I/O lines implemented using the I/O ports of the NSC810 RAM-I/O-Timer. The port bits may be individually defined as input or output, and can also be written to or read from in bytes. The I/O lines are conveniently brought to a 50 contact edge connector for user interface.
- **Serial I/O**
  An RS232 connector and accompanying support circuitry are provided on-board. Two I/O lines from the NSC810 RAM-I/O-Timer are used for the serial communications function, which is controlled exclusively by software. The baud rate is determined upon system initialization by the character bit rate from the users terminal. The maximum baud rate is 2400 baud.

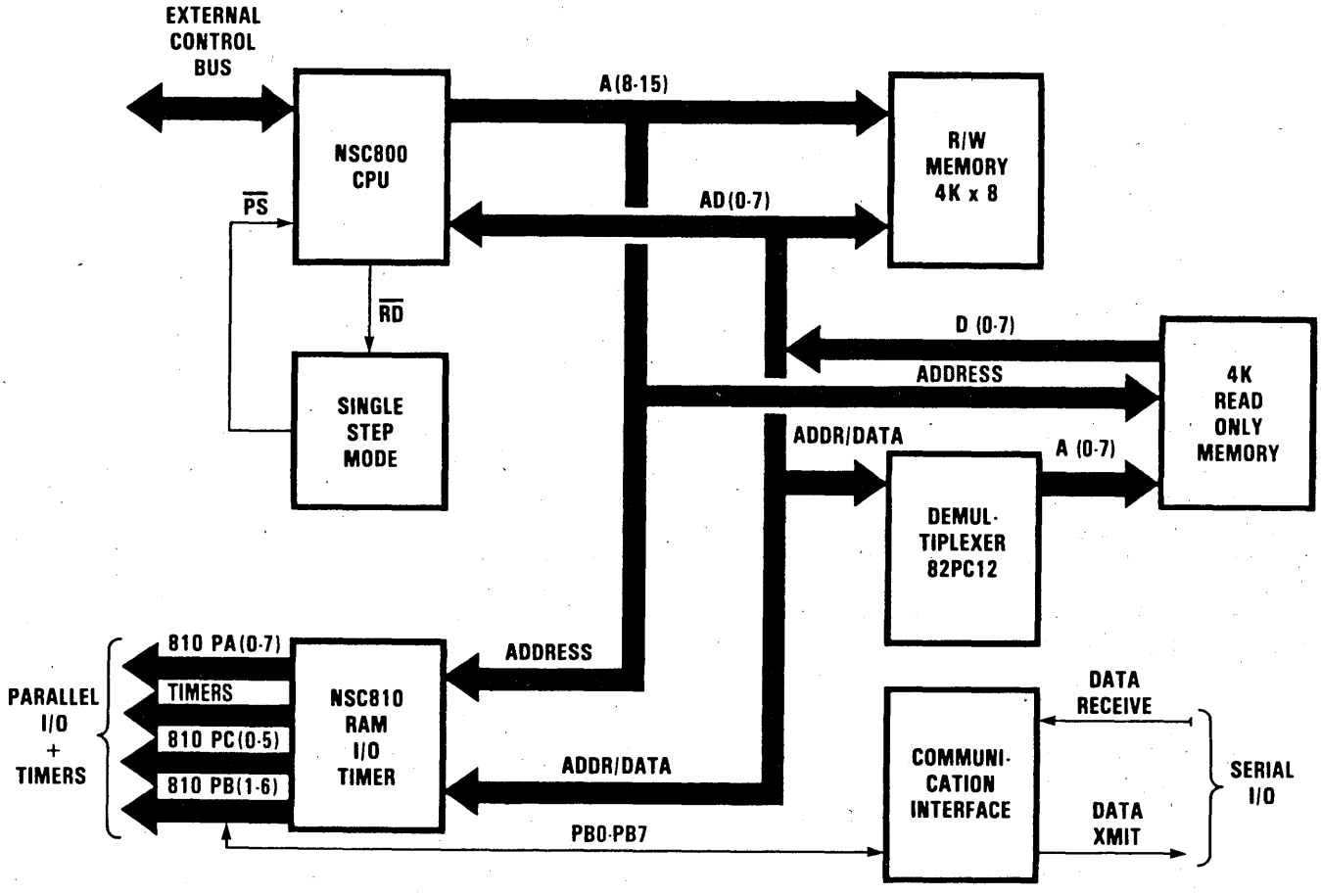


FIGURE 1. NSC888 Functional Block Diagram

SR-O/C/1356-13

© IC MASTER 1983

Timers

The NSC888 provides two fully programmable binary 16-bit counters/timers utilizing the NSC810 RAM-I/O-Timer. These signals are also brought to the parallel I/O connector. Each timer may operate in any of six different modes:

- Event Counter
- Accumulative Timer
- Restartable Timer
- One Shot
- Square Wave
- Pulse Generator

Connectors

- **Parallel I/O**
  The parallel I/O lines and timer lines from the NSC810 RAM-I/O-Timer, plus interrupt lines from the CPU are brought to this 50 contact edge connector.

- **System Bus**
  All NSC800 CPU lines except XIN are brought to this 86 contact edge connector. In addition, the -5V line is also brought to the system bus connector.

- **RS232**
  This connector is provided for system interface to the users terminal.

Interrupts

The NSC888 utilizes the powerful interrupt processing capability of the NSC800 CPU. Interrupts are routed via a jumper matrix to the five interrupt inputs of the NSC800. Each input, which may be from the NSC810 I/O ports, NSC810 timers or off board via the system bus connector, generates a unique memory address (see *Table 1*). All interrupts with the exception of NMI can be masked via software. Interrupt lines are also brought to the parallel I/O connector.

Table 1.

Interrupt Input	Memory Address	Type	Priority
NMI	0066H	Non-maskable	Highest
RSTA	003CH	Maskable	
RSTB	0034H	Maskable	
RSTC	002CH	Maskable	
INTR	0038H*	Maskable	Lowest

*mode 1

NSC888 FIRMWARE

The NSC888 system monitor is provided by a pre-programmed EPROM. This comprehensive monitor includes facilities to load, execute and debug programs. The monitor allows the user to examine and modify any RAM memory location or CPU register. It permits the insertion of break points to facilitate debugging. Programs can be executed starting at any location. The commands supported by the NSC888 system monitor are as follows:

- B - Select a new baud rate
- D - Display memory
- F - Fill memory between ranges
- G - Execute program with break points
- H - Hexadecimal math routine
- J - Non-destructive memory test
- K - Store 16-bit value in memory
- M - Move a block of data
- P - Put ASCII characters in memory
- Q - Query I/O ports
- S - Substitute and/or examine memory
- T - Type memory contents in ASCII
- V - Verify two blocks of data
- X - Examine or modify CPU registers
- Y - Memory search for string

These commands are fully explained in the NSC888 Hardware/Software Users Manual.

Single Step/Power Save

The NSC888 provides a unique single-step mode, utilizing the Power Save input of the NSC800 CPU. This input, when activated, reduces CPU power consumption from 50mW to only 25mW. It also allows the user to single-step through a program, checking and modifying code. This function is controlled via a switch on the board.

Specifications

Microprocessor

CPU-	NSC800
Data Word-	8 bits
Instruction Word-	8, 16, 24, 32 bits
Cycle Time-	2.00μs (minimum instruction time)
System Clock-	2.00MHz
Registers-	14 general purpose (8-bit) 2 index registers (16-bit) 1 stack pointer (16-bit) 1 program counter (16-bit)
Number of Instructions-	158
Address Capability-	64K bytes

Memory

RAM-	1152 bytes on-board plus sockets for an additional 3K bytes
ROM/EPROM-	Sockets for 4K bytes on-board
Access Time-	625ns for opcode fetch 875ns for memory read

Connectors

System Bus-	86-pin double-sided card cage edge connector on 0.156 inch centers

© IC MASTER 1983

Parallel I/O-	50-pin double-sided edge connector on 0.1 inch centers Recommended mating connector: 3M 3415-0001 AMP 2-86792-3
Serial I/O-	Standard RS232 connector
Power	+5V 30mA (27C16 EPROM monitor) or 90mA (2716 EPROM monitor) -5V 3mA
Physical	
Height-	6.75 (17.15cm)
Width-	7.85 (19.94cm)

Order Information

NSC888-	Includes CPU, 1152 bytes of RAM, sockets for additional 3K bytes of RAM, 2K byte monitor with additional socket for 2K byte ROM/EPROM, 20 I/O lines, RS232 interface, wire wrap area.
Documentation-	The NSC888 Hardware/ Software Users Manual and NSC800 Microprocessor Family Handbook are shipped with the NSC888 Evaluation Board

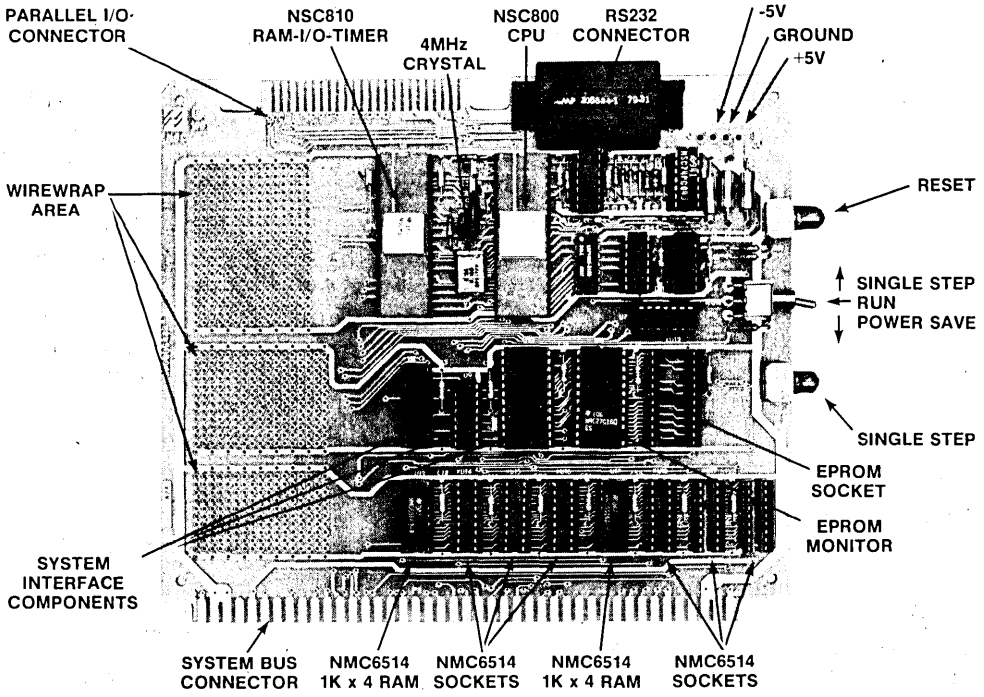


FIGURE 2. NSC888 Evaluation Board

LIFE SUPPORT POLICY:

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in a significant injury to the user.

2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness.

National Semiconductor Corporation
2900 Semiconductor Drive
Santa Clara, CA 95051
Tel (408)737-5000
TWX (910)339-9240

National Semiconductor GmbH
Elsenheimerstrasse 61/11
8000 Munchen 21
West Germany
Tel (089)576091
Telex 522772

NS Japan K.K.
POB 4152 Shinjuku Center Bldg.
1-25-1 Nishishinjuku, Shinjuku-Ku
Tokyo 160, Japan
Tel (03)349-0811
TWX 232-2015 NSCJ-J

National Semiconductor (Hong Kong) Ltd.
1st Floor,
Cheung Kong Electronic Bldg
4 Hing Yip Street
Kwun Tong
Kowloon, Hong Kong
Tel 3-899235
Telex 43866 NSEHK HX
Cable NATSEMI HX

NS Electronics Do Brasil
Avda Brigadeiro Faria Lima 844
11 Andar Conjunto 1104
Jardim Paulistano
Sao Paulo Brasil
Telex 1121008 Cabine Sao Paulo

NS Electronics Pty. Ltd.
Cnr. Stud Rd & Mtn Highway
Bayswater, Victoria 3153
Australia
Tel 03-729-6333
Telex AA32096

National does not assume any responsibility for use of any circuitry described; no circuit patent licenses are implied; and National reserves the right, at any time without notice, to change said circuitry

© IC MASTER 1983

National Semiconductor

PRELIMINARY
August 1982

NS16032-6 High-Performance Microprocessor

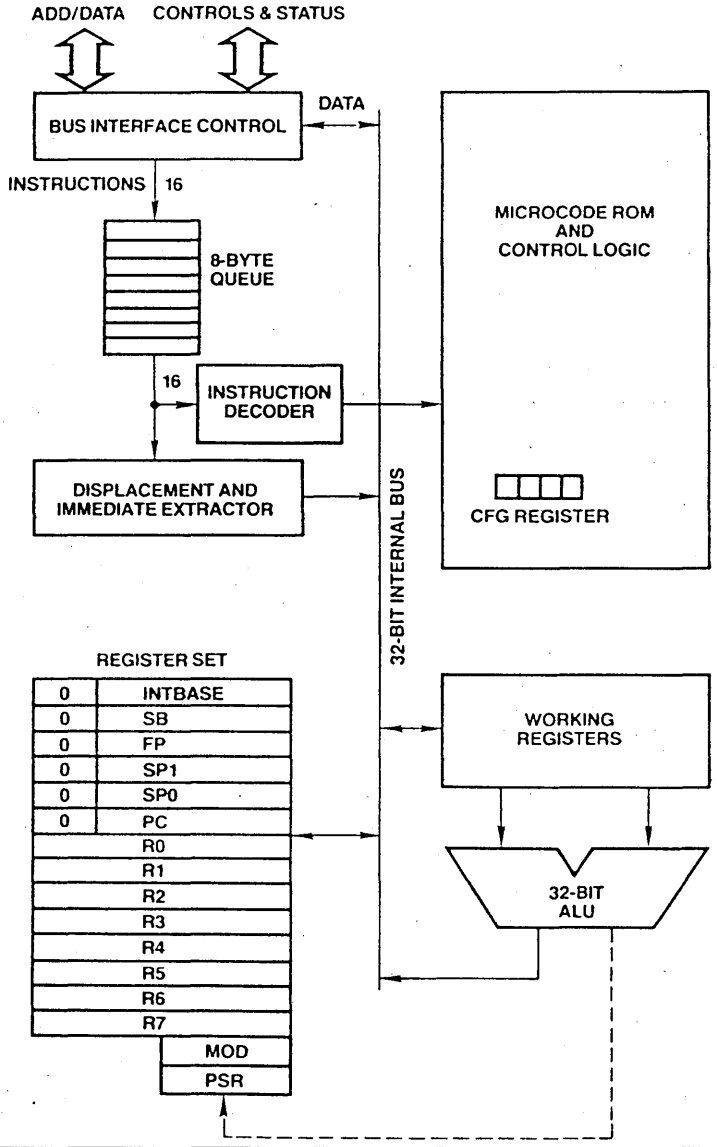
General Description

The NS16032-6 functions as a central processing unit (CPU) in National Semiconductor's NS16000 microcomputer family. It has been designed to optimally support microprocessor users who need the ability to use a large addressing space for large programs and/or large data structures. Because large programs must realistically be generated and maintained in high-level languages, the NS16000 architecture provides for very efficient compilation while remaining easy to program at the assembler level for optimizations. Full virtual memory capability is provided in conjunction with the NS16082 Memory Management Unit (MMU). High performance floating-point instructions are provided with the NS16081 Floating-Point Unit (FPU).

Features

- 32-bit Architecture and Implementation
- 16-MByte Uniform Addressing Space
- Powerful Instruction Set
  - — General 2-Address Capability
  - — Very High Degree of Symmetry
  - — Addressing Modes Optimized for High-Level Language References
  - — Expansion via Slave Processors or Traps
- High-Speed XMOS Technology
- Single 5V Supply
- 48-pin Dual-In-Line Package

NS16032-6 CPU Block Diagram



© IC MASTER 1983

National Semiconductor

NS16032-6

Absolute Maximum Ratings

Temperature under bias	0°C to +70°C
Storage Temperature	−65°C to +150°C
All input or output voltages with respect to GND	−0.5V to +7V
Power Dissipation	1.5 Watt

Note: *Absolute maximum ratings indicate limits beyond which permanent damage may occur. Continuous operation at these limits is not intended; operation should be limited to those conditions specified under DC Electrical Characteristics.*

DC Electrical Characteristics: NS16032-6 $T_A = 0$ to +70°C, $V_{CC} = 5V \pm 5\%$, GND = 0V

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{IH}	Logical 1 Input Voltage		2.0		V_{CC}+0.5	V
V_{IL}	Logical 0 Input Voltage		−0.5		0.8	V
V_{CH}	Logical 1 Clock Voltage	PHI1, PHI2 pins only	V_{CC}−0.6		V_{CC}+1.0	V
V_{CL}	Logical 0 Clock Voltage	PHI1, PHI2 pins only	−0.5		0.3	V
V_{CLT}	Logical 0 Clock Voltage, Transient (ringing tolerance)	PHI1, PHI2 pins only	−0.5		0.6	V
V_{OH}	Logical 1 Output Voltage	$I_{OUT} = -400\mu A$	2.4			V
V_{OL}	Logical 0 Output Voltage	$I_{OL} = 2mA$			0.45	V
I_{ILS}	AT/SPC Input Current (low)	$V_{IN} = 0.4V$, $\overline{AT}/\overline{SPC}$ in input mode	0.05		1.0	mA
I_{IL}	Input Leakage Current	$V_{IN} \leq V_{CC}$, All inputs except PHI1, PHI2, $\overline{AT}/\overline{SPC}$	−1.0		1.0	μA
I_{OL}	Output Leakage Current	$0 \leq V_{IN} \leq V_{CC}$	−1.0		1.0	μA
I_{CC}	Active Supply Current	$I_{OUT} = 0$, $T_A = 0°C$		180	300	mA

© IC MASTER 1983

1 NS16032 Pin Descriptions

The following is a brief description of all NS16032 pins. The descriptions reference portions of the Functional Description, Section 3.

1.1 SUPPLIES

Power (V_{CC}): +5V Positive Supply. Sec. 3.1.

Logical Ground (GNDL): Ground reference for on-chip logic. Sec. 3.1.

Buffer Ground (GNDB): Ground reference for on-chip drivers connected to output pins. Sec. 3.1.

Back-Bias Generator (BBG): Output of on-chip substrate voltage generator. Sec. 3.1.

1.2 INPUT SIGNALS

Clocks (PHI1, PHI2): Two-phase clocking signals. Sec. 3.2.

Ready (RDY): Active high. While RDY is inactive, the CPU extends the current bus cycle to provide for a slower memory or peripheral reference. Upon detecting RDY active, the CPU terminates the bus cycle. Sec. 3.4.1.

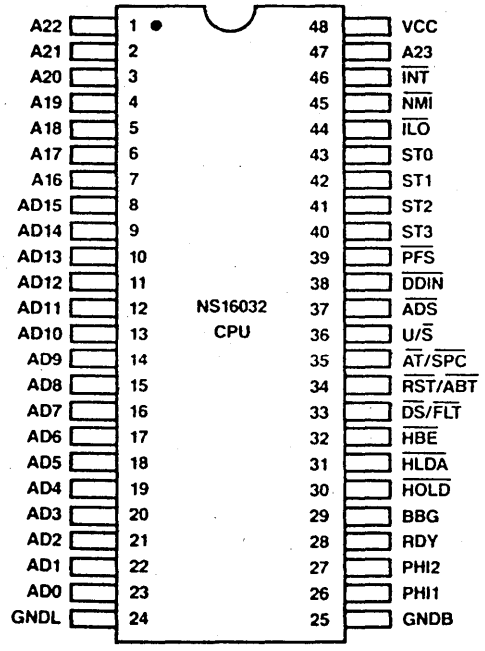
Hold Request ($\overline{HOLD}$): Active low. Causes the CPU to release the bus for DMA or multiprocessing purposes. Sec. 3.6.

Interrupt ($\overline{INT}$): Active low. Maskable Interrupt request. Sec. 3.8.

Non-Maskable Interrupt ($\overline{NMI}$): Active low. Non-Maskable Interrupt request. Sec. 3.8.

Reset/Abort ($\overline{RST}/\overline{ABT}$): Active low. If held active for one clock cycle and released, this pin causes an Abort Command, Sec. 3.5.4. If held longer, it initiates a Reset Sec. 3.3.

Pin Configuration



1.3 OUTPUT SIGNALS

Address Bits 16-23 (A16-A23): Active high. These are the most significant 8 bits of the memory address bus. Sec. 3.4.

Address Strobe ($\overline{ADS}$): Active low. Controls address latches; indicates start of a bus cycle. Sec. 3.4.

Data Direction In ($\overline{DDIN}$): Active low. Status signal indicating direction of data transfer during a bus cycle. Sec. 3.4.

High Byte Enable ($\overline{HBE}$): Active low. Status signal enabling transfer on the most-significant byte of the Data Bus. Sec. 3.4; Sec. 3.4.3.

Status (ST0-ST3): Active high. Bus cycle status code, ST0 least significant. Sec. 3.4.2. Encodings are:

0000 — Idle: CPU Inactive on Bus.
0001 — Idle: WAIT Instruction.
0010 — (Reserved)
0011 — Idle: Waiting for Slave.
0100 — Interrupt Ack., Master.
0101 — Interrupt Ack., Cascaded.
0110 — End of Interrupt, Master.
0111 — End of Interrupt, Cascaded.
1000 — Sequential Instruction Fetch.
1001 — Non-Sequential Instruction Fetch.
1010 — Data Transfer.
1011 — Read RMW Operand.
1100 — Read for Effective Address.
1101 — Transfer Slave Operand.
1110 — Read Slave Status Word.
1111 — Broadcast Slave ID.

Hold Acknowledge ($\overline{HLDA}$): Active low. Applied by the CPU in response to $\overline{HOLD}$ input, indicating that the bus has been released for DMA or multiprocessing purposes. Sec. 3.6.

User/Supervisor (U/$\overline{S}$): User or Supervisor Mode status. Sec. 3.7. High state indicates User Mode, low indicates Supervisor Mode. Sec. 3.7.

Interlocked Operation ($\overline{ILO}$): Active low. Indicates that an interlocked instruction is being executed. Sec. 3.7.

Program Flow Status ($\overline{PFS}$): Active low. Pulse indicates beginning of an instruction execution. Sec. 3.7.

1.4 INPUT-OUTPUT SIGNALS

Address/Data 0-15 (AD0-AD15): Active high. Multiplexed Address/Data information. Bit 0 is the least significant bit of each. Sec. 3.4.

Address Translation / Slave Processor Control ($\overline{AT}$/$\overline{SPC}$): Active low. Used by the CPU as the data strobe output for Slave Processor transfers; used by Slave Processors to acknowledge completion of an instruction. Sec. 3.4.6; Sec. 3.9. Sampled on trailing edge of Reset pulse as Address Translation Strap. Sec. 3.5.1.

Data Strobe/Float ($\overline{DS}/\overline{FLT}$): Active low. Data Strobe output, Sec. 3.4, or Float Command input, Sec. 3.5.3. Pin function is selected on $\overline{AT}/\overline{SPC}$ pin, Sec. 3.5.1.

© IC MASTER 1983

2 Architectural Description

2.1 PROGRAMMING MODEL

The NS16000 architecture includes 16 registers on the NS16032 CPU.

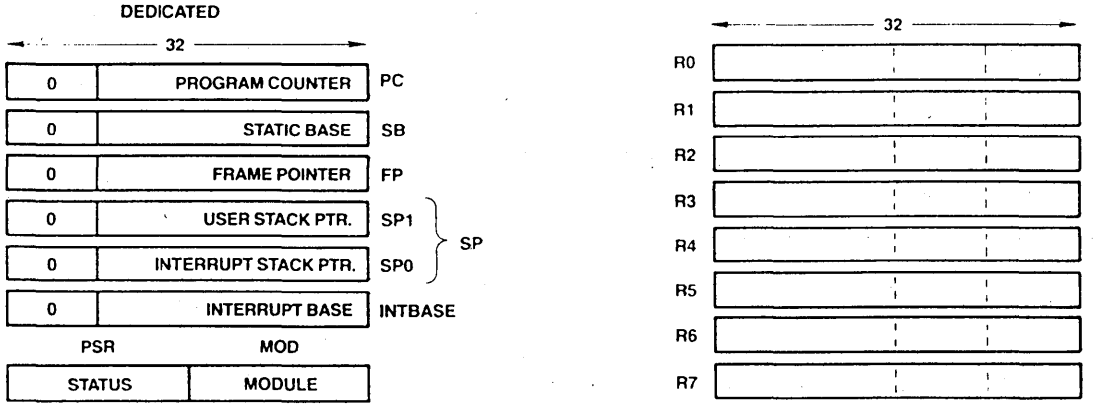


FIGURE 2-1. The General and Dedicated Registers.

2.1.1 General Purpose Registers

There are eight registers for meeting high speed general storage requirements, such as holding temporary variables and addresses. The general purpose registers are free for any use by the programmer. They are thirty-two bits in length. If a general register is specified for an operand which is eight or sixteen bits long, only the low part of the register is used; the high part is not referenced or modified.

2.1.2 Dedicated Registers

The eight dedicated registers of the NS16032 are assigned specific functions.

PC: The PROGRAM COUNTER register is a pointer to the first byte of the instruction currently being executed. The PC is used to reference memory in the program section. (In the NS16032 the upper eight bits of this register are always zero.)

SP0, SP1: The SP0 register points to the lowest address of the last item stored on the INTERRUPT STACK. This stack is normally used only by the operating system. It is used primarily for storing temporary data, and holding return information for operating system subroutines and interrupt and trap service routines. The SP1 register points to the lowest address of the last item stored on the USER STACK. This stack is used by normal user programs to hold temporary data and subroutine return information.

In this document, reference is made to the SP register. The terms "SP register" or "SP" refer to either SP0 or SP1, depending on the setting of the S bit in the PSR register. If the S bit in the PSR is 0 then SP refers to SP0. If the S bit in the PSR is 1 then SP refers to SP1. (In the NS16032 the upper eight bits of these registers are always zero).

Stacks in the NS16000 family grow downward in memory. A Push operation pre-decrements the Stack Pointer by the operand length. A Pop operation post-increments the Stack Pointer by the operand length.

FP: The FRAME POINTER register is used by a procedure to access parameters and local variables on the stack. The FP register is set up on procedure entry with the ENTER instruction and restored on procedure termination with the EXIT instruction.

The frame pointer holds the lowest address in memory occupied by the old contents of the frame pointer. (In the NS16032 the upper eight bits of this register are always zero.)

SB: The STATIC BASE register points to the global variables of a software module. This register is used to support relocatable global variables for software modules. The SB register holds the lowest address in memory occupied by the global variables of a module. (In the NS16032 the upper eight bits of this register are always zero.)

INTBASE: The INTERRUPT BASE register holds the address of the dispatch table for interrupts and traps (Sec. 3.8). The INTBASE register holds the lowest address in memory occupied by the dispatch table. (In the NS16032 the upper eight bits of this register are always zero.)

MOD: The MODULE register holds the address of the module descriptor of the currently executing software module. The MOD register is sixteen bits long, therefore the module table must be contained within the first 64K bytes of memory.

PSR: The PROCESSOR STATUS REGISTER (PSR) holds the status codes for the NS16032 microprocessor.

The PSR is sixteen bits long, divided into two eight-bit halves. The low order eight bits are accessible to all programs, but the high order eight bits are accessible only to programs executing in Supervisor Mode.

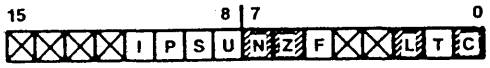


FIGURE 2-2. The Processor Status Register.

© IC MASTER 1983

C: The C bit indicates that a carry or borrow occurred after an addition or subtraction instruction. It is used in the calculation of multiple precision numbers. It may have a setting of 0 (no carry or borrow) or 1 (carry or borrow).

T: The T bit causes program tracing. If this bit is a 1, a TRC trap is executed after every instruction (Sec. 3.8.5).

L: The L bit is altered by comparison instructions. In a comparison instruction the L bit is set to "1" if the second operand is less than the first operand, when both operands are interpreted as unsigned integers. Otherwise, it is set to "0". In Floating Point comparisons, this bit is always cleared.

F: The F bit is a general condition flag, which is altered by many instructions (e.g., integer arithmetic instructions use it to indicate overflow).

Z: The Z bit is altered by comparison instructions. In a comparison instruction the Z bit is set to "1" if the second operand is equal to the first operand; otherwise it is set to "0".

N: The N bit is altered by comparison instructions. In a comparison instruction the N bit is set to "1" if the second operand is less than the first operand, when both operands are interpreted as signed integers. Otherwise, it is set to "0".

U: If the U bit is "1" no privileged instructions may be executed. If the U bit is "0" then all instructions may be executed. When U = 0 the NS16032 is said to be in Supervisor Mode; when U = 1 the NS16032 is said to be in User Mode. A User Mode program is restricted from executing certain instructions and accessing certain registers which could interfere with the operating system. For example, a User Mode program is prevented from changing the setting of the flag used to indicate its own privilege mode. A Supervisor Mode program is assumed to be a trusted part of the operating system, hence it has no such restrictions.

S: The S bit specifies whether the SP0 register or SP1 register is used as the stack pointer. The bit is automatically cleared on interrupts and traps. It may have a setting of 0 (use the SP0 register) or 1 (use the SP1 register).

P: The P bit prevents a TRC trap from occurring more than once for an instruction (Sec. 3.8.5). It may have a setting of 0 (no trace pending) or 1 (trace pending).

I: If I = 1, then all interrupts will be accepted (Sec. 3.8). If I = 0, only the NMI interrupt is accepted. Trap enables are not affected by this bit.

2.1.3 The Configuration Register (CFG)

Within the Control section of the NS16032 CPU is the four-bit CFG Register, which declares the presence of certain external devices. It is referenced by only one instruction, SETCFG, which is intended to be executed only as part of system initialization after reset. The format of the CFG Register is shown in Figure 2-3.

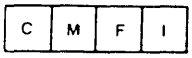


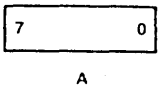
FIGURE 2-3. CFG Register.

The CFG I bit declares the presence of external interrupt vectoring circuitry (specifically, the NS16202 Interrupt Control Unit). If the CFG I bit is set, interrupts requested through the $\overline{INT}$ pin are "Vectored." If it is clear, these interrupts are "Non-Vectored." See Sec. 3.8.

The F, M and C bits declare the presence of the FPU, MMU and Custom Slave Processors. If these bits are not set, the corresponding instructions are trapped as being undefined.

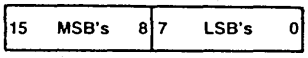
2.1.4 Memory Organization

The main memory of the NS16032 is a uniform linear address space. Memory locations are numbered sequentially starting at zero and ending at $2^{24} - 1$. The number specifying a memory location is called an address. The contents of each memory location is a byte consisting of eight bits. Unless otherwise noted, diagrams in this document show data stored in memory with the lowest address on the right and the highest address on the left. Also, when data is shown vertically, the lowest address is at the top of a diagram and the highest address at the bottom of the diagram. When bits are numbered in a diagram, the least significant bit is given the number zero, and is shown at the right of the diagram. Bits are numbered in increasing significance and toward the left.



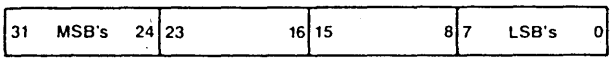
Byte at Address A

Two contiguous bytes is called a word. Except where noted (Sec. 2.2.1), the least significant byte of a word is stored at the lower address, and the most significant byte of the word is stored at the next higher address. In memory, the address of a word is the address of its least significant byte, and a word may start at any address.



Word at Address A

Two contiguous words is called a double word. Except where noted (Sec. 2.2.1), the least significant word of a double word is stored at the lowest address and the most significant word of the double word is stored at the address two greater. In memory, the address of a double word is the address of its least significant byte, and a double word may start at any address.



Double Word at Address A

Although memory is addressed as bytes, it is actually organized as words. Therefore, words and double words which are aligned to start at addresses which are even (multiples of two) are accessed more quickly than words and double words which are not so aligned.

© IC MASTER 1983

2.1.5 Dedicated Tables

Two of the NS16032 dedicated registers (MOD and INTBASE) serve as pointers to dedicated tables in memory.

The INTBASE register points to the Interrupt Dispatch and Cascade tables. These are described in Sec. 3.8.

The MOD register contains a pointer into the Module Table, whose entries are called Module Descriptors. A Module Descriptor contains four pointers, three of which are used by the NS16032. At any point in time, the MOD register contains the address of the Module Descriptor for the currently running module. It is automatically updated by the Call External Procedure instructions (CXP and CXPD).

The format of a Module Descriptor is shown in Figure 2-4. The Static Base entry contains the address of static data which is assigned to the running module. It is loaded into the CPU Static Base register by the CXP and CXPD instructions. The Program Base entry contains the address of the first byte of instruction code in the module. Since a module may have multiple entry points, the Program Base pointer serves only as a reference to find them.

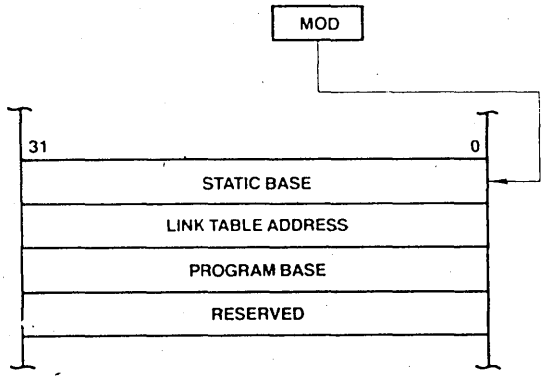


FIGURE 2-4. Module Descriptor Format.

The Link Table Address points to the Link Table for the currently running module. The Link Table provides the information which is needed for:

1) Sharing variables between modules. Such variables are accessed through the Link Table via the External addressing mode.
2) Transferring control from one module to another. This is done via the Call External Procedure (CXP) instruction.

The format of a Link Table is given in Figure 2-5. A Link Table Entry for an external variable contains the 32-bit address of that variable. An entry for an external procedure contains two 16-bit fields: Module and Offset. The Module field contains the new MOD register contents for the module being entered. The Offset field is an unsigned number giving the position of the entry point relative to the new module's Program Base pointer.

For further details of the functions of these tables, see the NS16000 Programmer's Manual.

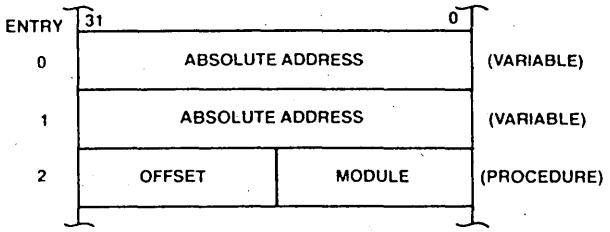


FIGURE 2-5. A Sample Link Table.

2.2 INSTRUCTION SET

2.2.1 General Instruction Format

Figure 2-6 shows the general format of an NS16000 instruction. The Basic Instruction is one to three bytes long and contains the Opcode and up to two 5-bit General Addressing Mode ("Gen") fields. Following the Basic Instruction field is a set of optional extensions, which may appear depending on the instruction and the addressing modes selected.

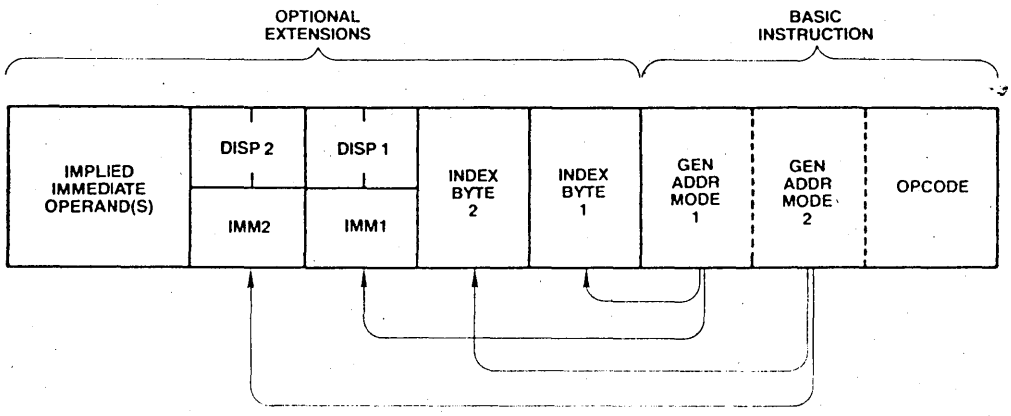


FIGURE 2-6. General Instruction Format.

© IC MASTER 1983

Index Bytes appear when either or both Gen fields specify Scaled Index. In this case, the Gen field specifies only the Scale Factor (1, 2, 4 or 8), and the Index Byte specifies which General Purpose Register to use as the index, and which addressing mode calculation to perform before indexing. See Figure 2-7.

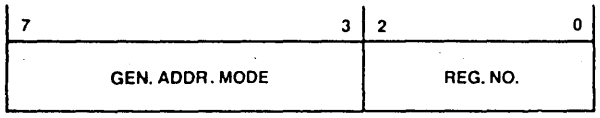


FIGURE 2-7. Index Byte Format.

Following Index Bytes come any displacements (addressing constants) or immediate values associated with the selected addressing modes. Each Disp/Imm field may contain one or two displacements, or one immediate value. The size of a Displacement field is encoded within the top bits of that field, as shown in Figure 2-8, with the remaining bits interpreted as a signed (two's complement) value. The size of an immediate value is determined from the Opcode field. Both Displacement and Immediate fields are stored most-significant byte first. Note that this is backward from the usual memory representation of data (Sec. 2.1.4).

Some instructions require additional, "implied" immediates and/or displacements, apart from those associated with addressing modes. Any such extensions appear at the end of the instruction, in the order that they appear within tne list of operands in the instruction definition (Sec. 2.2.3).

2.2 2 Addressing Modes

The NS16032 CPU generally accesses an operand by calculating its Effective Address based on information available when the operand is to be accessed. The method to be used in performing this calculation is specified by the programmer as an "addressing mode."

Addressing modes in the NS16032 are designed to optimally support high-level language accesses to variables. In nearly all cases, a variable access requires only one addressing mode, within the instruction which acts upon that variable. Extraneous data movement is therefore minimized.

NS16032 Addressing Modes fall into nine basic types:

Register: The operand is available in one of the eight General Purpose Registers. In certain Slave Processor instructions, an auxiliary set of eight registers may be referenced instead.

Register Relative: A General Purpose Register contains an address to which is added a displacement value from the instruction, yielding the Effective Address of the operand in memory.

Memory Space: Identical to Register Relative above, except that the register used is one of the dedicated registers PC, SP, SB or FP. These registers point to data areas generally needed by high-level languages.

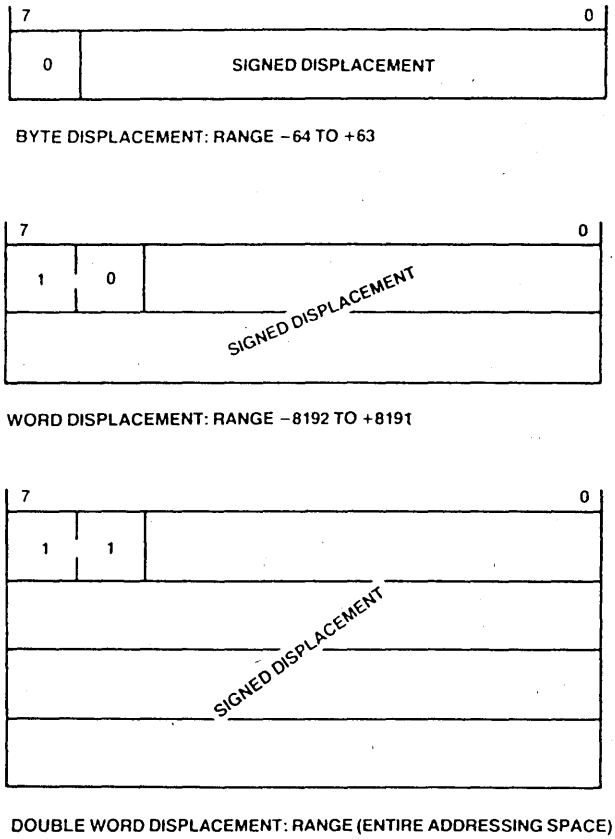


FIGURE 2-8. Displacement Encodings.

Memory Relative: A pointer variable is found within the memory space pointed to by the SP, SB or FP register. A displacement is added to that pointer to generate the Effective Address of the operand.

Immediate: The operand is encoded within the instruction. This addressing mode is not allowed if the operand is to be written.

Absolute: The address of the operand is specified by a displacement field in the instruction.

External: A pointer value is read from a specified entry of the current Link Table. To this pointer value is added a displacement, yielding the Effective Address of the operand.

Top of Stack: The currently-selected Stack Pointer (SP0 or SP1) specifies the location of the operand. The operand is pushed or popped, depending on whether it is written or read.

Scaled Index: Although encoded as an addressing mode, Scaled Indexing is an option on any addressing mode except Immediate or another Scaled Index. It has the effect of calculating an Effective Address, then multiplying any General Purpose Register by 1, 2, 4 or 8 and adding it into the total, yielding the final Effective Address of the operand.

The following table, Table 2-1, is a brief summary of the addressing modes. For a complete description of their actions, see the Programmer's Manual.

© IC MASTER 1983

2.2.3 Instruction Set Summary

This section presents a brief description of the NS16032 instruction set. The Format column of each table is a reference into the Instruction Format tables (Appendix A). The Instruction column gives the instruction as coded in assembly language, and the Description column provides a short description of the function provided by that instruction. Further details of the exact operations performed by each instruction may be found in the Programmer's Manual.

Notations:

i = Integer length suffix: B = Byte
W = Word
D = Double Word

f = Floating Point length suffix: F = Standard Floating
L = Long Floating

gen = General operand. Any addressing mode can be specified.

short = A 4-bit value encoded within the Basic Instruction.

imm = Implied immediate operand. An 8-bit value appended after any addressing extensions.

disp = Displacement (addressing constant): 8, 16 or 32 bits. All three lengths legal.

reg = Any General Purpose Register: R0-R7.

areg = Any Dedicated/Address Register: SP, SB, FP, MOD, INTBASE, PSR, US (bottom 8 PSR bits).

mreg = Any Memory Management Status/Control Register.

creg = A Custom Slave Processor Register (Implementation Dependent).

cond = Any condition code, encoded as a 4-bit field within the Basic Instruction.

© IC MASTER 1983

TABLE 2-1.
NS16032 Addressing Modes

ENCODING	MODE	ASSEMBLER SYNTAX	EFFECTIVE ADDRESS
Register			
00000	Register 0	R0 or F0	None: Operand is in the specified register.
00001	Register 1	R1 or F1	
00010	Register 2	R2 or F2	
00011	Register 3	R3 or F3	
00100	Register 4	R4 or F4	
00101	Register 5	R5 or F5	
00110	Register 6	R6 or F6	
00111	Register 7	R7 or F7	
Register Relative			
01000	Register 0 relative	disp(R0)	Disp + Register.
01001	Register 1 relative	disp(R1)	
01010	Register 2 relative	disp(R2)	
01011	Register 3 relative	disp(R3)	
01100	Register 4 relative	disp(R4)	
01101	Register 5 relative	disp(R5)	
01110	Register 6 relative	disp(R6)	
01111	Register 7 relative	disp(R7)	
Memory Space			
11000	Frame memory	disp(FP)	Disp + Register; "SP" is either SP0 or SP1, as selected in PSR.
11001	Stack memory	disp(SP)	
11010	Static memory	disp(SB)	
11011	Program memory	disp(PC)	
Memory Relative			
10000	Frame memory relative	disp2(disp1(FP))	Disp2 + Pointer; Pointer found at address Disp1 + Register. "SP" is either SP0 or SP1, as selected in PSR.
10001	Stack memory relative	disp2(disp1(SP))	
10010	Static memory relative	disp2(disp1(SB))	
Immediate			
10100	Immediate	value	None: Operand is input from instruction queue.
Absolute			
10101	Absolute	@disp	Disp.
External			
10110	External	EXTERNAL (disp1)+disp2	Disp2 + Pointer; Pointer is found at Link Table Entry number Disp1.
Top of Stack			
10111	Top of stack	TOS	Top of current stack, using either User or Interrupt Stack Pointer, as selected in PSR. Automatic Push/Pop included.
Scaled Index			
11100	Index, bytes	mode[Rn:B]	Mode + Rn.
11101	Index, words	mode[Rn:W]	Mode + 2×Rn.
11110	Index, double words	mode[Rn:D]	Mode + 4×Rn.
11111	Index, quad words	mode[Rn:Q]	Mode + 8×Rn. "Mode" and "n" are contained within the Index Byte.
10011	(Reserved for Future Use)		

© IC MASTER 1983

National Semiconductor

NS16032-6

MOVES

Format	Instruction		Description
4	MOVi	gen,gen	Move a value.
2	MOVQi	short,gen	Extend and move a 4-bit constant.
7	MOVMi	gen,gen,disp	Move Multiple: disp bytes.
7	MOVZBW	gen,gen	Move with zero extension.
7	MOVZiD	gen,gen	Move with zero extension.
7	MOVXBW	gen,gen	Move with sign extension.
7	MOVXiD	gen,gen	Move with sign extension.
4	ADDR	gen,gen	Move Effective Address.

INTEGER ARITHMETIC

Format	Instruction		Description
4	ADDi	gen,gen	Add.
2	ADDQi	short,gen	Add 4-bit constant.
4	ADDCi	gen,gen	Add with carry.
4	SUBi	gen,gen	Subtract.
4	SUBCi	gen,gen	Subtract with carry (borrow).
6	NEGi	gen,gen	Negate (2's complement).
6	ABSi	gen,gen	Take absolute value.
7	MULi	gen,gen	Multiply.
7	QUOi	gen,gen	Divide, rounding toward zero.
7	REMi	gen,gen	Remainder from QUO.
7	DIVi	gen,gen	Divide, rounding down.
7	MODi	gen,gen	Remainder from DIV (Modulus).
7	MEIi	gen,gen	Multiply to Extended Integer.
7	DEIi	gen,gen	Divide Extended Integer.

PACKED DECIMAL (BCD)

Format	Instruction		Description
6	ADDPi	gen,gen	Add Packed.
6	SUBPi	gen,gen	Subtract Packed.

INTEGER COMPARISON

Format	Instruction		Description
4	CMPi	gen,gen	Compare.
2	CMPQi	short,gen	Compare to 4-bit constant.
7	CMPMi	gen,gen,disp	Compare Multiple: disp bytes.

LOGICAL AND BOOLEAN

Format	Instruction		Description
4	ANDi	gen,gen	Logical AND.
4	ORi	gen,gen	Logical OR.
4	BICi	gen,gen	Clear selected bits.
4	XORi	gen,gen	Logical Exclusive OR.
6	COMi	gen,gen	Complement all bits.
6	NOTi	gen,gen	Boolean complement: LSB only.
2	Scondi	gen	Save condition code (cond) as a Boolean variable of size i.

SHIFTS

Format	Instruction		Description
6	LSHi	gen,gen	Logical Shift, left or right.
6	ASHi	gen,gen	Arithmetic Shift, left or right.
6	ROTi	gen,gen	Rotate, left or right.

© IC MASTER 1983

National Semiconductor

NS16032-6

BITS

Format	Instruction		Description
4	TBITi	gen,gen	Test bit.
6	SBITi	gen,gen	Test and set bit.
6	SBITIi	gen,gen	Test and set bit, interlocked.
6	CBITi	gen,gen	Test and clear bit.
6	CBITIi	gen,gen	Test and clear bit, interlocked.
6	IBITi	gen,gen	Test and invert bit.
8	FFSi	gen,gen	Find first set bit.

BIT FIELDS

Bit fields are values in memory which are not aligned to byte boundaries. Examples are PACKED arrays and records used in Pascal. "Extract" instructions read and align a bit field. "Insert" instructions write a bit field from an aligned source.

Format	Instruction		Description
8	EXTi	reg,gen,gen,disp	Extract bit field(array oriented).
8	INSi	reg,gen,gen,disp	Insert bit field (array oriented).
7	EXTSi	gen,gen,imm,imm	Extract bit field (short form).
7	INSSi	gen,gen,imm,imm	Insert bit field (short form).
8	CVTP	reg,gen,gen	Convert to Bit Field Pointer.

ARRAYS

Format	Instruction		Description
8	CHECKi	reg,gen,gen	Index bounds check.
8	INDEXi	reg,gen,gen	Recursive indexing step for multiple-dimensional arrays.

STRINGS

String instructions assign specific functions to the General Purpose Registers:

R4 – Comparison Value
R3 – Translation Table Pointer
R2 – String 2 Pointer
R1 – String 1 Pointer
R0 – Limit Count

Options on all string instructions are:

B (Backward): Decrement string pointers after each step rather than incrementing.
U (Until match): End instruction if String 1 entry matches R4.
W (While match): End instruction if String 1 entry does not match R4.

All string instructions end when R0 decrements to zero.

Format	Instruction		Description
5	MOVSi	options	Move String 1 to String 2.
	MOVST	options	Move string, translating bytes.
5	CMPSi	options	Compare String 1 to String 2.
	CMPST	options	Compare, translating String 1 bytes.
5	SKPSi	options	Skip over String 1 entries.
	SKPST	options	Skip, translating bytes for Until/While.

© IC MASTER 1983

JUMPS AND LINKAGE

Format	Instruction		Description
3	JUMP	gen	Jump.
0	BR	disp	Branch (PC Relative).
0	Bcond	disp	Conditional branch.
3	CASEi	gen	Multiway branch.
2	ACBi	short,gen,disp	Add 4-bit constant and branch if non-zero.
3	JSR	gen	Jump to subroutine.
1	BSR	disp	Branch to subroutine.
1	CXP	disp	Call external procedure.
3	CXPD	gen	Call external procedure using descriptor.
1	SVC		Supervisor Call.
1	FLAG		Flag Trap.
1	BPT		Breakpoint Trap.
1	ENTER	[reg list],disp	Save registers and allocate stack frame (Enter Procedure).
1	EXIT	[reg list]	Restore registers and reclaim stack frame (Exit Procedure).
1	RET	disp	Return from subroutine.
1	RXP	disp	Return from external procedure call.
1	RETT	disp	Return from trap. (Privileged)
1	RETI		Return from interrupt. (Privileged)

CPU REGISTER MANIPULATION

Format	Instruction		Description
1	SAVE	[reg list]	Save General Purpose Registers.
1	RESTORE	[reg list]	Restore General Purpose Registers.
2	LPRi	areg,gen	Load Dedicated Register. (Privileged if PSR or INTBASE)
2	SPRi	areg,gen	Store Dedicated Register. (Privileged if PSR or INTBASE)
3	ADJSPi	gen	Adjust Stack Pointer.
3	BISPSRi	gen	Set selected bits in PSR. (Privileged if not Byte length)
3	BICPSRi	gen	Clear selected bits in PSR. (Privileged if not Byte length)
5	SETCFG	[option list]	Set Configuration Register. (Privileged)

FLOATING POINT

Format	Instruction		Description
11	MOVf	gen,gen	Move a Floating Point value.
9	MOVLF	gen,gen	Move and shorten a Long value to Standard.
9	MOVFL	gen,gen	Move and lengthen a Standard value to Long.
9	MOVif	gen,gen	Convert any integer to Standard or Long Floating.
9	ROUNDfi	gen,gen	Convert to integer by rounding.
9	TRUNCfi	gen,gen	Convert to integer by truncating, toward zero.
9	FLOORfi	gen,gen	Convert to largest integer less than or equal to value.
11	ADDf	gen,gen	Add.
11	SUBf	gen,gen	Subtract.
11	MULf	gen,gen	Multiply.
11	DIVf	gen,gen	Divide.
11	CMPf	gen,gen	Compare.
11	NEGf	gen,gen	Negate.
11	ABSf	gen,gen	Take absolute value.
9	LFSR	gen	Load FSR.
9	SFSR	gen	Store FSR.

MEMORY MANAGEMENT

Format	Instruction		Description
14	LMR	mreg,gen	Load Memory Management Register. (Privileged)
14	SMR	mreg,gen	Store Memory Management Register. (Privileged)
14	RDVAL	gen	Validate address for reading. (Privileged)
14	WRVAL	gen	Validate address for writing. (Privileged)
8	MOVSUi	gen,gen	Move a value from Supervisor Space to User Space. (Privileged)
8	MOVUSi	gen,gen	Move a value from User Space to Supervisor Space. (Privileged)

© IC MASTER 1983

National Semiconductor

NS16032-6

MISCELLANEOUS

Format	Instruction		Description
1	NOP		No Operation.
1	WAIT		Wait for interrupt.
1	DIA		Diagnose. Single-byte "Branch to Self" for hardware breakpointing. Not for use in programming.

CUSTOM SLAVE

Format	Instruction		Description
15.5	CCAL0c	gen,gen	Custom Calculate.
15.5	CCAL1c	gen,gen	
15.5	CCAL2c	gen,gen	
15.5	CCAL3c	gen,gen	
15.5	CMOV0c	gen,gen	Custom Move.
15.5	CMOV1c	gen,gen	
15.5	CMOV2c	gen,gen	
15.5	CCMPc	gen,gen	Custom Compare.
15.1	CCV0ci	gen,gen	Custom Convert.
15.1	CCV1ci	gen,gen	
15.1	CCV2ci	gen,gen	
15.1	CCV3ic	gen,gen	
15.1	CCV4DQ	gen,gen	
15.1	CCV5QD	gen,gen	
15.1	LCSR	gen	Load Custom Status Register.
15.1	SCSR	gen	Store Custom Status Register.
15.0	CATST0	gen	Custom Address/Test. (Privileged)
15.0	CATST1	gen	(Privileged)
15.0	LCR	creg,gen	Load Custom Register. (Privileged)
15.0	SCR	creg,gen	Store Custom Register. (Privileged)

© IC MASTER 1983

3 Functional Description

3.1 POWER AND GROUNDING

The NS16032 requires a single 5-volt power supply, applied on pin 48 (V_{CC}). See DC Specification Section.

Grounding connections are made on two pins. Logic Ground (GNDL, pin 24) is the common pin for on-chip logic, and Buffer Ground (GNDB, pin 25) is the common pin for the output drivers. For optimal noise immunity, it is recommended that GNDL be attached through a single conductor directly to GNDB, and that all other grounding connections be made only to GNDB, as shown below (Figure 3-1).

In addition to V_{CC} and Ground, the NS16032 CPU uses an internally-generated negative voltage. It is necessary to filter this voltage externally by attaching a pair of capacitors (Fig. 3-1) from the BBG pin to ground. Recommended values for these are:

C_1: 1 μF, Tantalum.

C_2: 1000 pF, low inductance. This should be either a disc or monolithic ceramic capacitor.

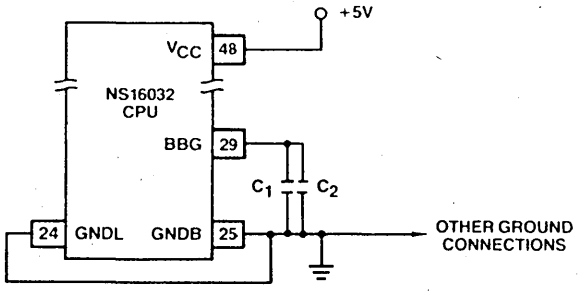


FIGURE 3-1. Recommended Supply Connections.

3.2 CLOCKING

The NS16032 inputs clocking signals from the NS16201 Timing Control Unit (TCU), which presents two non-overlapping phases of a single clock frequency. These phases are called PHI1 (pin 26) and PHI2 (pin 27). Their relationship to each other is shown below (Figure 3-2).

Each positive edge of PHI1 defines a transition in the timing state ("T-State") of the CPU. One T-State represents the execution of one microinstruction within the CPU, and/or one step of an external bus transfer. See the AC Specifications (Sec. 4) for complete specifications of PHI1 and PHI2.

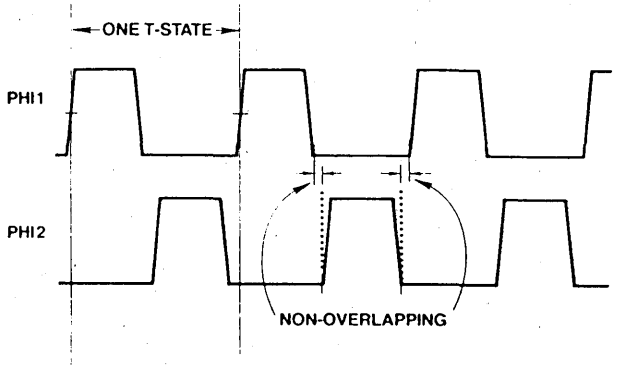


FIGURE 3-2. Clock Timing Relationships.

As the TCU presents signals with very fast transitions, it is recommended that the conductors carrying PHI1 and PHI2 be kept as short as possible, and that they not be connected anywhere except from the TCU to the CPU and, if present, the MMU. A TTL Clock signal (CTTL) is provided by the TCU for all other clocking.

3.3 RESETTING

The $\overline{RST}/\overline{ABT}$ pin serves both as a Reset for on-chip logic and as the Abort input for Memory-Managed systems. For its use as the Abort Command, see Sec. 3.5.4.

The CPU may be reset at any time by pulling the $\overline{RST}/\overline{ABT}$ pin low for at least 64 clock cycles. Upon detecting a reset, the CPU terminates instruction processing, resets its internal logic, and clears the Program Counter (PC) and Processor Status Register (PSR) to all zeroes.

On application of power, $\overline{RST}/\overline{ABT}$ must be held low for at least 50 μsec after V_{CC} is stable. This is to ensure that all on-chip voltages are completely stable before operation. Whenever a Reset is applied, it must also remain

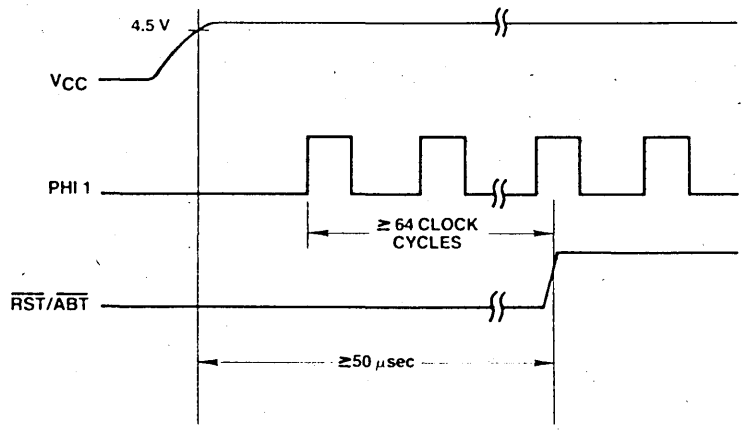


FIGURE 3-3. Power-on Reset Requirements.

© IC MASTER 1983

active for not less than 64 clock cycles. The trailing (positive-going) edge must occur while PHI1 is high, and no later than 10 ns before the PHI1 trailing edge. See Figures 3-3 and 3-4.

The NS16201 Timing Control Unit (TCU) provides circuitry to meet the Reset requirements of the NS16032 CPU. Figure 3-5a shows the recommended connections for a non-Memory-Managed system. Figure 3-5b shows the connections for a Memory-Managed system.

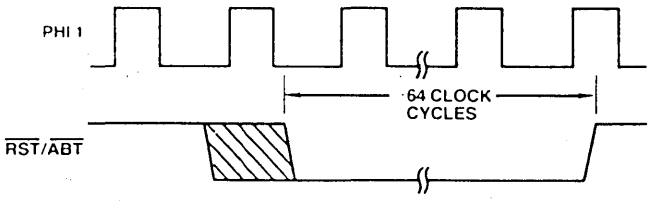


FIGURE 3-4. General Reset Timing.

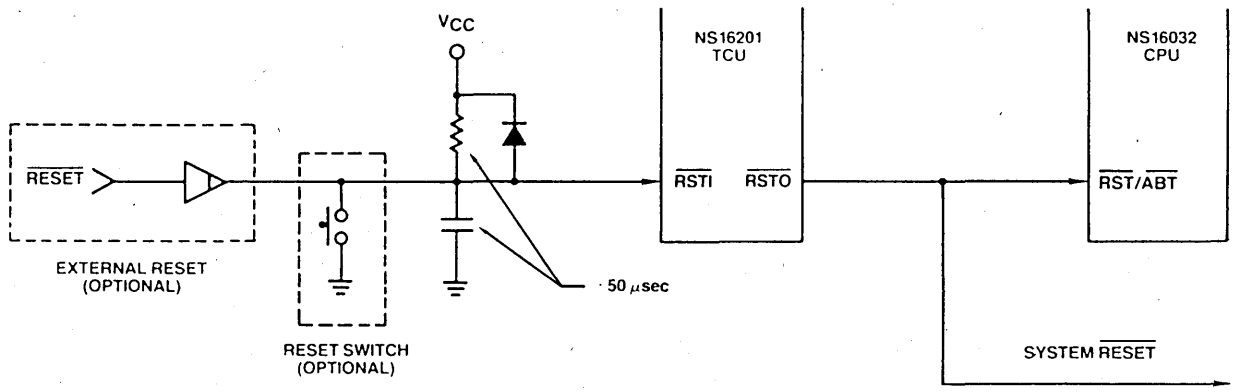


FIGURE 3-5a. Recommended Reset Connections, Non-Memory-Managed System.

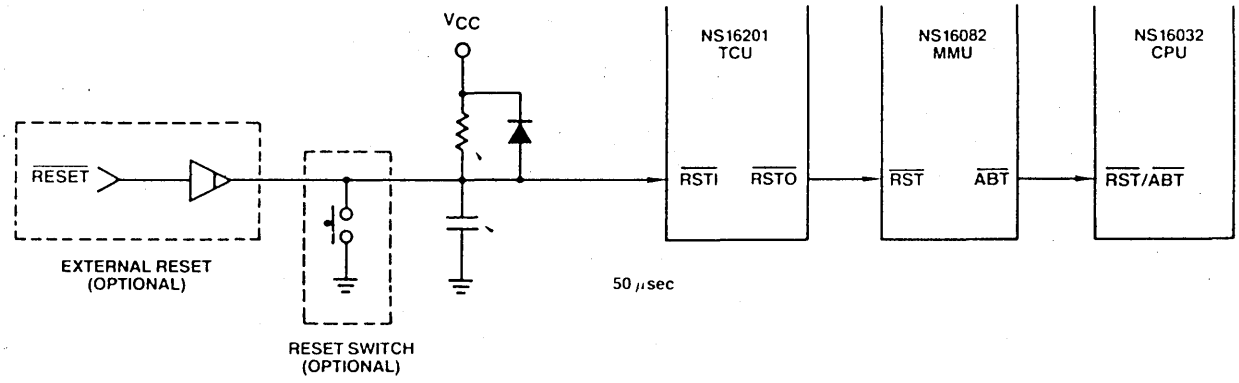


FIGURE 3-5b. Recommended Reset Connections, Memory-Managed System.

3.4 BUS CYCLES

The NS16032 CPU has a strap option which defines the Bus Timing Mode as either With or Without Address Translation. This section describes only bus cycles under the No Address Translation option. For details of the use of the strap and of bus cycles with address translation, see Sec. 3.5.

The CPU will perform a bus cycle for one of the following reasons:

1) To write or read data, to or from memory or a peripheral interface device. Peripheral input and output are memory-mapped in the NS16000 family.
2) To fetch instructions into the eight-byte instruction queue. This happens whenever the bus would otherwise be idle and the queue is not already full.
3) To acknowledge an interrupt and allow external circuitry to provide a vector number, or to acknowledge completion of an interrupt service routine.
4) To transfer information to or from a Slave Processor.

In terms of bus timing, cases 1 through 3 above are identical. For timing specifications, see Sec. 4. The only external difference between them is the four-bit code placed on the Bus Status pins (ST0-ST3). Slave Processor cycles differ in that separate control signals are applied (Sec. 3.4.6).

The sequence of events in a non-Slave bus cycle is shown below in Figure 3-7 for a Read cycle and Figure 3-8 for a Write cycle. The cases shown assume that the selected memory or interface device is capable of communicating with the CPU at full speed. If it is not, then cycle extension may be requested through the RDY line (Sec. 3.4.1).

© IC MASTER 1983

A full-speed bus cycle is performed in four cycles of the PHI1 clock signal, labeled T1 through T4. Clock cycles not associated with a bus cycle are designated Ti (for "Idle").

During T1, the CPU applies an address on pins AD0-AD15 and A16-A23. It also provides a low-going pulse on the $\overline{ADS}$ pin, which serves the dual purpose of informing external circuitry that a bus cycle is starting and of providing control to an external latch for demultiplexing Address bits 0-15 from the AD0-AD15 pins. See Figure 3-6. During this time also the status signals $\overline{DDIN}$, indicating the direction of the transfer, and $\overline{HBE}$, indicating whether the high byte (AD8-AD15) is to be referenced, become valid.

During T2 the CPU switches the Data Bus, AD0-AD15, to either accept or present data. Note that the signals A16-A23 remain valid, and need not be latched. It also starts the data strobe ($\overline{DS}$), signalling the beginning of the data transfer. Associated signals from the NS16201 Timing Control Unit are also activated at this time: $\overline{RD}$ (Read Strobe) or $\overline{WR}$ (Write Strobe), $\overline{TSO}$ (Timing State Output, indicating that T2 has been reached) and $\overline{DBE}$ (Data Buffer Enable).

The T3 state provides for access time requirements, and it occurs at least once in a bus cycle. At the beginning of T3, on the rising edge of the PHI1 clock, the RDY (Ready) line is sampled to determine whether the bus cycle will be extended (Sec. 3.4.1).

If the CPU is performing a Read cycle, the Data Bus (AD0-AD15) is sampled at the falling edge of PHI2 of the last T3 state. See Timing Specification, Sec. 4. Data must, however, be held at least until the beginning of T4. $\overline{DS}$ and $\overline{RD}$ are guaranteed not to go inactive before this point, so the rising edge of either of them may safely be used to disable the device providing the input data.

The T4 state finishes the bus cycle. At the beginning of T4, the $\overline{DS}$, $\overline{RD}$ or $\overline{WR}$, and $\overline{TSO}$ signals go inactive, and at the rising edge of PHI2, $\overline{DBE}$ goes inactive, having provided for necessary data hold times. Addresses (and Data during Write cycles) remain valid from the CPU throughout T4. Note that the Bus Status lines (ST0-ST3) change at the beginning of T4, anticipating the following bus cycle (if any).

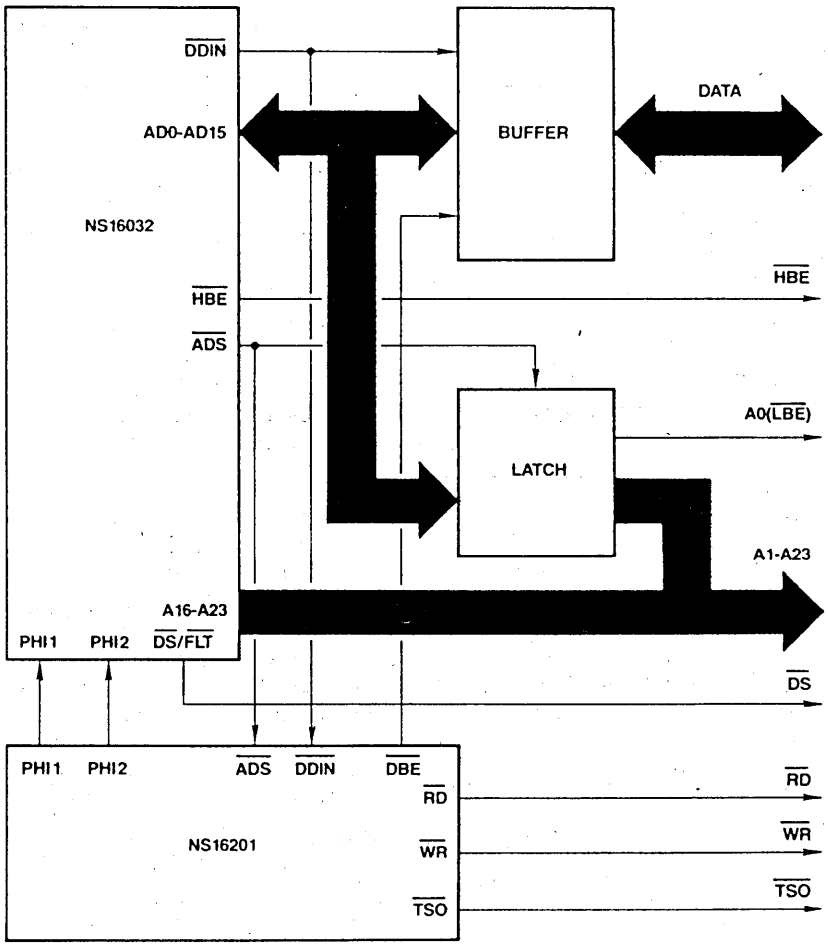


FIGURE 3-6. Bus Connections.

© IC MASTER 1983

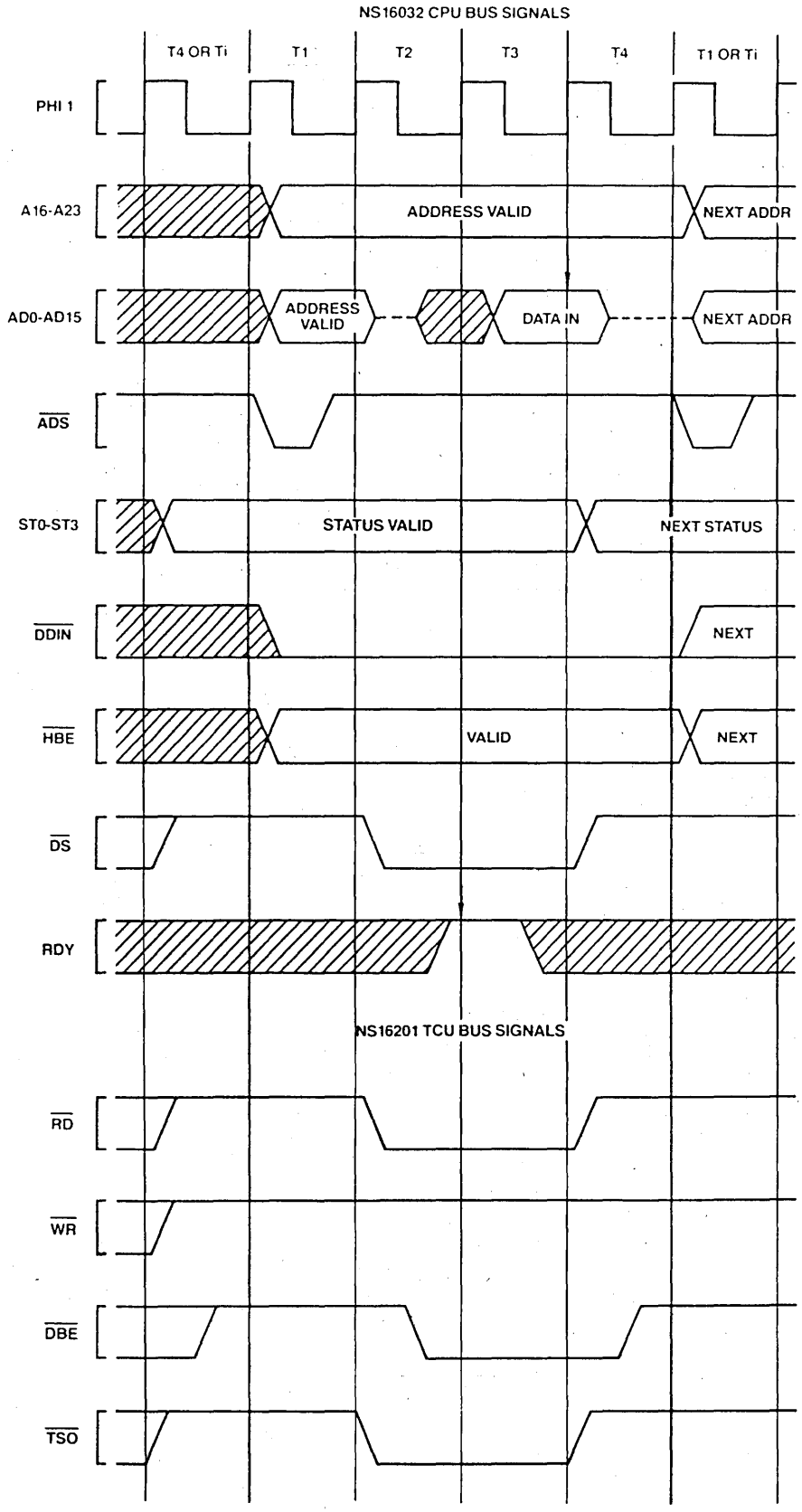


FIGURE 3-7. Read Cycle Timing.

© IC MASTER 1983

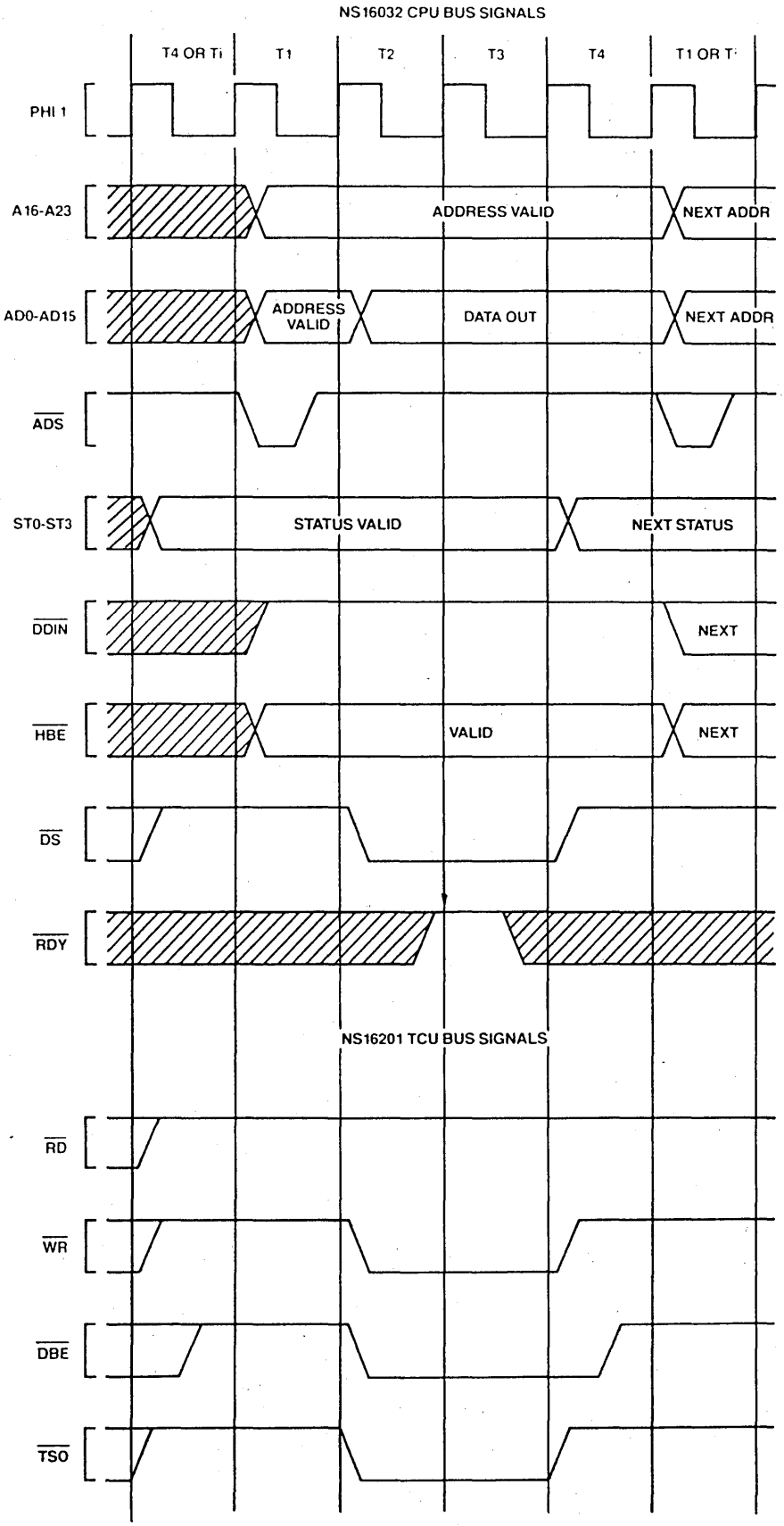


FIGURE 3-8. Write Cycle Timing.

© IC MASTER 1983

3.4.1 Cycle Extension

To allow sufficient strobe widths and access times for any speed of memory or peripheral device, the NS16032 provides for extension of a bus cycle. Any type of bus cycle except a Slave Processor cycle can be extended.

In Figures 3-7 and 3-8, note that during T3 all bus control signals from the CPU and TCU are flat. Therefore, a bus cycle can be cleanly extended by causing the T3 state to be repeated. This is the purpose of the RDY (Ready) pin.

At the beginning of T3, on the rising edge of PHI1, the RDY line is sampled by the CPU. If RDY is high, the next T-State will be T4, ending the bus cycle. If it is sampled low, then the next T-State will be another T3, and the RDY line will again be sampled on PHI1. Each additional T3 state after the first is referred to as a "WAIT State". See Figure 3-9.

The RDY pin is driven by the NS16201 Timing Control Unit, which applies WAIT States to the CPU as requested on three sets of pins:

1) $\overline{\text{CWAIT}}$ (Continuous WAIT), which holds the CPU in WAIT states until removed.
2) $\overline{\text{WAIT1}}$, $\overline{\text{WAIT2}}$, $\overline{\text{WAIT4}}$, $\overline{\text{WAIT8}}$ (Collectively $\overline{\text{WAITn}}$), which may be given a four-bit binary value requesting a specific number of WAIT States from 0 to 15.
3) $\overline{\text{PER}}$ (Peripheral), which inserts five additional WAIT states and causes the TCU to reshape the $\overline{\text{RD}}$ and $\overline{\text{WR}}$ strobes. This provides the setup and hold times required by most MOS peripheral interface devices.

Combinations of these various WAIT requests are both legal and useful. For details on their use, see the NS16201 Data Sheet.

Figure 3-10 illustrates a typical Read cycle, with two WAIT states requested through the TCU $\overline{\text{WAITn}}$ pins.

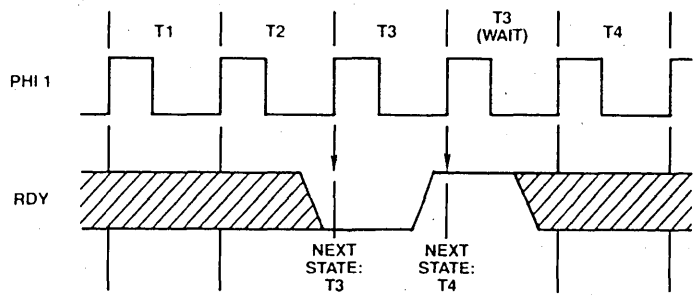


FIGURE 3-9. RDY Pin Timing.

3.4.2 Bus Status

The NS16032 CPU presents four bits of Bus Status information on pins ST0-ST3. The various combinations on these pins indicate why the CPU is performing a bus cycle, or, if it is idle on the bus, then why it is idle.

Referring to Figures 3-7 and 3-8, note that Bus Status leads the corresponding Bus Cycle, going valid one clock cycle before T1, and changing to the next state at T4. This allows the system designer to fully decode the Bus Status and, if desired, latch the decoded signals before $\overline{\text{ADS}}$ initiates the Bus Cycle.

The Bus Status pins are interpreted as a four-bit value, with ST0 the least significant bit. Their values decode as follows:

0000 – The bus is idle because the CPU does not yet need access to the bus.

0001 – The bus is idle because the CPU is executing the WAIT instruction.

0010 – (Reserved for future use.)

0011 – The bus is idle because the CPU is waiting for a Slave Processor to complete an instruction.

0100 – Interrupt Acknowledge, Master.
The CPU is performing a Read cycle. To acknowledge receipt of a Non-Maskable Interrupt (on $\overline{\text{NMI}}$) it will read from address $FFFF00_{16}$, but will ignore any data provided. To acknowledge receipt of a Maskable Interrupt (on $\overline{\text{INT}}$) it will read from address $FFFE00_{16}$, expecting a vector number to be provided from the Master NS16202 Interrupt Control Unit. If the vectoring mode selected by the last SETCFG instruction was Non-Vectored, then the CPU will ignore the value it has read and will use a default vector instead, having assumed that no NS16202 is present. See Sec. 3.4.5.

0101 – Interrupt Acknowledge, Cascaded.
The CPU is reading a vector number from a Cascaded NS16202 Interrupt Control Unit. The address provided is the address of the NS16202 Hardware Vector register. See Sec. 3.4.5.

0110 – End of Interrupt, Master.
The CPU is performing a Read cycle to indicate that it is executing a Return from Interrupt (RETI) instruction. See Sec. 3.4.5.

0111 – End of Interrupt, Cascaded.
The CPU is reading from a Cascaded Interrupt Control Unit to indicate that it is returning (through RETI) from an interrupt service routine requested by that unit. See Sec. 3.4.5.

1000 – Sequential Instruction Fetch.
The CPU is reading the next sequential word from the instruction stream into the Instruction

© IC MASTER 1983

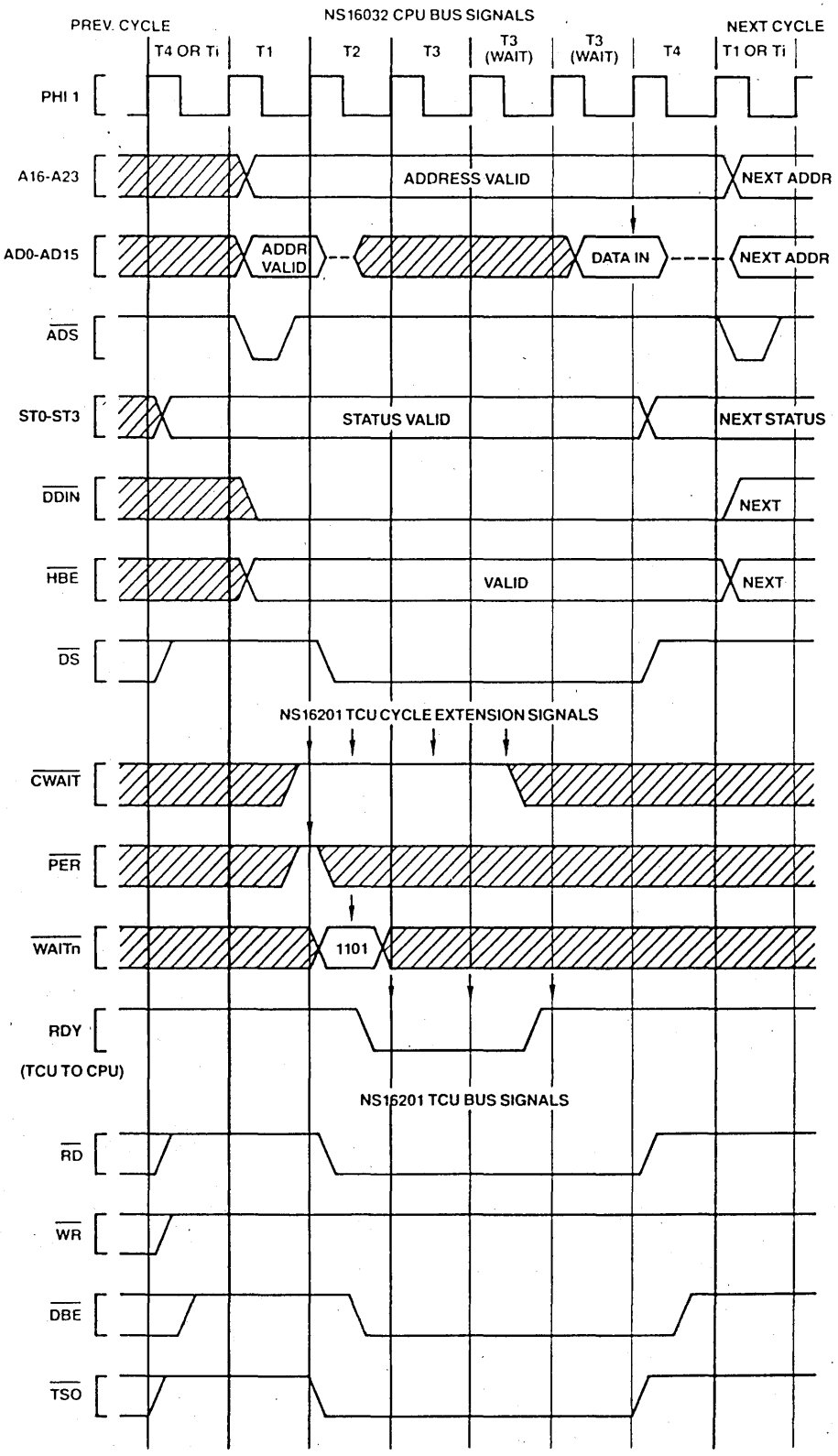


FIGURE 3-10. Extended Cycle Example.

NOTE:

Arrows on $\overline{\text{CWAIT}}$, $\overline{\text{PER}}$, $\overline{\text{WAITn}}$ indicate points at which the TCU samples. Arrows on AD0-AD15 and RDY indicate point at which the CPU samples.

© IC MASTER 1983

Queue. It will do so whenever the bus would otherwise be idle and the queue is not already full.

1001 – Non-Sequential Instruction Fetch.
The CPU is performing the first fetch of instruction code after the Instruction Queue is purged. This will occur as a result of any jump or branch, or any interrupt or trap, or execution of certain instructions.

1010 – Data Transfer.
The CPU is reading or writing an operand of an instruction.

1011 – Read RMW Operand.
The CPU is reading an operand which will subsequently be modified and rewritten. If memory protection circuitry would not allow the following Write cycle, it must abort this cycle.

1100 – Read for Effective Address Calculation.
The CPU is reading information from memory in order to determine the Effective Address of an operand. This will occur whenever an instruction uses the Memory Relative or External addressing mode.

1101 – Transfer Slave Processor Operand.
The CPU is either transferring an instruction operand to or from a Slave Processor, or it is issuing the Operation Word of a Slave Processor instruction. See Sec. 3.9.1.

1110 – Read Slave Processor Status.
The CPU is reading a Status Word from a Slave Processor. This occurs after the Slave Processor has signalled completion of an instruction. The transferred word tells the CPU whether a trap should be taken, and in some instructions it presents new values for the CPU Processor Status Register bits N, Z, L or F. See Sec. 3.9.1.

1111 – Broadcast Slave ID.
The CPU is initiating the execution of a Slave Processor instruction. The ID Byte (first byte of the instruction) is sent to all Slave Processors, one of which will recognize it. From this point the CPU is communicating with only one Slave Processor. See Sec. 3.9.1.

3.4.3 Data Access Sequences

The 24-bit address provided by the NS16032 is a byte address; that is, it uniquely identifies one of up to 16,777,216 eight-bit memory locations. An important feature of the NS16032 is that the presence of a 16-bit data bus imposes no restrictions on data alignment; any data item, regardless of size, may be placed starting at any memory address. The NS16032 provides a special control signal, High Byte Enable ($\overline{HBE}$), which facilitates individual byte addressing on a 16-bit bus.

Memory is intended to be organized as two eight-bit banks, each bank receiving the word address (A1-A23) in parallel. One bank, connected to Data Bus pins AD0-AD7, is enabled to respond to even byte addresses; i.e., when the least significant address bit (A0) is low. The other bank, connected to Data Bus pins AD8-AD15, is enabled when $\overline{HBE}$ is low. See Figure 3-11.

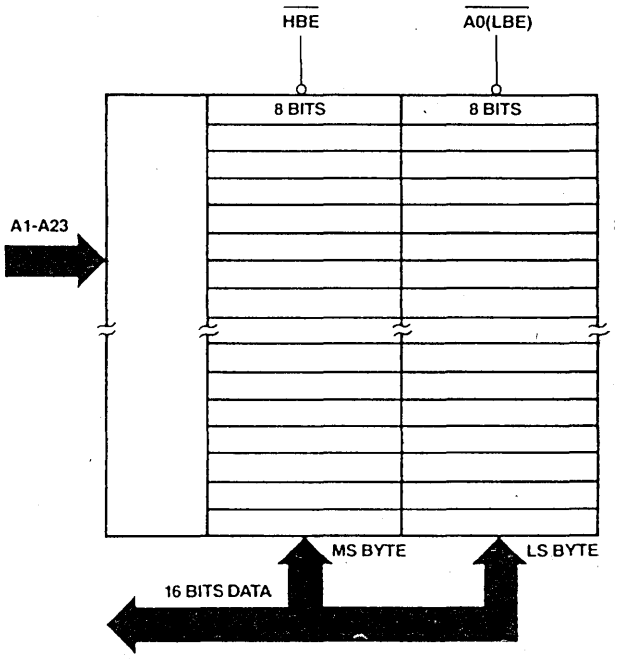


FIGURE 3-11. Memory Interface.

Any bus cycle falls into one of three categories: Even Byte Access, Odd Byte Access, and Even Word Access. All accesses to any data type are made up of sequences of these cycles. Table 3-1 gives the states of A0 and $\overline{HBE}$ for each category.

Table 3-1.
Bus Cycle Categories

Category	$\overline{HBE}$	A0
Even Byte	1	0
Odd Byte	0	1
Even Word	0	0

Accesses of operands requiring more than one bus cycle are performed sequentially, with no idle T-States separating them. The number of bus cycles required to transfer an operand depends on its size and its alignment (i.e., whether it starts on an even byte address or an odd byte address). Table 3-2 lists the bus cycle performed for each situation. For the timing of A0 and $\overline{HBE}$ see Sec. 3.4.

© IC MASTER 1983

Table 3.2
Access Sequences

Cycle	Type	Address	$\overline{HBE}$	A0	High Bus	Low Bus
		A. Odd Word Access Sequence				
					BYTE 1 | BYTE 0 ← A	
1	Odd Byte	A	0	1	Byte 0	Don't Care
2	Even Byte	A+1	1	0	Don't Care	Byte 1
		B. Even Double-Word Access Sequence				
					BYTE 3 | BYTE 2 | BYTE 1 | BYTE 0 ← A	
1	Even Word	A	0	0	Byte 1	Byte 0
2	Even Word	A+2	0	0	Byte 3	Byte 2
		C. Odd Double-Word Access Sequence				
					BYTE 3 | BYTE 2 | BYTE 1 | BYTE 0 ← A	
1	Odd Byte	A	0	1	Byte 0	Don't Care
2	Even Word	A+1	0	0	Byte 2	Byte 1
3	Even Byte	A+3	1	0	Don't Care	Byte 3
		D. Even Quad-Word Access Sequence				
					BYTE 7 | BYTE 6 | BYTE 5 | BYTE 4 | BYTE 3 | BYTE 2 | BYTE 1 | BYTE 0 ← A	
1	Even Word	A	0	0	Byte 1	Byte 0
2	Even Word	A+2	0	0	Byte 3	Byte 2
Other bus cycles (instruction prefetch or slave) can occur here.						
3	Even Word	A+4	0	0	Byte 5	Byte 4
4	Even Word	A+6	0	0	Byte 7	Byte 6
		E. Odd Quad-Word Access Sequence				
					BYTE 7 | BYTE 6 | BYTE 5 | BYTE 4 | BYTE 3 | BYTE 2 | BYTE 1 | BYTE 0 ← A	
1	Odd Byte	A	0	1	Byte 0	Don't Care
2	Even Word	A+1	0	0	Byte 2	Byte 1
3	Even Byte	A+3	1	0	Don't Care	Byte 3
Other bus cycles (instruction prefetch or slave) can occur here.						
4	Odd Byte	A+4	0	1	Byte 4	Don't Care
5	Even Word	A+5	0	0	Byte 6	Byte 5
6	Even Byte	A+7	1	0	Don't Care	Byte 7

© IC MASTER 1983

3.4.3.1 Bit Accesses

The Bit Instructions perform byte accesses to the byte containing the designated bit. The Test and Set Bit instruction (SBIT), for example, reads a byte, alters it, and rewrites it, having changed the contents of one bit.

3.4.3.2 Bit Field Accesses

An access to a Bit Field in memory always generates a Double-Word transfer at the address containing the least significant bit of the field. The Double Word is read by an Extract instruction; an Insert instruction reads a Double Word, modifies it, and rewrites it.

3.4.3.3 Extending Multiply Accesses

The Extending Multiply instruction (MEI) will return a result which is twice the size in bytes of the operands which it reads. If the multiplicand is in memory, the most-significant half of the result is written first (at the higher address), then the least-significant half. This is done in order to support retry if this instruction is aborted.

3.4.4 Instruction Fetches

Instructions for the NS16032 CPU are "prefetched"; that is, they are input before being needed into the next available entry of the eight-byte Instruction Queue. The CPU performs two types of Instruction Fetch cycles: Sequential and Non-Sequential. These can be distinguished from each other by their differing status combinations on pins ST0-ST3 (Sec. 3.4.2).

A Sequential Fetch will be performed by the CPU whenever the Data Bus would otherwise be idle and the Instruction Queue is not currently full. Sequential Fetches are always Even Word Read cycles (Table 3-1).

A Non-Sequential Fetch occurs as a result of any break in the normally sequential flow of a program. Any jump or branch instruction, a trap or an interrupt will cause the next Instruction Fetch cycle to be Non-Sequential. In addition, certain instructions flush the instruction queue, causing the next instruction fetch to display Non-Sequential status. Only the first bus cycle after a break displays Non-Sequential status, and that cycle is either an Even Word Read or an Odd Byte Read, depending on whether the destination address is even or odd.

3.4.5 Interrupt Control Cycles

Activating the $\overline{INT}$ or $\overline{NMI}$ pin on the CPU will initiate one or more bus cycles whose purpose is interrupt control rather than the transfer of instructions or data. Execution of the Return from Interrupt instruction (RETI) will also cause Interrupt Control bus cycles. These differ from instruction or data transfers only in the status presented on pins ST0-ST3. All Interrupt Control cycles are single-byte Read cycles.

This section describes only the Interrupt Control sequences associated with each interrupt and with the return from its service routine. For full details of the NS16032 interrupt structure, see Sec. 3.8.

© IC MASTER 1983

Table 3-3
Interrupt Sequences

Cycle	Status	Address	$\overline{DDIN}$	$\overline{HBE}$	A0	High Bus	Low Bus
A. Non-Maskable Interrupt Control Sequences.							
Interrupt Acknowledge							
1	0100	$FFFF00_{16}$	0	1	0	Don't Care	Don't Care
Interrupt Return							
None: Performed through Return from Trap (RETT) instruction.							
B. Non-Vectored Interrupt Control Sequences.							
Interrupt Acknowledge							
1	0100	$FFFE00_{16}$	0	1	0	Don't Care	Don't Care
Interrupt Return							
1	0110	$FFFE00_{16}$	0	1	0	Don't Care	Don't Care
C. Vectored Interrupt Sequences: Non-Cascaded.							
Interrupt Acknowledge							
1	0100	$FFFE00_{16}$	1	1	0	Don't Care	Vector: Range: 0-127
Interrupt Return							
1	0110	$FFFE00_{16}$	0	1	0	Don't Care	Vector: Same as in Previous Int. Ack. Cycle
D. Vectored Interrupt Sequences: Cascaded.							
Interrupt Acknowledge							
1	0100	$FFFE00_{16}$	0	1	0	Don't Care	Cascade Index: range −16 to −1
(The CPU here uses the Cascade Index to find the Cascade Address.)							
2	0101	Cascade Address	0	1 or 0*	0 or 1*	Vector, range 0-255; on appropriate half of Data Bus for even/odd address	
Interrupt Return							
1	0110	$FFFE00_{16}$	0	1	0	Don't Care	Cascade Index: same as in previous Int. Ack. Cycle
(The CPU here uses the Cascade Index to find the Cascade Address.)							
2	0111	Cascade Address	0	1 or 0*	0 or 1*	Don't Care	Don't Care

*If the Cascaded ICU Address is Even (A0 is low), then the CPU applies $\overline{HBE}$ high and reads the vector number from bits 0-7 of the Data Bus. If the address is Odd (A0 is high), then the CPU applies $\overline{HBE}$ low and reads the vector number from bits 8-15 of the Data Bus. The vector number may be in the range 0-255.

© IC MASTER 1983

3.4.6 Slave Processor Communication

In addition to its use as the Address Translation strap (Sec. 3.5.1), the $\overline{AT}/\overline{SPC}$ pin is used as the data strobe for Slave Processor transfers. In this role, it is referred to as Slave Processor Control ($\overline{SPC}$). In a Slave Processor bus cycle, data is transferred on the Data Bus (AD0-AD15), and the least significant two bits of CPU cycle status (ST0-ST1) are monitored by each Slave Processor in order to determine the type of transfer being performed. $\overline{SPC}$ is bidirectional, but is driven by the CPU during all Slave Processor bus cycles. See Sec. 3.9 for full protocol sequences.

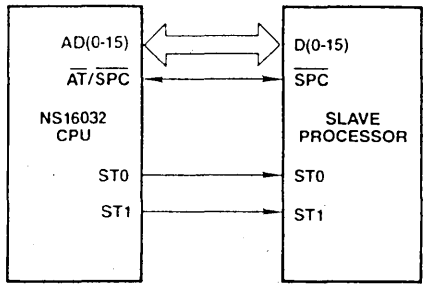
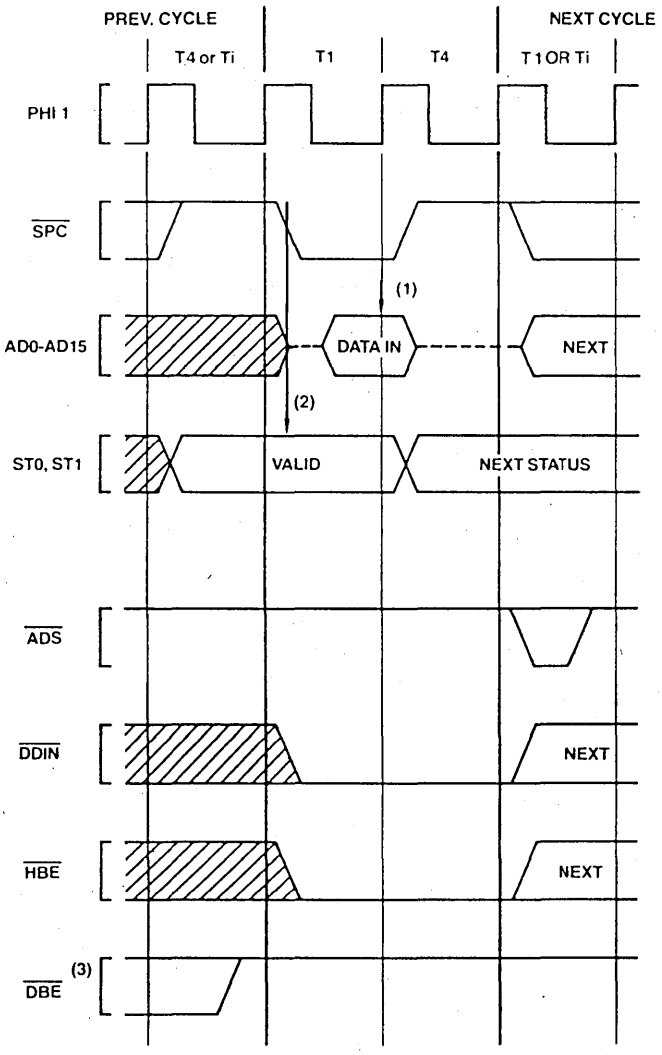


FIGURE 3-12. Slave Processor Connections.



NOTE:

(1) CPU samples Data Bus here.

(2) Slave Processor samples CPU Status here.

(3) $\overline{DBE}$ and all other NS16201 TCU bus signals remain inactive because no $\overline{ADS}$ pulse is received from the CPU.

FIGURE 3-13. CPU Read from Slave Processor.

© IC MASTER 1983

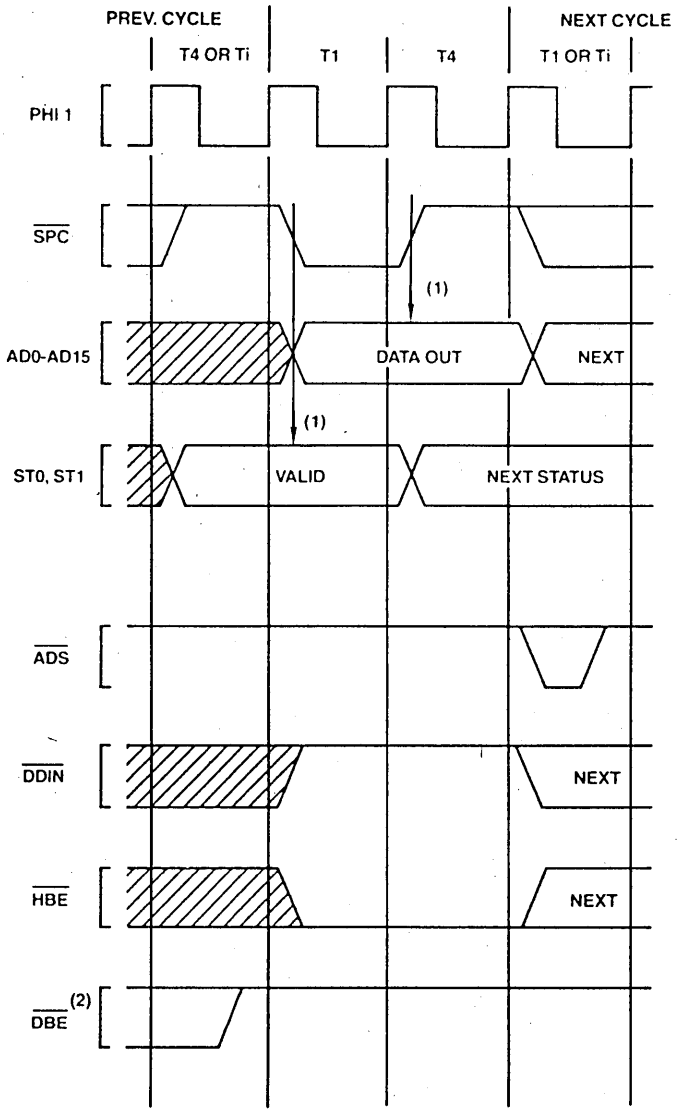
3.4.6.1 Slave Processor Bus Cycles

A Slave Processor bus cycle always takes exactly two clock cycles, labelled T1 and T4 (see Figures 3-13 and 3-14). During a Read cycle, $\overline{SPC}$ is activated at T1, data is sampled at T4, and $\overline{SPC}$ is removed. The Cycle Status pins lead the cycle by one clock period, and are sampled at the leading edge of $\overline{SPC}$. During a Write cycle, the CPU applies data and activates $\overline{SPC}$ at T1, removing $\overline{SPC}$ at T4. The Slave Processor latches status on the leading edge of $\overline{SPC}$ and latches data on the trailing edge.

Since the CPU does not pulse the Address Strobe ($\overline{ADS}$), no bus signals are generated by the NS16201 Timing Control Unit. The direction of a transfer is determined by the sequence ("protocol") established by the instruction under execution; but the CPU indicates the direction on the $\overline{DDIN}$ pin for hardware debugging purposes.

3.4.6.2 Operand Transfer Sequences

A Slave Processor operand is transferred in one or more Slave bus cycles. A Byte operand is transferred on the least-significant byte of the Data Bus (AD0-AD7), and a Word operand is transferred on the entire bus. A Double Word is transferred in a consecutive pair of bus cycles, least-significant word first. A Quad Word is transferred in two pairs of Slave cycles, with other bus cycles possibly occurring between them. The word order is from least-significant word to most-significant.



NOTE:

(1) Arrows indicate points at which the Slave Processor samples.

(2) $\overline{DBE}$, being provided by the NS16201 TCU, remains inactive due to the fact that no pulse is presented on $\overline{ADS}$. TCU signals $\overline{RD}$, $\overline{WR}$ and $\overline{TSO}$ also remain inactive.

FIGURE 3-14. CPU Write to Slave Processor.

© IC MASTER 1983

3.5 MEMORY MANAGEMENT OPTION

The NS16032 CPU, in conjunction with the NS16082 Memory Management Unit (MMU), provides full support for address translation, memory protection, and memory allocation techniques up to and including Virtual Memory.

3.5.1 Address Translation Strap

The Bus Interface Control section of the NS16032 CPU has two bus timing modes: With or Without Address Translation. The mode of operation is selected by the CPU by sampling the $\overline{AT}/\overline{SPC}$ (Address Translation/ Slave Processor Control) pin on the rising edge of the $\overline{RST}$ (Reset) pulse. If $\overline{AT}/\overline{SPC}$ is sampled as high, the bus timing is as previously described in Sec. 3.4. If it is sampled as low, two changes occur:

1) An extra clock cycle, Tmmu, is inserted into all bus cycles except Slave Processor transfers.
2) The $\overline{DS}/\overline{FLT}$ pin changes in function from a Data Strobe output ($\overline{DS}$) to a Float Command input ($\overline{FLT}$).

The NS16082 MMU will itself pull the CPU $\overline{AT}/\overline{SPC}$ pin low when it is reset, but this pin may be left floating in non-Memory-Managed systems.

Note that the Address Translation strap does not specifically declare the presence of an NS16082 MMU, but

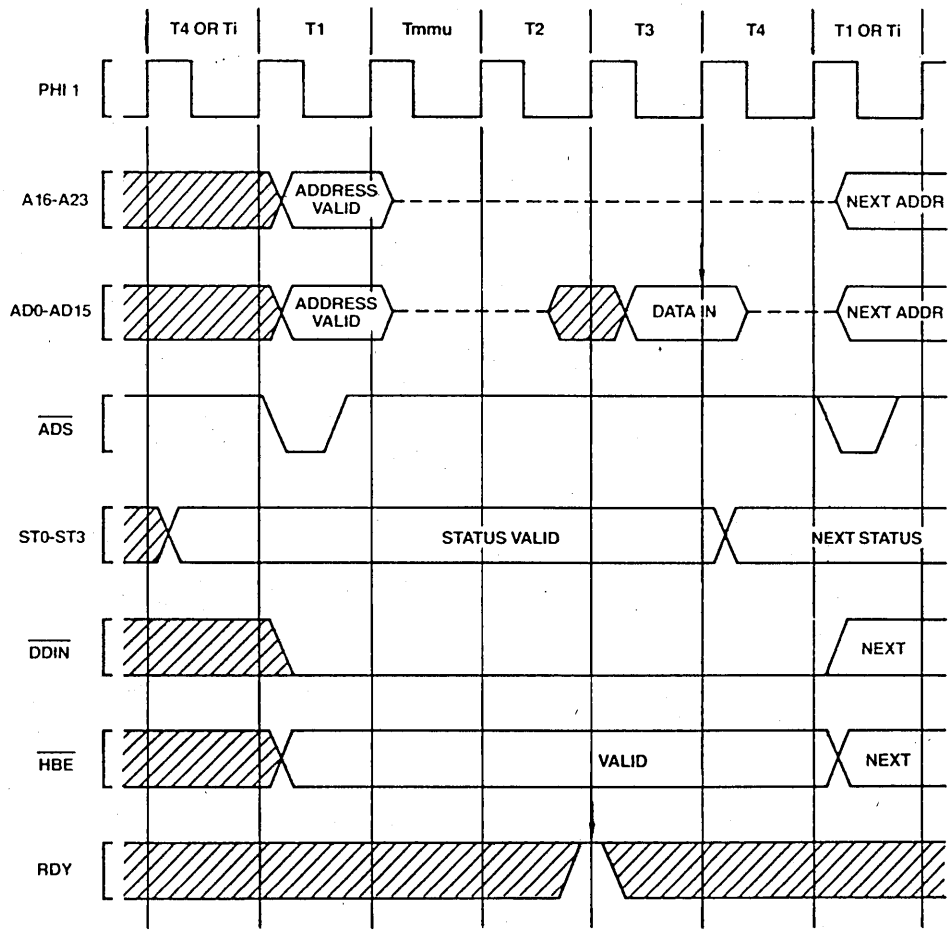


FIGURE 3-15. Read Cycle with Address Translation (CPU Action).

© IC MASTER 1983

only the presence of external address translation circuitry. MMU instructions will still trap as being undefined unless the SETCFG (Set Configuration) instruction is executed to declare the MMU instruction set valid. See Sec. 2.1.3.

3.5.2 Translated Bus Timing

Figures 3-15 and 3-16 illustrate the CPU activity during a Read cycle and a Write cycle in Address Translation mode. The additional T-State, Tmmu, is inserted between T1 and T2. During this time the CPU places AD0-AD15 and A16-A23 into the TRI-STATE® mode, allowing the MMU to assert the translated address and issue the physical address strobe $\overline{PAV}$. T2 through T4 of the cycle are identical to their counterparts without Address Translation, with the exception that the CPU Address lines A16-A23 remain in the TRI-STATE condition. This allows the MMU to continue asserting the translated address on those pins.

Figures 3-17 and 3-18 show a Read cycle and a Write cycle as generated by the 16032/16082/16201 group. Note that with the CPU $\overline{ADS}$ signal going only to the MMU, and with the MMU $\overline{PAV}$ signal substituting for $\overline{ADS}$ everywhere else, Tmmu through T4 look exactly like T1 through T4 in a non-Memory-Managed system. For the connection diagram, see Appendix B.

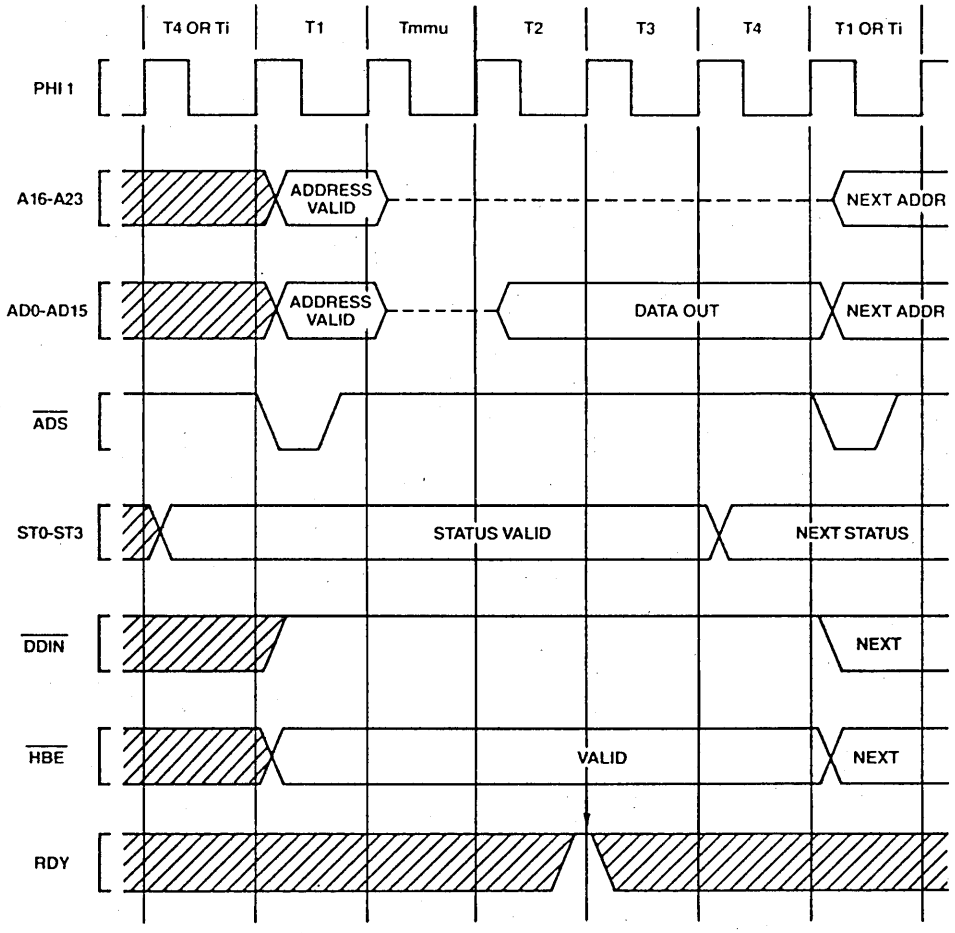


FIGURE 3-16. Write Cycle with Address Translation (CPU Action).

© IC MASTER 1983

National Semiconductor

16032-6

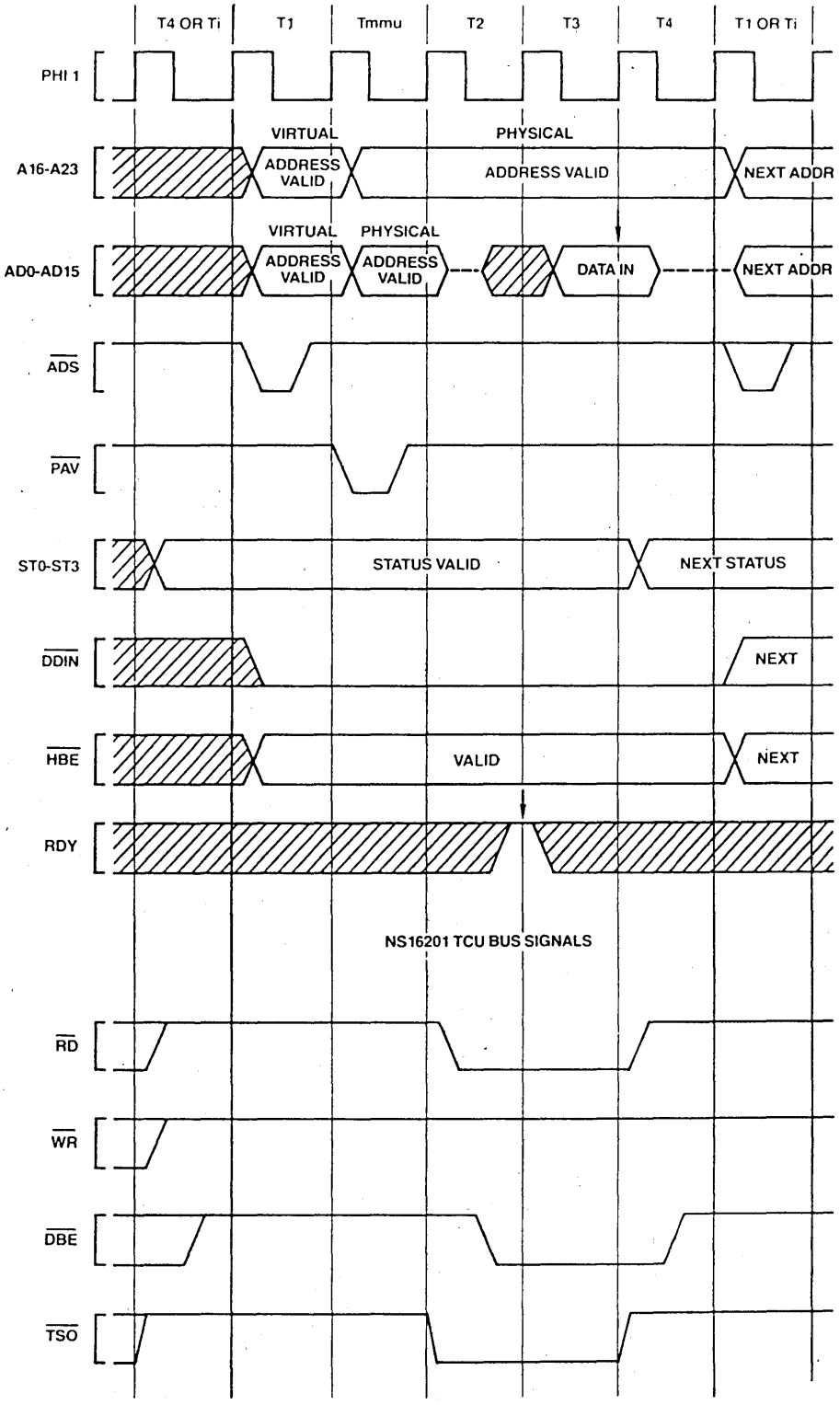


FIGURE 3-17. Memory-Managed Read Cycle.

© IC MASTER 1983

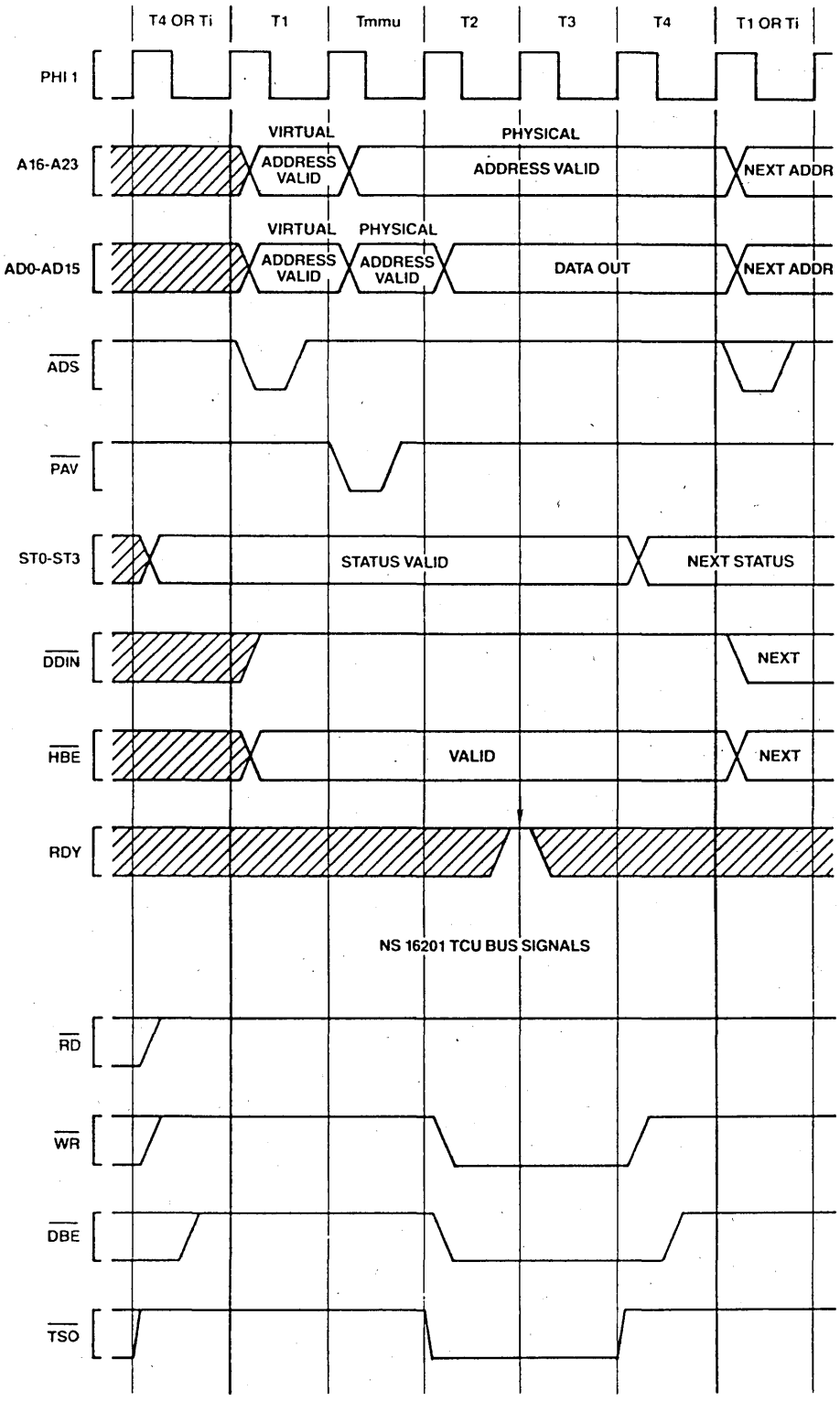


FIGURE 3-18. Memory-Managed Write Cycle.

© IC MASTER 1983

3.5.3 The $\overline{FLT}$ (Float) Pin

In Address Translation mode, the $\overline{DS}/\overline{FLT}$ pin is treated as the input command $\overline{FLT}$ (Float). Activating $\overline{FLT}$ during Tmmu causes the CPU to wait longer than Tmmu for address translation and validation. This feature is used occasionally by the NS16082 MMU in order to update its internal translation cache from page tables in memory, or to update certain status bits within them.

Figure 3-19 shows the effects of $\overline{FLT}$. Upon sampling $\overline{FLT}$ low, late in Tmmu, the CPU enters idle T-States (Tf) during which it:

1) Sets AD0-AD15, A16-A23, $\overline{ADS}$ and $\overline{DDIN}$ to the TRI-STATE condition ("floating").
2) Sets $\overline{HBE}$ low.
3) Suspends further internal processing of the current instruction. This ensures that the current instruction remains abortable with retry. (See $\overline{RST}/\overline{ABT}$ description, Sec. 3.5.4.)

Note that the AD0-AD15 pins may be briefly asserted during the first idle T-State. The above conditions remain in effect until $\overline{FLT}$ again goes high. See the Timing Specifications, Sec. 4.

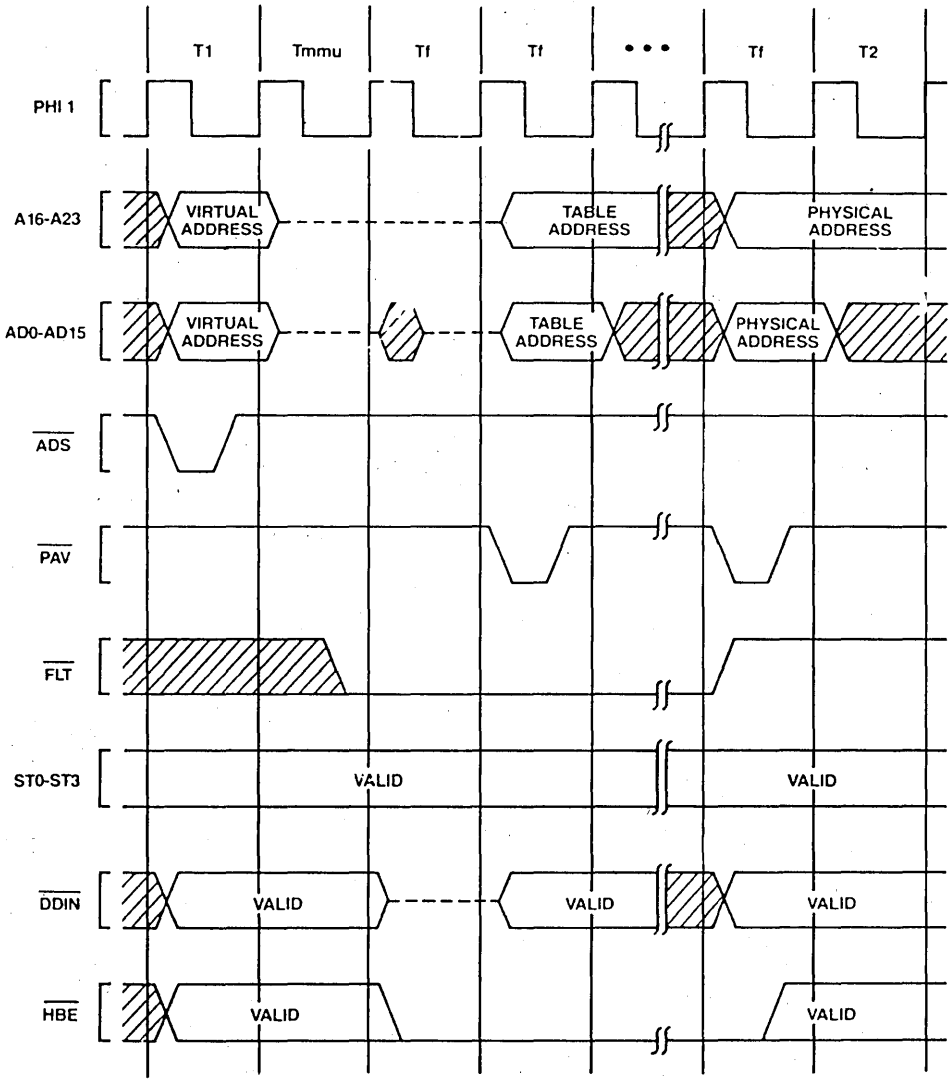


FIGURE 3-19. $\overline{FLT}$ Float Command Timing.

© IC MASTER 1983

3.5.4 Aborting Bus Cycles

The $\overline{RST}/\overline{ABT}$ pin, apart from its Reset function (Sec. 3.3), also serves as the means to "abort", or cancel, a bus cycle and the instruction, if any, which initiated it. An Abort request is distinguished from a Reset in that the $\overline{RST}/\overline{ABT}$ pin is held active for only one clock cycle.

If $\overline{RST}/\overline{ABT}$ is pulled low during Tmmu or Tf, this signals that the cycle must be aborted. The CPU itself will enter T2 and then Ti, thereby terminating the cycle. Since it is the MMU $\overline{PAV}$ signal which triggers a physical cycle, the rest of the system remains unaware that a cycle was even started.

The NS16082 MMU will abort a bus cycle for either of two reasons:

1) The CPU is attempting to access a virtual address which is not currently resident in physical memory. The referenced page must be brought into physical memory from mass storage to make it accessible to the CPU.

2) The CPU is attempting to perform an access which is not allowed due to the protection level assigned to that page.

When a bus cycle is aborted by the MMU, the instruction which caused it to occur is also aborted in such a manner that it is guaranteed re-executable later. Due to the NS16000 Family instruction set definition and its implementation in the NS16032 CPU, the only information which is changed irrecoverably by such partly-executed instructions is information which does not affect their re-execution.

3.5.4.1 The Abort Interrupt

Upon aborting an instruction, the CPU immediately performs an interrupt through the ABT vector in the Interrupt Table (see Sec. 3.8). The Return Address pushed on the Interrupt Stack is the address of the aborted instruction, such that a Return from Trap (RETT) instruction will automatically retry it.

The one exception to this sequence occurs if the aborted bus cycle was an instruction prefetch. If so, it is not yet certain that the aborted prefetched code is to be executed. Insted of causing an interrupt, the CPU only aborts the bus cycle, and stops prefetching. If the information in the Instruction Queue runs out, meaning that the instruction will actually be executed, the ABT interrupt will occur, in effect aborting the instruction which was being fetched.

3.5.4.2 Hardware Considerations

In order to guarantee instruction retry, certain rules must be followed in applying an Abort to the CPU. These rules are followed by the NS16082 Memory Management Unit.

1) If $\overline{FLT}$ has not been applied to the CPU, the Abort pulse must occur during or before Tmmu. See the Timing Specifications, Figure 4-22.

2) If $\overline{FLT}$ has been applied to the CPU, the Abort pulse must be applied before the T-State in which $\overline{FLT}$ goes inactive. The CPU will not actually respond to the Abort command until $\overline{FLT}$ is removed. See Figure 4-23.

3) No bus cycle may be aborted which is the Write half of a Read-Modify-Write operand access. The CPU guarantees that this will never be necessary for Memory Management functions by applying a special RMW status (Status Code 1011) during the Read half of the access. When the CPU presents RMW status, that cycle must be aborted if it would be illegal to write to any of the accessed addresses.

If $\overline{RST}/\overline{ABT}$ is pulsed at any time other than as indicated above, it will abort the instruction currently under execution, and will act as a very high-priority interrupt. However, the program which was running at the time is not guaranteed recoverable, and should be terminated.

3.6 BUS ACCESS CONTROL

The NS16032 CPU has the capability of relinquishing its access to the bus upon request from a DMA device or another CPU. This capability is implemented on the $\overline{HOLD}$ (Hold Request) and $\overline{HLDA}$ (Hold Acknowledge) pins. By asserting $\overline{HOLD}$ low, an external device requests access to the bus. On receipt of $\overline{HLDA}$ from the CPU, the device may perform bus cycles, as the CPU at this point has set the AD0-AD15, A16-A23, $\overline{ADS}$, $\overline{DDIN}$ and $\overline{HBE}$ pins to the TRI-STATE® condition. To return control of the bus to the CPU, the device sets $\overline{HOLD}$ inactive, and the CPU acknowledges return of the bus by setting $\overline{HLDA}$ inactive.

How quickly the CPU releases the bus depends on whether it is idle on the bus at the time the $\overline{HOLD}$ request is made, as the CPU must always complete the current bus cycle. Figure 3-20 shows the timing sequence when the CPU is idle. In this case, the CPU grants the bus during the immediately following clock cycle. Figure 3-21 shows the sequence if the CPU is using the bus at the time that the $\overline{HOLD}$ request is made. If the request is made during or before the clock cycle shown (two clock cycles before T4), the CPU will release the bus during the clock cycle following T4. If the request occurs closer to T4, the CPU may already have decided to initiate another bus cycle. In that case it will not grant the bus until after the next T4 state. Note that this situation will also occur if the CPU is idle on the bus but has initiated a bus cycle internally.

In a Memory-Managed system, the $\overline{HLDA}$ signal is connected in a daisy-chain through the NS16082, such that the MMU can release the bus if it is using it.

© IC MASTER 1983

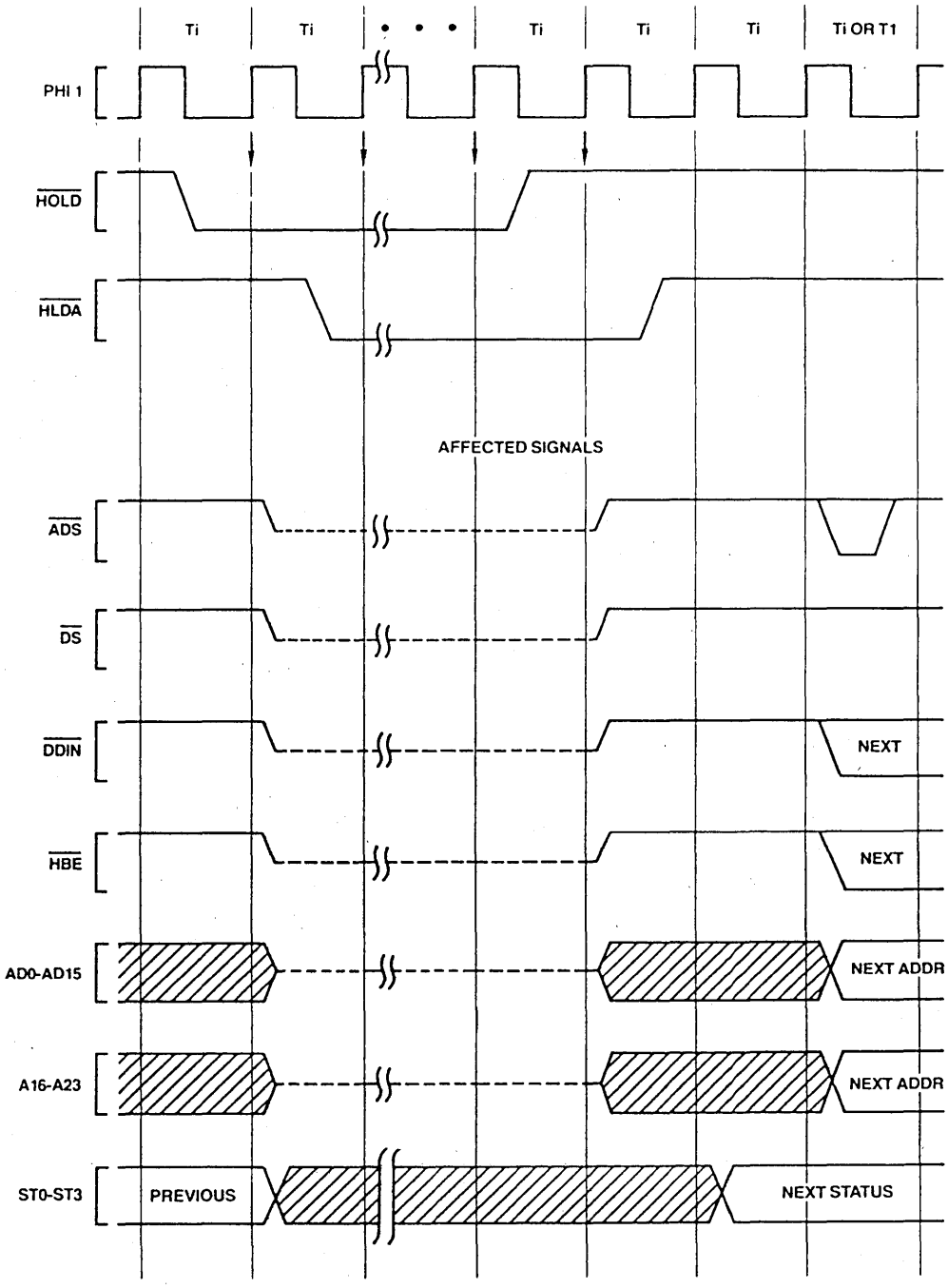


FIGURE 3-20. $\overline{\text{HOLD}}$ Timing, Bus Initially Idle.

© IC MASTER 1983

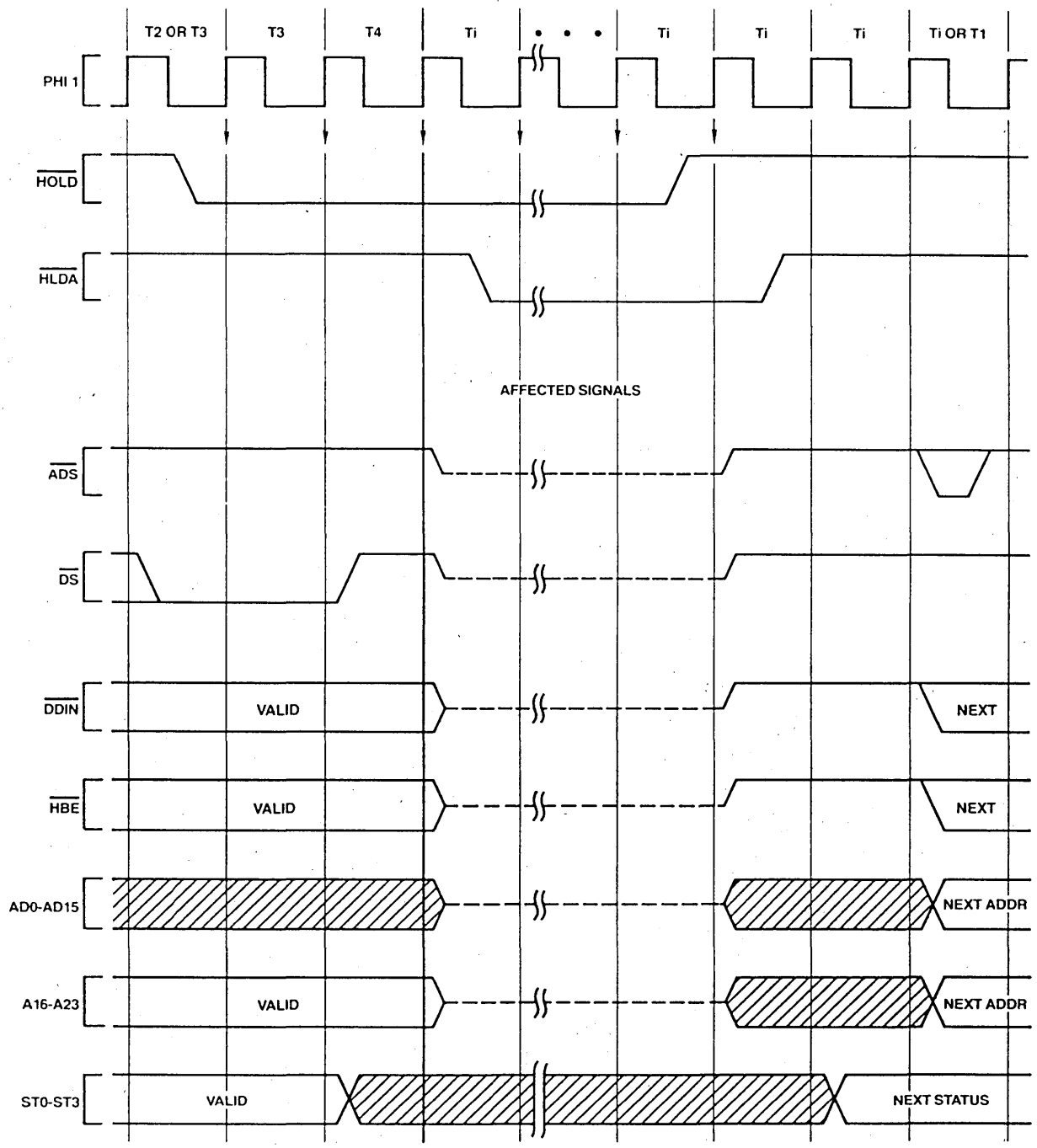


FIGURE 3-21. $\overline{\text{HOLD}}$ Timing, Bus Initially Not Idle.

© IC MASTER 1983

3.7 INSTRUCTION STATUS

In addition to the four bits of Bus Cycle status (ST0-ST3), the NS16032 CPU also presents Instruction Status information on three separate pins. These pins differ from ST0-ST3 in that they are synchronous to the CPU's internal instruction execution section rather than to its bus interface section.

$\overline{PFS}$ (Program Flow Status) is pulsed low as each instruction begins execution. It is intended for debugging purposes, and is used that way by the NS16082 Memory Management Unit.

U/$\overline{S}$ originates from the U bit of the Processor Status Register, and indicates whether the CPU is currently running in User or Supervisor mode. It is sampled by the MMU for mapping, protection and debugging purposes. Although it is not synchronous to bus cycles, there are guarantees on its validity during any given bus cycle. See the Timing Specifications, Figure 4-21.

$\overline{ILO}$ (Interlocked Operation) is activated during an SBITI (Set Bit, Interlocked) or CBITI (Clear Bit, Interlocked) instruction. It is made available to external bus arbitration circuitry in order to allow these instructions to implement the semaphore primitive operations for multiprocessor communication and resource sharing. As with the U/$\overline{S}$ pin, there are guarantees on its validity during the operand accesses performed by the instructions. See the Timing Specification Section, Figure 4-19.

3.8 NS16032 INTERRUPT STRUCTURE

$\overline{INT}$, on which maskable interrupts may be requested,

$\overline{NMI}$, on which non-maskable interrupts may be requested, and

$\overline{RST}$/$\overline{ABT}$, which may be used to abort a bus cycle and any associated instruction. It generates an interrupt request if an instruction was aborted. See Sec. 3.5.4.

In addition, there is a set of internally-generated "traps" which cause interrupt service to be performed as a result either of exceptional conditions (e.g., attempted division by zero) or of specific instructions whose purpose is to cause a trap to occur (e.g., the Supervisor Call instruction).

3.8.1 General Interrupt/Trap Sequence

Upon receipt of an interrupt or trap request, the CPU goes through four major steps:

1) Adjustment of Registers.
   Depending on the source of the interrupt or trap, the CPU may restore and/or adjust the contents of the Program Counter (PC), the Processor Status Register (PSR) and the currently-selected Stack Pointer (SP). A copy of the PSR is made, and the PSR is then set to reflect Supervisor Mode and selection of the Interrupt Stack.
2) Saving Processor Status.
   The PSR copy is pushed onto the Interrupt Stack as a 16-bit quantity.
3) Vector Acquisition.
   A Vector is either obtained from the Data Bus or is supplied by default.
4) Service Call.
   The Vector is used as an index into the Interrupt Dispatch Table, whose base address is taken from the CPU Interrupt Base (INTBASE) Register. See Figure 3-22. A 32-bit External Procedure Descriptor is read from the table entry, and an External Procedure Call is performed using it. The MOD Register (16 bits) and Program Counter (32 bits) are pushed on the Interrupt Stack.

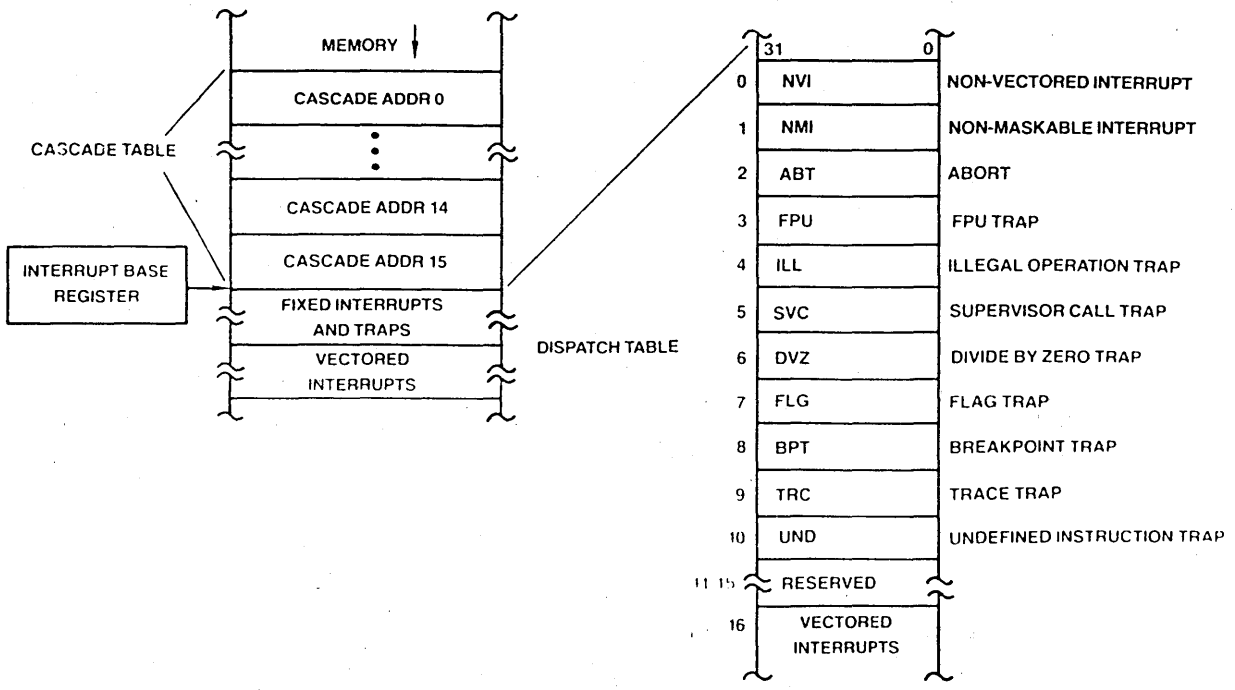


FIGURE 3-22. Interrupt Dispatch and Cascade Tables.

© IC MASTER 1983

This process is illustrated in Figure 3-23, from the viewpoint of the programmer.

Full sequences of events in processing interrupts and traps may be found as follows:

Interrupt on $\overline{INT}$ or $\overline{NMI}$ pin:	Sec. 3.8.7.1.
Abort Interrupt:	Sec. 3.8.7.4.
Traps (except Trace):	Sec. 3.8.7.2.
Trace Trap:	Sec. 3.8.7.3.

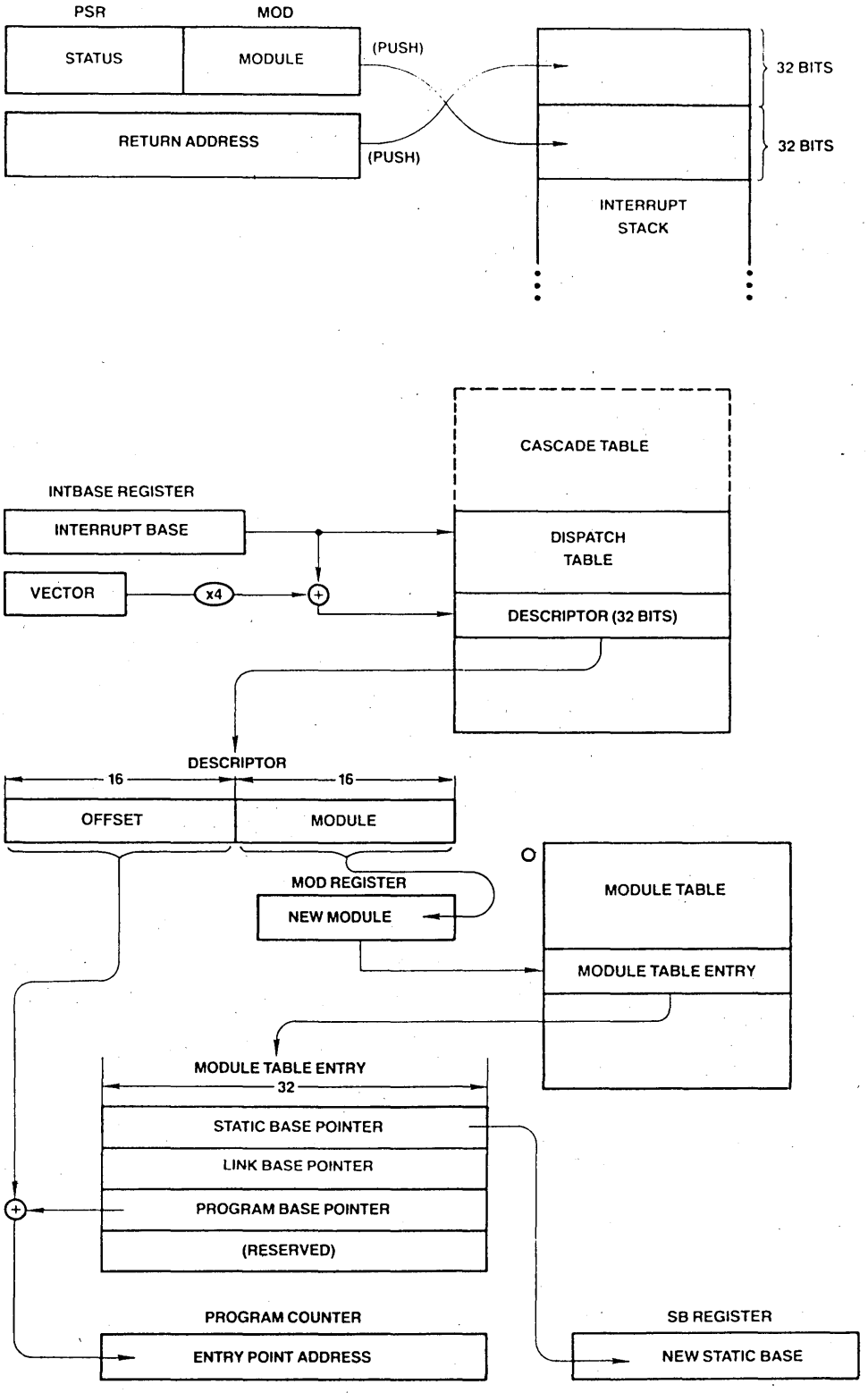


FIGURE 3-23. Interrupt/Trap Service Routine Calling Sequence.

© IC MASTER 1983

3.8.2 Interrupt/Trap Return

To return control to an interrupted program, one of two instructions is used. The RETT (Return from Trap) instruction (Figure 3-24) restores the PSR, MOD, PC and SB registers to their previous contents and, since traps are often used deliberately as a call mechanism for Supervisor Mode procedures, it also discards a specified number of bytes from the original stack as surplus parameter space. RETT is used to return from any trap or interrupt except the Maskable Interrupt. For this, the RETI (Return from Interrupt) instruction is used, which also informs any external Interrupt Control Units that interrupt service has completed. Since interrupts are generally asynchronous external events, RETI does not pop parameters. See Figure 3-25.

3.8.3 Maskable Interrupts (The $\overline{\text{INT}}$ Pin)

The $\overline{\text{INT}}$ pin is a level-sensitive input. A continuous low level is allowed for generating multiple interrupt requests. The input is maskable, and is therefore enabled to generate interrupt requests only while the Processor Status Register I bit is set. The I bit is automatically cleared during service of an $\overline{\text{INT}}$, $\overline{\text{NMI}}$ or Abort request, and is restored to its original setting upon return from the interrupt service routine via the RETT or RETI instruction.

The $\overline{\text{INT}}$ pin may be configured via the SETCFG instruction as either Non-Vectored (CFG Register bit I = 0) or Vectored (bit I = 1).

3.8.3.1 Non-Vectored Mode

In the Non-Vectored mode, an interrupt request on the $\overline{\text{INT}}$ pin will cause an Interrupt Acknowledge bus cycle, but the CPU will ignore any value read from the bus and use instead a default vector of zero. This mode is useful for small systems in which hardware interrupt prioritization is unnecessary.

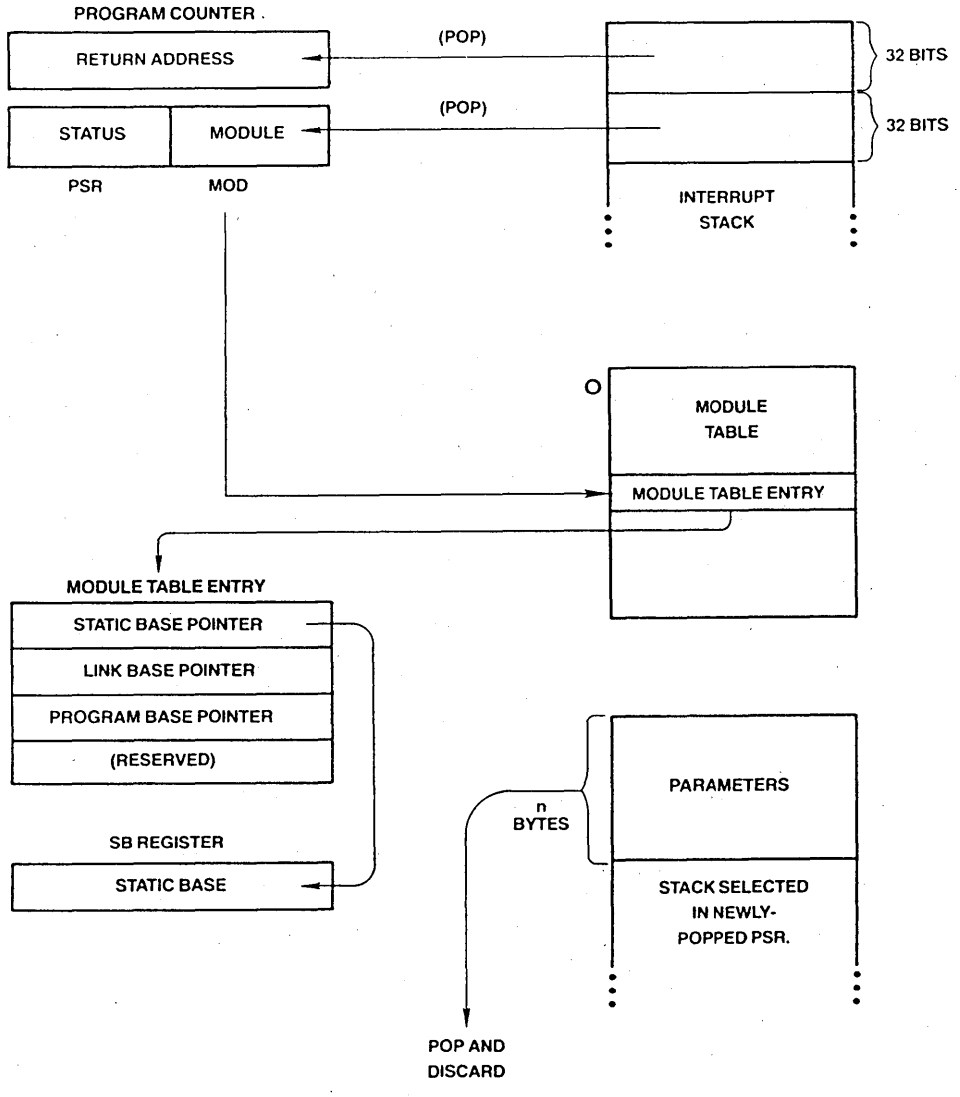


FIGURE 3-24. Return from Trap (RETT n) Instruction Flow.

© IC MASTER 1983

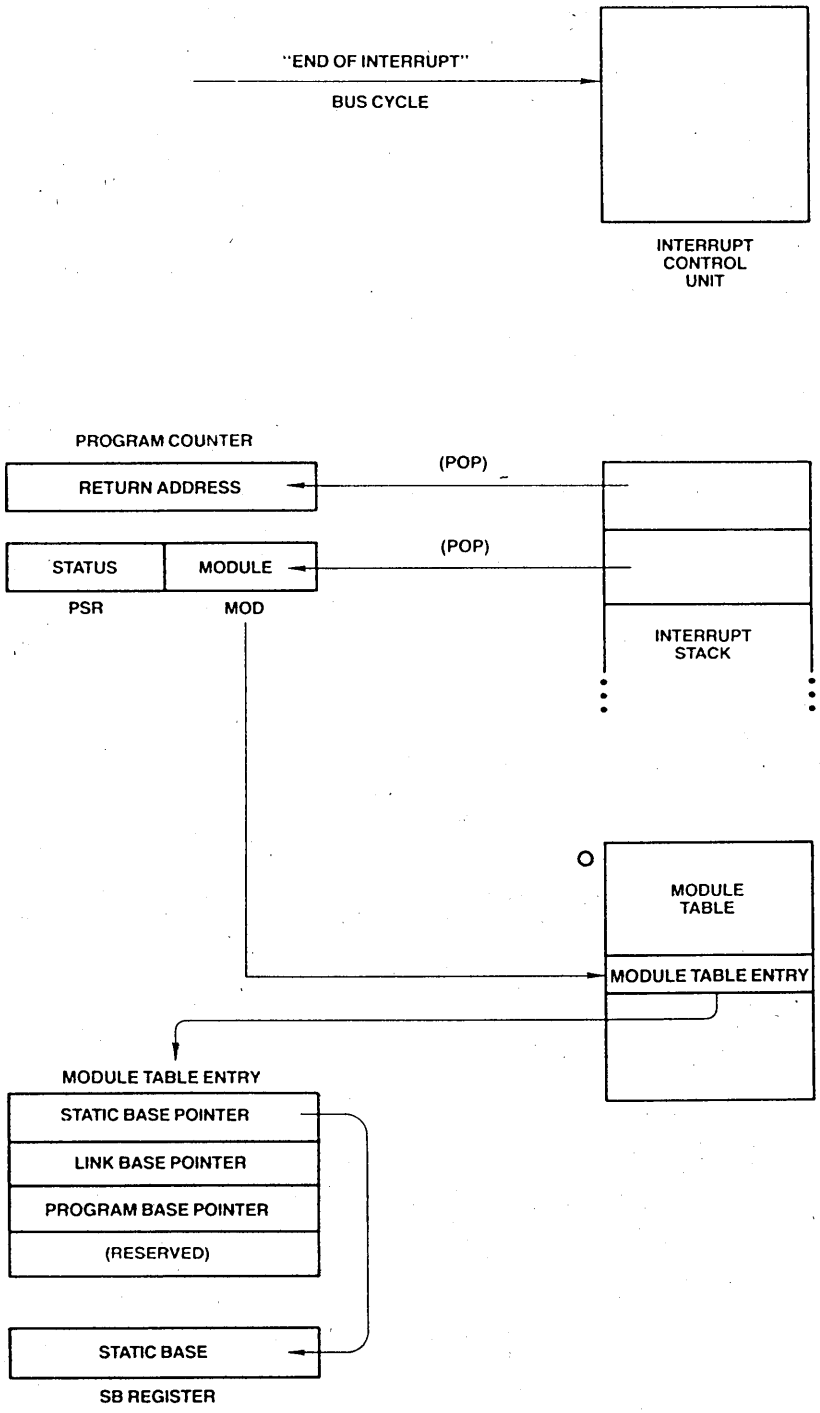


FIGURE 3-25. Return from Interrupt (RETI) Instruction Flow.

© IC MASTER 1983

3.8.3.2 Vectored Mode: Non-Cascaded Case

In the Vectored mode, the CPU uses an NS16202 Interrupt Control Unit (ICU) to prioritize up to 16 interrupt requests. Upon receipt of an interrupt request on the $\overline{INT}$ pin, the CPU performs an "Interrupt Acknowledge, Master" bus cycle (Sec. 3.4.2) reading a vector value from the low-order byte of the Data Bus. This vector is then used as an index into the Dispatch Table in order to find the External Procedure Descriptor for the proper interrupt service procedure. The service procedure eventually returns via the Return from Interrupt (RETI) instruction, which performs an End of Interrupt bus cycle, informing the ICU that it may re-prioritize any interrupt requests still pending. The ICU provides the vector number again, which the CPU uses to determine whether it needs also to inform a Cascaded ICU (see below).

In a system with only one ICU (16 levels of interrupt), the vectors provided must be in the range of 0 through 127; that is, they must be positive numbers in eight bits. By providing a negative vector number, an ICU flags the interrupt source as being a Cascaded ICU (see below).

3.8.3.3 Vectored Mode: Cascaded Case

In order to allow up to 256 levels of interrupt, provision is made both in the CPU and in the NS16202 Interrupt Control Unit (ICU) to transparently support cascading. Figure 3-27, shows a typical cascaded configuration. Note that the Interrupt output from a Cascaded ICU goes to an Interrupt Request input of the Master ICU, which is the only ICU which drives the CPU $\overline{INT}$ pin.

In a system which uses cascading, two tasks must be performed upon initialization:

1) For each Cascaded ICU in the system, the Master ICU must be informed of the line number (0 to 15) on which it receives the cascaded requests.
2) A Cascade Table must be established in memory. The Cascade Table is located in a NEGATIVE direction from the location indicated by the CPU Interrupt Base (INTBASE) Register. Its entries are 32-bit addresses, pointing to the Vector Registers of each of up to 16 Cascaded ICUs.

Figure 3-22 illustrates the position of the Cascade Table. To find the Cascade Table entry for a Cascaded ICU, take its Master ICU line number (0 to 15) and subtract 16 from it, giving an index in the range −16 to −1. Multiply this value by 4, and add the resulting negative number to the contents of the INTBASE Register The 32-bit entry at this address must be set to the address of the Hardware Vector Register of the Cascaded ICU. This is referred to as the "Cascade Address."

Upon receipt of an interrupt request from a Cascaded ICU, the Master ICU interrupts the CPU and provides the negative Cascade Table index instead of a (positive) vector number. The CPU, seeing the negative value, uses it as an index into the Cascade Table and reads the Cascade Address from the referenced entry. Applying this address, the CPU performs an "Interrupt Acknowledge, Cascaded" bus cycle (Sec. 3.4.2), reading the final vector value. This vector is interpreted by the CPU as an unsigned byte, and can therefore be in the range of 0 through 255.

In returning from a Cascaded interrupt, the service procedure executes the Return from Interrupt (RETI) instruction, as it would for any Maskable Interrupt. The CPU performs an "End of Interrupt, Master" bus cycle (Sec. 3.4.2), whereupon the Master ICU again provides the negative Cascade Table index. The CPU, seeing a negative value, uses it to find the corresponding Cascade Address from the Cascade Table. Applying this address, it performs an "End of Interrupt, Cascaded" bus cycle (Sec. 3.4.2), informing the Cascaded ICU of the completion of the service routine. The byte read from the Cascaded ICU is discarded.

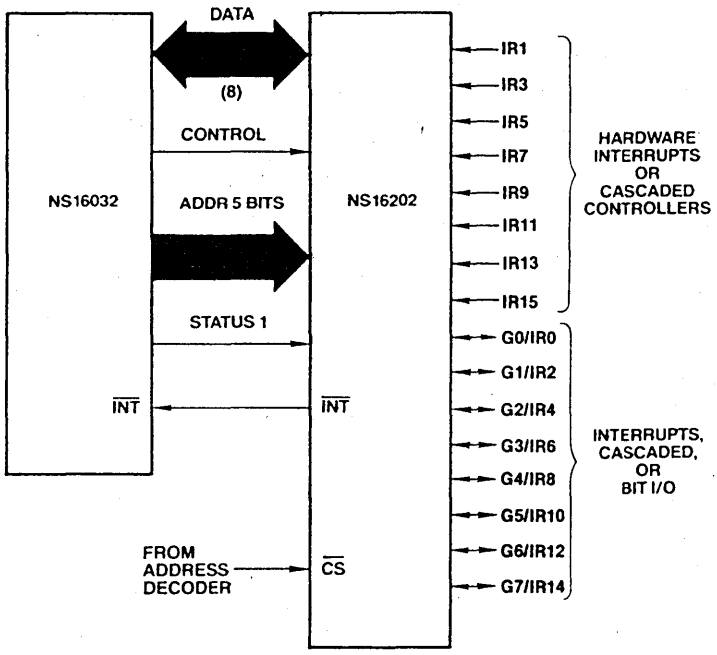


FIGURE 3-26. Interrupt Control Unit Connections (16 Levels).

© IC MASTER 1983

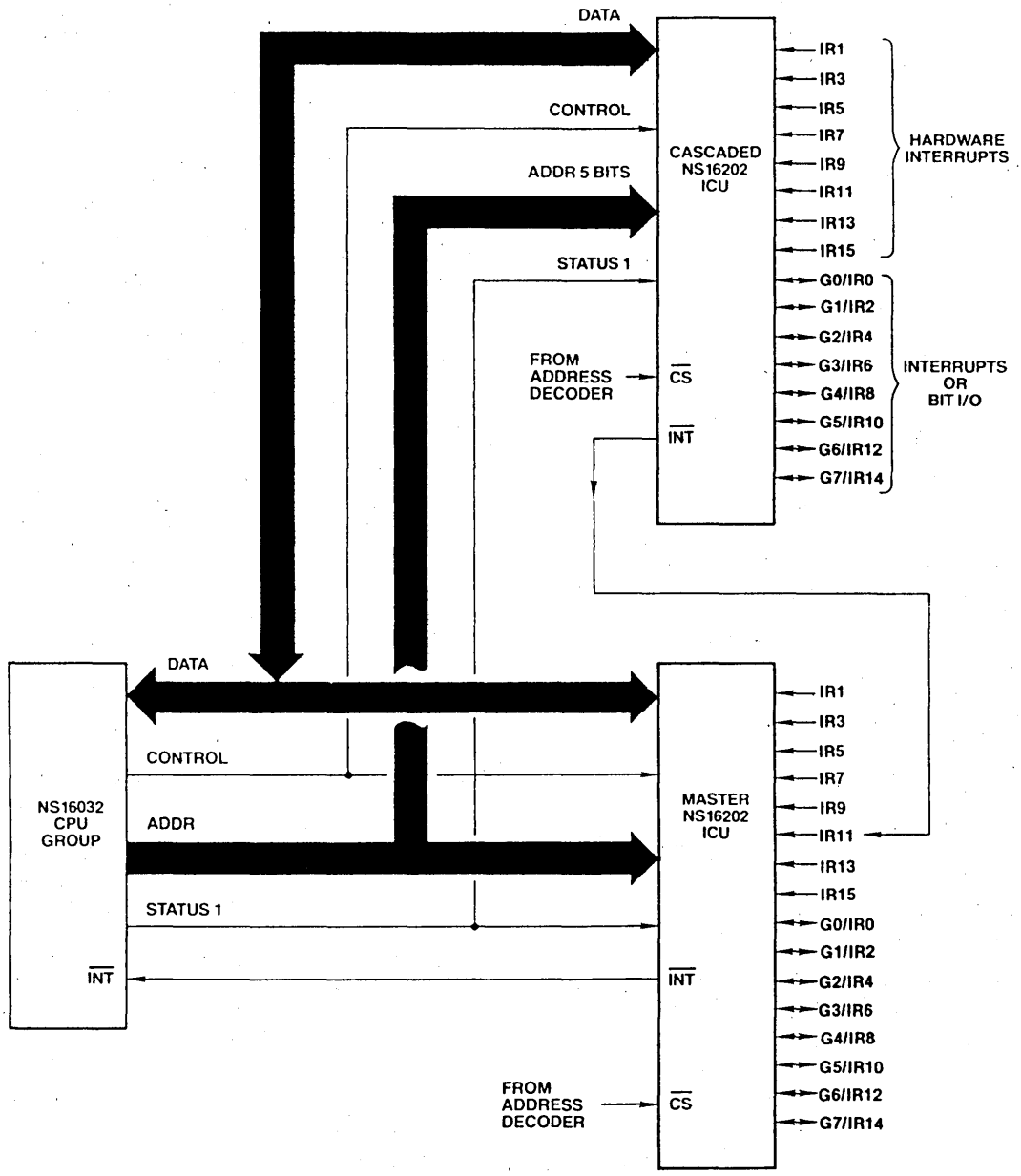


FIGURE 3-27. Cascaded Interrupt Control Unit Connections.

3.8.4 Non-Maskable Interrupt (The $\overline{\text{NMI}}$ Pin)

The Non-Maskable Interrupt is triggered whenever a falling edge is detected on the $\overline{\text{NMI}}$ pin. The CPU performs an "Interrupt Acknowledge, Master" bus cycle (Sec. 3.4.2) when processing of this interrupt actually begins. The Interrupt Acknowledge cycle differs from that provided for Maskable Interrupts in that the address presented is $FFFF00_{16}$. The vector value used for the Non-Maskable Interrupt is taken as 1, regardless of the value read from the bus.

The service procedure returns from the Non-Maskable Interrupt using the Return from Trap (RETT) instruction. No special bus cycles occur on return.

For the full sequence of events in processing the Non-Maskable Interrupt, see Sec. 3.8.7.1.

3.8.5 Traps

A trap is an internally-generated interrupt request caused as a direct and immediate result of the execution of an instruction. Traps recognized by the NS16032 CPU are:

Trap (FPU): An exceptional condition was detected by the NS16081 Floating Point Unit or another Slave Processor during the execution of a Slave Instruction. This trap is requested via the Status Word returned as part of the Slave Processor Protocol (Sec. 3.9.1).

Trap (ILL): Illegal operation. A privileged operation was attempted while the CPU was in User Mode (PSR bit U = 1).

Trap (SVC): The Supervisor Call (SVC) instruction was executed.

© IC MASTER 1983

Trap (DVZ): An attempt was made to divide an integer by zero. (The FPU trap is used for Floating Point division by zero.)

Trap (FLG): The FLAG instruction detected a "1" in the CPU PSR F bit.

Trap (BPT): The Breakpoint (BPT) instruction was executed.

Trap (TRC): The instruction just completed is being traced. See below.

Trap (UND): An undefined opcode was encountered by the CPU.

The Return Address pushed by any trap except TRC is the address of the first byte of the instruction during which the trap occurred. Traps do not disable interrupts, as they are not associated with external events.

A special case is the Trace Trap (TRC), which is enabled by setting the T bit in the Processor Status Register (PSR). At the beginning of each instruction, the T bit is copied into the PSR P (Trace "Pending") bit. If the P bit is set at the end of an instruction, then the Trace Trap is activated. If any other trap or interrupt request is made during a traced instruction, its entire service procedure is allowed to complete before the Trace Trap occurs. Each interrupt and trap sequence handles the P bit for proper tracing, guaranteeing one and only one Trace Trap per instruction, and guaranteeing that the Return Address pushed during a Trace Trap is always the address of the next instruction to be traced.

3.8.6 Prioritization

The NS16032 CPU internally prioritizes simultaneous interrupt and trap requests as follows:

1) Traps other than Trace (Highest priority)
2) Abort
3) Non-Maskable Interrupt
4) Maskable Interrupts
5) Trace Trap (Lowest priority)

3.8.7 Interrupt/Trap Sequences: Detailed Flow

For purposes of the following detailed discussion of interrupt and trap service sequences, a single sequence called "Service" is defined in Figure 3-28. Upon detecting any interrupt request or trap condition, the CPU first performs a sequence dependent upon the type of interrupt or trap. This sequence will include pushing the Processor Status Register and establishing a Vector and a Return Address. The CPU then performs the Service sequence.

For the sequence followed in processing either Maskable or Non-Maskable interrupts (on the $\overline{INT}$ or $\overline{NMI}$ pins, respectively), see Sec. 3.8.7.1. For Abort interrupts, see Sec. 3.8.7.4. For the Trace Trap, see Sec. 3.8.7.3, and for all other traps see Sec. 3.8.7.2.

3.8.7.1 Maskable/Non-Maskable Interrupt Sequence

This sequence is performed by the CPU when the $\overline{NMI}$ pin receives a falling edge, or the $\overline{INT}$ pin becomes active with the PSR I bit set. The interrupt sequence begins either at the next instruction boundary or, in the case of the String instructions, at the next interruptible point during its execution.

1) If a String instruction was interrupted and not yet completed:
   a) Clear the Procesor Status Register P bit.
   b) Set "Return Address" to the address of the first byte of the interrupted instruction.

   Otherwise, set "Return Address" to the address of the next instruction.
2) Copy the Processor Status Register (PSR) into a temporary register, then clear PSR bits S, U, T, P and I.
3) Push the PSR copy onto the Interrupt Stack as a 16-bit value.
4) If the interrupt is Non-Maskable:
   a) Read a byte from address $FFFF00_{16}$, applying Status Code 0100 (Interrupt Acknowledge, Master: Sec. 3.4.2). Discard the byte read.
   b) Set "Vector" to 1.
   c) Go to Step 9.
5) If the interrupt is Non-Vectored:
   a) Read a byte from address $FFFE00_{16}$, applying Status Code 0100 (Interrupt Acknowledge, Master: Sec. 3.4.2). Discard the byte read.
   b) Set "Vector" to 0.
   c) Go to Step 9.
6) Here the interrupt is Vectored. Read "Byte" from address $FFFE00_{16}$, applying Status Code 0100 (Interrupt Acknowledge, Master: Sec. 3.4.2).
7) If "Byte" ≥ 0, then set "Vector" to "Byte" and go to Step 9.
8) If "Byte" is in the range -16 through -1, then the interrupt source is Cascaded. (More negative values are reserved for future use.) Perform the following:
   a) Read the 32-bit Cascade Address from memory. The address is calculated as INTBASE + 4*Byte.
   b) Read "Vector," applying the Cascade Address just read and Status Code 0101 (Interrupt Acknowledge, Cascaded: Sec. 3.4.2).
9) Perform Service (Vector, Return Address), Figure 3-28.

Service (Vector, Return Address):

1) Push MOD Register onto the Interrupt Stack as a 16-bit value. (The PSR has already been pushed as a 16-bit value.)
2) Push the Return Address onto the Interrupt Stack as a 32-bit quantity.
3) Read the 32-bit External Procedure Descriptor from the Interrupt Dispatch Table: address is Vector*4 + INTBASE Register contents.
4) Move the Module field of the Descriptor into the MOD Register.
5) Read the new Static Base pointer from the memory address contained in MOD, placing it into the SB Register.
6) Read the Program Base pointer from memory address MOD+8, and add to it the Offset field from the Descriptor, placing the result in the Program Counter.

FIGURE 3-28. Service Sequence.
Invoked during all interrupt/trap sequences.

© IC MASTER 1983

3.8.7.2 Trap Sequence: Traps Other Than Trace

1) Restore the currently selected Stack Pointer and the Processor Status Register to their original values at the start of the trapped instruction.
2) Set "Vector" to the value corresponding to the trap type.

FPU:	Vector = 3.
ILL:	Vector = 4.
SVC:	Vector = 5.
DVZ:	Vector = 6.
FLG:	Vector = 7.
BPT:	Vector = 8.
UND:	Vector = 10.

3) Copy the Processor Status Register (PSR) into a temporary register, then clear PSR bits S, U, P and T.
4) Push the PSR copy onto the Interrupt Stack as a 16-bit value.
5) Set "Return Address" to the address of the first byte of the trapped instruction.
6) Perform Service (Vector, Return Address), Figure 3-28.

3.8.7.3 Trace Trap Sequence

1) In the Processor Status Register (PSR), clear the P bit.
2) Copy the PSR into a temporary register, then clear PSR bits S, U and T.
3) Push the PSR copy onto the Interrupt Stack as a 16-bit value.
4) Set "Vector" to 9.
5) Set "Return Address" to the address of the next instruction.
6) Perform Service (Vector, Return Address), Figure 3-28.

3.8.7.4 Abort Sequence

1) Restore the currently selected Stack Pointer to its original contents at the beginning of the aborted instruction.
2) Clear the PSR P bit.
3) Copy the PSR into a temporary register, then clear PSR bits S, U, T and I.
4) Push the PSR copy onto the Interrupt Stack as a 16-bit value.
5) Set "Vector" to 2.
6) Set "Return Address" to the address of the first byte of the aborted instruction.
7) Perform Service (Vector, Return Address), Figure 3-28.

3.9 SLAVE PROCESSOR INSTRUCTIONS

The NS16032 CPU recognizes three groups of instructions as being executable by external Slave Processors:

Floating Point Instruction Set
Memory Management Instruction Set
Custom Instruction Set

Each Slave Instruction Set is validated by a bit in the Configuration Register (Sec. 2.1.3). Any Slave Instruction which does not have its corresponding Configuration Register bit set will trap as undefined, without any Slave Processor communication attempted by the CPU. This allows software simulation of a non-existent Slave Processor.

Status Combinations:

Send ID (ID): Code 1111
Xfer Operand (OP): Code 1101
Read Status (ST): Code 1110

Step	Status	Action
1	ID	CPU Send ID Byte.
2	OP	CPU Sends Operation Word.
3	OP	CPU Sends Required Operands.
4	—	Slave Starts Execution. CPU Pre-fetches.
5	—	Slave Pulses $\overline{SPC}$ Low.
6	ST	CPU Reads Status Word. (Trap? Alter Flags?)
7	OP	CPU Reads Results (If Any).

FIGURE 3-29. Slave Processor Protocol.

3.9.1 Slave Processor Protocol

Slave Processor instructions have a three-byte Basic Instruction field, consisting of an ID Byte followed by an Operation Word. The ID Byte has three functions:

1) It identifies the instruction as being a Slave Processor instruction.
2) It specifies which Slave Processor will execute it.
3) It determines the format of the following Operation Word of the instruction.

Upon receiving a Slave Processor instruction, the CPU initiates the sequence outlined in Figure 3-29. While applying Status Code 1111 (Broadcast ID, Sec. 3.4.2), the CPU transfers the ID Byte on the least-significant half of the Data Bus (AD0-AD7). All Slave Processors input this byte and decode it. The Slave Processor selected by the ID Byte is activated, and from this point the CPU is communicating only with it. If any other slave protocol was in progress (e.g., an aborted Slave instruction), this transfer cancels it.

The CPU next sends the Operation Word while applying Status Code 1101 (Transfer Slave Operand, Sec. 3.4.2). Upon receiving it, the Slave Processor decodes it, and at this point both the CPU and the Slave Processor are aware of the number of operands to be transferred and their sizes. The operation Word is swapped on the Data Bus; that is, bits 0-7 appear on pins AD8-AD15 respectively, and bits 8-15 appear on pins AD0-AD7 respectively.

Using the Addressing Mode fields within the Operation Word, the CPU starts fetching operands and issuing them to the Slave Processor. To do so, it references any Addressing Mode extensions which may be appended to the Slave Processor instruction. Since the CPU is

© IC MASTER 1983

solely responsible for memory accesses, these extensions are not sent to the Slave processor. The Status Code applied is 1101 (Transfer Slave Processor Operand, Sec. 3.4.2).

After the CPU has issued the last operand, the Slave Processor starts the actual execution of the instruction. Upon completion, it will signal the CPU by pulsing $\overline{SPC}$ low. To allow for this, and for the Address Translation strap function, $\overline{AT}/\overline{SPC}$ is normally held high only by an internal pull-up device of approximately 5K ohms.

While the Slave Processor is executing the instruction, the CPU is free to prefetch instructions into its queue. If it fills the queue before the Slave Processor finishes, the CPU will wait, applying Status Code 0011 (Waiting for Slave, Sec. 3.4.2).

Upon receiving the pulse on $\overline{SPC}$, the CPU uses $\overline{SPC}$ to read a Status Word from the Slave Processor, applying Status Code 1110 (Read Slave Status, Sec. 3.4.2). This word has the format shown in Figure 3-30. If the Q bit ("Quit", Bit 0) is set, this indicates that an error was detected by the Slave Processor. The CPU will not continue the protocol, but will immediately trap through the FPU vector in the Interrupt Table. Certain Slave Processor instructions cause CPU PSR bits to be loaded from the Status Word.

The last step in the protocol is for the CPU to read a result, if any, and transfer it to the destination. The Read cycles from the Slave Processor are performed by the CPU while applying Status Code 1101 (Transfer Slave Operand, Sec. 3.4.2).

An exception to the protocol above is the LMR (Load Memory Management Register) instruction, and a corresponding Custom Slave instruction (LCR: Load Custom Register). In executing these instructions, the protocol ends after the CPU has issued the last operand. The CPU does not wait for an acknowledgement from the Slave Processor, and it does not read status.

3.9.2 Floating Point Instructions

Table 3-4 gives the protocols followed for each Floating Point instruction. The instructions are referenced by their mnemonics. For the bit encodings of each instruction, see Appendix A.

The Operand class columns give the Access Classes for each general operand, defining how the addressing modes are interpreted (see Programmer's Manual).

The Operand Issued columns show the sizes of the operands issued to the Floating Point Unit by the CPU. "D" indicates a 32-bit Double Word. "i" indicates that the instruction specifies an integer size for the operand (B = Byte, W = Word, D = Double Word). "f" indicates that the instruction specifies a Floating Point size for the operand (F = 32-bit Standard Floating, L = 64-bit Long Floating).

The Returned Value Type and Destination column gives the size of any returned value and where the CPU places it. The PSR Bits Affected column indicates which PSR bits, if any, are updated from the Slave Processor Status Word (Figure 3-30).

Table 3-4.
Floating Point Instruction Protocols.

Mnemonic	Operand 1 Class	Operand 2 Class	Operand 1 Issued	Operand 2 Issued	Returned Value Type and Dest.	PSR Bits Affected
ADDf	read.f	rmw.f	f	f	f to Op. 2	none
SUBf	read.f	rmw.f	f	f	f to op. 2	none
MULf	read.f	rmw.f	f	f	f to Op. 2	none
DIVf	read.f	rmw.f	f	f	f to Op. 2	none
MOVf	read.f	write.f	f	N/A	f to Op. 2	none
ABSf	read.f	write.f	f	N/A	f to Op. 2	none
NEGf	read.f	write.f	f	N/A	f to Op. 2	none
CMPf	read.f	read.f	f	f	N/A	N,Z,L
FLOORfi	read.f	write.i	f	N/A	i to op. 2	none
TRUNCfi	read.f	write.i	f	N/A	i to Op. 2	none
ROUNDfi	read.f	write.i	f	N/A	i to Op. 2	none
MOVFL	read.F	write.L	f	N/A	L to Op. 2	none
MOVLF	read.L	write.F	L	N/A	F to Op. 2	none
MOVif	read.i	write.f	i	N/A	f to Op. 2	none
LFSR	read.D	N/A	D	N/A	N/A	none
SFSR	write.D	N/A	N/A	N/A	D to Op. 1	none

NOTE:
D = Double Word
i = Integer size (B,W,D) specified in mnemonic.
f = Floating Point type (F,L) specified in mnemonic.
N/A = Not Applicable to this instruction

© IC MASTER 1983

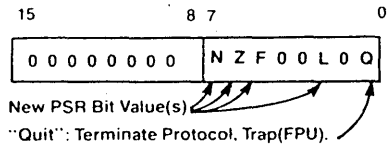


FIGURE 3-30. Slave Processor Status Word Format.

Any operand indicated as being of type "f" will not cause a transfer if the Register addressing mode is specified. This is because the Floating Point Registers are physically on the Floating Point Unit and are therefore available without CPU assistance.

3.9.3 Memory Management Instructions

Table 3-5 gives the protocols for Memory Management instructions. Encodings for these instructions may be found in Appendix A.

In executing the RDVAL and WRVAL instructions, the CPU calculates and issues the 32-bit Effective Address of the single operand. The CPU then performs a single-byte Read cycle from that address, allowing the MMU to safely abort the instruction if the necessary information is not currently in physical memory. Upon seeing the memory cycle complete, the MMU continues the protocol, and returns the validation result in the F bit of the Slave Status Word.

The size of a Memory Management operand is always a 32-bit Double Word. For futher details of the Memory Management Instruction set, see the Programmer's Manual and the NS16082 MMU Data Sheet.

Table 3-5.
Memory Management Instruction Protocols.

Mnemonic	Operand 1 Class	Operand 2 Class	Operand 1 Issued	Operand 2 Issued	Returned Value Type and Dest.	PSR Bits Affected
RDVAL *	addr	N/A	D	N/A	N/A	F
WRVAL *	addr	N/A	D	N/A	N/A	F
LMR *	read.D	N/A	D	N/A	N/A	none
SMR *	write.D	N/A	N/A	N/A	D to Op. 1	none

NOTE: In the RDVAL and WRVAL instructions, the CPU issues the address as a Double Word, and performs a single-byte Read cycle from that memory address. For details, see the Programmer's Manual and the NS16082 Memory Management Unit Data Sheet.

D = Double Word.
* = Privileged Instruction: will trap if CPU is in User Mode.
N/A = Not Applicable to this instruction.

© IC MASTER 1983

3.9.4 Custom Slave Instructions

Provided in the NS16032 is the capability of communicating with a user-defined, "Custom" Slave Processor. The instruction set provided for a Custom Slave Processor defines the instruction formats, the operand classes and the communication protocol. Left to the user are the interpretations of the Op Code fields, the programming model of the Custom Slave and the actual types of data transferred. The protocol specifies only the size of an operand, not its data type.

Table 3-6 lists the relevant information for the Custom Slave instruction set. The designation "c" is used to represent an operand which can be a 32-bit ("D") or 64-bit ("Q") quantity in any format; the size is determined by the suffix on the mnemonic. Similarly, an "i" indicates an integer size (Byte, Word, Double Word) selected by the corresponding mnemonic suffix.

For the instruction encodings, see Appendix A.

Table 3-6.
Custom Slave Instruction Protocols.

Mnemonic	Operand 1 Class	Operand 2 Class	Operand 1 Issued	Operand 2 Issued	Returned Value Type and Dest.	PSR Bits Affected
CCAL0c	read.c	rmw.c	c	c	c to Op. 2	none
CCAL1c	read.c	rmw.c	c	c	c to Op. 2	none
CCAL2c	read.c	rmw.c	c	c	c to Op. 2	none
CCAL3c	read.c	rmw.c	c	c	c to Op. 2	none
CMOV0c	read.c	write.c	c	N/A	c to Op. 2	none
CMOV1c	read.c	write.c	c	N/A	c to Op. 2	none
CMOV2c	read.c	write.c	c	N/A	c to Op. 2	none
CCMPc	read.c	read.c	c	c	N/A	N,Z,L
CCV0ci	read.c	write.i	c	N/A	i to Op. 2	none
CCV1ci	read.c	write.i	c	N/A	i to Op. 2	none
CCV2ci	read.c	write.i	c	N/A	i to Op. 2	none
CCV3ic	read.i	write.c	i	N/A	c to Op. 2	none
CCV4DQ	read.D	write.Q	D	N/A	Q to Op. 2	none
CCV5QD	read.Q	write.D	Q	N/A	D to Op. 2	none
LCSR	read.D	N/A	D	N/A	N/A	none
SCSR	write.D	N/A	N/A	N/A	D to Op. 2	none
CATST0 *	addr	N/A	D	N/A	N/A	F
CATST1 *	addr	N/A	D	N/A	N/A	F
LCR *	read.D	N/A	D	N/A	N/A	none
SCR *	write.D	N/A	N/A	N/A	D to Op. 1	none

NOTE:

D = Double Word.
i = Integer size (B,W,D) specified in mnemonic.
c = Custom size (D:32 bits or Q: 64 bits) specified in mnemonic.
* = Privileged Instruction: will trap if CPU is in User Mode.
N/A = Not Applicable to this instruction.

© IC MASTER 1983

NS16081 Floating-Point Unit

General Description

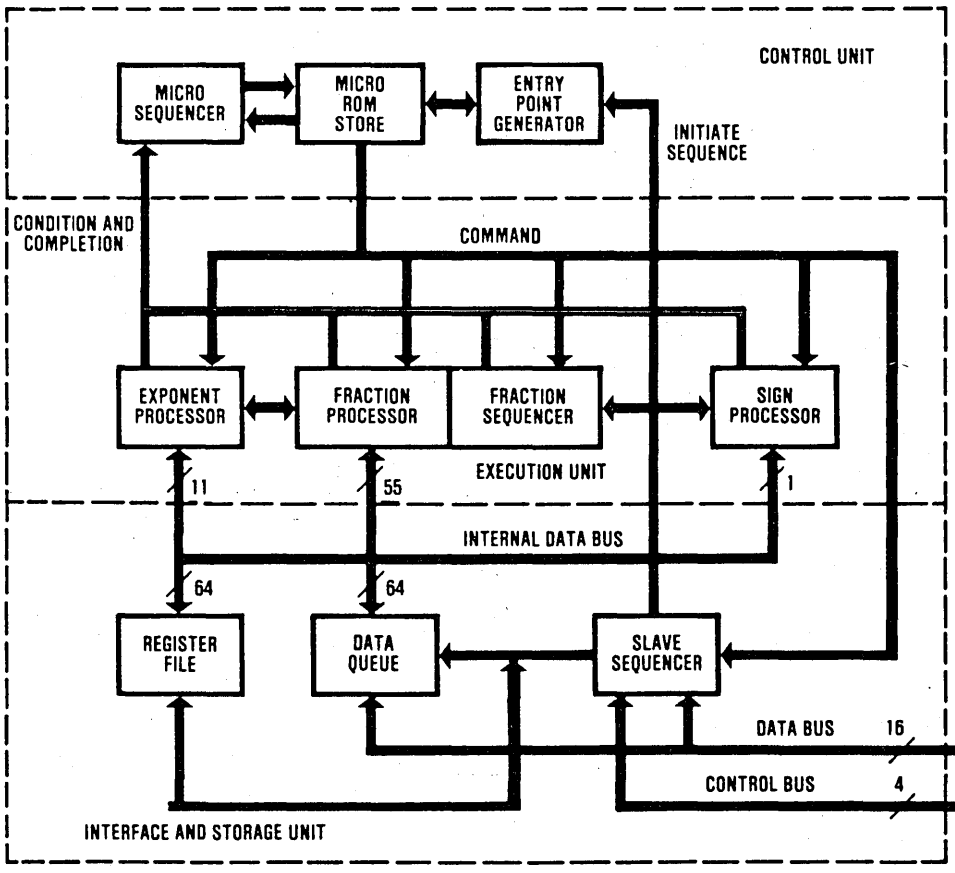
The NS16081 is the Floating-Point Unit (FPU) in the NS16000 microprocessor family. The NS16081 operates as a slave processor, and the NS16081 instruction set appears to the programmer as part of the NS16000 instruction set. Thus, the user can utilize all the powerful addressing modes and data types present in the NS16000 architecture. The FPU performs both single-precision (32-bit) and double-precision (64-bit) floating-point arithmetic, and conforms to the proposed IEEE format. The FPU instruction set includes Add, Subtract, Multiply, Divide, and other popular arithmetic operations. The FPU is compatible with all microprocessors in the NS16000 family.

Features

- Both 32-bit and 64-bit operation
- Eight on-board, general-purpose, 32-bit registers
- Conforms to proposed IEEE format
- Accepts direct memory-to-memory operation
- High-speed execution—typical values (at 10MHz) are:

	32-bit	64-bit
Add	7.4 μs	7.4 μs
Multiply	4.8 μs	6.2 μs
Divide	8.9 μs	11.8 μs

- High-speed XMOS™ technology
- Single, +5V supply
- 24-pin package



FPU Block Diagram

OC1799-1

XMOS is a trademark of National Semiconductor Corp.

©1982 National Semiconductor Corp. O/C/1799

In-H/B25M102/Printed in U.S.A.

© IC MASTER 1983

NS16081 Pin Descriptions

Figure 1 is an NS16081 connection diagram. The function of each pin is described below.

D0-D15: Data input and output pins
VCC, GND: +5V, signal ground power pins
CLK: TTL-compatible clock input
$\overline{RST}$: Slave processor reset input
ST0, ST1: Status input lines (from CPU)
$\overline{SPC}$: Bidirectional slave processor communication line

NS16081
Dual-In-Line Package

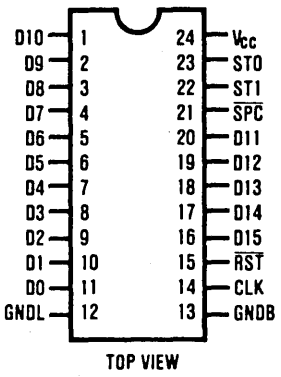


FIGURE 1. FPU Pinout OC1799-2

Functional Description

REGISTER SET

The NS16081 FPU has nine on-board, 32-bit registers. Eight are general-purpose registers and one is dedicated to FPU status. *Figure 2* illustrates the FPU register set layout.

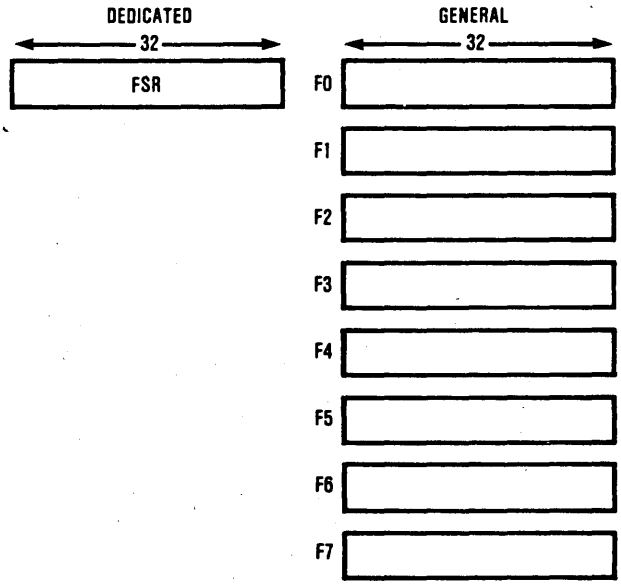


FIGURE 2. Register Set Layout OC1799-3

Each general-purpose register holds a 32-bit, single-precision, floating-point operand. For 64-bit, double-precision operation, a pair of general-purpose registers are concatenated. Register pairs consist of one even-numbered (N) and one odd-numbered (N+1) register. In double-precision operation, register pairs are identified by the even-numbered register of the pair.

Figure 3 shows the possible FPU floating-point formats.

The FPU Status Register (FSR) stores control and error data. Users can write control words to the FSR and read FPU operation and error status from the FSR.

The control options available via the FSR include enabling CPU traps, enabling FPU errors, and setting the rounding mode. Writing the FSR allows the user to specify one of the following rounding modes:

- Round to nearest
- Round towards zero
- Round towards + infinity
- Round towards - infinity

The error conditions reported via the FSR include the following:

- Underflow: If a result is too small (after rounding) to be represented as a normalized number, the FPU sets the underflow error bit in the FSR. If the trap enable bit is set, an underflow error traps the CPU. If the trap enable bit is not set, the result returned to the CPU is zero.
- Illegal Division: If a divisor is zero, the FPU generates a trap to the CPU.
- Illegal Instruction: If an undefined opcode is received, the FPU generates a trap to the CPU.
- Reserved Operand: If a reserved operand is received, the FPU generates a trap to the CPU.

Note: A reserved operand is defined as either an all-zero exponent, with the fraction not zero, or an all-one exponent.

- Inexact Result: The inexact result bit is set in the FSR if the result of an operation (after rounding) cannot be represented properly. If the trap enable bit is set, the FPU generates a trap to the CPU.

INSTRUCTION SET

The NS16081 FPU instruction set provides the following operations:

Add, Subtract, Multiply, Divide: These instructions provide basic arithmetic operations for two 32-bit or 64-bit operands.

Compare: This instruction compares the magnitude of two 32-bit or 64-bit operands and posts the results in the Processor Status Register (PSR) of the CPU. (Refer to each individual CPU's data sheet for details on the PSR.)

© IC MASTER 1983

National Semiconductor

PRELIMINARY
MARCH 1982

NS16082 Memory Management Unit (MMU)

General Description

The NS16082 Memory Management Unit (MMU) provides hardware support for demand-paged virtual memory management. Its specific capabilities include fast dynamic address translation, protection on individual 512-byte pages, and detailed status to assist an operating system in efficiently managing up to 16 MB of physical memory. Support for virtual machine implementations is provided, along with comprehensive software debugging features.

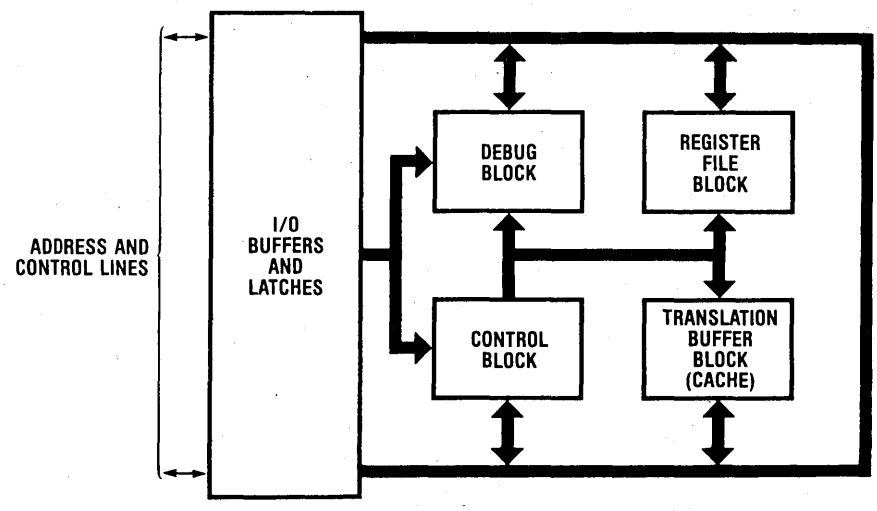
High-speed address translation is performed on-chip through a 32-entry associative cache, which maintains itself from tables in memory with no software intervention. Protection violations and page faults (references to nonresident pages) are automatically detected by the MMU, invoking the instruction abort with retry feature of the CPU. This fault handling mechanism provides the necessary hooks for virtual memory and virtual machines.

Additional features for program debugging include two hardware breakpoint registers and a program flow traceback facility, which provide the programmer with powerful stand-alone debugging capability even without expensive test equipment.

Features

- Dynamic address translation
- 32-entry on-chip translation cache, updated automatically from page tables in memory
- Full hardware support for virtual memory and virtual machines
- Security mechanisms implemented via access level checking and dual-space mapping
- Program debugging support:
  - — Two breakpoint registers
  - — "Break on Branch" mode
  - — Program flow traceback
- High-speed XMOS technology
- 48-pin dual-in-line package
- Single 5V supply

NS16082 MMU Block Diagram



ISE is a trademark of National Semiconductor Corporation.

©1982 National Semiconductor Corporation OC1647

DA-B30M32/Printed in U.S.A.

© IC MASTER 1983

National Semiconductor

NS16082

Absolute Maximum Ratings

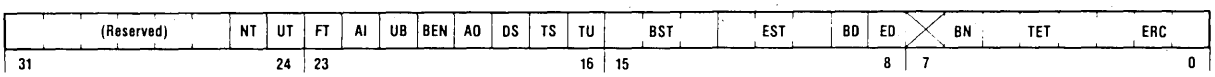
Temperature Under Bias	0°C to 70°C
Storage Temperature	−65°C to 150°C
All Input or Output Voltages with respect to GND	−0.5V to +7.0V
Power Dissipation	1.5Watt

Note: Absolute maximum ratings are those values beyond which the safety of the device cannot be guaranteed. Continuous operation at these limits is not intended. Therefore, operation should be limited to those conditions specified under DC Electrical Characteristics (see below).

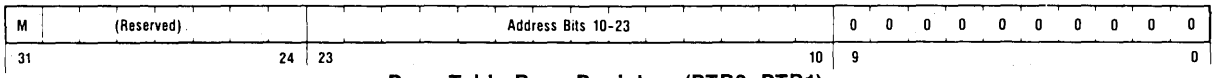
DC Electrical Characteristics $V_{CC} = 5V \pm 5\%$

Symbol	Parameter	Test	Min.	Max.	Unit
V_{IL}	Input Low Voltage		−0.5	+0.8	V
V_{IH}	Input High Voltage		2.0	$V_{CC}+0.5$	V
V_{OL}	Output Low Voltage	$I_{OL} = 2.0mA$		0.45	V
V_{OH}	Output High Voltage	$I_{OH} = -400\mu A$	2.4		V
I_{CC}	Power Supply Current	$T_A = 0°C$		300	mA
I_{IL}	Input Leakage Current	$0 < V_{IN} < V_{CC}$		10	μA
I_{OL}	Output Leakage Current	$0.45 < V_O < V_{CC}$		10	μA

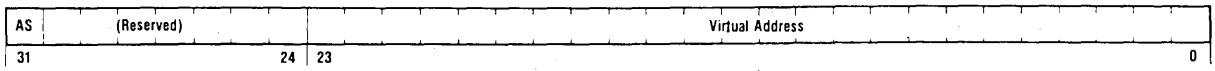
NS16082 MMU Bit Maps



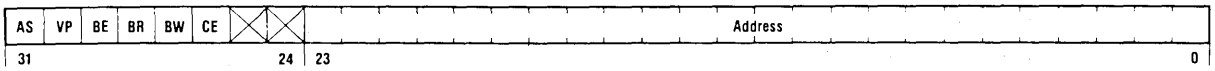
Memory Management Status Register (MSR)



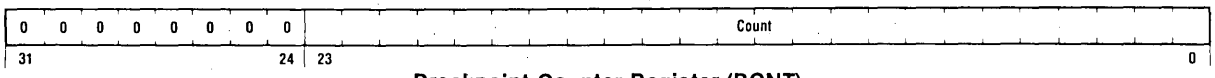
Page Table Base Registers (PTB0, PTB1)



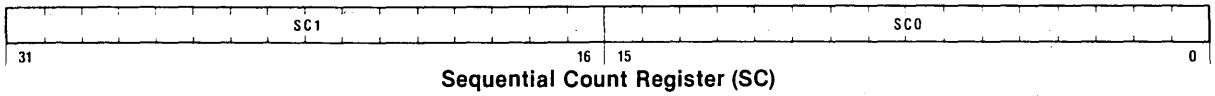
Error/Invalidate Address Register (EIA)
Program Flow Registers (PF0, PF1)



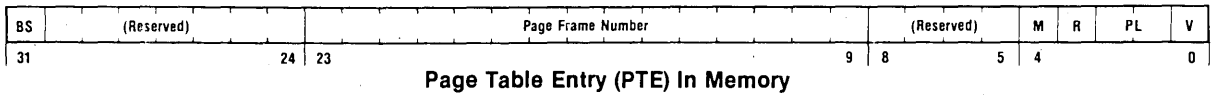
Breakpoint Registers (BPR0, BPR1)



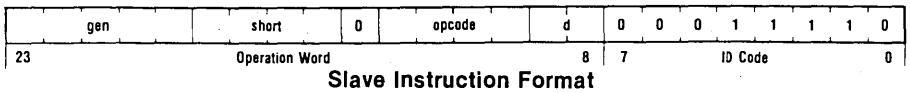
Breakpoint Counter Register (BCNT)



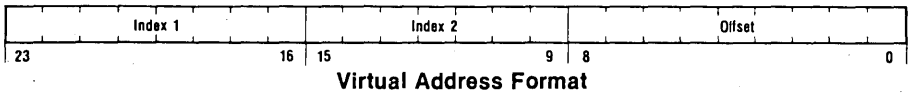
Sequential Count Register (SC)



Page Table Entry (PTE) In Memory



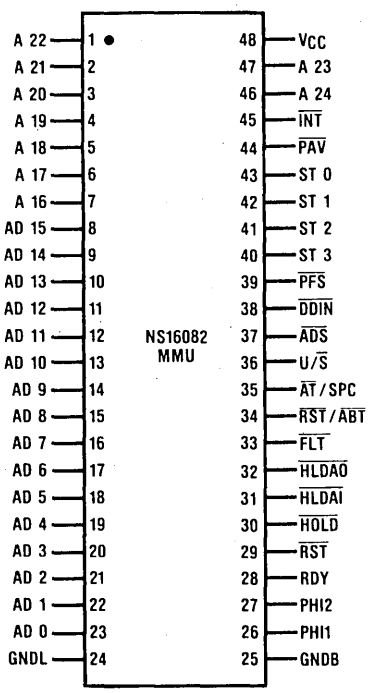
Slave Instruction Format



Virtual Address Format

© IC MASTER 1983

1 Pin Descriptions



Pin Configuration

1 Pin Descriptions

The following is a brief description of all NS16082 pins. The descriptions reference portions of the functional descriptions, Section 3.

1.1 Supplies

Power (V_{CC}): +4.75 to 5.25 V DC supply. (Sec. 3.1)

Logical Ground (GNDL): Internal Logic Common Ground. (Sec. 3.1)

Buffer Ground (GNDB): Signal Ground and Power Supply return. (Sec. 3.1)

1.2 Input Signals

Clock (PHI1, PHI2): Two-phase clocking signals from 0.5 to 10 MHz MOS Level clocks from NS16201 clock generator. See NS16032.

Ready (RDY): Used by slow memories to extend the memory cycle for more than four clock periods. It is synchronized externally and sampled at the beginning of T3.

Hold Request ($\overline{HOLD}$), ($\overline{HLDAI}$), ($\overline{HLDAO}$): Hold/Hold Acknowledge Input/Hold Acknowledge Output — three pins for active low signals used in DMA transfers. A DMA device requests the bus pulling the $\overline{HOLD}$ line low. $\overline{HLDAI}$ is connected to the $\overline{HLDA}$ output line of the CPU and $\overline{HLDAO}$ is output to the DMA device.

Reset ($\overline{RST}$): System reset, active low.

Status Lines (ST0-3): Status lines output by the CPU. Active from T4 of previous bus transfer through T3 of present bus transfer. See NS16032 Data Sheet for assignments.

Program Flow Status ($\overline{PFS}$): Active low pulse issued by the CPU at the beginning of each instruction.

User/Supervisor Modes (U/$\overline{S}$): This signal is provided by the CPU, from its U-bit in Program Status Register (PSR). It is used by the MMU for memory protection and for selection of the Address Space (in Dual Space mode only).

Address Strobe Input ($\overline{ADS}$): Active low pulse received from the CPU during T1. Used as a strobe to latch the virtual address from the multiplexed bus.

1.3 Output Signals

Reset Output or Abort ($\overline{RST}$/$\overline{ABT}$): Active low pulse accepted by the CPU during TMMU or T2. When active, the CPU is interrupted. The MMU status register (MSR) holds the information about the cause of the abort. When held longer than one clock cycle it is interpreted by the CPU as a reset signal. Upon receiving the $\overline{RST}$ signal on its own pin, the MMU will activate the $\overline{RST}$/$\overline{ABT}$ pin to reset the CPU.

Interrupt Output ($\overline{INT}$): Active low pulse used by the debug functions to inform the CPU (when connected to its $\overline{NMI}$ input) or external hardware that a break condition has occurred. The MMU status register (MSR) holds the information about the cause of the interrupt.

Float Output ($\overline{FLT}$): An active low signal that floats the CPU from the bus, when the MMU has to get Page Table Entries from memory. It is sampled by the CPU during TMMU. It is held high during reset.

Physical Address Valid ($\overline{PAV}$): Active low pulse generated during TMMU. Used as a strobe pulse by the memory address latches. It floats during HOLD ACKNOWLEDGE and it is also pulsed when $\overline{FLT}$ is active to access page tables.

Most significant bit of Physical Address (A24): Valid from TMMU to T4.

Hold Acknowledge Output ($\overline{HLDAO}$): See Hold Request. (Sec. 1.2)

1.4 Input-Output Signals

Multiplexed Address/Data Bus (AD0-AD15): During clock period T1, contains the Virtual Address (output by the CPU). During period TMMU contains the Physical Address (output by the MMU). During periods T2-T4 contains Data (output by the CPU, memory or MMU).

Virtual/Physical Address Multiplexed Bus (A16-A23): High-order bits of address. During T1, the bus contains the Virtual Address (output by the CPU). During TMMU-T4 it contains the Physical Address (output by the MMU).

Data Direction In ($\overline{DDIN}$): As an input indicates to the MMU the type of memory cycle: Low for Read and high for Write. When the CPU tri-states this line, the line is driven by the MMU allowing it to read/write in the memory pages independently of the CPU.

Address Translation or Slave Processor Control ($\overline{AT}$/$\overline{SPC}$): A bidirectional control line used in slave instructions. For a description of the characteristics of this line refer to the NS16032 CPU Data Sheet. During reset it is held low by the MMU to set the CPU for the Address Translation mode.

© IC MASTER 1983

2 General Description

For purposes of address translation, memory is divided into 512-byte pages. A virtual address for the MMU is composed of two fields: a virtual page frame number and a 9-bit offset. The offset is unchanged by the translation algorithm. The MMU translates the virtual page number to a physical page number, according to page tables stored in memory.

The Operating System and MMU exchange information on the status of the memory pages through a Page Table in physical memory. The entries track both the presence of a page in the physical memory and the protection level of that page.

By manipulating the page tables, an Operating System dynamically controls the mapping of virtual to physical addresses. In particular, the Operating System may specify that references to certain pages should generate translation error aborts. This mechanism implements virtual memory management and protection.

The virtual address output from the NS16032 CPU is 24 bits wide while the physical address output from the MMU is 25 bits wide. The extra bit (bit 25) can partition memory, making it especially useful in an In-System Emulation (ISE™) environment.

The MMU has an internal cache memory which contains direct virtual-to-physical address mappings of the 32 most recently used pages. Thus, most address translations take only one additional clock cycle. The "hit rate" of the cache memory is usually better than 98%, so that the time overhead involved in dynamic translation is minimal.

The MMU is also capable of debugging support. The MMU's ability to perform program flow tracing and address breakpoints aids debugging.

Program flow tracing allows software to reconstruct the sequence of instructions executed prior to an exception or a breakpoint. The address of a nonsequential instruction is stored and a count is kept of the number of instructions following until the next nonsequential instruction is reached. The MMU enables retracing of two such branchings with no effect on execution time. By enabling a special "Break on Nonsequential Fetch" feature, a table of arbitrary length can be maintained.

Up to two breakpoint addresses, virtual or physical, may be activated in the MMU. A counter may be attached to one of these, enabling "break on N occurances" capability.

2.1 Internal Organization

Internal organization of the NS16032 MMU consists of five functional blocks and their respective addressable registers. These are shown in *Figure 2-1*. Both internal and external MMU connections are shown in the block diagram. Detailed block and register operation is described in the following subsections.

2.1.1 Hardware Debug Block

This block contains the registers, counters, and logic which allow the execution of program breakpoints. The circuits also permit program flow tracing, which, in turn, enables the software to reconstruct the sequence of instructions executed before breakpoint.

Program flow tracing information is recorded in the two 24-bit Program Flow registers (PF0 and PF1). The 32-bit Sequential Counter (SC) contains the number of sequentially executed instructions following the last two program flow changes. The PF registers store the virtual addresses of the last two nonsequentially executed instructions. If such an address is obtained, it is entered into PF0. The old PF0 contents are shifted into PF1; the previous contents of PF1 are lost. The corresponding counts in the halves of SC are transferred similarly. For the user these are read-only registers read by means of the Store Memory Management Register (SMR) slave instruction. A Load Memory Management Register (LMR) instruction addressing any of the PF registers will reset the PF and SC registers.

The debug block includes the following registers. Each is described below. Particular emphasis is placed on the the MMU Status Register (MSR).

- MMU Status Register (MSR)
- Program Flow Registers (PF0 and PF1)
- Sequential Counter (SC)
- Breakpoint Registers (BPR0 and BPR1)
- Breakpoint Counter Register (BCNT)

Memory Management Status Register

The Memory Management Status Register (MSR) specifies the operational mode and current processing status of the MMU. The register permits user control of address translation, breakpoints, and program tracing. The MMU Status Register is 32 bits in length. The MSR format is shown on page 2.

Bits 0 to 25 are the various control bits and flags of the MMU. Bits 26 to 31 are not used. The following describes the control bits and flags:

ERC is the Error Class flag. The 3-bit flag specifies the cause of the current MMU exception.

Bit 0 is set to 1 on an address translation error.

Bit 1 is not used.

Bit 2 is set to 1 on a break and set to 0 on a nonsequential trace interrupt.

TET is the Translation Error Trace flag. The 3-bit flag specifies the cause of the current address translation error.

Bit 3 is set to 1 on a protection level error.

Bit 4 is set to 1 on an invalid Level 1 Page Table Entry.

Bit 5 is set to 1 on an invalid Level 2 Page Table Entry.

BN is the Breakpoint Number bit. BN is set to indicate the breakpoint address of the current break. If BN is 1, the breakpoint address is contained in BPR1. If BN is 0, the breakpoint address is in BPR0.

ED is the error Data Direction bit. If ED is 1, a read operation or the first part of a read-modify-write operation caused an address translation error. If

© IC MASTER 1983

ED is 0, a write or the last part of a read-modify-write operation caused the error.

BD is the Breakpoint Direction bit. If BD is 1, a read operation or the first part of a read-modify-write operation caused the current break. If BD is 0, a write operation on the last part of a read-modify-write operation caused the break.

EST is the Error Status flag. The 3-bit flag is set on an address translation error to the low order three bits of the system status bus. (See CPU Hardware Specs.)

BST is the Breakpoint Status flag. The 3-bit flag is set on a break to the low order three bits of the system status bus. (See CPU Hardware Specs.)

TU is the Translate User bit. If TU is 1, the MMU translates all adddresses specified in the User mode. If TU is 0, the MMU interprets addresses specified in the User mode as physical address.

TS is the Translate Supervisor bit. If TS is 1, the MMU translates all addresses specified in the Supervisor mode. If TS is 0, the MMU interprets addresses specified in the Supervisor mode as physical addresses.

DS is the Dual Space bit. If DS is 1, the PTB1 register contains the Level 1 Page Table Base address of all addresses specified in the User mode. If DS is 0, the PTB0 register contains the Level 1 Page Table Base address of all addresses specified in both User and Supervisor modes.

AO is the Access Override bit. If AO is 1, the MMU overrides the protection level of all addresses. This permits a program to access memory which is normally accessible only to the supervisor while the system is in the User mode. If A0 is 0, the MMU does not override protection level.

BEN is the Breakpoint Enable bit. If BEN is 1, the MMU enables the BPR0 and BPR1 registers and breaks program execution whenever a breakpoint is encountered. If BEN is 0, the MMU disables the BPR0 and BPR1 registers.

UB is the User Break bit. If UB is 1, the MMU enables the BPR0 and BPR1 registers for User mode operation only. If UB is 0, the MMU enables the registers for both User and Supervisor mode. The UB bit is ignored if breakpoints are disabled (BE = 0).

AI is the Abort or Interrupt bit.

FT is the Flow Trace bit. If FT is 1, the MMU enables the PF0, PF1, SC0, and SC1 registers and traces program execution. If FT is 0, the MMU disables the registers.

UT is the User Trace bit. IF UT is 1, the MMU enables the PF0, PF1, SC0, and SC1 registers for User mode operation only. IF UT is 0, the MMU enables the registers for both User and Supervisor mode. The UT bit is ignored if flow trace is disabled (FT = 0).

NT is the Nonsequential Trace bit. If NT is 1, the MMU enables the Nonsequential Trace interrupt. The MMU stops execution of any branch, jump, call, or return instruction and sends a non-maskable interrupt to the system CPU. If NT is 0, the MMU disables the interrupt.

The MSR control bits and flags may be read or modified by executing the SMR and LMR instructions. The NT, FT, TS, TU bits and the ERC flag are set to 0 whenever the system is reset. The NT, FT, and BEN bits are set to 0 whenever the MMU generates a break on a breakpoint, a flow trace interrupt, or an instruction abort on an address translation error.

After writing to the MSR, the MMU automatically suppresses the generation of breaks and flow tracing until a branch, jump, call, or return instruction has been executed. This permits a routine to set the MSR and

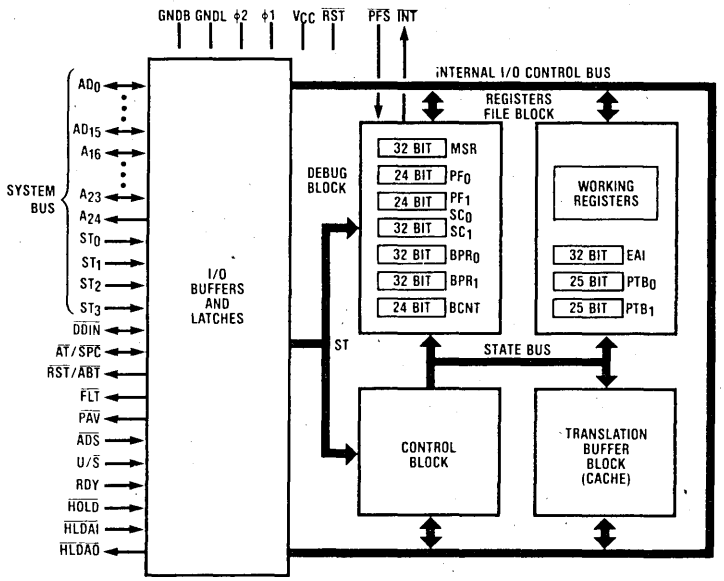


Figure 2-1. MMU Block Diagram

© IC MASTER 1983

then pass execution to the program being debugged without generating a premature break. The Error Memory Cycle Type (EMCT) is the combination of the BST, EST, BD and ED fields.

Program Flow Registers

The Program Flow registers PF0 and PF1 record the addresses of the two most recently executed nonsequential instructions. Nonsequential instructions are instructions to which execution control is passed by a program exception or a branch, jump, call, or return instruction.

The PF0 and PF1 registers are each 24 bits in length. PF0 contains the address of the last nonsequential instruction to be executed, and PF1 contains the address of the next to last nonsequential instruction to be executed.

The MMU records program flow by copying the address of the current nonsequential instruction to PF0 and copying the previous contents of PF0 to PF1. The MMU copies new addresses to the PF0 and PF1 registers each time a nonsequential instruction is executed by the system.

The FT bit in the MSR enables/disables the registers. If FT is 1, the registers record the program flow. If FT is 0, the registers are disabled.

The contents of the PF0 and PF1 registers may be read by executing the SMR instruction and cleared by executing the LMR instruction to any of the program flow registers.

Sequential Count Registers

The Sequential Count Registers SC0 and SC1 record the number of sequential instructions the system executes after each of the two most recent non-sequential instructions. The SC0 and SC1 registers occupy one 32-bit register and have the format shown on page 2.

SC0 contains the number of sequential instructions executed after the most recent nonsequential instruction. SC1 specifies the number of sequential instructions executed between the nonsequential instruction specified by PF1 and the instruction specified by PF0.

The MMU records the sequential count by incrementing by 1 the SC0 register for each sequential instruction executed. On execution of a nonsequential instruction, the MMU copies the contents of SC0 to SC1 and clears SC0 to 0 to begin a new count. The MMU continues to increment SC0 until another nonsequential instruction is executed or until SC0 is incremented to 65535. SC0 count cannot exceed 65535.

The FT bit in the MSR enables/disables the SC0 and SC1 registers. If FT is 1, the registers record the sequential instruction count. If FT is 0, the registers are disabled.

The contents of the SC0 and SC1 registers may be read by executing the SMR instructions and cleared by executing the LMR instruction to any of the program flow registers. The instructions treat the registers as a single 32-bit register with SC0 at the low order word, SC1 at the high order word.

Breakpoint Registers

The Breakpoint Registers BPR0 and BPR1 provide the breakpoint addresses and breakpoint conditions for system breaks. The registers are each 32 bits in length and have the format shown on page 2.

Bits 0 to 23 specify the breakpoint address. The MMU compares the breakpoint address with addresses referred to by the program. If a match is found and breakpoint conditions are met, the MMU sends a Nonmaskable interrupt to the system CPU and breaks program execution.

Bits 26 to 31 specify the breakpoint conditions (bits 24 and 25 are not used). Breakpoint conditions define how the MMU compares the breakpoint address and which conditions permit the MMU to generate breaks.

AS is the Address Space bit. If AS is 0, the MMU compares the breakpoint address with virtual addresses whose Level 1 Page Table is specified by the PTB0 register. If AS is 1, the MMU compares the breakpoint address with virtual addresses whose Level 1 Page Table is specified by the PTB1 register. If the VP bit is 1, the MMU takes the AS bit as bit 24 of the physical address.

VP is the Virtual/Physical bit. if VP is 0, the MMU compares the breakpoint address with virtual addresses only. If VP is 1, the MMU compares the breakpoint address with translated virtual addresses (i.e., final physical addresses) or physical addresses only.

BE is the Breakpoint Execution bit. If BE is 1, the MMU breaks program execution when the instruction at the breakpoint address is executed. The instruction must start at the breakpoint address for the break to occur. If BE is 0, no break occurs.

BR is the Breakpoint Read bit. If BR is 1, the MMU breaks execution when data is read from the breakpoint address. If BR is 0, no break occurs.

BW is the Breakpoint Write bit. If BW is 1, the MMU breaks execution when data is written to the breakpoint address or when data is read from the breakpoint address in the first part of a read-modify-write operation. If BW is 0, no break occurs.

CE is the Counter Enable bit (BPR0 only). If CE is 1, the Breakpoint Count register is enabled. If CE is 0, the register is disabled. The Breakpoint Count register is described in the next section.

Breakpoint Count Register

The Breakpoint Count Register (BCNT) controls the generation of the MMU interrupt signal to the CPU. It permits the user to specify the number of breakpoints the MMU should ignore before generating a break. The BCNT register is 24 bits in length.

The BCNT register affects system breaks only when it is enabled. The CE bit in the BPR0 register enables/disables the register. When the MMU encounters a breakpoint, it checks the CE bit in the register containing the breakpoint address. If CE is 1, the MMU decrements the contents of BCNT by 1, compares the new contents with

© IC MASTER 1983

zero. If the new contents are not equal to zero, the MMU ignores the breakpoint, i.e., it permits program execution to continue. If the contents are zero, the MMU breaks execution. If CE is 0, the MMU ignores the BCNT register and breaks program execution.

The user may set the register to any value within the range 0 to $2^{24}-1$ by executing an LMR instruction. If the register is not given a new value after a break, the next breakpoint decrements the register contents by 1.

2.1.2 Register File Block

This block contains a number of working registers, with no external access, used to execute the address translation algorithm. In addition, it has three addressable registers (PTB_0, PTB_1, and EAI) used in performing dynamic address translations.

Page Table Base Registers

The Page Table Base registers PTB0 and PTB1 specify the base addresses of the Level 1 Page Tables used in address translation. The PTB0 and PTB1 registers are each 32 bits in length and have the format shown on page 2.

Bits 0 to 23 specify the Page Table Base address. When a virtual address is translated, the MMU reads the base address from the register and accesses the specified Page Table. Bits 0 to 9 must be zeroes. Bits 24 to 30 are not used. Bit 31 is the Memory Space bit. It is intended to be used in system emulation.

The MMU accesses only one Page Table Base register for any given address translation. The current mode of system operation (User or Supervisor) and the Dual Space bit (DS) in the MSR specify which register is read. If the DS bit is 0, the MMU reads the base address from the PTB0 register when in either User or Supervisor mode. If the DS bit is 1, the MMU reads the base address from PTB1 when in User mode and reads the base address from PTB0 when in Supervisor mode.

The contents of the registers may be read or modified at any time by executing an SMR and LMR instruction.

Error/Invalidate Address Register

The Error/Invalidate Address register (EIA) is a dual purpose register that (1) holds a virtual address that has generated an MMU exception, and (2) when written to, removes page table entries from the MMU's Translation Buffer. The EIA is 32 bits in length.

The EIA permits examination of the virtual address that caused the current MMU exception. On an exception (such as a protection level error), the MMU copies the virtual address that generated the error to the EIA. The MMU sets bit 31 in the EIA to 1 if the address's Level 1 Page Table is specified by PTB1 and to 0 if the Level 1 Page Table is specified by PTB0. The error address may be read by executing an SMR instruction. The cause of the error is specified by the ERC and TET flags in the MSR.

The EIA also permits removal of invalid Page Table Entries from the MMU's Translation Buffer. The Translation Buffer contains a copy of the Level 2 Page Table Entries of recently accessed virtual addresses. A virtual address written to the EIA causes the MMU to remove the Page Table Entries of that virtual address from the Translation Buffer. Bit 31 of the EIA must be set to 1 if the address' Level 1 Page Table is specified by PTB1 and set to 0 if the Level 1 Page Table is specified by PTB0. Page Table Entries must be removed whenever the user modifies the corresponding entries in the page tables. The user may write to the EIA register using an LMR instruction.

2.1.3 Translation Buffer Block

The Translation Buffer is the cache memory of the chip. It provides direct virtual to physical address mapping for the most recently used pages in memory. Entries in the Translation Buffer are allocated and replaced by the MMU; the programmer is not involved in the process.

The Translation Buffer is a content-addressable memory. The virtual page frame number (the 15 high order bits of the virtual address) and the address space bit are compared to the entries in the buffer. If the virtual page frame number is present in the buffer, the mapped physical address is output immediately. If not, a control line is set, indicating to the Control Block that the memory page tables should be referenced. When this occurs, the MMU gets the corresponding mapping from memory and replaces the least recently used entry in the Translation Buffer with the new mapping.

Each entry in the Translation Buffer has, besides the virtual and physical page frame numbers and the address space bit, a copy of the protection level field (PL) and the modified bit (M) of the corresponding Page Table Entry. These bits are used by the MMU to implement the translation and error handling algorithms described in the Functional Description. The protection level field contains the most restrictive combination of the Level 1 and Level 2 PTE's.

2.1.4 Control Block

This block is made up of state machines and combinatorial logic. Each machine controls the sequence of operations taking place during the different MMU operations. A State Bus carries the operation code; the different blocks decode appropriate signals from the State Bus.

2.1.5 Input/Output Block

The Input/Output block consists of I/O buffers and internal buffers.

The I/O buffers provide the communication between the MMU and the outside system bus. The internal buffers between the I/O buses which transfer the address offset and the complete address in no-translation mode are also part of this block.

© IC MASTER 1983

2.2 Memory Management Instructions

Format	Instruction		Description
14	LMR	mreg,gen	Load Memory Management Register. (Privileged)
14	SMR	mreg,gen	Store Memory Management Register. (Privileged)
14	RDVAL	gen	Validate address for reading. (Privileged)
14	WRVAL	gen	Validate address for writing. (Privileged)
8	MOVSUi	gen,gen	Move a value from Supervisor Space to User Space. (Priv.)
8	MOVUSi	gen,gen	Move a value from User Space to Supervisor Space. (Priv.)

The MOVSUi and MOVUSi instructions are intended for memory management. Instruction format detail can be found in the NS16032 Data Sheet, Appendix A.

3 Functional Description

3.1 Power and Grounding

The NS16082 requires a single 5V power supply applied to pin 48 (V_{CC}). See DC Electrical Characteristics.

Grounding connections are made on pins 24 and 25, Logic Ground Pin (GNDL) and Buffer Ground Pin (GNDB), respectively. GNDL is the common pin for on-chip logic, and GNDB is the common pin for the output drivers. As shown in *Figure 3-1*, GNDL is directly connected to GNDB with a single conductor.

All other grounding connections should be made only to GNDB (pin 25) to ensure optimum noise immunity.

3.2 MMU Operation

The MMU operation incorporates the following:

1. Bus Operation—related to Address Translation, DMA Transfers, Breakpoints on Physical Address, and Slave Operation
2. Slave Instruction Execution
3. Address Translation
4. Hardware Debugging
5. Error Handling

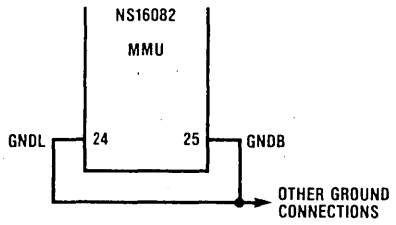


Figure 3-1. Grounding Connections

3.2.1 Bus Operation

Address Translation (see *Figures 3-2* to *3-5*): The MMU time-shares the address/data bus with the CPU. During a memory access cycle, the MMU reads the virtual address, performs the virtual to physical translation, and places the physical address on the bus. A typical memory cycle has five clock periods: T1, TMMU (time of physical address on the bus), T2, T3, and T4. The 16 A/D bus drivers of the MMU are in high impedance state at all times except during TMMU or when the $\overline{FLT}$ signal is active. The bus drivers of lines A16 to A24 drive the bus from TMMU through T4.

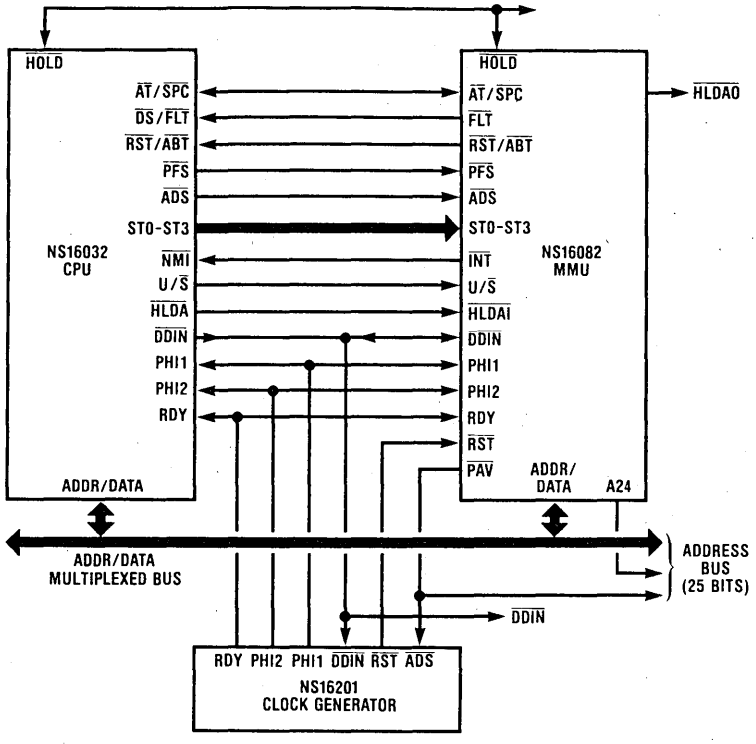


Figure 3-2. CPU, MMU Interconnections

© IC MASTER 1983

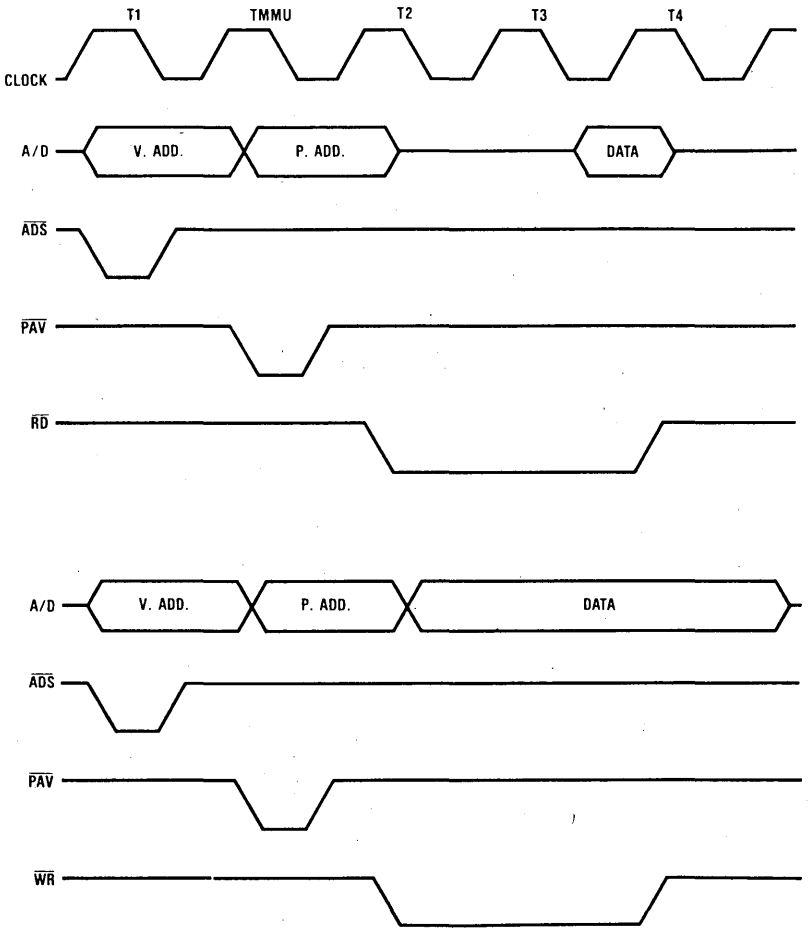


Figure 3-3. Bus Operation Timing: Virtual Address in Translation Buffer

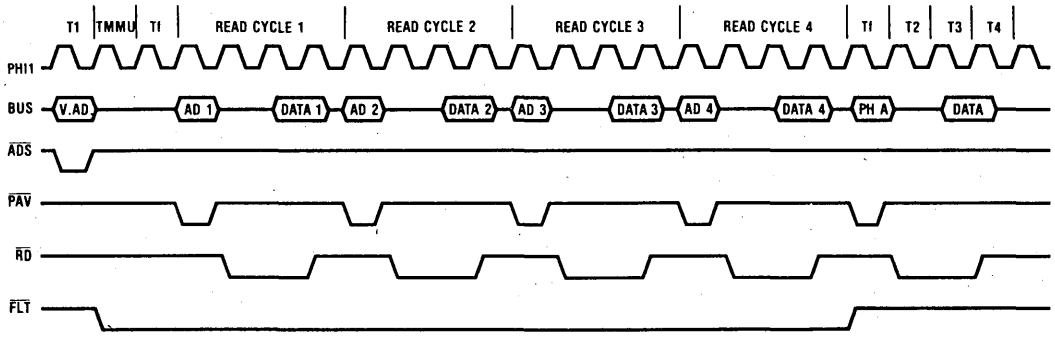


Figure 3-4. Bus Operation: Read Cycle When Virtual Address Is Not In Translation Buffer

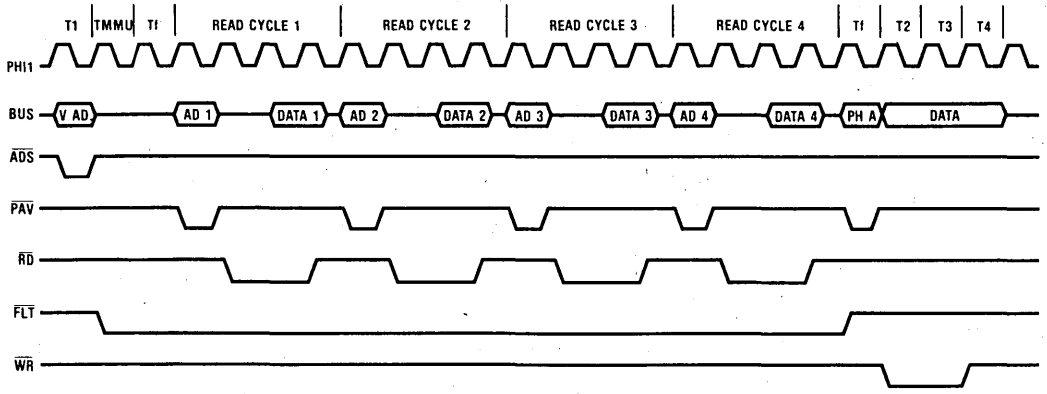


Figure 3-5. Bus Translation Write Cycle When Virtual Address Is Not In Translation Buffer

© IC MASTER 1983

During period T1, the CPU places on the bus the virtual address to be translated; this address is strobed into the MMU with the $\overline{ADS}$ pulse. During period TMMU, the CPU places the bus in high impedance and the MMU does one of two things. If the address to be translated is in the Translation Buffer, the MMU sends the physical address on the bus with a $\overline{PAV}$ timing pulse; if not, it takes the bus from the CPU with the $\overline{FLT}$ signal and executes four memory read cycles, to get the two double words needed to perform the translation algorithm. When necessary, the MMU executes two memory write cycles to update the referenced and modified bits in the Page Table Entry. It then releases control of the bus and sends the physical address on the bus. The memory cycle initiated by the CPU is resumed from the point it was stopped.

Between periods T2 and T4, there is data on the AD0-AD15 bus lines, output either by the CPU or memory. Bus lines A16 to A24 continue to hold the physical address.

DMA Transfers: The Hold and Hold Acknowledge lines are connected as shown in *Figure 3-6.*

The DMA device pulls the $\overline{HOLD}$ line low to request the bus; this line is input to both the CPU and the MMU. If the MMU is not floating the CPU (through the $\overline{FLT}$ line), the MMU transfers the $\overline{HLDA}$ CPU output directly to the $\overline{HLDAO}$ MMU output. If the MMU (when accessing the Memory Page Tables) is floating the CPU, the CPU cannot respond to $\overline{HOLD}$ request, $\overline{HLDAI}$ remains high, and the MMU grants the bus by pulling low $\overline{HLDAO}$ at the end of the present memory cycle. When the DMA device releases $\overline{HOLD}$, the MMU releases $\overline{HLDAO}$ and regains control of the bus.

Breakpoint on Physical Address: During debug, if a breakpoint is specified to occur on a physical address (VP is set in any BPR), an additional clock period is needed in the bus cycle. The additional clock period is required to make the address comparison after getting the physical address from the cache or page table. In this case the MMU floats the CPU for one clock period. This gives the memory cycles six periods: T1, TMMU, Tf, T2, T3, and T4. The corresponding waveforms are illustrated in the Timing Characteristics, *Figure 3-7.*

Slave Instruction Bus Operation: For slave instructions, the bus operation follows a different protocol. The bus cycle has only two periods (T1 and T4) and the timing is done by a one-clock-wide pulse on the Slave Processor Control ($\overline{SPC}$) bidirectional line. All bus transfers are illustrated in Timing Diagrams, *Figures 3-8* and *3-9.*

3.2.2 Slave Instructions

Introduction to Slave Instructions

The MMU Slave Instructions serve two purposes. First, slave instructions set up the different registers and check their contents (LMR and SMR instructions) in order to control the MMU mode of operation. Second, a slave instruction can request the MMU to return a flag indicating whether a specified access to a given address would generate a protection fault in user mode.

The general format for slave instructions appears in the NS16032 Microprocessor Data Sheet. The formats for the MMU slave instructions are described below.

Note: All MMU instructions are privileged. While in the User Mode, the CPU will trap on any MMU instruction.

MMU Slave Instruction Format

The 3-byte format of the MMU slave instruction is shown on page 2.

The format corresponds to the instructions as they are stored in memory; the CPU sends the operation word to the MMU with its bytes swapped, i.e., high byte in low bus byte and vice versa.

The short code assignments for the registers are shown below:

Code Value	Register
0000	BPR0
0001	BPR1
0100	PF0
0101	PF1
1000	SC
1010	MSR
1011	BCNT
1100	PTB0
1101	PTB1
1111	EAI/INVALIDATE

Note: All other short codes are illegal.

Address Translation Validation Instructions

The two instructions used to validate an address are: RDVAL address and WRVAL address. Both instructions consist of mnemonics and address type operands.

Upon receipt of a RDVAL or WRVAL instruction, the MMU checks if the address operand can be translated without protection violations in user mode (user space). If the address can be translated without violations, the MMU sends status word zero. If not, the MMU sends status word 32.

A trap is generated with error class 1 and error translation type 2 if the first Page Table Entry is invalid. No trap is generated if the second PTE is invalid or if protection violation errors occur.

A Validate instruction generates a status word which sets or resets a flag bit (F) in the CPU PSR register. This flag is positioned in bit 5. The remaining bits are all zero. Slave Instruction operation is shown in the following charts.

© IC MASTER 1983

RDVAL/WRVAL Instruction (Validate Read/Write Address)

CPU		MMU	
Execution Unit	**Bus Interface Unit**	**Status Pins**	**Action**
Sends ID Code in low byte	Sends ID Code with SPC timing pulse	1111	Recognizes ID Code
Sends Opcode in two bytes	Sends Opcode with SPC timing pulse	1101	Latches Opcode
Sends Address to be validated in two words (bits 24-31 set to zero)	Sends Address in two Write Slave cycles with SPC timing pulse	1101	
Generates Dummy Read with address to be validated	Starts a Read cycle with address to be validated	1010	Performs validation
	Detects MMU completion	0011	Signals completion SPC pulse
Reads MMU status	Reads MMU status word with SPC strobe	1110	Sends status word

LMR Instruction (Load MMU Register)

LMR short, read.d (See NS16000 Programmers Reference Manual, Document No. 420306565-001.)

The MMU register specified by first operand is loaded with the contents of the second operand. The instruction executes as follows:

CPU		MMU	
Execution Unit	**Bus Interface Unit**	**Status Pins**	**Action**
Sends ID Code in low byte	Sends ID Code with SPC timing pulse	1111	Recognizes ID Code
Sends Opcode in two bytes	Sends Opcode with SPC timing pulse	1101	Latches Opcode
Sends low word of operand	Sends low word of operand with SPC timing pulse	1101	Stores operand in low word of addressed register
Sends high word of operand	Sends high word of operand with SPC timing pulse	1101	Stores operand in high word of addressed register

SMR Instruction (Store MMU Register)

SMR short, write.d

The MMU register specified by first operand is stored in the second operand. The instruction executes as follows:

CPU		MMU	
Execution Unit	**Bus Interface Unit**	**Status Pins**	**Action**
Sends ID Code in low byte	Sends ID Code with SPC timing pulse	1111	Recognizes ID Code
Sends Opcode in two bytes	Sends Opcode with SPC timing pulse	1101 (See Note 1)	Latches Opcode
	Detects MMU completion	0011	Signals completion with SPC pulse
	Reads status with SPC strobe	1110	Sends zero status
	Strobes operand with the SPC pulse	1101	Sends low word of addressed register
	Strobes operand with SPC pulse	1101	Sends high word of addressed register

Notes:
1. The CPU may prefetch more code before this step.
2. After CPU reads the operand, the contents are stored in second operand according to the second operand addressing mode.
3. If addressed register is less than 32 bits, then the high order bits are reset to zero.

© IC MASTER 1983

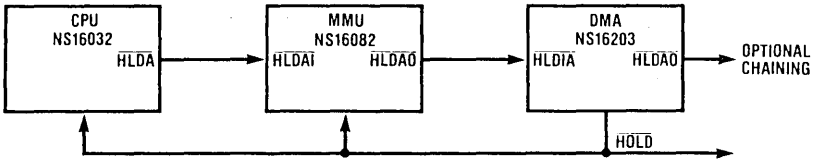


Figure 3-6. Hold Connections

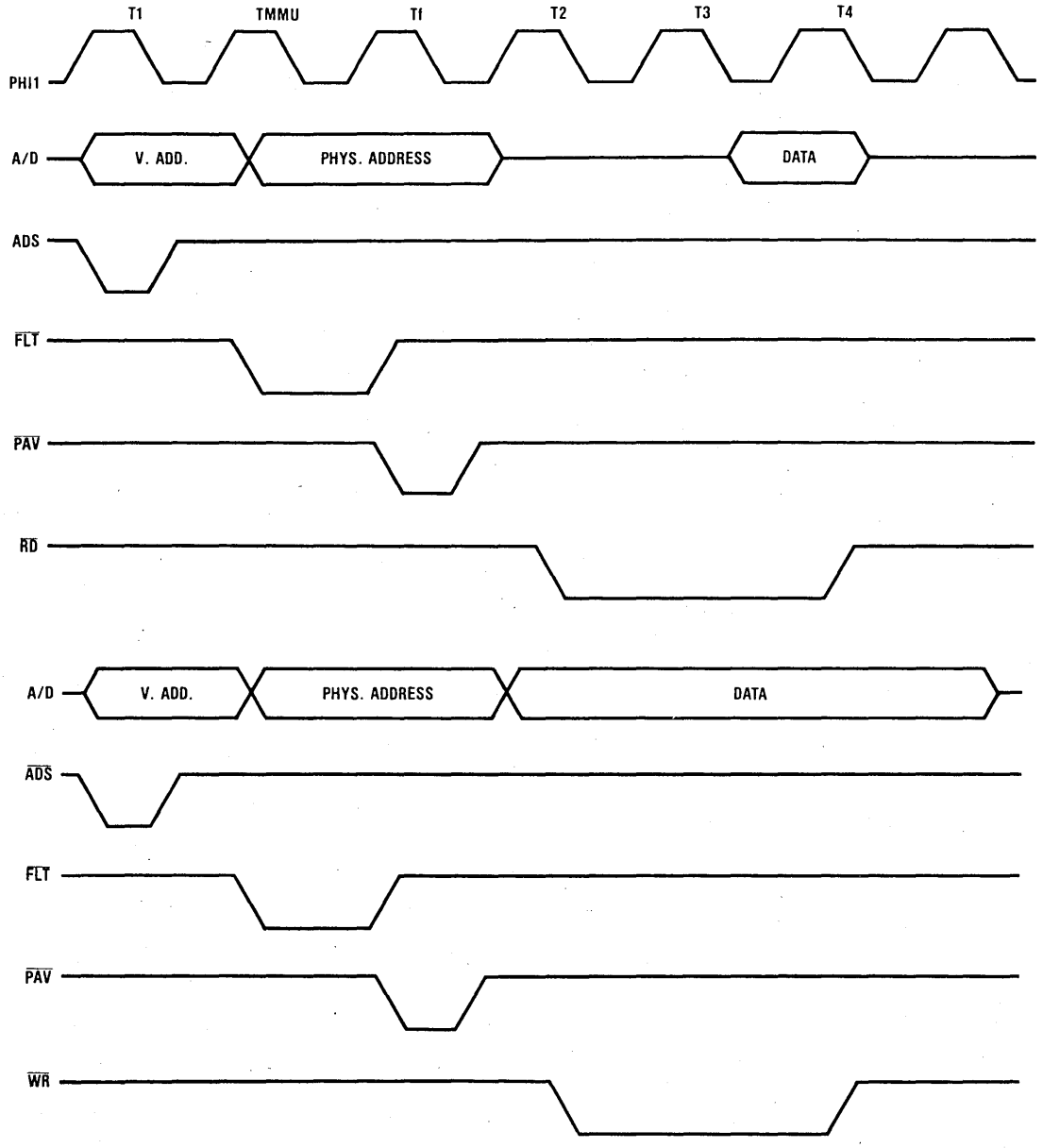


Figure 3-7. Bus Operation in Breakpoints on Physical Address

© IC MASTER 1983

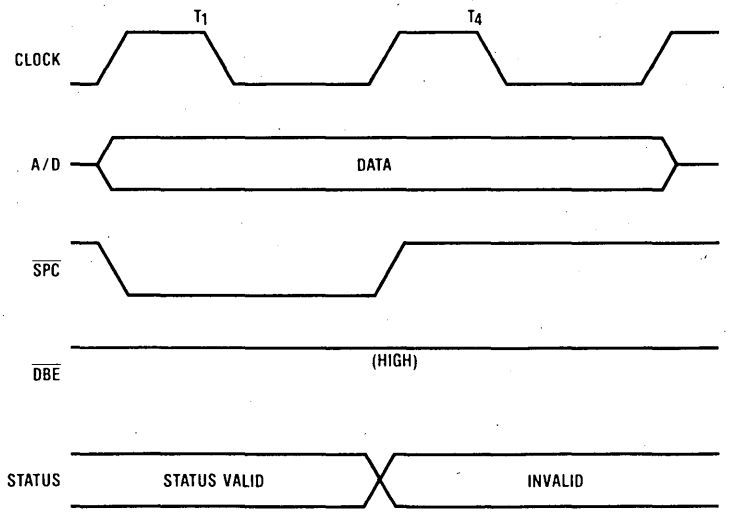


Figure 3-8. Slave Instruction Timing: Get ID/Opcode/ Data from CPU

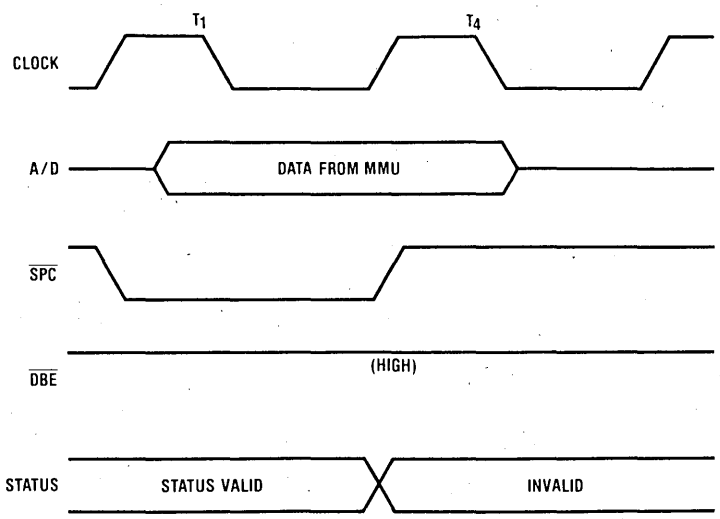


Figure 3-9. Slave Instruction Timing: MMU Sends Status/Data to CPU

© IC MASTER 1983

3.2.3 Address Translations

Page Table Entry (PTE) Format

Address translation is controlled by page tables contained in memory. A page table is a linear array of Page Table Entries. Each PTE defines the access characteristics of one page (512 bytes) of virtual storage. The PTE bit format is shown on page 2.

BS Bank select; most significant bit of PFN field.

PFN Page Frame Number; when the V bit is set, the PFN low field, together with the BS bit, contains the high order 16 bits of a physical page address which is used by the address translation algorithm.

M Modified; used only in index 2 (bits 9 to 15 of virtual address) PTE's and set when page mapped is modified.

R Referenced; set when page mapped by PTE is referenced.

PL Protection Level; Index 1 PTE and Index 2 PTE's control access to pages mapped by the PTE. The table below shows the relationship between User, Supervisor and protection level bit:

Mode	PSR bit 8	Protection Level Bits 00	01	10	11
User	1	no access	no access	read only	full access
Supervisor	0	read only	full access	full access	full access

V Valid bit; when set indicates that the corresponding page is resident in physical memory. When cleared, any attempted reference to the page will cause the MMU to abort the reference. If the V-bit is cleared, the PTE may be used by the Operating System for any desired function.

Note: Bits 7 and 8 are reserved for the user and are not affected by the MMU.

Address Translation Algorithm

The MMU translates the 24-bit virtual address generated by the CPU to either a 25-bit physical address or a translation error. This process is described below. See *Figure 3-10.*

The virtual address is divided into three components as shown on page 2.

The access level of a reference is a two-bit number whose logical expressions are:

bit 1 = U and AO

where AO = Access Override bit in MSR

bit 0 = 1 for write, read/modify/write, (RMW)

bit 0 = 0 for read

The detailed description of the translation algorithm follows. (See NS16000 Programmers Reference Manual 420306565-001.)

If TU = 0 and U = 1 or TS = 0 and U = 0, then PA = virtual address, else

1. Select first PTE:

   If DS (in MSR) = 1 and U (in PSR) = 1, then PTEP = PTB1 or Index 1 * 4

   else

   PTEP = PTB0 or Index 1 * 4

   end.

   Validate PTE:

   If access level is greater than (PTEP).PL or if (PTEP).V = 0, then abort CPU

   else

   Set (PTEP).R = 1

2. Select second PTE:

   PTEP = (PTEP).PFN * 512 or Index 2 * 4

   Validate PTE:

   If access level is greater than (PTEP).PL or if (PTEP).V = 0, then abort CPU

   else

   Set (PTEP).R = 1

   If writing, then set (PTEP).M = 1

3. Generate physical address:

   PA = (PTEP).PFN * 512 or Offset

   Legend:

   PA - Physical Address
   TU, DS, TS - MSR bits
   U - Program Status Register bit (sent to MMU via the U/S pin)
   PTEP - PTE pointer
   (PTEP).PL - represents protection level in Page Table Entry
   (PTEP).V - represents valid bit in Page Table Entry
   (PTEP).M - represents modified bit in Page Table Entry
   PFN - Page Frame Number

The MMU marks bits R and M of the PTE for subsequent use by the operating system. If a physical page is written upon, it is assumed that the user intends for this modification to be permanent in his storage system. The M bit indicates whether a page needs to be written to mass storage when it is deallocated from physical memory. The R bit is tested and cleared periodically by the operating system in order to compile statistics of the frequency of references to each page currently in memory. It will use this information to deallocate the least frequently used pages when new pages must be called in.

Page tables that refer to physical pages are themselves referenced by two page tables of double length. Selection of the PTB0 or PTB1 register depends on the Dual Space (DS) and User/Supervisor (U/S) modes as shown below:

DS \ U/S	0	1
0	PTB0	PTB0
1	PTB0	PTB1

© IC MASTER 1983

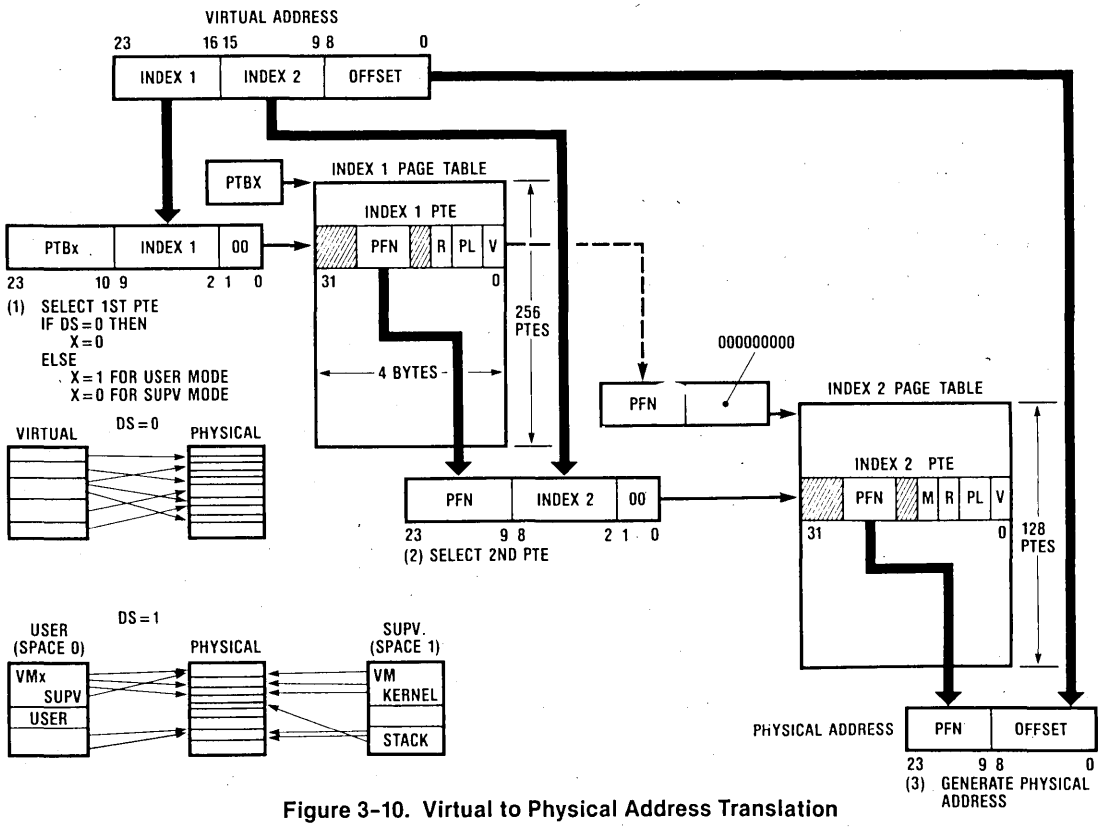


Figure 3-10. Virtual to Physical Address Translation

Page Table Base (PTB) Registers

PTB0 and PTB1 registers are specified as double words. The BS bit is used by the MMU to produce the 25th bit of the physical addresses pointing to the entries in the first translation table. Their format is given on page 2.

3.2.4 Hardware Debugging

The MS16082 MMU incorporates two special debugging facilities: program flow tracing and breakpointing.

Program Flow Tracing: Program Flow Tracing allows the software to reconstruct the sequence of exception executed prior to a certain instruction or breakpoint. Registers PF0, PF1 and SC are used to record program flow information. The SC register is divided into two 16-bit fields (SC0 and SC1). SC0 is also a 16-bit counter. For the user, these are read-only registers which can be read via an SMR slave instruction. An LMR instruction addressing any of the PF registers resets all of them.

When a sequential instruction is executed, a PFS pulse is received form the CPU for acknowledgement. This pulse is also used to increment the SC0 counter.

When a nonsequential instruction is fetched, the content of register PF0 is copied into PF1 and that of SC0 into SC1; then the virtual address of this instruction is stored in PF0 and the SC0 counter is reset. This happens only if before the fetch the SC0 content was not zero (to prevent multiple tracing for instructions which cause more than one queue flush, e.g., ACBI), and bits FT and UT in the MSR register were set.

Note: When the SC0 counter reaches 64k minus 1, it stops counting.

Entry To and Exit From a Debugged Program: When the MSR is written to, debugging traps are disabled. At the end of the second nonsequential fetch cycle they are enabled. This feature enables entry to a debugged program from a monitor or debugger after the flushing of the queue and a nonsequential fetch. This will occur normally without getting an immediate trap if bit NT is set.

After a debugging trap, the MSR bits which enable this trap (NT, BEN) are cleared, thus inhibiting further debug traps until the MSR is rewritten by the monitor or debugger program. Bit FT in the MSR is also cleared thus freezing the program tracing. This last feature inhibits the tracing of useless information (like the program flow inside the monitor or debugger), until the program tracing registers are read.

Breakpoints: A breakpoint generates an abort or interrupt pulse when a software specified address is referenced under software controlled conditions. It also updates the ERC and BN fields in MSR. Breakpoints are controlled by the BEN and UB bits (in MSR) and the BPR registers which have the format shown on page 2.

© IC MASTER 1983

Breakpoint on Execution Fetch mechanism: When a sequential instruction is fetched by the CPU, the instruction is placed in the queue. Unless the queue is empty, aborts on queue fetches are not received and so a breakpoint could be missed. The proper operation of breakpoint execution requires flushing the queue, as described below.

When the BE bit is set and the location specified in the BPR is accessed in a nonsequential fetch, an Abort or INT pulse is generated.

When the BE bit is set and the location specified in the breakpoint register is accessed in a sequential fetch (or in a nonsequential fetch from an even-numbered address (2n) and the location specified in BPR is (2n + 1), the MMU returns a DIA instruction instead of the memory byte at the breakpoint location. This is preceded by a read cycle in order to return the other original byte from memory. This causes the CPU to flush the queue and to fetch the instruction a second time, now with a nonsequential fetch status.

The BPR bit functions are tabulated below:

AS Address Space; virtual address when VP = 0, bank select bit of physical address when VP = 1.

VP Virtual or Physical address; if VP is set, address field is matched against physical address. If VP is reset, address field is matched against virtual address.

BE Breakpoint on Execution; if BE is set, a breakpoint occurs when the location specified in ADDRESS field is referenced in an instruction fetch cycle (instruction execution detailed below).

BR Breakpoint on Read operand; if BR is set, a breakpoint occurs when the location specified in ADDRESS field referenced in a read operand cycle.

BW Breakpoint on Write operands; if BW is set, a breakpoint occurs when the location specified in ADDRESS field is referenced in a write or RMW operand cycle.

CE Counter Enable (BPR0 only); the 24-bit BCNT counter decrements when Counter Enable bit (CE) is set and the conditions for a breakpoint in register BPR0 are obtained. When this counter reaches zero, an "abort" or INT pulse is generated by the MMU.

Note: An erroneous count will result if both the CE and BW bits are set.

3.2.5 Error Handling

Traps are serviced according to class and type (c, t) as follows:

In the MSR register, the appropriate bit in the ERC field is set due to the fact that RMW accesses are counted twice.

For Address Translation Error, the following bits are set in the TET field:

If access level is greater than (PTEP).PL	bit 0 set
If (PTEP).V = 0 in Index 1 PTE	bit 1 set
If (PTEP).V = 0 in Index 2 PTE	bit 2 set

In the EMCT field set the CPU status and DDIN bits.

In the EAI register, set AS bit to designate the address space PTB0/PTB1 of virtual address being translated and set the address field to the value of the virtual address being translated, as shown in the register format shown on page 2.

For Breakpoint Error, the following bits are set in the MSR register:

BN field — the number of the appropriate breakpoint register

EMCT field — CPU status and DDIN bits

4 AC Electrical Characteristics

4.1 Definitions

All the timing specifications given in this chapter refer to 50% of the leading or trailing edges of the appropriate clock phase and 0.8V or 2.0V on the appropriate signal as illustrated in *Figures 4-1* and *4-2*, unless specifically stated otherwise.

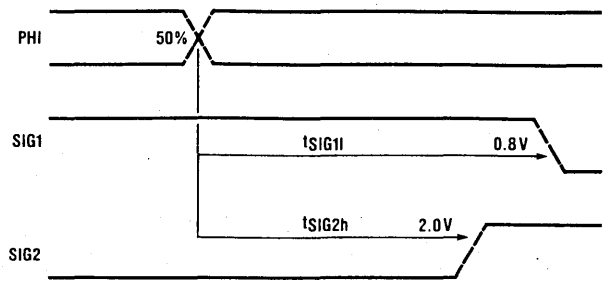


Figure 4-1. Timing Specification Standard (Signal Valid After Edge)

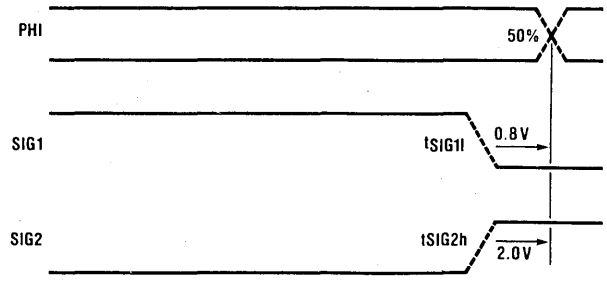


Figure 4-2. Timing Specification Standard (Signal Valid After Edge)

© IC MASTER 1983

National Semiconductor

NS16201-6 Timing Control Unit

General Description

The NS16201 Timing Control Unit (TCU) is a 24 pin device fabricated on a schottky bipolar process. It provides the 2 phase MOS clock drivers, system control logic (read, write, and data buffer enable) and cycle extension logic for the NS16000 family.

A crystal or external signal may be used as the 2X frequency source. Besides the 2 phase MPU clock outputs (PHI1 and PHI2), there are two other clock outputs (TTL compatible) available for system timing use. One of these is a fast clock (FCLK), at twice the MPU clock frequency (i.e., at the crystal frequency). The other is a TTL version of PHI1 (CTTL).

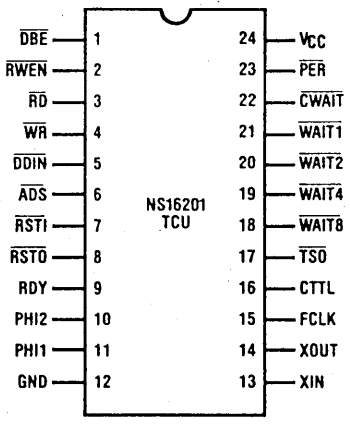
The cycle extension features include:

* Digitally programmable wait state inputs ($\overline{WAITn}$)
* Peripheral (Slow) cycle to accomodate slower MOS peripheral interface ICs (where just adding wait states is not adequate)
* Cycle Hold between the first (T1) and second (T2) timing states to allow additional time for arbitration prior to generating control signals.

Features

* 2 phase full-VCC swing high capacitance clock drivers
* 4 bit input ($\overline{WAITn}$) allowing precise specification of from 0 to 15 wait states
* Cycle Hold for system arbitration and/or memory refresh
* System timing (CTTL & FCLK) and control ($\overline{RD}$, $\overline{WR}$, & $\overline{DBE}$) outputs
* General purpose Timing State Output ($\overline{TSO}$) that identifies internal states
* Support of slow MOS peripheral interface ICs (e.g., 8080 series)
* Provides "ready" (RDY) output for NS16000 MPUs
* Synchronous system reset generation from Schmitt trigger input
* Single 5V power supply
* 24 Pin Dual-In-Line Package

PIN CONFIGURATION

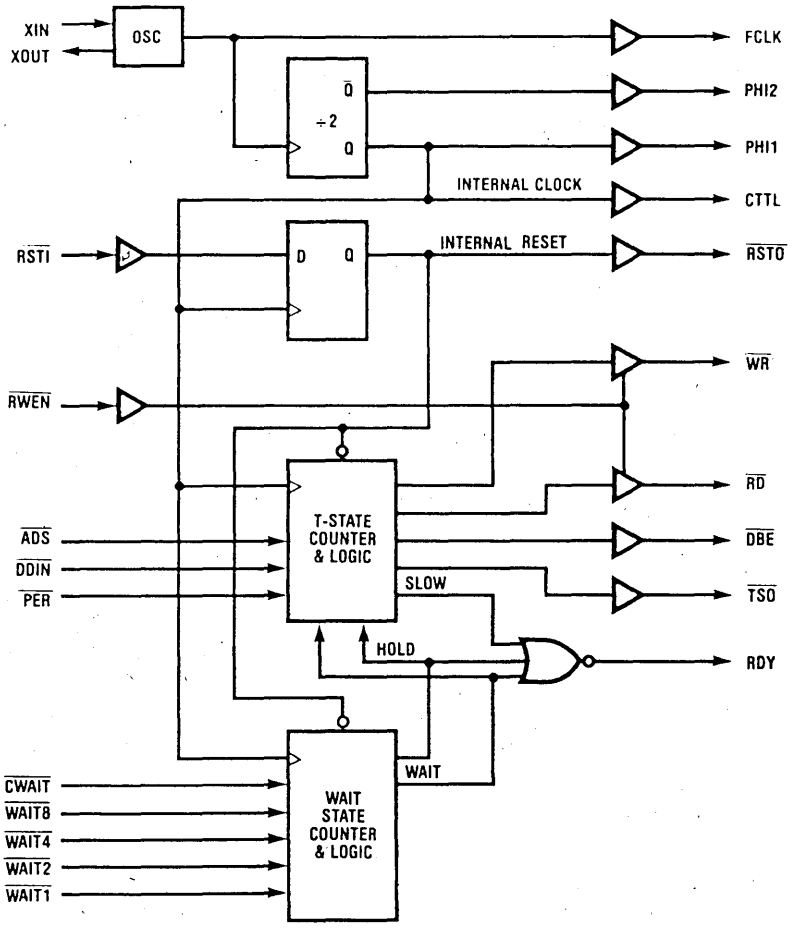


TRI-STATE is a registered trademark of National Semiconductor Corp.

© IC MASTER 1983

National Semiconductor

NS16201 TCU Block Diagram



© IC MASTER 1983

National Semiconductor

NS16201 Functional Pin Descriptions

SUPPLIES

VCC (24): +5V Power Input

GND (12): 0V Power Return

A 0.1uf ceramic decoupling capacitor must be connected across VCC and GND as close to the device as possible (i.e., with least amount of lead and trace resistance). This is not only good layout practice but necessary due to the high current transients delivered by the PHI1 and PHI2 outputs.

CLOCK PINS

XIN (13): Crystal or External Frequency Source Input
The desired MPU clock (PHI1 and PHI2) frequency will be half that of the crystal or external source. A schottky series gate (VOH(min)=2.7V) is recommended to drive XIN (Vthreshold=2.5V) as the external frequency source.

XOUT (14): Crystal Feedback Output
This output is used in crystal operation only. It must be left open when driving XIN with an external frequency source.

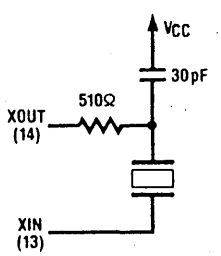
Crystal Oscillator Characteristics:

The 16201 has a "Pierce" type oscillator that requires a parallel resonant crystal. Connections of the crystal and bias components to XIN and XOUT are shown below. It is important that the crystal be mounted in close proximity to the XIN and XOUT pins to keep printed circuit trace lengths to an absolute minimum.

Typical Crystal Specifications

Type	At-Cut
Tolerance	0.005% at 25°C
Stability	0.01% from 0°C to 70°C
Resonance	Fundamental (parallel)
Capacitance	20pf
Maximum Series Resistance	50ohms

CRYSTAL CONNECTION DIAGRAM



© IC MASTER 1983

National Semiconductor

NS16201

FCLK (15): Fast Clock Output
This is a TTL level clock output at the same frequency as the crystal or external frequency source. Consequently its frequency is twice that of the MPU clocks.

PHI1(11) and PHI2(10): MPU Clock Outputs
These outputs provide the NS16000 series MPUs with two-phase non-overlapping MOS (full VCC swing, high capacitive drive) clock signals. Their frequency will be half that of the crystal or external source.

CTTL (16): TTL System Clock
This is a TTL output version of PHI1. Therefore, it operates at the MPU clock frequency.

CONTROL PINS

$\overline{\text{RSTI}}$ (7) and $\overline{\text{RSTO}}$ (8): Reset Input and Reset Output
$\overline{\text{RSTI}}$ is a Schmitt trigger input that will generate the synchronous system reset signal, $\overline{\text{RSTO}}$. $\overline{\text{RSTO}}$'s rising edge is synchronized to PHI1 to satisfy the MPU's requirements. $\overline{\text{RSTI}}$ going low will cause RSTO to go low, signaling a system reset. When the slow ramping rising edge (via external RC combination) of $\overline{\text{RSTI}}$ reaches the Schmitt trigger threshold, $\overline{\text{RSTO}}$ will go high on the next rising edge of PHI1.

$\overline{\text{ADS}}$ (6): Address Strobe input from MPU/MMU
This input (going low) identifies the first timing state (T1) of a bus cycle for the TCU (see Note (1)).

$\overline{\text{DDIN}}$ (5): Data Direction Input
This signal determines whether a Write (when high) or a Read (when low) cycle will be performed. It is connected to the MPU's $\overline{\text{DDIN}}$ output pin in a normal configuration.

$\overline{\text{RD}}$ (3): Read Output Strobe (TRISTATE)
This is an active low signal that identifies a Read cycle. It is decoded from $\overline{\text{DDIN}}$ and tristated by $\overline{\text{RWEN}}$.

$\overline{\text{WR}}$ (4): Write Output Strobe (TRISTATE)
This is an active low signal that identifies a Write cycle. It is decoded from $\overline{\text{DDIN}}$ and tristated by $\overline{\text{RWEN}}$.

$\overline{\text{RD}}$ and $\overline{\text{WR}}$ are mutually exclusive (active low) in any cycle.

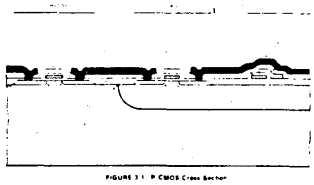
$\overline{\text{RWEN}}$ (2): Read/Write Enable input
This input tristates the $\overline{\text{RD}}$ and $\overline{\text{WR}}$ outputs when high and enables them when low.

Notes: (1) The MPU and TCU view some timing states (T-states) differently. For clarity, references to T-states will sometimes be followed by (TCU) or (MPU). (MPU) also implies (MMU).

© IC MASTER 1983

National Semiconductor

NS80CX48/80CX35 P²CMOS™ Microcomputer/ Microprocessor Family



General Description

The NS80CX48 is a parallel 8-bit microcomputer contained in a standard 40-pin, dual-in-line package. The device is fabricated using P²CMOS silicon gate technology. This technology provides the system designer with devices that equal the speed performance levels of comparable NMOS products, combined with low-power advantages of CMOS. The NS80CX48 is a stand-alone microcomputer designed for efficient controller applications. It executes powerful bit manipulative instructions and BCD as well as binary arithmetic. The NS80CX48 contains on-chip oscillator and clock circuits, 1K x 8 ROM program memory, 64 x 8 RAM data memory, 27 I/O lines, and an 8-bit Timer/Counter. Also, it is pin and instruction compatible with the XMOS™ INS8048.

The NS80CX48 has an extra feature mode which permits enhanced microcomputer performance. When the NS80CX48 is not in the extra feature mode, the device operates the same as the standard INS8048. Device capabilities can be expanded using readily available compatible components. The NS80CX35 is a ROMless version of the NS80CX48.

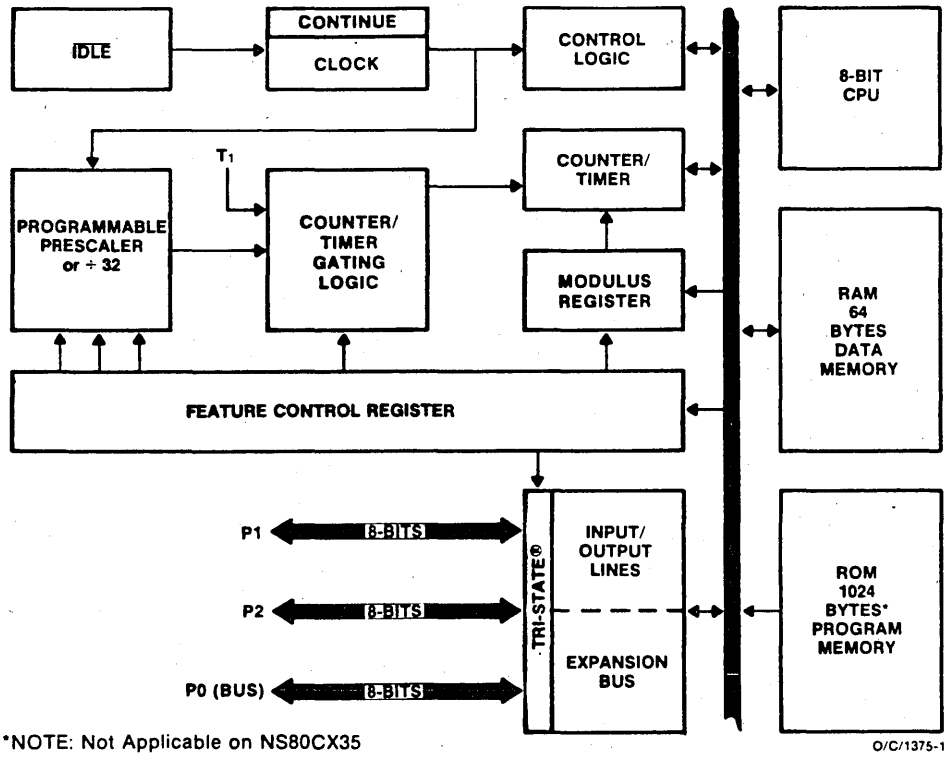
Features — NS80CX48

- 8-Bit CPU, RAM, ROM, I/O in a Single Package
- 2.5 μsec Cycle Time, 6MHz Oscillator
- Low Power
- Very Low Stand-by Power
- Expandable Memory and I/O
- Single-Level Interrupt
- Efficient Instructions
- Instruction Compatible to INS8048
- Pin Compatible to INS8048

Extra Features

- Programmable Prescaler for Timer/Counter
- Gating Mode for Timer/Counter
- Modulo Mode for Timer/Counter
- Power Down Mode (Idle Mode)

NS80CX48/NS80CX35 Block Diagram



*NOTE: Not Applicable on NS80CX35

O/C/1375-1

TRI-STATE is a registered trademark and P²CMOS and XMOS are trademarks of National Semiconductor Corporation

©National Semiconductor Corp. O/C/1375

In-H/B30M111/Printed in U.S.A.

© IC MASTER 1983

National Semiconductor

NS80CX48/80CX35

Absolute Maximum Ratings

Voltage at any pin ..... V_{DD} +2.0V to V_{SS} -0.3V
Operating Temperature ..... See "Operating Range" Below
Storage Temperature ..... -65° C to +150° C
Operating V_{DD}, V_{CC} Range ..... 4.5 to 5.5V
Lead Temperature (Soldering, 10 seconds) ..... 300° C

NOTE: *Absolute maximum ratings indicate limits beyond which permanent damage may occur. Continuous operation at these limits is not intended; operation should be limited to those conditions specified under DC Electrical Characteristics.*

Operating Range

Component Type	Ambient Temperature	V_{CC}	Part Number
Industrial	-40° C to +85° C	+ 4.5V to + 5.5V	NS80CX48XXX/NI, NS80CX35NI (ROMless)
Commercial	0° C to +70° C	+ 4.5V to + 5.5V	NS80CX48XXX/N, NS80CX35N (ROMless)

DC Electrical Characteristics — NS80CX48 and NS80CX35

$V_{CC} = V_{DD} = +5V \pm 10\%$, $V_{SS} = 0V$, unless otherwise specified. The following values are valid over the 0° C to 70° C temperature range (or -40° C to 85° C for the industrial part).

Symbol	Parameter	Min	Typ	Max	Units	Test Conditions
V_{IL}	Input Low Voltage			1.5	V	
V_{IH}	Input High Voltage	3.5			V	
V_{OL}	Output Low Voltage			.45	V	$I_{SINK} \leq 2$ mA
V_{OH}	Output High Voltage	2.4 V_{CC}-0.5			V V	$I_{SOURCE} \leq 100\ \mu A$ $I_{SOURCE} \leq 10\ \mu A$
I_{IL}	Input Leakage Current (T1, EA, $\overline{INT}$) All Others			 10 10	 μA μA	 $V_{IN} = V_{CC} = V_{DD}$ $V_{DD} \geq V_{IN} \geq V_{SS}$
I_{OL}	Output Leakage Current (High Impedance State) Bus Outputs, T0			10	μA	$V_{DD} \geq V_{IN} \geq V_{SS}$
I_{DD}	Operating Supply Current		5 1	10 5	mA mA	f_C = 6 MHz f_C = 1 MHz (All Outputs Open)
I_{DDQ}	Quiescent Current (Stand-by)		20		μA	XTAL 1 = $\overline{RESET}$ = V_{SS}, V_{CC} = 0V, Outputs open

© IC MASTER 1983

National Semiconductor

NS80CX48/80CX35

AC Electrical Characteristics — NS80CX48 and NS80CX35

$V_{DD} = V_{CC} = +5V \pm 10\%$, $V_{SS} = 0V$, unless otherwise specified.

Symbol	Parameter	Min	Typ	Max	Units	Test Conditions
t_{LL}	ALE Pulse Width	400			ns	
t_{AL}	Address Setup to ALE	150			ns	
t_{LA}	Address Hold from ALE	80			ns	
t_{CC}	Control Pulse Width $\overline{PSEN}$, $\overline{RD}$, $\overline{WR}$	700			ns	
t_{DW}	Data Set-Up Before $\overline{WR}$	500			ns	
t_{WD}	Data Hold After $\overline{WR}$	80			ns	$C_L = 20pF$
t_{CY}	Cycle Time	2.5 15 30			μs μs μs	$f_C = 6$ MHz $f_C = 1$MHz $f_C = 500$KHz
t_{DR}	Data Hold	0		200	ns	
t_{RD}	$\overline{PSEN}$, $\overline{RD}$ to Data In			500	ns	
t_{AW}	Address Setup to $\overline{WR}$	230			ns	
t_{AD}	Address Setup to Data In			950	ns	
t_{AFC}	Address Float to $\overline{RD}$, $\overline{PSEN}$	0			ns	
t_{CA}	Control Pulse to ALE	10			ns	

Port 2 Timing

Symbol	Parameter	Min	Typ	Max	Units	Test Conditions
t_{CP}	Port Control Setup before Falling Edge of $\overline{PROG}$	110			ns	
t_{PC}	Port Control Hold after Falling Edge of $\overline{PROG}$	140			ns	
t_{PR}	$\overline{PROG}$ to P2 Input Valid	220		810	ns	
t_{DP}	Output Data Setup Time	250			ns	
t_{PD}	Output Data Hold Time	65			ns	
t_{PF}	Input Data Hold Time	0		150	ns	
t_{PP}	$\overline{PROG}$ Pulse Width	1510			ns	
t_{PL}	Port 2 I/O Data Setup	400			ns	
t_{LP}	Port 2 I/O Data Hold	150			ns	

Capacitance

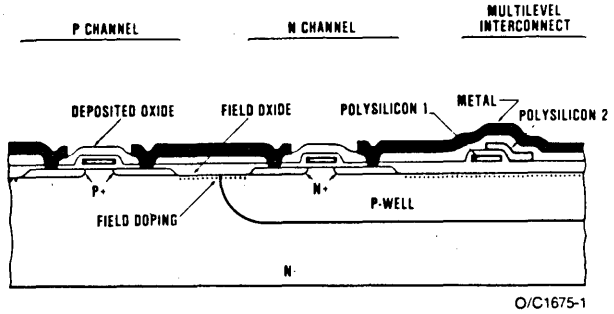
$T_A = 25°$ C, $V_{CC} = V_{SS} = 0V$

Symbol	Parameter	Min	Typ	Max	Units	Test Conditions
C_{IN}	Input Capacitance (All Except $\overline{RESET}$)		6		pF	$f_c = 1$ MHz
C_{OUT}	OUTPUT and $\overline{RESET}$ Capacitance		10		pF	Unmeasured pins returned to V_{SS}

© IC MASTER 1983

National Semiconductor

NS87PC48 Piggy-Back Microcomputer



O/C1675-1

General Description

The NS87PC48 Piggy-Back 8-bit Microcomputer is a prototyping aid for NS80C48 and NS80CX48 designs. It is fabricated using National's P²CMOS™ silicon gate technology. This technology provides the system designer with devices that equal the speed performance levels of comparable NMOS products, combined with low-power advantages of CMOS. Housed in a 40-pin dual-in-line package, the NS80PC48 includes a plug-in adapter that will accept either a 27C16 or a 27C58A EPROM.

The NS87PC48 Piggy-Back Microcomputer contains the system timing, control logic, RAM data memory and EPROM socket, plus 27 I/O lines to implement prototype program development and emulation. It has extensive bit handling capability as well as facilities for both binary and BCD arithmetic. Efficient use of program memory is derived from an instruction set comprised of predominantly single-byte instruction; the remaining instructions are two bytes in length. It also has an extra feature mode which permits enhanced microcomputer performance. When not in the extra features mode, the device operates the same as the standard INS8048.

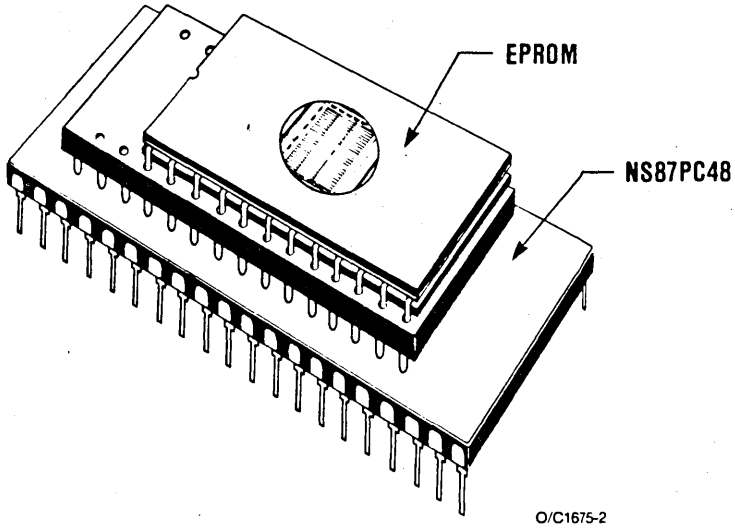
Features - NS87PC48

- 8-Bit CPU, RAM, ROM, I/O in Single Package
- 2.5 μsec Cycle Time, 6MHz Oscillator
- Low Power
- Very Low Standby Power
- Expandable Memory and I/O
- Single-Level Interrupt
- Efficient Instructions
- Instruction Compatible to INS8048
- Pin Compatible to INS8048

Extra Features

- Programmable Prescaler for Timer/Counter
- Gating Mode for Timer/Counter
- Modulo Mode for Timer/Counter
- Power Down Mode (IDLE Mode)

Piggy-Back Package



O/C1675-2

P²CMOS, Microbus, XMOS are trademarks of National Semiconductor Corporation.
TRI-STATE is a registered trademark of National Semiconductor Corporation.

© IC MASTER 1983

National Semiconductor

NS87PC48

Absolute Maximum Ratings

Voltage at Any Pin	V_{DD} +2.0V to V_{SS} −0.3C
Operating Temperature	See "Operating Range" Below
Storage Temperature	−65°C to +150°C
Operating V_{DD}, V_{CC} Range	4.5 to 5.5V
Lead Temperature (Soldering, 10 Seconds)	300°C

NOTE: Absolute maximum ratings indicate limits beyond which permanent damage may occur. Continuous operation at these limits is not intended; operation should be limited to those conditions specified under DC Electrical Characteristics.

Operating Range

Component Type	Ambient Temperature	V_{CC}	Part Number
Commercial	0°C to +70°C	+4.5V to +5.5V	NS87PC48

DC Electrical Characteristics — NS87PC48

$V_{CC} = V_{DD} = +5V \pm 10\%$, $V_{SS} = 0V$, unless otherwise specified. The following values are valid over the 0°C to 70°C temperature range.

Symbol	Parameter	Min	Typ	Max	Units	Test Conditions
V_{IL}	Input Low Voltage			.2V_{CC}	V	
V_{IH}	Input High Voltage	1.8V_{CC}			V	
V_{OL}	Output Low Voltage			.45	V	$I_{SINK} \leq 2mA$
V_{OH}	Output High Voltage	2.4 V_{CC}−0.5			V V	$I_{SOURCE} \leq 100\mu A$ $I_{SOURCE} \leq 10\mu A$
I_{IL}	Input Leakage Current (T1, EA, $\overline{INT}$) All Others			10 10	μA μA	$V_{DD} \geq V_{IN} \geq V_{SS}$ $V_{IN} = V_{CC} = V_{DD}$
I_{OL}	Output Leakage Current (High Impedance State) Bus Outputs, T0			10	μA	$V_{DD} \geq V_{IN} \geq V_{SS}$
I_{DD}	Operating Supply Current		5 1	10 5	mA mA	f_C = 6MHz f_C = 1MHz (All Outputs Open)
I_{DDQ}	Quiescent Current (Stand-by)		200		μA	XTAL1 = $\overline{RESET}$ = V_{SS}, V_{CC} = 0V, Outputs Open

© IC MASTER 1983

AC Electrical Characteristics — NS87PC48

National Semiconductor

$V_{DD} = V_{CC} = +5V \pm 10\%$, $V_{SS} = 0V$, unless otherwise specified.

Symbol	Parameter	Min	Typ	Max	Units	Test Conditions
t_{LL}	ALE Pulse Width	400			ns	See Note 1
t_{AL}	Address Setup to ALE	150			ns	See Note 1
t_{LA}	Address Hold from ALE	80			ns	See Note 1
t_{CC}	Control Pulse Width $\overline{PSEN}$, $\overline{RD}$, $\overline{WR}$	700			ns	See Note 1
t_{DW}	Data Setup before $\overline{WR}$	500			ns	See Note 1
t_{WD}	Data Hold after $\overline{WR}$	80			ns	$C_L = 20pF$
t_{CY}	Cycle Time	2.5 15 30			μs μs μs	$f_C = 6MHz$ $f_C = 1MHz$ $f_C = 500kHz$
t_{DR}	Data Hold	0		200	ns	See Note 1
t_{RD}	$\overline{PSEN}$, $\overline{RD}$ to Data In			500	ns	See Note 1
t_{AW}	Address Setup to $\overline{WR}$	230			ns	See Note 1
t_{AD}	Address Setup to Data In			950	ns	See Note 1
t_{AFC}	Address Float to $\overline{RD}$, $\overline{PSEN}$	0			ns	See Note 1
t_{CA}	Control Pulse to ALE	10			ns	See Note 1

Port 2 Timing

Symbol	Parameter	Min	Typ	Max	Units	Test Conditions
t_{CP}	Port Control Setup before Falling Edge of $\overline{PROG}$	110			ns	See Note 1
t_{PC}	Port Control Hold after Falling Edge of $\overline{PROG}$	140			ns	See Note 1
t_{PR}	PROG to P2 Input Valid	220		810	ns	See Note 1
t_{DP}	Output Data Setup Time	250			ns	See Note 1
t_{PD}	Output Data Hold Time	65			ns	See Note 1
t_{PF}	Input Data Hold Time	0		150	ns	See Note 1
t_{PP}	$\overline{PROG}$ Pulse Width	1510			ns	See Note 1
t_{PL}	Port 2 I/O Data Setup	400			ns	See Note 1
t_{LP}	Port 2 I/O Data Hold	150			ns	See Note 1

NOTE 1. Control outputs $C_L = 100pF$

Capacitance

$T_A = 25°C$, $V_{CC} = V_{SS} = 0V$

Symbol	Parameter	Min	Typ	Max	Units	Test Conditions
C_{IN}	Input Capacitance (All Except $\overline{RESET}$)		6		pF	$f_C = 1MHz$
C_{OUT}	OUTPUT and $\overline{RESET}$ Capacitance		10		pF	Unmeasured pins returned to V_{SS}

© IC MASTER 1983

National Semiconductor

NS87PC48

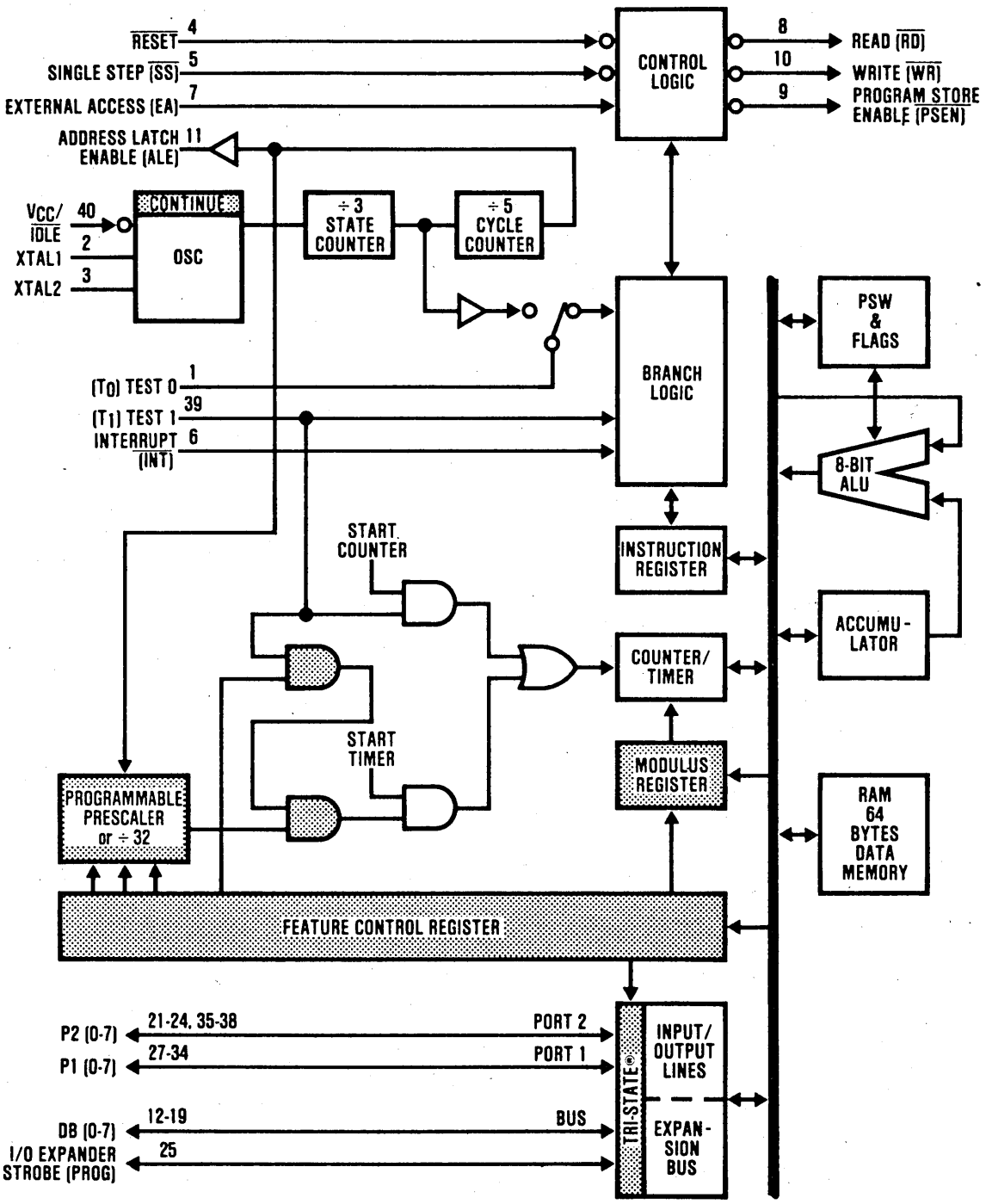
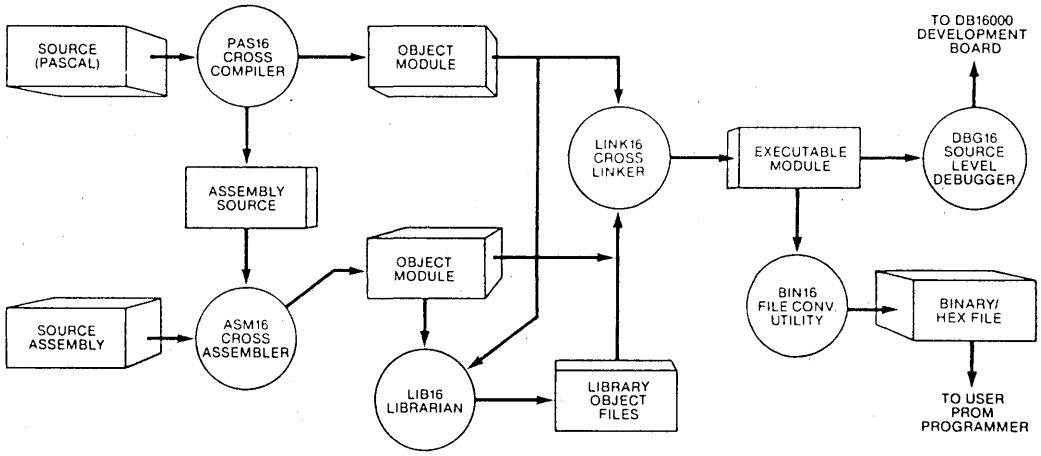


FIGURE 1. NS87PC48 Detailed Block Diagram

© IC MASTER 1983

NSX16 Cross Software Package



NSX16 Cross Software Package

- **Runs under STARPLEX II™ operating system and DEC® VAX/VMS operating system**
- **Compatible with ANSI standard Pascal**
- **Supports NS16081 floating point unit**
- **Pascal run-time support environment for DB16000 development board**
- **Pascal compiler produces NS16000 code directly**
- **High-level symbolic debugger allows debug at source level**

Product Overview

NSX16 is a comprehensive software development package that includes all the components necessary to produce NS16000 native code. Intended as a support package to facilitate the development of software for NS16000-based systems, NSX16 has been designed to run initially on two hardware configurations. These are National Semiconductor's STARPLEX II operating system and Digital Equipment's VAX11 series running the VMS operating system.

Consisting of a Pascal compiler, NS16000 cross-assembler, linker, librarian, and source-level debugger, NSX16 provides the full ensemble of tools to make the generation of NS16000 code an easy task. Code thus developed may then be downloaded via a serial port to the DB16000 development board for execution and debug.

NSX16 consists of the following components:

— PAS16, the Pascal Cross-Compiler
— RTS16, the Run-Time Support Package
— ASM16, NS16000 Cross-Assembler
— LINK16, the Cross Linker
— LIB16, the Librarian
— BIN16, the File Conversion Utility
— DBG16, the Source-Level Symbolic Debugger

PAS16

Designed to be compatible with the ANSI standard, with listed extensions and restrictions, the Pascal cross-compiler is capable of accepting compatible Pascal source and generating NS16000 code. Extensions include features such as IMPORT/EXPORT in support of full modularity and FAST variables for code optimization. Also included is the run-time support environment for the DB16000 development board.

ASM16

The cross-assembler produces relocatable NS16000 object code. It accepts complex expressions, floating point scientific notation, external symbol references and can handle external address arithmetic.

LINK16

Modules generated by the cross-compiler or assembler are linked by LINK16 to produce executable modules. LINK16 is interactive, allowing the user to include additional files and libraries at link time whenever symbol matching is unsuccessful. LINK16 provides an extensive repertoire of directives to support complex system configurations. Directives can be entered from disk or directly from the console. LINK16 permits user control of RAM/ROM allocation.

STARPLEX and STARPLEX II are trademarks of National Semiconductor Corp.
DEC is a registered trademark of Digital Equipment Corp.
©1982 National Semiconductor Corp. O-Mesa-1692

DA-B30M72/Printed in U.S.A.

© IC MASTER 1983

National Semiconductor

NSX16

LIB16

The librarian maps module characteristics and builds module libraries.

BIN16

The BIN16 program is a utility that converts 16000 executable files into a format acceptable for PROM programmers.

DBG16

DBG16 is an interactive symbolic debugger that allows debugging at the source level. It communicates with the DB16000 monitor via a serial link allowing execution and debug on the board. Source code may be displayed and breakpoints set by line numbers. Single-stepping is possible at the machine instruction level, the Pascal statement level, the procedure level, or until a register/address value match occurs. DBG16 supports debugging of multimodule programs, drawing all information needed to support debug from source files and the output of the linker. It supports command files and output to a file to serve as a history file.

Supported Hardware

— STARPLEX II™
STARPLEX™ Operating System
— DEC® VAX 11 Family
VMS Operating System Vers 2.X or later

Shipping Package

VAX Version:
1600 bpi mag tape (9-track VMS copy format)
User and reference documentation

STARPLEX II Version:
Compatible diskette
User and reference documentation

Order Information

NSX-16	Cross Software Package, VAX/VMS version (Includes PAS16, RTS16 ASM16, LINK16, LIB16, BIN16 and DBG16)
NS-PAS-16	Pascal Cross-Compiler, VAX/VMS version
NS-ASM-16	NS16000 Cross-Assembler, VAX/VMS version (Includes ASM16, LINK16, LIB16, BIN16 and DBG16)
SFW-90-A500	Cross Software Package, STARPLEX II version (Includes same as NSX-16)
SFW-90-A400	Pascal Cross-Compiler, STARPLEX II version
SFW-90-A010	NS16000 Cross-Assembler, STARPLEX II version (Includes same as NS-ASM-16)

LIFE SUPPORT POLICY

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

National Semiconductor Corporation
2900 Semiconductor Drive
Santa Clara, California 95051
Tel.: (408) 721-5000
TWX: (910) 339-9240

National Semiconductor GmbH
Furstenriederstraße Nr.5I
8 München 21
West Germany
Tel.: (089) 56 01 20
Telex: 522772

NS Japan K.K.
POB 4152,
Shinjuku Center Building,
1-25-1 Nishishinjuku,
Shinjuku-ku,
Tokyo 160, Japan
Tel.: (03) 349-0811
TWX: 232-2015 NSC J-J

National Semiconductor Hong Kong, Ltd.
1st Floor,
Cheung Kong Electronic Bldg
4 Hing Yip Street
Kwun Tong
Kowloon, Hong Kong
Tel.: 3-899235
Telex: 43866 NSEHK HX
Cable: NATSEMI HX

NS Electronics Do Brasil
Avda Brigadeiro Faria Lima 830
8 Andar
01452 Sao Paulo, Brasil
Telex:
1121008 CABINE SAO PAULO
113193 INSBR BR

NS Electronics Pty. Ltd.
Cnr. Stud Rd. & Mtn. Highway
Bayswater, Victoria 3153
Australia
Tel.: 03-729-6333
Telex: AA32096

National does not assume any responsibility for use of any circuitry described; no circuit patent licenses are implied, and National reserves the right, at any time without notice, to change said circuitry.

© IC MASTER 1983

The 1800 Series — Unique and Versatile

The 1800-Series has found its way into a wide variety of applications in the last several years — applications that make optimum use of its low power and architectural characteristics. Since the virtues of CMOS as a technology are well known in the industry, it is more beneficial to concentrate on the internal architecture and external interfacing features of the 1800-series family and how they can prove useful in your system design.

Register-Based Addressing and Data Storage

The register-based addressing-and-data storage concept is the prime feature that sets the 1800 series apart from many other CPU structures. Contained on the CPU chip is an array of sixteen 16-bit scratchpad registers that provide control over memory addressing and internal housekeeping. The user has a variety of software instructions available to program this scratchpad indirectly by use of three 4-bit register designators (P, N, and X). The designators select the scratchpad registers to be program counters, stack pointers, memory pointers, loop counters, or storage locations (8 or 16 bit) for variable data. (Fig. 1) Once the user has mapped out a register assignment plan, a rich variety of software techniques is possible, since the register designators can be changed at will. Multiple program counters for quick subroutine calls, multiple stacks for I/O, data, and context switching, and multiple memory pointers for low-software-overhead data transfers can be facilitated. Since all scratchpad registers are 16 bits wide, the registers can address any of the 64K memory locations available to CDP1800-series CPU's.

Manipulation of data in the scratchpad registers is through the D register (accumulator) in the case of the CDP-1802 microprocessor family. (Fig. 2) Enhanced register data transfer — directly from program memory or to or from data memory — is possible with the CDP1804 microcomputer family. (Fig. 3) Treatment of the scratchpad register array as a 256-bit memory can reduce external memory requirements and allow for convenient storage of interim data.

Addressing Modes

The 1800-series architecture features indirect addressing as its primary addressing mode. Memory locations are addressed by loading address values into the scratchpad registers, which are selected by the 4-bit designator indicated within the instruction. As an example, a memory-to-accumulator move can be implemented with a LDN (load via N) instruction, which can take on one of sixteen opcodes, one for each of the sixteen scratchpad registers. In addition to indirect addressing, three other addressing modes are provided — direct addressing for page or extended jumps, immediate addressing for data transfer from program memory to the accumulator or scratchpad registers, and register addressing for register moves or internal register control.

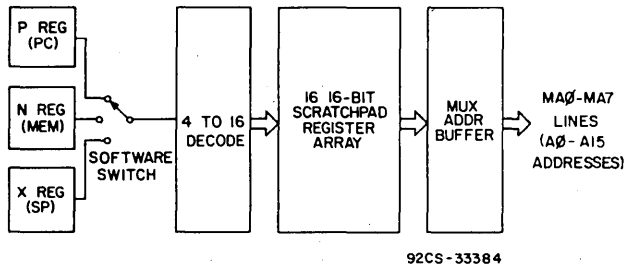


FIG. 1 — The 1800-Series CPU uses a general-register array to generate all memory addressing.

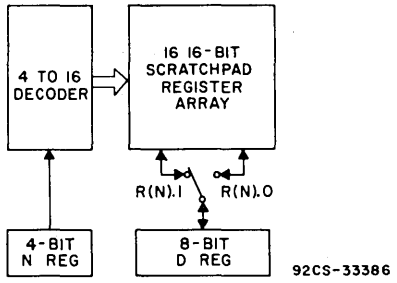


FIG. 2 — The general-register array can also be used for data storage.

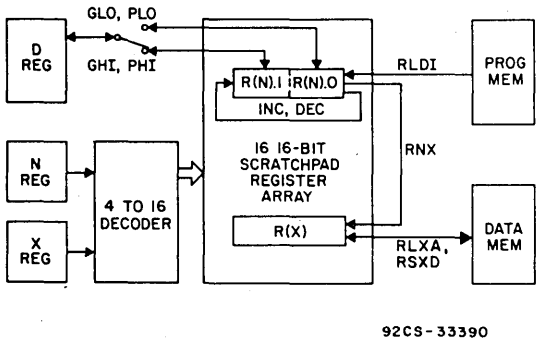


FIG. 3 — The CDP1804 microcomputer family features enhanced data manipulation with the register array.

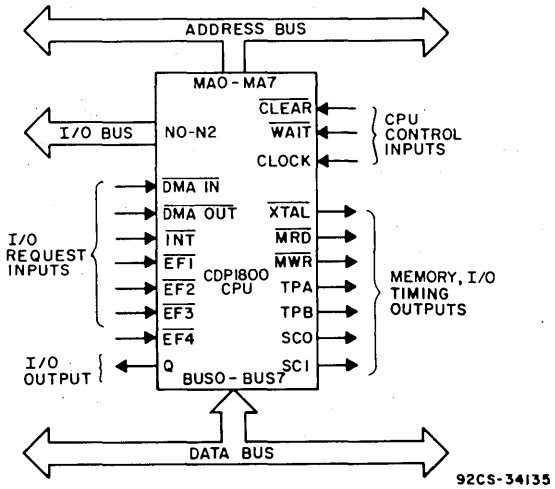


FIG. 4 — A variety of memory and I/O interface pins are available on all CDP-1800-series CPU's.

© IC MASTER 1983

External Interfacing

An 8-bit multiplexed address bus is used to generate one of 64K possible addresses to memory; a separate bi-directional bus is used for data transfer. A latch pulse, TPA, is provided to capture the high-order address byte to provide a stable address to external memory (Fig. 4): Special ROM's are available to eliminate the need for an external latch for this purpose.

The I/O structure is unique, with a separate I/O address bus, four flag inputs and one interrupt input, and a single Q-bit output port. The I/O structure allows for stack transfer directly to and from memory, while the flag and Q lines can be used as I/O pins under software control, or in serial I/O applications. In addition, DMA request inputs are provided for control of an on-board DMA counter. The DMA feature allows the CPU section to generate address and control signals for memory/I/O transfer in a continuous or cycle-stealing mode. This feature may also be used to provide a real-time clock function under hardware-update control. (Fig. 5)

Designing a System

Putting together a complete CDP-1800-based system is a straightforward task, since separate building blocks are available for each microcomputer function. A large section of this guide is devoted to details on the RAM, ROM, and I/O support components that can be used in a complete system.

A typical design (Fig. 6) can start off with a CDP1802, a ROM with built-in latches and decoding for direct interface to CDP1802 timing signals, a small RAM array for scratchpad and stack usage, and some I/O ports for interfacing to the external world. No additional memory or I/O decoders or latches are required. The 1800-series ROM has these functions on board, and can pass a chip select to an external RAM, while the ports are directly mapped in I/O space.

A higher performance level can be achieved with other devices in the line. (Fig. 7). The CDP1805, which has on-board RAM and a counter-timer, can replace and expand the discrete RAM function, while adding real-time control to the system. A larger ROM, the CDP1835, which maintains the same pinout as the CDP1833, is used here for upward compatibility. Finally, the CDP1851 replaces the two I/O ports with a 20-line expansion function, complete with handshaking and additional bidirectional and bit-programmable port-mode capability.

The Next Step

The above examples give an idea of how a system can be put together. But there is much more — complex I/O functions, serial communication, CRT control, memory latches, decoder interfaces, and other functions to suit nearly any CMOS application.

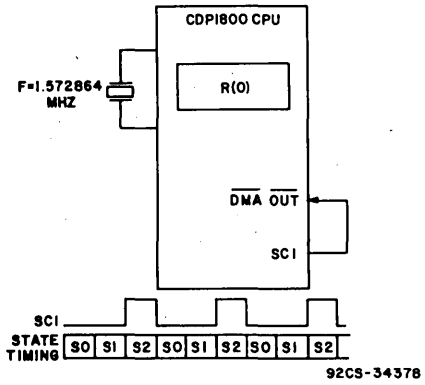


FIG. 5 — The CPU DMA feature can be used to implement a real-time clock.

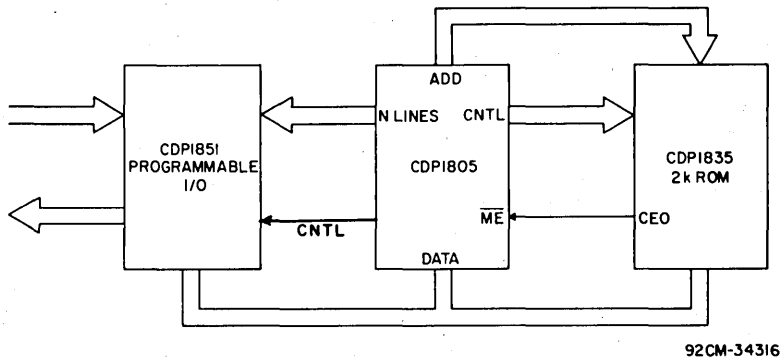


FIG. 7 — Several chip functions can be combined for a higher level of system integration and performance.

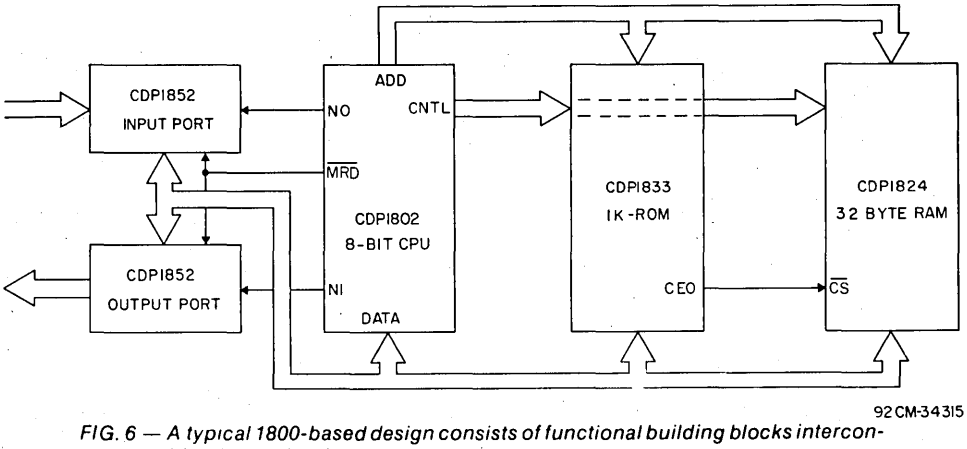


FIG. 6 — A typical 1800-based design consists of functional building blocks interconnected with minimal hardware.

© IC MASTER 1983

Microprocessors and Microcomputers

CDP1802, CDP1802AC, CDP1802BC

The RCA-CDP1802 CMOS microprocessor is an LSI 8-bit silicon-gate CMOS register-oriented central-processing unit (CPU) designed for use as a general-purpose computing or control element in a wide variety or commercial, industrial, and military applications.

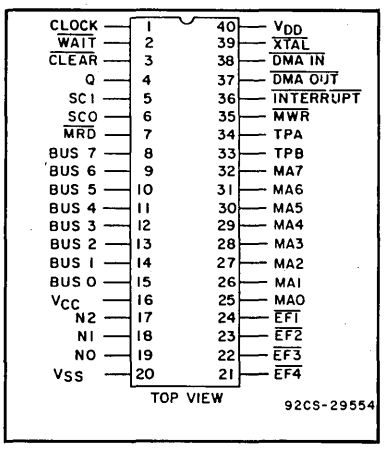
The unique architecture of the CDP1802 has been designed with a complete microcomputer system in mind so that systems with maximum flexibility and minimum cost can be realized.

The CMOS technology provides a high noise immunity to enable the CDP1802 to operate in electrically hostile environments. The CDP1802 can be powered by an unregulated power supply over a wide operating-voltage range. Further, the processor is completely static so that its system clock can be controlled to interface with slow memories or stopped to provide reduced power consumption during standby conditions.

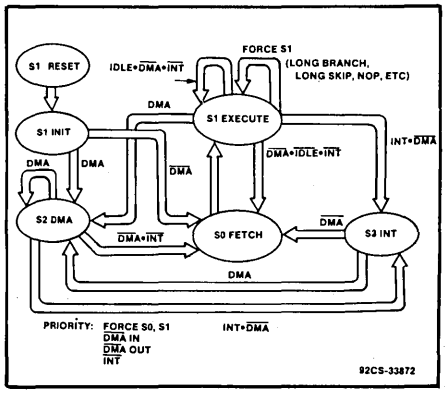
The CDP1802 provides a set of simple, easy-to-use general-purpose instructions to permit the design of programs for CDP1802-based products with minimum effort.

The CPU is available in five performance selections.

Terminal-Assignment Diagram

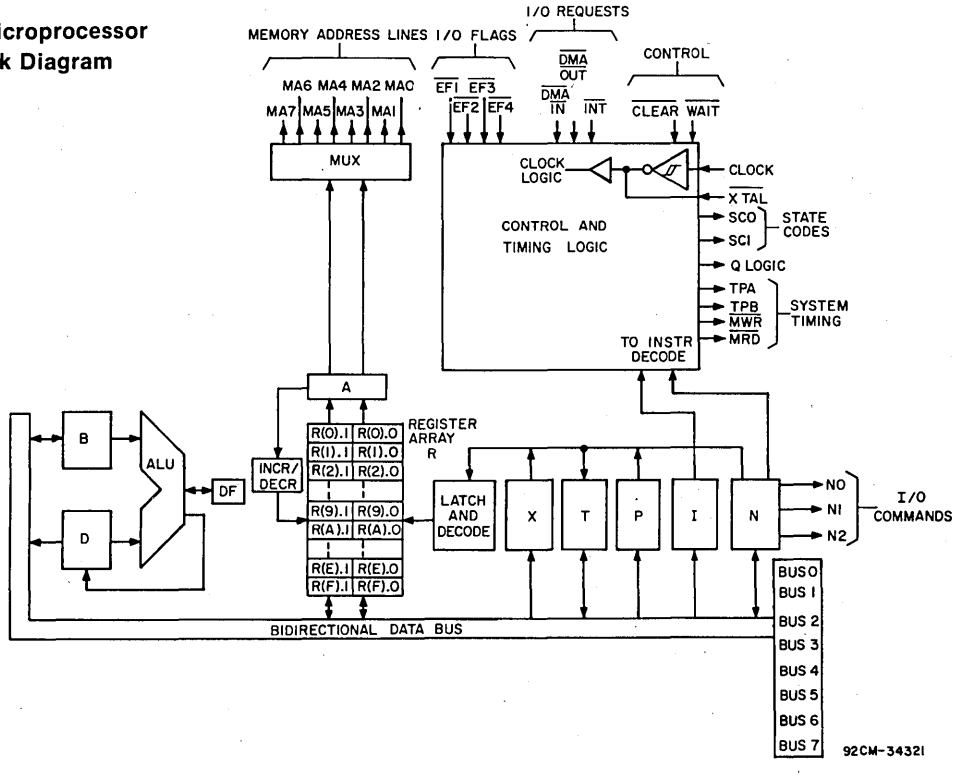


- **16 x 16 matrix of registers for use as multiple program counters, data pointers, or data registers**
- **Single-phase clock; optional on-chip crystal-controlled oscillator**
- **Flexible programmed I/O mode**
- **Four flag inputs directly tested by branch instructions**
- **Programmable single-bit output port**
- **Static circuitry — no minimum clock frequency**
- **8-bit parallel organization with bi-directional data bus and multiplexed address bus**
- **Any combination of standard RAM and ROM up to 65,536 bytes**
- **91 easy-to-use instructions**
- **On-chip DMA**
- **Program interrupt mode**

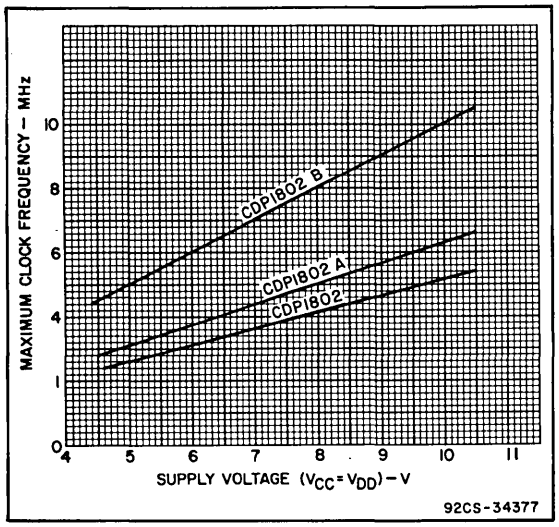


State Diagram

CDP1802 Microprocessor Family Block Diagram



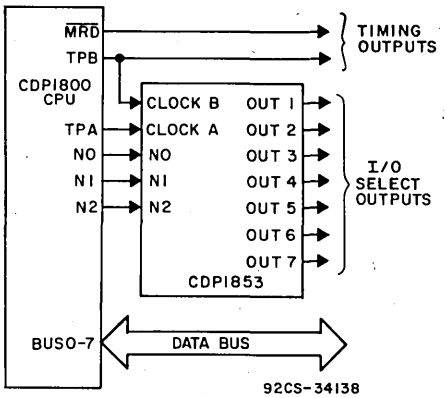
© IC MASTER 1983



CPU Selections

	Max. Clock Freq.	Operating Voltage
CDP1802C	2.5 MHz (5V)	4-6.5V
CDP1802	5.0 MHZ (10V)	4-10.5V
CDP1802AC	3.2 MHz (5V)	4-6.5V
CDP1802A	6.4 MHZ (10V)	4-10.5V
CDP1802BC	5.0 MHz (5V)	4-6.5V

I/O Address Decoding



I/O address lines (N lines) are easily decoded to provide expanded addressing in I/O space for ports and other peripheral devices.

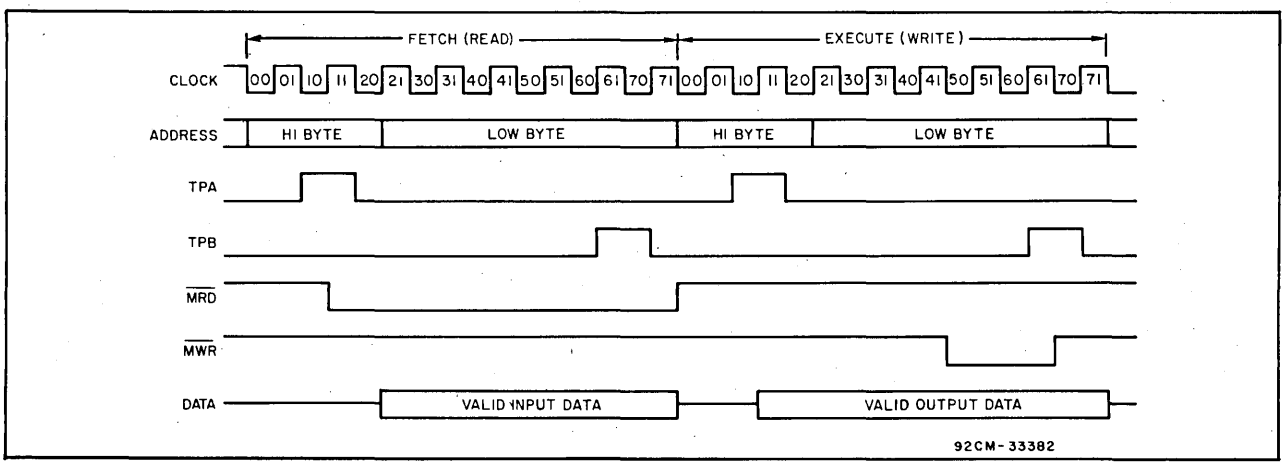
Instruction Set

The CDP1802 instruction set has a full complement of arithmetic and logic operations, conditional page and long-branch instructions that test the contents of the accumulator and carry flag, register instructions that modify the contents of the internal scratchpads or register selectors, and I/O and interrupt handling instructions.

Listed below is a breakdown of the 91 instructions common to the CDP-1802 family.

Memory Transfer	7
Internal Register	7
Logic	10
Arithmetic	12
Unconditional Jumps	4
Conditional Jumps	27
Control	7
Interrupt Control	3
I/O Transfer	14

Timing



The trailing edge of TPA is used by the memory system to latch the higher-order byte of the 16-bit memory address.

TPB is used by I/O devices to latch valid data.

$\overline{MWR}$ is the write enable signal for memory devices.

$\overline{MRD}$ is the read enable signal for memory devices and goes low during the fetch cycle.

Address Bus

In each cycle, the higher-order byte of the 16-bit address appears on the memory address lines first. Those bits required by the memory system can be strobed into external address latches by timing pulse TPA. The low-order byte of the 16-bit address appears on the address lines after the termination of TPA. Latching of all 8 higher-order address bits would permit a memory system of 64K bytes.

© IC MASTER 1983

CDP1804AC, CDP1805AC, CDP1806AC
CDP1805AC, CDP1806AC

The new 1804A μC comprises a CPU, 2k bytes of mask-programmable ROM, 64 bytes of RAM and an 8-bit timer/counter that operates in six different modes.

It's the world's first 100% static, full CMOS micro with all these functions.

Execution time is only 3.2 μs at 5MHz. The internal ROM may be deactivated for prototyping or test and debugging purposes.

In addition to program storage, the internal ROM can hold system firmware such as operating system high-level language, math routines and user-defined routines.

Our 123 powerful instructions help to make the 1804A exceptionally easy to use. Included are a full set of BCD instructions, improved call and return instructions, improved call and return instructions that minimize processing time, a 16-bit data instruction for faster data transfer, and a save instruction for improved interrupt servicing.

The CPU chip contains an array of 16-bit scratchpad registers that provide control over memory addressing and internal housekeeping. This scratchpad can be programmed indirectly through three 4-bit register designators. Memory locations are also addressed by loading address values into the scratchpad registers.

One feature that really sets the 1804A apart from competitive microcomputers is its ability to accommodate external RAM and ROM—any combination up to 64K. It includes an 8-bit multiplex address bus which can be used to generate 64K bytes of possible addresses to memory. A separate bidirectional bus is used for data transfer. A latch pulse, TPA, is provided to capture the high-order address byte to provide a stable address to external memory. Special ROMs are available to eliminate the need for an external latch for this purpose.

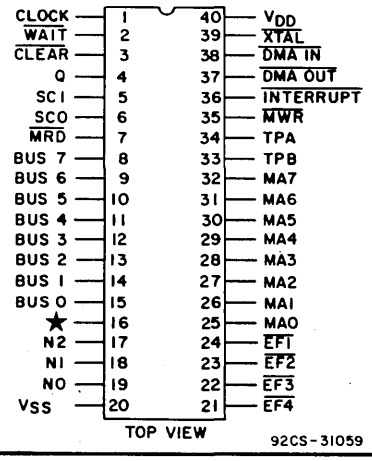
The I/O structure is unique, with a separate I/O address bus, four flag inputs, one interrupt input, and a single Q-bit output port.

The I/O structure allows for stack transfer directly to and from memory, while the flag and Q lines can be used as I/O pins under software control, or in serial I/O applications.

In addition, DMA request inputs are provided for control of an on-board DMA counter. The DMA feature allows the CPU section to generate address and control signals for memory-to-I/O transfer in a continuous or cycle-stealing mode. This feature may also be used to provide a real-time clock function under hardware-update control.

- 2k bytes of mask-programmable ROM (CDP1804A)
- 64 bytes of RAM (CDP1804A, CDP1805)
- 8-bit counter-timer operating in 6 different modes
- Enhanced interrupt controller
- Crystal- or RC- oscillator capability
- 5-MHz crystal clock (CDP1804A)
- Call-and-return instructions
- 16-bit data instruction
- 3.27-μs instruction fetch-execute time
- 123 powerful instructions (CDP1804A)
- Dual-channel event counting and pulse-width measurement
- Can address 64K bytes of external memory
- Can be used as timebase with clock source from prescaled TPA signal
- Can configure in unique modes for special functions
- Can plug into existing 1800-series sockets
- Extended temperature range: -55° C to +125° C

Terminal-Assignment Diagram



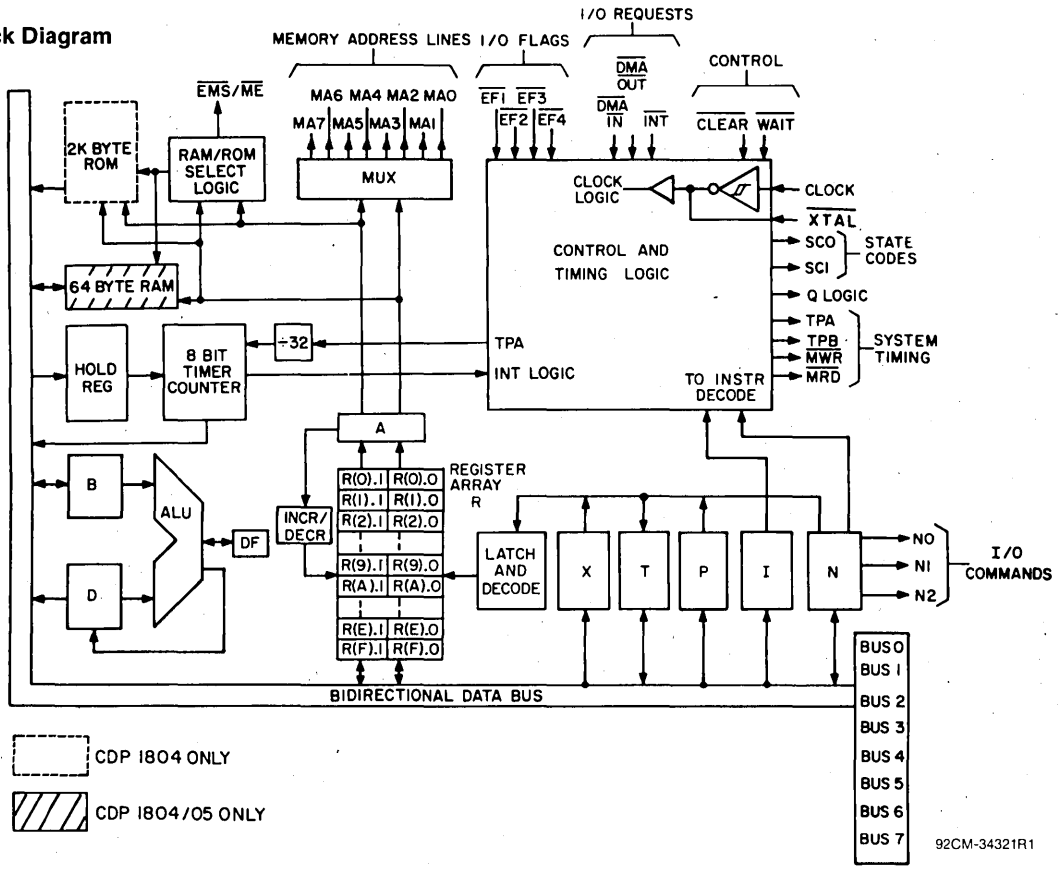
★ **Note: All terminal assignments are identical to those for the CDP1802 microprocessor family, except for terminal 16. Terminal 16 assignments for each type are shown in chart below.**

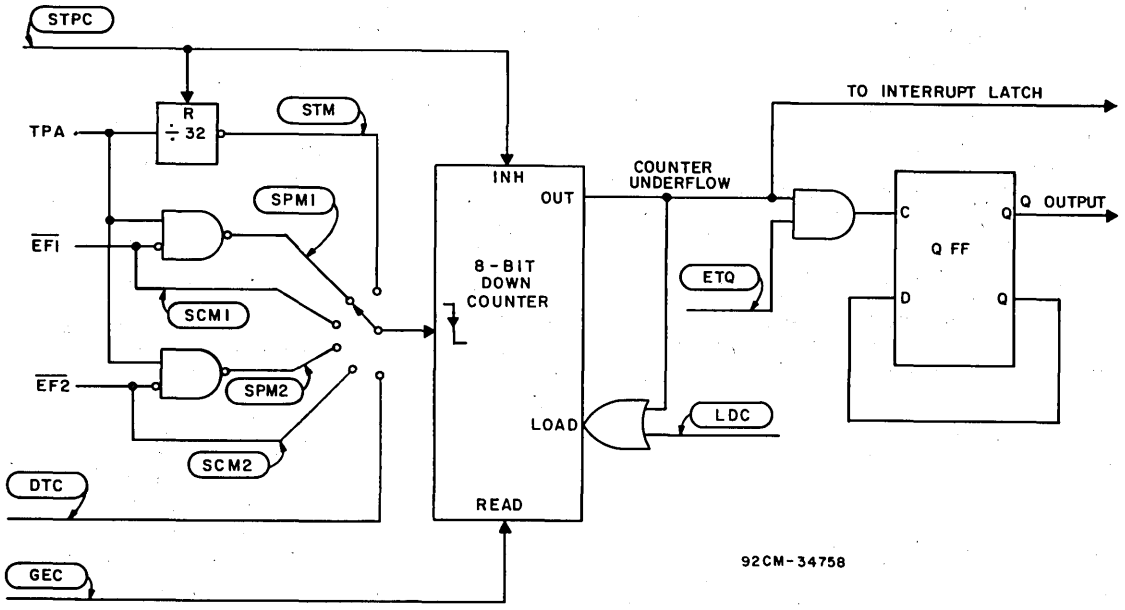
Device	Pin 16 Function
CDP1804A	1804 Mode: $\overline{EMS}$ Output Signal, active when external memory selected 1805 Mode: $\overline{ME}$ input signal, active when internal RAM selected
CDP1805	$\overline{ME}$ Input
CDP1806	Must be tied to V_{DD}

© IC MASTER 1983

CDP1804AC, CDP1805AC, CDP1806AC
CDP1805C, CDP1806C

CDP1804A Block Diagram

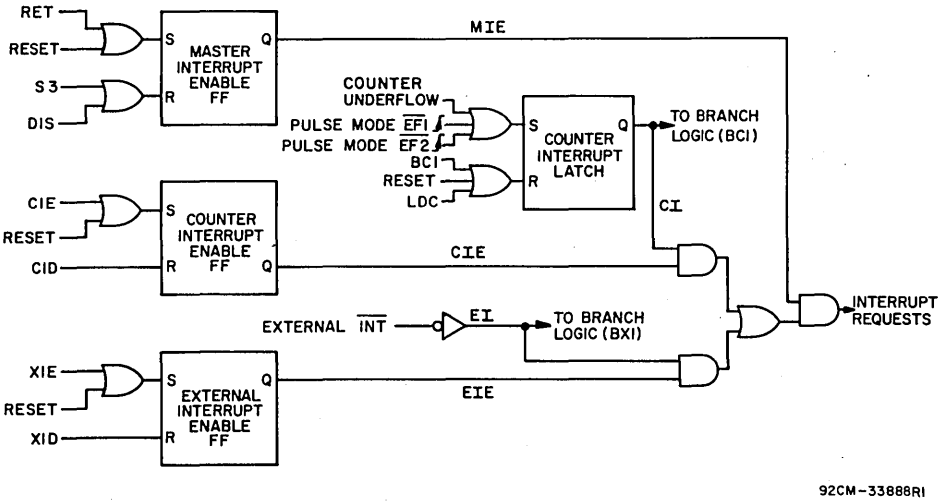




Timer/Counter diagram for CDP1804A, CDP1805, and CDP1806.

© IC MASTER 1983

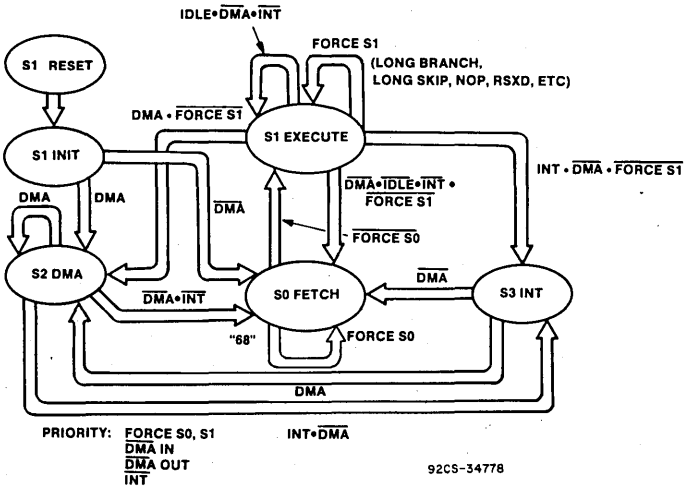
CDP1804AC, CDP1805AC, CDP1806AC
CDP1805C, CDP1806C



Interrupt logic-control diagram for CDP1804A, CDP1805, and CDP1806.

Summary of CDP1804A, CDP1805, and CDP1806 Features Relative to CDP1802 Family

	CDP1804A	CDP1805C,AC	CDP1806C,AC
2K Bytes Mask-Programmable ROM	X		
64 Bytes RAM	X	X	
On-Board Counter-Timer W/IO Timer Instructions	X	X	X
Enhanced Interrupt Control	X	X	X
Crystal or RC Oscillator Capability	X	X	X
Higher Crystal Clock (4 MHz)	X	X	X
Call and Return Instructions	X	X	X
16-Bit Data Instructions	X	X	X



State transition diagram for CDP1804A, CDP1805, and CDP1806.

© IC MASTER 1983

CDP1804AC, CDP1805AC, CDP1806AC
CDP1805C, CDP1806C

Applications

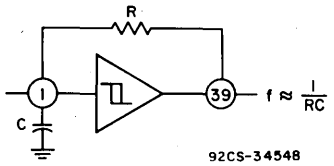
Using Internal ROM

The on-board ROM of the CDP-1804A, in addition to program storage, can hold system firmware:

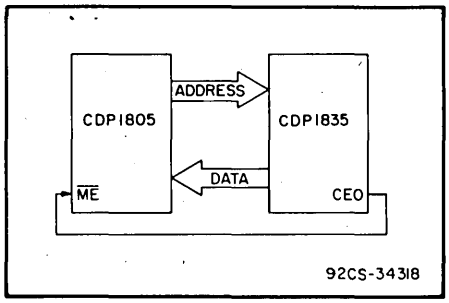
- **Operating System**
- **High-Level Language**
- **Math Routines**
- **User-Defined Routines**

Using the Clock Input

The CDP1804 family supports an RC-network configuration that can replace a crystal oscillator for clock frequencies up to 1 MHz.

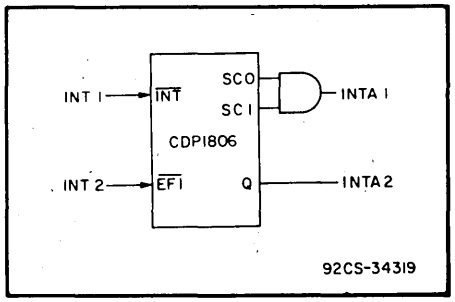


Using External ROM



Minimum 2-chip microcomputer system using CDP1805 and 2Kx8 CDP1835 ROM. This system uses the CDP1835 to address RAM, eliminating the need for external decoding.

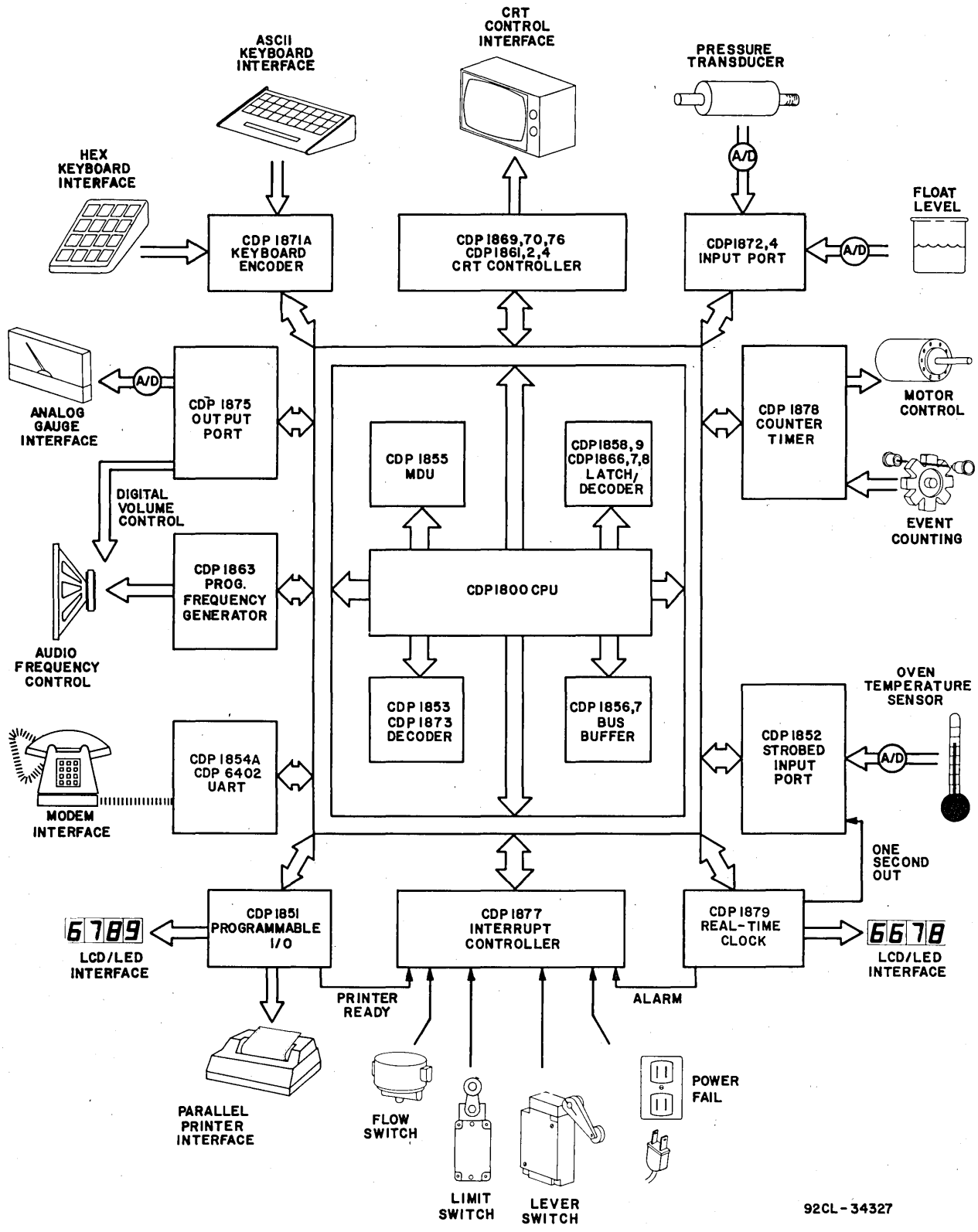
Using the Counter-Timer



This configuration allows the CDP-1806 to have two interrupt inputs, the normal INT input of the CDP1802, and a latched, edge-sensitive interrupt created by loading the counter-timer with 01 in the event counting-mode. The Q line provides a handshake signal to the interrupting device which is reset during the service routine.

© IC MASTER 1983

Peripheral Support Functions —
A Host of Chips to Interface to the Outside World



© IC MASTER 1983

CDP1853 CDP1853C

N-Bit 1 of 8 Decoder

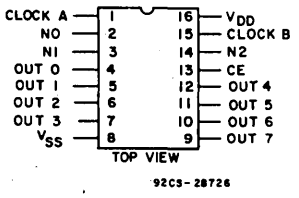
The RCA-CDP1853 and CDP1853C are 1 of 8 decoders designed for use in general purpose microprocessor systems. These devices, which are functionally identical, are specifically designed for use as gated N-bit decoders and interface directly with the 1800-series microprocessors without additional components. The CDP1853 has a recommended operating voltage range of 4 to 10.5 volts, and the CDP1853C has a recommended operating voltage range of 4 to 6.5 volts.

When CHIP ENABLE (CE) is high, the selected output will be true (high) from the trailing edge of CLOCK A (high-to-low transition) to the trailing edge of CLOCK B (high-to-low transition). All outputs will be low when the device is not selected (CE = 0) and during conditions of CLOCK A and CLOCK B. The CDP1853 inputs N0, N1, N2, CLOCK A, and CLOCK B are connected to an 1800 series microprocessor outputs N0, N1, TPA, and TPB respetively, when used to decode I/O commands as shown in Fig. 1. The CHIP ENABLE (CE) input provides the capability for multiple levels of decoding as shown in Fig. 2.

- **Provides direct control of up to 7 input and 7 output devices**
- **CHIP ENABLE (CE) allows easy expansion for multi-level I/O systems**

The CDP1853 can also be used as a general 1 of 8 decoder for I/O and memory system applications.

The CDP1853 and CDP1853C are supplied in hermetic 16-lead dual-in-line ceramic (D suffix) and plastic (E suffix) packages.



TERMINAL ASSIGNMENT

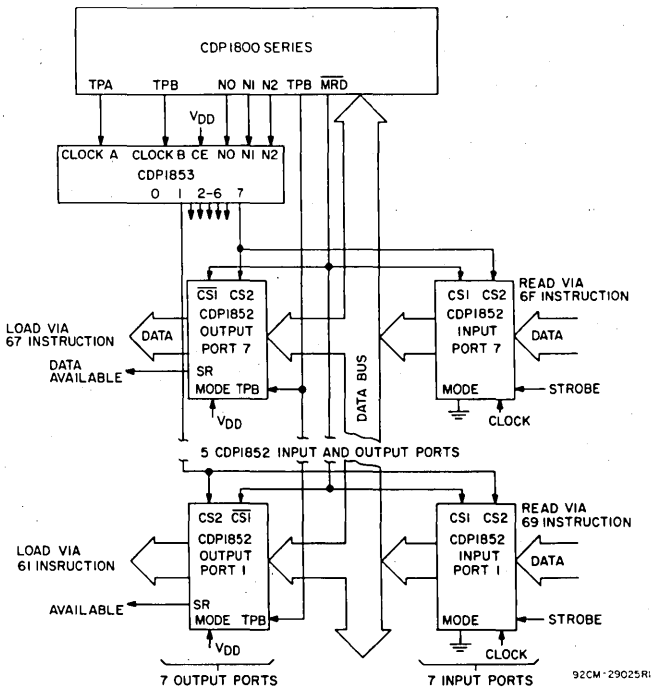


Fig. 1 — N-bit decoder in a one-level I/O system.

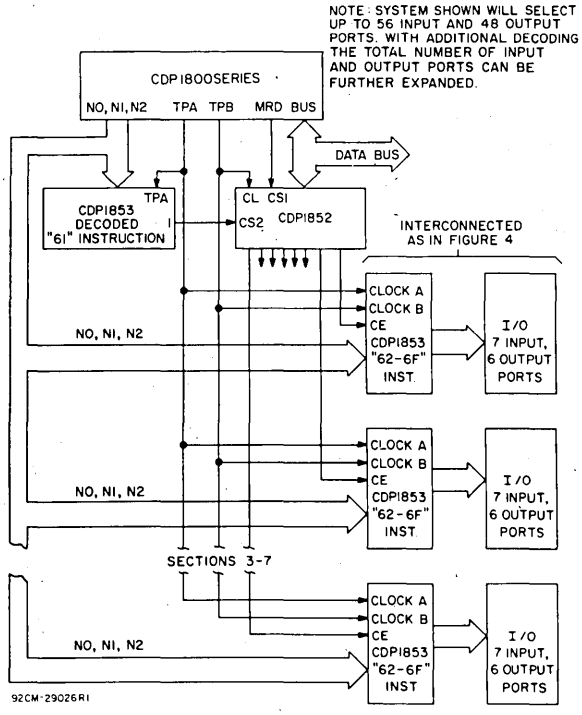


Fig. 2 — Two-level I/O using CDP1853 and CDP1852.

© IC MASTER 1983

CDP1873C

Preliminary Data

CMOS 1 of 8 Binary Decoder

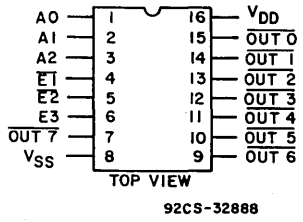
The RCA-CDP1873C is a high-speed 1 of 8 decoder designed for use with microprocessor systems that require expansion capabilities utilizing memory or input/output ports with active low chip-select inputs. The CDP1873C has a recommended operating voltage range of 4 to 6.5 volts.

When the decoder is enabled and addressed, one of its 8 outputs goes low.

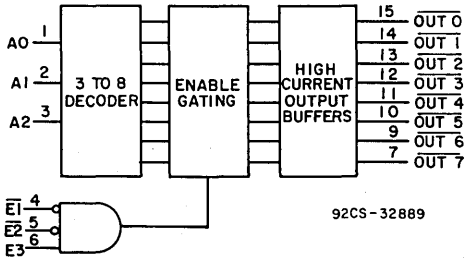
Enabling is controlled by 3 chip-select inputs, allowing for easy system expansion. All outputs will be high when the decoder is not selected. The CDP1873C can be cascaded for very large systems and offers a low propagation delay that reduces memory-access time requirements in those designs where delays are critical.

The CDP1873C is supplied in hermetic 16-lead dual-in-line ceramic (D suffix) and plastic (E suffix) packages.

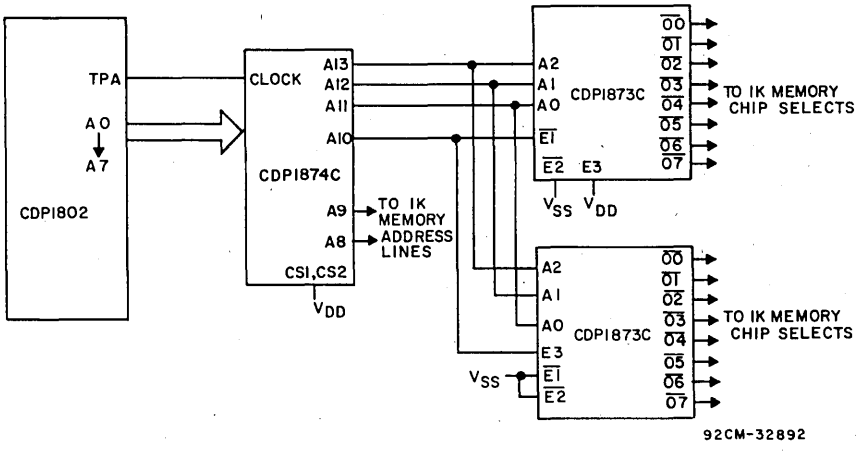
- *High-speed address to output enable delay 100 ns (max.) at V_{DD}=5 V*
- *Output sink 6 mA (min.) at V_{DD}=5 V*
- *I/O port or memory selector*
- *3 chip-select input allows simple expansion*



Terminal Assignment



CDP1873C functional diagram.



16-k memory-select using the CDP1873C with the CDP1874C as an address latch.

© IC MASTER 1983

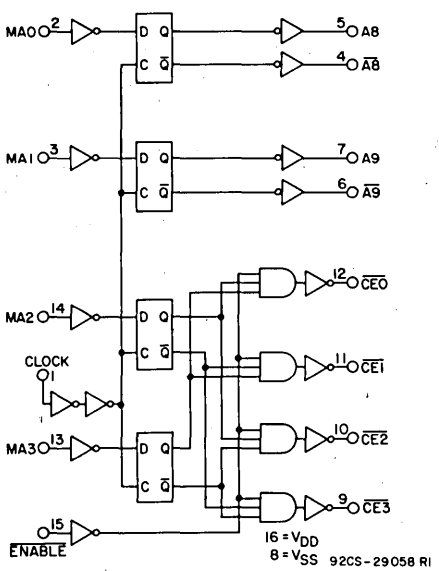
4-Bit Latch and Decoder Memory Interfaces CDP1858, CDP1859

The CDP1858, and CDP1859 are COS/MOS 4-bit latch and decoder circuits designed for use in CDP1800-series microprocessor systems. These devices are specifically designed for use as memory-system decoders and interface directly with the CDP1802 or CDP1804 family multiplexed address bus at maximum clock frequency.

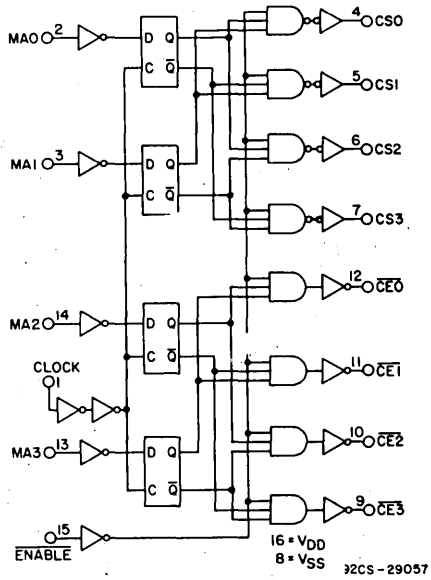
The CDP1858 interfaces the CDP-1802 or CDP1804 family address bus and up to 32 MWS5101 256x4 RAM's to provide a 4K-byte RAM system. No additional components are required.

The CDP1859 interfaces the CDP-1802 or CDP1804 family address bus and up to 32 CDP1821 1024x1 RAM's to provide a 4K-byte RAM system. The CDP1859 generates the chip selects required by the CDP1821 RAM.

CDP1858 Functional Diagram

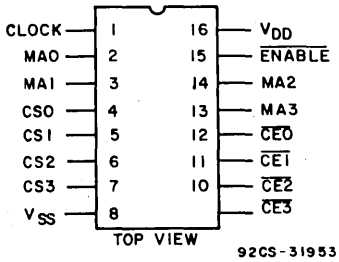


CDP1859 Functional Diagram

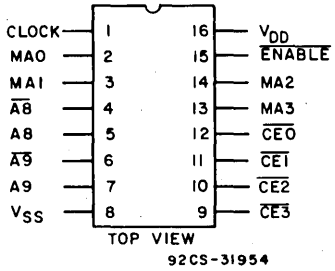


- **Performs memory address latch and decoder functions multiplexed or non-multiplexed**
- **Interfaces directly with the CDP-1802 and CDP1804 families**
- **Allows decoding for systems 4096-words by 8-bits or larger**
- **Non-inverting fully buffered data transfer**

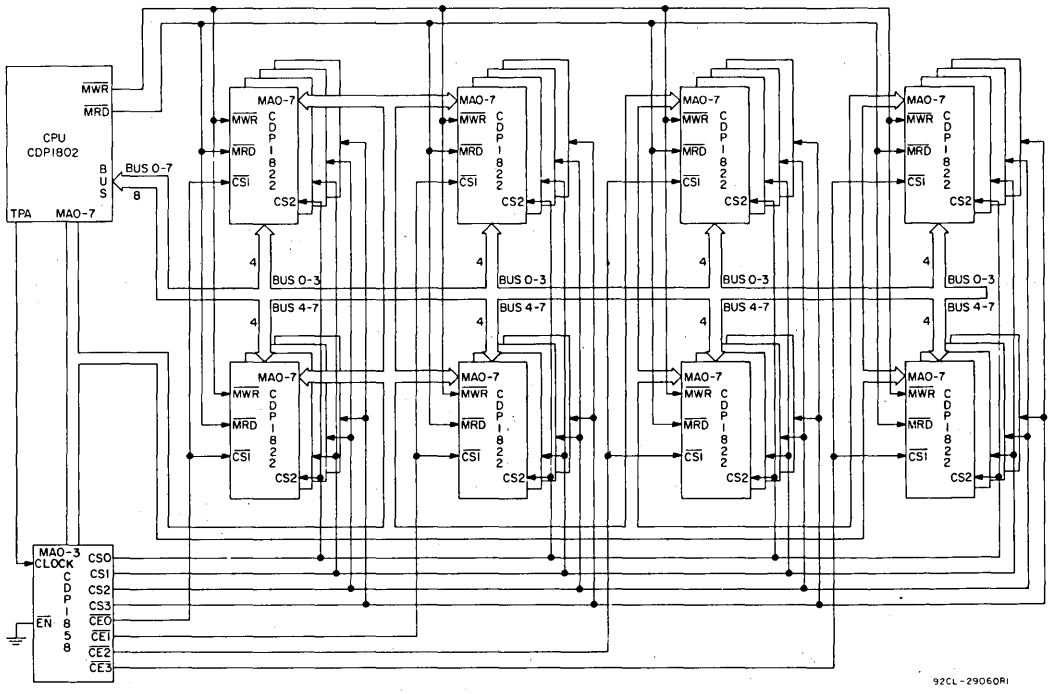
CDP1858 Terminal-Assignment Diagram



CDP1859 Terminal-Assignment Diagram



4K-Byte RAM System Using the CDP1858 and CDP1822



© IC MASTER 1983

CDP1866, CDP1867, CDP1868 Types

CMOS 4-Bit Latch and Decoder Memory Interfaces

The RCA-CDP1866, CDP1867, and CDP1868 are CMOS 4-bit memory latch and decoder circuits intended for use in CDP1800 series microprocessor systems. They can interface directly with the multiplexed address bus of this system at maximum clock frequency, and up to eight 4096-bit random-access memories to provide a 4096-byte RAM system. All the necessary chip selects are provided as outputs along with additional enable inputs so that in larger memory systems, the 9-chip 4096-byte blocks can be readily accessed.

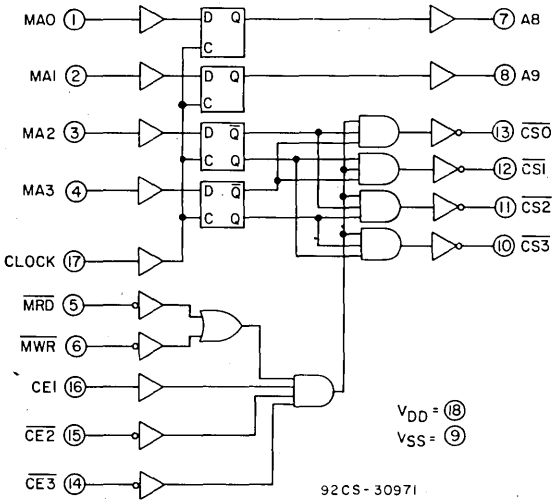
These devices are also compatible with non-multiplexed address bus microprocessors.

By connecting the clock input to V_{DD}, the latches are in the data-following mode and the decoded outputs can be used in general-purpose memory-system applications.

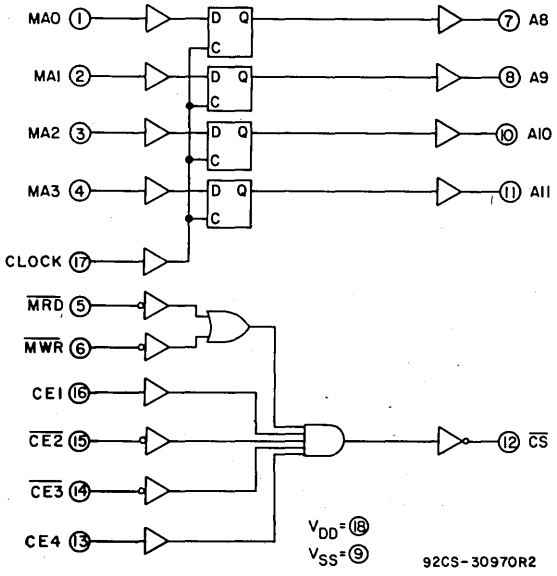
The CDP1866 and CDP1868 are intended for use with 1024-word RAMs and are identical except that in the CDP1868, CE1 and $\overline{CE2}$ are latched and $\overline{CS2}$ is valid on $\overline{MWR}$ only. This allows the CDP1868 to be used in a color display system with the CDP1861 and CDP1862. The CDP1867 is intended for use with 4096-word RAMs.

The CDP1866, CDP1867, and CDP1868 are supplied in an 18-lead hermetic dual-in-line ceramic package (D suffix) and an 18-lead plastic package (E suffix). The CDP1866C, CDP1867C, and the CDP1868C are available in chip form (H suffix).

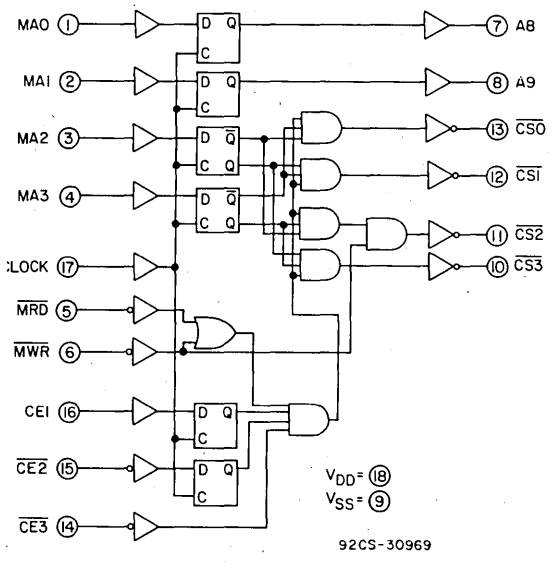
- *Performs memory address latch and decoder functions multiplexed or non-multiplexed*
- *Interfaces directly with all CDP1800 family CPUs*



Functional diagram for the CDP1866.

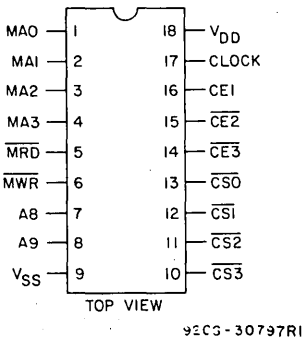


Functional diagram for the CDP1867.

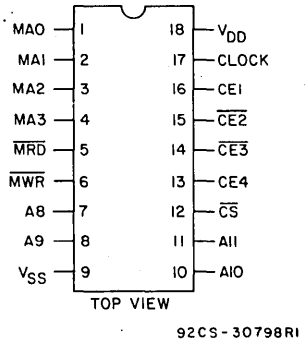


Functional diagram for the CDP1868.

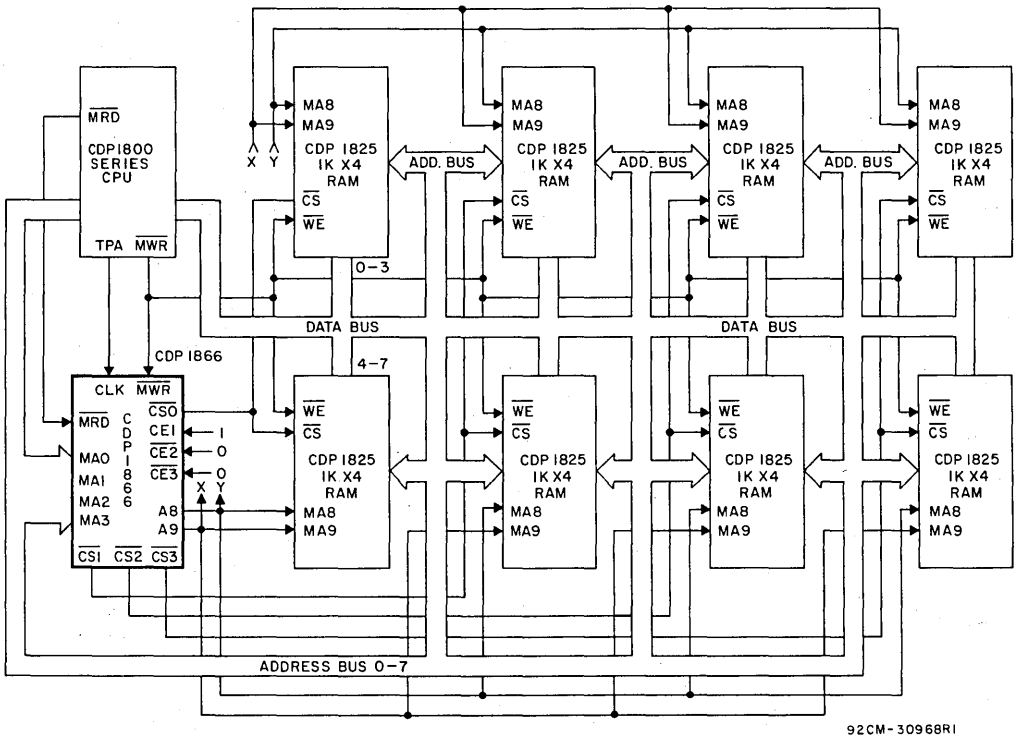
© IC MASTER 1983



TERMINAL DIAGRAM
CDP1866, CDP1868



TERMINAL DIAGRAM
CDP1867



4096-word by 8-bit random-access memory system using the CDP1866.

© IC MASTER 1983

Byte-Wide Input/Output Port
CDP1852

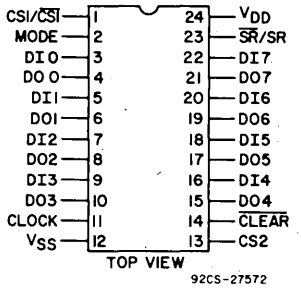
The CDP1852 is an 8-bit register with logic that allows two modes of operation, input and output. In both modes, input data are strobed and latched into the register by the clock input, and a service-request output signal is available for handshaking functions.

When the mode select pin is low, the input mode is selected and the output drivers turn on when both chip selects are active, and tri-state if either one is low.

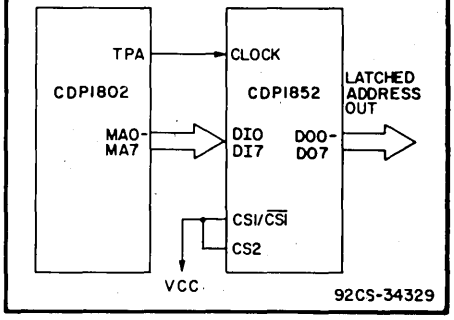
In the output mode, when the mode select pin is high, the output drivers are always on. Input data are placed in the register by the combination of the active chip selects and clock input.

- **Parallel 8-bit data latch and buffer**
- **Hand shaking via service-request signal**
- **3-state outputs**
- **Mode selectable**
- **Drives one TTL load**
- **Directly interfaces with CDP1800-series microprocessors**

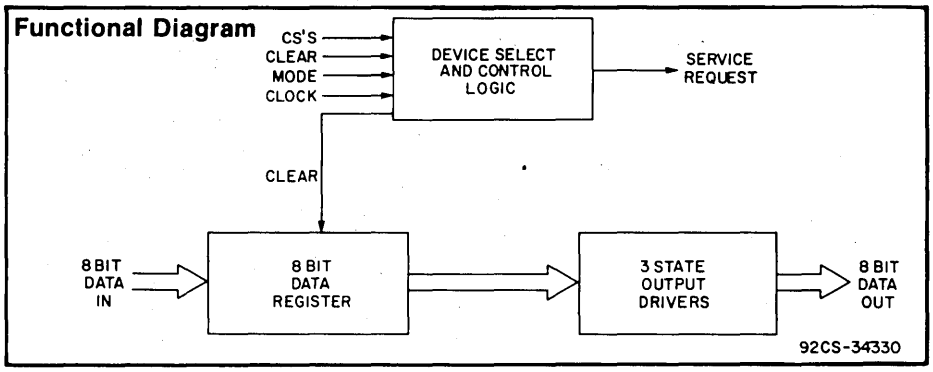
Terminal-Assignment Diagram



CDP1852 Used as Address Latch



Functional Diagram



© IC MASTER 1983

CDP1856 CDP1857
CDP1856C CDP1857C

4-Bit Bus Buffers/Separators

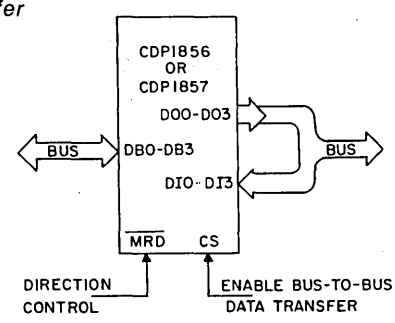
The RCA-CDP1856, CDP1856C, CDP1857, and CDP1857C are 4-bit CMOS non-inverting bus separators designed for use in CDP1800-series microprocessor systems. They can be controlled directly by a 1800-series microprocessor without the use of additional components.

The CDP 1856 is designed for use as a bus buffer or separator between the 1800-series microprocessor data bus and memories. The CDP1857 is designed for use as a bus buffer or separator between the 1800-series microprocessor data bus and I/O devices. Both types provide a chip-select (CS) input signal which, when high (1), enables the bus-separator three-state output drivers. The direction of data flow, when enabled, is controlled by the MRD input signal.

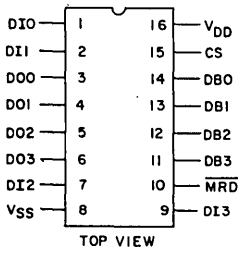
The CDP1856 or CDP1857 can be used as a bi-directional bus buffer by connecting the corresponding DI and DO terminals (Fig. 2). The $\overline{MRD}$ output signal from the 1800 series microprocessor has the correct polarity to control the CDP1856 when this device is used as a memory data bus buffer/ separator, or the CDP1857 when it is used as I/O bus buffer/separator. Therefore, the 1800 series microprocessor $\overline{MRD}$ signal can be connected directly to the $\overline{MRD}$ input of either device.

The CDP1856 and CDP1857 are functionally identical to the CDP1856C and CDP1857C, respectively. The CDP1856 and CDP1857 have a recommended operating-voltage range of 4 to 10.5 volts, and the CDP1856C and CDP1857C have a recommended operating-voltage range of 4 to 6.5 volts. The CDP1856, CDP1856C, CDP1857 and CDP1857C are supplied in 16-lead hermetic, dual-in-line ceramic packages (D suffix), and in 16-lead plastic packages (E suffix).

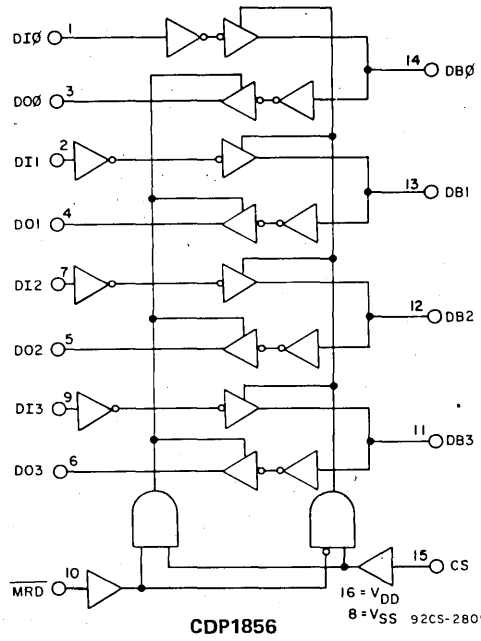
- *Provides easy connection of memory and I/O devices to CDP1800-series microprocessor data bus.*
- *Non-inverting fully buffered data transfer*

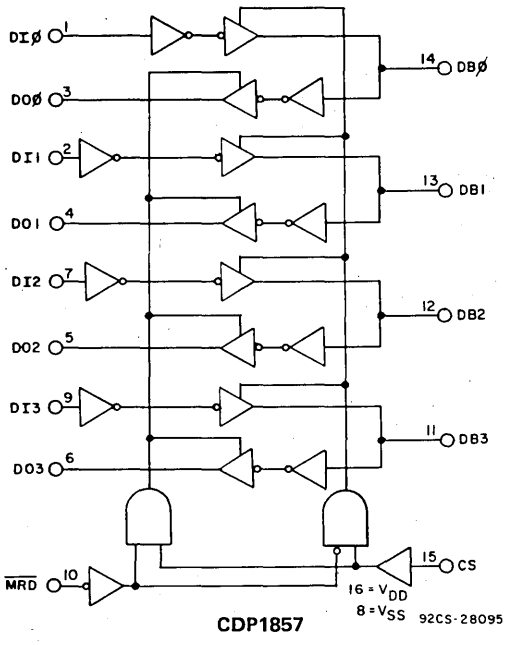


CDP1856, CDP1857 bidirectional bus buffer operation.



TERMINAL ASSIGNMENT





Functional diagrams for CDP1856 and CDP1857.

© IC MASTER 1983

Preliminary Data

CDP1872C, CDP1874C, CDP1875C

High-Speed 8-Bit Input and Output Ports

The RCA-CDP1872C, CDP1874C and CDP1875C devices are high-speed 8-bit parallel input and output ports designed for use in the CDP1800 microprocessor system and for general use in other microprocessor systems. The CDP1872C and CDP1874C are 8-bit input ports; the CDP1875C is an 8-bit output port.

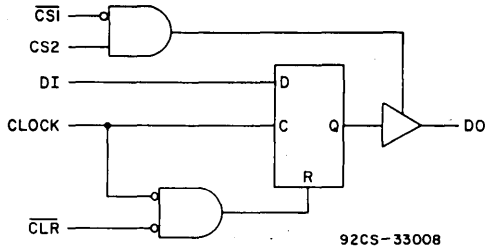
These devices have flexible capabilities as buffers and data latches and are reset by $\overline{CLR}$ input when the data strobe is not active.

The CDP1872C and CDP1874C are functionally identical except for device selects. The CDP1872C has one active low and one active high select; the CDP1874C has two active high device selects. These devices also feature 3-state outputs when deselected. Data is strobed into the register on the leading edge of the CLOCK and latched on the trailing edge of the CLOCK.

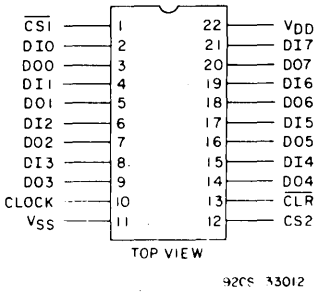
The CDP1875C is an output port with data latched into the registers when the device selects are active. There are two active high and one active low selects. The output buffers are enabled at all times.

These devices are supplied in 22-lead hermetic, dual-in-line side-brazed ceramic packages (D suffix) and in 22-lead dual-in-line plastic packages (E suffix).

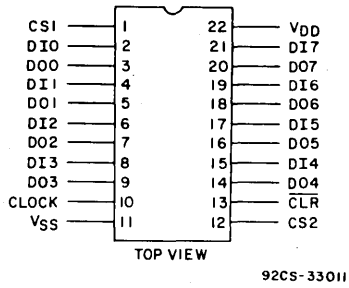
- *Parallel 8-bit input/output register with buffered outputs*
- *High-speed data-in to data-out: 85 ns (max.) at V_{DD}=5 V*
- *Flexible applications in microprocessor systems as buffers and latches*
- *High order address-latch capability in CDP1800 series microprocessor systems*
- *Output sink current=5 mA (min.) at V_{DD}=5 V*
- *3-state output-CDP1872C and CDP1874C*



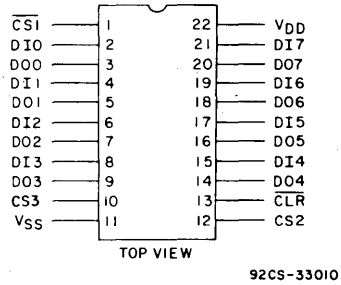
Equivalent logic diagram (1 of 8 latches shown) for CDP1872C.



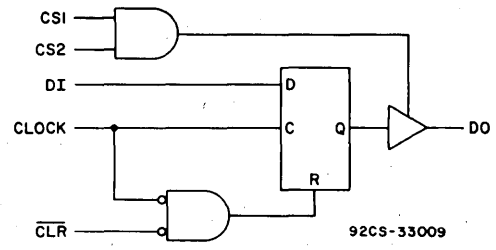
CDP1872C Input Port TERMINAL ASSIGNMENT



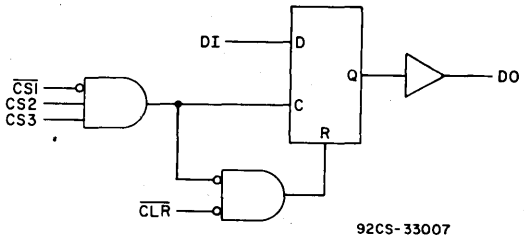
CDP1874C Input Port TERMINAL ASSIGNMENT



CDP1875C Output Port TERMINAL ASSIGNMENT

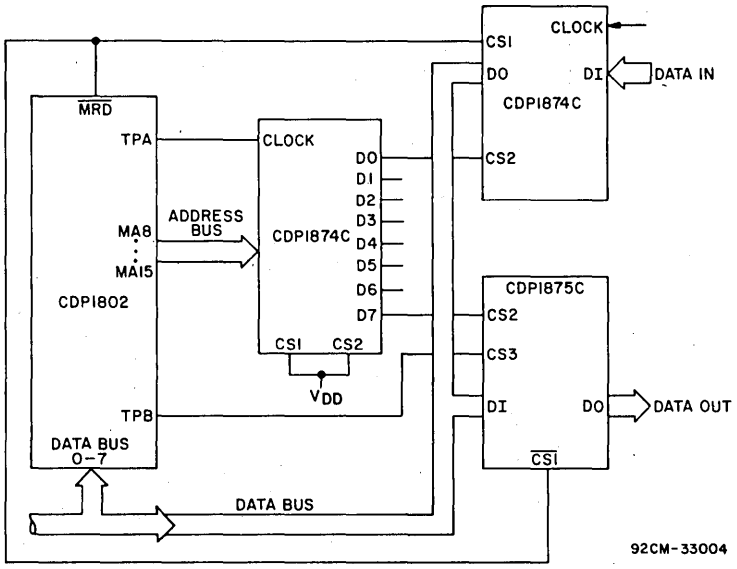


Equivalent logic diagram (1 of 8 latches shown) for CDP1874C.

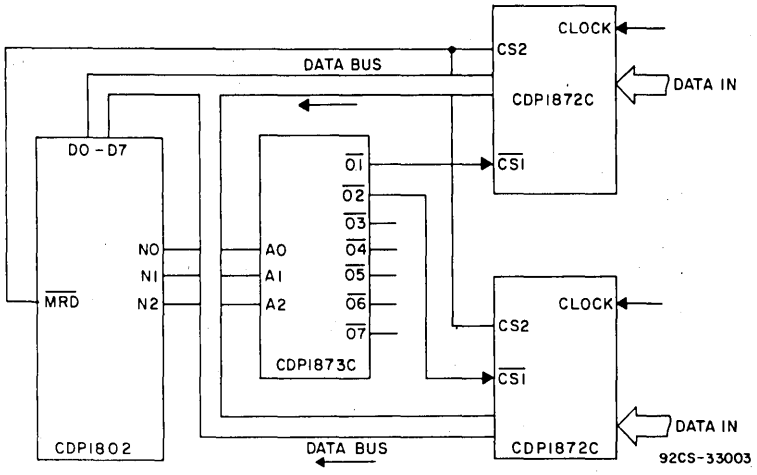


Equivalent logic diagram (1 of 8 latches shown) for CDP1875C.

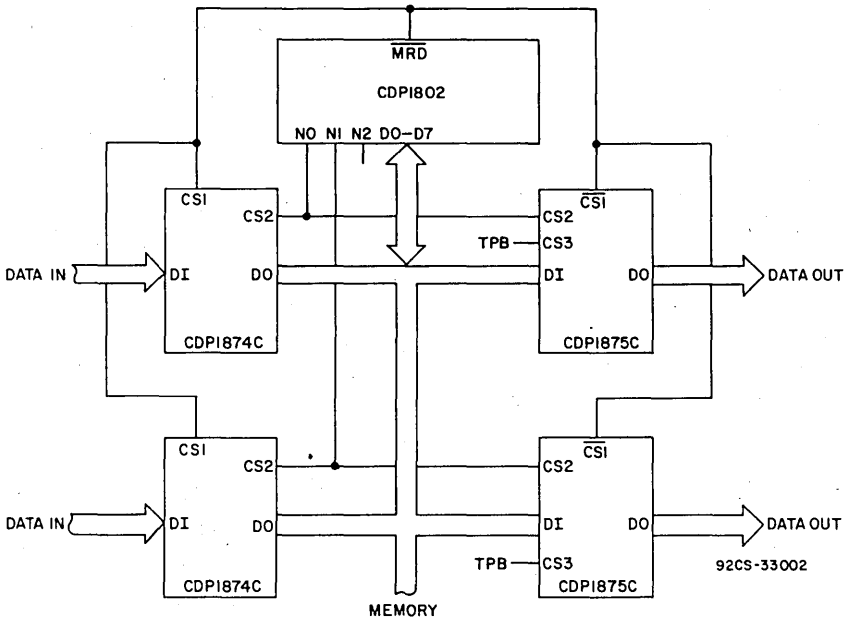
© IC MASTER 1983



CDP1874C used as an input port and address latch with CDP1875C used as an output port.



CDP1872C used as an input port and selected by CDP1873C.



CDP1874C and CDP1875C used as input/output buffers.

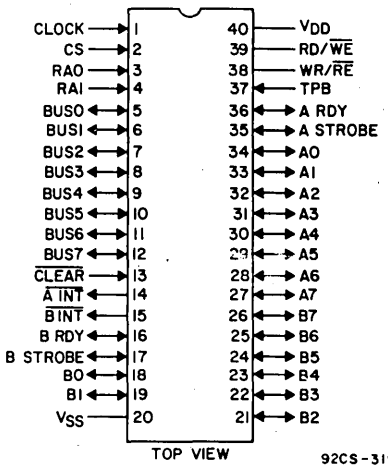
© IC MASTER 1983

Programmable I/O Interface
CDP1851

The CDP1851 is a general-purpose, software-programmable I/O device that has 20 I/O lines that may be used in several different modes of operation. Two full 8-bit ports, complete with handshaking lines, are provided for efficient interfacing between a parallel CPU bus and peripheral functions. The CDP1851 is programmed by the CPU, by means of its control register, to define port mode, interrupt enabling, I/O bit assignment, and bit-masking.

- **General-purpose programmable I/O device that has 20 I/O lines that may be used in several different modes of operation**
- **Four software-controlled modes of operation: input, output, bidirectional, and bit-programmable**
- **Interfaces without additional components to all 1800-series microprocessors, in I/O or memory space**

Terminal-Assignment Diagram

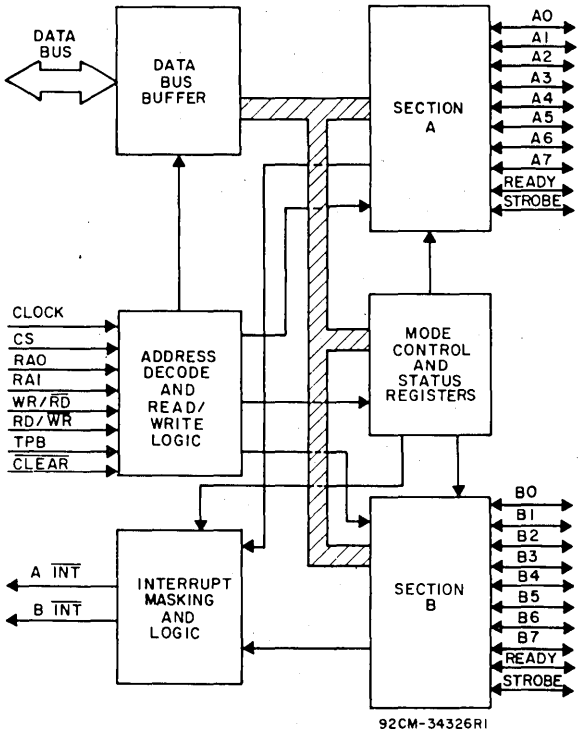


92CS-31924

CDP1851 Programming Modes

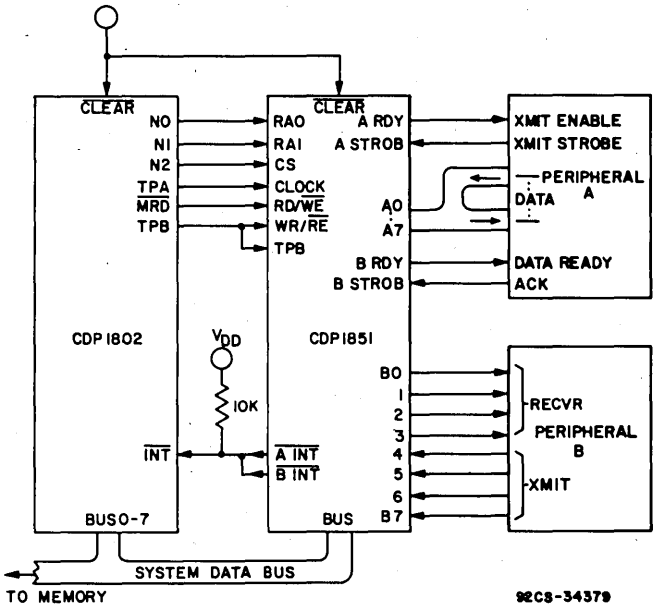
Mode	(8) Port A Data Pins	(2) Port A, Handshaking Pins	(8) Port B Data Pins	(2) Port B, Handshaking Pins
Input	Accept input data	Ready, Strobe	Accept input data	Ready, Strobe
Output	Output data	Ready, Strobe	Output data	Ready, Strobe
Bidirectional (Port A only)	Transfer input/output data	Input handshaking for Port A	Must be previously set to bit-programmable mode	Output handshaking for Port A
Bit-Programmable	Programmed individually as inputs or outputs	Programmed individually as inputs or outputs	Programmed individually as inputs or outputs	Programmed individually as inputs or outputs

Block Diagram



92CM-34326R1

Typical Application with Port A in Bidirectional Mode and Port B in Bit-Programmable Mode.



92CS-34379

© IC MASTER 1983

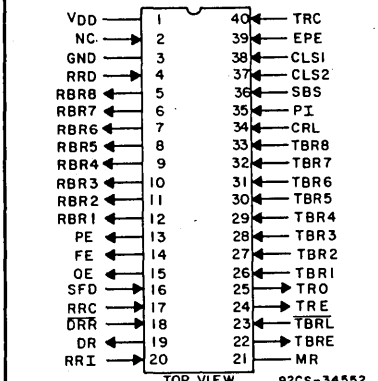
Programmable UART's
CDP1854A, CDP6402

The CDP1854A and the CDP6402 are CMOS/LSI Universal Asynchronous Receiver/Transmitters (UART's) for interfacing computers or microprocessors to asynchronous serial data channels. The receiver converts serial start, data, parity, and stop bits to parallel data verifying proper code transmission, parity, and stop bits. The transmitter converts parallel data into serial form and automatically adds start, parity, and stop bits.

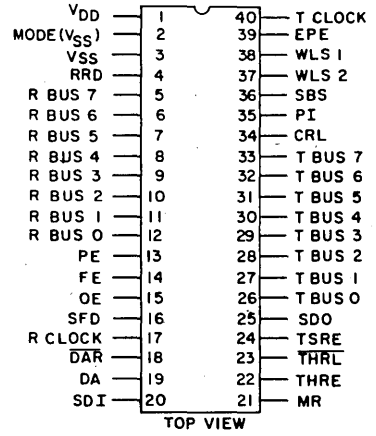
The data word length can be 5, 6, 7, or 8 bits. Parity may be odd or even. Parity checking and generation can be inhibited. Stop bits can be 1, 1½, or 2 bits.

- **Programmable word length, stop bits, and parity**
- **Baud rate to 250K bits/sec. at 5V (500K at 10V)**
- **Two operating modes (CDP1854A) selected by pin 2**
  Mode 0 — (pin 2 grounded) — hardware - programmable word length, stop bits, and parity
  Mode 1 — (pin 2 at VDD) — interfaces directly to 1800-series microprocessors without additional components; software-selectable word length, stop bits, and parity
- **CDP6402 industry standard pinout (pin 2, no connection). Direct replacement for IM6402 and HD6402**
- **Single, noncritical voltage supply**

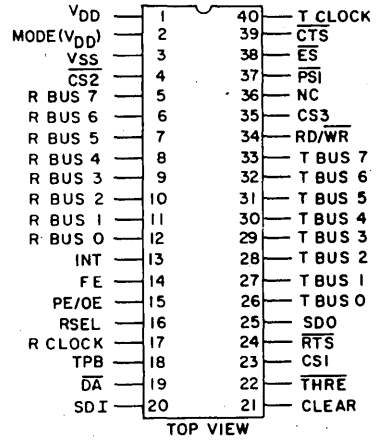
CDP6402
Terminal-Assignment Diagram



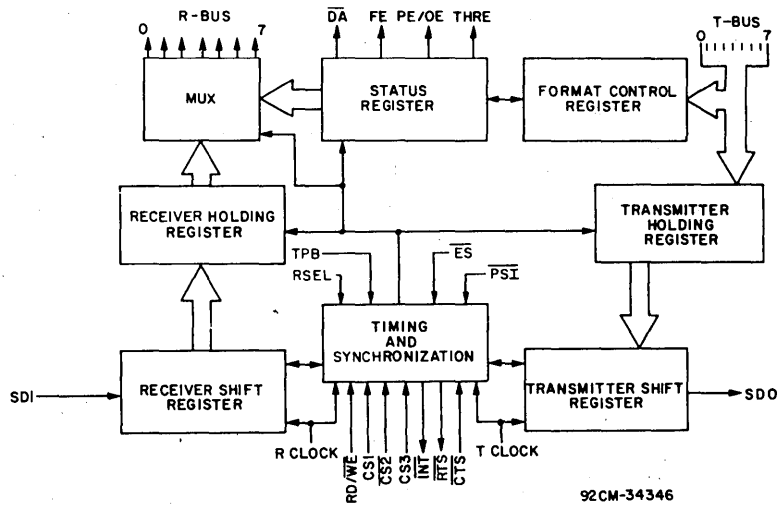
CDP1854A (Mode 0)
Terminal-Assignment Diagram



CDP1854A (Mode 1)
Terminal-Assignment Diagram



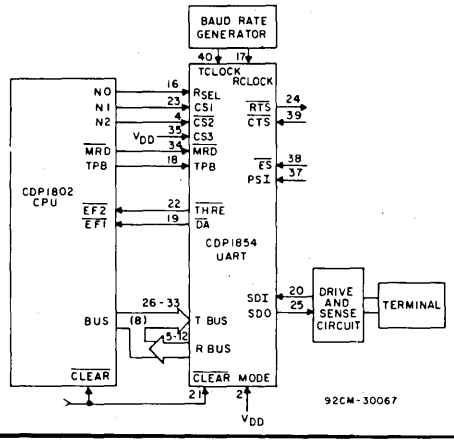
CDP1854A (Mode 1) Block Diagram



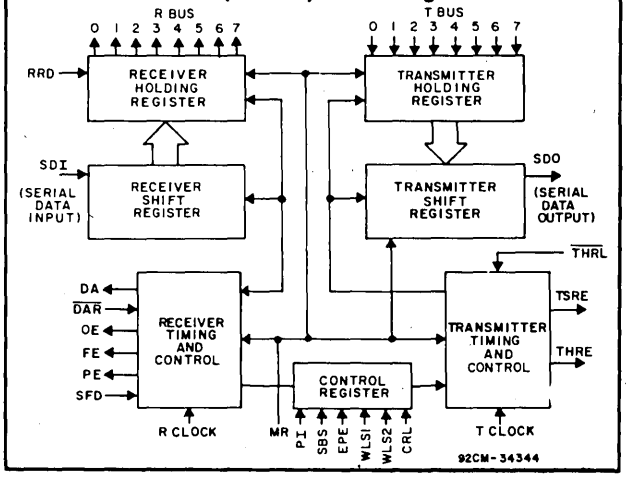
© IC MASTER 1983

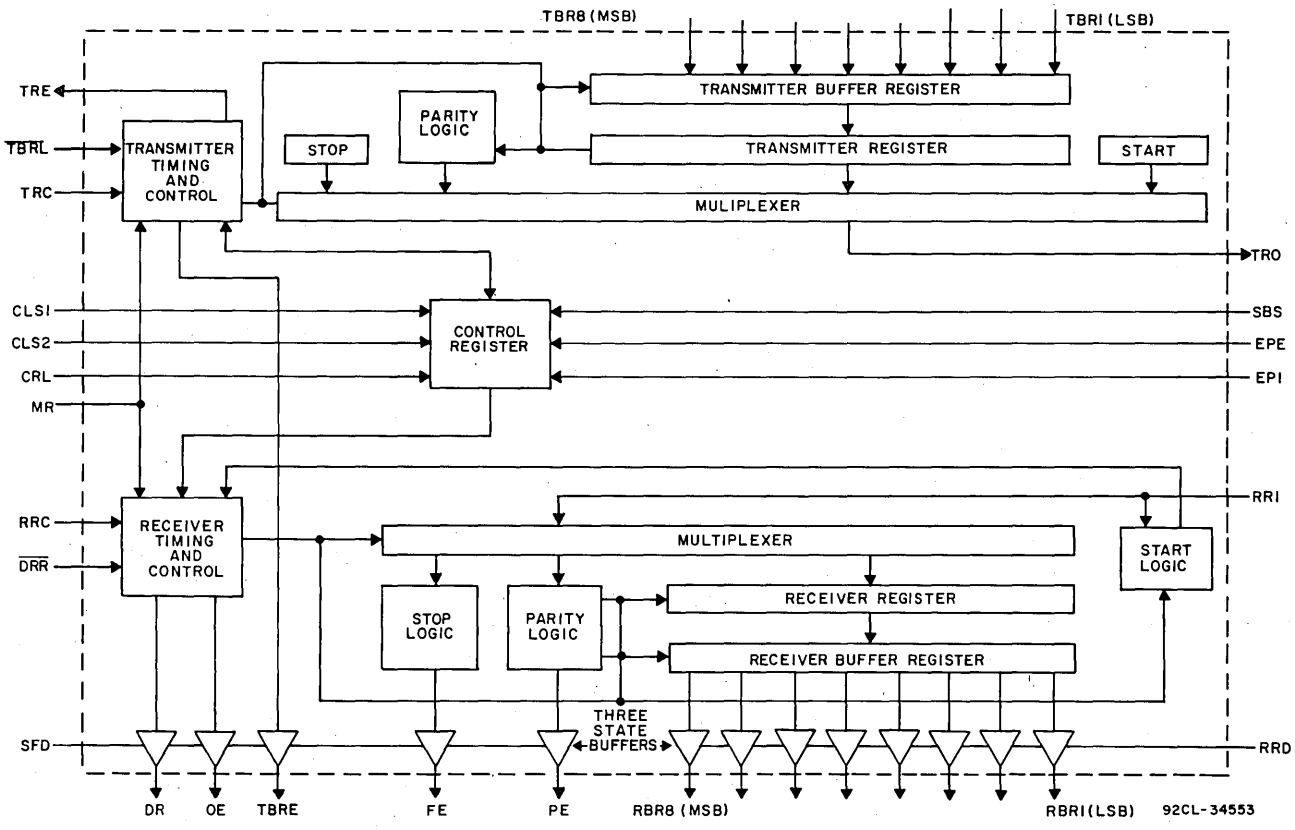
CDP1854A, CDP6402

Interface of CPU CDP1802 to Data Terminal Using UART CDP1854 (Mode 1)



CDP1854A (Mode 0) Block Diagram





CDP6402 Functional block diagram.

© IC MASTER 1983

Multiply/Divide Unit (MDU)

CDP1855

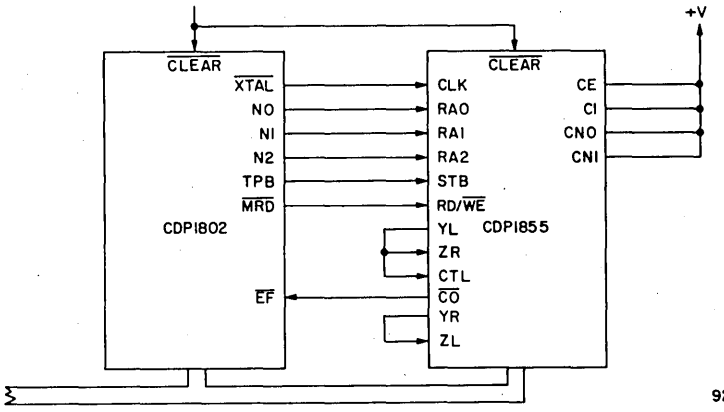
The CDP1855 is an efficient hardware replacement for the software only implementation of arithmetic and signal-processing algorithms. It performs multiply and divide operations on unsigned 8-bit data with an add-and-shift type of hardware implementation and is structured to permit cascading of identical units to handle operations up to 32 bits.

The MDU has three 8-bit registers, X, Y, and Z, which are loaded by the CPU with operands prior to the arithmetic operation and which contain a product or quotient when the process is complete.

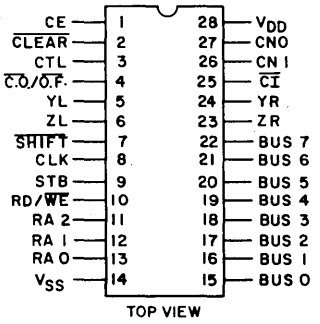
The CDP1855 can be used in any application that requires fast multiply or divide throughput, or where the CPU would be required to perform real-time tasks during a long arithmetic routine. MDU efficiency increases as word size increases.

Word Size	Approximate Number of Machine Cycles	
	Software Algorithm	Hardware (MDU)
8x8, or 16÷8	280	26
16x16, or 32÷16	1000	41
32x32, or 64÷32	5000	89

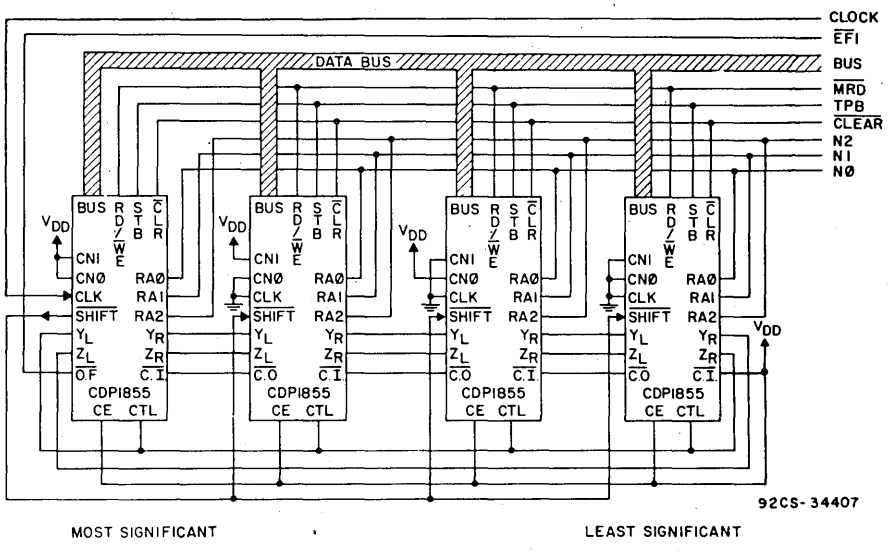
Circuit Configuration for a Single MDU Addressed in I/O Space.



Terminal-Assignment Diagram



Cascaded CDP1855 Configuration.



- **Significantly reduces throughput time of microcomputer systems used for arithmetic calculations**
- **Directly interfaces with 1800-series microprocessors without additional components**
- **Performs the actual hardware 8x8 bit multiply or 16÷8 divide in 5usec, with additional software overhead for I/O of data**
- **Cascadable up to 4 units for 32x3 bit multiply or 64÷32 divide**

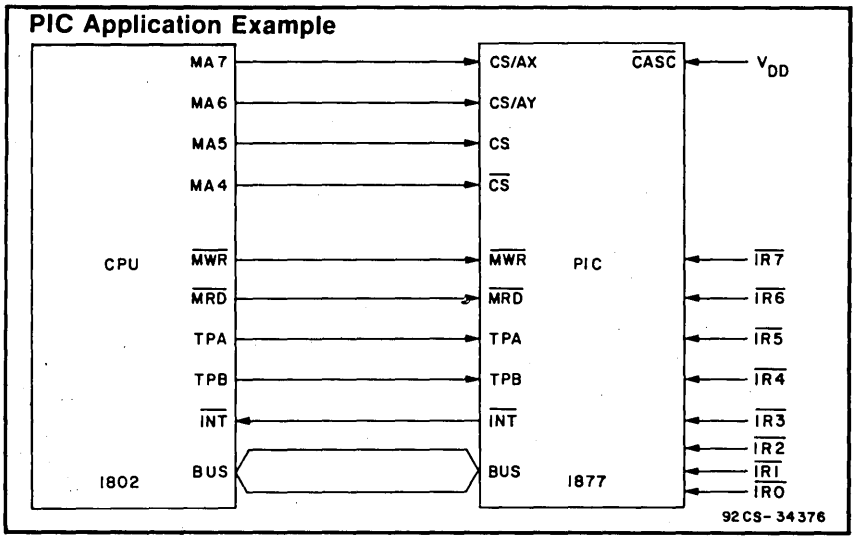
© IC MASTER 1983

Programmable Interrupt Controller (PIC)
CDP1877

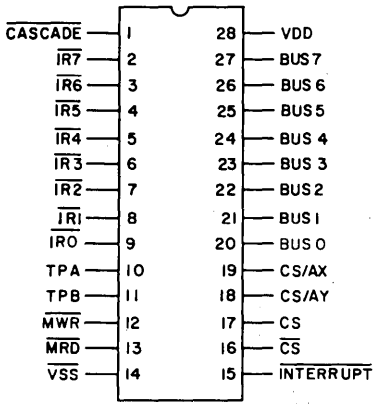
The CDP1877 is a programmable 8-level interrupt controller designed for use in CDP1800-series microprocessor systems. It provides added versatility by extending the number of permissible interrupts from 1 to N in increments of 8.

- **Memory mapped**
- **Programmable long-branch vector address and vector interval**
- **Eight levels of interrupt per chip**
- **Easily expandable**
- **Latched interrupt requests**
- **Hard-wired interrupt priorities**
- **Multiple chip-select inputs to minimize address-space requirements**

PIC Application Example



Terminal-Assignment Diagram



Programming Instructions for PIC

1. Disable INTERRUPT at CPU.
2. Reset Master Interrupt Bit, B3, of Control Register.
3. Write a "1" into the interrupt input bit location of the mask register if masking is desired.
4. Write the High-Order Address byte into the page register.
5. Write the Low-Order Address and the Vector Interval into the control register.
6. Program R(1) of the CPU to point to the PIC so that the Long-Branch Instruction can be read from the PIC during the Interrupt Service Routine.

Programming Model

Page Register — WRITE ONLY

BUS 7							BUS 0
A15	A14	A13	A12	A11	A10	A9	A8

Contains the high-order vector address the device issues in response to an interrupt.

Control Register — WRITE ONLY

BUS 7							BUS 0
B7	B6	B5	B4	B3	B2	B1	B0

Under nibble contains the low-order vector address the device will issue in response to an interrupt. Lower nibble is used for master mask reset, interrupt reset, and interval select.

Mask Register — WRITE ONLY

BUS 7							BUS 0
M7	M6	M5	M4	M3	M2	M1	M0

A "1" written into any location in this register will mask the corresponding interrupt request line.

Status Register — READ ONLY

BUS 7							BUS 0
S7	S6	S5	S4	S3	S2	S1	S0

A "1" will be present in the corresponding bit location for every pending interrupt.

Polling Register — READ ONLY

BUS 7							BUS 0
P7	P6	P5	P4	P3	P2	P1	P0

Provides the low-order vector address and is used to identify the source of interrupt if a polling technique is used.

CDP1877 Programming Procedure

Several PIC's can be cascaded together by connecting the interrupt output of one chip to the cascade input of another. Each cascaded PIC provides 8 additional interrupt levels to the system.

Interrupts are prioritized in descending order; IR7 has the highest, and IR0 has the lowest priority.

© IC MASTER 1983

Dual Counter-Timer
CDP1878

The CDP1878 is a versatile 28-pin device that consists of two 16-bit programmable down counters that function independently in one of five possible modes. There are three address pins to select the counters or separate control and status registers. Each counter has complemented outputs that are activated as the operating mode requires, and a common maskable interrupt output is available for handshaking functions.

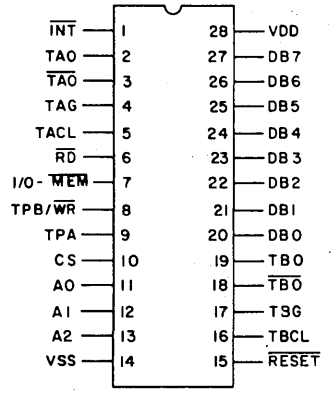
In operation, a user jams a desired counter value in two 8-bit sequences and then selects the desired mode and intiates timing by writing to the control register. This control register, which programs gate-level and interrupt enabling, can also be used to stop the counter at any time and can assure a stable counter readout by freezing the present count into a separate holding register.

The five counter modes, together with different combinations of gating levels, output polarity, and underflow interrupt indication, provide a complete array of timing, pulse-forming, and event-counting programming, as shown in the "Modes of Operation" chart.

CDP1878 Counter-Timer — Modes of Operation

Name	Function	Application
Timeout	Outputs change when clock decrements counter to zero	Event counter
Timeout strobe	One clock-wide output pulse when clock decrements counter to zero	Trigger pulse
Gate controlled one-shot	Outputs change when clock decrements counter to zero, Retriggerable	Time-delay generation
Rate generator	Repetitive clockwide output pulse	Timebase generator
Variable duty cycle	Repetitive output with Programmed duty cycle	Motor control

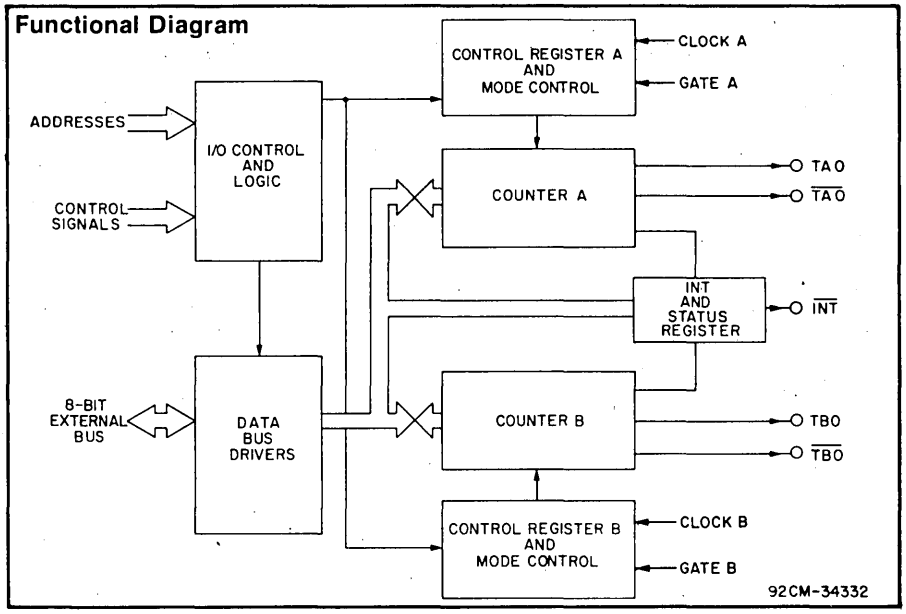
Terminal-Assignment Diagram



92CS-34342

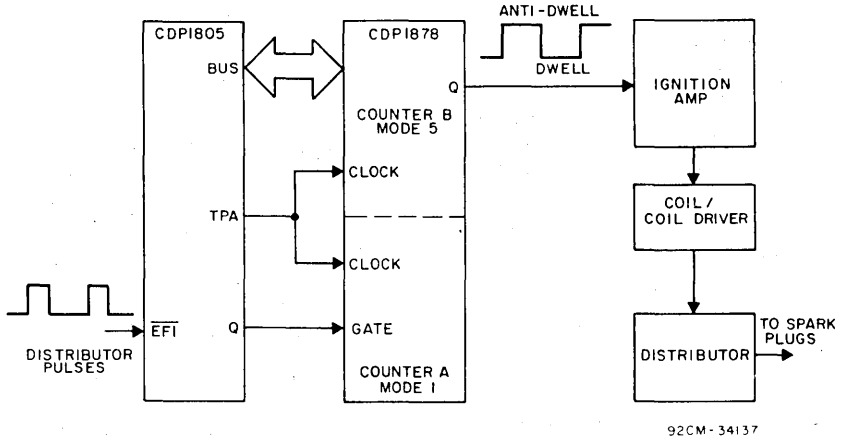
- **Two 16-bit down counters**
- **Two 8-bit control registers**
- **Five modes including a versatile variable-duty-cycle mode**
- **Addressable in memory space or CDP1800-series I/O space**
- **Programmable gate-level select**
- **Two complemented output pins for each counter-timer**
- **Software-controlled interrupt output**

Functional Diagram



92CM-34332

CDP1878 Engine-Control Application. Counter A Monitors Engine Speed and Counter B Outputs a Phase Shifted Variable Duty Cycle Signal.



92CM-34137

© IC MASTER 1983

Real Time Clock
CDP1879

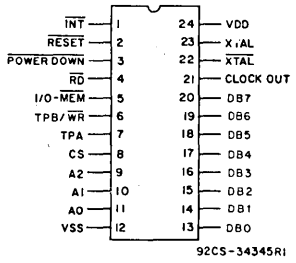
The CDP1879 real-time clock consists of five programmable counters that divide down an oscillator input to supply time and calendar information in BCD from seconds to months. The device operates with several different crystal frequencies and has a separate clock output that can supply subsecond to day square-wave outputs along with an interrupt request.

The CDP1879 includes an alarm circuit that can be set for seconds, minutes, or hours and that activates the interrupt output when the alarm registers match those of the counters. A status register keeps track of alarm and clock status when interrupts are disabled.

The power-down input pin, used in conjunction with the alarm circuit and interrupt output, can be used as a "wake-up" control for low-power applications.

Clock rollover (when the seconds counter is clocked during counter reads, resulting in additional software overhead to check this condition) is eliminated with a transparent "freeze" circuit that guarantees stable and accurate readouts.

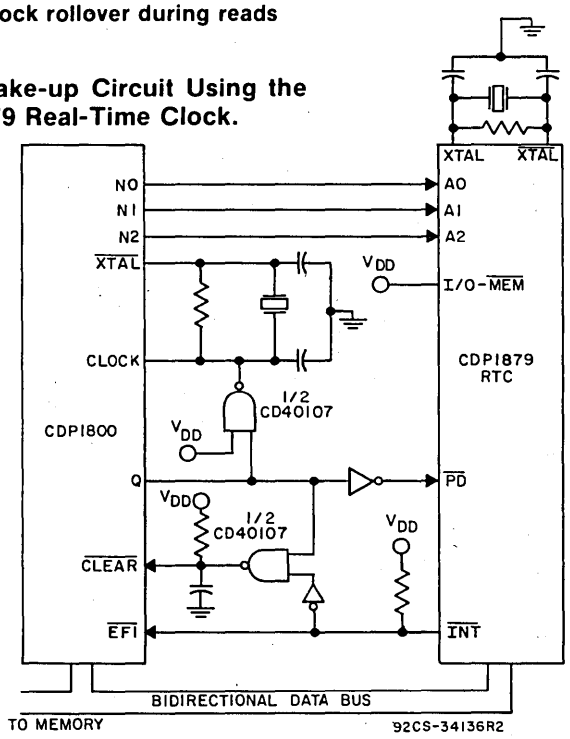
- **Time-of-day/calendar reads seconds, minutes, hours, day of month, and month**
- **Seconds, minutes, and hours alarm circuitry**
- **General-purpose and CDP1800-Series microprocessor compatibility**
- **1-of-4 crystal frequency operation — 32768 Hz, 1.04 MHz, 2.09 MHz, 4.194 MHz**
- **Interrupt output activated by clock output or alarm circuit**
- **Separate clock output selects 1 of 15 50% duty cycle output signals**
- **Power-down mode**
- **Transparent "freeze" circuit eliminates clock rollover during reads**



92CS-34345R1

TERMINAL ASSIGNMENT

CPU Wake-up Circuit Using the CDP1879 Real-Time Clock.



92CS-34136R2

8-Bit Control Register Assignments

7	6	5	4	3	2	1	0

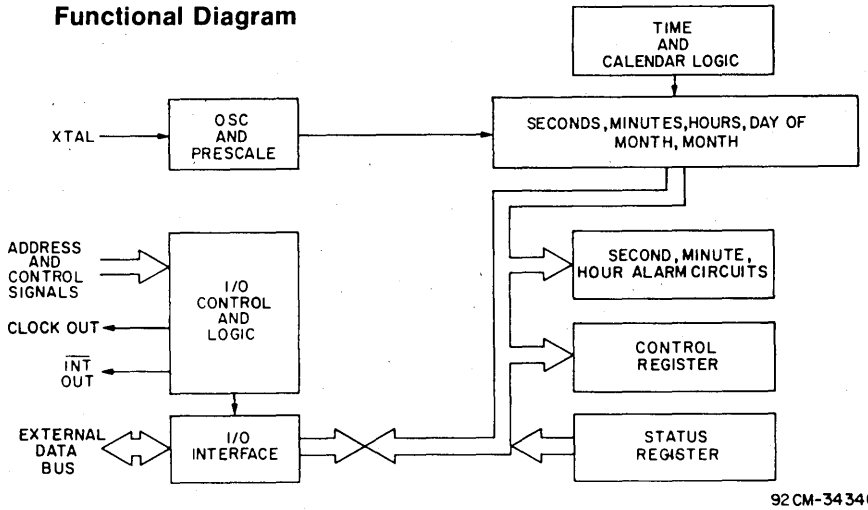
Bit	Function		
0	Frequency	00	32768 MHz
1	Select	01	1.048576 MHz
		10	2.097152 MHz
		11	4.194304 MHz
2	Start/Stop	1	Start
		0	Stop
3	Counter/Latch Control	0	Write to Counter
		1	Write to and Enable Alarm

Clock Output Select

(1 of 15 50% Duty Cycle Output Signals)

4	Disable	0 0 0 0
5	488.2 μSEC	0 0 0 1
6	976.5 μSEC	0 0 1 0
7	1953.1 μSEC	0 0 1 1
	3906.2 μSEC	0 1 0 0
	7812.5 μSEC	0 1 0 1
	15.625 MS	0 1 1 0
	31.25 MS	0 1 1 1
	62.5 MS	1 0 0 0
	125 MS	1 0 0 1
	250 MS	1 0 1 0
	500 MS	1 0 1 1
	Second	1 1 0 0
	Minute	1 1 0 1
	Hour	1 1 1 0
	Day	1 1 1 1

Functional Diagram



92CM-34340

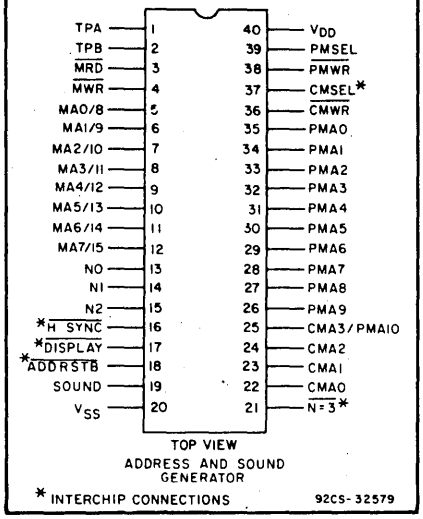
© IC MASTER 1983

Video Interface System
CDP1869, CDP1870, CDP1876

RCA Solid State

The CDP1869 and CDP1870 or CDP1876 form a two-chip Video Interface System used to control the screen formatting, screen-refresh memory, and synchronization of a raster-scan color display. The CDP-1869 handles the system interface with the CPU and provides the refresh memory address timing. A tone and white-noise output, programmable in both frequency and amplitude, is also available. The CDP1870 or CDP1876 handles the TV synchronization and color subcarrier information. The dot (LUM), color (CHROM) and sync (COMPSYNC) signals are all produced on-board and externally combined into a single signal for use with a standard color monitor. The CDP-1876 is a bond-out option of the CDP-1870 for use with RGB monitors.

CDP1869
Terminal-Assignment Diagram

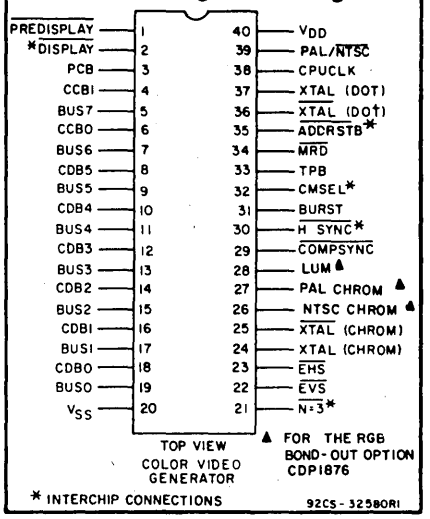


TOP VIEW
ADDRESS AND SOUND GENERATOR

* INTERCHIP CONNECTIONS

92CS-32579

CDP1870, CDP1876
Terminal-Assignment Diagram



TOP VIEW
COLOR VIDEO GENERATOR

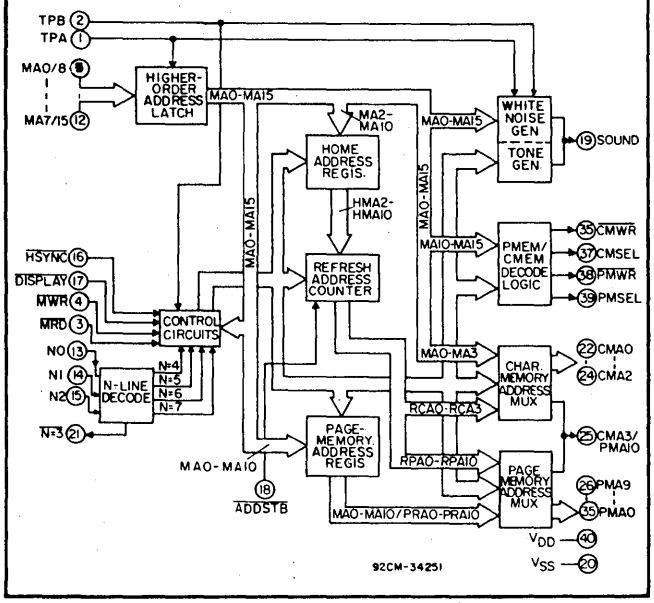
▲ FOR THE RGB BOND-OUT OPTION CDP1876

* INTERCHIP CONNECTIONS

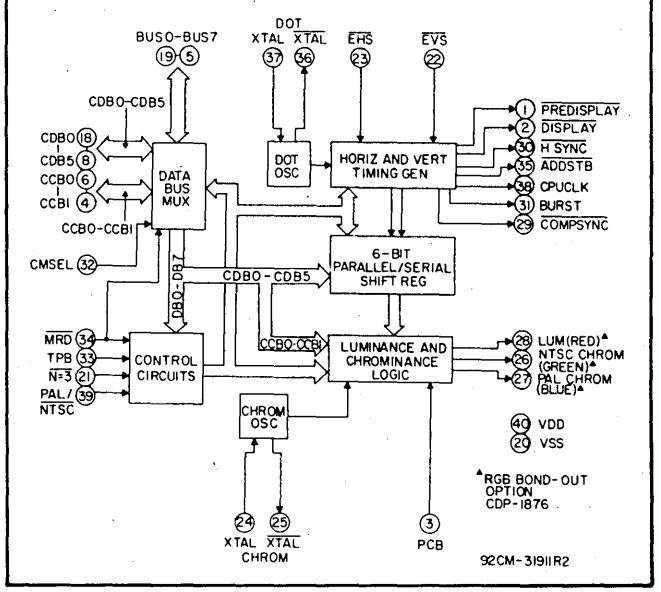
92CS-32580R1

- **PAL and NTSC compatible**
- **Page memory is accessed as extension of CPU memory during non-display time**
- **Hardware scroll capability**
- **Audio generator (576 selectable tones covering 8 octaves) and white noise generator. Both tones and white noise can be enveloped from 0 volts to 0.78 V_{DD} in 16 steps**
- **6x8 or 6x16 char. matrix (6x9 for PAL)**
- **Low chip-count systems for games and/or "intelligent" terminals**
- **Programmable for 12/24 rows, 20/40 char/rows**
- **Graphics and motion through character selection or bit map in character memory**
- **Character memory may be any combination of ROM or RAM, allowing modification of characters and graphics**
- **CPU not involved in screen refresh**
- **Composite sync, composite luminance, and composite chrominance outputs**
- **Programmable background color**
- **Programmable color format control allowing several modes for high resolution color**
- **External horizontal and vertical sync inputs allow for integration into existing chassis for character-on-picture overlays**
- **Character generation approach minimizes memory**
- **Non-interlaced**
- **RGB bond-option available (CDP-1876)**

CDP1869 Block Diagram

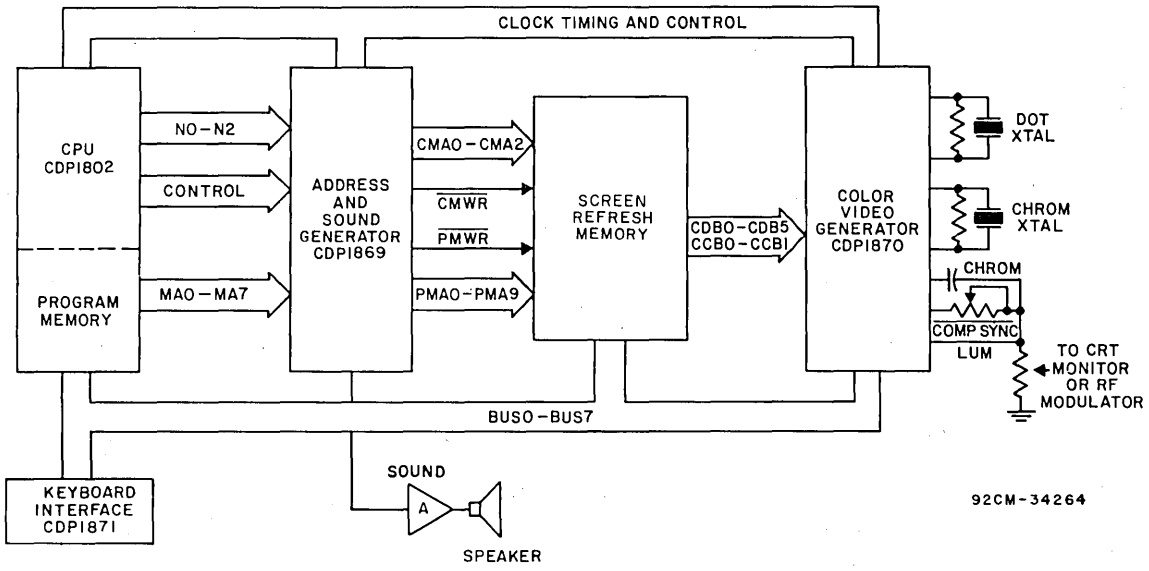


CDP1870, and CDP1876 Block Diagram.

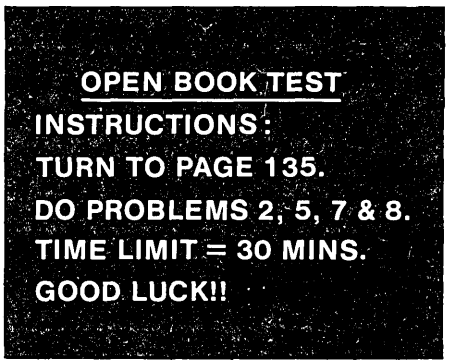


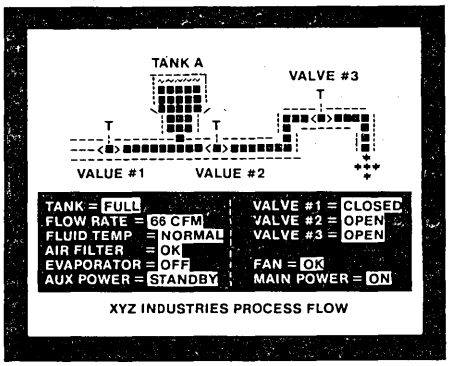
© IC MASTER 1983

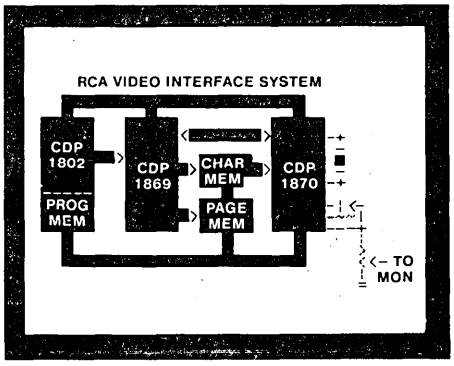
System Diagram Using CDP1869 and CDP1870 (Composite Output)

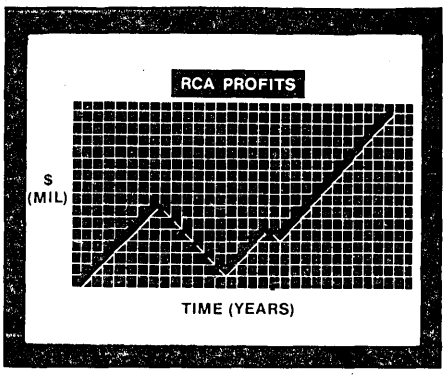


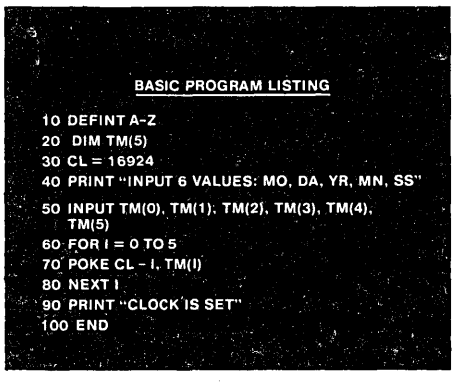
Typical Display Applications









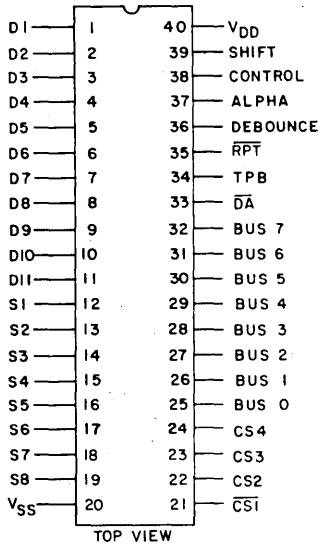


© IC MASTER 1983

Keyboard Encoder
CDP1871A

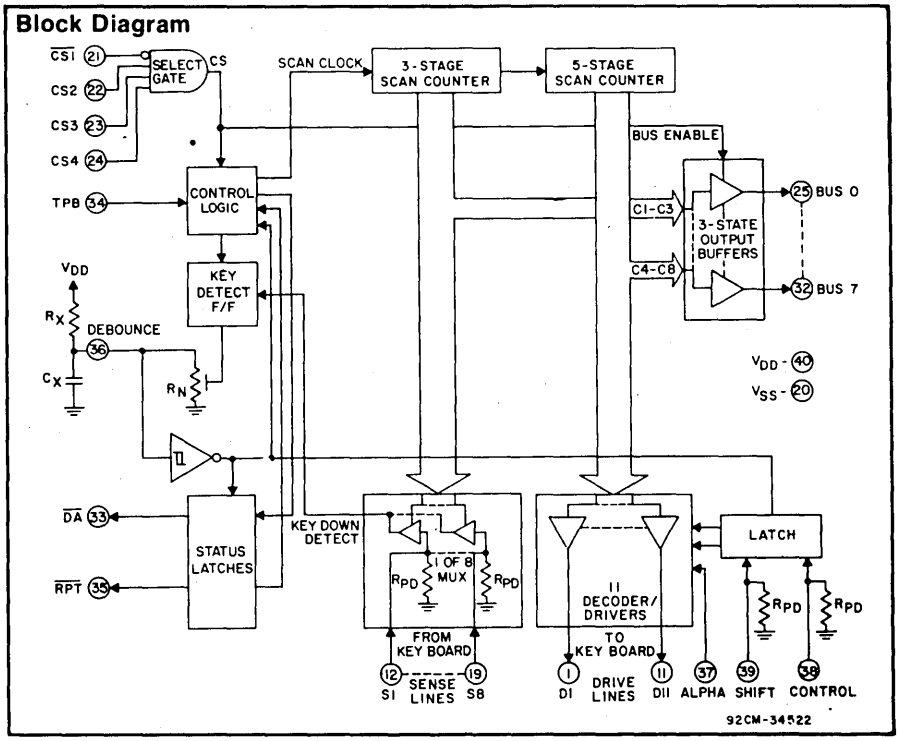
The CDP1871A keyboard encoder is used to scan up to 53 ACSII-coded keys and 32 hex-coded keys. The keyboard may be made up of simple single-pole-single-throw (SPST) mechanical switches. Alpha-lock, shift, and control inputs are provided, as is an external R-C debounce input. The N-key lockout features prevents unwanted key codes if more than one key is pressed.

Terminal-Assignment Diagram



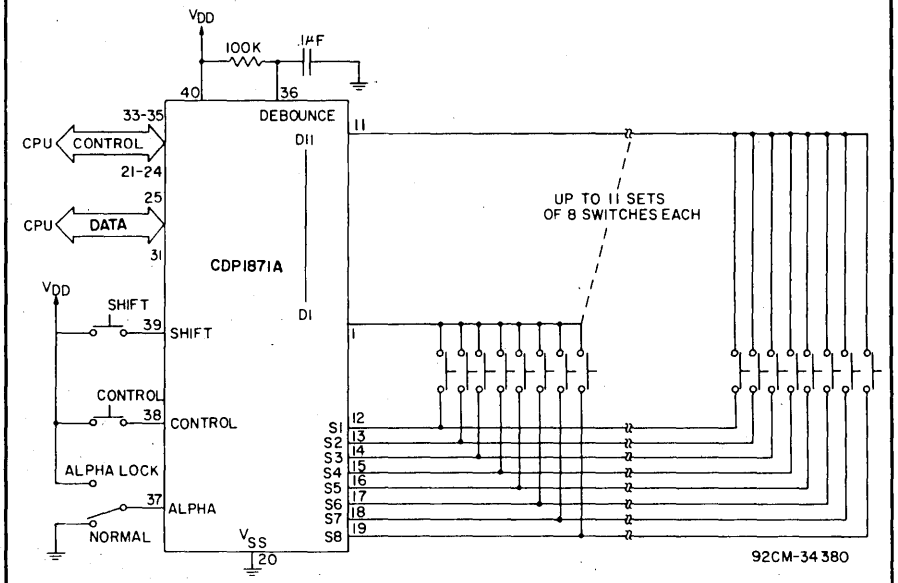
92CS-32527

Block Diagram



92CM-34522

Keyboard Interface Diagram



92CM-34380

- **3-state outputs**
- **Scans and generates code for 53 key ASCII Keyboard Plus 32 HEX Keys (SPST mechanical contact switches)**
- **Shift, control, and alpha lock inputs**
- **RC-controlled debounce circuitry**
- **N-Key lockout**

© IC MASTER 1983

CDP1863, CDP1863C

Preliminary Data

CMOS 8-Bit Programmable Frequency Generator

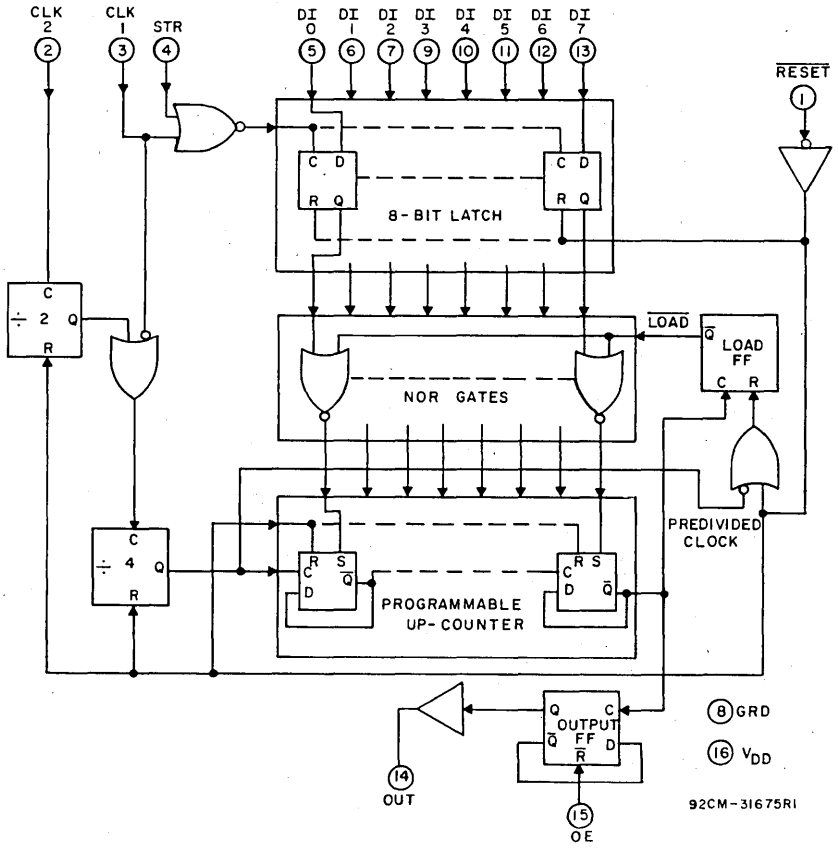
The RCA-CDP1863 and CDP1863C CMOS integrated circuits are programmable frequency generators designed to produce 256 possible frequencies from a single-frequency input clock. They will interface directly with the CDP1800-series microprocessor as shown in the system diagram (see Fig. 1).

The CDP1863 and CDP1863C consist of a programmable up-counter and an 8-bit latch (see Fig. 2). An input clock is predivided by a fixed internal counter chain in addition to the programmable counter. The final stage of the device divides the output of the up-counter by two to provide a square-wave output. The input clock may be applied to either of two inputs; CLK1 provides a divide-by-four predivide, and CLK2 a divide-by-eight. The unused input must be tied to V_{DD} to avoid interference with the true clock. After the programmable up-counter has reached its maximum count, the next predivided clock pulse will cause it to go to zero. At this time, the output flip-flop toggles and the load flip-flop is turned on. The output of the load flip-flop is fed into the NOR gates which allow the divide rate stored in the 8-bit latch to preset the up-counter. Before the next predivided clock pulse clocks this up-counter, the load flip-flop is reset and the NOR gates are turned off. The counter then resumes its up-count. The data at the eight data inputs is latched into the device by the high-to-low transition of CLK1, when STR(STROBE) is high, or by the high-to-low transition of STR, when CLK1 is high.

When using CLK2, CLK1 must be tied to V_{DD} to permit the STR input to generate the internal latch clock. The 8-bit data in the latch determines the divide rate of the programmable up-counter in the device. This rate may range from divide-by-one to divide-by-256.

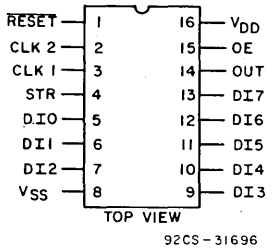
A low level on the $\overline{\text{RESET}}$ input resets the up-counter, predividers, and flip-flops, and forces an initial state into the 8-bit data latch. This initial state provides a fixed divide rate for the device prior to running the system. A high level on the $\overline{\text{RESET}}$ input enables the up-counter, predividers, and flip-flops and allows programming a new divide rate into the device.

The CDP1863 and CDP1863C are functionally identical. They differ in that the CDP1863 has an operating voltage range of 4 to 10.5 volts and the CDP1863C has an operating voltage range of 4 to 6.5 volts. Both are supplied in 16-lead hermetic dual-in-line ceramic packages (D suffix) and in 16-lead dual-in-line plastic packages (E suffix).



Block diagram for the CDP1863 and CDP1863C.

- *Directly interfaces with CDP1800-series microprocessors*
- *256 possible programmable frequencies*
- *Two clock input predividers (÷ 4 and ÷ 8)*
- *Gated square-wave output*
- *Single 4 to 10.5 supply*



TERMINAL ASSIGNMENT

© IC MASTER 1983

CDP1861C, CDP1862C, CDP1864C

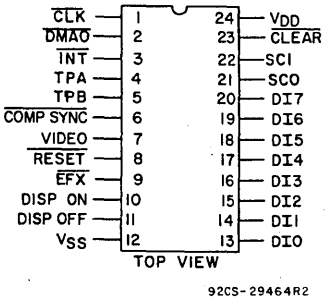
Video-Display Controllers

The CDP1861C is low-resolution video controller designed for sample graphics displays. It uses a combination of interrupt and DMA techniques for screen refreshing. The CDP1862C is used with the CDP1861C to add programmable color capability to a system.

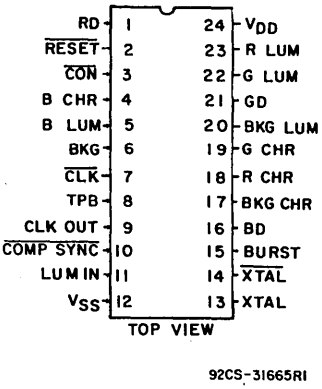
The CDP1864C is a combination of the CDP1861C and CDP1862C, but for use with the European PAL TV standard.

- **Supports bit-mapped video display for graphic flexibility**
- **Generates composite horizontal and vertical sync**
- **Programmable background color**
- **Programmable vertical resolution for matrix display**
- **Real-time interrupt generator**
- **Programmable video (dot) color**
- **On-chip crystal controlled oscillator**
- **Interlaced or non-interlaced displays**
- **NTSC compatible color and RGB compatible**
- **Single chip contains circuitry for video, sync, RBG color, and programmable frequency for tone generation**
- **Programmable 1-of-8 dot colors plus 1-of-4 background colors**
- **Bit-mapped display with maximum resolution of 192 vertical x 64 horizontal**

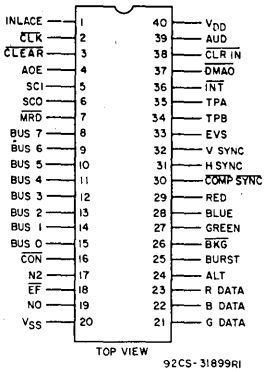
CDP1861C
Terminal-Assignment Diagram

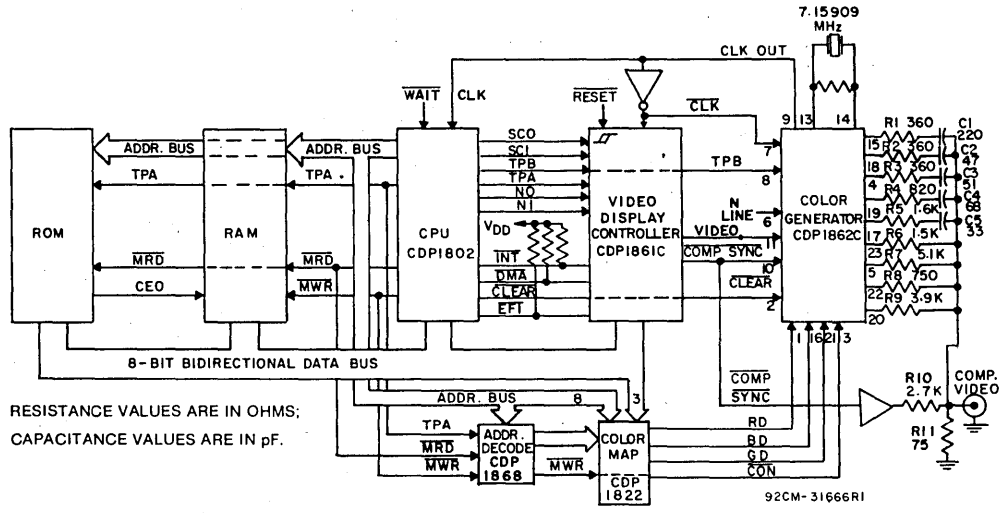


CDP1862C
Terminal-Assignment Diagram



CDP1864C
Terminal-Assignment Diagram





Typical CDP1802 microprocessor system using the CDP1862C.

© IC MASTER 1983

The CMOS 6805 Family

The 8-bit CMOS micro market is starting to grow at an explosive rate. Because no single line of CMOS micros can cover every application, RCA decided to alternate source a popular single-chip microcomputer series. Therefore, RCA entered into a technical exchange agreement with Motorola to alternate source the 6805 series of micros. This comprehensive agreement includes provisions for the exchange of masks.

An important reason for choosing the CMOS 6805 to supplement the RCA 1800 series is that the CMOS 6805 is based on the powerful and versatile 6805 architecture, a proven industry standard with familiar instruction sets. We were impressed with Motorola's thoughtful and orderly approach to the 8-bit CMOS μC. And the baseline process technology was compatible with RCA's existing CMOS μP technology.

The technical leadership of RCA and Motorola in CMOS microprocessors will make the CMOS 6805 series a great success in the marketplace.

A powerful microcomputer.

The CDP6805 series consists of static CMOS single-chip devices.

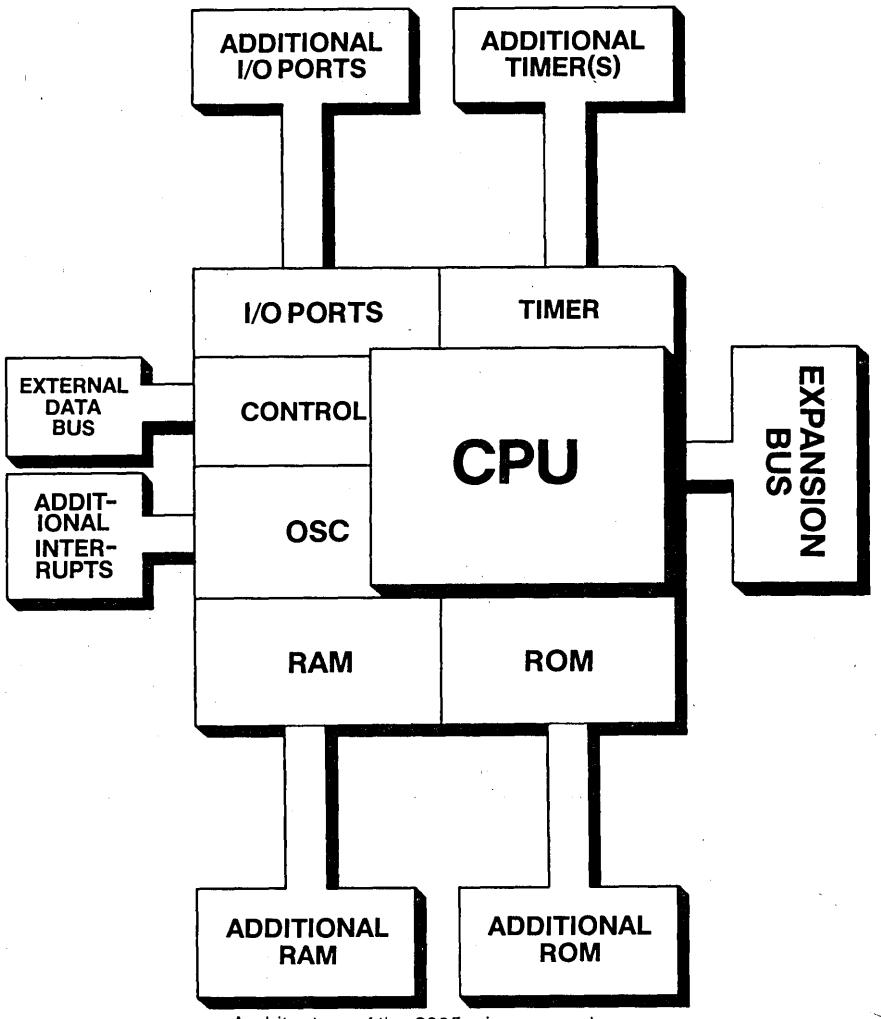
Each micro has a 3 to 8V operating voltage range, with "wait" and "stop" instructions that save power in standby modes.

The instruction set is optimized for controller applications, where the bit handling instruction, indexed addressing, and memory mapped I/O are effective. The 8-bit timer-counter has a programmable prescaler.

The micros in the family have 61 basic instruction types and 209 total instructions that execute in an average of less than 4.05 μs each at 1MHz.

Industry standard architecture.

The features of the various CMOS 6805 micros are described in the chart below.



Architecture of the 6805 microcomputer.

But there's one very important point they have in common: They're all based on the powerful and versatile 6805 architecture, a proven industry standard. This means you get compatibility with other 6800-based programs and devices and easier product conversion into CMOS systems.

The easy-to-program architecture even allows complete program access to the RAM and ROM memory spaces.

Peripheral devices, too.

In addition to the microcomputers, we'll be offering a full line of peripheral devices.

The first devices to be made available are the CDP65516 2KX8 CMOS ROM; the CDP6818 CMOS real-time clock I/O with 50 bytes of user RAM, programmable period interrupts and square wave generator; and the CDP6823 parallel interface with 24 individually programmable bi-directional ports.

With these peripherals, and the new devices we're developing right now, you'll be ready to put the power and economy of the CDP6805 CMOS family to work for you immediately.

Device	Description	Availability
CDP6805E2	112 bytes RAM, 16 I/O ports	1Q'83, Warehouse stock
CDP6805F2	1K ROM, 64 bytes RAM, 20 I/O ports	4Q'82, Acceptance of ROM patterns
CDP6805G2	2K ROM, 112 bytes RAM, 32 I/O ports	4Q'82, Acceptance of ROM patterns
CDP65516	2KX8 MUX ROM	4Q'82, Acceptance of ROM patterns
CDP6818	Real-Time Clock I/O	1Q'83, Warehouse stock
CDP6823	Peripheral Interface Adapter I/O	2Q'83, Warehouse stock

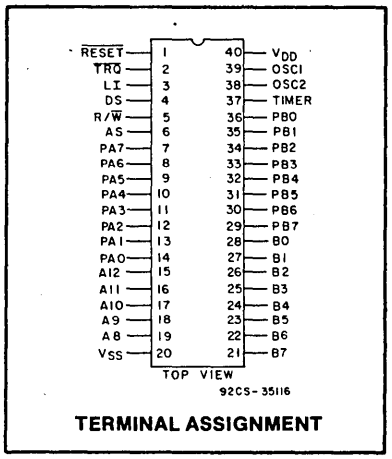
© IC MASTER 1983

CDP6805E2

Objective Data

CMOS 8-Bit Microprocessor

The CDP6805E2 Microprocessor Unit (MPU) belongs to the CDP6805 Family of Microcomputers. This 8-bit fully static and expandable microprocessor contains a CPU, on-chip RAM, I/O, and TIMER. It is a low-power, low-cost processor designed for low-end to mid-range applications in the consumer, automotive, industrial, and communications markets where very low power consumption constitutes an important factor. The following are the major features of the CDP6805E2 MPU.



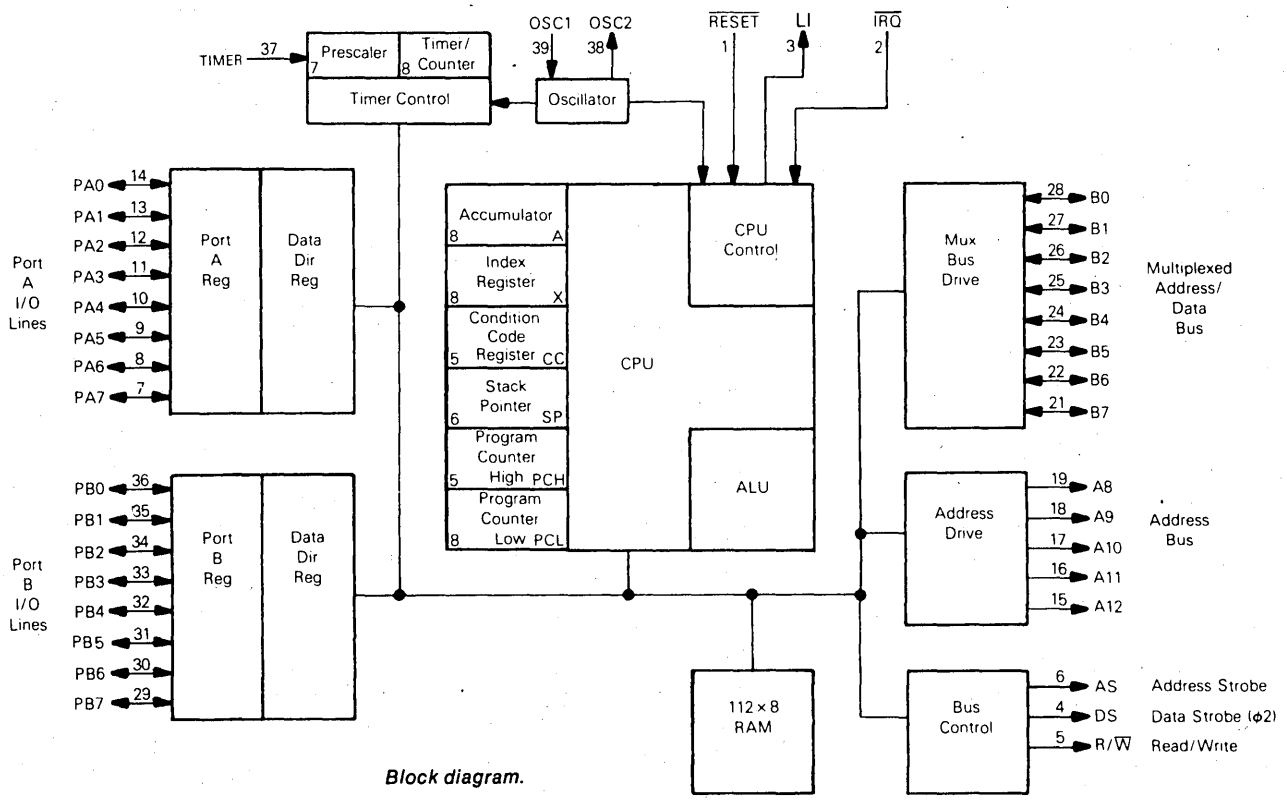
TERMINAL ASSIGNMENT

Hardware Features

- *Typical full speed operating power of 35 mW @ 5 V*
- *Typical WAIT mode power of 5 mW*
- *Typical STOP mode power of 25 µW*
- *112 bytes of on-chip RAM*
- *16 bidirectional I/O lines*
- *Internal 8-bit timer with software programmable 7-bit prescaler*
- *External timer input*
- *Full external and timer interrupts*
- *Multiplexed address/data bus*
- *Master reset and power-on reset*
- *Capable of addressing up to 8K bytes of external memory*
- *Single 3- to 6-volt supply*
- *On-chip oscillator*
- *40-pin dual-in-line package*

Software Features

- *Similar to the MC6800*
- *Efficient use of program space*
- *Versatile interrupt handling*
- *True bit manipulation*
- *Addressing modes with indexed addressing for tables*
- *Efficient instruction set*
- *Memory mapped I/O*
- *Two power saving standby modes*



Block diagram.

© IC MASTER 1983

Objective Data

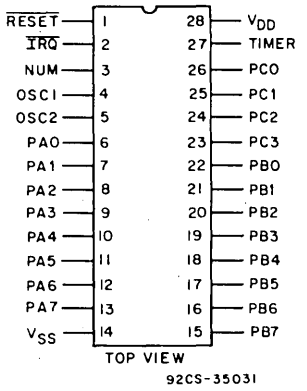
CDP6805F2
CMOS High-Performance Silicon-Gate 8-Bit Microcomputer

The CDP6805F2 Microcomputer Unit (MCU) belongs to the CDP6805 Family of Microcomputers. This 8-bit MCU contains on-chip oscillator CPU, RAM, ROM, I/O, and Timer. The fully static design allows operation at frequencies down to DC, further reducing its already low-power consumption. It is a low-power processor designed for low-end to mid-range applications in the consumer, automotive, industrial, and communications markets where very low power consumption constitutes an important factor.

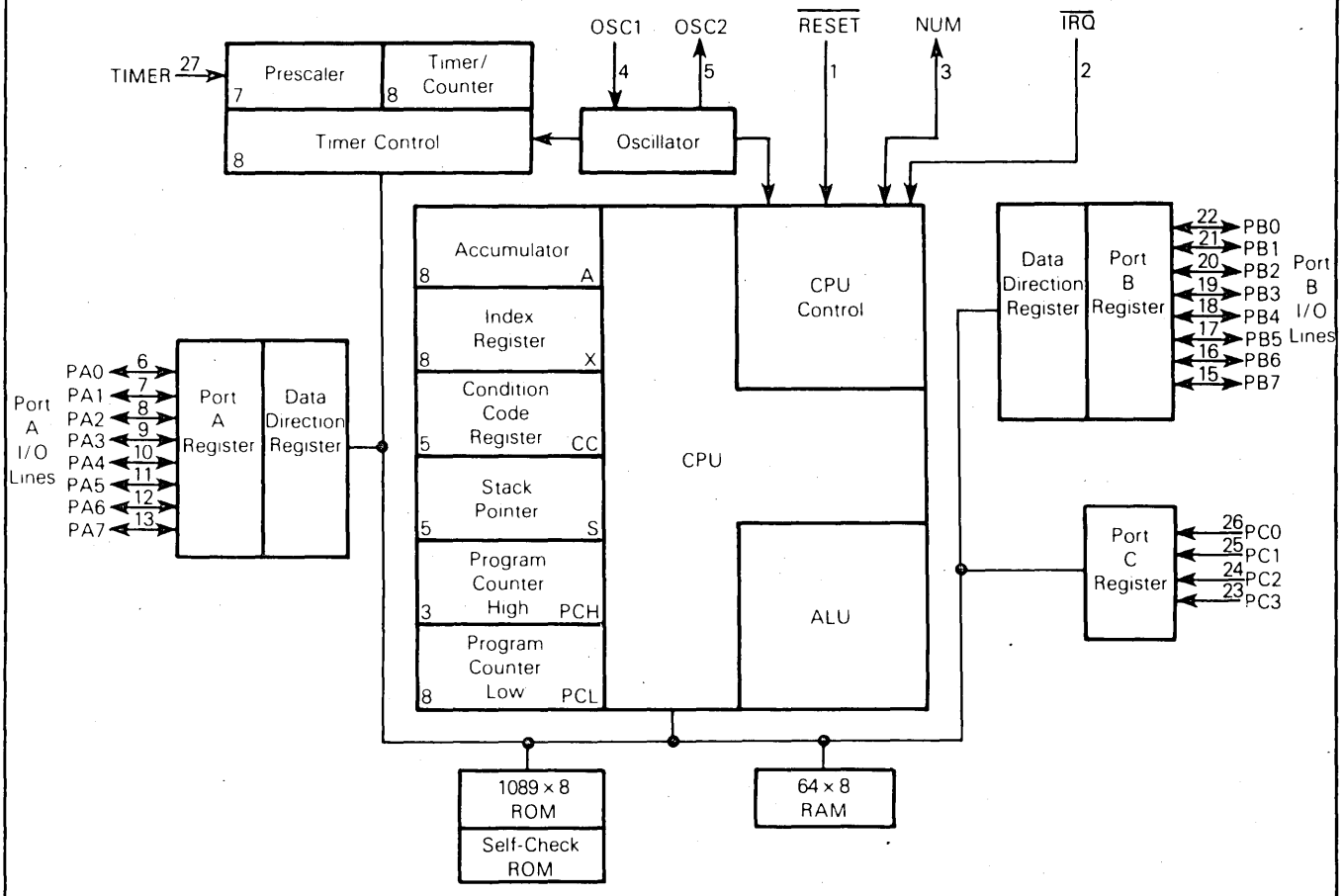
- *Typical full speed operating power of 10 mW at 5 V*
- *Typical WAIT mode power of 3 mW*
- *Typical STOP mode power of 25 µW*
- *Fully static operation*
- *64 bytes of on-chip RAM*
- *1089 bytes of on-chip ROM*
- *16 bidirectional I/O lines*
- *4 input-only lines*
- *Internal 8-bit timer with software programmable 7-bit prescaler*
- *External timer input*
- *External and timer interrupts*
- *Self-check mode*
- *Master reset and power-on reset*
- *Single 3 to 6 volt supply*
- *On-chip oscillator*
- *1 µs cycle time*
- *28-pin dual-in-line package*

Software Features:

- *Similar to the MC6800*
- *Efficient use of program space*
- *Versatile interrupt handling*
- *True bit manipulation*
- *Addressing modes with indexed addressing for tables*
- *Efficient instruction set*
- *Memory-mapped I/O*
- *User-callable self-check routines*
- *Two power-saving standby modes*



TERMINAL ASSIGNMENT



CDP6805F2 CMOS microcomputer block diagram.

© IC MASTER 1983

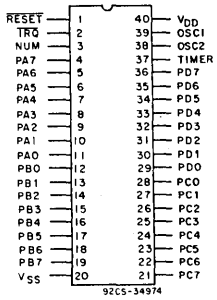
CDP6805G2

Objective Data

CMOS High-Performance Silicon-Gate 8-Bit Microcomputer

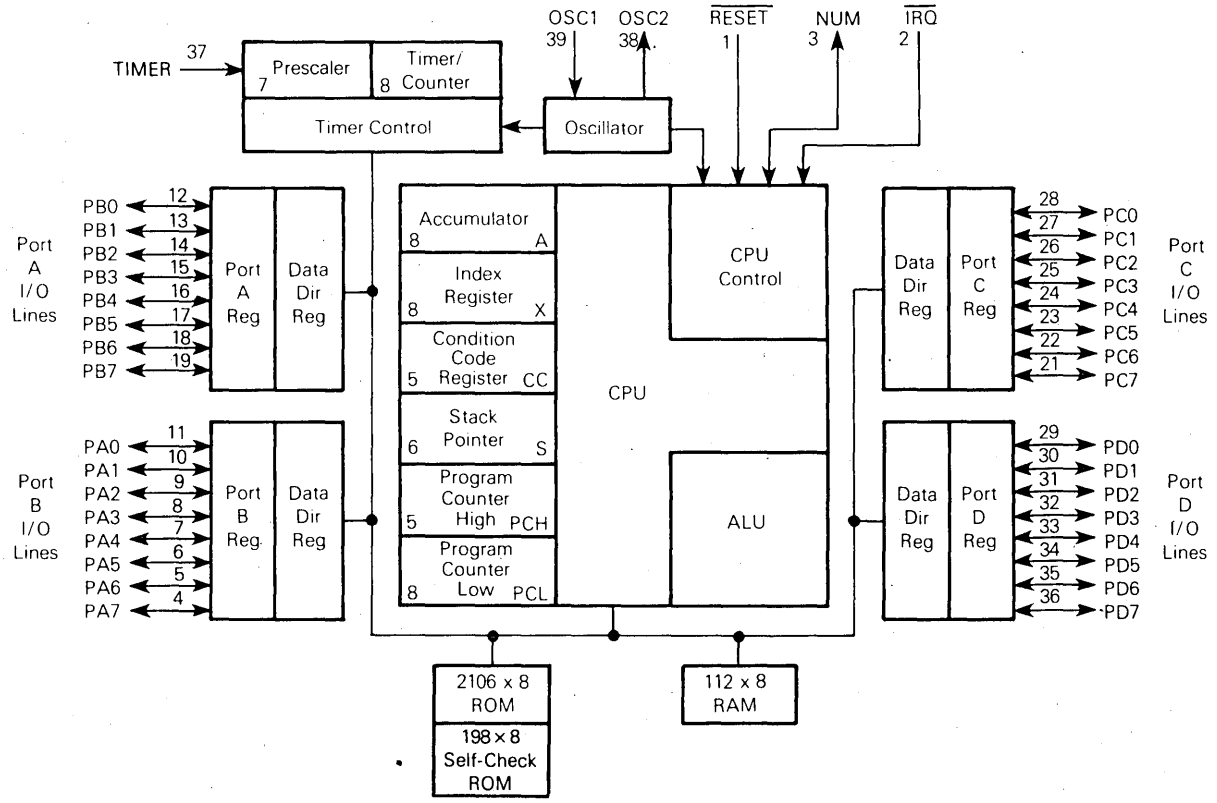
The CDP6805G2 Microcomputer Unit (MCU) belongs to the CDP6805 Family of Microcomputers. This 8-bit MCU contains on-chip oscillator CPU, RAM, ROM, I/O, and Timer. The fully static design allows operation at frequencies down to DC, further reducing its already low-power consumption. It is a low-power processor designed for low-end to mid-range applications in the consumer, automotive, industrial, and communications markets where very low power consumption constitutes an important factor.

- *Typical full speed operating power of 15 mW at 5 V*
- *Typical WAIT mode power of 4 mW*
- *Typical STOP mode power of 25 μW*
- *Fully static operation*
- *112 bytes of on-chip RAM*
- *2106 bytes of on-chip ROM*
- *32 bidirectional I/O lines*
- *High current drive*
- *Internal 8-bit timer with software programmable 7-bit prescaler*
- *External timer input*
- *External and timer interrupts*
- *Self-check mode*
- *Master reset and power-on reset*
- *Single 3 to 6 volt supply*
- *On-chip oscillator with RC or crystal mask options*
- *40-pin dual-in-line package*
- *Similar to the MC6800*
- *Efficient use of program space*
- *Versatile interrupt handling*
- *True bit manipulation*
- *Addressing modes with indexed addressing for tables*
- *Efficient instruction set*
- *Memory mapped I/O*
- *Most self-check routines user callable*
- *Two power saving standby modes*



TOP VIEW

TERMINAL ASSIGNMENTS



CDP6805G2 CMOS microcomputer block diagram.

© IC MASTER 1983

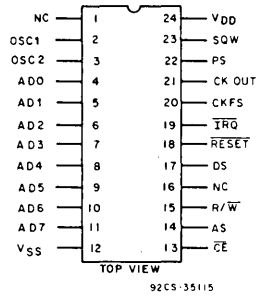
CDP6818

Objective Data

CMOS Real-Time Clock with RAM

The CDP6818 Real-Time Clock plus RAM is a peripheral device which includes the unique MOTEL concept for use with various microprocessor, microcomputers, and larger computers. This part combines three unique features: a complete time-of-day clock with alarm and one hundred year calendar, a programmable periodic interrupt and square-wave generator, and 50 bytes of low-power static RAM. The CDP6818 uses high-speed CMOS technology to interface with 1 MHz processor buses, while consuming very little power.

The Real-Time Clock plus RAM has two distinct uses. First, it is designed as a battery powered CMOS part (in an otherwise NMOS/TTL system) including all the common battery backed-up functions such as RAM, time, and calendar. Secondly, the CDP6818 may be used with a CMOS microprocessor to relieve the software of the timekeeping workload and to extend the available RAM of an MPU such as the CDP6805E2.



TERMINAL ASSIGNMENT

- Low-Power, High-Speed, High-Density CMOS
- Internal Time Base and Oscillator
- Counts Seconds, Minutes, and Hours of the Day
- Counts Days of the Week, Date, Month, and Year
- 3 V to 6 V Operation
- Time Base Input Options: 4.194304 MHz, 1.048576 MHz, or 32.768 kHz
- Time Base Oscillator for Parallel Resonant Crystals
- 40 to 200 μW Typical Operating Power at Low Frequency Time Base
- 4.0 to 20 mW Typical Operating Power at High Frequency Time Base
- Binary or BCD Representation of Time, Calendar, and Alarm
- 12- or 24-Hour Clock with AM and PM in 12-Hour Mode
- Daylight Savings Time Option
- Automatic End of Month Recognition
- Automatic Leap Year Compensation

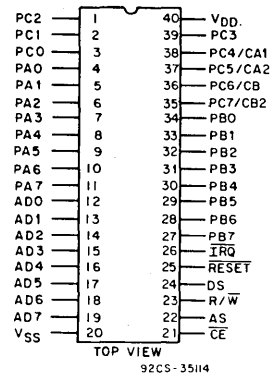
CDP6823

Objective Data

CMOS Parallel Interface

The CMOS CDP6823 Parallel Interface (PI) provides a universal means of interfacing external signals with the CDP6805E2 CMOS microprocessor, and other multiplexed bus microprocessors. The unique MOTEL circuit on-chip allows direct interfacing to most industry CMOS microprocessors, as well as many NMOS MPUs.

The CDP6823 PI includes three bidirectional 8-bit ports, or 24 I/O pins. Each I/O line may be separately established as an input or an output under program control via data direction registers associated with each port. Using the bit change and test instructions of the CDP6805E2, each individual I/O pin can be separately accessed. All port registers are read/write bytes to accommodate read/modify/write instructions.



TERMINAL ASSIGNMENT

- 24 Individual Programmed I/O Pins
- MOTEL Circuit for Bus Compatibility with Many Microprocessors
- Multiplexed Bus Compatible with: CDP6805E2 and Competitive Microprocessors
- Data Direction Registers for Ports A, B, and C
- Port C may also be Control Lines for:
  - Four Interrupt Inputs
  - Input Byte Latch
  - Output Pulse
- 16 Registers Addressed as Memory Locations
- Handshake Control Logic for Input and Output Peripheral Operation
- Interrupt Output Pin
- Reset Input to Clear Interrupts and Initialize Internal Registers
- 40-Pin Package

© IC MASTER 1983

8001
EDLC™ ETHERNET DATA LINK CONTROLLER

PRELIMINARY DATA SHEET

NOVEMBER 1982

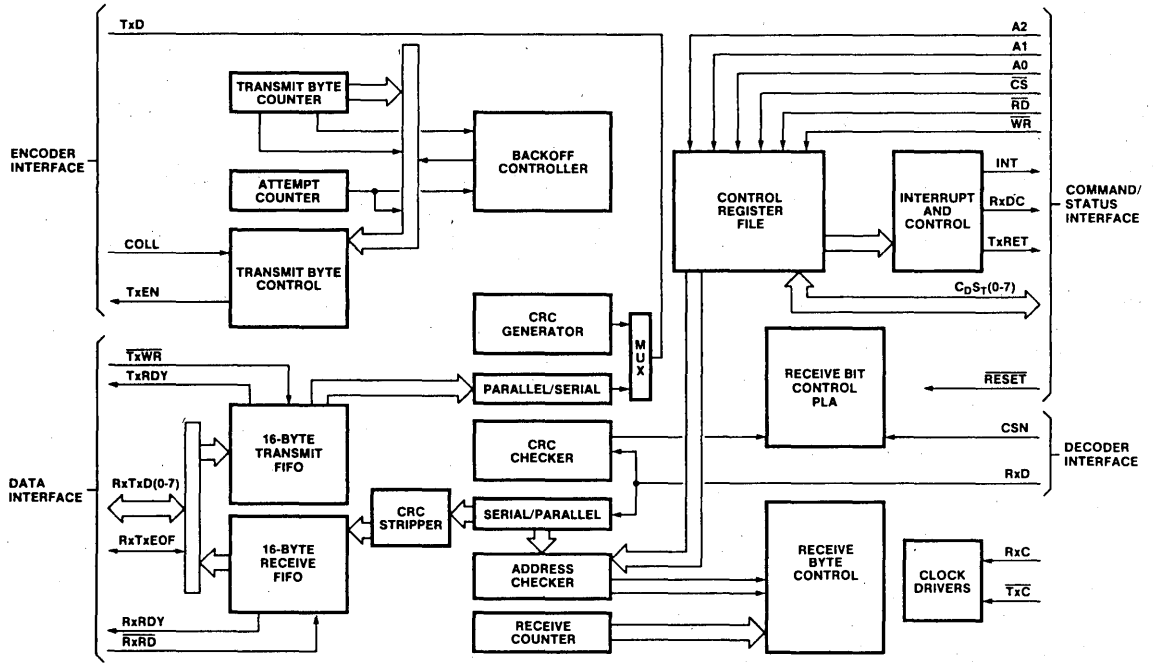
Features

- 100% Ethernet Compatible
- 10 MHz Serial/Parallel Conversion
- Preamble Generation and Removal
- Automatic 32-Bit FCS (CRC) Generation and Checking
- Collision Handling, Transmission Deferral and Retransmission with Automatic Jam and Backoff Functions
- Error Interrupt and Status Generation
- 40 Pin Package
- Single 5V ±5% Power Supply
- Standard CPU and Peripheral Interface Control Signals
- Loopback Capability for Diagnostics
- Single Phase Clock
- All Inputs and Outputs TTL Compatible

Description

The SEEQ Ethernet Data Link Controller (EDLC) is designed to support the Data Link Layer (layer 2) of the Ethernet specification for Local Area Networks (LAN). The protocol used is Carrier Sense Multiple Access with Collision Detection (CSMA/CD). The 8001 EDLC chip is a single 40 pin VLSI device which replaces approximately 60 MSI and SSI devices. It is designed to greatly simplify the development of Ethernet communication in computer based systems. The 8001 provides an economic solution for the construction of an Ethernet node, providing high speed data communication at 10 Megabits/second and sees applications in terminals, workstations, personal computers, small business systems, and large computer systems, in both the office and industrial environment. The 8001 EDLC chip has a universal system interface which will interface with almost any microprocessor, microcomputer, or system bus with equal ease, allowing the system designer to make the price performance tradeoffs for each application. The transmit and receive sections of the EDLC chip are independent and can operate simultaneously to allow reception of a transmitted frame for use in loopback diagnostics modes.

Functional Block Diagram



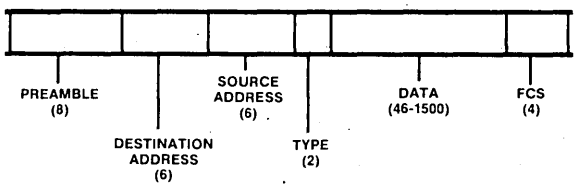
SEEQ Technology, Incorporated 1849 Fortune Drive, San Jose, California 95131 • (408) 942-1990

© IC MASTER 1983

Functional Description

Frame Format

On an Ethernet communication network, information is transmitted and received in packets or frames. An Ethernet frame consists of a preamble, two address fields, a type field, a data field, and a frame check sequence. Each field has a specific format which is described in detail below. An Ethernet frame has a minimum length of 64 bytes and a maximum length of 1518 bytes exclusive of the preamble. The Ethernet frame format is shown below.



NOTE:
Field length in bytes in (parens).

Preamble: *The preamble is a 64 bit field consisting of 62 alternating "1"s and "0"s followed by a "11" End-of-Preamble indicator.*

Destination Address: *The Destination Address is a 6 byte field containing either a specific Station Address, a Broadcast Address, or a Multicast Address to which this frame is directed.*

Source Address: *The Source Address is a 6 byte field containing the specific Station Address from which this frame originated.*

Type Field: *The Type Field consists of two bytes. This field is uninterpreted at the Data Link Layer, and is passed through the EDLC chip to be handled at the Client Layer.*

Data Field: *The Data Field consists of 46 to 1500 bytes of information which are fully transparent in the sense that any arbitrary sequence of bytes may occur.*

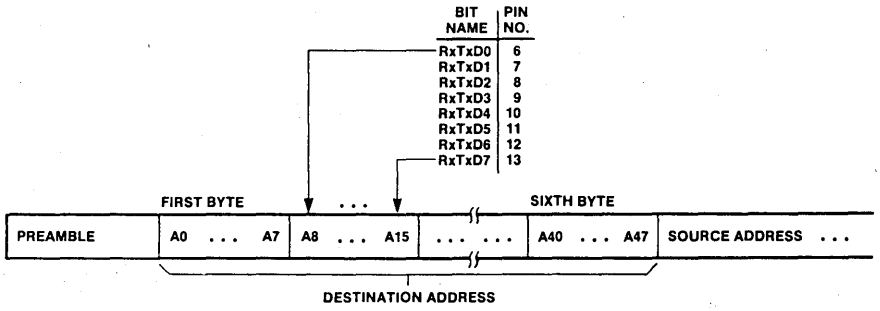
Frame Check Sequence: *The Frame Check Sequence field is a 32-bit cyclic redundancy check (CRC) value computed as a function of the Destination Address Field, Source Address Field, Type Field, and Data Field. The FCS is appended to each transmitted frame, and used at reception to determine if the received frame is valid.*

Transmitting

The transmit data stream consists of the Preamble, four information fields, and the FCS which is computed in real time by the EDLC and automatically appended to the frame at the end of the serial data. The preamble is also generated by the EDLC chip and transmitted immediately prior to the Destination Address. Destination Address, Source Address, Type Field and Data Field are prepared in the buffer memory prior to initiating transmission. The EDLC chip encapsulates these fields into an Ethernet frame by inserting a preamble prior to these information fields and appending a CRC after the information fields.

Transmission Initiation/Deferral

The Ethernet node initiates a transmission by storing the entire information content of the frame to be transmitted in an external buffer memory, and then transferring initial frame bytes to the EDLC chip Transmit FIFO. "Transmit-buffer to FIFO" transfers are coordinated via the $\overline{TxWR}$ and TxRDY handshake interface, i.e., bytes are written to the FIFO via $\overline{TxWR}$ only when TxRDY is HIGH. Actual transmission of the data onto the network will only occur if the network has not been busy for the minimum defer time (9.6 μsec) and any Backoff time requirements have been satisfied. When transmission begins, the EDLC chip activates the transmit enable (TxEN) line concurrently with the transmission of the first bit of the preamble and keeps it active for the duration of the transmission.



BITS WITHIN A BYTE ARE TRANSMITTED/RECEIVED
BIT NO. "0" FIRST THROUGH BIT NO. "7" LAST.

Figure 1. Bit Serialization/Deserialization

© IC MASTER 1983

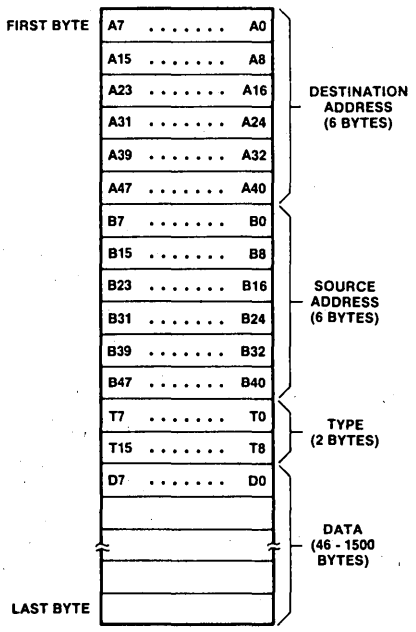


Figure 2. Typical Frame Buffer Format for Byte-Organized Memory

Collision

When concurrent transmissions from two or more Ethernet nodes occur, (collision), the EDLC chip halts the transmission of the data bytes in the Transmit FIFO and transmits a Jam pattern consisting of 55555555 Hex. At the end of the Jam transmission, the EDLC chip issues a TxRET signal to the CPU, and begins the Backoff wait period.

To reinitiate transmission, the initial bytes of the frame information fields must be reloaded into the EDLC chip transmit FIFO. The RxRET is used to indicate to the Buffer Manager the need for frame reinitialization. The reloading of the Transmit FIFO may be done prior to the Backoff interval elapsing, so that no additional delay need be incurred to retransmission.

Scheduling of retransmission is determined by a controlled randomization process called Truncated Binary Exponential Backoff. The EDLC chip waits a random interval between 0 and 2^K slot times (51.2 μsec per slot time) before attempting retransmission, where "K" is the current transmission attempt number (not to exceed 10).

When 16 consecutive attempts have been made at transmission and all have been terminated due to collision, the EDLC chip Transmit Processor sets an error status bit and issues an interrupt to the CPU if enabled.

Terminating Transmission

Transmission terminates under the following conditions:

***Normal:** The frame has been transmitted successfully without contention. Loading of the last data byte into the transmit FIFO is signaled to the EDLC chip by activation of the RxTxEOF signal concurrently with the last byte of data loaded into the transmit FIFO. This line acts as a ninth bit in the Transmit FIFO. When this last byte is serialized, the CRC is appended and transmitted concluding frame transmission. The transmit Ready-For-New-Frame bit of the Transmit Status register will be set by a normal termination.*

***Collision:** Transmission attempted by two or more Ethernet nodes. The Jam sequence is transmitted, the Collision status bit is set, the TxRET signal is generated, and the Backoff interval begun.*

***Underflow:** Transmit data is not ready when needed for transmission. Once transmission has begun, the EDLC chip on average requires one transmit byte every 800 nsec in order to avoid transmit FIFO underflow (starvation). If this condition occurs, the EDLC chip terminates the transmission, issues a TxRET signal, and sets the Transmit-Underflow status bit.*

***16 Transmission Attempts:** If a Collision occurs for the sixteenth consecutive time, the 16-Transmission-Attempts status bit is set, in addition to the Collision status bit. The TxRET signal is generated, and the backoff interval begun. The counter that keeps track of the number of collisions is modulo 16 and therefore rolls over on the 17th collision.*

At the completion of every transmission or retransmission, new status information is loaded into the Transmit Status Register. Dependent upon the bits enabled in the Transmit Command Register, an interrupt will be generated for the just completed transmission. In both collision and underflow the TxRET signal is activated.

Receiving

The EDLC chip is continuously monitoring the network. When activity is recognized via the Carrier Sense (CSN) line going active, the EDLC chip synchronizes itself to the incoming data stream during the Preamble, and then examines the destination address field of the frame. Depending on the Address Match Mode specified, the EDLC chip will either recognize the frame as being addressed to itself in a general or specific fashion or abort the frame reception.

Preamble Processing

The ELDC chip recognizes activity on the Ethernet via the Carrier Sense line. The Preamble is normally 64

© IC MASTER 1983

bits (8 bytes) long. The Preamble consists of a sequence of 62 alternating "1"s and "0"s followed by 11, with the frame information fields immediately following. In order for the decoder phase-lock to occur, the EDLC chip waits 8 bit times before looking for the 11, end of preamble indicator. If the EDLC chip receives a 00 before receiving the 11 in the preamble, an error condition has occured. The frame is not received, and the EDLC chip begins monitoring the network for a carrier again.

Address Matching

Ethernet addresses consist of two 6 byte fields. The first bit of the address signifies whether it is a Station address or a Multicast/Broadcast address.

First Bit	Address
0	Station Address (Physical)
1	Multicast/Broadcast Address (logical)

Address matching occurs as follows:

Station Address: All destination address bytes must match the corresponding bytes found in the Station Address register.

Multicast Address: If the first bit of the incoming address is a 1, and the EDLC chip is programmed to accept Multicast addresses, the frame is received.

Broadcast Address: The six incoming destination address bytes must all be FF hex. If the EDLC chip is programmed to accept Broadcast or Multicast Addresses the frame will be received.

If the incoming frame is addressed to the EDLC chip specifically (Destination Address matches the contents of the Station Address Register), or is of general or group interest (Broadcast or Multicast Address), the EDLC chip will pass the frame exclusive of preamble and FCS to the CPU buffer and indicate any error conditions at the end of the frame. If however the address does not match, as soon as the mismatch is recognized the EDLC chip will terminate reception and issue an RxDC if transfers to the CPU buffer have been initiated.

The EDLC chip may be programmed via the Match Mode bits of the Receive Command Register to ignore all frames (Disable Receiver), accept all frames (Promiscuous mode), accept frames with the proper Station Address or the Broadcast Address (Station/Broadcast), or accept all frames with the proper Station Address, the Broadcast Address, or all Multicast Addresses (Station/Broadcast/Multicast).

Terminating Reception

Reception is terminated when either of the following conditions occur:

Carrier Sense Inactive: Indicates that traffic is no longer present on the Ethernet cable.

Overflow: The host node for some reason is not able to empty the Receive FIFO as rapidly as it is filled, and an error occurs as frame data is lost. On average the Receive FIFO must be serviced every 800 ns to avoid this condition.

Frame Reception Conditions

Upon terminating reception, the EDLC chip will determine the status of the received frame and conditionally load it into the Receive Status Register. An interrupt will be issued if the appropriate conditions as specified in the Receive Command Register are present. The EDLC chip may report the following conditions at the end of frame reception:

Overflow: The EDLC chip internal receive FIFO overflows.

Dribble Error: Carrier Sense did not go inactive on a receive data byte boundary.

CRC Error: The 32-bit CRC transmitted with the frame does not match that calculated upon reception.

Short Frame: A frame containing less than 64 bytes of information was received (including FCS).

Good Frame: A frame is received that does not have a CRC, Shortframe, Dribble, or Overflow condition.

System Interface

The EDLC chip system interface consists of two independent busses and respective control signals. Data is read and written over the Receive/Transmit Data Bus RxTxD (0-7). These transfers are controlled by the TxRDY and $\overline{TxWR}$ signals for transmitted data, and RxRDY and $\overline{RxRD}$ for received data. All Commands and Station Addresses are written, and all Status read over a separate Command/Status Bus CdSt (0-7). These transfers are controlled by the $\overline{CS}$, $\overline{RD}$, $\overline{WR}$, and A0-A2 signals. The EDLC chip's command and status registers may be accessed at any time. However, it is recommended that writing to the command register be done only during interframe gaps.

With the exception of the two Match Mode bits in the Receive Command Register, all bits in both command registers are interrupt mask bits. Changing the interrupt mask bits during frame transmission does not affect the frame integrity. Asynchronous error events, however, e.g., overflow, underflow, etc., may cause chip operation to vary, depending on the condition of their corresponding mask bits.

© IC MASTER 1983

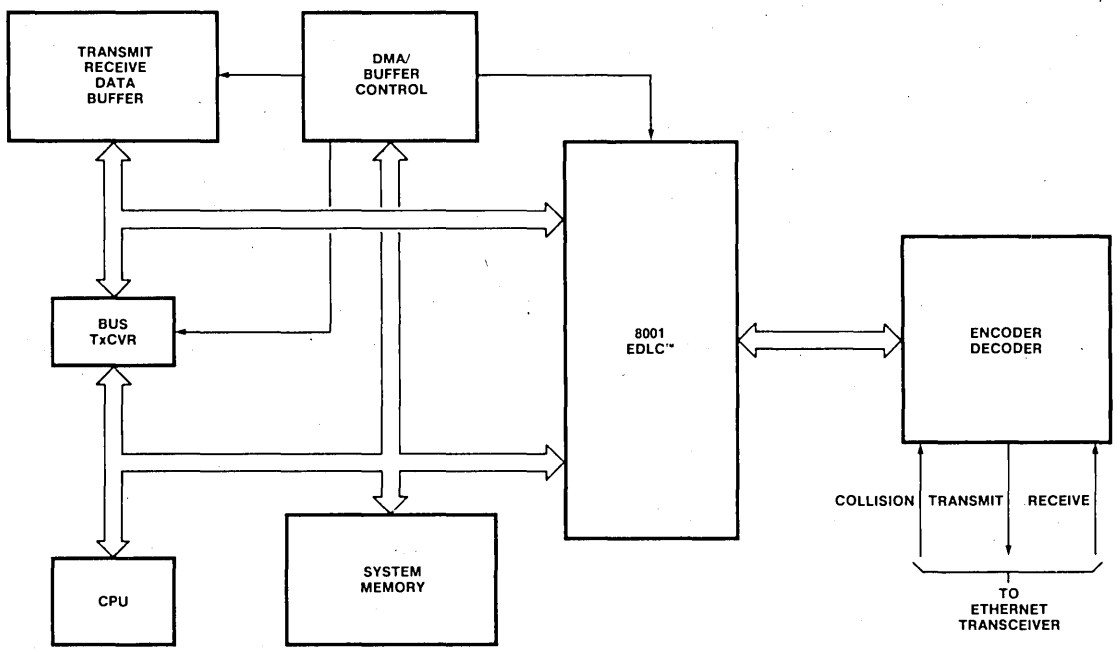


Figure 3. Typical Ethernet Node Configuration

Reading the Status registers may also occur at any time during transmission or reception. It is recommended, however, that to ensure stable status values that Status Registers be read during the interframe gap.

Internal Register Addressing

	Register Address			Register Description	
	A2	A1	A0	Read	Write
0	0	0	0	—	Station Addr 0
1	0	0	1	—	Station Addr 1
2	0	1	0	—	Station Addr 2
3	0	1	1	—	Station Addr 3
4	1	0	0	—	Station Addr 4
5	1	0	1	—	Station Addr 5
6	1	1	0	Rx Status	Rx Command
7	1	1	1	Tx Status	Tx Command

Status Registers are read only registers. Command and Station Address Registers are write only registers. Access to these registers is via the CPU interface: Control signals $\overline{CS}$, $\overline{RD}$, $\overline{WR}$, and the Command/Status Data Bus CdSt (0-7).

Station Address Register

The Station Address Register is 6 bytes in length. The contents may be written in any order, with bit "0" of byte "0" corresponding to the first bit received in the data stream, and indicating whether the address is physical or logical. Bit 7 of station address byte 5 is compared to the last bit of the received destination address. The Station Address should be programmed prior to enabling the receiver.

Transmit Command Register

The Transmit Command Register is an interrupt mask register, which provides for control of the conditions allowed to generate transmit interrupts. Each of the four least significant bits of the register may be individually set or cleared. When set, the occurrence of the associated condition will cause an interrupt to be generated. The four specific conditions for which interrupts may be generated are:

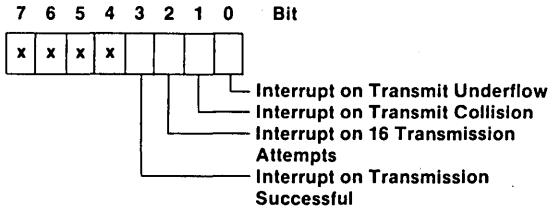
- *Underflow*
- *Collision*
- *16 Collisions*
- *Transmission Successful*

The interrupt signal INT will be set when one or more of the specified transmission termination conditions occurs and the associated command bit has been set. The interrupt signal INT will be cleared when the Transmit Status Register is read.

© IC MASTER 1983

All bits of the Transmit Command Register are cleared upon chip reset.

Transmit Command Register Format



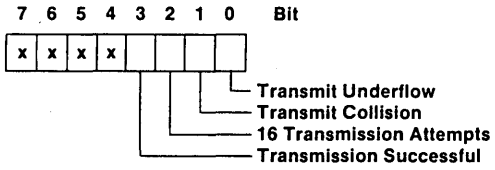
Transmission Successful is set only on the successful transmission or retransmission of a frame.

Transmit Status Register

The Transmit Status Register is loaded at the conclusion of each frame transmission or retransmission attempt. It provides for the reporting of both the normal and error termination conditions of each transmission.

All bits of the Transmit Status Register are cleared upon chip reset.

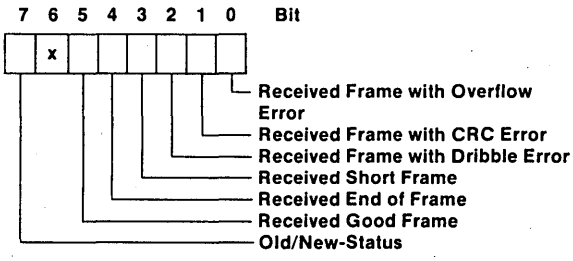
Transmit Status Register Format



Receive Status Register

The Receive Status Register is loaded with the status of each received frame when the frame has been received or frame reception has been terminated due to an error condition. In addition, this register contains an Old/New-Status bit which is set when the Receive Status Register is read or the chip is reset, and cleared only when new status is loaded for a Frame-of-Interest. All other bits are cleared upon chip reset.

Receive Status Register Format

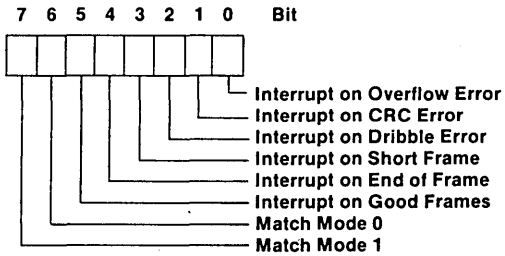


Receive Command Register

The Receive Command Register has two primary functions, it specifies the Address Match Mode, and it specifies Frames-of-Interest. i.e. frames whose arrival must be communicated to the CPU via interrupts and status register updates. Frames of Interest are frames whose status must be saved for inspection even at the expense of losing subsequent frames.

The definition of a Frame-of-Interest is set by the five interrupt mask bits in the Receive Command Register. Setting each bit allows an interrupt to be generated on the occurrence of the specified condition.

Receive Command Register Format



Bits 0-5 specify Frames-of-Interest

Changing the receive Match Mode bits, during frame reception, may change chip operation and give unpredictable results.

Match Mode Definition

	Match Mode 1	Match Mode 0	Function
0	0	0	Receiver Disable
1	0	1	Receive All Frames
2	1	0	Receive Station or Broadcast Frames
3	1	1	Receive Station, Broadcast/multicast Frames

The status of each frame is always loaded into the Receive Status Register on completion of reception unless (1) the previous frame was determined to be a Frame of Interest (i.e. had generated an interrupt) and (2) the previous frame status has not been read (as indicated by the Old/New status bit equal zero).

The Old/New status bit is cleared whenever the status of a new Frame-of-Interest is loaded into the Receive Status Register and is set whenever that status is read.

Thus the status of any frame received following the reception of a Frame-of-Interest will not be loaded into the Receive Status Register unless the previous status has been read. If any following frame is received

© IC MASTER 1983

before the status of the previous frame has been read, the Receive Discard (RxDC) signal will be issued.

The status of a Frame-of-Interest following a frame defined as "not of interest", will be loaded into the Receive Status Register, and the Old/New Status bit cleared.

These conditions ensure that a maximum number of good frames are received and retained.

Any Frame-of-Interest successfully received will cause an interrupt to be generated. This interrupt is reset upon reading the Receive Status Register.

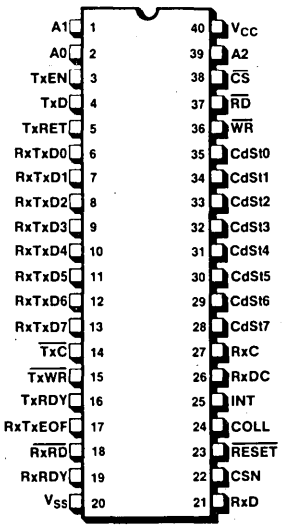


Figure 4. Pin Configuration

Pin Description

The EDLC chip has four groups of interface signals:

- *Power Supply*
- *Encoder/Decoder*
- *Data Buffer*
- *Command/Status*

Power Supply

V_{CC} ..... +5V
V_{SS} ..... Ground

Encoder/Decoder Interface

$\overline{TxC}$ Transmit Clock (Input): *10 MHz, 50% duty cycle transmit clock used to synchronize the transmit data from the EDLC chip to the Encoder. This clock runs continuously, and is asynchronous to RxC.*

TxD Transmit Data (Output): *Serial data output to the encoder. Active HIGH.*

TxEN Transmit Enable (Output): *This signal is used to activate the encoder. It becomes active with the first bit of the Preamble transmitted and inactive with the last bit of the frame transmitted. Active HIGH and forced low during Reset.*

RxC Receive Clock (Input): *10 MHz, 50% duty cycle nominal. The receive clock is used to synchronize incoming data to the EDLC chip from the Decoder. This clock runs continuously, and is asynchronous to $\overline{TxC}$.*

RxD Receive Data (Input): *Serial input data to the EDLC chip from the Decoder. Active HIGH.*

CSN Carrier Sense (Input): *Indicates traffic on the coaxial cable to the EDLC chip. Becomes active with the first bit of the preamble received, and inactive one bit time after the last bit of the frame is received. Active HIGH.*

COLL Collision (Input): *Indicates transmission contention on the Ethernet cable. Once activated must be active until EDLC chip terminates Jam pattern transmission to assure recognition. Active High.*

Data Buffer Interface

RxTxD (0-7) Receive/Transmit Data Bus (I/O): *Carries Receive/Transmit data byte from/to the EDLC chip Receive/Transmit FIFOs. Active HIGH.*

RxTxEOF Receive/Transmit End of Frame (I/O): *Indicates last byte of data on the Receive/Transmit Data Bus. Effectively a ninth bit in the FIFOs with the identical timing. Active HIGH.*

RxRDY Receive Ready (Output): *Indicates at least one byte of received data available in the Receive FIFO. $\overline{RxRD}$ should not be activated if this pin is LOW. Active HIGH.*

$\overline{RxRD}$ Receive Read Strobe (Input): *Enables transfer of received data from the EDLC Receive FIFO to the RxTxD bus. Data is valid from the EDLC chip Receive FIFO at the RxTxD pins on the rising edge of this signal. This signal should not be activated unless RxRdy is high. Active LOW.*

RxDC Receive Discard (Output): *Asserted when one of the following errors occur: overflow, shortframe, CRC, receive frame address non-match, or back-to-back Frames-of-Interest received with no status read in between. Active HIGH, and nominally active for 800 nsec.*

TxRDY Transmit Ready (Output): *Indicates that the EDLC chip internal FIFO has space available for transmit data bytes. Forced inactive during Reset. Active HIGH.*

© IC MASTER 1983

$\overline{TxWR}$ Transmit Write (Input): *Synchronizes data transfer from the RxTxD bus to the Transmit FIFO. Data is written to the FIFO on the rising edge of this signal. This signal should not be active unless TxRDY is high. Active LOW.*

TxRET Transmit Retransmit (Output): *Asserted whenever either transmit underflow or transmit collision conditions occur. It is nominally 800 nsec in width. Active HIGH.*

Command/Status Interface

CdSt (0-7) Command/Status Data Bus (I/O): *These lines carry commands and status as well as station address initialization information between the EDLC chip and CPU. These lines are nominally tristate until activated by $\overline{CS}$ and $\overline{RD}$ being simultaneously active. Active HIGH.*

A0-A2 Address (0-2) (Input): *Address lines to select the proper EDLC chip internal registers for reading or writing. Active HIGH.*

$\overline{CS}$ Chip Select (Input): *Chip Select input, must be active in conjunction with $\overline{RD}$ or $\overline{WR}$ to successfully access the EDLC chip internal registers. Active LOW.*

$\overline{RD}$ Read (Input): *Enables reading of the EDLC chip internal registers in conjunction with $\overline{CS}$. Read data from the internal registers is enabled via the falling edge of $\overline{RD}$ and is valid on the rising edge of the signal. Active LOW.*

$\overline{WR}$ Write (Input): *Enables writing of the EDLC chip internal registers in conjunction with $\overline{CS}$. Write data on the CdSt (0-7) data lines must be set up relative to the rising edge of the signal. Active LOW.*

INT Interrupt (Output): *Enabled as outlined above by a variety of transmit and receive conditions. Remains active until the status register containing the reason for the interrupt is read. Active HIGH.*

$\overline{RESET}$ (Input): *Resets the interrupt logic, clears command and status registers, asserts the TxRET signal, deactivates the RxRDY and TxEN lines, and initializes the pseudo-random backoff generator logic. Reset must be active for a minimum of 1 µsec. Active LOW.*

Absolute Maximum Ratings

Ambient Temperature
Under Bias ..... -10° C to +80° C
Storage Temperature ..... -65° C to +150° C
All Input or Output Voltages
with Respect to Ground ..... +7 V to -0.5 V
Package Maximum
Power Dissipation ..... 1.5 Watts

Operating Conditions

Ambient Temperature Range ..... 0° C to 70° C
V_{CC} Power Supply ..... 4.75 V to 5.25 V

Capacitance

T_A = 25° C, F_C = 1 MHz

Symbol	Parameter	Maximum	Condition
C_{IN}	Input Capacitance	15 pF	V_{IN} = 0 V
$C_{I/O}$	I/O Capacitance	15 pF	$V_{I/O}$ = 0 V

AC Test Conditions

Output Load: 1 Schottky TTL Gate + CL = 100 pF
(All pins except TxEN, TxD)
TxEN, TxD Load: 1 Schottky TTL Gate + CL = 35 pF
Input Pulse Level: 0.8 V to 2.0 V
Timing Reference Level: 1.5 V

DC Characteristics

T_A = 0° C to 70° C, V_{CC} = 4.75 V to 5.25 V

Symbol	Parameter	Limits[1] Min.	Typ.	Max.	Units	Condition
I_{IN}	Input Leakage Current			10	µA	V_{IN} = 0.45 V to 5.25 V
I_O	Output Leakage Current			10	µA	V_{OUT} = 0.45 V to 5.25 V
I_{CC}	Vcc Current		150	200	mA	
V_{CH}	Clock Input High Voltage	3.5		V_{CC} + 1	V	
V_{CL}	Clock Input Low Voltage			0.8	V	
V_{IL}	Input Low Voltage			0.8	V	
V_{IH}	Input High Voltage	2.0		V_{CC} + 1	V	
V_{OL}	Output Low Voltage			0.4	V	I_{OL} = 2.1 mA
V_{OH}	Output High Voltage	2.4			V	I_{OH} = -400 µA

NOTE:
1. Typical values are for T_A = 25° C and nominal supply voltages.

© IC MASTER 1983

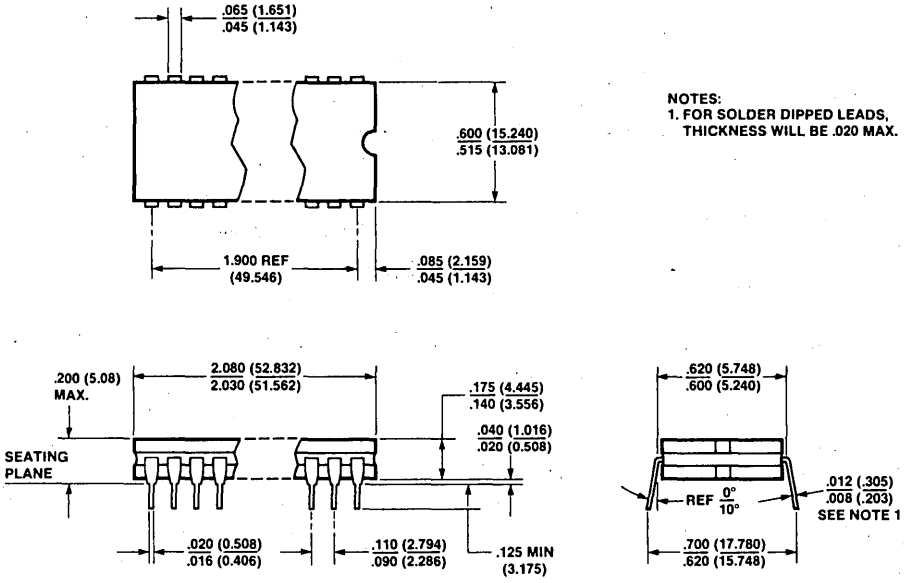
Ordering and Package Information

PART NUMBER

D Q 8001

- 8001 — PRODUCT: EDLC™ IC
- Q — TEMPERATURE RANGE: 0° C TO 70° C
- D — PACKAGE: CERDIP

40-LEAD HERMETIC CERDIP
PACKAGE TYPE D



NOTES:
1. FOR SOLDER DIPPED LEADS, THICKNESS WILL BE .020 MAX.

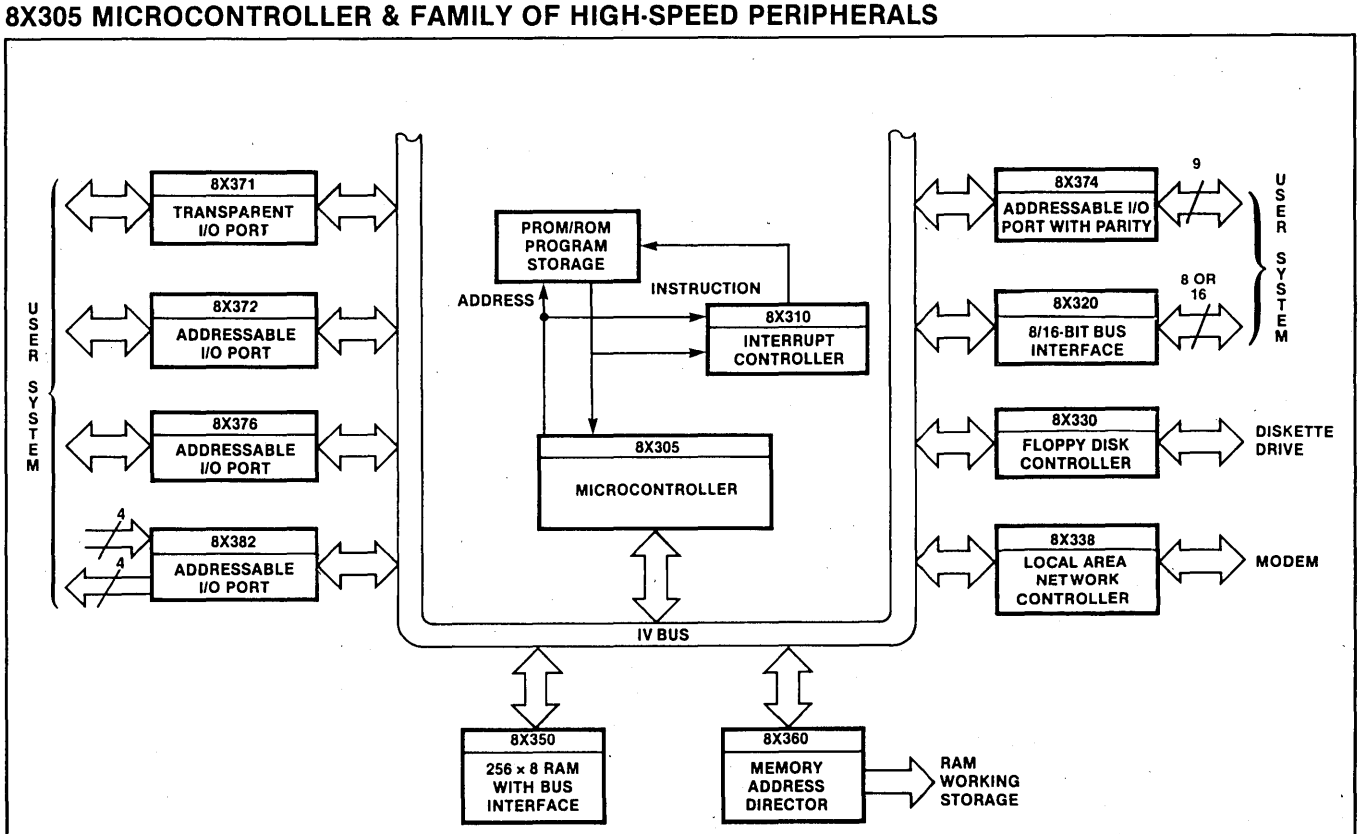
ALL DIMENSIONS IN INCHES AND (MILLIMETERS)

© IC MASTER 1983

BIPOLAR MICROPROCESSORS 8X300 FAMILY

FEATURES	USER BENEFITS
■ MINIMUM PARTS COUNT	• Reduced Cost • Extended Life of Product
■ BIPOLAR DEVICE USING LOW-POWER SCHOTTKY TECHNOLOGY	• Full System Drive Without Buffering • TTL Compatibility • Proven Reliability
■ HIGH PERFORMANCE	• Instruction Cycle Time of 200ns (8X305) or 250ns (8X300) • Bit Addressability — Instruction Data Formats of 1-to-8 Bits Without Added Delay
■ SOURCE/DESTINATION ARCHITECTURE	• Efficient Use of Fixed Instruction Set • Easy to Program • Well-Suited for Control Applications
■ DESIGN FLEXIBILITY	• Single-Chip Processor • Full Complement of Support Devices
■ AFTER-SALES SUPPORT	• Development Systems • Training • Complete Documentation • Applications Support from Qualified Field Engineers

8X305 MICROCONTROLLER & FAMILY OF HIGH-SPEED PERIPHERALS



NOTES
1. The shaded devices are designed to take advantage of the improved performance of the 8X305.
2. Refer to "Reference Table" on next page for a descriptive summary of each part in the 8X300 Family.
3. The actual parts used in a specific system are selected based on the application requirements.

Signetics

© IC MASTER 1983

BIPOLAR MICROPROCESSORS 8X300 FAMILY

PRODUCT LINE OVERVIEW

The Bipolar LSI Microprocessor product line is centered around two high-speed Schottky-fabricated, MicroControllers and an ever-expanding family of I/O devices, support ICs, and development tools to expedite and simplify systems design. No other microprocessor product line offers the advantages of the 8X300 Family in systems that require intelligent control of high-speed data streams.

Both the "new generation (8X305)" and the "old generation (8X300)" MicroControllers can fetch, decode, and execute an instruction in one machine cycle (200ns for the 8X305 and 250ns for the 8X300). In a single instruction, data can be read from the bus, masked, shifted, an ALU operation performed, after which the data can be rotated, merged, and returned to the bus. The architecture and instruction set of each MicroController are designed to provide high data throughput with both bit and byte oriented operations. The 8X305 offers more on-chip registers and significant data handling capability improvements over the original 8X300.

Because of its extremely high performance, the 8X300 Family permits many applications that would normally require special hardware to be implemented in software. For example, using the 8X305 MicroController, the 8X338 Local Area Network Controller, program memory, and a few support devices, a complete Local Area Network controller can be built using less than ten ICs. The design is programmable and provides complete support for the proposed IEEE802 token pass standard.

The 8X300 Family is implemented using bipolar, Low-power Schottky technology to provide TTL speeds and drive capability without additional buffering. In addition, the family is compatible with most special-purpose devices often required in control applications. The excellent environmental characteristics of the technology make the 8X300 Family ideal for military applications as well.

To simplify design with the 8X300 Family of parts, a complete complement of development-support tools is available. A self-contained universal development system that supports full speed in-circuit emulation is available; also available are evaluation and demonstration systems. Software modules are provided so that mainframes or minicomputers can be used to generate compatible software. Complete documentation is in place, including both data sheets and comprehensive reference manuals. To supplement these tools, Signetics employs a large, professional staff of applications engineers both in the field and at the factory to support your design efforts.

REFERENCE TABLE FOR 8X300 FAMILY

PART DESIG		PRODUCT DESCRIPTION	FUNCTION
NEW GEN	OLD GEN		
	8X300	MicroController	250ns processor for I/O and data control
8X305		MicroController	200ns processor for I/O and data control
8X310		Interrupt Controller	3 prioritized interrupts with 4-level stack
8X320		Bus Interface Array	2-port RAM for 8/16-bit mailbox interfacing
8X330		Floppy Disk Controller	1Mb/sec data rate, programmable, supports ECC
8X338		Local Area Network Controller	8-bit interface to MODEM
8X350		Bipolar RAM	256 x 8 high-speed memory with bus interface
8X360		Memory Address Director	16-bit address controller for working storage
8X371		Transparent I/O Port	High-speed, 8-bit bidirectional, 3-state
8X372		Addressable I/O Port	High-speed, 8-bit bidirectional, synchronous, 3-state
8X374		Addressable I/O Port with Parity	
8X376		Addressable I/O Port	High-speed, 8-bit bidirectional, asynchronous, 3-state
8X382		Addressable I/O Port	High-speed, 4-in/4-out, 3-state
	8T31/8X31	Transparent I/O Port	8-bit, bidirectional, 3-state
	8T32/8X32	Addressable I/O Port	8-bit bidirectional, synchronous, 3-state
	8T33	Addressable I/O Port	8-bit bidirectional, synchronous, open collector
	8T35	Addressable I/O Port	8-bit bidirectional, asynchronous, open collector
	8T36/8X36	Addressable I/O Port	8-bit bidirectional, asynchronous, 3-state
	8T39	Addressable Bus Expander	Data bus driver
	8X42	Addressable I/O Port	4-in/4-out, 3-state
	8T58	Transparent Bus Expander	High-drive bus driver

	PIN COUNT	PACKAGE WIDTH	PLASTIC	CERAMIC	CERDIP	COMMERCIAL	MILITARY	VOLTAGE	CURRENT (TYPICAL) (mA)
8X305	50	.9"	√	√		√	√	V_{CC} 5.0 V_{CR} 3.0*	180 200
8X310	40	.6"	√	√		√	√	V_{CC} 5.0	180
8X320	40	.6"	√	√		√		V_{CC} 5.0	270
8X330	40	.6"	√			√		V_{CC} 5.0 V_{CR} 3.0*	200 250
8X338	40	.6"	√			√		V_{CC} 5.0 V_{CR} 3.0*	180 250
8X350	22	.4"	√		√	√	√	V_{CC} 5.0	135
8X360	40	.6"	√	√		√	√	V_{CC} 5.0 V_{BB} 1.5	70 130
8X371	24	.4"	√	√		√	√	V_{CC} 5.0	90
8X372	24	.4"	√	√		√	√	V_{CC} 5.0	90
8X374	28	.6"	√		√	√	√	V_{CC} 5.0	100
8X376	24	.4"	√	√		√	√	V_{CC} 5.0	90
8X382	24	.4"	√	√		√	√	V_{CC} 5.0	90

*Internally Generated

© IC MASTER 1983

MICROCONTROLLER 8X305 AND 8X300

N8X305N, N8X305I, S8X305I, N8X300I

PRODUCT DESCRIPTION

The Signetics 8X305 MicroController is a high-speed bipolar microprocessor implemented with low-power Schottky technology. In a single chip, the 8X305 combines speed, flexibility, and a bit-oriented instruction set. These features and other basic characteristics of the chip combine to provide cost-effective solutions for a broad range of applications. The 8X305 is particularly useful in systems that require high-speed bit manipulations — sophisticated controllers, data communications, very fast interface control, and other applications of a similar nature.

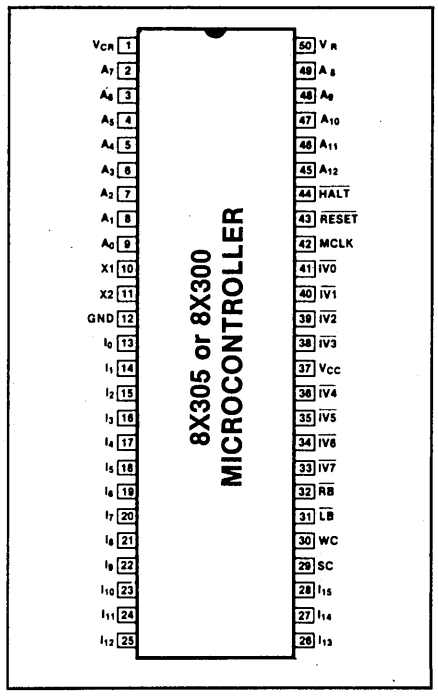
The 8X305 can fetch, decode, and execute a 16-bit instruction word in a minimum of 200 nanoseconds. Within one instruction cycle, the 8-bit data-processing path can be programmed to rotate, mask, shift, and/or merge single or multiple bit subfields and, in addition, perform an ALU operation; in the same instruction, an external data field can be input, processed, and output to a specified destination — likewise, single or multiple bit data fields can be internally moved from a given source to a given destination. To summarize, fixed or variable-length data fields can be fetched, processed, operated on by the ALU, and moved to a different location — all in a timeframe of 200 nanoseconds. To interface with I/O and program memory, the 8X305 uses a 13-bit instruction address bus, a 16-bit instruction bus, an 8-bit bidirectional multiplexed I/O data/address bus and a 5-bit I/O control bus.

A wide selection of I/O devices, interface chips, and special-purpose parts are available for systems use. In most applications, the more powerful 8X305 is functionally interchangeable with its predecessor — the 8X300.

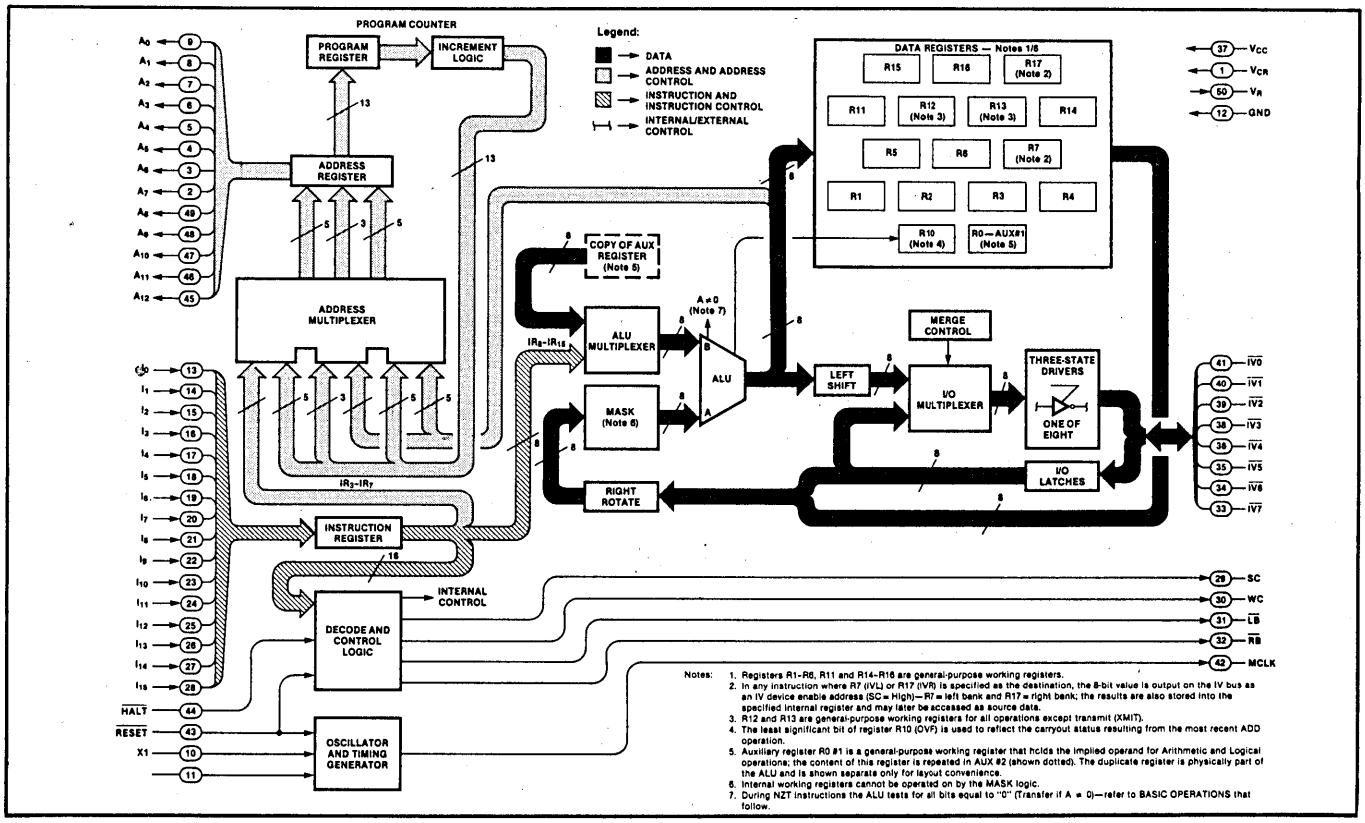
FEATURES

- **Fetch, Decode, and Execute a 16-bit instruction in one machine cycle —**
  8X305: Commercial = 200ns
  Military = 250ns
  8X300: Commercial = 250ns
- **Bit-oriented instruction set (addressable single-or-multiple bit subfields)**
- **Separate buses for Instruction, Instruction Address and I/O (Three-State I/O for 8X305)**
- **Thirteen 8-bit general-purpose working registers for 8X305 (Eight 8-bit working registers for 8X300)**
- **Source/destination architecture**
- **Bipolar low-power Schottky technology/TTL inputs and outputs**
- **On-chip oscillator and timing generation**
- **Single +5V supply**
- **0.9-in. 50-pin DIP**

PIN CONFIGURATION



BLOCK DIAGRAM OF 8X305 MICROCONTROLLER



Notes:
1. Registers R1-R6, R11 and R14-R16 are general-purpose working registers.
2. In any instruction where R7 (IVL) or R17 (IVR) is specified as the destination, the 8-bit value is output on the IV bus as an IV device enable address (SC = High)—R7 = left bank and R17 = right bank; the results are also stored into the specified internal register and may later be accessed as source data.
3. R12 and R13 are general-purpose working registers for all operations except transmit (XMIT).
4. The least significant bit of register R10 (OVF) is used to reflect the carryout status resulting from the most recent ADD operation.
5. Auxiliary register R0 #1 is a general-purpose working register that holds the implied operand for Arithmetic and Logical operations; the content of this register is repeated in AUX #2 (shown dotted). The duplicate register is physically part of the ALU and is shown separate only for layout convenience.
6. Internal working registers cannot be operated on by the MASK logic.
7. During NZT instructions the ALU tests for all bits equal to "0" (Transfer if A ≠ 0)—refer to BASIC OPERATIONS that follow.

© IC MASTER 1983

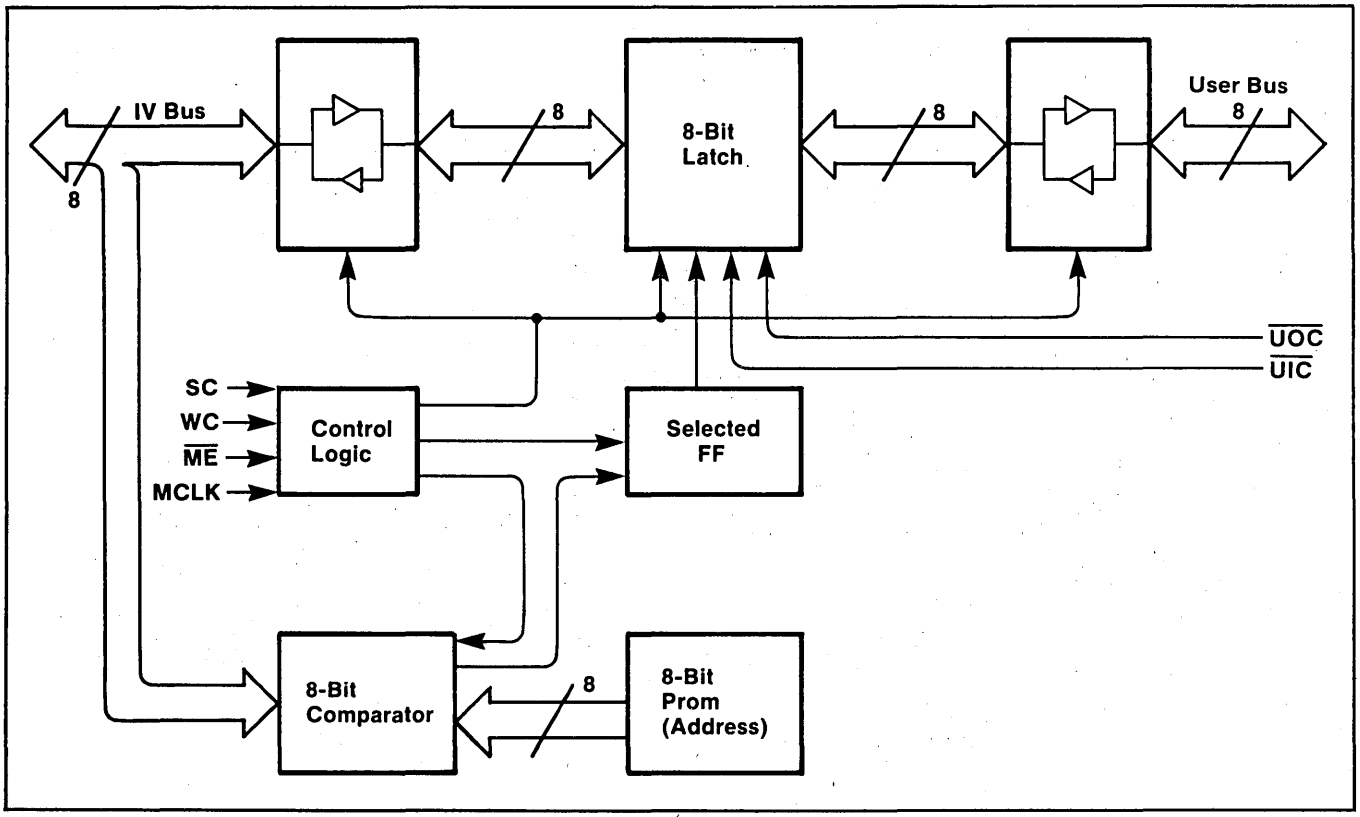
I/O PORTS 8X300 FAMILY

PRODUCT DESCRIPTION

The 8X300 MicroController Family is supported by a series of I/O Ports designed to simplify interfacing with the IV bus. These devices are bidirectional latches designed for direct attachment to the MicroController's IV bus and control signals. They are available in a wide variety of different configurations as shown in the table below to support the vast majority of design alternatives. Addressable versions of the devices are available with the IV bus address preprogrammed at the factory, or can be ordered unaddressed for subsequent programming by the user (a programming module is available from Data I/O). The 8X371, 8X372, 8X374, 8X376, and 8X382 are capable of operation at a 200ns cycle for full-speed suport of Signetics 8X305 MicroController; other ports in the family will support the 8X300. The recently announced 8X374 provides parity checking and generation in addition to the functions of the other devices, and is ideal for use in mainframe or military applications where extremely high data integrity assurance is required. While the devices are specifically designed for operation with the 8X300 MicroController Family, numerous applications use the devices independently due to their speed and versatility. The 8X300 Family I/O Ports are implemented using Bipolar Low-Power Schottky technology.

	8-BIT BIDIRECTIONAL	4/IN-4/OUT	ADDRESSABLE	FAST I/O SELECT	SYNCHRONOUS	ASYNCHRONOUS	TRI-STATE	OPEN COLLECTOR	PARITY GEN/CHECK	24-PIN, .4" PACKAGE	24 PIN, .6" PACKAGE	28-PIN, .6" PACKAGE	200ns OPERATION
8T31	✓		✓	✓	✓		✓				✓		
8T32	✓		✓		✓		✓				✓		
8T33	✓		✓		✓			✓			✓		
8T35	✓		✓			✓		✓			✓		
8T36	✓		✓			✓	✓				✓		
8X31	✓		✓	✓	✓		✓			✓			
8X32	✓		✓		✓		✓			✓			
8X36	✓		✓			✓	✓			✓			
8X42		✓	✓		✓		✓			✓			
8X371	✓		✓	✓	✓		✓			✓			✓
8X372	✓		✓		✓		✓			✓			✓
8X374	✓		✓		✓		✓		✓			✓	✓
8X376	✓		✓			✓	✓		✓	✓			✓
8X382		✓	✓		✓		✓			✓			✓

FUNCTIONAL BLOCK DIAGRAM OF ADDRESSABLE I/O PORTS



© IC MASTER 1983

INTERRUPT CONTROL COPROCESSOR 8X310

N8X310N, N8X310I, S8X310I

PRODUCT DESCRIPTION

The Signetics 8X310 Interrupt Control Coprocessor (ICC) supports the 8X305 MicroController in systems that are interrupt driven and those that require subroutine handling capabilities. As shown in the System Configuration, the ICC monitors the binary flow of information on the instruction and address busses to capture and decode all instructions relating to the interrupt and subroutine-handling capabilities of the device. These instructions are five in number — *Set Mask*, *Clear Mask*, *Push*, *Return*, and *Clear Interrupt*.

All ICC instructions are treated as NOPs by the MicroController; likewise, valid instructions of the 8X305 are perceived as NOPs by the ICC.

The user can initiate up to three interrupts via prioritized inputs INT 0, INT 1, and INT 2—the highest priority being INT 0 and the lowest being INT 2. the status of each interrupt input is automatically sampled during each instruction cycle of the MicroController. When an interrupt is acknowledged, the ICC forces the MicroController to jump to a preassigned location in Program Memory. Each preassigned memory location corresponds to a specific interrupt, that is, address 4 is assigned to INT 0, address 5 to INT 1, and address 6 to INT 2. In each of the three locations, the user stores a branch to a vector address instruction in Program Memory where the appropriate interrupt service routine is located. Addresses 4, 5, and 6 are dedicated memory locations and address 0 is always decoded as a reset instruction; addresses 1, 2, and 3 are available for initialization and other setup operations of the system.

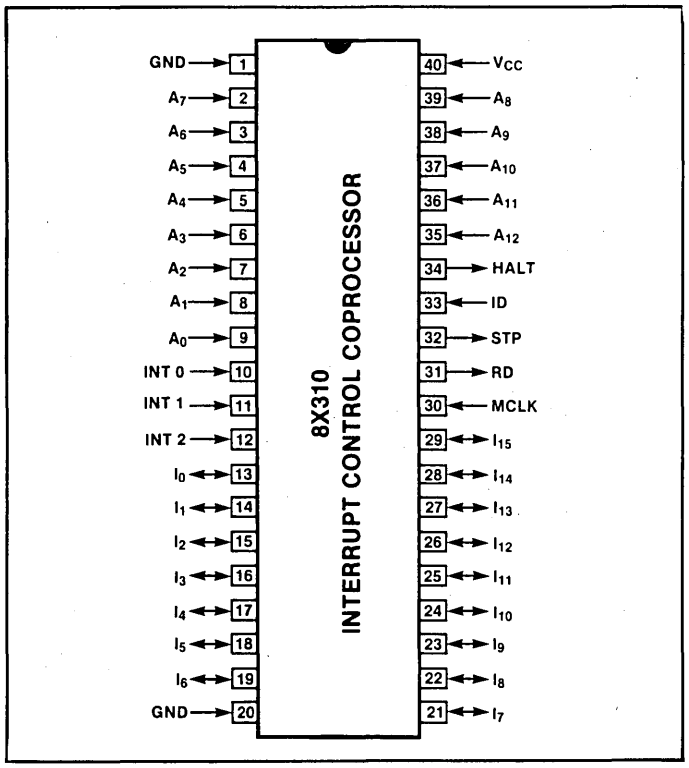
The ICC can efficiently handle subroutine branches from the main program or subroutine branches nested in the interrupt service routine; in either case, the limiting factor is the number of vacancies in the LIFO stack. The user can program the ICC to set or clear interrupt masks and, if desired, to clear all pending interrupts.

In short, the ICC brings some unique and very flexible facilities to an 8X350-based system. Besides the interface management that prevents race conditions and conflicting actions within the system, the ICC also offers the user some software capabilities that improves efficiency and minimizes memory space. These features, both from a chip and system point-of-view, are described in subsequent paragraphs.

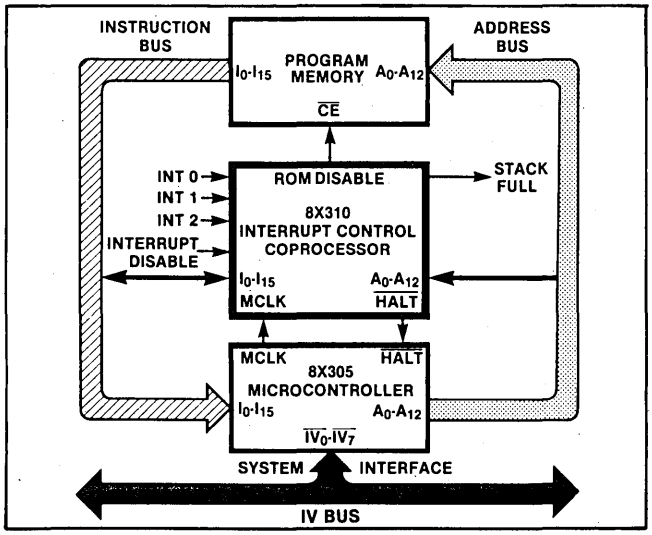
FEATURES

- **Three Maskable, Prioritized Interrupts**
- **Subroutine Handling Capabilities**
- **4-Level LIFO Stack**
- **Interrupt Disable**
- **Stack Full Flag**
- **Directly Compatible with 8X305 MicroController**
- **Bipolar ISL and Low-Power Schottky Technology**
- **Single +5V Power Supply**
- **40-Pin DIP**

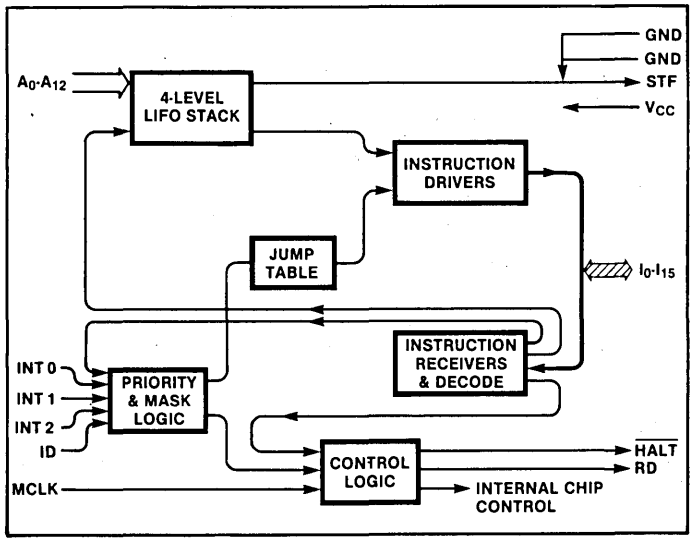
PIN CONFIGURATION



SYSTEM CONFIGURATION



BLOCK DIAGRAM OF INTERRUPT COPROCESSOR



Signetics

© IC MASTER 1983

BUS INTERFACE REGISTER ARRAY 8X320

N8X320N

PRODUCT DESCRIPTION

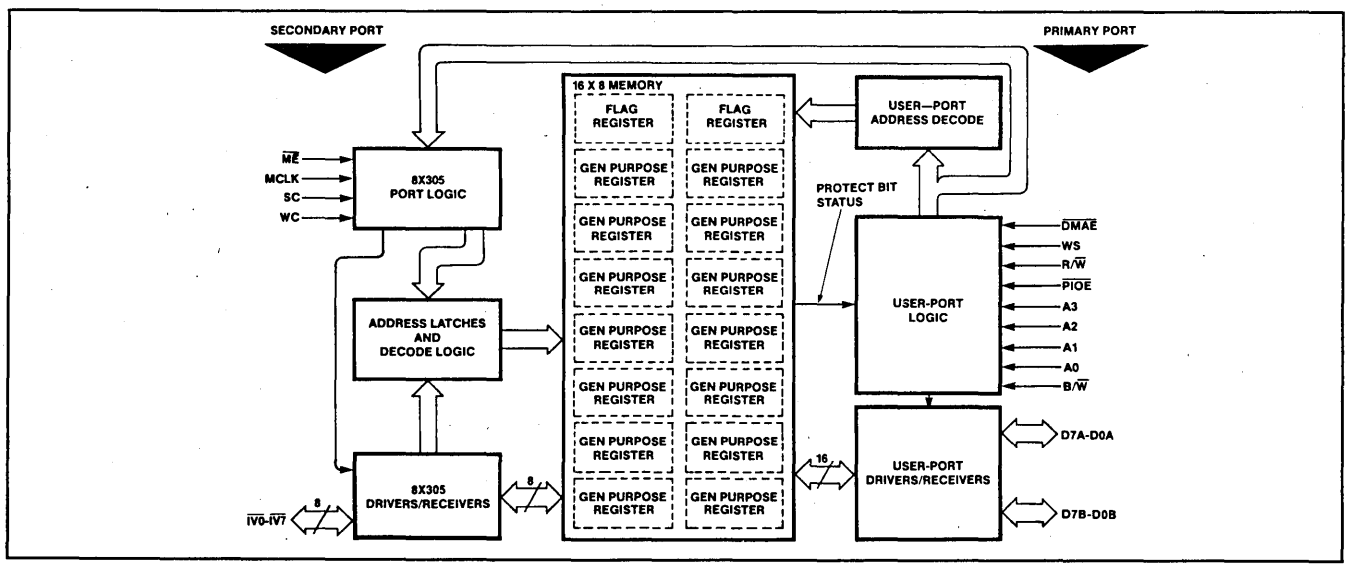
The Signetics 8X320 Bus Interface Register Array is a dual-port RAM memory designed for use between a host processor and a peripheral processor. Specifically, the register array provides a convenient and economical interface between the 8X305 Micro-Controller (secondary port) and User's Host System (primary port); the host can be almost any bus-oriented device—another processor, a minicomputer, or a mainframe computer. The host has 8-bit (byte) or 16-bit (word) access to the primary port; data can be read-from or written-into any memory location as determined by the primary-port address and control lines. The secondary port (8X305 bus) consists of eight input/output lines and four bus control lines. To implement the secondary-port interface, an 8-bit memory location is addressed during one machine cycle and, during another cycle, data is read or written under control of the secondary (8X305) processor. Both primary and secondary ports feature three-state outputs and both ports are bidirectional.

Besides the convenience and economy of a two-port memory, the array also provides simple handshake control via two 8-bit flag registers, logic to facilitate DMA transfers, and a write-protect feature for the primary port in both byte and word modes of operation.

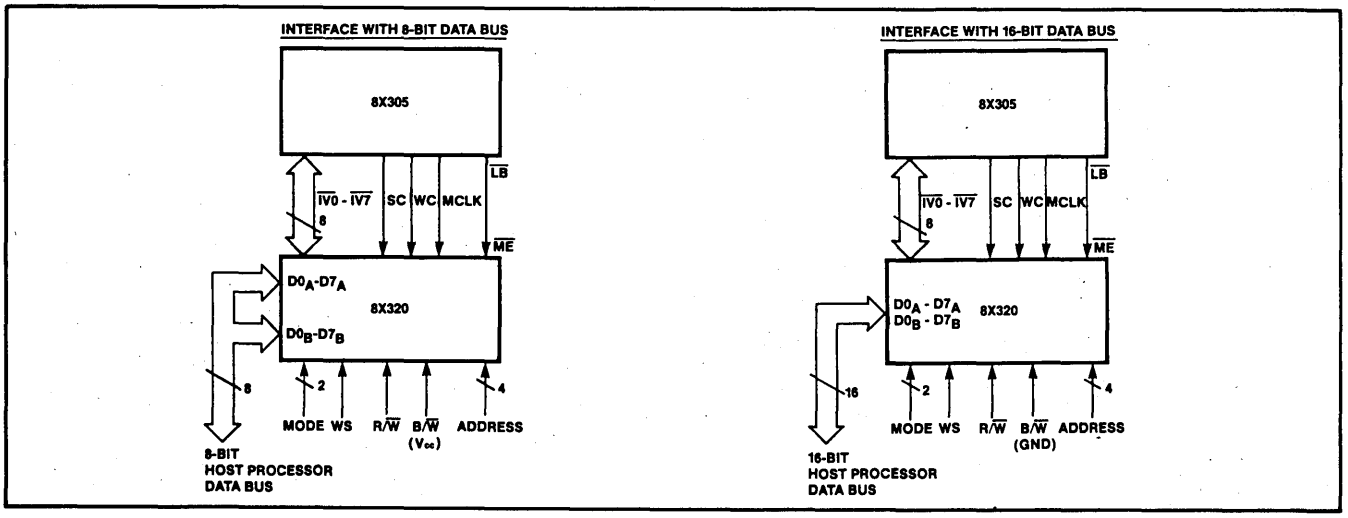
FEATURES

- **16-Byte/2-Port interface**
- **8 or 16 Bit primary-port (Host) interface (user selectable)**
- **8-Bit secondary-port interface**
- **Two 8-Bit flag registers (handshake control)**
- **DMA or programmed I/O operation**
- **Two Three-State Bidirectional Ports**
- **Secondary Port is bus compatible with 8X305**
- **Single 5V supply**
- **40-Pin package**

BLOCK DIAGRAM OF 8X320



8X320 Applications



© IC MASTER 1983

FLOPPY DISK FORMATTER/CONTROLLER 8X330

N8X330N

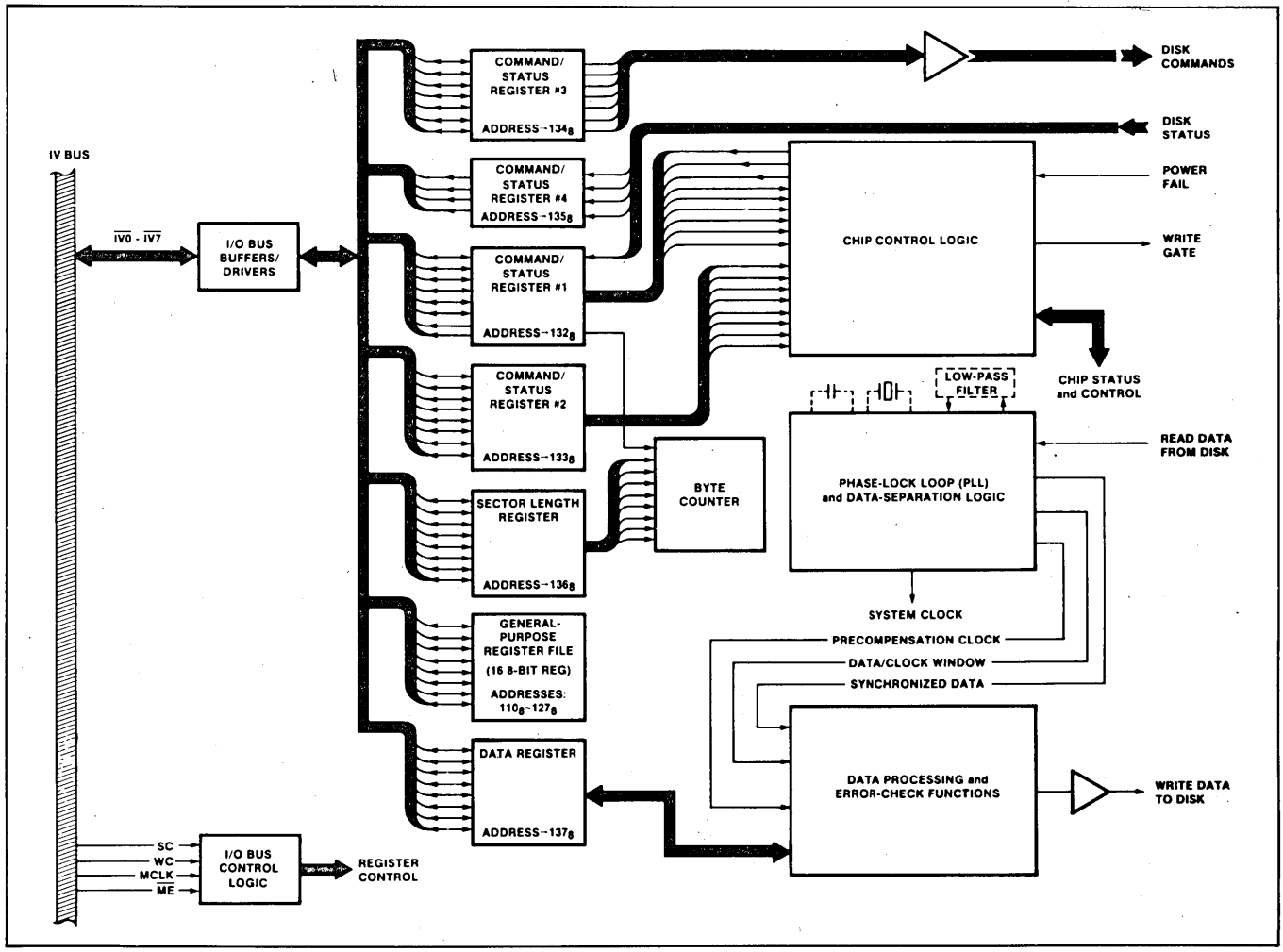
PRODUCT DESCRIPTION

The Signetics 8X330 Floppy Disk Formatter/Controller is a special purpose member of the 8X300 Family designed to provide all control and data transfer functions required for diskette drives. The device is programmable, permitting the use of virtually any format on the diskette. It is capable of data rates of up to 1 Megabit/second to support both current generation and future drives. The 8X330 is unique among Floppy Disk controller ICs in that all functions and encoding schemes are supported on the chip, including a PLL data separator, write precompensation, address mark and preamble detection, and power failure protection. In addition, 16 bytes of scratchpad RAM are provided for storage of control and status parameters. Twelve user definable command and status lines are also provided for. Using the 8X330 coupled with an 8X305 MicroController and an external low pass filter, a complete controller can be built using less than ten ICs. If desired, Error Checking and Correction (ECC) can be implemented in 8X305 software since the 8X330 optionally provides the CRC remainder required to perform correction. The 8X330 Floppy Disk Formatter/Controller is implemented using a combination of Bipolar Schottky and I^2L technologies to provide these advanced functions.

FEATURES

- **Single or double density encoding/decoding**
- **On-chip data separator**
- **Programmable:**
  - **FM, MFM, and M^2FM encoding/decoding**
  - **Preamble Polarity**
  - **Data transfer rate**
  - **Address mark encoding/decoding**
  - **Sector length**
  - **Output port (7-bits disk command)**
  - **Input port (5-bits disk status)**
- **Write Precompensation with on/off control**
- **On-chip phase lock loop**
- **CRC generator with software-controlled error correction capabilities**
- **40-pin package**
- **+5 volt operation**

BLOCK DIAGRAM



Signetics

© IC MASTER 1983

LOCAL AREA NETWORK CONTROLLER 8X338

N8X338N

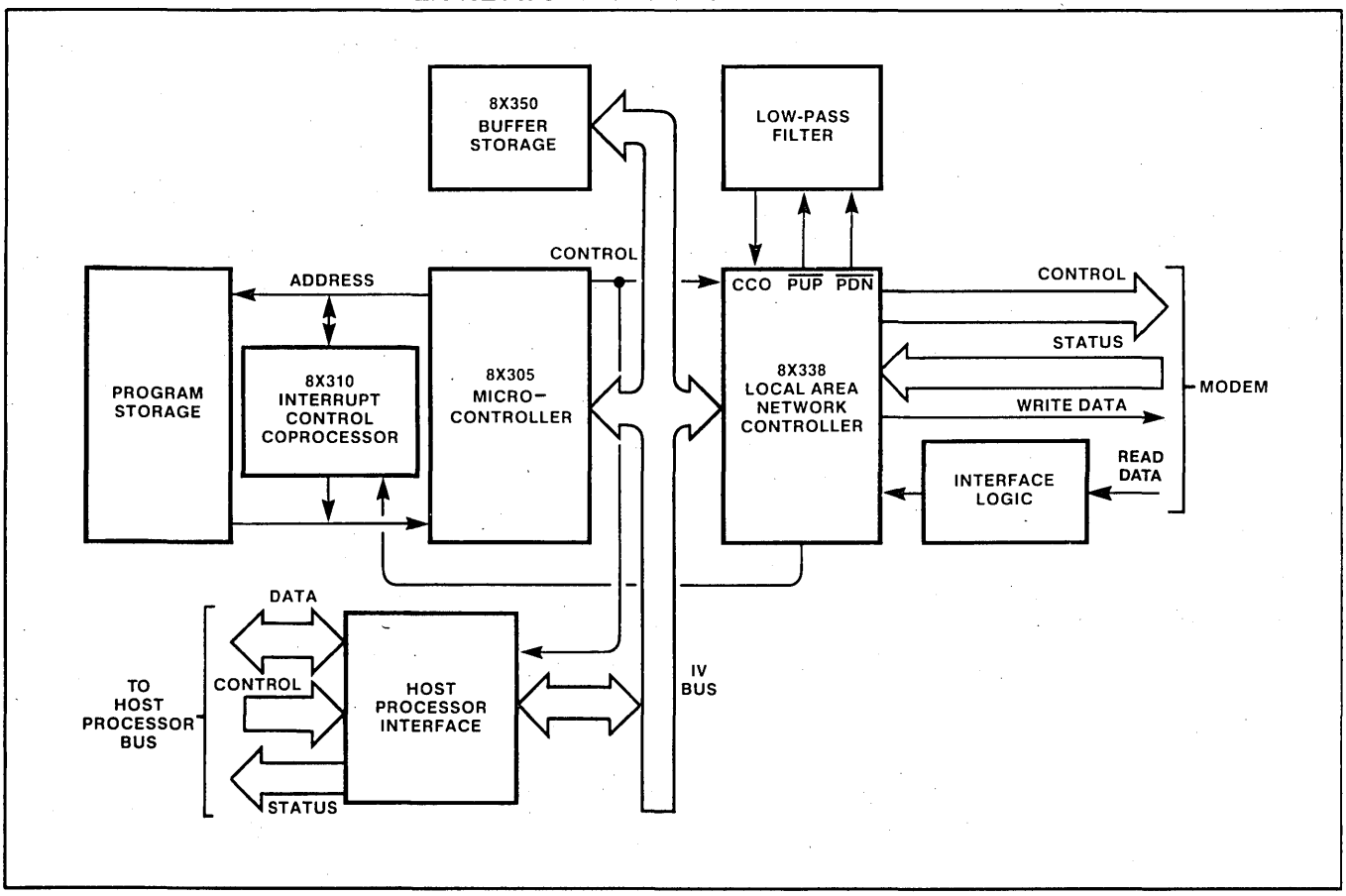
PRODUCT DESCRIPTION

The Signetics 8X338 Local Area Network Controller is a special purpose member of the 8X300 Family that provides the control and data handling functions required to interface with a Local Area Network that conforms with the proposed IEEE802 token-pass standard. The device is programmable, permitting the flexibility required to work with the standard as it evolves. The device operates at a data rate of 1 Megabit/second, as required for the current baseband specification. The first monolithic controller that supports the token-pass protocol, the 8X338 provides all modem control functions required by the proposed standard and supports Differential Manchester encoding/decoding through an on-chip PLL data separator. In addition to preamble header detection and power failure protection, the 8X338 contains 16 bytes of scratchpad RAM for storage of control and status parameters. Command and status lines are user definable. Using the 8X338 Local Area Network Controller coupled with an 8X305 MicroController and an external low pass filter, a complete node controller can be built using less than 10 ICs, as shown in the block diagram below. Error Checking and Correction (ECC) is implemented in 8X305 software. The 8X338 Local Area Network Controller is implemented using a combination of Bipolar Schottky and I^2L technologies to provide these advanced functions.

FEATURES

- **Supports Differential Manchester encoding**
- **1 MBit/sec data transfer rate**
- **On-chip PLL data separator**
- **Compatible with proposed IEEE802 token pass**
- **Sixteen 8-bit scratchpad registers**
- **User definable control and status lines**

8X305/8X338 BASED LOCAL AREA NETWORK CONTROLLER



Signetics

© IC MASTER 1983

2048-BIT BIPOLAR RAM (256×8) 8X350

N8X350N, N8X350F

DESCRIPTION

The 8X350 bipolar RAM is designed principally as a working storage element in an 8X305-based system. Internal circuitry is provided for direct use in 8X305 applications. When used with the 8X305 the RAM address and data busses are tied together and connected to the IV bus of the system.

The data inputs and outputs share a common I/O bus with 3-state outputs.

The 8X350 is available in commercial and military temperature ranges.

FEATURES

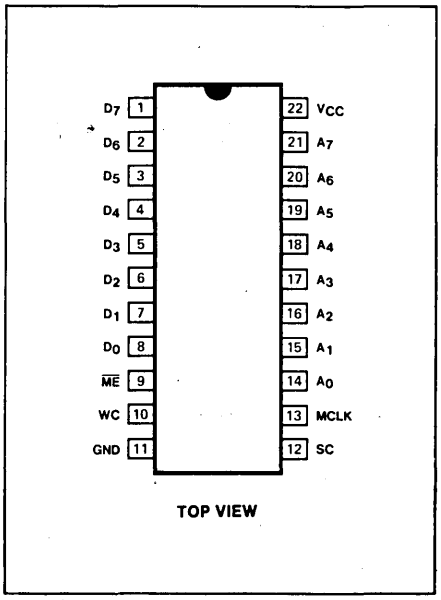
- **On-chip address latches**
- **3-state outputs**
- **Schottky clamped TTL**
- **Internal control logic for 8X305 system**
- **Directly interfaces with the 8X305 Bipolar MicroController with no external logic**

TRUTH TABLE

$\overline{ME}$	SC	WC	MCLK	BUSSED DATA/ADDRESS LINES
1	X	X	X	High Z data out
0	1	0	1	Address High Z
0	1	0	0	High Z data out
0	0	1	1	Data in
0	0	1	0	High Z data out
0	0	0	X	Data out
0	1	1	1	—
0	1	1	0	High Z data out

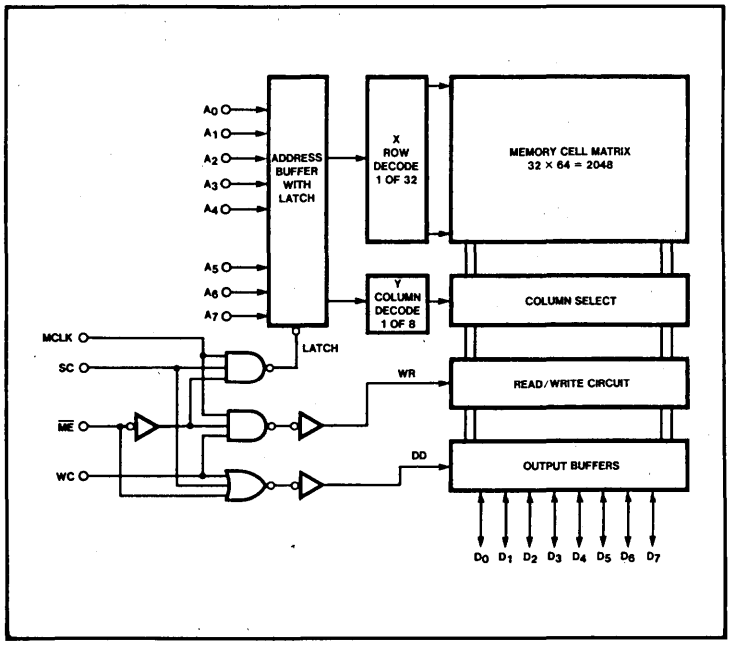
X = Don't care

PIN CONFIGURATION

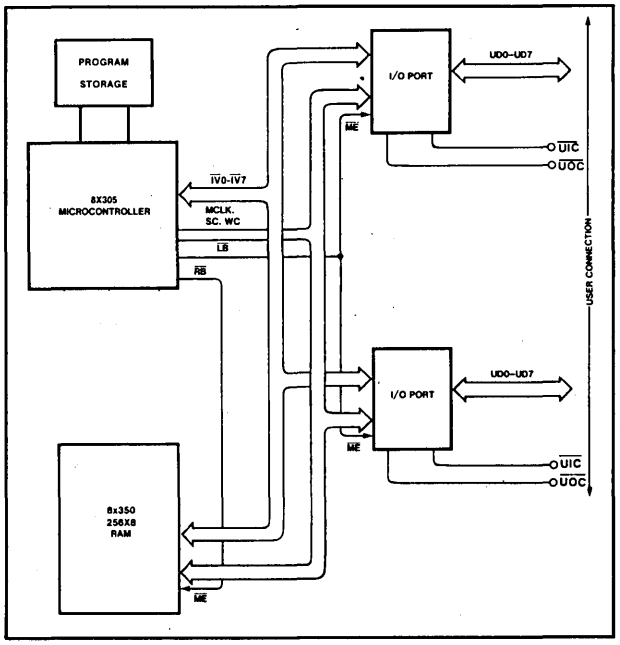


TOP VIEW

BLOCK DIAGRAM



8X350 APPLICATIONS



© IC MASTER 1983

MEMORY ADDRESS DIRECTOR 8X360

N8X360N, N8X360I, S8X360I

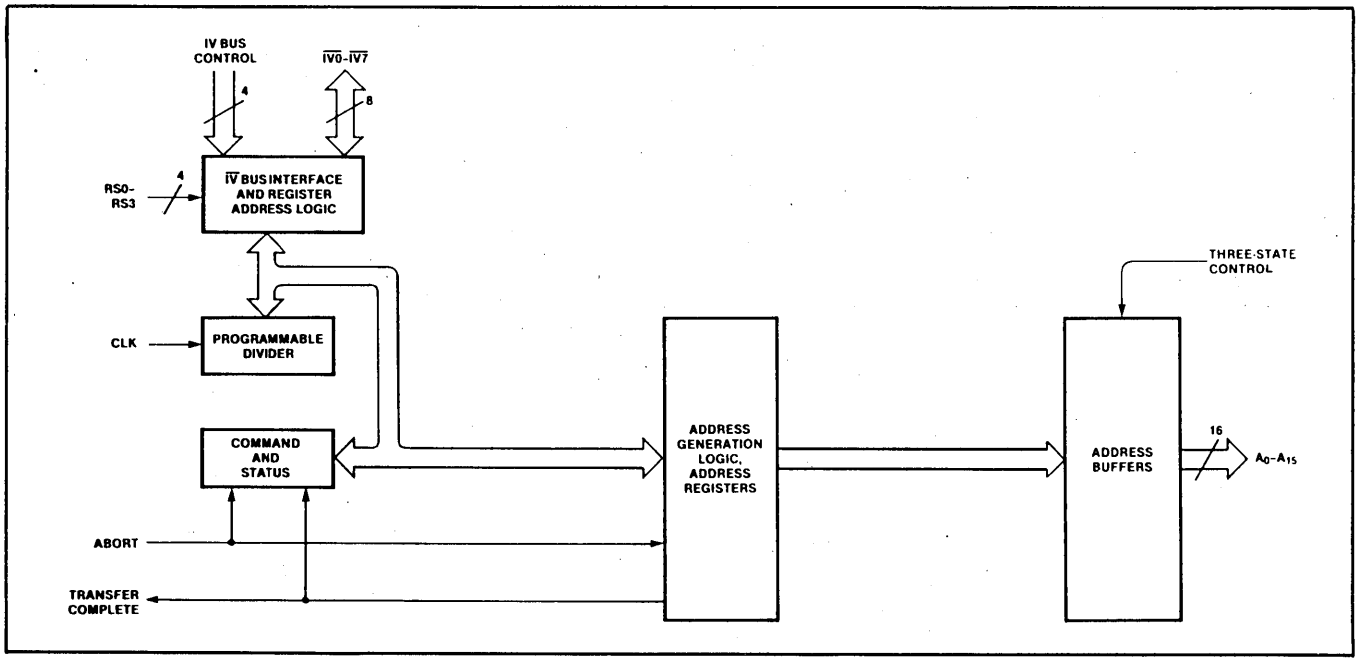
PRODUCT DESCRIPTION

The 8X360 Memory Address Director (MAD) is a high-performance member of the 8X300 Family that generates sequential memory addresses to facilitate the transfer of data to and from memory. The MAD provides a highly-efficient and cost-effective solution for DMA and other applications requiring large working-storage memories and high-speed data transfers. Once initialized with such information as starting address, ending address, byte count, address increment, address decrement, etc., the 8X360 performs all bookkeeping chores automatically and all address-management software is off-loaded from the processor. The 8X360 can be addressed by conventional means or by extended microcode; system status is available to the user via I/O pins.

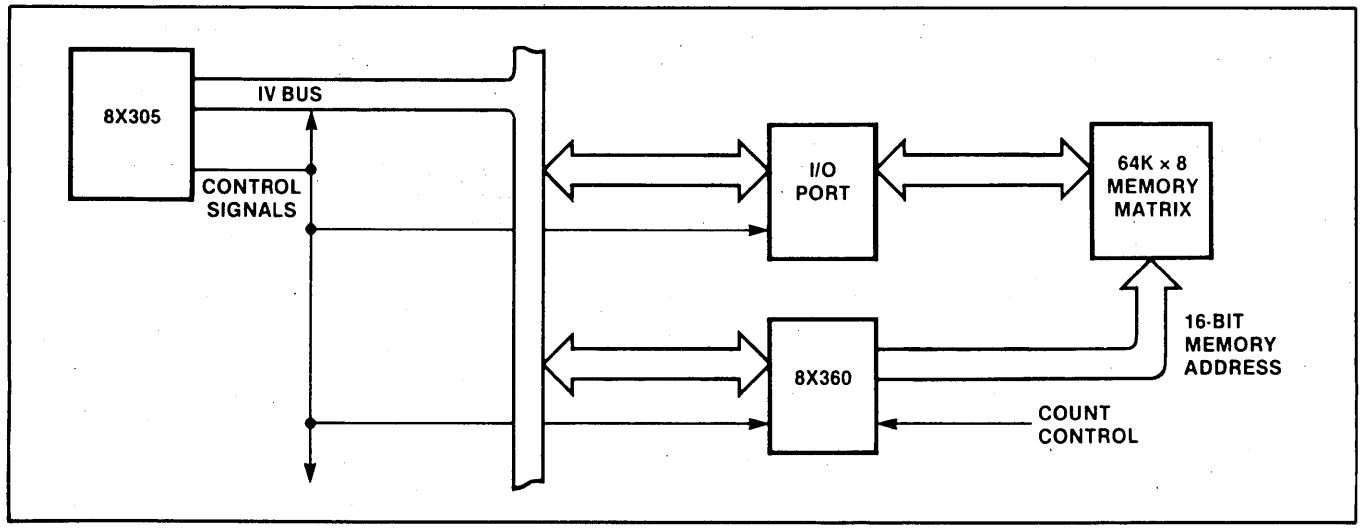
FEATURES

- **Address control for working storage**
- **16-bit addressing capability**
- **Byte and word addressing support**
- **Automatic increment and decrement**
- **11 Address and word-count registers**
- **Reduces number of 8X305 instructions required**

BLOCK DIAGRAM OF 8X360



8X360 APPLICATIONS



Signetics

© IC MASTER 1983

BUS EXPANDERS 8T39/8T58

N8T39N, N8T58N

DESCRIPTION

The Bus Expander is specifically designed to increase the I/O capability of 8X300 systems previously limited by fanout considerations. The bus expander serves as a buffer between the 8X300 and blocks of I/O devices. Each bus expander can buffer a block of 16 I/O ports while only adding a single load to the 8X300.

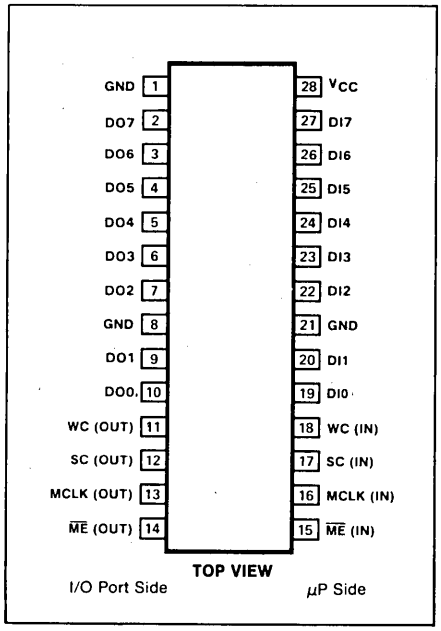
8T39 FEATURES

- **15ns max propagation delay**
- **Bidirectional**
- **Three-state outputs on both ports**
- **Pre-programmed address range**

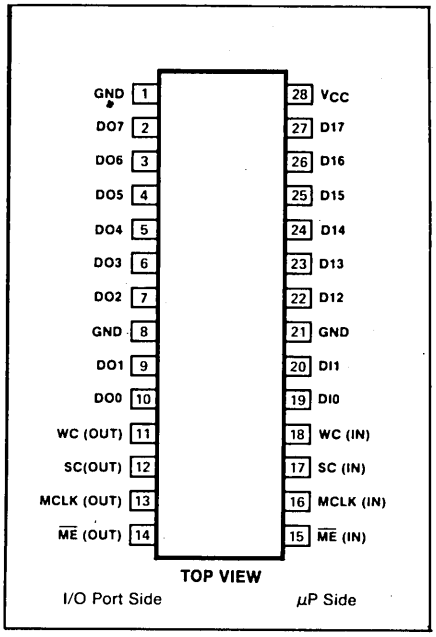
8T58 FEATURES

- **15ns max propagation delay**
- **Bidirectional**
- **Three-state outputs on both ports**

PIN CONFIGURATION—8T39



PIN CONFIGURATION—8T58



BIPOLAR LSI DIVISION

PRODUCT SUPPORT 8X300 FAMILY

SUPPORT FACILITIES

The 8X300 Family is strongly supported with Development Systems, Support Software, Applications, Training and Documentation. Together, this support provides the user with a powerful set of tools to evaluate, design, debug, and implement a simple or complex system.

DEVELOPMENT SYSTEMS

EZ-PRO (Manufactured by American Automation)

- Universal Development System
- Relocating macroassembler
- Full speed in-circuit emulator/debugger
- Maximum memory support

8X305 ICEPACK (Manufactured by Sigen Corp.)

- Full speed in-circuit emulator/debugger
- RS-232 interface to CP/M or Intellec
- 4K word memory/8-bit extended microcode
- Low cost

Signetics 8X305 Prototyping System

- Single board module
- RS-232 interface
- Resident monitor
- 256 to 4096 words of Writable Control Storage
- Minimum cost

SOFTWARE

MCCAP CrossAssembler

- Full function macroassembler
  - — Free format source code
  - — Symbolic address assignment
  - — Nested macro support
  - — Cross-reference table
  - — Supports extended microcode
- Multiple output formats
- Availabe in two versions
  - — FORTRAN source code
  - — Intellec/ISIS object code

APPLICATIONS SUPPORT

Field applications engineers
Product applications engineers
Application notes

- Floppy disk controller
- ECC
- Hard disk controller
- Local network interfacing

TRAINING AND DOCUMENTATION

- Videocassette training course
- Designer's seminar
- 8X305 User's Manual
- 8X300 Family Product Capabilities Manual
- MCCAP Programming Manual
- Full complement of Data Sheets

© IC MASTER 1983

MICROPROGRAM CONTROL UNIT SN3001

N3001N, N30011, S3007I

DESCRIPTION

The SN3001 MCU is 1 element of a bipolar microcomputer set. When used with the SN3002, 54/74S182, ROM or PROM memory, a powerful microprogrammed computer can be implemented.

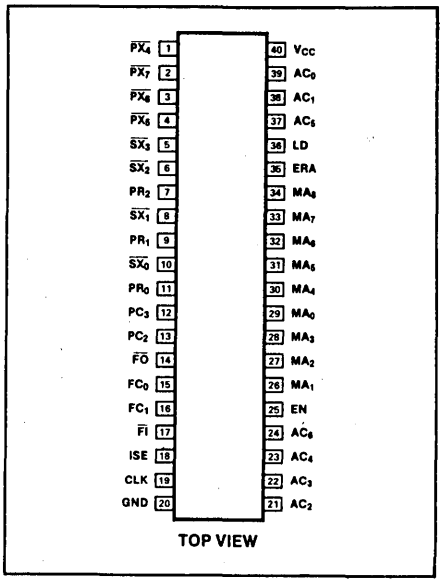
The 3001 MCU controls the fetch sequence of microinstructions from the microprogram memory. Functions performed by the 3001 include:

- Maintenance of microprogram address register
- Selection of next microinstruction address
- Decoding and testing of data supplied via several input buses
- Saving and testing of carry output data from the central processing (CP) array
- Control of carry/shift input data to the CP array
- Control of carry/shift input data to the CP array

FEATURES

- **Schottky TTL process**
- **45ns cycle time (typ.)**
- **Direct addressing of standard bipolar PROM or ROM**
- **512 microinstruction addressability**
- **Advanced organization:**
  - **9-bit microprogram address register and bus organized to address memory by row and column**
  - **4-bit program latch**
  - **2-flag registers**
- **11 address control functions:**
  - **3 jump and test latch function**
  - **16 way jump and test instruction**
- **8 flag control functions:**
  - **4 flag input functions**
  - **4 flag output functions**

PIN CONFIGURATION



TOP VIEW

CENTRAL PROCESSING ELEMENT SN3002

S30021, N3002F, N3002N

DESCRIPTION

The N3002 Central Processing Element (CPE) is one part of a bipolar microcomputer set. The N3002 is organized as a 2-bit slice and performs the logical and arithmetic functions required by microinstructions. A system with any number of bits in a data word can be implemented by using multiple N3002s, the N3001 microcomputer control unit, the N74S182 carry look-ahead unit and ROM or PROM memory.

FEATURES

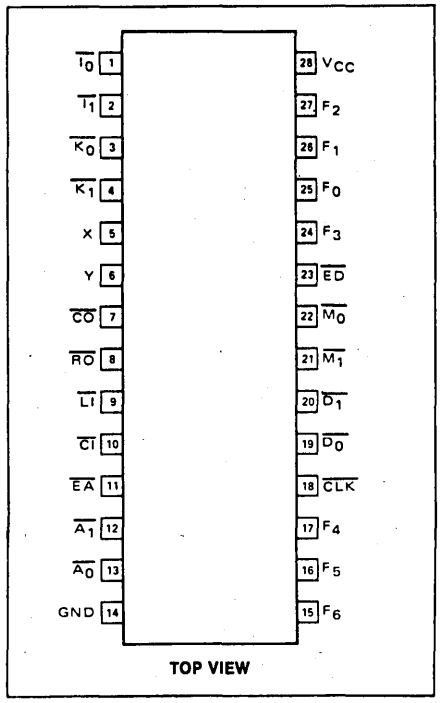
- **45ns cycle time (typ)**
- **Easy expansion to multiple of 2 bits**
- **11 general purpose registers**
- **Full function accumulator**
- **Useful functions include:**
  - **2's complement arithmetic**
  - **Logical AND, OR, NOT, exclusive-NOR**
  - **Increment, decrement**
  - **Shift left/shift right**
  - **Bit testing and zero detection**
  - **Carry look-ahead generation**
  - **Masking via K-bus**
  - **Conditioned clocking allowing non-destructive testing of data in accumulator and scratchpad**
- **3 input buses**
- **2 output buses**
- **Control bus**

FUNCTION TRUTH TABLE

FUNCTION GROUP	F_6	F_5	F_4
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0
7	1	1	1

REGISTER GROUP	REGISTER	F_3	F_2	F_1	F_0
I	R_0	0	0	0	0
	R_1	0	0	0	1
	R_2	0	0	1	0
	R_3	0	0	1	1
	R_4	0	1	0	0
	R_5	0	1	0	1
	R_6	0	1	1	0
	R_7	0	1	1	1
	R_8	1	0	0	0
	R_9	1	0	0	1
	T	1	1	0	0
	AC	1	1	0	1
II	T	1	0	1	0
	AC	1	0	1	1
III	T	1	1	1	0
	AC	1	1	1	1

PIN CONFIGURATION



TOP VIEW

Signetics

© IC MASTER 1983

CONTROL STORE SEQUENCER 8X02A

N8X02AN

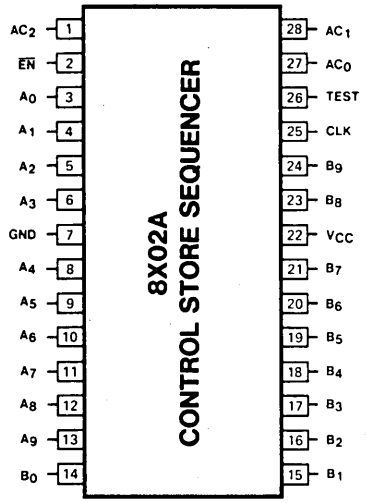
PRODUCT DESCRIPTION

The Signetics 8X02A Control Store Sequencer generates addresses to access instructions from a microprogram memory (control store). This high-speed device provides an efficient means of controlling the flow through a microprogram with a powerful set of sequencing functions. The 8X02A can directly address up to 1024 microinstructions; however, the total address space can be expanded by adding conventional paging techniques. Combined with memory, the 8X02A forms a powerful control section for CPU's, controllers, test equipment, and other microprogram-controlled systems.

FEATURES

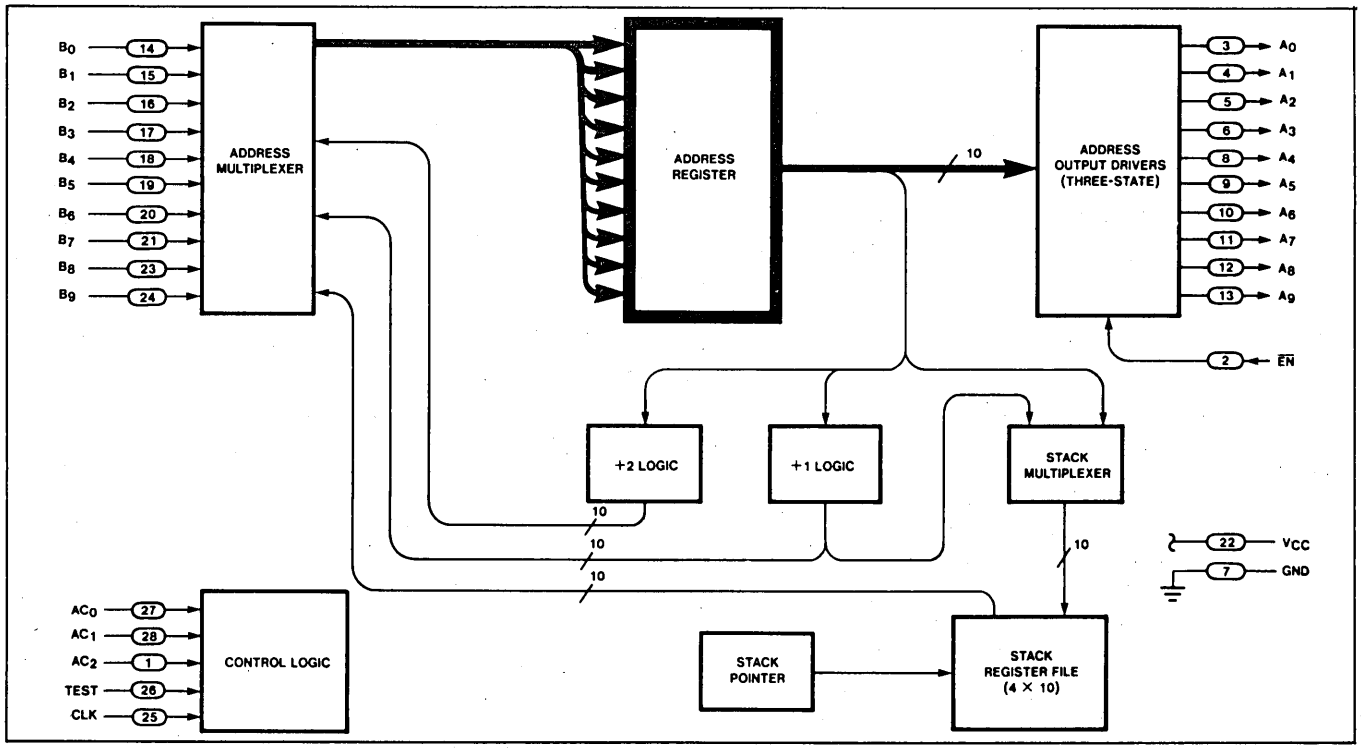
- **10-Bit Address Generator (1024 Microinstruction Addressability)**
- **Operating Frequency Exceeding 12 MHz**
- **Direct Branching Over Full Address Range**
- **Conditional Branching**
- **Subroutine Branching Capability**
- **4-Level Stack Register File**
- **Loop Control Facility Using Stack**
- **Three-State Address Outputs**

8X02A PACKAGE AND PIN DESIGNATIONS



PIN NO.	IDENTIFIER	FUNCTION
1, 28, 27	AC_2-AC_0	Inputs used to select any one of eight Address Control Functions—see Table 1.
2	$\overline{EN}$	Enable three-state address outputs (A_0-A_9); active-low input.
3-6, 8-13	A_0-A_9	Three-state address outputs used to specify microprogram address; (A_0 = LSB, A_9 = MSB).
7	GND	Ground.
14-21, 23, 24	B_0-B_9	Branch address inputs: (B_0 = LSB, B_9 = MSB).
22	V_{CC}	Supply voltage.
25	CLK	Clock input (positive edge used for all triggering).
26	TEST	Active-high condition input used to determine conditional skips, branches, subroutine calls, and loop termination.

BLOCK DIAGRAM



Signetics

© IC MASTER 1983

CRC GENERATOR/CHECKER 8X01A/9401

8X01AF, 8X01AN, N9401I, N9401N

PRODUCT DESCRIPTION

The CRC Generator/Checker (8X01A or 9401) provides error-correction capabilities for digital systems that handle serial data. The two parts differ in that the 8X01A provides Synchronous Data Link Control (SDLC).

The serial data stream is divided by a selected polynomial; the remainder resulting from this algebraic process is transmitted at the end of the data stream as a Cyclic Redundancy Check Character (CRCC). At the receiving end, the same calculation is performed on the data. If the received message is error-free, the calculated remainder should satisfy a predetermined pattern. In most cases, the remainder is zero; however, where SDLC protocols (8X01A only) are used, the correct remainder is 1111000010111000 (X^0-X^{15}).

Eight polynomials are provided and any of these can be selected via a 3-bit control bus. Popular polynomials, such as CRC-16 and CCITT are implemented and the one selected can be programmed to start with all zeroes or all ones. Right justification for polynomials of degree less than 16 is automatic.

FUNCTIONAL OPERATION

8X01A and 9401

The CRC Generator/Checker circuit provides a means of detecting errors in a serial data communications environment. A binary message can be interpreted as a binary polynomial H(x). This polynomial can be divided by a generator polynomial P(x) such that $H(x) = P(x)\,Q(x) + R(x)$ whereby Q(x) is the quotient and R(x) is the remainder. During transmission, the remainder is appended to the end of the message as check bits. For a given message, a unique remainder is generated.

Each polynomial can be selected via control inputs S_0, S_1 and S_2. To generate the check bits, the data stream is entered via the Data (D) input, using the high to low transition of the Clock ($\overline{CP}$) input. This data is gated with the most significant output (Q) of the shift register which, in turn, controls the exclusive OR gates. The Check Word Enable (CWE) must be held high while the data is being entered. After the last data bit is entered, the CWE is brought low and the check bits are shifted out of the register and appended to the data bits using external gating.

To check an incoming message for errors, both the data and check bits are entered through the "D" input with the CWE input held high. The 8X01A while not in the data path, monitors the message. After the last check bit is entered, in the 8X01A, the ERror output is made valid by a high-to-low transition of CP. If no error is detected during the data transmission, all bits of the internal register are low and the ERror output is also low; if an error is detected, it is reflected by the bit pattern and the ERror output is high. The ERror output status remains valid until the next high-to-low transition of CP or until initialized by the preset (P) or reset (MR) functions. The PME line must be high if the ERror output is used to indicate an all-zero result.

A high level applied to the Master Reset (MR) input asynchronously clears the shift register. A low level applied to the Preset (P) input asynchronously sets all bits to the appropriate state if the control-code inputs (S_0, S_1, and S_2) specify a 16-bit polynomial. In the case of check polynomials that are 8-or-12 bits in length, only the most significant 8-or-12 bits of the shift register are set; all remaining bits are cleared.

8X01A ONLY

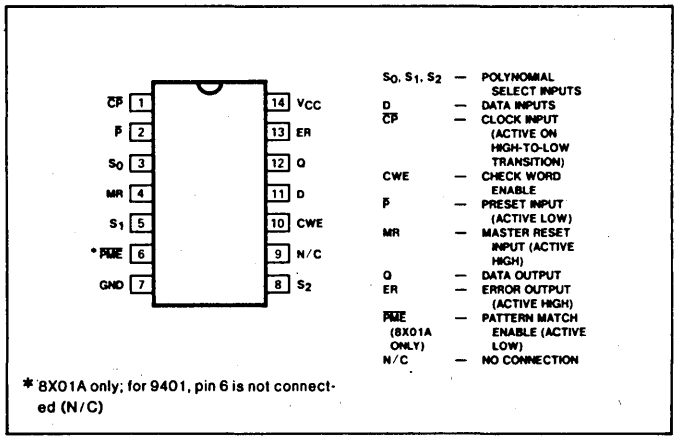
For data communications using the Synchronous Data Link Control (SDLC) protocol, the 8X01A is preset to an all-ones configuration before any accumulation is done; this applies to both transmitting and receiving modes of operation. Using SDLC, the check sum shifted out of the 8X01A must be inverted.

During the receiving mode, a special pattern of 1111000010111000 (X^0-X^{15}) is used in place of all-zeroes to check for a valid message. The Pattern Match Enable pin allows the user to select this option. If $\overline{PME}$ is low during the last bit time of the message, the ERror output is low providing the result matches the special pattern; if an error occurs, ER is high.

DESIGN FEATURES

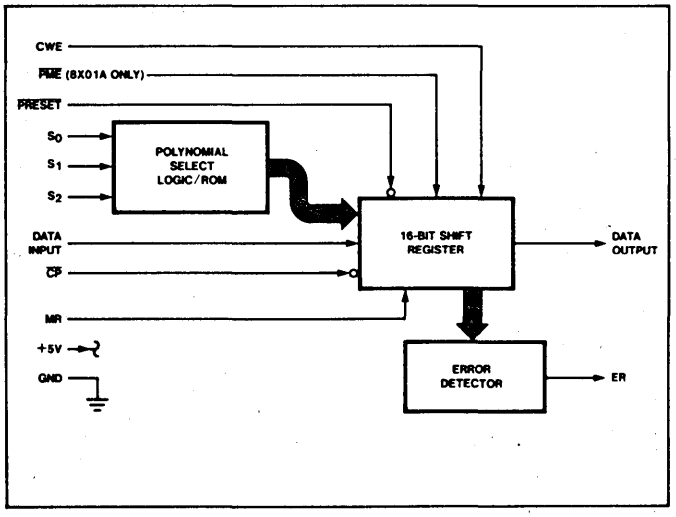
- **TTL inputs/outputs**
- **12MHz (Max) data rate**
- **Separate preset/reset controls**
- **SDLC specified pattern match (8X01A only)**
- **Automatic right justification**
- **V_{CC} = 5V**
- **14-Pin DIP**

8X01A & 9401 PACKAGE/PIN DESIGNATOR



* 8X01A only; for 9401, pin 6 is not connected (N/C)

BLOCK DIAGRAM OF 8X01A & 9401



Signetics

© IC MASTER 1983

64-BIT FIFO BUFFER MEMORY (16×4) 9403

N9403N

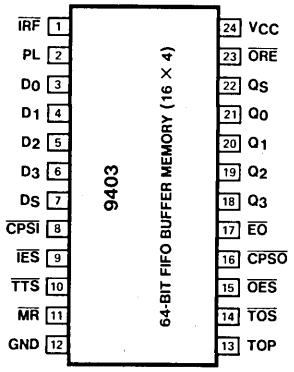
PRODUCT DESCRIPTION

The 9403 is an expandable fall-through type First-In First-Out (FIFO) Buffer Memory that is optimized for high-speed disc/tape controllers and communication-buffer applications. In multiples of four, the device can be expanded to any number of bits and subsequently, to any number of words. Serial or parallel data can be asynchronously entered or retrieved which makes the 9403 *the* cost-effective solution for implementing buffer memories.

FEATURES

- **10MHz Serial or Parallel Data Rate**
- **Serial or Parallel Input and Output**
- **Expandable Without External Logic**
- **Three-State Outputs**
- **Fully TTL-Compatible**
- **Slim (0.4 in.) 24-Pin DIP**

PIN DESIGNATIONS & DESCRIPTIONS



MNEMONIC AND FUNCTION		DESCRIPTION
$\overline{IRF}$	= Input register full output	Low when input register is full
PL	= Parallel load input	High on PL enables D_0-D_3; not edge-triggered, 1's catching
D_0-D_3	= Parallel data input	—
D_S	= Serial data input	—
$\overline{CPSI}$	= Serial input clock	Edge-triggered and activates on falling edge
$\overline{IES}$	= Serial input enable	When low, serial input is enabled
$\overline{TTS}$	= Transfer to stack input	When low, initiates fall-through
$\overline{MR}$	= Master Reset	Active low
TOP	= Transfer out parallel input	When high and $\overline{TOS}$ is low, enables word transfer from stack to output register—not edge-triggered

MNEMONIC AND FUNCTION		DESCRIPTION
$\overline{TOS}$	= Transfer out serial input	When low and TOP is high, enables word transfer from stack to output register—not edge-triggered
$\overline{OES}$	= Serial output enable input	When low, enables serial output
$\overline{CPSO}$	= Serial output clock input	Edge-triggered and activates on falling edge
$\overline{EO}$	= Output enable	Active low
Q_0-Q_3	= Parallel data output	
Q_S	= Serial data output	
$\overline{ORE}$	= Output register empty output	When high, output register contains valid data
GND	= Ground	—
V_{CC}	= Supply voltage	+5 volts

BLOCK DIAGRAM

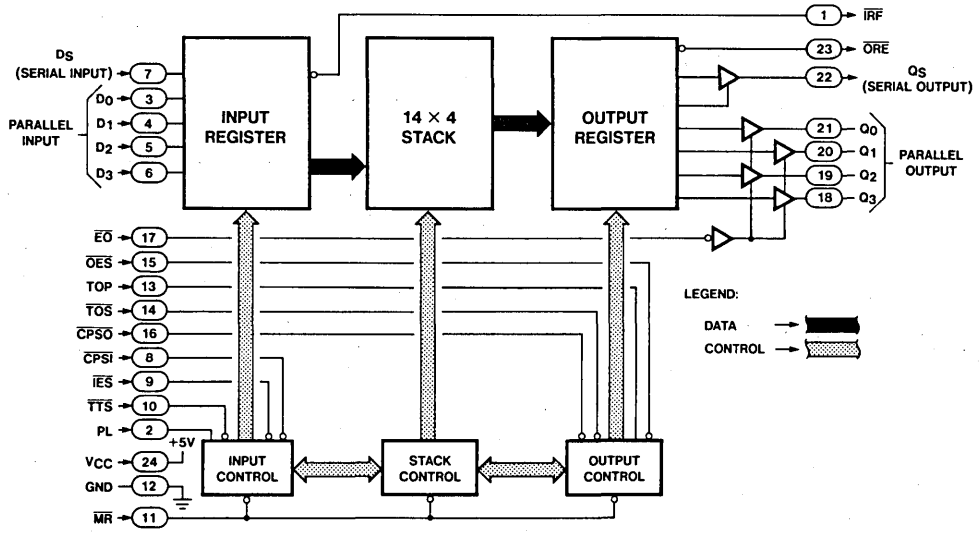


Figure 1. Simplified Block Diagram of 9403 Buffer Memory

© IC MASTER 1983

BIDIRECTIONAL BUS EXTENDER/REPEATER 8X41

N8X41F, N8X41N

PRODUCT DESCRIPTION

The Signetics Asynchronous Bidirectional Bus Extender and Repeater is a general purpose device ideal for system bus expansion applications. The 8X41 consists of eight data channels, each with one pair of terminals (A_i and B_i); each data channel can be operated independently.

The device requires no external controls since all intelligence is internally generated; thus, operation of the device is completely autonomous. The first logic low signal that occurs on one channel terminal (A_i or B_i) will be repeated on the corresponding terminal (B_i or A_i) of the same channel.

FUNCTIONAL OPERATION

As shown, the 8X41 consists of eight functionally independent yet logically identical channels. Each channel consists of two bus terminals (A_i and B_i); each terminal is internally connected to an open-collector driver and a high-impedance receiver. The monitoring state of each channel is defined when both terminals (A_i and B_i) are "high"; in this state, the internal logic of the 8X41 continually examines the A and B bus signals to determine signal direction—A_i to B_i or B_i to A_i. A low signal occurring at either of the two terminals causes the open-collector driver on the opposite terminal to follow suit; hence, the signal is repeated by the 8X41. For each channel, latches L1 and L2 determine signal direction.

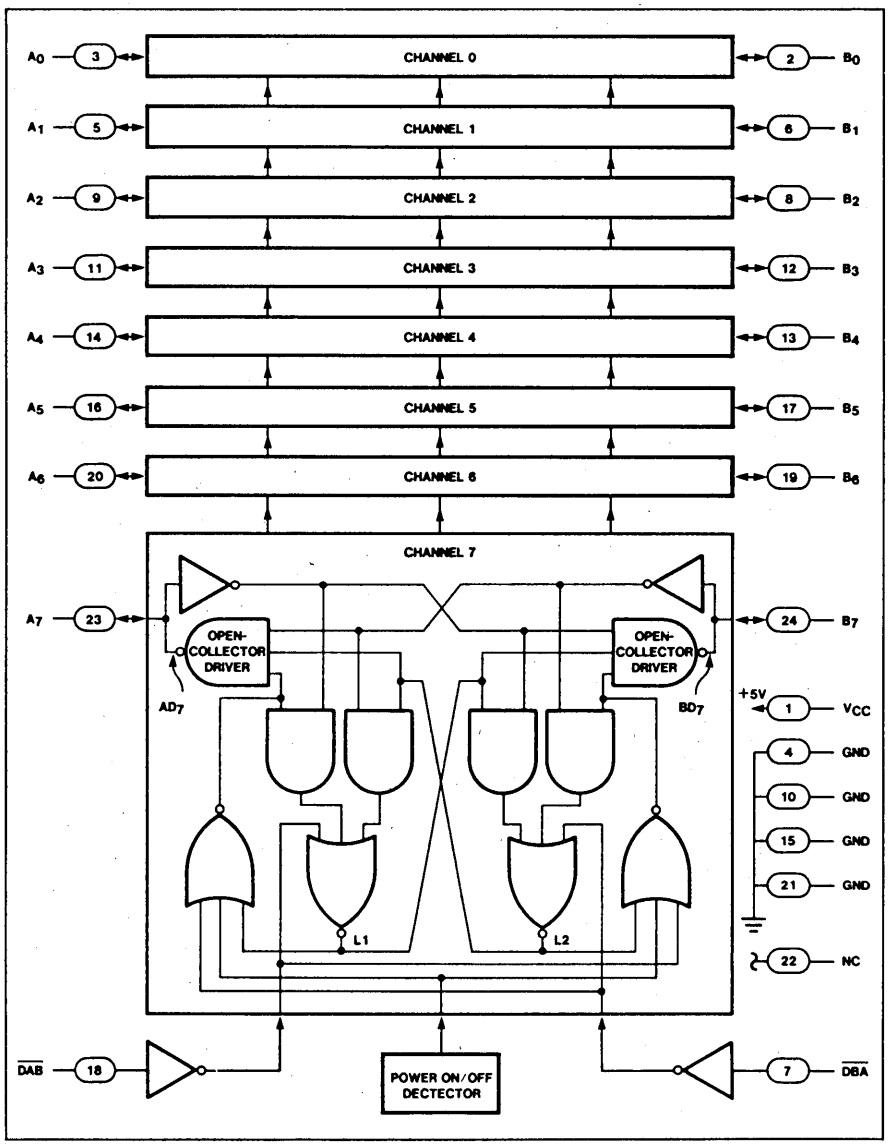
The internal automatic direction control can be overridden by either or both of the common disable inputs—DBA and DAB. When DBA is driven low (DAB = high), the B_i to A_i path is interrupted and the 8X41 becomes a unidirectional repeater in the A_i to B_i direction only. With these conditions reversed (DAB = low and DBA = high), the A_i to B_i path is interrupted and the chip functions as a unidirectional repeater in the B_i to A_i direction. When both control signals are low, data passage is inhibited in both directions.

DESIGN FEATURES

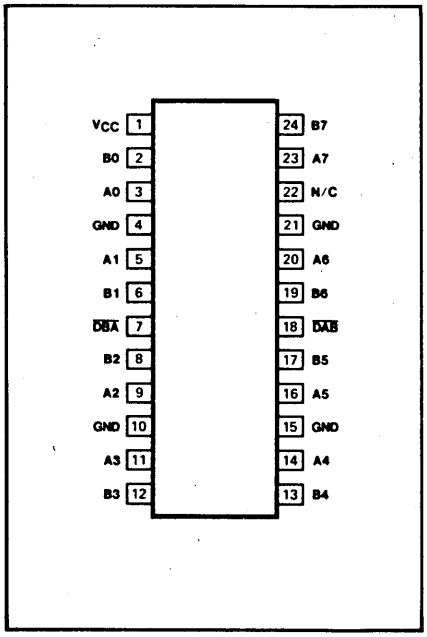
- **Intelligent bidirectional bus repeater with self-generating or external control**
- **Eight independent channels**
- **Open-collector outputs (meets DEC UNIBUS* specifications)**
- **TTL compatible**
- **High speed (30-nanoseconds max)**
- **Expandable to any number of bits**
- **High input impedance for every operating value of V_{CC}**
- **Low input current (less than 100-microamperes); high output current (up to 70-milliamperes)**
- **24-pin DIP**
- **+5V supply**

*Trademark of the Digital Equipment Corporation

BLOCK DIAGRAM



8X41 PACKAGE/PIN DESIGNATIONS



© IC MASTER 1983

FIFO RAM CONTROLLER (FRC) 8X60

PRODUCT DESCRIPTION

The Signetics 8X60 FIFO RAM Controller (FRC) is an address and status generator designed to implement a high-speed/high-capacity First-In/First-Out (FIFO) stack utilizing standard off-the-shelf RAMs. The FRC can control up to 4096 words of buffer memory; intermediate buffer sizes can be selected—refer to the memory length table on the next page. Built-in arbitration logic handles read/write operations on a first-come/first-served basis.

As shown in Figure 1, the FRC consists of:

- A 12-Bit Write Address Generation Counter (Counter #1) and a 12-Bit Read Address Generation Counter (Counter #2).
- A 12-Bit Up/Down Status Counter (Counter #3).
- Twelve Three-State Address Drivers.
- Control Logic.

The two address counters, #1 and #2, respectively, are used to generate write and read addresses; the outputs of these counters are multiplexed to the three-state address drivers. Counter #3 generates *full, empty,* and *half full* status.

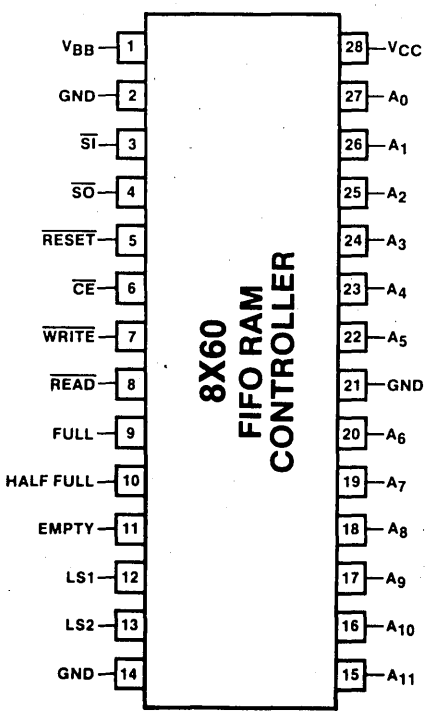
DESIGN FEATURES

- **12-Bit FIFO Address Generator**
- **Data Rate Exceeding 8MHz**
- **Asynchronous Read/Write Operations**
- **Three-State Address Outputs**
- **User-Defined Word Width**
- **Specifically Designed for Use with High-Speed Bipolar RAMs (Adaptable for Use with MOS RAMs)**
- **TTL Input and Output**
- **16mA Address-Drive Capability**

USE AND APPLICATION

- **Interface Between Independently-Clocked Systems**
- **Buffer Memories for Disk and/or Tape**
- **Data Communication Concentrators**
- **CPU/Terminal Buffering**
- **DMA Applications**
- **CRT Terminals**

PACKAGE AND PIN DESIGNATIONS



PIN NO.	IDENTIFIER	FUNCTION
1	V_{BB}	Supply voltage for internal circuits.
2, 14, 21	GND	Circuit ground.
3	$\overline{SI}$	Shift-In request for write cycle; active-low input.
4	$\overline{SO}$	Shift-Out request for read cycle; active-low input.
5	$\overline{RESET}$	Active-low master reset input.
6	$\overline{CE}$	Active-low chip enable input.
7	$\overline{WRITE}$	Write cycle address valid; active-low output.
8	$\overline{READ}$	Read cycle address valid; active-low output.
9	FULL	Memory full status output; also, override input capability. Active when *high*.
10	HALF FULL	Memory half-full status output; active-high.
11	EMPTY	Memory empty status output; also, override input capability. Active when *high*
12	LS1	Least significant bit (LSB) of the memory length select input.
13	LS2	Most significant bit (MSB) of the memory length select input.
15-20 22-27	A_{11}-A_0	Three-state address outputs; A_0 = LSB.
28	V_{CC}	Supply voltage.

© IC MASTER 1983

positive-going edge of $\overline{SO}$ when Counter #3 reaches a count of 127, the HALF FULL output will go from *high*-to-*low*.

- **FULL**—this signal serves both as a status output and as an override input. The FULL signal goes *high* on the negative-going edge of $\overline{SI}$ if all bits of Counter #3 for selected length are equal to "1". The FULL output goes from *high*-to-*low* on the negative-going edge of $\overline{SO}$.
- **EMPTY**—this signal also serves as a status output and as an override input. On the negative-going edge of $\overline{SO}$, the EMPTY output is driven *high* if Status Counter #3 contains a value of "1"; on the positive-going edge of $\overline{SO}$, the counter is decremented to "0". The EMPTY output goes from *high*-to-*low* on the negative-going edge of $\overline{SI}$.

Once the FULL signal is *high*, further Write Cycle Requests ($\overline{SI}$ = low) are ignored; similarly, once the EMPTY signal is *high*, further Read Cycle requests ($\overline{SO}$ = low) are ignored. However, to accommodate diversified applications, the FULL and EMPTY outputs are open-collector with on-chip 4.7K passive pull-up resistors. If either the FULL or EMPTY pins are forced *low* via external control, the corresponding *write* or *read* cycle may resume (provided the external FULL or EMPTY input is held *low* until the corresponding $\overline{WRITE}$ or $\overline{READ}$ output goes *low* and the address/status counters will continue normal operation.

The user must force the $\overline{RESET}$ input *low* to initialize the chip. (*Note.* If the $\overline{RESET}$ signal is driven *low* during a *write* or *read* cycle, the address output may have a short period of uncertainty before assuming a high-impedance state.) The following actions occur when $\overline{RESET}$ is active:

- All internal counters are set to "0".
- All address output lines are forced to the high-impedance state.
- HALF FULL and FULL outputs are forced *low*.
- $\overline{WRITE}$, $\overline{READ}$, and EMPTY outputs are forced high.

When $\overline{CE}$ is *high*, the address output lines are forced to the high-impedance state, further *write* or *read* cycle requests are ignored, and all counters remain unchanged. If $\overline{CE}$ switches from *low*-to-*high* during a *write* or *read* cycle, the cycle in progress is always completed before the disabled state is entered.

SUMMARY OF OPERATION

INPUTS				INITIAL	RESULTING OUTPUTS			
$\overline{RESET}$	$\overline{CE}$	$\overline{SI}$	$\overline{SO}$	CONDITIONS	$\overline{WRITE}$	$\overline{READ}$	ADDRESS BUS	COMMENTS
L	X	X	X		H	H	Hi-Z	Reset all counters to 0.
H	X	H	H		H	H	Hi-Z	No action
H	L	L	H	FULL = L	L	H	Write address from Ctr #1	Shift into FIFO stack (Write Cycle)
H	L	L	H	FULL = H	H	H	Hi-Z	Stack full (Write inhibited)
H	L	H	L	EMPTY = L	H	L	Read address from Ctr #2	Shift out of FIFO stack (Read Cycle)
H	L	H	L	EMPTY = H	H	H	Hi-Z	Stack empty (Read inhibited)
H	L	L	↓	Write cycle in progress	L	H	Write address from Ctr #1	Continue write cycle (until $\overline{SI}$ goes high)
H	L	↓	L	Read cycle in progress	H	L	Read address from Ctr #2	Continue read cycle (until $\overline{SO}$ goes high)
H	L	L	L	EMPTY = H	L	H	Write address from Ctr #1	Shift in (Read inhibited)
H	L	L	L	FULL = H	H	L	Read address from Ctr #2	Shift out (Write inhibited)
H	L	↑	H	Write cycle in progress	↑	H	Goes to Hi-Z	Increment write address counter #1 and status counter #3
H	L	H	↑	Read cycle in progress	H	↑	Goes to Hi-Z	Increment read address counter #2; decrement status counter #3
H	L	↑	L	Write cycle in progress (Note 1)	↑	↓	Changes to read address from Ctr #2	Increment write address counter #1 and status counter #3
H	L	L	↑	Read cycle in progress (Note 2)	↓	↑	Changes to write address from Ctr #1	Increment read address counter #2; decrement status counter #3
H	H	↓	H		H	H	Hi-Z	Chip disabled
H	H	H	↓		H	H	Hi-Z	Chip disabled
H	↑	L	X	FULL = L; write cycle begun (Note 1)	L	H	Write address from Ctr #1	Continue write cycle (until $\overline{SI}$ goes high)
H	↑	X	L	EMPTY = L; read cycle begun (Note 2)	H	L	Read address from Ctr #2	Continue read cycle (until $\overline{SO}$ goes high)
H	↓	L	L	FULL = L; EMPTY = L	—	—	—	This set of conditions should be avoided

Notes:
1. Write cycle will occur if either $\overline{SI}$ goes *low* before $\overline{SO}$ goes *low* or EMPTY = H when $\overline{SO}$ goes *low*.
2. Read cycle will occur if either $\overline{SO}$ goes *low* before $\overline{SI}$ goes *low* or FULL = H when $\overline{SI}$ goes

© IC MASTER 1983

FIFO RAM CONTROLLER (FRC) 8X60

BLOCK DIAGRAM

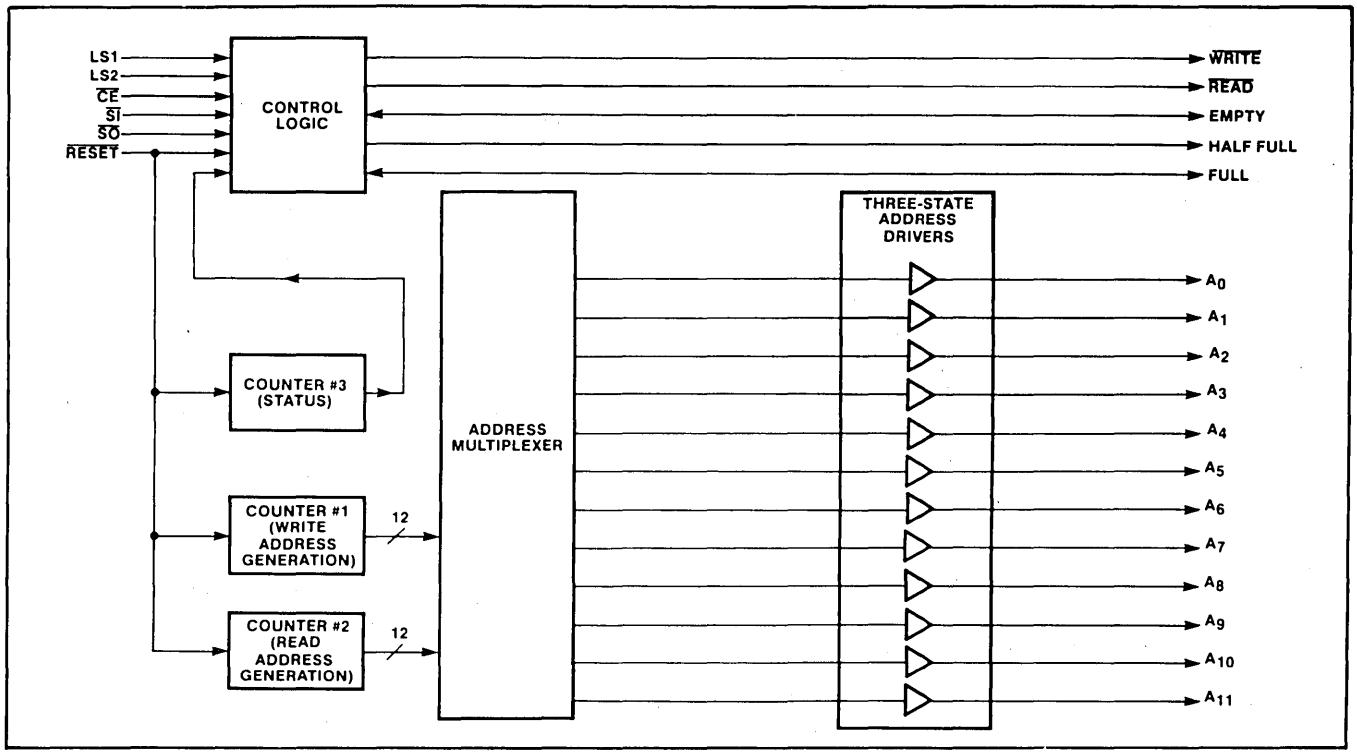


Figure 1. Functional Block Diagram of FIFO RAM Controller

FUNCTIONAL OPERATION

The FRC operates in either of two basic modes—*write* into the FIFO buffer memory or *read* from the FIFO buffer memory. These two operations are described in subsequent paragraphs and the complete sequence is summarized on the next page.

FIFO BUFFER MEMORY—WRITE CYCLE

To perform a write operation, $\overline{SO}$ must be *high* and SI must be *low*. When these conditions exist and other control parameters are satisfied, the write address in Counter #1 is output to the address bus via the multiplexer and the $\overline{WRITE}$ output goes *low*. (*Note.* Normally, the $\overline{WRITE}$ output goes *low* after the address output becomes stable. The $\overline{WRITE}$ output may then act as a *write* or *chip* enable for the RAMs that are used to implement the memory.)

When the *write* cycle is ended ($\overline{SI}$ is forced high), the $\overline{WRITE}$ output goes *high*, the address output buffers return to a high-impedance state, Counter #1 (Write Address Generation) and Counter #3 (Status) are both incremented, and Counter #2 (Read Address Generation) remains unchanged.

FIFO BUFFER MEMORY—READ CYCLE

To perform a read operation, $\overline{SI}$ must be *high* and $\overline{SO}$ must be *low*. When these conditions exist and other control parameters are satisfied, the read address contained in Counter #2 is output to the address bus and the $\overline{READ}$ output goes *low*.

When the *read* cycle is ended ($\overline{SO}$ is forced *high*), the $\overline{READ}$ output goes *high*, the output buffers return to a high-impedance state, Counter #2 (Read Address Generation) is incremented, Counter #3 (Status) is decremented, and Counter #1 (Write Address Generation) remains unchanged.

CONTROL LOGIC

To prevent the possibility of operational conflicts, $\overline{SI}$ and $\overline{SO}$ are treated on a first-come/first-served basis; these two input signals are controlled by internal arbitration logic. If one cycle is requested while the other cycle is in progress, the requested cycle will commence as soon as the current cycle is complete (provided other control parameters are satisfied).

As shown in the accompanying diagram, the buffer length of the FIFO memory can be hardware-selected via the Length Select (LS1.LS2) inputs. When less than the maximum length is selected, the unused high-order bits of the address outputs are held in the high-impedance state.

MEMORY LENGTH

LSI	LS2	HALF LENGTH	FULL LENGTH
L	L	2048	4096
H	L	32	64
L	H	512	1024
H	H	128	256

Generation of the status output signals (HALF FULL, FULL, and EMPTY) is a function of the Length Select (LS1, LS2) inputs and the current state of Status Counter #3. In general, the status outputs reflect the conditions that follow:

- **HALF FULL**—this status output signal goes *high* on the positive-going edge of $\overline{SI}$ if the MSB of the selected length of Counter #3 becomes a "1". The HALF FULL signal will go from *high*-to-*low* on the positive-going edge of $\overline{SO}$ when, after the *read* cycle, the selected length of Counter #3 changes from "100...00" to "011...11". For example, if the selected memory length is 256 words (FULL = 256), then HALF FULL = 128 words; hence, on the

© IC MASTER 1983

PROGRAMMABLE COMMUNICATIONS INTERFACE (PCI) SCN2651

DESCRIPTION

The Signetics 2651 PCI is a universal synchronous/asychronous data communications controller chip designed for microcomputer systems. It interfaces directly to the Signetics 2650 microprocessor and may be used in a polled or interrupt driven system environment. The 2651 accepts programmed instructions from the microprocessor and supports many serial data communication disciplines, synchronous and asynchronous, in the full or half-duplex mode.

The PCI serializes parallel data characters received from the microprocessor for transmission. Simultaneously, it can receive serial data and convert it into parallel data characters for input to the microcomputer.

The 2651 contains a baud rate generator which can be programmed to either accept an external clock or to generate internal transmit or receive clocks. Sixteen different baud rates can be selected under program control when operating in the internal clock mode.

The PCI is constructed using Signetics n-channel silicon gate depletion load technology and is packaged in a 28-pin DIP.

FEATURES

- Synchronous operation
  - 5 to 8-bit characters
  - Single or double SYN operation
  - Internal character synchronization
  - Transparent or non-transparent mode
  - Automatic SYN or DLE-SYN insertion
  - SYN or DLE stripping
  - Odd, even, or no parity
  - Local or remote maintenance loop back mode
  - Baud rate: dc to 1M bps (1X clock)
- Asynchronous operation
  - 5 to 8-bit characters
  - 1, 1 1/2 or 2 stop bits
  - Odd, even, or no parity
  - Parity, overrun and framing error detection
  - Line break detection and generation
  - False start bit detection
  - Automatic serial echo mode
  - Local or remote maintenance loop back mode
  - Baud rate: dc to 1M bps (1X clock)
    dc to 62.5K bps (16X clock)
    dc to 15.625K bps (64X clock)

FEATURES

- Internal or external baud rate clock
- 16 internal rates-50 to 19,200 baud
- Double buffered transmitter and receiver
- Full or half duplex operation
- Fully compatible with 2650 CPU
- TTL compatible inputs and outputs
- Single 5V power supply
- No system clock required
- 28-pin dual in-line package

APPLICATIONS

- Intelligent terminals
- Network processors
- Front end processors
- Remote data concentrators
- Computer to computer links
- Serial peripherals

MICROPROCESSOR DIVISION

MULTI-PROTOCOL COMMUNICATIONS CONTROLLER SCN2652/68652

DESCRIPTION

The 2652 Multi-Protocol Communications Controller (MPCC) is a monolithic n-channel MOS LSI circuit that formats, transmits and receives synchronous serial data while supporting bit-oriented or byte control protocols. The chip is TTL compatible, operates from a single +5V supply, and can interface to a processor with an 8 or 16-bit bidirectional data bus.

FEATURES

- DC to 1Mbps data rate, 2652-1 to 2Mbps
- Bit-oriented protocols (BOP): SDLC, ADCCP, HDLC
- Byte-control protocols (BCP): DDCMP, BISYNC (external CRC)
- Programmable operation
  - 8 or 16-bit tri-state data bus
  - Error control—CRC or VRC or none
  - Character length—1 to 8 bits for BOP or 5 to 8 bits for BCP
  - SYNC or secondary station address comparison for BCP-BOP
  - Idle transmission of SYNC/FLAG or MARK for BCP-BOP
- Automatic detection and generation of special BOP control sequences, i.e., FLAG, ABORT, GA
- Zero insertion and deletion for BOP
- Short character detection for last BOP data character
- SYNC generation, detection, and stripping for BCP
- Maintenance Mode for self-testing
- TTL compatible
- Single +5V supply

APPLICATIONS

- Intelligent terminals
- Line controllers
- Network processors
- Front end communications
- Remote data concentrators
- Communication test equipment
- Computer to computer links

MICROPROCESSOR DIVISION

POLYNOMIAL GENERATOR CHECKER SCN2653/68653

DESCRIPTION

The Signetics 2653 Polynomial Generator Checker (PGC) is a polynomial generator checker/character comparator circuit that complements a receiver/transmitter (R/T or USART/USRT/UART) in the support of character oriented data link controls. Table 1 defines many of the more commonly used PGC terms and abbreviations.

Parallel data characters transferred between the CPU and R/T are monitored by the PGC which performs block check character (BCC) and parity (VRC) generation/checking, single character detection, and two character sequence detection. Since the PGC operates on parallel characters, the data transmission format may be serial (synchronous or asynchronous) or parallel.

There are four modes of BCC accumulation and each mode can select one of three polynomials to compute the BCC. In the BISYNC normal and transparent modes, the PGC determines which characters are to be accumulated and which characters are to be excluded from the accumulation. The block terminating characters and the initiation and termination of BISYNC transparent text can be detected and an interrupt generated. The single interrupt output represents the inclusive OR of four maskable status conditions.

In the automatic accumulation mode, all characters are accumulated while the single accumulate mode requires a specific accumulation command for each character to be accumulated.

Character accumulation control and character comparisons are facilitated by a character class array which places each of 128 characters into one of four character classes. The four classes are normal, SYN/BISYNC not included, block terminating character (BTC)/search character (SC), and secondary search character (SSC).

Additional PGC applications include off-line R/T operation where the BCC is generated on data not sent to the R/T, BCC multiplexing by sharing the PGC among several R/Ts and reading/writing the partial BCC accumulation on a character by character basis, VRC generation/checking on characters appearing on a bidirectional data bus, and programmable character comparisons or searches.

PGC operation is half duplex (either receive or transmit, one way or two way alternate). Full duplex (two way simultaneous) is achieved by using two PGCs. The device is directly compatible with the Signetics 2651 Programmable Communications Interface (PCI) and 2661 Enhanced Programmable Communications Interface (EPCI). When used in BISYNC modes with the 2661, software requirements are minimized by the 2653-2661 control character comparisons, character sequence comparisons, and automatic DLE insertion/detection.

Other bus oriented R/Ts can be interfaced to the PGC with a minimum of external circuitry. See figure 1 for a typical system configuration.

This NMOS LSI circuit is TTL compatible, operates from a single + 5V supply and is contained in a 16 pin dual in line package.

FEATURES

- Parallel Block Check Character accumulation/checking: CRC-16, CRC-12, LRC-8
- BISYNC normal and transparent modes
- Automatic or single character accumulation modes
- Character detection - up to 128 characters
- Two character sequence detection; examples: DLE-STX, ACK 0, ACK 1, WACK, RVI, DISC, WBT
- 6, 7, or 8-bit characters
- VRC generation/checking on data bus
- Four maskable interrupt conditions
- Four classes of characters
- Internal power-on reset
- Maximum character accumulation rate of 500 kHz (4 Mbps)
- Directly compatible with Signetics 2651, 2652 and 2661
- No system clock required
- TTL compatible inputs and outputs
- Single 5V supply
- 16-pin dual in line package

APPLICATIONS

- Character oriented data link control:
  - -dedicated to one USART/USRT
  - -multiplexed among several USART/USRTs
- Automated BISYNC with 2661 (minimal software intervention)
- BCC and VRC generation/detection on a block of memory or peripheral data
- Programmable character array comparator

BLOCK DIAGRAM

The PGC consists of six major sections. These are the operation control, character class array, DLE ROM, character register, BCC and parity generators, and BCC registers. These sections communicate with each other via an internal data bus and an internal control bus. The internal data bus interfaces to the CPU data bus via a data bus buffer.

Signetics

© IC MASTER 1983

ENHANCED PROGRAMMABLE COMMUNICATIONS INTERFACE SCN2661/68661

PRODUCT BRIEF, contact your Signetics sales offices for complete information.

DESCRIPTION

The Signetics 2661 EPCI is a universal synchronous/asynchronous data communications controller chip that is an enhanced pin compatible version of the 2651. It interfaces directly to most 8-bit microprocessors and may be used in a polled or interrupt driven system environment. The 2661 accepts programmed instructions from the microprocessor while supporting many serial data communications disciplines—synchronous and asynchronous—in the full or half-duplex mode. Special support for BISYNC is provided.

The EPCI serializes parallel data characters received from the microprocessor for transmission. Simultaneously, it can receive serial data and convert it into parallel data characters for input to the microcomputer.

The 2661 contains a baud rate generator which can be programmed to either accept an external clock or to generate internal transmit or receive clocks. Sixteen different baud rates can be selected under program control when operating in the internal clock mode. Each version of the EPCI (A, B, C) has a different set of baud rates.

The EPCI is constructed using Signetics n-channel silicon gate depletion load technology and is packaged in a 28-pin DIP.

FEATURES

- **Synchronous operation**
  - **5 to 8-bit characters plus parity**
  - **Single or double SYN operation**
  - **Internal or external character synchronization**
  - **Transparent or non-transparent mode**
  - **Transparent mode DLE stuffing (Tx) and detection (Rx)**
  - **Automatic SYN or DLE-SYN insertion**
  - **SYN, DLE and DLE-SYN stripping**
  - **Odd, even, or no parity**
  - **Local or remote maintenance loop back mode**
  - **Baud rate: dc to 1M bps (1X clock)**
- **Asynchronous operation**
  - **5 to 8-bit characters plus parity**
  - **1, 1½ or 2 stop bits transmitted**
  - **Odd, even, or no parity**
  - **Parity, overrun and framing error detection**
  - **Line break detection and generation**
  - **False start bit detection**
  - **Automatic serial echo mode (echoplex)**
  - **Local or remote maintenance loop back mode**
  - **Baud rate: dc to 1M bps (1X clock)**
    dc to 62.5K bps (16X clock)
    dc to 15.625K bps (64X clock)

OTHER FEATURES

- **Internal or external baud rate clock**
- **3 baud rate sets**
- **16 internal rates for each set**
- **Double buffered transmitter and receiver**
- **Dynamic character length switching**
- **Full or half duplex operation**
- **Fully compatible with 2650 CPU**
- **TTL compatible inputs and outputs**
- **RxC and TxC pins are short circuit protected**
- **3 open drain MOS outputs can be wire-ORed**
- **Single 5V power supply**
- **No system clock required**
- **24- and 28-pin versions**

APPLICATIONS

- **Intelligent terminals**
- **Network processors**
- **Front end processors**
- **Remote data concentrators**
- **Computer to computer links**
- **Serial peripherals**
- **BISYNC adaptors**

MICROPROCESSOR DIVISION

DUAL ASYNCHRONOUS RECEIVER/TRANSMITTER (DUART) SCN2681 SERIES

DESCRIPTION

The Signetics SCN2681 Dual Universal Asynchronous Receiver/Transmitter (DUART) is a single chip MOS-LSI communications device that provides two independent full-duplex asynchronous receiver/transmitter channels in a single package. It interfaces directly with microprocessors and may be used in a polled or interrupt driven system.

The operating mode and data format of each channel can be programmed independently. Additionally, each receiver and transmitter can select its operating speed as one of eighteen fixed baud rates, a 16x clock derived from a programmable counter/timer, or an external 1x or 16x clock. The baud rate generator and counter/timer can operate directly from a crystal or from external clock inputs. The ability to independently program the operating speed of the receiver and transmitter make the DUART particularly attractive for dual-speed channel applications such as clustered terminal systems.

Each receiver is quadruply buffered to minimize the potential of receiver overrun or to reduce interrupt overhead in interrupt driven systems. In addition, a flow control capability is provided to disable a remote DUART transmitter when the buffer of the receiving device is full.

Also provided on the SCN2681 are a multipurpose 7-bit input port and a multipurpose 8-bit output port. These can be used as general purpose I/O ports or can be assigned specific functions (such as clock inputs or status/interrupt outputs) under program control.

The SCN2681 is available in three package versions to satisfy various system requirements: 40-pin and 28-pin, both 0.6″ wide DIPs, and a compact 24-pin, 0.4″ wide, DIP.

FEATURES

- **Dual full-duplex asynchronous receiver/transmiter**
- **Quadruple buffered receiver data registers**
- **Programmable data format**
  - **—5 to 8 data bits plus parity**
  - **—Odd, even, no parity or force parity**
  - **—1, 1.5 or 2 stop bits programmable in 1/16 bit increments**
- **Programmable baud rate for each receiver and transmiter selectable from:**
  - **—18 fixed rates: 50 to 38.4K baud**
  - **—One user defined rate derived from programmable timer/counter**
  - **—External 1x or 16x clock**
- **Parity, framing, and overrun error detection**
- **False start bit detection**
- **Line break detection and generation**
- **Programmable channel mode**
  - **—Normal (full duplex)**
  - **—Automatic echo**
  - **—Local loopback**
  - **—Remote loopback**
- **Multi-function programmable 16-bit counter/timer**
- **Multi-function 7-bit input port**
  - **—Can serve as clock or control inputs**
  - **—Change of state detection on four inputs**
- **Multi-function 8-bit output port**
  - **—Individual bit set/reset capability**
  - **—Outputs can be programmed to be status/interrupt signals**
- **Versatile interrupt system**
  - **—Single interrupt output with eight maskable interrupting conditions**
  - **—Output port can be configured to provide a total of up to six separate wire-OR'able interrupt outputs**
- **Maximum data transfer: 1X — 1MB/sec, 16X — 125KB/sec**
- **Automatic wake-up mode for multidrop applications**
- **Start-end break interrupt/status**
- **Detects break which originates in the middle of a character**
- **On-chip crystal oscillator**
- **TTL compatible**
- **Single +5V power supply**

MICROPROCESSOR DIVISION

DISPLAY CHARACTER AND GRAPHICS GENERATOR (DCGG) SCN2670

DESCRIPTION

The Signetics Display Character and Graphics Generator (DCGG) is a mask-programmable 11,648-bit line select character generator. It contains 128 10X9 characters placed in a 10X16 matrix, and has the capability of shifting certain characters, such as j, y, g, p and q, that normally extend below the baseline. Character shifting, previously requiring additional external circuitry, is now accomplished internally by the DCGG; effectively, the 9 active lines are lowered within the matrix to compensate for the character's position.

Seven bits of an 8-bit address code are used to select 1 of the 128 available characters. The eighth bit functions as a chip enable signal. Each character is defined by a pattern of logic 1s and 0s stored in a 10X9 matrix. When a specific 4-bit binary line address code is applied, a word of 10 parallel bits appears at the output. The lines can be sequentially selected, providing a 9-word sequence of 10 parallel bits per word for each character selected by the address inputs. As the line address inputs are sequentially addressed, the device will automatically place the 10X9 character in 1 of 2 preprogrammed positions on the 16-line matrix with the positions defined by the 4-line address inputs. One or more of the 10 parallel outputs can be used as control signals to selectively enable functions such as half-dot shift, color selection, etc.

The 2670 DCGG includes latches to store the character address and line address data. A control input to inhibit character data output for certain groups of characters is also provided. The 2670 also includes a graphics capability, wherein the 8-bit character code is translated directly into 256 possible user programmable graphic patterns. Thus, the DCGG can generate data for 384 distinct patterns, of which 128 are defined by the mask programmable ROM. See figure 1 for a typical applications display.

FEATURES

- 128 10X9 matrix characters
- 256 graphic characters
- Optional thin graphics for forms
- Character and line address latches
- Internal descend logic
- 200nsec and 300nsec character select access time versions
- Control character output inhibit logic
- Static operation—no clocks required
- Single 5V power supply
- TTL compatible inputs and outputs

© IC MASTER 1983

PROGRAMMABLE KEYBOARD & COMM CONTROLLER (PKCC) SCN2671

DESCRIPTION

The Signetics 2671 Programmable Keyboard and Communications Controller (PKCC) is an MOS LSI device which provides a versatile keyboard encoder and an independent full duplex asynchronous communications controller. It is intended for use in microprocessor based systems and provides an eight bit data bus interface.

The keyboard encoder handles the scanning, debounce, and encoding of a keyboard matrix with a maximum of 128 keys. It provides four levels of key encoding corresponding to the separate SHIFT and CONTROL input combinations. Four keyboard rollover modes can be programmed including provisions for up to 16 latched keys. Control outputs are provided for interfacing with contact or capacitive keyboards. An eight bit keyboard status register provides status information to the CPU.

The receiver section of the communications controller accepts serial data from the RxD pin and converts it to parallel data characters. Simultaneously, the transmitter section accepts parallel data from the data bus and outputs serialized data onto the TxD pin. Received data is checked for parity and framing errors, and break conditions are flagged. Character lengths can be programmed as 5, 6, 7, or 8 bits not including parity, start or stop bits. An internal baud rate generator (BRG) with 16 divider ratios can be used to derive the receive and/or transmit clocks. The BRG can accept an external clock or operate directly from a crystal. An eight bit communications status register provides status information to the CPU.

The PKCC has an interrupt mask register to selectively enable certain keyboard and communications status bits to generate interrupts. Priority encoded interrupt vectoring is available. Upon receipt of an interrupt acknowledge, an interrupt vector will be output on D0-D7 reflecting the source of the interrupt. The interrupt source can also be read from an interrupt status register.

FEATURES

- **Keyboard interface**
  - **Contact or capacitive keyboard**
  - **Up to 128 keys on an 8 X 16 matrix**
  - **Encoded or unencoded operation**
  - **Four code levels per key**
  - **Latched key option—separate depress and release codes**
  - **Programmable scan rate and debounce time**
  - **Programmable rollover modes**
  - **Programmable auto-repeat for selected keys**
  - **Tone output—two frequencies**
- **Asynchronous communication interface**
  - **Internal baud rate generator—16 rates**
  - **Full duplex operation**
  - **Detection of start and end of break**
  - **Programmable break generation**
  - **Programmable character parameters**
  - **Auto-echo and maintenance loopback modes**
- **Polled or interrupt operation**
- **Interrupt priority controller and vector generator**
- **Operates directly from crystal or external clocks**
- **TTL compatible**
- **Single +5 volt power supply**
- **40 pin dual in-line package**

APPLICATIONS

- **CRT terminals**
- **Hard copy terminals**
- **Word processing systems**
- **Data entry terminals**
- **Small business computers**

FUNCTIONAL DESCRIPTION

The PKCC consists of six major sections (see block diagram). These are the transmitter, receiver, timing, operation control, keyboard encoder, and a priority encoded interrupt control unit. These sections communicate with each other via an internal data bus and an internal control bus. The internal data bus interfaces to the microprocessor data bus via a bidirectional data bus buffer.

Operation Control

This functional block stores configuration and operation commands from the CPU and generates appropriate signals to various internal sections to control the overall device operation. It contains read and write circuits to permit communications with the microprocessor via the data bus and contains mode registers KMR and CMR, the command decoder, and status registers KSR and CSR. Details of operating modes and status information are presented in the Operation section of this data sheet. The register addressing is specified in table 1.

Timing

The PKCC contains a baud rate generator (BRG) which is programmable to accept external transmit or receive clocks or to divide an external clock to perform data communications. The unit can generate 16 baud rates, any of which can be selected for full duplex operation. The external clock to the baud rate generator can be applied directly to the XTAL2 input (see figure 21) or can be generated internally by connecting a crystal across the XTAL1, XTAL2 input pins. The clock input is also utilized by the keyboard encoder section. Thus, a clock must be provided even if external transmitter and receiver clocks are used.

MICROPROCESSOR DIVISION

PROGRAMMABLE VIDEO TIMING CONTROLLER (PVTC) SCN2672

DESCRIPTION

The Signetics 2672 Programmable Video Timing Controller (PVTC) is a programmable device designed for use in CRT terminals and display systems that employ raster scan techniques. The PVTC generates the vertical and horizontal timing signals necessary for the display of interlaced or non-interlaced data on a CRT monitor. It provides consecutive addressing to a user specified display buffer memory domain and controls the CPU-display buffer interface for various buffer configuration modes. A variety of operating modes, display formats, and timing profiles can be implemented by programming the control registers in the PVTC.

A minimum CRT terminal system configuration consists of a PVTC, a 2671 Keyboard and Communication Controller (PKCC), a 2670 Display Character and Graphics Generator (DCGG), a 2673 Video and Attributes Controller (VAC), a single chip microcomputer such as the 8048, a display buffer RAM, and a small amount of TTL for miscellaneous address decoding, interface, and control. Typically, the package count for a minimum system is between 15 and 20 devices; system complexity can be enhanced by upgrading the microprocessor and expanding via the system address and data busses.

FEATURES

- **4MHz character rate**
- **Up to 256 characters per row**
- **1 to 16 raster lines per character row**
- **Up to 128 character rows per frame**
- **Programmable horizontal and vertical sync generators**
- **Interlaced or non-interlaced operation**
- **Up to 16K RAM addressing for multiple page operation**
- **Automatic wraparound of RAM**
- **Addressable incrementable and readable cursor**
- **Programmable cursor size, position, and blink**
- **Split screen and horizontal scroll capability**
- **Light pen register**
- **Selectable buffer interface modes**
- **Dynamic RAM refresh**
- **Completely TTL compatible**
- **Single +5 volt power supply**
- **Power on reset circuit**

APPLICATIONS

- **CRT terminals**
- **Word processing systems**
- **Small business computers**
- **Home Computers**

MICROPROCESSOR DIVISION

VIDEO ATTRIBUTES CONTROLLER (VAC) SCN2673

DESCRIPTION

The Signetics 2673A and 2673B Video Attributes Controllers (VAC) are bipolar LSI devices designed for CRT terminals and display systems that employ raster scan techniques. Each contains a high speed video shift register, field and character attributes logic, attribute latch, cursor format logic and half dot shift control.

The VAC provides control of visual attributes on a field or character by character. Internal logic preserves field attribute data from character row to character row so that an attribute byte is not required at the beginning of each row. The 2673B provides for reverse video, blank (non-display), blink, underline and highlight attributes and a graphics mode attribute to work in conjunction with the Signetics 2670 Display Character and Graphics Generator (DCGG). The 2673A substitutes a light pen (strike-thru) attribute for the graphics attribute.

The horizontal dot frequency is the basic timing input to the VAC. Internally, this clock is divided down to provide a character clock output for system synchronization. Up to ten bits of video dot data are parallel loaded into the video shift register on each character boundary. The video data is shifted out on three outputs at the dot frequency. On the VIDEO output, the data is presented as a three level signal representing low, medium and high intensities. The three intensities are also encoded on two TTL compatible video outputs. Light or dark screen background can be selected.

FEATURES

- **25MHz video dot rate**
- **Three level current driven (75 ohms) video output**
- **Three level encoded TTL video outputs**
- **Character/field attribute logic**
  - **Reverse video**
  - **Character blank**
  - **Character blink**
  - **Underline**
  - **Highlight**
  - **Light pen strike-thru or graphics control**
- **Field attributes extend from row to row**
- **Light or dark field**
- **Cursor reverse video logic**
- **Up to 10 dots per character**
- **Composite blanking for light field retrace**
- **Optional field graphics control output**
- **High speed bipolar design**
- **40 pin dual in-line package**
- **TTL compatible**
- **Compatible with Signetics 2672 PVTC and 2670 DCGG**

APPLICATIONS

- **CRT terminals**
- **Word processing systems**
- **Small business computers**

© IC MASTER 1983

ADVANCED VIDEO DISPLAY CONTROLLER (AVDC) SCN2674

DESCRIPTION

The Signetics SCN2674 Advanced Video Display Controller (AVDC) is a programmable device designed for use in CRT terminals and display systems that employ raster scan techniques. The AVDC generates the vertical and horizontal timing signals necessary for the display of interlaced or non-interlaced data on a CRT monitor. It provides consecutive addressing to a user specified display buffer memory domain and controls the CPU-display buffer interface for various buffer configuration modes. A variety of operating modes, display formats, and timing profiles can be implemented by programming the control registers in the AVDC.

A minimum CRT terminal system configuration consists of an AVDC, an SCN2671 Keyboard and Communication Controller (PKCC), an SCN2670 Display Character and Graphics Generator (DCGG), an SCN2675 Color/Monochrome Attributes Controller (CMAC), a single chip microcomputer such as the 8048, a display buffer RAM, and a small amount of TTL for miscellaneous address decoding, interface, and control. Typically, the package count for a minimum system is between 15 and 20 devices; system complexity can be enhanced by upgrading the microprocessor and expanding via the system address and data busses.

FEATURES

- 4MHz character rate
- 1 to 256 characters per row
- 1 to 16 raster lines per character row
- 1 to 128 character rows per frame
- Bit mapped graphics mode
- Programmable horizontal and vertical sync generators
  - RS170 compatible sync
- Interlaced or non-interlaced operation
- Up to 16K RAM addressing for multiple page operation
- Readable, writable and incrementable cursor
  - Programmable cursor size and blink
- AC line lock
- Automatic wraparound of RAM
- Automatic split screen
- Automatic bidirectional soft scrolling
  - Programmable scan line increment
- Double height tops and bottoms
- Double width control output
- Selectable buffer interface modes
- Dynamic RAM refresh
- Completely TTL compatible
- Single +5 volt power supply
- Power on reset circuit

APPLICATIONS

- CRT terminals
- Word processing systems
- Small business computers
- Home computers

MICROPROCESSOR DIVISION

COLOR/MONOCHROME ATTRIBUTES CONTROLLER (CMAC) SCB2675

DESCRIPTION

The Signetics SCB2675 Color/Monochrome Attributes Controller (CMAC) is a bipolar LSI device designed for CRT terminals and display systems that employ raster scan techniques. It contains a programmable dot clock divider to generate a character clock, a high speed shift register to serialize input dot data into a video stream, latches and logic to apply visual attributes to the resulting display, and logic to display a cursor on the display.

The CMAC provides control of visual attributes on a character by character basis for two operating modes: monochrome and color. The monochrome mode provides reverse video, blank, highlight and two general purpose user definable attributes. In this mode, the display characters can be specified to appear on either a light or dark screen background. Retrace video suppression can be automatically or externally controlled. The color mode provides eight colors for foreground (character) video and eight colors for background video together with a luminance output for external color set selection or to simultaneously drive a monochrome monitor. Additionally, both modes provide double width, underline, blink, dot stretching and dot width attributes. In monochrome mode, the SCB2675 emulates the attribute characteristics of Digital Equipment Corporation's VT100 terminal.

The horizontal dot frequency is the basic timing input to the CMAC. This clock is divided internally to provide a character clock output for system synchronization. Up to ten bits of dot data are parallel loaded into the video shift register on each character boundary. The two TTL video data outputs in monochrome mode are encoded to provide four video intensities (black, gray, white and highlight). The video data in color mode is encoded to provide eight foreground colors and shifted out on three TTL outputs, together with the luminance output.

FEATURES

- 30 and 18MHz video dot rate versions
- Four video intensities encoded on two TTL outputs (monochrome mode)
- Eight foreground and background colors encoded on three TTL outputs (color mode)
- Internally latched character attributes:
  - Reverse video
  - Blank
  - Blink
  - Underline
  - Highlight
  - Two general purpose
  - Eight foreground colors
  - Eight background colors
  - Dot width control
  - Double width characters
- VT100 compatible attributes
- Reverse video cursor with optional white cursor in color mode
- Up to 10 dots per character
- Light or dark background in monochrome mode
  - Automatic retrace blanking
- Programmable dot stretching
- Compatible with SCN2674 AVDC and SCN2670 DCGG
- TTL compatible
- 40-pin dual in-line package

APPLICATIONS

- CRT terminals
- Word processing systems
- Small business computers

MICROPROCESSOR DIVISION

SINGLE CHIP 8-BIT MICROCOMPUTERS SCN80 SERIES

DESCRIPTION

The Signetics SCN80 Series microcomputers are self-contained, 8-bit processors which contain the system timing, control logic, RAM data memory, ROM program memory (8048/49/50 only), and I/O lines necessary to implement dedicated control functions. All SCN80 Series devices are pin and program compatible, differing only in the size of the on-board program ROM and data RAM, as follows:

TYPE	RAM SIZE	ROM SIZE
8048	64 x 8	1K x 8
8049	128 x 8	2K x 8
8050	256 x 8	4K x 8
8035	64 x 8	—
8039	128 x 8	—
8040	256 x 8	—

Program memory can be expanded externally up to a maximum total of 4K bytes without paging. Data memory can also be expanded externally. I/O capabilities can be expanded using standard devices or the 8243 I/O expander.

The SCN80 Series processors are designed to be efficient control processors as well as arithmetic processors. They provide an instruction set which allows the user to directly set and reset individual lines within its I/O ports as well as test individual bits within the accumulator. A large variety of branch and table look-up instructions make these processors very efficient in implementing standard logic functions. Also, special attention has been given to code efficiency. Over 70% of the instructions are a single byte long and all others are only 2 bytes long.

An on-chip 8-bit counter is provided which can count, under program control, either internal clock pulses (with a divide by 32 prescaler) or external events. The counter can be programmed to cause an interrupt on terminal count.

FEATURES

- 8-bit CPU, ROM, RAM, I/O in a 40-pin package
- 24 quasi bidirectional I/O lines
- Two test inputs
- Internal counter/timer
- Single-level vectored interrupts: external, counter/timer
- Over 90 instructions, 70% single byte
- 1.36μs or 2.5μs instruction cycle, all instructions one or two cycles
- Expandable memory and I/O
- Low voltage standby
- TTL compatible inputs and outputs
- Single +5V power supply

Signetics

© IC MASTER 1983

16-BIT MICROPROCESSOR SCN68000

PRODUCT BRIEF, contact your Signetics sales offices for complete information.

DESCRIPTION

Advances in semiconductor technology have provided the capability to place on a single chip a microprocessor at least an order of magnitude higher in performance and circuit complexity than has been previously available. The SCN68000 is the first of a family of such VLSI microprocessors from Signetics. It combines state-of-the-art technology and advanced circuit design techniques with computer sciences to achieve an architecturally advanced 16-bit microprocessing unit. The SCN68000 offers seventeen 32-bit registers in addition to the 32-bit program counter and a 16-bit status register (see the programming model in figure 1). The first eight registers (D0-D7) are used as data registers for byte (8-bit), word (16-bit), and long word (32-bit) data operations. The second set of seven registers (A0-A6) and the system stack pointer can be used as software stack pointers and base address registers. In addition, these registers can be used for word and long word address operations. All 17 registers can be used as index registers.

FEATURES

- 32-bit data and address registers
- 16-megabyte direct addressing range
- 56 powerful instruction types
- Operations on five main data types
- Memory mapped I/O
- 14 addressing modes

MICROPROCESSOR DIVISION

INTELLIGENT PERIPHERAL CONTROLLER SCN68120

DESCRIPTION

The SCN68120 Intelligent Peripheral Controller (IPC) is a general-purpose, user-programmable peripheral controller. It contains a system interface, an 8-bit CPU, a serial communications interface, 21 parallel I/O lines, a 16-bit timer, 2048 bytes of ROM, and eight operating modes. In addition, the SCN68120 features 128 bytes of dual-ported RAM and six semaphore registers that are accessible to both the internal CPU and an external processor or device through the system interface. The SCN68120 provides all the control signals necessary to interface with the asynchronous bus of the SCN68000.

FEATURES

- Bus compatible with the 16-bit SCN68000 and with 8-bit microprocessors
- Bus compatible with 8-bit peripherals
- TTL compatible I/O
- 8-bit CPU
- 2K bytes ROM
- 128 bytes dual-ported RAM
- Six shared semaphore registers
- 16-bit timer
- 21 parallel I/O and two handshake lines
- Serial communications interface
- Interrupt capability
- Operates in single-chip mode or expandable to 64K-byte addressing range
- DMA capability
- 8 x 8-bit multiply

MICROPROCESSOR DIVISION

PARALLEL INTERFACE/TIMER SCN68230

DESCRIPTION

The SCN68230 Parallel Interface/Timer (PI/T) is a general-purpose, programmable parallel interface device which meets most system parallel I/O and timing needs. The parallel interfaces of the PI/T may be used to connect a wide variety of peripheral devices to the SCN68000 bus. The PI/T can be programmed to generate interrupt requests to the SCN68000, or DMA requests to direct memory access controllers on demand of the peripheral. No external logic is needed to connect the PI/T to the DMAC or to the SCN68000. The PI/T also provides complete port and timer status information.

The SCN68230 contains two multi-mode, double-buffered I/O ports (Port A and Port B), a third 8-bit I/O port, and a 24-bit programmable timer. The PI/T also contains flexible prioritization logic for generating unique interrupt vectors. Autovectored interrupts are also supported. Port C pins provide either another port pin or special functions consisting of interrupt, timer, or direct memory access control lines.

FEATURES

- 24 programmable I/O lines
- Port modes include:
  - Bit mode
  - Unidirectional 8-bit mode
  - Unidirectional 16-bit mode
  - Bidirectional 8-bit mode
  - Bidirectional 16-bit mode
- Selectable handshaking modes
- 24-bit programmable timer
- Several timer modes
- Contains interrupt prioritization logic
- Unique interrupt vectors for each source
- Supports interrupt and DMA service requests
- Contains port and timer status registers
- SCN68000 bus compatible

© IC MASTER 1983

DIRECT MEMORY ACCESS INTERFACE (DMAI) SCB68430

PRODUCT BRIEF, contact your Signetics sales office for complete information.

DESCRIPTION

The SCB68430 DMAI is a single channel DMA interface circuit which is intended to complement the performance and architectural capabilities of the SCN68000 microprocessor. The DMAI functions by transferring a series of operands (data) between memory and a device: operand sizes may be byte, word, or long word. A block is a sequence of operands: the number of operands in the block is determined by a transfer count stored within the DMAI. The SCB68430 can be programmed to utilize single cycle (cycle stealing) or burst data transfers.

The DMAI provides two interfaces. The microprocessor interface is fully compatible with the SCN68000 microprocessor. The device interface includes lines for requesting, acknowledging, controlling, and timing the data transfers.

The DMAI is a single-channel subset of other 68000 family DMA controllers. It is software compatible with the other devices and provides similar interfacing signals to both the system bus and the device.

The SCB68430 is constructed using Signetics ISL bipolar technology and is contained in a 48-pin dual-in-line package.

FEATURES

- Single channel DMA controller
- Bus compatible with SCN68000 microprocessor
- Software compatible with 68000 family DMA controllers
- Single address transfers
- Cycle steal and burst mode operation
- Bus arbitration daisy chain
- Automatic rerun on bus error
- Supports SCN68000 vectored interrupts
- Supports 32 bit transfers on VME bus
- 24-bit address register
- 16-bit transfer count register
- 16 data/address lines (multiplexed) and 7 bidirectional address lines
- Maximum transfer rate of 4Mbytes per second
- Signetics ISL bipolar technology
- 48-pin DIP

MICROPROCESSOR DIVISION

MEMORY MANAGEMENT UNIT SCN68451

DESCRIPTION

The SCN68451 Memory Management Unit (MMU) provides address translation and protection of the 16-megabyte addressing space of the SCN68000. The MMU can be accessed by any potential bus master, such as instruction set processors, or DMA controllers. Each bus master (or processor) in the SCN68000 family provides a function code and an address during each bus cycle. The function code specifies an address space while the address specifies a location within that address space. The function codes are provided by the SCN68000 to distinguish between program and data spaces as well as supervisor and user spaces. This separation of address spaces provides the basis of protection in an operating system. By simplifying the programming model of the address space, the MMU also increases the reliability of a complex multiprocess system.

FEATURES

- Separates address spaces of system and user resources
- Provides write protection
- Increases system reliability
- Provides efficient memory allocation
- Allows interprocess communication through shared resources
- Simplifies programming model of address space
- Minimizes operating system overhead with quick context switches
- 32 segments with variable segment sizes
- Multiple MMU system capability
- Supports both paging and segmentation
- DMA compatible
- Provides virtual memory support
- SCN68000 bus compatible

MICROPROCESSOR DIVISION

DUAL ASYNCHRONOUS RECEIVER/TRANSMITTER (DUART) SCN68681

DESCRIPTION

The Signetics SCN68681 Dual Universal Asynchronous Receiver/Transmitter (DUART) is a single chip MOS-LSI communications device that provides two independent, full-duplex, asynchronous receiver/transmitter channels in a 40-pin package. It interfaces directly with the SCN68000 16-bit CPU and other microprocessors and may be used in a polled or interrupt driven system.

The operating mode and data format of each channel can be programmed independently. Additionally, each receiver and transmitter can select its operating speed as one of 18 fixed baud rates, a 16× clock derived from a programmable counter/timer, or an external 1× or 16× clock. The baud rate generator and counter/timer can operate directly from a crystal or from external clock inputs. The ability to independently program the operating speed of the receiver and transmitter make the DUART particularly attractive for dual-speed channel applications such as clustered terminal systems.

Each receiver is quadruply buffered to minimize the potential of receiver overrun or to reduce interrupt overhead in interrupt driven systems. In addition, a handshaking capability is provided to disable a remote DUART transmitter when the buffer of the receiving device is full.

Also provided on the SCN68681 are a multipurpose 6-bit input port and a multipurpose 8-bit output port. These can be used as general-purpose I/O ports or can be assigned specific functions (such as clock inputs or status/interrupt outputs) under program control.

The SCN68681 is similar to the Signetics SCN2681, differing primarily in that the SCN68681 bus interface is compatible with the SCN68000 16-bit microprocessor. Refer to the SCN2681 data sheet for operational details.

FEATURES

- S68000 compatible bus interface
- Dual, full-duplex, asynchronous receiver/transmitter
- Quadruple buffered receiver data registers
- Programmable data format
  - 5 to 8 data bits plus parity
  - Odd, even, no parity or force parity
  - 1, 1.5 or 2 stop bits programmable in 1/16-bit increments
- Programmable baud rate for each receiver and transmitter selectable from
  - 18 fixed rates: 50 to 38.4K baud
  - One user-defined rate derived from programmable timer/counter
  - External 1X or 16X clock
- Parity, framing, and overrun error detection
- False start bit detection
- Line break detection and generation
- Programmable channel mode
  - Normal (full duplex)
  - Automatic echo
  - Local loopback
  - Remote loopback
- Multi-function programmable 16-bit counter/timer
- Multi-function 6-bit input port
  - Can serve as clock or control inputs
  - Change of state detection on four inputs
- Multi-function 8-bit output port
  - Individual bit set/reset capability
  - Outputs can be programmed to be status/interrupt signals
- Versatile interrupt system
  - Single interrupt output with eight maskable interrupting conditions
  - Interrupt vector output on interrupt acknowledge
  - Output port can be configured to provide a total of up to six separate wire-OR'able interrupt outputs
- Maximum data transfer: 1X — 1MB/sec, 16X — 125KB/sec
- Automatic wake-up mode for multidrop applications
- Start-end break interrupt/status
- Detects break which originates in the middle of a character
- On-chip crystal oscillator
- TTL compatible
- Single +5V power supply

Signetics

© IC MASTER 1983

Synertek.

SY6500

8-Bit Microprocessor Family

Features

- Single 5 V ±5% power supply
- N channel, silicon gate, depletion load technology
- Eight bit parallel processing
- 56 Instructions
- Decimal and binary arithmetic
- Thirteen addressing modes
- True indexing capability
- Programmable stack pointer
- Variable length stack
- Interrupt capability
- Non-maskable interrupt
- Use with any type or speed memory
- Bi-directional Data Bus
- Instruction decoding and control
- Addressable memory range of up to 65 K bytes
- "Ready" input
- Direct memory access capability
- Bus compatible with MC6800
- Choice of external or on-board clocks
- 1 MHz, 2 MHz, 3 MHz and 4 MHz operation
- On-chip clock options
  - * External single clock input
  - * Crystal time base input
- 40 and 28 pin package versions
- Pipeline architecture

Description

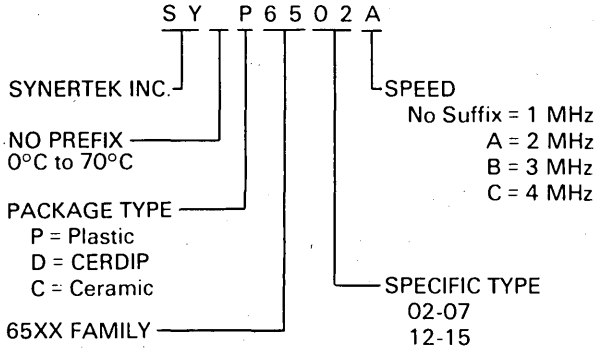
The SY6500 Series Microprocessors represent the first totally software compatible microprocessor family. This family of products includes a range of software compatible microprocessors which provide a selection of addressable memory range, interrupt input options and on-chip clock oscillators and drivers. All of the microprocessors in the SY6500 family are software compatible within the group and are bus compatible with the MC6800 product offering.

The family includes six microprocessors with on-board clock oscillators and drivers and four microprocessors driven by external clocks. The on-chip clock versions are aimed at high performance, low cost applications where single phase inputs or crystals provide the time base. The external clock versions are geared for the multi-processor system applications where maximum timing control is mandatory. All versions of the microprocessors are available in 1 MHz, 2 MHz, 3 MHz and 4 MHz maximum operating frequencies.

Members of the Family

PART NUMBERS	CLOCKS	PINS	$\overline{IRQ}$	$\overline{NMI}$	RYD	ADDRESSING
SY6502	On-Chip	40	√	√	√	64 K
SY6503	"	28	√	√		4 K
SY6504	"	28	√			8 K
SY6505	"	28	√		√	4 K
SY6506	"	28	√			4 K
SY6507	"	28			√	8 K
SY6512	External	40	√	√	√	64 K
SY6513	"	28	√	√		4 K
SY6514	"	28	√			8 K
SY6515	"	28	√		√	4 K

Ordering Information



Only 6502 and 6512 are available in 3 and 4 MHz

Synertek MICROPROCESSOR

© IC MASTER 1983

Synertek.

SY6520/SY6520A
SY6820/SY68B20
Peripheral Interface Adapter (PIA)

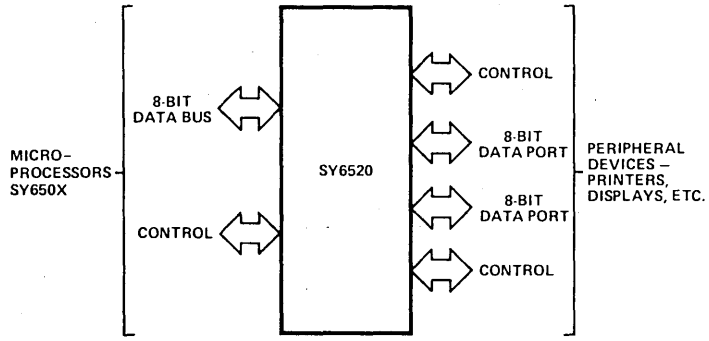
Features

- Direct Replacement for MC6820
- Single +5V Power Supply
- Two 8-bit Bi-directional I/O Ports with Individual Data Direction Control
- CMOS-Compatible Peripheral Port A Lines
- Automatic "Handshake" Control of Data Transfers
- Programmable Interrupt Capability
- Automatic Initialization on Power Up
- 1 and 2 MHz Versions

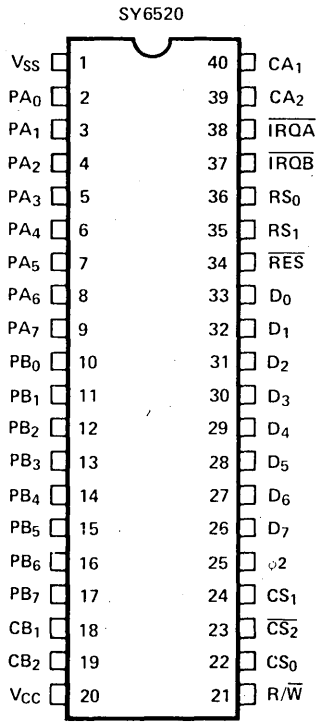
Description

The SY6520 Peripheral Interface Adapter (PIA) is designed to provide a broad range of peripheral control to microcomputer systems. Control of peripheral devices is accomplished through two 8-bit bi-directional I/O ports. Each I/O line may be programmed to be either an input or an output. In addition, four peripheral control lines are provided to perform "handshaking" during data transfers.

Basic SY6520 Interface Diagram



Pin Configuration



Ordering Information

Part Number	Package	Speed
SYC6520/6820	Ceramic	1MHz
SYD6520/6820	Cerdip	1MHz
SYP6520/6820	Plastic	1MHz
SYC6520A/68B20	Ceramic	2MHz
SYD6520A/68B20	Cerdip	2MHz
SYP6520A/68B20	Plastic	2MHz

© IC MASTER 1983

Synertek.

SY6521/SY6821
SY6521A/SY68B21

Peripheral Interface Adapter (PIA)

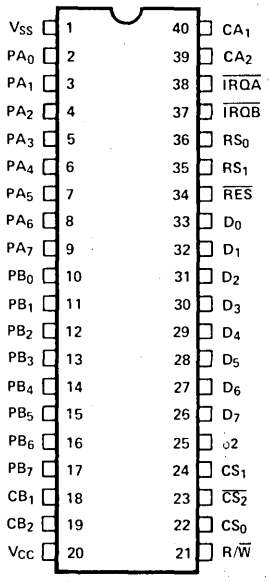
Features

- Extended Performance Version of SY6520
- Single +5V Power Supply
- Two 8-bit Bi-directional I/O Ports with Individual Data Direction Control
- CMOS-Compatible Peripheral Port A lines
- Automatic "Handshake" Control of Data Transfers
- Programmable Interrupt Capability
- Automatic Initialization on Power Up
- 1 and 2 MHz Versions
- Direct Replacement for MC6821

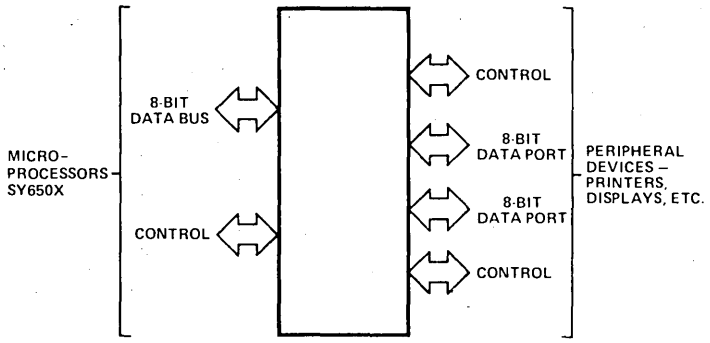
Description

The SY6521 Peripheral Interface Adapter (PIA) is designed to provide a broad range of peripheral control to microcomputer systems. It is functionally compatible with the SY6520, but with more drive capability and improved performance. Control of peripheral devices is accomplished through two 8-bit bi-directional I/O ports. Each I/O line may be programmed to be either an input or an output. In addition, four peripheral control lines are provided to perform "handshaking" during data transfers.

Pin Configuration



Basic SY6521 Interface Diagram



Ordering Information

Part Number	Package	Speed
SYC6521	Ceramic	1 MHz
SYD6521	Cerdip	1 MHz
SYP6521	Plastic	1 MHz
SYC6521A	Ceramic	2 MHz
SYD6521A	Cerdip	2 MHz
SYP6521A	Plastic	2 MHz
SYC6821	Ceramic	1 MHz
SYD6821	Cerdip	1 MHz
SYP6821	Pastic	1 MHz
SYC68B21	Ceramic	2 MHz
SYD68B21	Cerdip	2 MHz
SYP68B21	Plastic	2 MHz

© IC MASTER 1983

Synertek.

SY6522/SY6522A

Versatile Interface Adapter (VIA)

Features

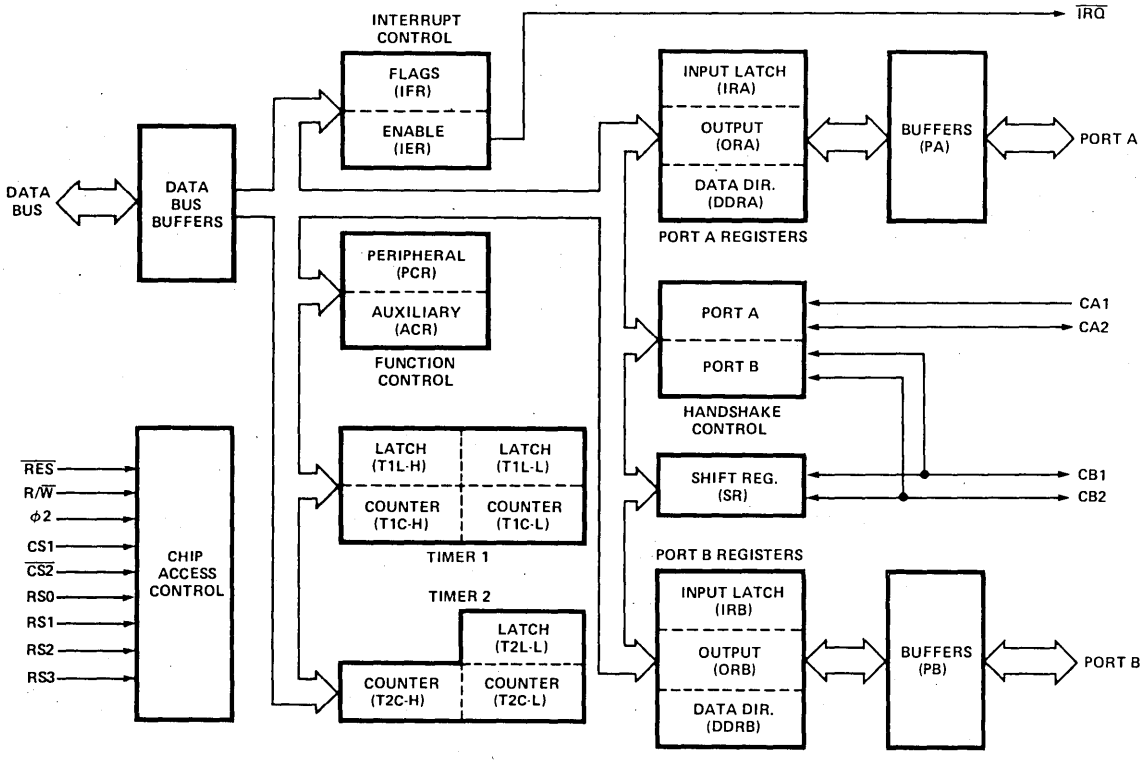
- Two 8-Bit Bidirectional I/O Ports
- Two 16-Bit Programmable Timer/Counters
- Serial Data Port
- Single +5V Power Supply
- TTL Compatible
- CMOS Compatible Peripheral Port A lines
- Expanded "Handshake" Capability Allows Positive Control of Data Transfers Between Processor and Peripheral Devices
- Latched Output and Input Registers
- 1 MHz and 2 MHz Operation

Description

The SY6522 Versatile Interface Adapter (VIA) is a very flexible I/O control device. In addition, this device contains a pair of very powerful 16-bit interval timers, a serial-to-parallel/parallel-to-serial shift register and input data latching on the peripheral ports. Expanded handshaking capability allows control of bi-directional data transfers between VIA's in multiple processor systems.

Control of peripheral devices is handled primarily through two 8-bit bi-directional ports. Each line can be programmed as either an input or an output. Several peripheral I/O lines can be controlled directly from the interval timers for generating programmable frequency square waves or for counting externally generated pulses. To facilitate control of the many powerful features of this chip, an interrupt flag register, an interrupt enable register and a pair of function control registers are provided.

Block Diagram



© IC MASTER 1983

Synertek.

SY6530

Memory, I/O, Timer Array

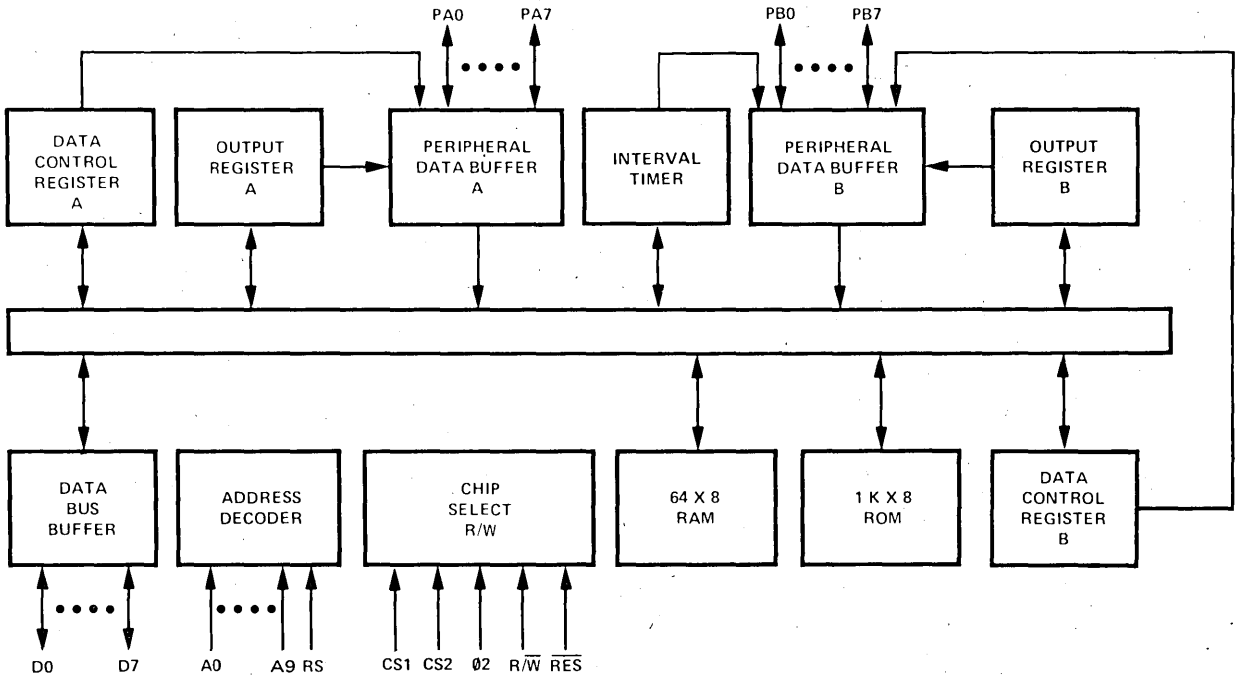
Features

- 8 bit bi-directional Data Bus for direct communication with the microprocessor
- 1024 x 8 ROM
- 64 x 8 static RAM
- Two 8 bit bi-directional data ports for interface to peripherals
- Two programmable I/O Peripheral Data Direction Registers
- Programmable Interval Timer
- Programmable Interval Timer Interrupt
- TTL & CMOS compatible peripheral lines
- Peripheral pins with Direct Transistor Drive Capability
- High Impedance Three-State Data Pins
- Allows up to 7K contiguous bytes of ROM with no external decoding

Description

The SY6530 is designed to operate in conjunction with the SY6500 microprocessor Family. It is comprised of a mask programmable 1024 x 8 ROM, a 64 x 8 static RAM, two software controlled 8 bit bi-directional data ports allowing direct interfacing between the microprocessor unit and peripheral devices, and a software programmable interval timer with interrupt, capable of timing in intervals from 1 to 262,144 clock periods.

Block Diagram



© IC MASTER 1983

Synertek.

SY6532

RAM, I/O, Timer Array

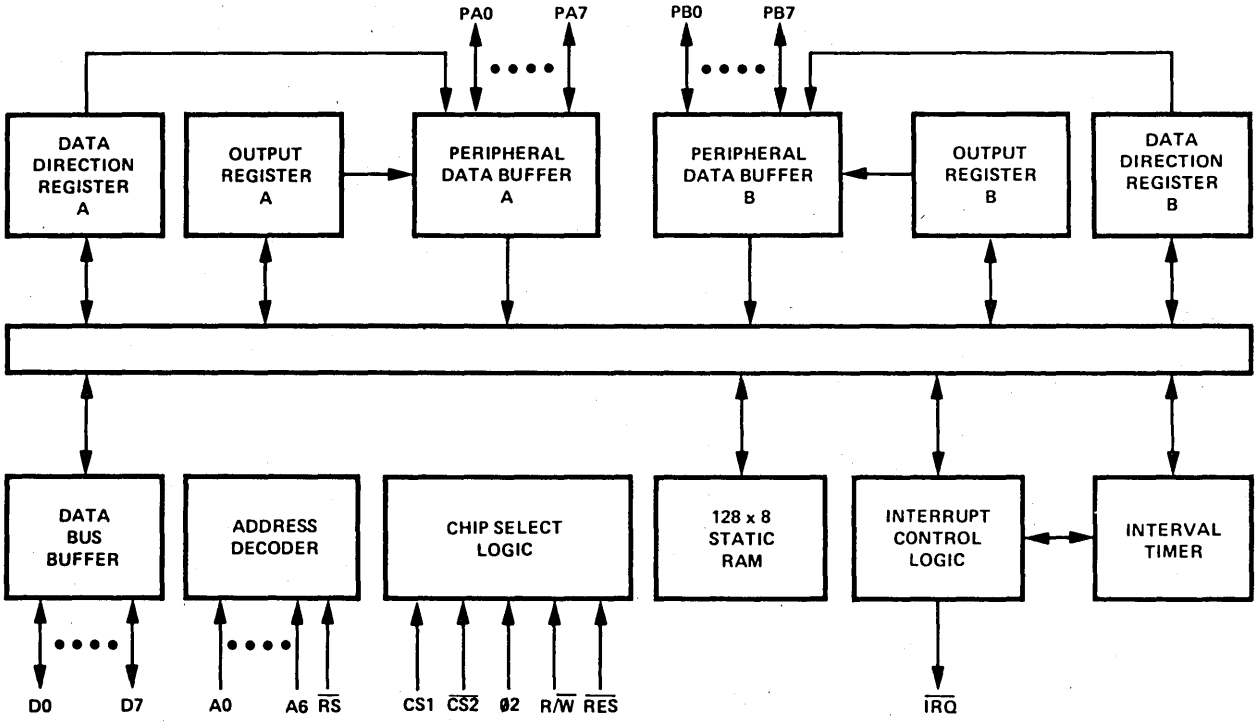
Features

- 8 Bit Bi-directional Data Bus for Direct Communication with the Microprocessor
- Programmable Edge-Sensitive Interrupt
- 128 x 8 Static RAM
- Two 8 Bit Bi-directional Data Ports for Interface to Peripherals
- Two Programmable I/O Peripheral Data Direction Registers
- Programmable Interval Timer
- Programmable Interval Timer Interrupt
- TTL & CMOS Compatible Peripheral Lines
- Peripheral Pins with Direct Transistor Drive Capability
- High Impedance Three-State Data Pins

Description

The SY6532 is designed to operate in conjunction with the SY6500 Microprocessor Family. It is comprised of a 128 x 8 static RAM, two software controlled 8 bit bi-directional data ports allowing direct interfacing between the microprocessor unit and peripheral devices, a software programmable interval timer with interrupt capable of timing in various intervals from 1 to 262, 144 clock periods, and a programmable edge-detect interrupt circuit.

Block Diagram



© IC MASTER 1983

Synertek.

SY6545R
SY6845R
CRT Controller

PRELIMINARY

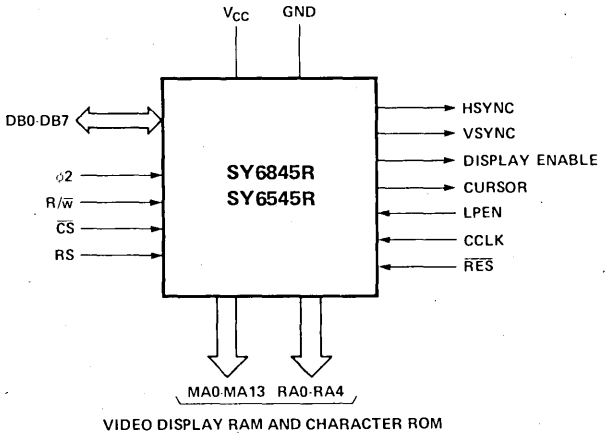
Features

- Single +5 volt (±5%) power supply.
- Alphanumeric and limited graphics capabilities.
- Fully programmable display (rows, columns, blanking, etc.).
- Interlaced or non-interlaced scan.
- 50/60 Hz operation.
- Fully programmable cursor.
- External light pen capability.
- Capable of addressing up to 16K character Video Display RAM.
- No DMA required.
- Pin-compatible with MC6845.
- 3.7 MHz Character Clock
- Internal status register.

Description

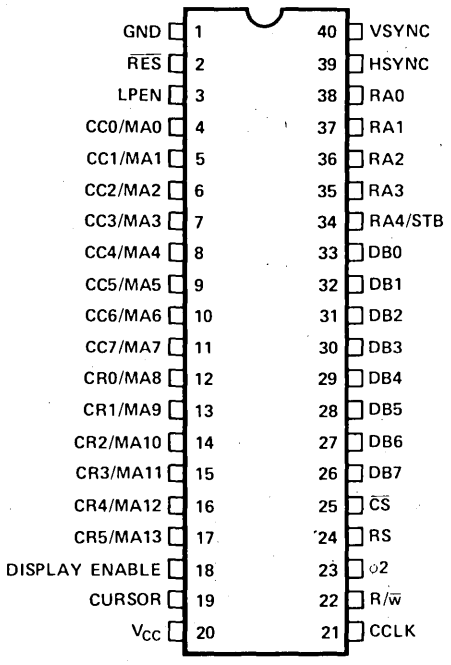
The SY6545 is a CRT Controller intended to provide capability for interfacing any microprocessor to a CRT or TV-type raster scan display. A unique feature is the inclusion of several modes of operation, so that the system designer can configure the system with a wide assortment of techniques. This part is also a direct replacement for the ML6845R.

Interface Diagram



VIDEO DISPLAY RAM AND CHARACTER ROM

Pin Configuration



Ordering Information

Part Number	Package	φ2 Clock Rate
SYC6545R	Ceramic	1 MHz
SYD6545R	Cerdip	1 MHz
SYP6545R	Plastic	1 MHz
SYC6545RA	Ceramic	2 MHz
SYD6545RA	Cerdip	2 MHz
SYP6545RA	Plastic	2 MHz

© IC MASTER 1983

Synertek.

SY6545-1
CRT Controller

PRELIMINARY

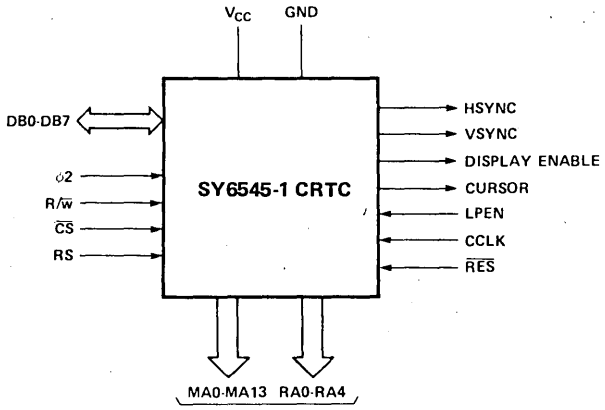
Features

- Single +5 volt (±5%) power supply.
- Alphanumeric and limited graphics capabilities.
- Fully programmable display (rows, columns, blanking, etc.).
- Interlaced or non-interlaced scan.
- 50/60 Hz operation.
- Fully programmable cursor.
- External light pen capability.
- Capable of addressing up to 16K character Video Display RAM.
- No DMA required.
- Pin-compatible with MC6845.
- Row/Column or straight-binary addressing for Video Display RAM.
- Video Display RAM may be configured as part of microprocessor memory field or independently slaved to 6545.
- Internal status register.

Description

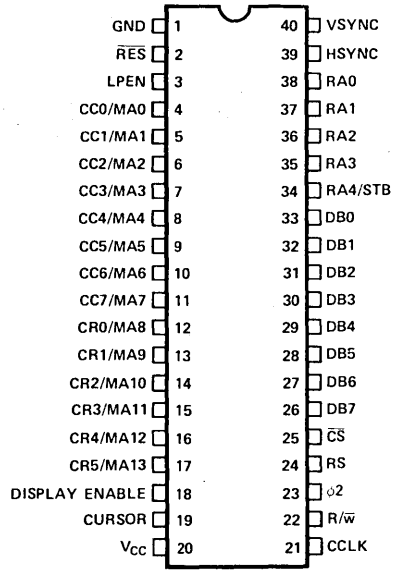
The SY6545 is a CRT Controller intended to provide capability for interfacing the 6500/6800 microprocessor families to CRT or TV-type raster scan displays. A unique feature is the inclusion of several modes of operation, so that the system designer can configure the system with a wide assortment of techniques.

Interface Diagram



VIDEO DISPLAY RAM AND CHARACTER ROM

Pin Configuration



Ordering Information

Part Number	Package	φ2 Clock Rate
SYC6545-1	Ceramic	1 MHz
SYD6545-1	Cerdip	1 MHz
SYP6545-1	Plastic	1 MHz
SYC6545A-1	Ceramic	2 MHz
SYD6545A-1	Cerdip	2 MHz
SYP6545A-1	Plastic	2 MHz

© IC MASTER 1983

Synertek.

SY6545E
CRT Controller

PRELIMINARY

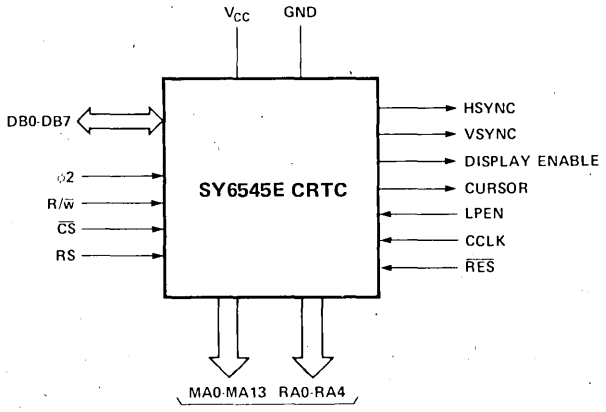
Features

- Single +5 volt (±5%) power supply.
- Alphanumeric and limited graphics capabilities.
- Fully programmable display (rows, columns, blanking, etc.).
- Interlaced or non-interlaced scan.
- 50/60 Hz operation.
- Fully programmable cursor.
- External light pen capability.
- Capable of addressing up to 16K character Video Display RAM.
- No DMA required.
- Pin-compatible with MC6845.
- Row/Column or straight-binary addressing for Video Display RAM.
- Video Display RAM may be configured as part of microprocessor memory field or independently slaved to 6545E
- Internal status register.
- 3.7 MHz Character Clock

Description

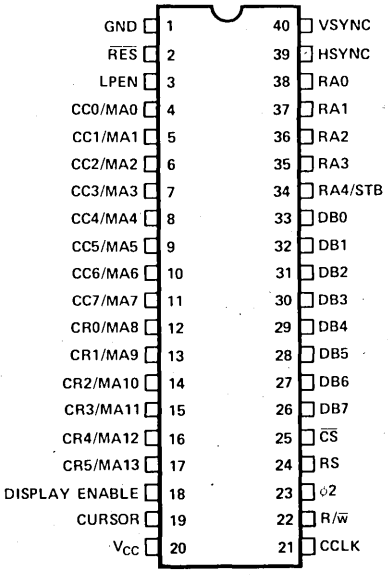
The SY6545E is a CRT Controller intended to provide capability for interfacing any microprocessor family to a CRT or TV-type raster scan display. A unique feature is the inclusion of several modes of operation, so that the system designer can configure the system with a wide assortment of techniques.

Interface Diagram



VIDEO DISPLAY RAM AND CHARACTER ROM

Pin Configuration



Ordering Information

Part Number	Package	φ2 Clock Rate
SYC6545E	Ceramic	1 MHz
SYD6545E	Cerdip	1 MHz
SYP6545E	Plastic	1 MHz
SYC6545EA	Ceramic	2 MHz
SYD6545EA	Cerdip	2 MHz
SYP6545EA	Plastic	2 MHz

© IC MASTER 1983

Synertek.

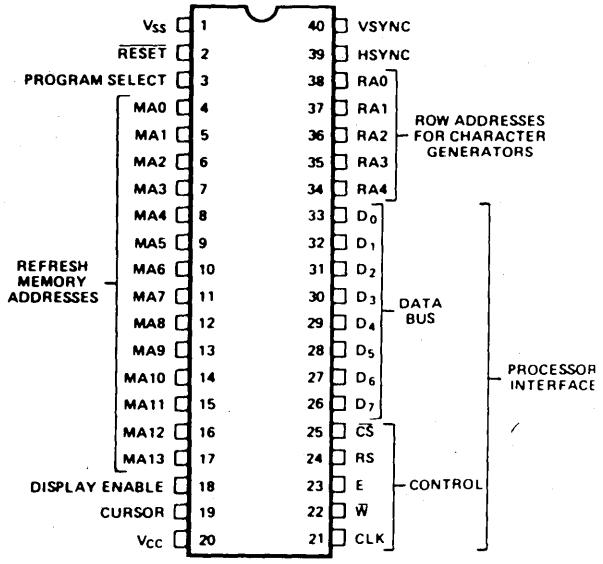
SY68045

CRT Controller (CRTC)

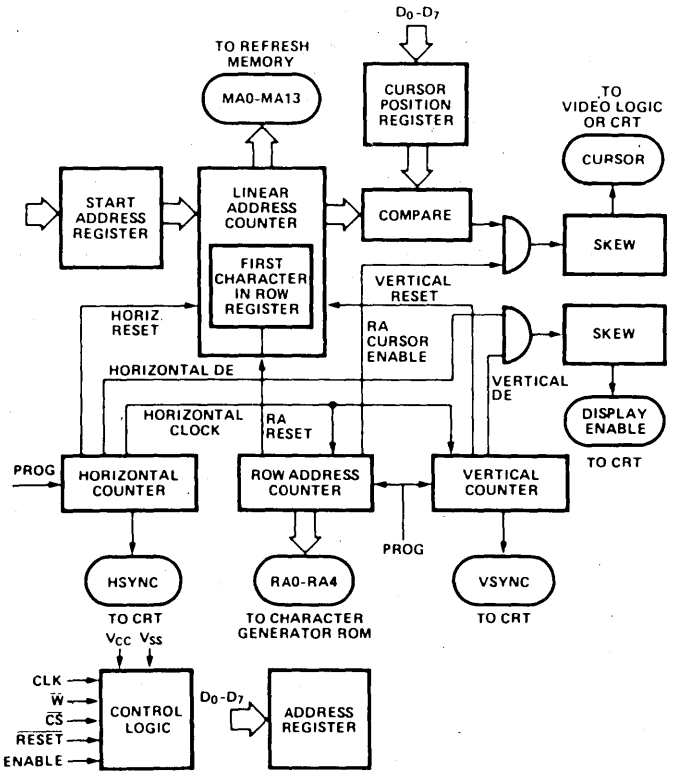
Features

- Generates Refresh Addresses and Row Selects
- Generates Video Monitor Inputs: Horizontal and Vertical Sync and Display Enable
- Low Cost; MC6845, SY6545 Pin Compatible
- Text Can Be Scrolled on a Character, Line or Page Basis
- Addresses 16K Bytes of Memory
- Screen Can Be Up to 128 Characters Tall by 256 Wide
- Characters Can be 32 Lines High with any Width
- Two Complete ROM Programs
- Cursor and/or Display Can Be Delayed 0, 1 or 2 Clock Cycles
- Four Cursor Modes:
  - — Non-Blink
  - — Slow Blink
  - — Fast Blink
  - — Reverse Video With Addition of a Single TTL Gate
- Three Interlace Modes
  - — Normal Sync
  - — Interlace Sync
  - — Interlace Sync and Video
- Full Hardware Scrolling
- NMOS Silicon Gate Technology
- TTL-Compatible, Single +5 Volt Supply

Pin Configuration



Block Diagram



Ordering Information

Part Number	Package	E Clock Rate
SYP68045	Plastic	1 MHz
SYC68045	Ceramic	1 MHz
SYD68045	Cerdip	1 MHz
SYP68045A	Plastic	1.5 MHz
SYC68045A	Ceramic	1.5 MHz
SYD68045A	Cerdip	1.5 MHz
SYP68045B	Plastic	2.0 MHz
SYC68045B	Ceramic	2.0 MHz
SYD68045B	Cerdip	2.0 MHz

© IC MASTER 1983

Synertek.

SY6551

Asynchronous Communication Interface Adapter

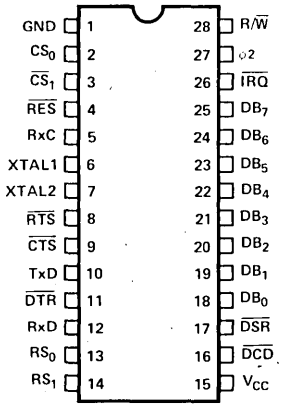
Features

- On-chip baud rate generator: 15 programmable baud rates derived from a standard 1.8432 MHz external crystal (50 to 19,200 baud).
- Programmable interrupt and status register to simplify software design.
- Single +5 volt power supply.
- Serial echo mode.
- False start bit detection.
- 8-bit bi-directional data bus for direct communication with the microprocessor.
- External 16x clock input for non-standard baud rates (up to 125 Kbaud).
- Programmable: word lengths; number of stop bits; and parity bit generation and detection.
- Data set and modem control signals provided.
- Parity: (odd, even, none, mark, space).
- Full-duplex or half-duplex operation.
- 5, 6, 7, 8 and 9 bit transmission.

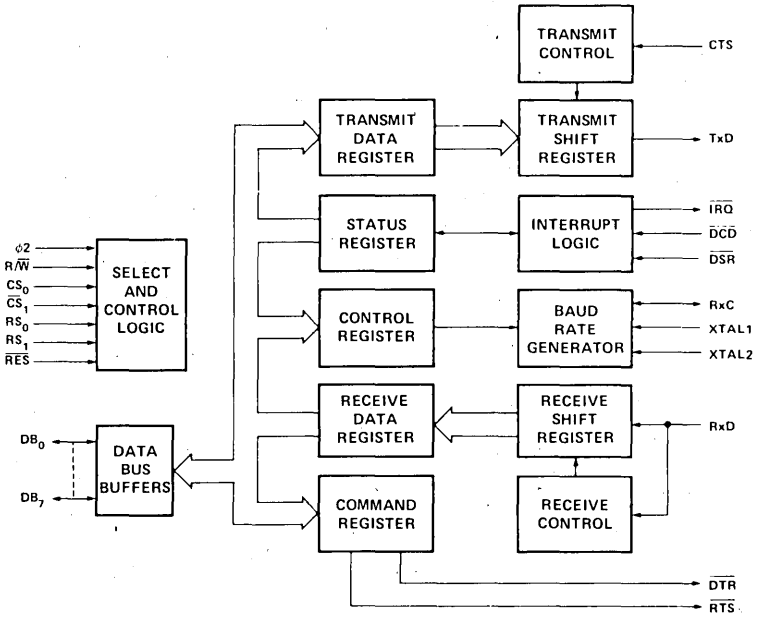
Description

The SY6551 is an Asynchronous Communication Adapter (ACIA) intended to provide for interfacing the 6500/6800 microprocessor families to serial communication data sets and modems. A unique feature is the inclusion of an on-chip programmable baud rate generator, with a crystal being the only external component required.

Pin Configuration



Block Diagram



Ordering Information

Part No.	Package	Clock Rate
SYC6551	Ceramic	1 MHz
SYD6551	Cerdip	1 MHz
SYP6551	Plastic	1 MHz
SYC6551A	Ceramic	2 MHz
SYD6551A	Ceramic	2 MHz
SYP6551A	Plastic	2 MHz

© IC MASTER 1983

Synertek.

SY6591/SY6591A

Floppy Disk Controller (FDC)

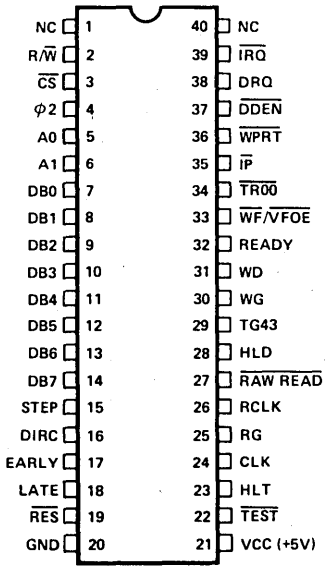
Features

- Functionally compatible with SY1791-02/SY1793-02
- MPU bus interface directly compatible with SY6500 and MC6800 microprocessors.
- Single 5 volt power supply
- Accommodates both single-density (FM) and double-density (MFM) formats
- IBM format compatibility:
  - IBM 3740 Single-Density
  - IBM System-34 Double-Density

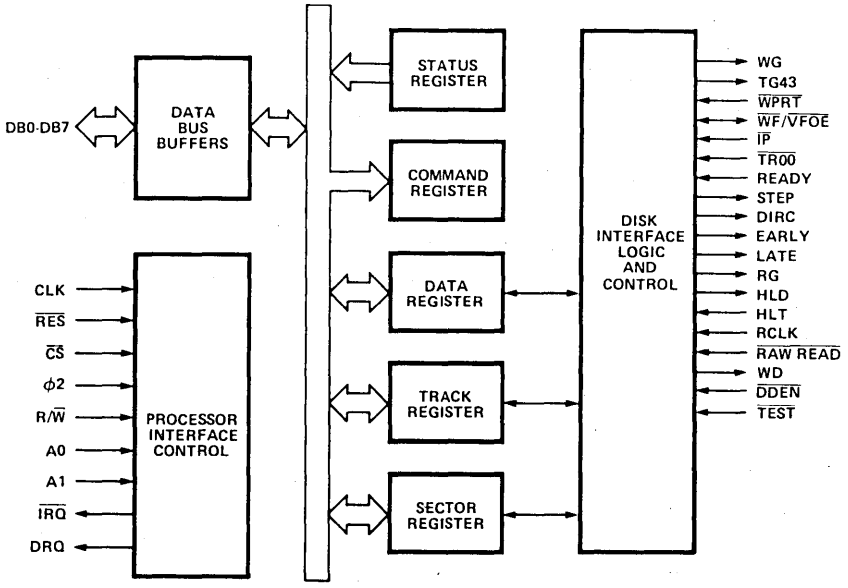
Description

The SY6591 Floppy Disk Controller is a fully programmable device intended for SY6500 or MC6800 microprocessor-based systems. Floppy disk control functions are fully autonomous and are thoroughly described in the SY1791-02/SY1793-02 data sheet. The SY6591 version is different only in the MPU bus interface characteristics.

Pin Configuration



Block Diagram



Ordering Information

Part Number	Package	MPU Clock Rate
SYC6591	Ceramic	1MHz
SYD6591	Cerdip	1MHz
SYP6591	Plastic	1MHz
SYC6591A	Ceramic	2MHz
SYD6591A	Cerdip	2MHz
SYP6591A	Plastic	2MHz

© IC MASTER 1983

Synertek

SY1791-02/SY1793-02

Floppy Disk Controller (FDC)

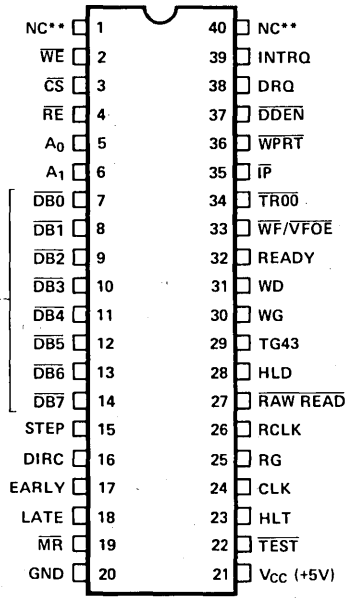
Features

- Pin and function compatible with Western-Digital FD1791-02 and FD1793-02
- Single 5-volt power supply
- Accommodates both single-density (FM) and double-density (MFM) formats
- IBM format compatibility:
  IBM 3740 single-density
  IBM System-34 double-density
- Numerous automatic control functions

Description

The SY1791-02/SY1793-02 Floppy Disk Controller is a fully programmable device intended for microprocessor based systems. Autonomous operation permits complete control of floppy disk functions with minimum CPU intervention required. Programmability is provided to allow either single-density (FM) or double-density (MFM) formats compatible with IBM standards, or formats uniquely defined by the user. The SY1791-02 uses negative-true data bus logic; the SY1793-02 uses positive-true.

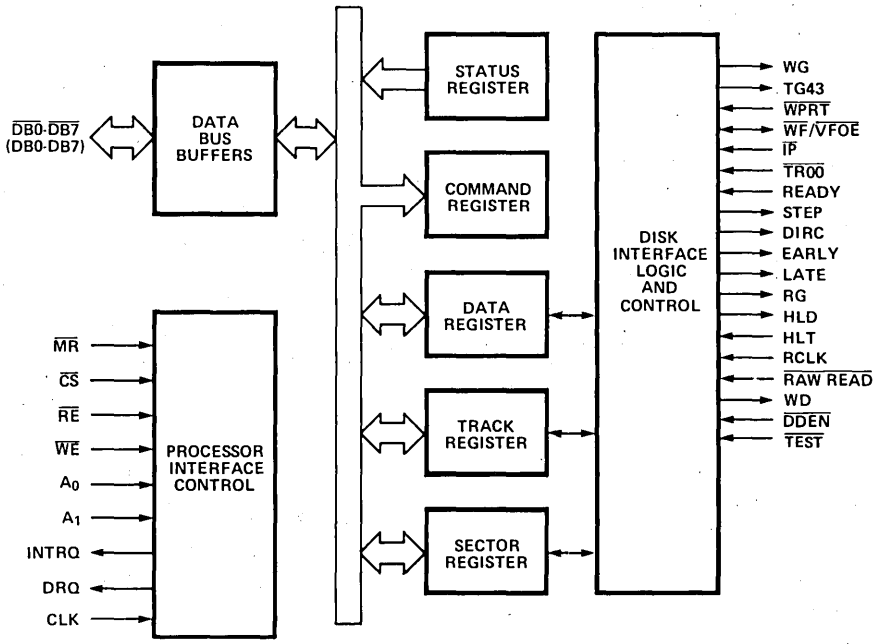
Pin Configuration



*1793-02 HAS POSITIVE-TRUE DATA BUS LOGIC.

**NC PINS ARE INTERNALLY OPEN CIRCUITED. VOLTAGES APPLIED TO THESE PINS HAVE NO AFFECT.

Block Diagram



( ) DENOTES SY1793-02 SIGNALS

Ordering Information

PART NUMBER	PACKAGE	DATA BUS LOGIC
SYC1791-02	CERAMIC	NEGATIVE-TRUE
SYD1791-02	CERDIP	NEGATIVE-TRUE
SYP1791-02	PLASTIC	NEGATIVE-TRUE
SYC1793-02	CERAMIC	POSITIVE-TRUE
SYD1793-02	CERDIP	POSITIVE-TRUE
SYP1793-02	PLASTIC	POSITIVE-TRUE

© IC MASTER 1983

Synertek.

SY2661

Enhanced Programmable Communications Interface

Features

SYNCHRONOUS OPERATION

- 5 to 8-bit characters plus parity
- Single or double SYN operation
- Internal or external character synchronization
- Transparent or non-transparent mode
- Transparent mode DLE stuffing (Tx) and detection (Rx)
- Automatic SYN or DLE-SYN insertion
- SYN, DLE and DLE-SYN stripping
- Odd, even, or no parity
- Local or remote maintenance loop back mode
- Baud rate: dc to 1M bps (1X clock)
- Pin & Function Compatible with Signetics 2661

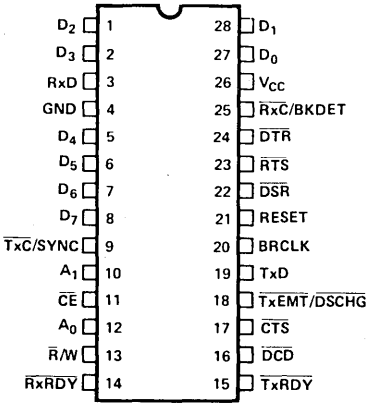
ASYNCHRONOUS OPERATION

- 5 to 8-bit characters plus parity
- 1, 1½ or 2 stop bits transmitted
- Odd, even, or no parity
- Parity, overrun and framing error detection
- Line break detection and generation
- False start bit detection
- Automatic serial echo mode (echoplex)
- Local or remote maintenance loop back mode
- Baud rate: dc to 1M bps (1X clock)
  - — dc to 62.5K bps (16X clock)
  - — dc to 15.625K bps (64X clock)

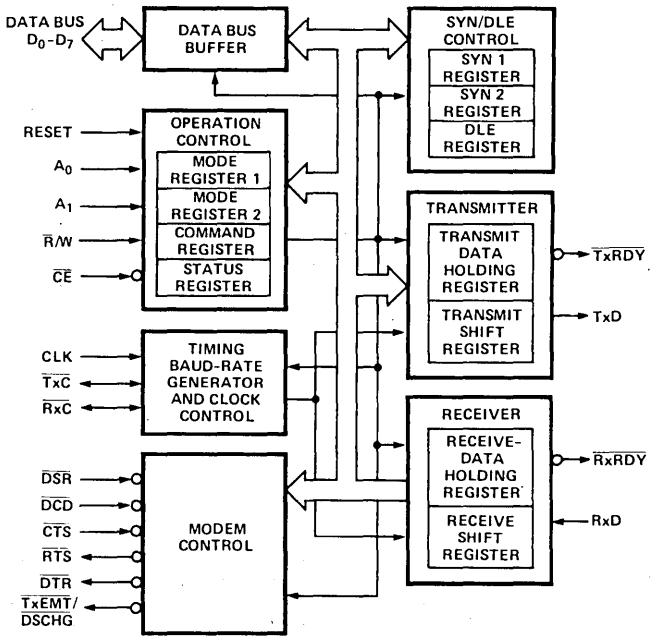
OTHER FEATURES

- Internal or external baud rate clock
- 3 baud rate sets (2661-1, -2, -3)
- 16 internal rates for each set
- Double buffered transmitter and receiver
- Dynamic character length switching
- Full or half duplex operation
- TTL compatible inputs and outputs
- RxC and TxC pins are short circuit protected
- 3 open drain MOS outputs can be wire-ORed
- Single 5V power supply
- No system clock required
- 28-pin dual-in-line package

Pin Configuration



Block Diagram



ORDERING INFORMATION

Part No.	Package
SYP2661-X	Plastic
SYD2661-X	Cerdip
SYC2661-X	Ceramic

X = 1, 2 or 3
(See Table 1)

© IC MASTER 1983

Synertek.

Z8601/Z8601A

Single-Chip Microcomputer with 2K ROM

Features

- Complete microcomputer with on-chip RAM, ROM and I/O
  - — 128 bytes of on-chip RAM
  - — 4K bytes of on-chip ROM
  - — 32 I/O lines
- Two programmable 8-bit counter/timers, each with a 6-bit programmable prescaler
- Full-duplex UART clocked by an internal timer
- 144-byte register file includes:
  - — 124 general-purpose registers, each of which can be used as an accumulator, index register, storage element, address register or part of the internal stack
  - — Four I/O port registers
  - — Sixteen status and control registers
- Register pointer permits shorter, faster instructions to access one of nine working-register groups
- Vectored, prioritized interrupts for I/O, counter/timers and UART
- Expandable bus interfaces up to 60K bytes each of external program memory and external data memory
- On-chip oscillator can be driven by a crystal, RC, LC or external clock source
- High-speed instruction execution

	8601	8601A
— Working-register operations =	1.5 μs	1.0 μs
— Average instruction execution =	2.2 μs	1.4 μs
— Longest instruction =	5.0 μs	3.4 μs

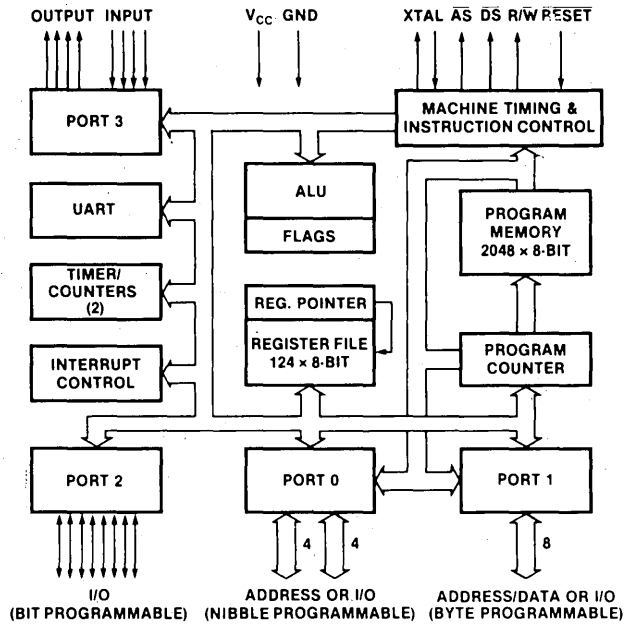
- Low-power standby mode retains contents of general-purpose registers
- Single +5 V supply
- All I/O pins TTL compatible

Description

The Z8 microcomputer introduces a new level of sophistication to single-chip architecture. Compared to earlier single-chip microcomputers, the Z8 offers faster execution; more efficient use of memory; more sophisticated interrupt, input/output and bit-manipulation capabilities; and easier system expansion.

Under program control, the Z8 can be tailored to the needs of its user. It can be configured as a stand-alone microcomputer with 2K of internal ROM, a traditional microprocessor that manages up to 120K of external memory, or a parallel-processing element in a system with other processors and peripheral controllers linked by the Z-Bus. In all configurations, a large number of pins remain available for I/O.

Block Diagram



Z8 is a trademark of Zilog, Inc.

© IC MASTER 1983

Synertek.

Z8602/Z8602A

Development Device with Memory Interface

Features

- Complete microcomputer with on-chip RAM, ROM and I/O
  - 128 bytes of on-chip RAM
  - 4K bytes of on-chip ROM
  - 32 I/O lines
- Two programmable 8-bit counter/timers, each with a 6-bit programmable prescaler
- Full-duplex UART clocked by an internal timer
- 144-byte register file includes:
  - 124 general-purpose registers, each of which can be used as an accumulator, index register, storage element, address register or part of the internal stack
  - Four I/O port registers
  - Sixteen status and control registers
- Register pointer permits shorter, faster instructions to access one of nine working-register groups
- Vectored, prioritized interrupts for I/O, counter/timers and UART
- Expandable bus interfaces up to 60K bytes each of external program memory and external data memory
- On-chip oscillator can be driven by a crystal, RC, LC or external clock source
- High-speed instruction execution

	8602	8602A
— Working-register operations =	1.5 μs	1.0 μs
— Average instruction execution =	2.2 μs	1.4 μs
— Longest instruction =	5.0 μs	3.4 μs

- Low-power standby mode retains contents of general-purpose registers
- Single +5 V supply
- All I/O pins TTL compatible

Description

The functions of the Z8602 I/O lines, $\overline{AS}$, $\overline{DS}$, R/$\overline{W}$, XTAL1, XTAL2 and $\overline{RESET}$ are identical to those of their Z8601 counterparts. The functions of the remaining 24 pins are as follows:

A_0-A_{11}. *Program Memory Address* (outputs). A_0-A_{11} access the first 2K bytes of program memory.

D_0-D_7. *Program Data* (inputs). Program data from the first 4K bytes of program memory is input through pins D_0-D_7.

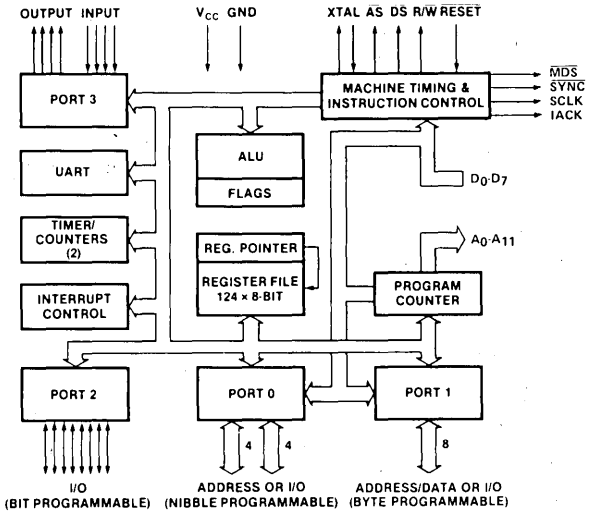
$\overline{MDS}$. *Program Memory Data Strobe* (output, active Low). $\overline{MDS}$ is Low during an instruction fetch cycle when the first 2K bytes of program memory are being accessed. MDS remains High during other program memory read cycles.

$\overline{SYNC}$. *Instruction Sync* (output, active Low). This strobe output is forced Low during the internal clock period preceding the beginning of an opcode fetch.

SCLK. *System Clock* (output). SCLK is the internal clock output through a buffer. The clock rate is equal to one-half the crystal frequency.

IACK. *Interrupt Acknowledge* (output, active High). IACK is driven High in response to an interrupt during the interrupt machine cycle.

Block Diagram



Z8 is a trademark of Zilog, Inc.

© IC MASTER 1983

Synertek.

Z8603/Z8603A

Prototyping Device with EPROM Piggyback

Features

- Prototyping version of Synertek Z8601
- Piggyback 2716 EPROM program memory.
- Pin-compatible with Z8601 masked-ROM for hardware debugging or low-volume production.
- Complete microcomputer on-chip
  - 128 bytes of on-chip data RAM
  - 32 I/O lines
  - Socket for 2716 4K x 8 EPROM
- Two 14-bit counter/timers.
- Duplex UART and baud-rate generator.
- Vectored priority interrupt system.
- Up to 62K of external data memory.
- Up to 62K of external program memory.
- On-chip cyrstal, RC, or LC oscillator.
- High-speed instruction execution.

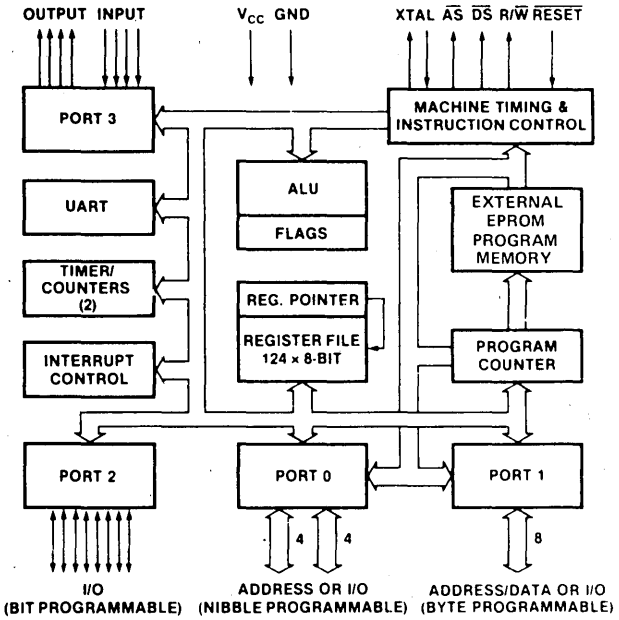
	8603	8603A
Working-register operations =	1.5 μs	1.0 μs
Average instruction =	2.2 μs	1.4 μs

- Single +5V supply voltage.
- All inputs/outputs TTL compatible.

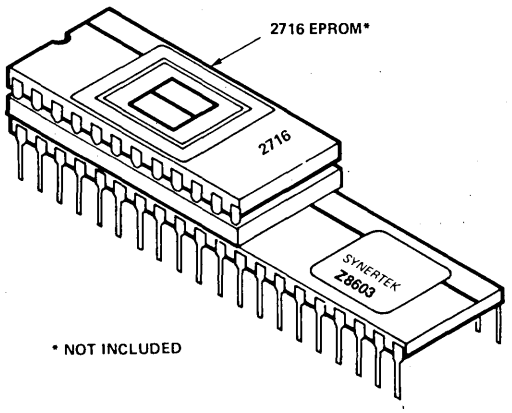
Description

The Synertek Z8603 Microcomputer Protopak Emulator is a ROM-less version of the Synertek 2K Z8 single-chip microcomputer. A removable 2716 EPROM plugged into the 24-pin "piggy-back" socket atop the Z8603 allows pin-compatible emulation of the Z8601 masked-ROM version.

Block Diagram



Package Drawing



Z8 is a trademark of Zilog, Inc.

© IC MASTER 1983

Synertek.

Z8611/Z8611A

Single-Chip Microcomputer with 4K ROM

Features

- Complete microcomputer with on-chip RAM, ROM and I/O
  - — 128 bytes of on-chip RAM
  - — 4K bytes of on-chip ROM
  - — 32 I/O lines
- Two programmable 8-bit counter/timers, each with a 6-bit programmable prescaler
- Full-duplex UART clocked by an internal timer
- 144-byte register file includes:
  - — 124 general-purpose registers, each of which can be used as an accumulator, index register, storage element, address register or part of the internal stack
  - — Four I/O port registers
  - — Sixteen status and control registers
- Register pointer permits shorter, faster instructions to access one of nine working-register groups
- Vectored, prioritized interrupts for I/O, counter/timers and UART
- Expandable bus interfaces up to 60K bytes each of external program memory and external data memory
- On-chip oscillator can be driven by a crystal, RC, LC or external clock source
- High-speed instruction execution

	Z8611	Z8611A
— Working-register operations =	1.5 μs	1.0 μs
— Average instruction execution =	2.2 μs	1.4 μs
— Longest instruction =	5.0 μs	3.4 μs

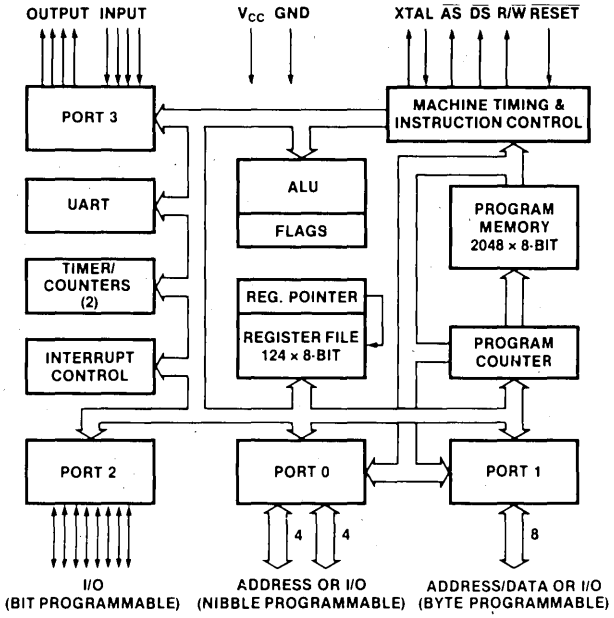
- Low-power standby mode retains contents of general-purpose registers
- Single +5 V supply
- All I/O pins TTL compatible

Description

The Z8 microcomputer introduces a new level of sophistication to single-chip architecture. Compared to earlier single-chip microcomputers, the Z8 offers faster execution; more efficient use of memory; more sophisticated interrupt, input/output and bit-manipulation capabilities; and easier system expansion.

Under program control, the Z8 can be tailored to the needs of its user. It can be configured as a stand-alone microcomputer with 4K of internal ROM, a traditional microprocessor that manages up to 120K of external memory, or a parallel-processing element in a system with other processors and peripheral controllers linked by the Z-Bus. In all configurations, a large number of pins remain available for I/O.

Block Diagram



Z8 is a trademark of Zilog, Inc.

© IC MASTER 1983

Synertek.

Z8612/Z8612A

Development Device with Memory Interface

Features

- Complete microcomputer with on-chip RAM, ROM and I/O
  - — 128 bytes of on-chip RAM
  - — 4K bytes of on-chip ROM
  - — 32 I/O lines
- Two programmable 8-bit counter/timers, each with a 6-bit programmable prescaler
- Full-duplex UART clocked by an internal timer
- 144-byte register file includes:
  - — 124 general-purpose registers, each of which can be used as an accumulator, index register, storage element, address register or part of the internal stack
  - — Four I/O port registers
  - — Sixteen status and control registers
- Register pointer permits shorter, faster instructions to access one of nine working-register groups
- Vectored, prioritized interrupts for I/O, counter/timers and UART
- Expandable bus interfaces up to 60K bytes each of external program memory and external data memory
- On-chip oscillator can be driven by a crystal, RC, LC or external clock source
- High-speed instruction execution

	8612	8612A
— Working-register operations =	1.5 μs	1.0 μs
— Average instruction execution =	2.2 μs	1.4 μs
— Longest instruction =	5.0 μs	3.4 μs

- Low-power standby mode retains contents of general-purpose registers
- Single +5 V supply
- All I/O pins TTL compatible

Description

The functions of the Z8612 I/O lines, $\overline{AS}$, $\overline{DS}$, R/$\overline{W}$, XTAL1, XTAL2 and $\overline{RESET}$ are identical to those of their Z8611 counterparts. The functions of the remaining 24 pins are as follows:

A_0-A_{11}. *Program Memory Address* (outputs). A_0-A_{11} access the first 4K bytes of program memory.

D_0-D_7. *Program Data* (inputs). Program data from the first 4K bytes of program memory is input through pins D_0-D_7.

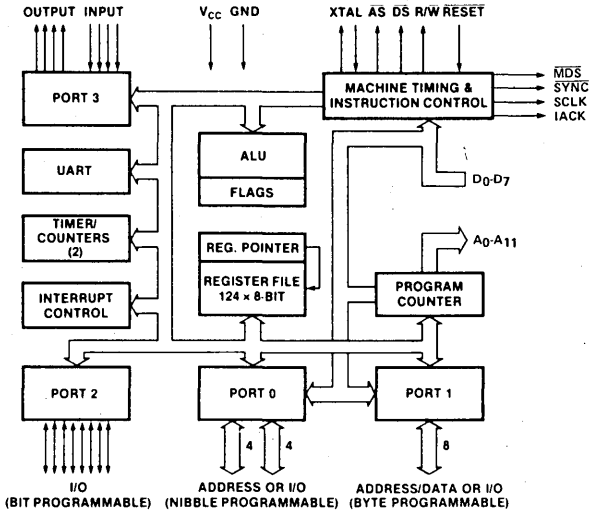
$\overline{MDS}$. *Program Memory Data Strobe* (output, active Low). $\overline{MDS}$ is Low during an instruction fetch cycle when the first 4K bytes of program memory are being accessed. $\overline{MDS}$ remains High during other program memory read cycles.

$\overline{SYNC}$. *Instruction Sync* (output, active Low). This strobe output is forced Low during the internal clock period preceding the beginning of an opcode fetch.

SCLK. *System Clock* (output). SCLK is the internal clock output through a buffer. The clock rate is equal to one-half the crystal frequency.

IACK. *Interrupt Acknowledge* (output, active High). IACK is driven High in response to an interrupt during the interrupt machine cycle.

Block Diagram



Z8 is a trademark of Zilog, Inc.

© IC MASTER 1983

Synertek.

Z8613

Prototyping Device with EPROM Piggyback

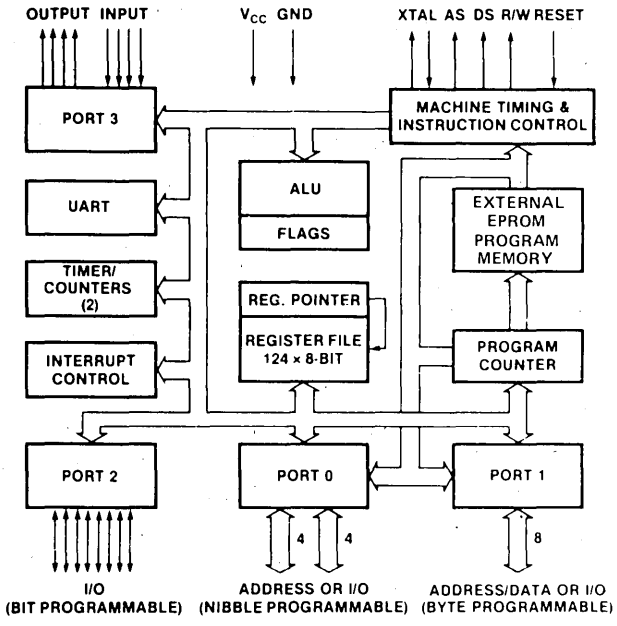
Features

- Prototyping version of Synertek 8611
- Piggyback 2732 EPROM program memory.
- Pin-compatible with Z8611 masked-ROM for hardware debugging or low-volume production.
- Complete microcomputer on-chip
  - 128 bytes of on-chip data RAM
  - 32 I/O lines
  - Socket for 2732 4K x 8 EPROM
- Two 14-bit counter/timers.
- Duplex UART and baud-rate generator.
- Vectored priority interrupt system.
- Up to 60K of external data memory.
- Up to 60K of external program memory.
- On-chip cyrstal, RC, or LC oscillator.
- High-speed instruction execution. 8613 8613A
  - Working-register operations = 1.5 μs 1.0 μs
  - Average instruction = 2.2 μs 1.4 μs
- Single +5V supply voltage.
- All inputs/outputs TTL compatible.

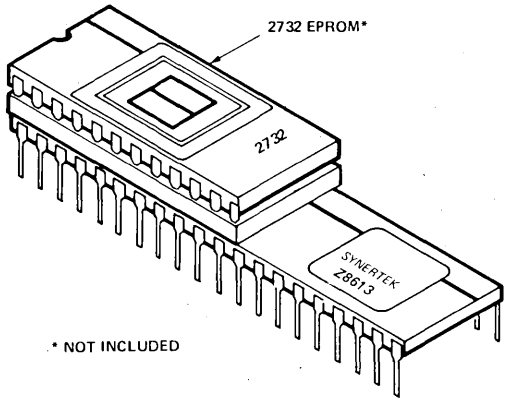
Description

The Synertek Z8613 Microcomputer Protopack Emulator is a ROM-less version of the Synertek 4K Z8 single-chip microcomputer. A removable 2732 EPROM plugged into the 24-pin "piggy-back" socket atop the Z8613 allows pin-compatible emulation of the Z8611 masked-ROM version.

Block Diagram



Package Drawing



Z8 is a trademark of Zilog, Inc.

© IC MASTER 1983

Synertek.

Z8681

Z8 Family
Z8681 Microcomputer

Features

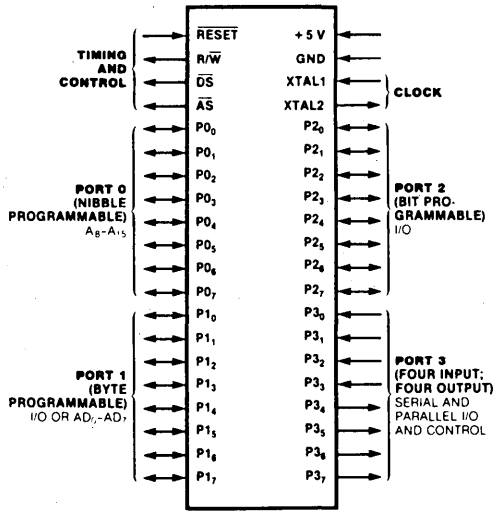
- "ROMless" version of the Z8601 Single-Chip Microcomputer, capable of Addressing up to 128K Bytes of External Memory Space
- Up to 24 Programmable I/O Lines
- 40-pin Package, Single +5 V supply, all Pins TTL Compatible

Description

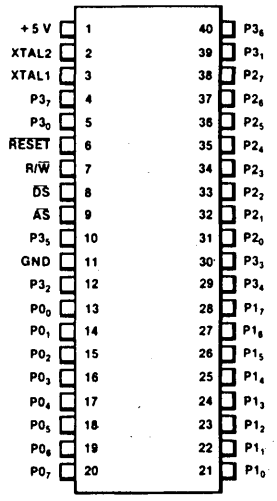
The Z8681 MCU is the "ROMless" version of the Z8601 single-chip microcomputer and offers all the outstanding features of the Z8 Family architecture. Using the Z8681, it is possible to design a powerful microprocessor system incorporating a minimum number of support devices.

Port 1 is configured to function as a multiplexed Address/Data bus (AD_0-AD_7), while Port 0 is software configurable to output address bits A_8-A_{15}. This provides for program memory and data memory space of up to 64K bytes each. Located on-chip are 144 bytes of RAM, organized as a register file of 124 general-purpose registers, 16 control and status registers, and three I/O port registers. (Port 1 cannot be utilized as an I/O register.) This file is divided into groups of working registers in such a way that short format instructions may be used to quickly access a register within a certain group.

Pin Functions



Pin Configuration



Z8 is a trademark of Zilog, Inc.

© IC MASTER 1983

Synertek.

Z8S MCU
Microcomputer

Features

- Complete microcomputer with on-chip RAM, ROM and I/O
  - o 64 bytes of on-chip RAM
  - o 1K bytes of on-chip ROM
  - o 30 I/O lines
- Subset of Z8 instruction set
- Only 2 pins differ from those of Z8 offering easy upgrade
- One programmable 8-bit counter/timer with a 6-bit programmable prescaler
- Ability to force all program memory fetches to reference external memory
- 75-byte register file includes:
  - o 60 general-purpose registers, each of which can be used as an accumulator, index register, storage element, address register or part of the internal stack
  - o Four I/O port registers
  - o Eleven status and control registers for programming and polling the Z8S Microcomputer
- Register pointer permits shorter, faster instructions to access one of five working-register groups
- Vectored interrupts for I/O and counter/timers
- Expandable bus interfaces up to 4K bytes of external program memory and 3K bytes of external data memory
- On-chip oscillator can be driven by a crystal, RC, LC or external clock source
- High-speed instruction execution
  - o Working-register operations = 1.5 μs
  - o Average instruction execution = 2.2 μs
  - o Longest instruction = 4.25 μs
- Optional low-power standby mode retains contents of general-purpose registers
- Single +5V supply
- All pins TTL compatible

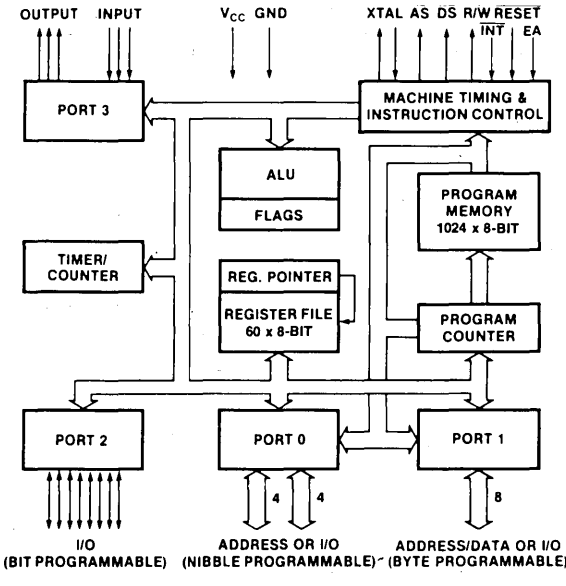
Description

The Z8S microcomputer introduces a new level of sophistication to low-end single-chip architecture. It retains the power and versatility of the Z8 architecture while halving the ROM and RAM. Compared to earlier low-end single-chip microcomputers, the Z8S offers faster execution, more efficient use of memory, more sophisticated I/O and bit-manipulation capabilities, and easier system expansion.

Under program control, the Z8S can be tailored to the needs of its user. It can be configured as a stand-alone microcomputer with 1k of ROM and 30 I/O lines. If the user needs more program or data memory, some of the I/O pins may be traded off as external address lines. Thus, the Z8S may also address up to an extra 3k of external program or external data memory (or both for 6 external kilobytes). Programs that grow beyond these bounds are best served by the Z8. The Z8 and Z8S differ only in two pins, interrupt vectors, and some on-chip resources (memory, timer, UART, options).

Z8 is a trademark of Zilog, Inc.

Block Diagram



© IC MASTER 1983

Synertek.

Z86C01

Single-Chip CMOS Microcomputer with 2K ROM

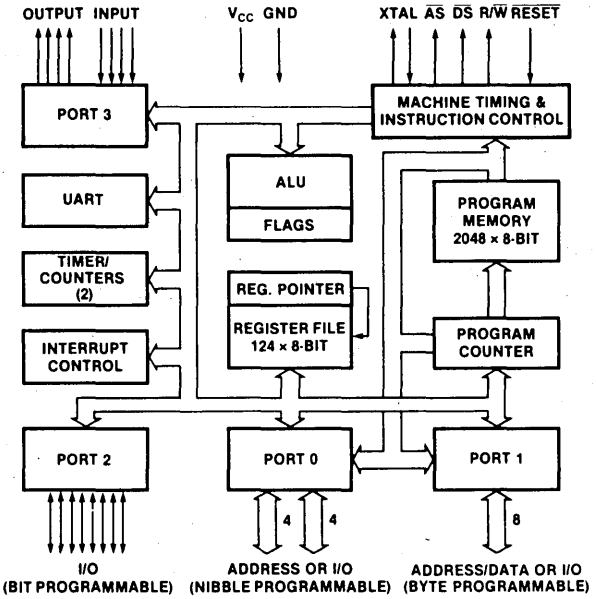
Features

- Complete CMOS microcomputer with on-chip RAM, ROM and I/O
  - 128 bytes of on-chip RAM
  - 4K bytes of on-chip ROM
  - 32 I/O lines
- Two programmable 8-bit counter/timers, each with a 6-bit programmable prescaler
- Full-duplex UART clocked by an internal timer
- 144-byte register file includes:
  - 124 general-purpose registers, each of which can be used as an accumulator, index register, storage element, address register or part of the internal stack
  - Four I/O port registers
  - Sixteen status and control registers
- Pin, function and object code compatible with Synertek HMOS Z8601 MCU
- Register pointer permits shorter, faster instructions to access one of nine working-register groups
- Vectored, prioritized interrupts for I/O, counter/timers and UART
- Expandable bus interfaces up to 60K bytes each of external program memory and external data memory
- On-chip oscillator can be driven by a crystal, RC, LC or external clock source
- High-speed instruction execution
  - Working-register operations = 1.5 μs
  - Average instruction execution = 2.2 μs
  - Longest instruction = 5 μs
- Low-power standby mode retains contents of general-purpose registers
- Single +5 V supply
- All I/O pins TTL compatible

Description

The Z86C01 is an implementation of the powerful Z8 architecture in a high performance, N-well HCMOS process. The Z86C01 is capable of performing in the same socket as a Z8601 with at least an order of magnitude savings in power consumption. It is the first in a line of Synertek CMOS microcomputers based on the Z8 architecture. Future members of the family will have architectural enhancements in order to optimize speed/power performance, as well as different amounts of memory and I/O capabilities.

Block Diagram



Z8 is a trademark of Zilog, Inc.

© IC MASTER 1983

Synertek.

SY66016
High-Speed 16 x 16 Parallel Multiplier

Features

- High-Speed 16 x 16 Parallel Array Multiplier
- 100 nsec Typical Multiply Time
- Low Power (I_{CC} = 300 mA Typical)
- Full Product Multiplexed at Output
- 2's Complement, Unsigned or Mixed Operands
- Input/Output Latches Selectable for Clocked or Transparent Mode of operation
- Advanced HMOS Technology
- Input/Output Levels TTL Compatible
- Single +5V Power Supply
- SY66016 Pin-for-Pin Functional Replacement for TRW MPY 16HJ and AMD 29516

Description

The SY66016 is a parallel array multiplier built using Synertek's advanced HMOS process technology. By use of a modified Booths algorithm and the state-of-the-art 2μ design rules, the SY66016 provides a performance comparable to existing bipolar TTL multipliers at less than half the power consumption (I_{CC} = 300 mA typical).

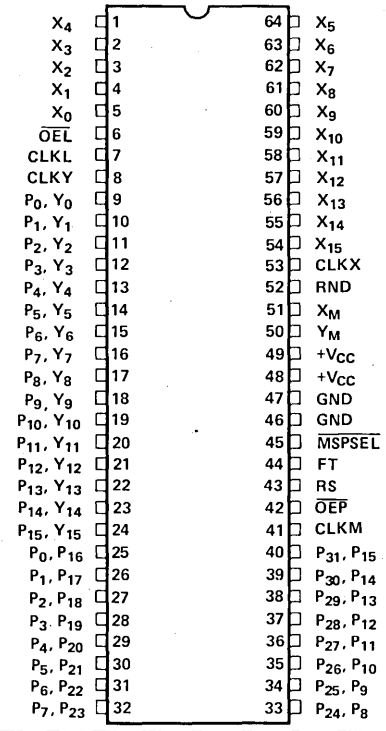
Input data is accepted in the form of 16-bit 2's complement and unsigned magnitude or mixed operands. At the output of the array a format adjust control (FA) allow the user to select a full 32-bit product or a left shifted 31-bit product suitable for 2's-complement only.

The two halves of the product may be routed to a 16-bit three-state output port via a multiplexer. In addition the LSP is connected to the Y-input through a separate three-state buffer.

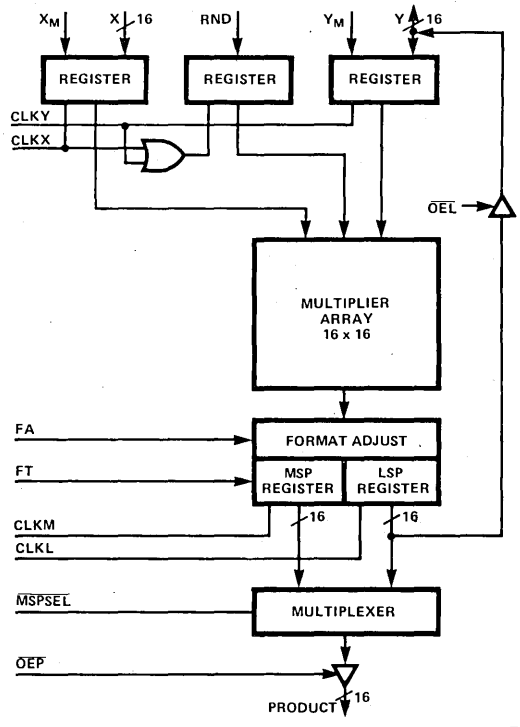
Applications of the SY66016 multiplier include a variety of digital signal-processing systems including floating-point processors, FFT processors, array processors, image/video processors, speech recognition and synthesis, digital filtering, modems, missile guidance, etc.

In the SY66016 the X, Y, MSP and LSP registers have independent clocks (CLKX, CLKY, CLKM, CLKL). The output multiplexer control ($\overline{\text{MSPSEL}}$) uses a pin which is a supply ground in the TRW MPY 16HJ. When this control is LOW the function is that of the MPY 16HJ, thus allowing full compatibility.

PIN CONFIGURATION



Block Diagram



© IC MASTER 1983

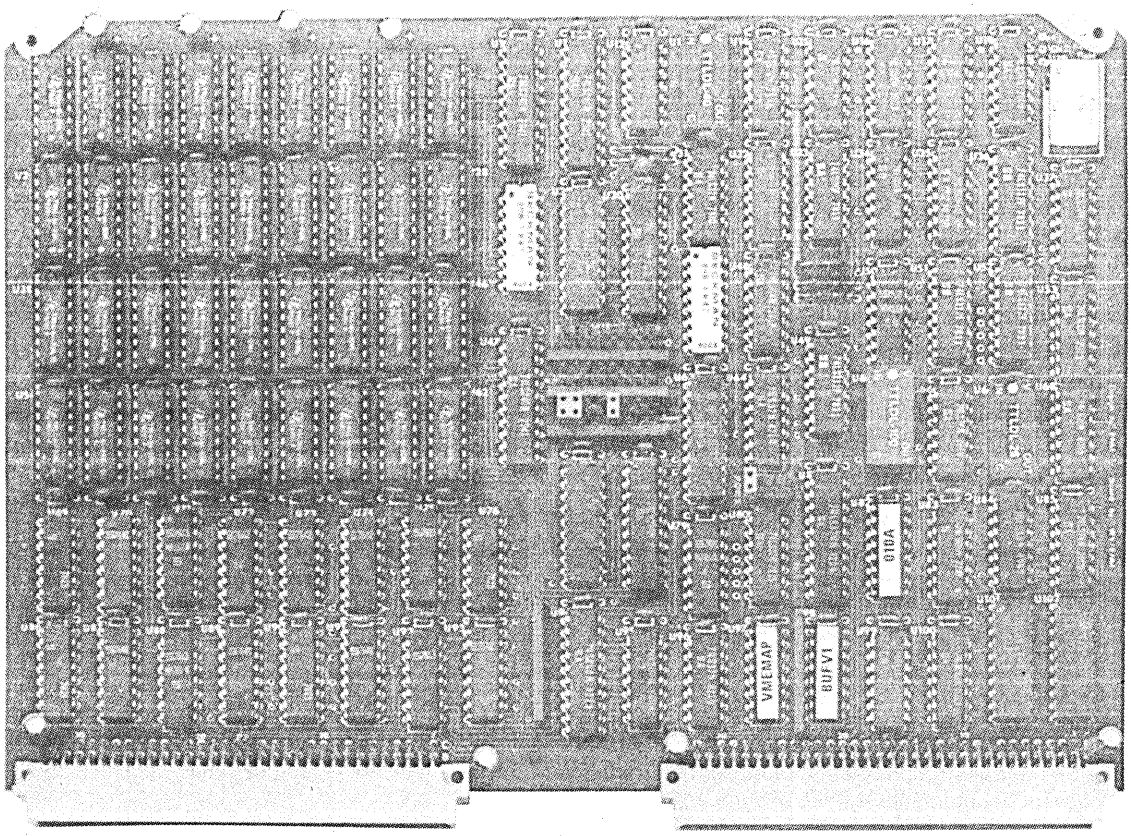
Definition of Signals

X_{15}-X_0	Multiplicand Data inputs.
Y_{15}-Y_0	Multiplier Data inputs or least significant product (LSP) output.
X_M, Y_M (TCX, TCY)*	Mode control inputs for each data word; LOW for unsigned data and HIGH for 2's complement data.
FA (RS)*	Format adjust control selects either a full 32-bit product (HIGH) or a left shifted 31-bit product with the sign bit replicated in the LSP (LOW). This control is normally high, except for certain fractional 2's complement applications.
FT	Feedthrough control (HIGH) makes both MSP and LSP registers transparent.
$\overline{\text{MSPSEL}}$	Selects either MSP (LOW) or LSP (HIGH) to be available at the product output port.
RND	Round control for the rounding of the MSP.
$\overline{\text{OEP}}$ (TRIM)*	Three-state enable for product output port.
$\overline{\text{OEL}}$ (TRIL)*	Three-state enable for routing LSP through Y input/output port.
CLKX	Register Clock, $X_{15\text{-}0}$, X_M, RND
CLKY	Register Clock, $Y_{15\text{-}0}$, Y_M, RND
CLKM	MSP Register Clock
CLKL	LSP Register Clock

*TRW MPY 16HJ pin designation.

© IC MASTER 1983

For Key Data On Every IC On This Board, The Place To Look Is...



This Signetics Memory Module provides 256K bytes of dynamic random access memory, plus parity protection.

Equipment and system design often require the use of a wide variety of integrated circuits in order to obtain optimum performance. One way for an engineer to be certain that he hasn't overlooked the best device for his application is to refer to the pages of IC MASTER.

Surveys conducted by IC MASTER, integrated circuit manufacturers, and independent research agencies confirm that four out of five IC MASTER users have specified one or more products as the result of using IC MASTER.

Device No.	Description
74LS00	Quadruple 2-Input NAND Gate
74LS08	Quadruple 2-Input AND Gate
74LS04	Hex Inverter
74LS20	Dual 4-Input NAND Gate
74LS32	Quadruple 2-Input OR Gate
74LS37	Quadruple 2-Input NAND Buffer
74LS24	Schmitt Trigger
74LS74	Dual D-Type Edge-Triggered Flip-Flop
74LS132	Quadruple 2-Input Schmitt Trigger
74LS112	Dual J-K Edge-Triggered Flip-Flop
74LS10	Triple-3-Input NAND Gate
74LS244	Octal Buffer/Line Driver
74LS645	Octal Bus Transceiver
AM25LS2521	8-Bit Equal-to Comparator
74S38	AND/NAND Gate
N7411	Triple-3-Input AND Gate
N74S40	Dual 4-Input NAND Buffer
TMS4164	64K Dynamic RAM
7641	512 x 8 PROM
7642	1K x 4 PROM

Representative list of ICs on Signetics SMVME3100 Memory Card. Key specifications for all of these ICs can be found in IC MASTER.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

TMS99000 16-Bit Microprocessor Family

The TI 99000 Family provides a choice of high-performance, and single-chip microprocessors and microcomputers. Each is unique. An advanced architecture, bus structure, and instruction set common to the entire Family provide design ease and flexibility, high performance, economy, and other benefits for both designer and user. Fully supported by software, software development systems, and TI's technical assistance, these circuits are available now. The key microprocessors of the 99000 Family include:

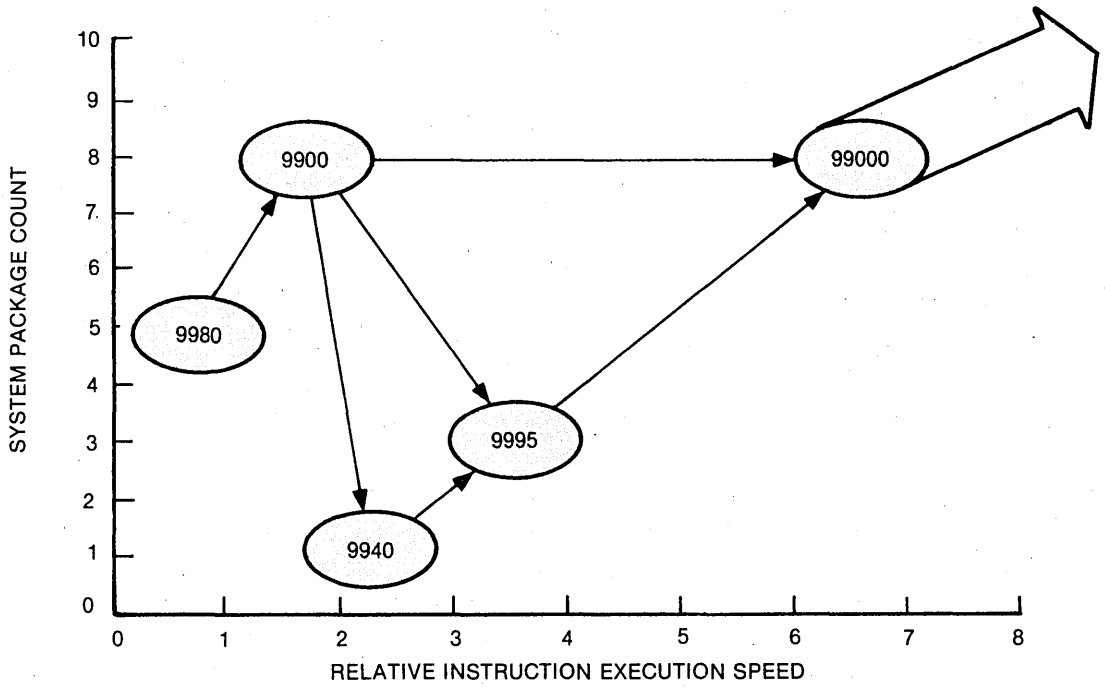
TMS9900 MICROPROCESSOR. The TMS9900, introduced in 1977, is the world's first 16-bit microprocessor. The TMS9900 is backed by an established base of software, design support, and AMPL development systems. Key features include: 16-bit instruction word; 8- and 16-bit data format; bidirectional parrallel data bus; direct addressing of up to 64K bytes; 69 instructions, including multiply and divide; 7 addressing modes; 17 prioritized interrupts; and a unique bit serial I/O is addition to general memory-mapped I/O. For military applications, the SBP9989 provides the operating temperature range and radiation tolerance of the SBP9900A with the added feature of twice the throughput of the SBP9900A.

TMS9980A AND TMS9981 MICROPROCESSORS. Lower-cost versions of the TMS9900 featuring an 8-bit memory data bus for smaller systems needing 9900 16-bit capabilities. TMS9980A and TMS9981 are similar, except for minor differences in supply voltages and clock-drive requirements.

TMS9940 MICROCOMPUTER. The TMS9940 is the world's first single-chip 16-bit microcomputer featuring 2048 bytes of ROM and 256 bytes of RAM on-chip. Key features include: 9900 CPU architecture and instruction set; 4 prioritized interrupts; on-chip timer/event counter; and 32 general purpose I/O ports.

TMS9995 MICROPROCESSOR. Contains a performance enhanced CPU, on-chip 256 bytes of RAM, and external memory and I/O bus to bring speed and low chip count for systems requiring both high performance and low system cost. Key Features include 9900 instruction set including signed multiply and divide; 256 bytes of on-chip RAM; on-chip 16-bit interval timer/event counter; on-chip I/O mapped flag register; 7 prioritized interrupts; 64K bytes memory addressability; and an on-chip 12-MHz clock generator.

TMS99000 MICROPROCESSORS. The 99000 Family is the third and newest family of advanced 16-bit microprocessors from TI. With performance 5 to 7 times that of the TMS9900, the 99000 Family features 84 powerful instructions that are a direct superset of the 9900. With a fast, 167 nanosecond cycle time, the 99000 family of processors can perform a memory-to-memory move in just 0.8 microseconds. Also new for the 99000 Family is both parallel and serial I/O address space for flexibility in configuring input/output devices. The first member of the 99000 Family is the TMS99105 Advanced 16-bit Microprocessor. The TMS99105 supports all the features of the 99000 Family. The TMS99110 Advanced 16-bit Microprocessor includes all the features of the TMS99105 with the addition of the 12 single-precision floating point instructions.



© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

The 99000 Family of Microprocessors and Microcomputers

FEATURES	DEVICE NUMBER							
	TMS99110A	TMS99105A	TMS9995*	TMS9940M	SBP9989	TMS9981	TMS9980A	TMS9900-40*
Minimal System Chip Count	5	5	3	1	5	3	3	6
Clock Rate (MHz)	24	24	12	4	4.4	2.5	2.5	3, 4
Max Memory Reach (Bytes)								
Stand-Alone	256k	256k	64K	2K	128K	16K	16K	64K
Memory Mapper	16M	16M	16M	NA	16M	4M	4M	16M
On-chip Memory (Bytes)								
ROM	1024	1024	0	2048	NA	NA	NA	NA
RAM	32	32	256	128	NA	NA	NA	NA
Addressing Modes	7	–	7	7	7	7	7	7
Number of Instructions	96	84	73	73	73	69	69	69
Development System	AMPL	AMPL	AMPL	AMPL	AMPL	AMPL	AMPL	AMPL
Power Supply	+5 V	+5 V	+5 V	+5 V	400 mA	+5, +12 V	±5, +12 V	±5, +12 V
Temperature Range	0°C to 70°C				−55°C to 125°C	0°C to 70°C		
On-chip Clock	Yes	Yes	Yes	Yes	No	Yes	No	No
CRU Address Reach	32K	32K	32K	256	32K	4K	4K	4K
Package								
Pins	40	40	40	40	64	40	40	64
Type	N,J	N,J	N,J	N,J	J	N,J	N,J	N,J

* Available in Industrial Temperature Range (−40°C to +85°C)

TMS99000 Family Instruction Set

MNEMONIC	DESCRIPTION
A	Add Word (16-bit)
AB	Add Byte (8-bit)
ABS	Absolute Value
AI	Add Immediate
AM	Add Multiple (32-bit)
ANDI	AND Immediate
B	Branch
BIND	Branch Indirect
BL	Branch and Link
BLWP	Branch and Load Workspace Pointer
BLSK	Branch Immediate and Push Link to Stack
C	Compare Word
CB	Compare Byte
CI	Compare Immediate
CKOF	External Clock Off
CKON	External Clock On
CLR	Clear Word
COC	Compare Ones Corresponding
CZC	Compare Zeros Corresponding
DCA**	Decimal Correct Add
DCS**	Decimal Correct Subtract
DEC	Decrement
DECT	Decrement By Two
DIV	Unsigned Divide
DIVS	Signed Divide
IDLE	Idle Processor
INC	Increment
INCT	Increment By Two
INV	Invert
JXX	Jump (1-unconditional, 12-conditional)
LDD*	Long Distance Destination (Memory Mapper Control)
LDCR	Load Communications Register Unit (I/O)
LDS*	Long Distance Source (Memory Mapper Control)
LI	Load Workspace Register Immediate
LIMI	Load Interrupt Mask Immediate
LREX	Load External
LST	Load Status Register
LWP	Load Workspace Pointer

MNEMONIC	DESCRIPTION
LWPI	Load Workspace Pointer Immediate
MOV	Move Word
MOVB	Move Byte
MPY	Multiply
MPYS	Signed Multiply
NEG	Negate
ORI	OR Immediate
RSET	External Reset
RTWP	Return to Workspace Pointer
S	Subtract (16-Bit)
SB	Subtract Byte (8-Bit)
SBO	Set Bit to One (I/O)
SBZ	Set Bit to Zero (I/O)
SETO	Set Word to Ones
SLA	Shift Left Arithmetic
SLAM	Shift Left Arithmetic Multiple (32-Bit)
SM	Subtract Multiple (32-Bit)
SRA	Shift Right Arithmetic
SRAM	Shift Right Arithmetic Multiple (32-Bit
SRC	Shift Right with Carry
SRL	Shift Right Logical
SOC	Set Ones Corresponding Word
SOCB	Set Ones Corresponding Byte
STCR	Store Communication Register Unit (I/O)
STST	Store Status
STWP	Store Workspace Pointer
SWPB	Swap Bytes
SZC	Set Zeros Corresponding Word
SZCB	Set Zeros Corresponding Byte
TB	Text Bit (I/O)
TCMB	Test and Clear Memory Bit
TMB	Test Memory Bit
TSMB	Test and Set Memory Bit
X	Execute
XOP	Extended Operation (Software Context Switch-16 XOP's)
XOR	Exclusive-OR

*Implemented in TMS99110A only.
**TMS9940 only.

TMS99110 FLOATING POINT FUNCTIONS

AR	Add Real	CR	Compare Reals
SR	Subtract Real	CIR	Convert Integer to Real
MR	Multiply Real	CER	Convert Extended Integer to Real
DR	Divide Real	CRI	Convert Real to Integer
LR	Load Real	CRE	Convert Real to Extended Integer
STR	Store Real	MM	Multiply Multiple (32 bit integer × 32 bit integer = >64 bit general source/destination)
NEGR	Negate Real		

© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

TMS99000 Family of Advanced Peripherals

The 99000 Family contains a wide selection of system support circuits used to easily and cost effectively perform peripheral and interface functions, such as data communications, memory functions, special signal processing, and display. Included are controllers, latches, encoders, and others. The bus structure, architecture, I/O features, and other characteristics of these peripherals and interface circuits are compatible with other members of the 99000 Family.

As additional peripheral and interface circuits are added to the Family, they will be compatible with existing members.

Peripheral and Interface Circuits

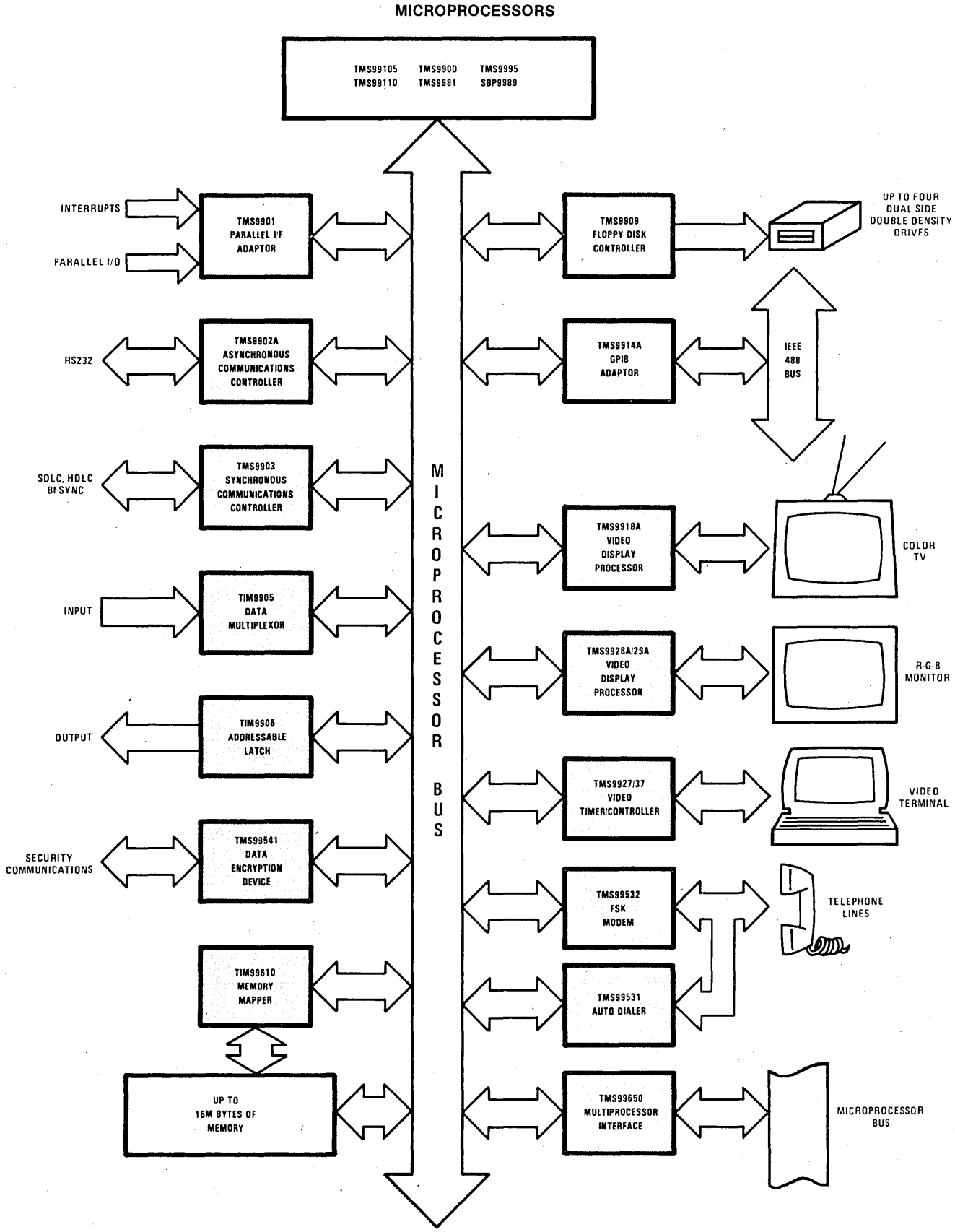
FUNCTION	DEVICE NUMBER	TECHNOLOGY	INTERFACE TO CPU	DATA TRANSFER RATE (MAX)	NO. OF PINS	PACKAGE
Digital I/O						
Program System Interface	TMS9901	NMOS	Serial	NA	40	N,J
Octal I/O and Priority Encoders	TIM9905 TIM9906 TIM9907 TIM9908	LS TTL	Serial	NA	16	N,J
Communications Interface						
Async. Comm. Controller	TMS9902A	NMOS	Serial	19.2K Baud	18	N,J
Sync. Comm. Controller	TMS9903		Serial	19.2K Baud	20	
IEEE 488 Interface	TMS9914A		Parallel	IM Bytes/Sec	40	
FSK MODEM-Bell 103 Comp.	TMS99532		Parallel	300 Bits/Sec	18	
Pulse, Dual-Tone Dialer	TMS99531**		Parallel	NA	14	
Data Encryption Unit	TMS99541**		Parallel	5.1K/Baud	40	
Memory Interface						
Floppy Disk Controller	TMS9909	NMOS	Parallel	2M Bits/Sec	40	N,J
Multi-Processor Interface	TMS99650**		Parallel	NA	40	
Video Interface						
Video Display Processor						
Composite Video	TMS9918A	NMOS	Parallel	Composite Video	40	N,J
R-G-B Output	TMS9928A			525 Line		
R-G-B Output	TMS9929A			625 Line		
CRT Controller	TMS9927/5027* TMS9937/5037*	NMOS	Parallel	NA	40	N,J

* SMC second source
** Planned new products
NA = Not Applicable
All Power Supplies Are Rated At +5V

© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

TMS99000 Family of Advanced Peripherals



© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

TMS7000 8-Bit Microcomputer Family

The first microprogrammable 8-bit microcomputer

Setting new VLSI standards in cost, performance, and flexibility with unique chip design and rich instruction set...

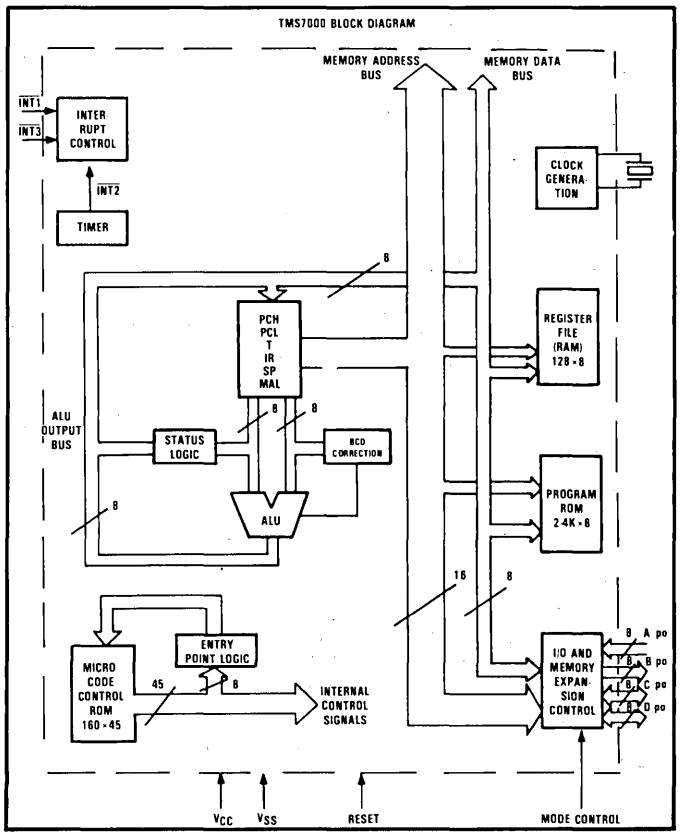
The TMS7000 is the newest, most cost-effective system solution for 8-bit microcomputer applications, such as computer peripherals, telecommunications, industrial control, automotive, appliances, toys, and games. The significantly smaller chip size of the TMS7000 means lower cost. The singular VLSI design concept provides the ability to add family members quickly and easily by simply inserting new areas on the chip for additional memory capacity or functions.

The TMS7000 instruction set, variety of addressing modes, and unequaled architecture maximize throughput while minimizing memory requirements. The instruction set contains the usual byte-oriented instructions, and in addition offers multiplication, double precision arithmetic, and single- and multiple-bit testing, as well as BCD arithmetic.

At the heart of the TMS7000 family is TI's newly developed STRIPCHIP ARCHITECTURE TOPOLOGY (SCAT). The TMS7000 is a unique memory-like array-structured chip, resulting in a significant size reduction. Smaller chips equate to lower prices.

Another feature of SCAT is the control ROM used to define the instruction set. This feature allows customizing of the TMS7000 instruction set.

Five memory expansion modes allow trade off of I/O pins for easy interface to a wide range of external memory and peripheral devices. Up to 64K may be addressed for increased configuration flexibility.



FEATURES	DEVICE NUMBER					
	TMS7000	TMS7020	TMS7040	TMS70E40*	TMS7041*	TMS70C20*
ROM (Bytes)	0	2K	4K	4K(EPROM)	4K	2K
RAM (Bytes)	128	128	128	128	128	128
I/O BITS	32	32	32	32	32	32
SERIAL PORT	NO	NO	NO	NO	YES**	NO
NO. OF MEMORY EXPANSION MODES	5	5	5	4	4	5
NO. OF INTERRUPTS	3	3	3	3	3	3
8-BIT TIMER/EVENT COUNTER	YES	YES	YES	YES	YES (2)	YES
INTERNAL CLOCK FREQ (MHz)	2.5/4.0	2.5	2.5	2.5	2.5/4.0	1.5
EXTERNAL CRYSTAL FREQ	5.0/8.0	5.0	5.0	5.0	5.0/8.0	3
OPERATING VOLTAGE	5	5	5	5	5	5
POWER CONSUMPTION (mW) @ 5 VOLTS	500/600	500	500	650	650/750	30
POWER DOWN CURRENT	–	–	–	–	–	5 μA
TECHNOLOGY	SMOS	SMOS	SMOS	SMOS	SMOS	Si Gate CMOS
DIP PACKAGE	40-pin	40-pin	40-pin	40-pin	40-pin	40-pin

* Planned new product
** On-Chip UART

© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

TMS1000 4-Bit Microcomputer Family

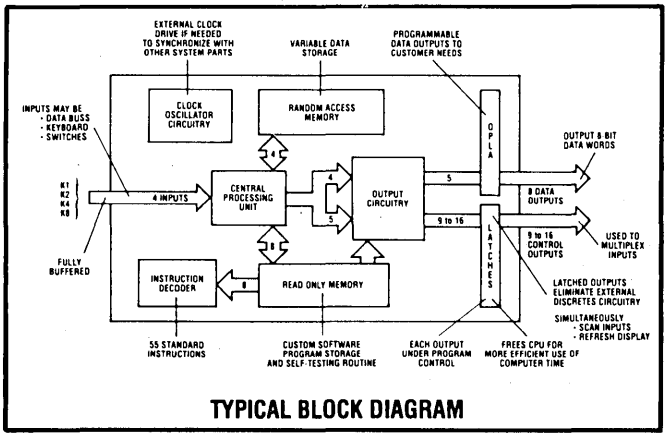
For high-volume low-cost applications, no other microcomputer family has enjoyed the continued popularity of the TMS1000 family of 4-bit single-chip microcomputers. Since its introduction in 1974, the TMS1000 family has become the world's most widely used microcomputer, with over 80 million units shipped for applications as diverse as microwave ovens, electronic toys and games, television tuners, dishwashers, radios, scanners, and security systems.

Available in PMOS, CMOS, and LMOS (Low-power PMOS) processes with wide variations of ROM/RAM, package sizes, I/O, output drive capability, and clock speeds, the family offers well over 40 base-sets to fit into various end-equipment applications at the lowest system cost. The unique functionality of the microcomputer is determined by the customer-specified software that is mask-programmed into the ROM at the factory.

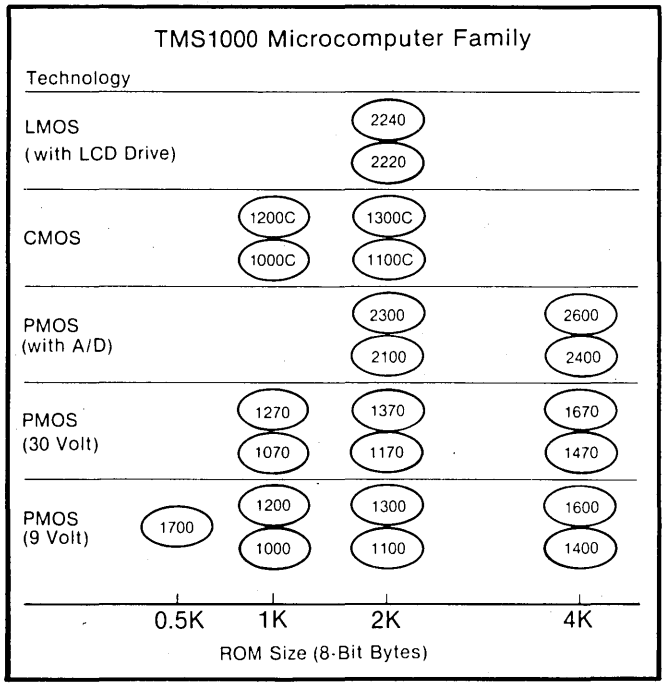
Several years of learning curve experience have resulted in continued unit cost reduction with significantly improved reliability.

The TMS1000 family is well supported with extensive design, test and application support. A complete line of development tools in the form of ROMless evaluator chips, System Evaluator boards, and AMPL 1000 systems (consisting of Editor, Assembler, In-Circuit Emulators, and diagnostics) are available to the user to develop his custom software.

There is an on-going effort in further cost-reduction and reliability improvement and several new additions to the family are planned in the future to meet future user product and application requirements.



TYPICAL BLOCK DIAGRAM



TMS1000 PMOS Series

FEATURES		DEVICE NUMBER												
		TMS1700	TMS1000	TMS1070	TMS1200	TMS1270	TMS1100	TMS1170	TMS1300	TMS1370	TMS1400	TMS1470	TMS1600	TMS1670
Supply Voltage (V)		9/15	9/15	9/15	9/15	9/15	9/15	9/15	9/15	9/15	9	9	9	9
ROM (8-Bit Bytes)		0.5K	1K	1K	1K	1K	2K	2K	2K	2K	4K	4K	4K	4K
Data RAM (Bits)		32x4	64x4	64x4	64x4	64x4	128x4	128x4	128x4	128x4	128x4	128x4	128x4	128x4
I/O	K/L Inputs	4/0	4/0	4/0	4/0	4/0	4/0	4/0	4/0	4/0	4/0	4/0	4/4	4/4
I/O	'R' Individually Addressed Outputs	9	11	11	13	13	11	11	16	16	11	10	16	16
I/O	'O' Parallel Latched Data Outputs	8	8	8	8	10	8	8	8	8	8	8	8	8
Subroutine Levels		1	1	1	1	1	1	1	1	1	3	3	3	3
Output Voltage (V)		−9/−15	−9/−15	−30/−35	−9/−15	−30/−35	−9/−15	−30/−35	−9/−15	−30/−35	−9	−30	−9	−30
Package Pin Count		28	28	28	40	40	28	28	40	40	28	28	40	40
Power Dissipation (mW)		36/68	36/68	45/105	36/68	45/105	45/105	45/105	45/105	45/105	63	63	63	63
Evaluator (ROMless Chip)		SE1000P					SE1100P				SE1400P			
Emulator Support		AMPL1000									AMPL1400			

© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

TMS1000 CMOS Series

FEATURES			DEVICE NUMBER						
			TMS1000C	TMS1070C	TMS1200C	TMS1270C	TMS1100C	TMS1300C	TMS1004C**
Supply Voltage Range (V)			3-6	3-6	3-6	3-6	3-6	3-6	3-6
ROM (8-Bit Bytes)			1K	1K	1K	1K	2K	2K	1K
Data RAM (Bits)			64x4	64x4	64x4	64x4	128x4	128x4	256x4
I/O	K/L Inputs		4/0	4/0	4/4	4/4	4/0	4/4	4/0
I/O	'R' Individually Addressed Output Latches		10	10	16	16	10	16	10
I/O	'O' Parallel Latched Data Outputs		8	8	8	8	8	8	8
Subroutine Levels			3	3	3	3	3	3	3
Output Levels (V)			5	30	5	30	5	5	5
Package Pin Count			28	28	40	40	28	40	28
Power Dissipation	Operating Mode (mW @ 5 V)		3.5	5	3.5	5	5	5	5
Power Dissipation	Halt Mode (μW @ 5 V)		0.5	5	0.5	5	5	5	5
Evaluator (ROMless Chip)			SE1000C				SE1100C		SE1004C**
Emulator Support			AMPL1000C						AMPL1004C**

TMS2100 Series (Expanded I/O with A/D Converters)

FEATURES		DEVICE NUMBER							
		TMS2100	TMS2170	TMS2300	TMS2370	TMS2400	TMS2470	TMS2600	TMS2670
Supply Voltage (V)		9	9	9	9	9	9	9	9
ROM (8-Bit Bytes)		2K	2K	2K	2K	4K	4K	4K	4K
Data RAM (Bits)		128x4	128x4	128x4	128x4	256x4	256x4	256x4	256x4
I/O	'K' and 'J' Inputs	4	4	8	8	4	4	8	8
I/O	'R'Bi-Directional	4	4	4	4	4	4	4	4
I/O	'R' Individually Addressed Outputs	7	6	15	14	7	6	15	14
I/O	'O' Parallel Latched Data Outputs	8	8	8	8	8	8	8	8
I/O	Interrupts	1	1	1	1	1	1	1	1
I/O	Timer/ECI	Yes/No	Yes/No	Yes/Yes	Yes/Yes	Yes/No	Yes/No	Yes/Yes	Yes/Yes
I/O	8-Bit A/D	1	1	2	2	1	1	4	4
I/O	Zero-cross Detector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Subroutine Levels		4	4	4	4	4	4	4	4
Output Voltage (V)		−15	−35	−15	−35	−15	−35	−15	−35
Package Pin Count		28	28	40	40	28	28	40	40
Power Dissipation (mW)		90	90	90	90	105	105	105	105
Evaluator (ROMless Chip)		SE2100				SE2400			
Emulator Support		AMPL2100				AMPL2400**			

TMS2200 LMOS Series (Low Power)

FEATURES			DEVICE NUMBER	
			TMS2220	TMS2240
Supply Voltage (V)			3	3
ROM (8-Bit Bytes)			2K	2K
Data RAM (Bits)			128x4	128x4
I/O	K/L Inputs		4/0	4/0
I/O	'R' Lines		4-8	8-13
LCD Drive	Duty Cycle		1/4	1/4
LCD Drive	Select Lines		8-12	15-20
LCD Drive	Display Digits		4-6	7.5-10
LCD Drive	Segments		32-40	60-80
Subroutine Levels			3	3
Output Voltage (V)			−3	−3
Package Pin Count			28	40
Power Dissipation		Slow Mode (μW)	180	180
Power Dissipation		Fast Mode (μW)	1200	1200
Evaluator (ROMless Chip)			SE2240	
Emulator Support			AMPL2240**	

**Planned new product

TMS2132 Microcomputer With On-Board Complex Sound Generator

FEATURES		DEVICE NUMBER
		TMS2132
Supply Voltage (V)		9
ROM (8-Bit Bytes)		2K
Data RAM (Bits)		128x4
I/O	K/L Inputs	4/0
I/O	LED Digit Inputs	9
I/O	LED Segment Outputs	8
I/O	*Complex Sound Generator Outputs (T, $\bar{T}$)	2
Subroutine Levels		3
Output Voltage (V)		−9
Package Pin Count		28
Power Dissipation (mW)		100
Power On/Off		YES
Evaluator (ROMless Chip)		SE2130
Emulator Support		AMPL2130

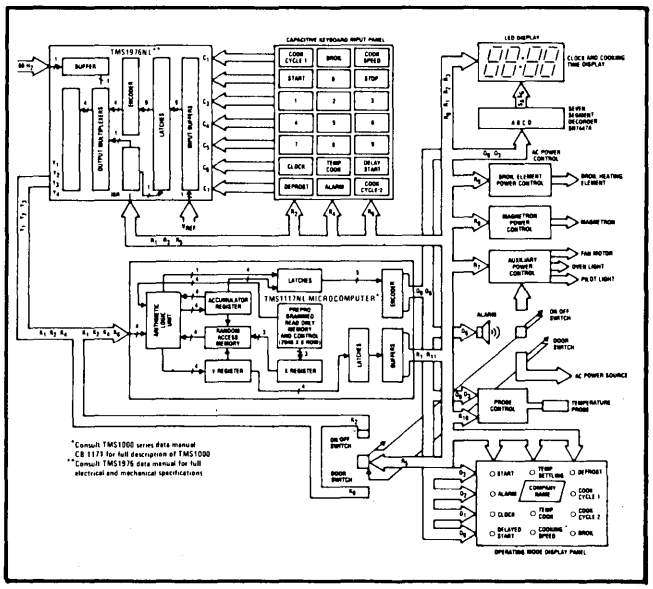
* Complex Sound Generator Consists of 2-Tone Generators and 1 White Noise Generator With Individual Attenuators for Each Generator.

© IC MASTER 1983

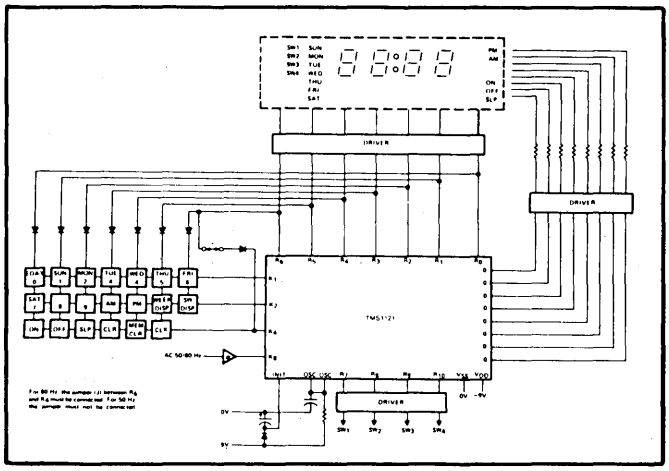
TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

Firmware Products

TI firmware products are preprogrammed versions of the TMS1000 Family intended for specific applications. These products use standard TMS1000 chips and TI-developed software algorithms. So, there are no software development expenses. Products are available off-the-shelf. Some have built-in test routines. Time to production is minimized. Currently available firmware products include:



TMS1117NLP APPLIANCE CONTROLLER/TIMER
WITH TMS1976 CAPACITIVE TOUCH CHIP



TMS1121NLL UNIVERSAL TIMER BLOCK DIAGRAM

TMS1121NLL—Universal Timer Controller
User programmable microcomputer which drives a 4-digit LED clock display and functions as a time-of-day, day-of-week controller with up to 18 programmable timer sets.

TMS1020NLL—Programmable Timer Controller
Real-Time Clock/Timer whose output lines can control various outputs in sequential mode.

TMS2372NLL—User Programmable Climate Controller
Controls the temperature of 1 or 2 areas and drives a 4-digit UF display that shows the temperature and time-of-day.

TMS1018NLL—Arithmetic Processor
Performs arithmetic operations on BCD numbers up to 10 digits including 1/x and x^2, and performs simple control functions (keyboard interface).

TMS0117NLP—Arithmetic Processor
Performs arithmetic operations on BCD numbers up to 10 digits and interfaces with other processors.

TMS1117NPL—User Programmable Appliance Controller
Decodes operator inputs from a capacitive-touch keyboard and translates these inputs into specific appliance control signals.

© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

TMS1000 Family Development Systems

The TMS1000 family of microcomputers are supported by the AMPL1000 line of development systems. The AMPL1000 system can be broken into software and hardware components. The hardware consists of an emulator buffer with specific SE emulator boards, while the software consists of a completely self-contained editor, assembler, emulator control, and diagnostics.

TMS1000 AMPL Development Systems

EMULATOR KITS	DEVICES SUPPORTED
TMAM6075	TMS1000/1070/1100/1170/1200/1270/1300/1370/1700 PMOS Family Members
TMAM6071	TMS1000/1070/1100/1170/1200/1300 CMOS Family Members
TMAM6073	TMS1400/1470/1600/1670 PMOS Family Members
TMAM6081	TMS2100/2170/2300/2370 PMOS Family Members

The Following Texas Instruments Host Computers Support the AMPL1000 Development Systems

FEATURES	TMS1000 FAMILY HOST COMPUTERS			
	TMAM9000*	TMAM9010*	TMAM9021	TMAM9041
RAM Main Memory (Bytes)	64K	256K	256K	320K
Hard Disk Drives		1 (Dual)	2 (Dual)	2
Floppy Disk Drives	2 DSDD			
Total Disk Storage (Bytes)	2.2M	9.4M	18.8M	89.4M
Number of Terminals Included	1	1 – 2	2 – 4	4 – 8
CPU Clockspeed (MHz)	4	10	10	10
Operating System	TX5	DX	DX	DX

* See pages 1748 and 1749 for further information.
DSDD: Double-sided, Double-Density Floppy Disk

The following is a list of ROMless Microcomputers to aid the user in ensuring that his algorithm in EPROM is functionally correct before he commits it to a MASK-ROM device.

System Evaluators

SYSTEM EVALUATOR	DEVICES SUPPORTED
SE1000P	TMS1000/1070/1200/1270/1700 PMOS Family Members
SE2200P	TMS1100/1170/1300/1370 PMOS Family Members
SE1000C	TMS1000/1200 CMOS Family Members
SE1004C**	TMS1004 CMOS Family Member
SE1100C	TMS1100/1300 CMOS Family Members
SE1400P	TMS1400/1470/1600/1670 PMOS Family Members
SE2100P	TMS2100/2170/2300/2370 PMOS Family Members
SE2400P**	TMS2400/2470/2600/2670 PMOS Family Members
SE2130P	TMS2132 PMOS Family Member

Texas Instruments also offers the ROMless microcomputers listed above with the following fully assembled and tested evaluation boards.

System Evaluator Boards

EVALUATOR BOARDS	BOARD CONTENTS
SEB1000P	PCB Assembly With SE1000P, EPROM Program Memory and O-PLA PROM
SEB1100P	PCB Assembly With SE1100P, EPROM Program Memory and O-PLA PROM
SEB1000C	PCB Assembly With SE1000C, EPROM Program Memory and O-PLA PROM
SEB1004C**	PCB Assembly With SE1004C, EPROM Program Memory and O-PLA PROM
SEB1100C	PCB Assembly With SE1100C, EPROM Program Memory and O-PLA PROM
SEB1400P	PCB Assembly With SE1400P, EPROM Program Memory and O-PLA PROM
SEB2100P	PCB Assembly With SE2100P, EPROM Program Memory and O-PLA PROM
SEB2400P**	PCB Assembly With SE2400P, EPROM Program Memory and O-PLA PROM
SEB2130P**	PCB Assembly With SE2130P, EPROM Program Memory and O-PLA PROM

** Planned new product

© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

Let Your Product Speak For Itself

Whether it's appliances, automotive consoles, transaction terminals, office systems, telecommunications, robotics, or electronic toys and games, TI's Solid State Speech ™ technology promises to have a dramatic impact on design, now, and for generations to come.

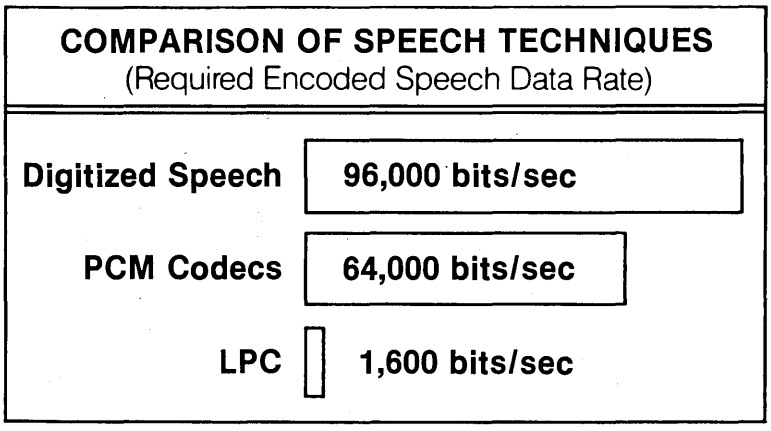
TI's Solid State Speech technology provides a revolutionary approach to the design of man-machine interfaces. A wide variety of applications can benefit from this technology due to the high intelligibility, reliability, and low cost of Solid State Speech reproduction.

The development of Solid State Speech technology at Texas Instruments began with the analysis of the human mechanisms for production and perception of speech. Based on the mechanisms of natural speech production, a model of the speech production process was implemented using digital signal processing techniques. This model is the basis for TI's Solid State Speech products.

The speech recording/processing begins by recording actual human speech, extracting energy and pitch information, and then using Linear Predictive Coding (LPC) analysis to produce data suitable for the digital speech model. These techniques faithfully preserve the character of the speaker's voice, including intonation, accent, dialect, and pitch in any language. Whole phrases and sentences, as well as single words and sounds, can be reproduced, preserving authentic human inflections. The result is more lifelike, natural sounding speech.

Value to the user of TI's LPC technique is its modest memory requirement compared to other approaches. Brute-force storage of speech signals can be accomplished by sampling and converting speech at an 8 to 10-kilohertz clock rate. This results in a digital data rate of 100,000 bits per second of speech. Pulse-coded modulation (PCM) codecs and companding techniques have found acceptance in new, all-digital telecommunications systems. However, their data rate of 64,000 bits per second is still too high for many applications.

Linear Predictive Coding provides speech quality comparable to other techniques, yet it only requires an average data rate of about 1,600 bits per second. With the advent of 128K-bit and larger storage devices, LPC packs minutes of high-quality speech into memories that would hold only one or two seconds of speech using other techniques. To illustrate, a speech reproduction of the words "Texas Instruments" requires approximately 90 times as many bits using digitized speech techniques as it requires with LPC. Using these techniques a single 128K-bit ROM can hold as many as 200 words.



© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

Voice Synthesis Processors (VSP)

Speech encoding on TI Voice Synthesis Processors is achieved through LPC coding. Codes for twelve synthesis parameters (pitch, energy, and 10 filter coefficients) serve as inputs to the VSP. After being decoded by the VSP, these codes represent a time-varying description of the LPC model of the original voice.

Inputs to the VSP's digital filter takes two forms: periodic and random. The periodic inputs are used to reproduce voiced sounds which have a definite pitch, such as vowel sounds or voiced fricatives (Z,B,D). A random input models unvoiced sounds such as S, F, T, and SH. Separate models generate the voiced and unvoiced excitations. Output from the digital filter drives a digital-to-analog converter, which in turn drives a speaker.

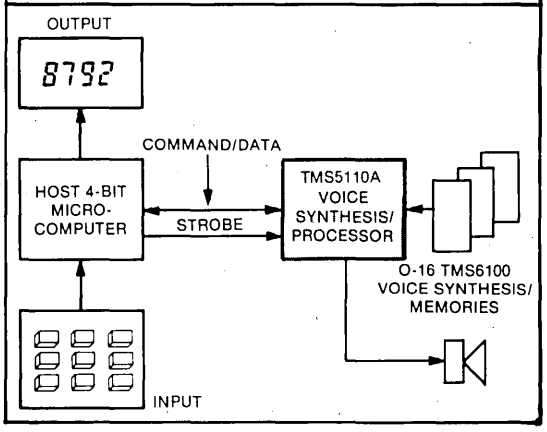
With one TMS6100 128K-bit ROM, a TMS5000 Series VSP can produce more than 100 seconds of speech, or about 200 synthesized words. A single TMS5110A or TMS5220 VSP can support up to 16 128K-bit VS Memories, or approximately 3200 words of speech. In addition, the TMS5220 is capable of tapping host storage or off-line storage to produce virtually unlimited vocabularies.

TMS5110A VOICE SYNTHESIS PROCESSORS

Features

- Interfaces easily to 4-bit microprocessors, such as TI's TMS1000 Family of microcomputers
- A complete voice synthesis system can be designed with 3 chips: TMS5110A VSP, TMS6100 VSM and a TMS1000 microcomputer
- Directly addresses up to 16 TMS6100 VS Memories (128K bits each) for up to 3200 words of speech
- Ideal for high-volume, low-cost applications
- Low average data rate: 1600 bits/second
- TMS5110A can process male and female voices, plus tones, chimes and sound effects.

TMS5100/10 VS PROCESSOR SYSTEM ARCHITECTURE

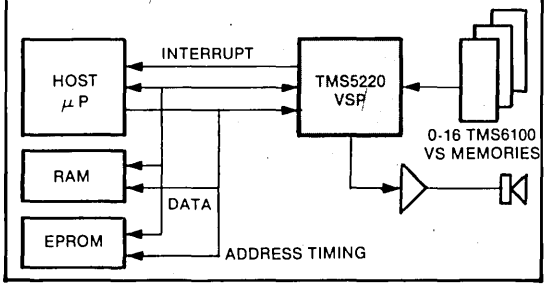


TMS5220 VOICE SYNTHESIS PROCESSOR

Features

- High-quality voice synthesis for microprocessor-based system
- Low average data rate: 1600 bits/second
- Compatible with 8 and 16-bit microprocessors
- Commands supplied over standard 8-bit data bus
- Speech data can be stored in up to 16 TMS6100 Series VS Memories, in host system storage, or off-line in disk
- Interrupt-driven service request capability
- On-chip FIFO (16-byte) buffers two frames of speech data when coming from host processor
- Can process male and female voices plus tones, chimes and sound effects
- Capable of stringing basic 'allophone' sounds together to form words and phrases

TMS5220 VS PROCESSOR SYSTEM ARCHITECTURE



Voice Synthesis Processors Summary

FEATURES	DEVICE NUMBER	
	TMS5110A	TMS5220
Microprocessors interface (Bits)	4	8
Data from ROM	Yes	Yes
Data from microprocessor	No	Yes
Operating Voltage (Volts)	−9	+5 −5
Audio Amplifier	Internal	External
Pitch Coding (Bits)	5	6
Frame Rate (Samples Frame)	200	200
Internal Clock Frequency (kHz)	640	640
ROM Interface (TMS100 128K-Bit)	1-16	1-16
Technology	PMOS	PMOS
DIP Package	28 pin	28 pin

* All VSP's are linear predictive coding with 10 poles

© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

Voice Synthesis Memories (VSM)

TMS6100 VOICE SYNTHESIS MEMORY

- Low-cost, 128K-bit ROM

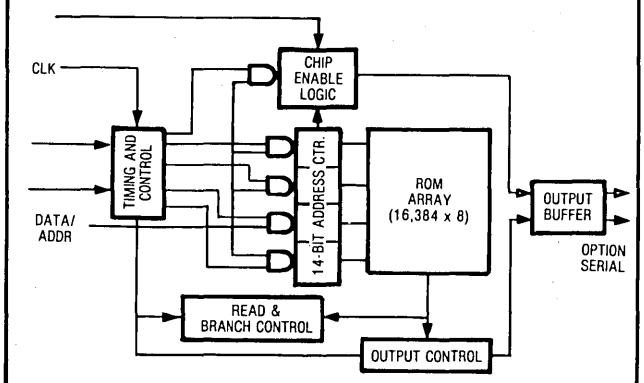
TMS6125 VOICE SYNTHESIS MEMORY

- Low-cost, 32K-bit ROM

FEATURES:

- Optimized interface for use with TMS5110 series and TMS5220 series voice synthesis processors
- On-chip address decode logic – no address decoding required for up to 16 VSM's with the TMS6100s or up to 4 VSM's with the TMS6125s
- On-chip memory address register – autoincrements through speech data until stopped by VSP
- Look-up and branch capability allows vocabulary-independent access to speech data on chip

TMS6100 128K VS MEMORY BLOCK DIAGRAM



•SIMPLE, DEDICATED INTERFACE TO ALL TI VSPs.

Voice Synthesis Memory Summary

FEATURES	DEVICE NUMBER	
	TMS6100	TMS6125
Memory Storage (Bits)	128k	32k
DIP Package	28 pin	16 pin
Oscillator Clock	External	Internal/External
Chip Select Bits	4	2
Address Bits	14	12
Serial Option	Yes	Yes
4-Bit Parallel Option	Yes	Yes
Operating Voltage (Volts)	−9	−9
Access Time (μs)	2	2
Clocking Frequency (kHz)	160	160
Technology	PMOS	PMOS

Speech Library Service

FEATURES:

- Pre-encoded words and phrases available
- Low-cost means of obtaining speech data
- Much faster turnaround than with custom processing
- Adequate quality for prototyping and many applications
- Available through TI Regional Technology Centers

Preprogrammed Speech Vocabulary ROMS

VOCABULARY ROMs (VROMs)

FEATURES:

- Preprogrammed vocabularies for industrial, consumer, and military markets
- Male or female voice intonations offered
- Used with TI's TMS5110A and TMS5220 Voice Synthesis Processors
- Very low-cost synthesized speech
- Ideal for industrial use, low-volume applications, evaluation, and prototyping

Preprogrammed Vocabulary ROMS

DEVICE NUMBER	TYPE OF VOCABULARY	VOICE TYPE OPTION	NO. OF WORDS	VSP INTERFACE	NO. OF BITS
VM61002	Industrial	Male	204	TMS5110A	128K
VM61003	Industrial	Male	206	TMS5220	128K
VM61004	Time/Weather	Male	139	TMS5220	128K
VM61005*	Military	Male	148	TMS5220	128K
VM61006	Avionics	Male	119	TMS5220	128K
VM71003	Industrial	Male	50	TMS5110A	32K
VM71004	Numeric/Time	Male	35	TMS5110A	32K
VM71005	Numeric/Time	Female	34	TMS5220	32K

NOTE: All devices have an operating voltage of −9V
* To have a complete avionics vocabulary, the TMS61003, 004, and 005 should be used together

Example:

The VM71004 is a TMS6125 voice synthesis memory precoded for a male voice with a vocabulary of 50 words. Each of the words, syllables, and selected letters of the alphabet is accessed individually and then concatenated to form phrases and sentences.

Vocabulary Data in VM71004

Word List		
Zero	Hundred	Power
One	Thousand	Check
Two	A	Complete
Three	M	Connect
Four	P	Degrees
Five	T	Minus
Six	And	Repair
Seven	The	Seconds
Eight	Amps	Service
Nine	Hertz	Not
Ten	Farad	Temperature
Eleven	Watts	Start
Twelve	Meter	Stop
Thir-	Ohms	Off
Fif-	Area	On
−teen	Light	Is
Twenty	Pressure	

© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

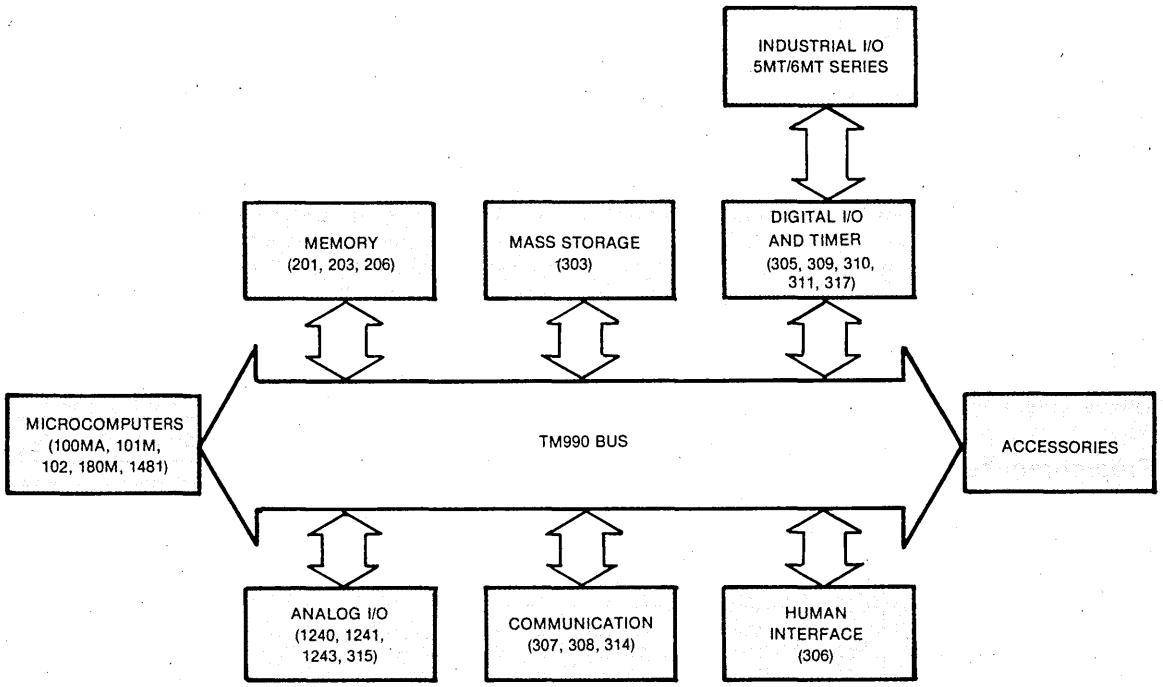
TM990 Family of Microcomputer Modules

The TM990 Series provides an extensive choice of preassembled, high-performance, 16 bit microcomputer modules that save design and development time, cut the number of system components, reduce costs, and improve reliability. Each module is a single, pretested, ready-to-plug-in board. The series includes: complete CPU modules with on-board memory and I/O interface; memory and I/O expansion modules; data entry and display modules; software development modules, industrial AC and DC I/O modules; A/D and D/A interface modules; a floppy disk controller; a speech module; and industrial communication modules. In addition, OEM card cages, cables, connectors, extender, and prototyping boards are available.

All TM990 modules are compatible with other members of TI's 9900 Family of microprocessors and microcomputers, which allows easy conversion to a dedicated-component solution if your application warrants.

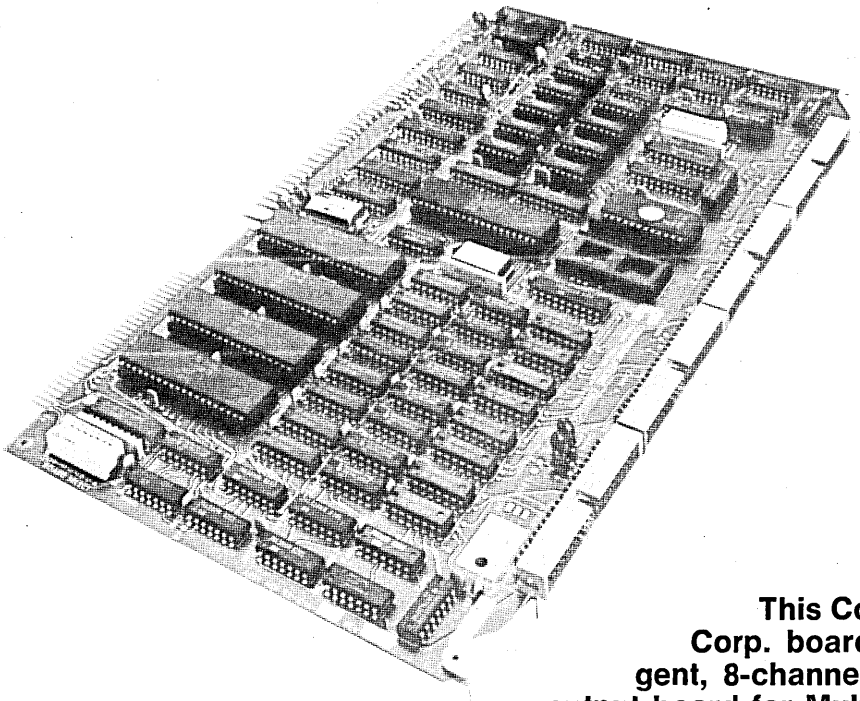
Reliability for Harsh Industrial Environments—All components used in TM990 module construction are subjected to TI's strict quality assurance criteria. All assembled modules go through a computer-controlled test station providing verification of product compliance with specifications. All modules are dynamically exercised in a severe environment chamber that cycles products through a 25-70°C temperature range; burn-in time varies from eight hours to four days. Prior to shipping, all modules are system tested for strict compliance to system specifications and quality assurance criteria. TM990 modules are guaranteed over the industrial 0°C to 70°C operating temperature range.

Hardware Product Overview



© IC MASTER 1983

For Key Data On Every IC On This Board, The Place To Look Is...



This Codata Systems Corp. board is an intelligent, 8-channel serial input/output board for Multibus systems.

Equipment and system design often require the use of a wide variety of integrated circuits in order to obtain optimum performance. One way for an engineer to be certain that he hasn't overlooked the best device for his application is to refer to the pages of IC MASTER.

Surveys conducted by IC MASTER, integrated circuit manufacturers, and independent research agencies confirm that four out of five IC MASTER users have specified one or more products as the result of using IC MASTER.

Device No.	Description
AM25LS2521	8-Bit, Equal-to Comparator
AM26LS29	Line Driver, Single-Ended
AM26LS32	Line Receiver, Differential
74LS02	Quad 2-Input NOR Gate
74LS08	Quad 2-Input AND Gate
74LS32	Quad 2-Input OR Gate
74LS74	Dual D-Type Positive Edge Triggered Flip-Flop with Preset and Clear
74LS138	3 Line to 8 Line Decoder/Demultiplexer
74LS164	8-Bit Gated Serial-In, Parallel-Out Shift Register
74LS244	Octal Bus Driver (Schmitt trigger) Non-Inverting, 3-State, Complementary Control
74LS273	Octal D-Type Edge-Triggered Flip-Flop
MBM2716	Fujitsu 248 by 8 PROM
SN74LS04	Hex Inverter
SN74LS133	13-Input NAND Gate
SN74S240	Octal Buffer/Line Driver/Line Receiver Inverted 3-State Outputs
Z80A	Zilog 8-Bit Microprocessor
Z8530	Zilog Serial Communications Controller

Representative list of ICs on Codata Systems Corp. board for data communications equipment.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

ADVANCE INFORMATION

WESTERN DIGITAL
CORPORATION

WD1014 Error Detection and Support Logic

FEATURES

- 32 BIT ECC POLYNOMIAL
- SINGLE BURST ERROR CORRECTION TO 11 BITS
- MULTIPLE BURST DETECTION
- 5 MBIT DATA TRANSFER RATE
- OPTIMIZED FOR 128, 256, OR 512 BYTE SECTOR SIZES
- SUPPORTS READ/WRITE LONG FEATURE
- SINGLE +5V SUPPLY
- 8 BIT I/O DATA BUS

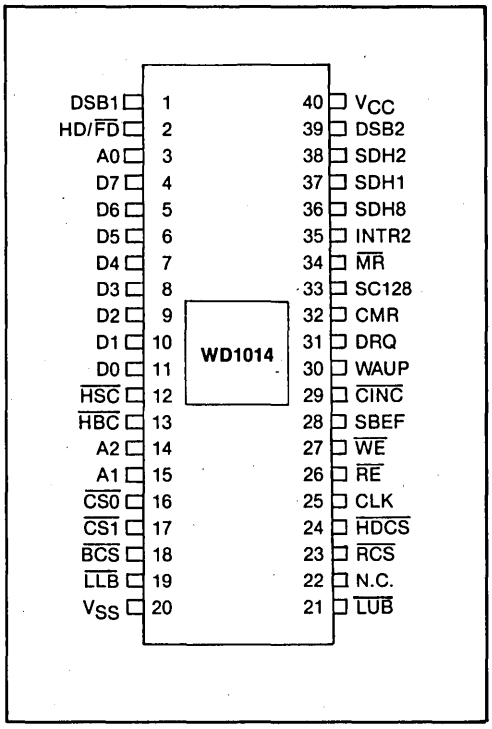
GENERAL DESCRIPTION

The WD1014 Error Detection and Support Logic (EDS) provides the user with easy to implement ECC and support logic in design of a Winchester Controller. In addition to providing ECC generation and checking, the EDS contains three 8-bit registers, three modulo-2 counters and several latches that can be used to provide real-time control functions for Winchester operation.

The WD1014 is designed to operate as part of the WD1002 Winchester/Floppy controller and is not meant as a stand-alone general purpose device unless it is used in the same way.

The ECC polynomial is the same as that implemented in the WD1100-06. A 2-bit serial method is implemented and no CRC is provided. This provides for faster operation. 11-bit single burst errors can be corrected and double bursts to 4 bits can be detected depending on the correction span selected.

The WD1014 is fabricated in N-Channel silicon gate technology and is available in a ceramic 40-pin dual-in-line package.



PIN DESIGNATION

© IC MASTER 1983

WD1100 Series Winchester Controller Chips

DESCRIPTION

The WD1100 Chip series provides a low cost alternative for developing a Winchester Controller. These devices have been designed to read and convert an MFM data stream into 8-bit parallel bytes. During a write operation, parallel data is converted back into MFM to be written on the disk. Address Marks are generated and detected while CRC bytes can be appended and checked on the data stream. The WD1100 is fabricated in N-channel silicon gate technology and is available in a 20-pin Dual-In-Line package.

- WD1100-01 SER/PARALLEL CONVERTER
- WD1100-02 MFM GENERATOR
- WD1100-12 IMPROVED MFM GENERATOR
- WD1100-03 AM DETECTOR
- WD1100-04 CRC GENERATOR/CHECKER
- WD1100-05 PAR/SERIAL CONVERTER
- WD1100-06 ECC/CRC LOGIC
- WD1100-07 HOST INTERFACE LOGIC
- WD1100-09 DATA SEPARATION SUPPORT LOGIC

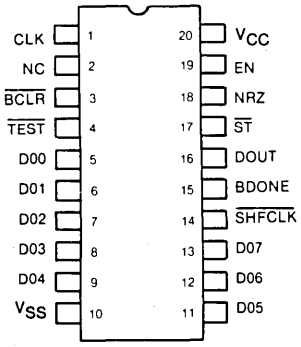
FEATURES

- SA1000/ST506 COMPATIBLE
- SINGLE 5V SUPPLY
- TRI-STATE DATA LINES
- 5 MBITS/SEC TRANSFER RATE
- SIMPLIFIED INTERCONNECT

APPLICATIONS

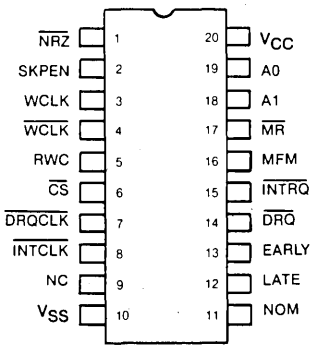
Winchester Controllers For:

SHUGART ASSOCIATES
SEAGATE TECHNOLOGY
QUANTUM CORP.
TANDON MAGNETICS
MINISCRIBE
RMS
CMI . . . AND OTHERS



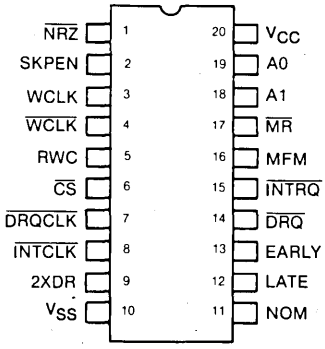
WD1100-01

SERIAL/PARALLEL CONVERTER



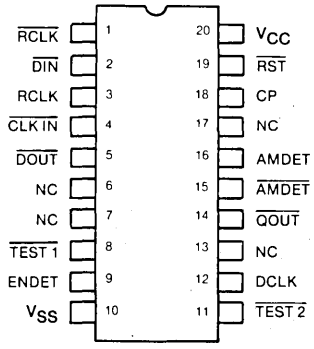
WD1100-02

MFM GENERATOR



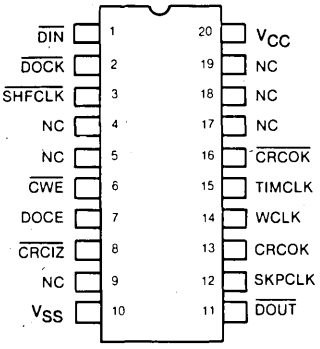
WD1100-12

IMPROVED MFM GENERATOR



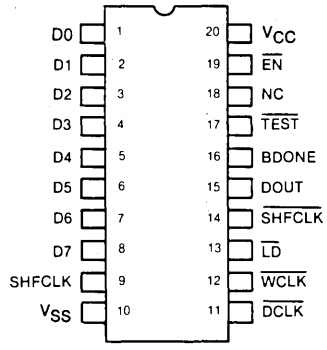
WD1100-03

AM DETECTOR



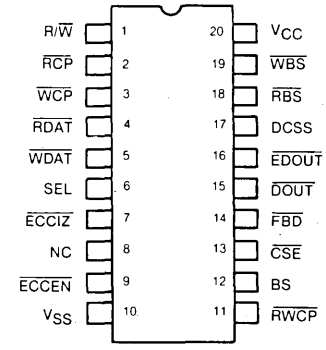
WD1100-04

CRC GENERATOR/CHECKER



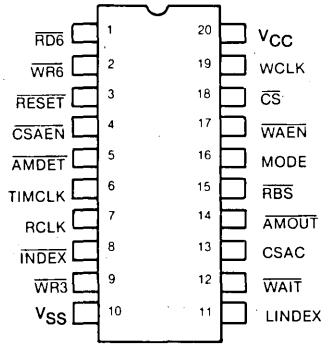
WD1100-05

PARALLEL/SERIAL CONVERTER



WD1100-06

ECC/CRC LOGIC



WD1100-07

HOST INTERFACE LOGIC

PIN DESIGNATIONS

© IC MASTER 1983

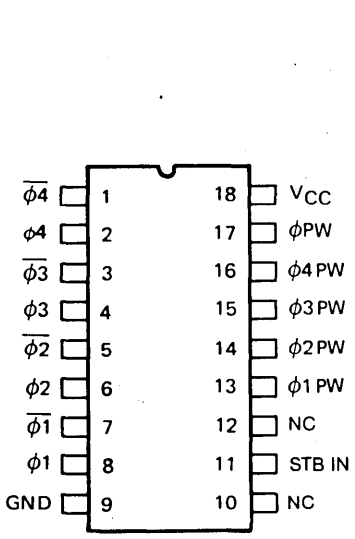
WD2143-03 Four Phase Clock Generator

FEATURES

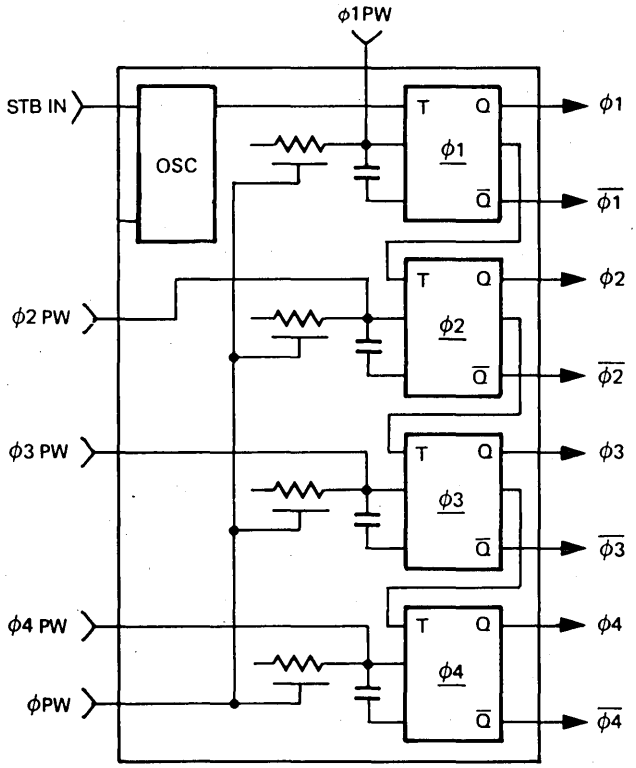
- IMPROVED VERSION OF WD2143-01
- TRUE AND INVERTED OUTPUTS
- SINGLE 5 VOLT SUPPLY
- TTL COMPATABLE
- ON CHIP OSCILLATOR
- TTL CLOCK INPUT
- TTL CLOCK OUTPUTS
- PROGRAMMABLE PULSE WIDTHS
- PROGRAMMABLE PHASE WIDTHS
- NO EXTERNAL CAPACITOR

GENERAL DESCRIPTION

The WD2143-03 Four-Phase Clock Generator is a MOS/LSI device capable of generating four phase clocks. The output pulse widths are controlled by tying an external resistor to the proper control inputs. All pulse widths may be set to the same width by tying the ϕPW line through an external resistor. Each pulse width can also be individually programmed by tying a resistor through the appropriate ϕ1PW—ϕ4PW control inputs.



PIN DESIGNATION



BLOCK DIAGRAM

DEVICE OPERATION

Each of the phase outputs can be controlled individually by typing an external resistor from ϕ1PW-ϕ4PW to a +5V supply. When it is desired to have ϕ1 through ϕ4 outputs the same width, the ϕ1PW-ϕ4PW inputs should be left open and an external resistor tied from the ϕPW (Pin 17) input to +12V.

STROBE IN (pin 11) is driven by a TTL square wave. Each of the four phase outputs provide both true and inverted signals, capable of driving 1 TTL load each.

© IC MASTER 1983

WD1691 Floppy Support Logic (F.S.L.)

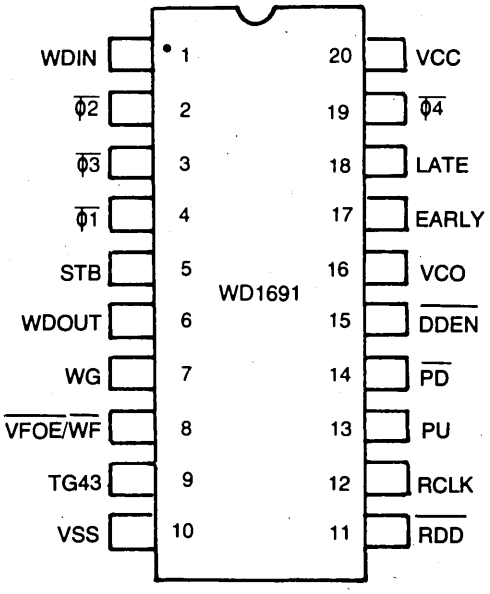
FEATURES

- DIRECT INTERFACE TO THE FD179X
- ELIMINATES EXTERNAL FDC LOGIC
- DATA SEPARATION/RCLK GENERATION
- WRITE PRECOMPENSATION SIGNALS
- VFOE/WF DEMULTIPLEXING
- PROGRAMMABLE DENSITY
- 8" OR 5.25" DRIVE COMPATIBLE
- ALL INPUTS AND OUTPUTS TTL COMPATIBLE
- SINGLE +5V SUPPLY

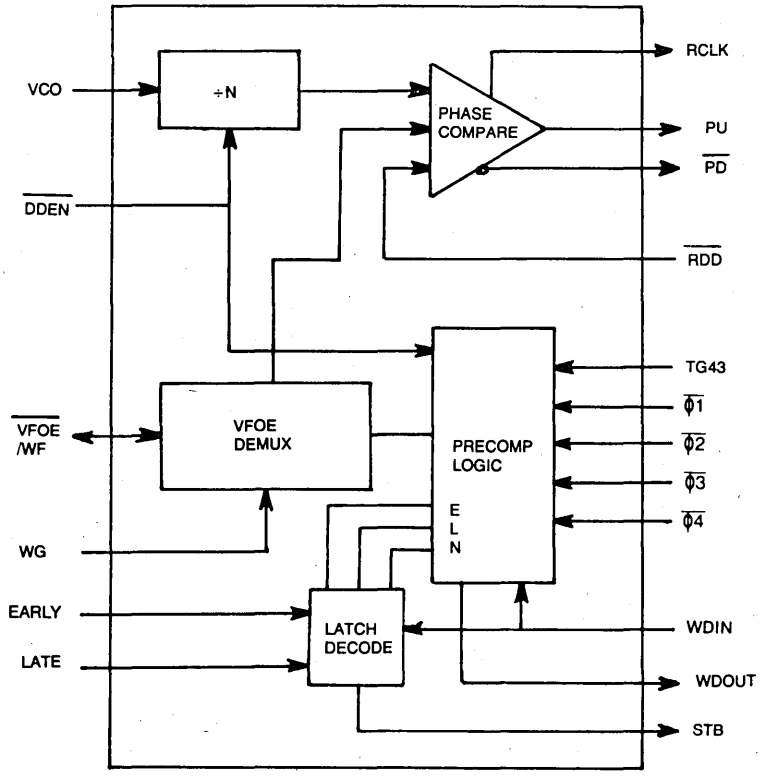
GENERAL DESCRIPTION

The WD1691 F.S.L. has been designed to minimize the external logic required to interface the 179X Family of Floppy Disk Controllers to a drive. With the use of an external VCO, the WD 1691 will generate the RCLK signal for the WD179X, while providing an adjustment pulse (PUMP) to control the VCO frequency. VFOE/WF de-multiplexing is also accomplished and Write Precompensation signals have been included to interface directly with the WD2143 Clock Generator.

The WD1691 is implemented in N-MOS silicon gate technology and is available in a plastic or ceramic 20 pin dual-in-line package.



WD1691 PIN DESIGNATION



WD1691 BLOCK DIAGRAM

© IC MASTER 1983

PRELIMINARY

WESTERN DIGITAL
CORPORATION

WD9216-00/WD9216-01
Floppy Disk Data Separator — FDDS

FEATURES

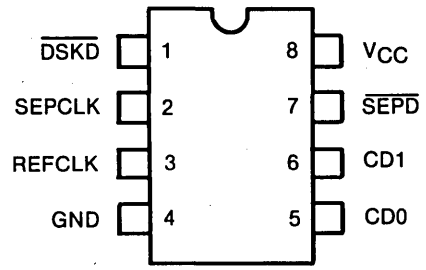
- PERFORMS COMPLETE DATA SEPARATION FUNCTION FOR FLOPPY DISK DRIVES
- SEPARATES FM OR MFM ENCODED DATA FROM ANY MAGNETIC MEDIA
- ELIMINATES SEVERAL SSI AND MSI DEVICES NORMALLY USED FOR DATA SEPARATION
- NO CRITICAL ADJUSTMENTS REQUIRED
- COMPATIBLE WITH WESTERN DIGITAL 179X, 176X AND OTHER FLOPPY DISK CONTROLLERS
- SMALL 8-PIN DUAL-IN-LINE PACKAGE
- +5 VOLT ONLY POWER SUPPLY
- TTL COMPATIBLE INPUTS AND OUTPUTS

GENERAL DESCRIPTION

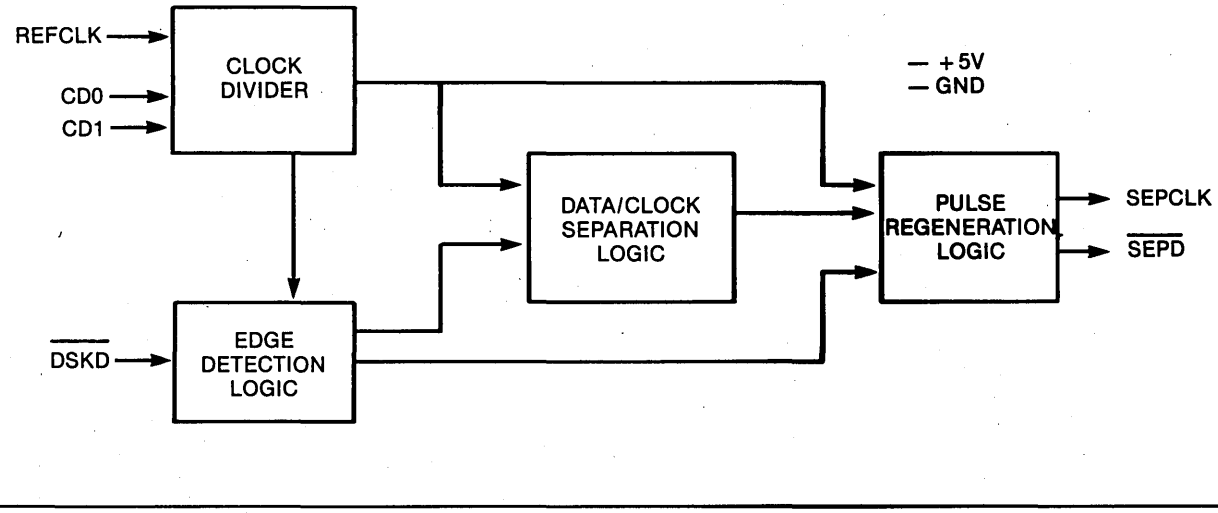
The Floppy Disk Data Separator provides a low cost solution to the problem of converting a single stream of pulses from a floppy disk drive into separate Clock and Data inputs for a Floppy Disk Controller.

The FDDS consists primarily of a clock divider, a long-term timing corrector, a short-term timing corrector, and reclocking circuitry. Supplied in an 8-pin Dual-In-Line package to save board real estate, the FDDS operates on +5 volts only and is TTL compatible on all inputs and outputs.

The WD9216 is available in two versions; the WD9216-00, which is intended for 5¼" disks and the WD9216-01 for 5¼" and 8" disks.



PIN DESIGNATION



FLOPPY DISK DATA SEPARATOR BLOCK DIAGRAM

© IC MASTER 1983

ADVANCE INFORMATION

WD1050 SMD Controller/Formatter

FEATURES

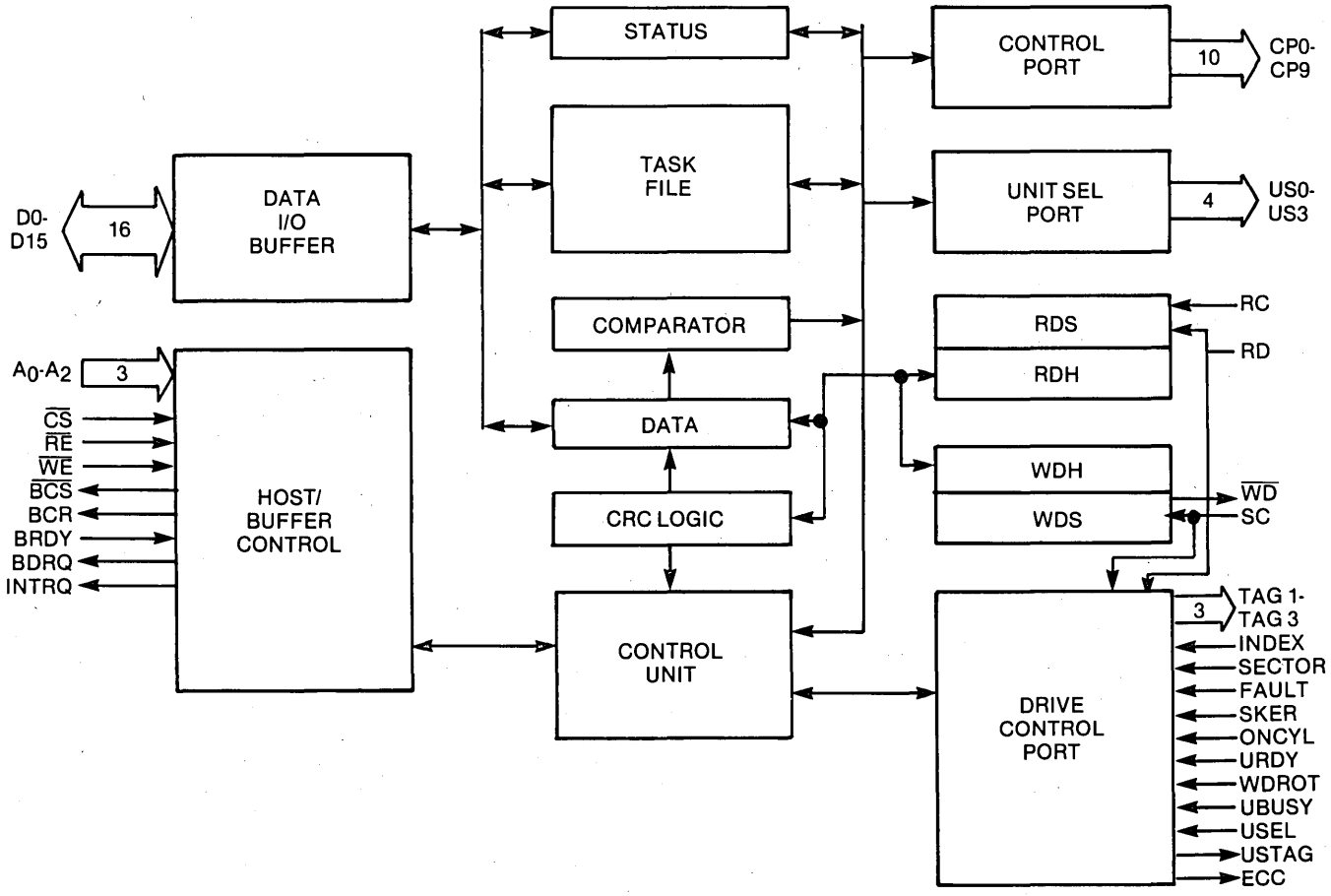
- 16 BIT HOST INTERFACE
- 9.677 MBITS/SEC DATA RATE
- SINGLE/MULTIPLE SECTOR TRANSFERS
- HARD SECTOR FORMAT
- TTL COMPATIBLE INPUT/OUTPUTS
- SINGLE 5V SUPPLY
- 64 PIN JEDEC CHIP CARRIER PACKAGE
- COMPATIBLE WITH SMD, MMD, FHT, LMD, AND CMD FAMILIES

DESCRIPTION

The WD1050 SMD controller/formatter is a MOS/LSI device designed to interface an SMD compatible rigid disk drive to a host processor. The device is compatible with all rigid disk drives adhering to Control Data Corporation's flat cable interface for SMD, MMD, FHT, FMD, LMD and CMD families (CDC specification 64712400 Rev H). It is TTL compatible on all inputs and outputs, with interface capability for 8 or 16 bit data busses.

The WD1050 contains a powerful set of macro-commands for read/write and control functions. An internal 16 bit task file is used to process a selected command based upon parameter information in the file.

The WD1050 operates from a single +5V supply and is available in a 64 pin JEDEC chip-carrier package.



BLOCK DIAGRAM

© IC MASTER 1983

WD279X-02 Floppy Disk Formatter/Controller Family

FEATURES

- ON-CHIP PLL DATA SEPARATOR
- ON-CHIP WRITE PRECOMPENSATION LOGIC
- SINGLE +5V SUPPLY
- ACCOMMODATES SINGLE AND DOUBLE DENSITY FORMATS
  - IBM 3740 (FM)
  - IBM 34 (MFM)
- AUTOMATIC SEEK WITH VERIFY
- MULTIPLE SECTOR READ/WRITE
- TTL COMPATIBLE
- PROGRAMMABLE CONTROL
  - SELECTABLE TRACK-TO-TRACK ACCESS
  - HEAD LOAD TIMING
- SOFTWARE COMPATIBLE WITH THE FD179X SERIES
- SOFT SECTOR FORMAT COMPATIBILITY

APPLICATIONS

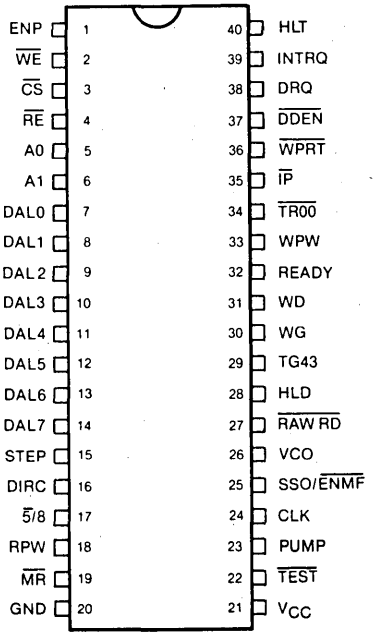
8" FLOPPY AND 5¼" MINI FLOPPY CONTROLLER
SINGLE OR DOUBLE DENSITY
CONTROLLER/FORMATTER

The WD279X Family are MOS/LSI devices which perform the functions of a Floppy Disk Controller/Formatter. Software compatible with its predecessor, the FD179X, the device also contains a high performance Phase-Lock-Loop Data Separator as well as Write Precompensation Logic.

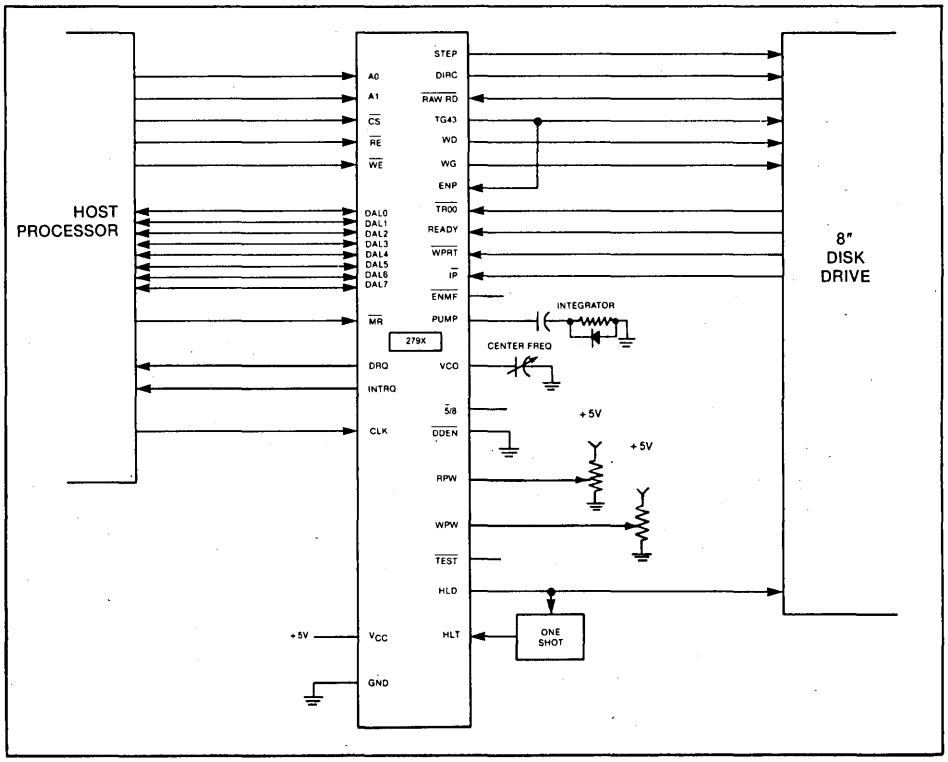
When operating in Double Density mode, Write Precompensation is automatically engaged to a value programmed via an external potentiometer. An on-chip VCO and phase comparator allows adjustable frequency range for 5¼" or 8" Floppy Disk interfacing.

The WD279X is fabricated in NMOS silicon gate technology and available in a 40 pin dual-in-line ceramic or plastic package.

FEATURES	2791	2793	2795	2797
Single Density (FM)	X	X	X	X
Double Density (MFM)	X	X	X	X
True Data Bus		X		X
Inverted Data Bus	X		X	
Side Select Out			X	X
Internal CLK Divide	X	X		



PIN DESIGNATION



© IC MASTER 1983

ADVANCE INFORMATION

WD1010 Winchester Disk Controller

FEATURES

- Compatible with most 8- and 16-bit processors
- Data rate up to 5 Mbits per second
- Multiple sector read/write commands
- Unlimited interleave capability
- Automatic formatting
- Software selectable sector size (128, 256, 512, or 1024 bytes per sector)
- CRC generation/verification
- Automatic retries on all errors
- Automatic restore on seek errors
- Single +5V supply
- Provision for external ECC capability

APPLICATIONS

Seagate ST506, ST512
Shugart SA1000, SA1100, SA600
Tandon 600 Series
Texas Instruments 506
RMS 500 Series
Quantum Q2000 Series
Miniscribe
. . . and others

DESCRIPTION

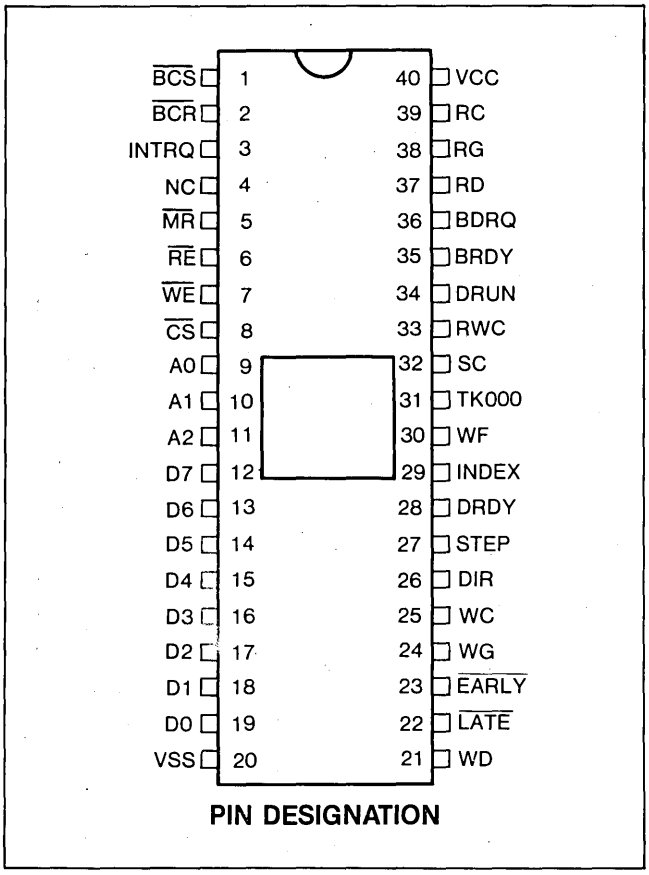
The WD1010 is a MOS/LSI device designed for use with the drives listed above as well as other drives compatible with the SA1000 or ST506 interface. The controller requires only a single +5 volts supply. It is designed to operate with an external sector buffer memory and to interface directly with TTL logic.

The WD1010 is fabricated in NMOS silicon-gate technology and is available in a 40-pin, Dual-in-line ceramic or plastic package.

FUNCTIONAL DESCRIPTION

The WD1010 is software compatible with the WD1000 controller board. Programming is very similar to that of the Western Digital FD179X floppy disk controller.

Data bytes are transferred to or from the buffer every 1.6μsec., with a 5Mbit/sec drive. The buffer may be either the Western Digital WD1510 128x9 FIFO memory (Fig. 1) or a combination of a 256x8 static RAM and a 9 bit resettable counter (Fig. 2). The WD1010 generates control signals to minimize external gating. Buffer to processor transfers are made via programmed I/O or DMA. The controller also generates handshake signals to control DMA operations for multiple sector transfers. The WD1010 interfaces to the Western Digital DM1883 and other DMA controllers.



PIN DESIGNATION

© IC MASTER 1983

FD179X-02
Floppy Disk Formatter/Controller Family

FEATURES

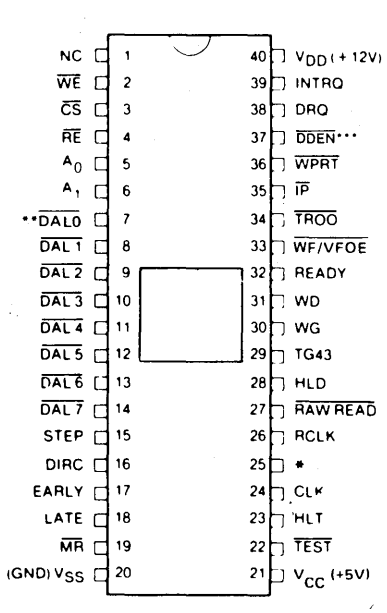
- TWO VFO CONTROL SIGNALS — RG & VFOE
- SOFT SECTOR FORMAT COMPATIBILITY
- AUTOMATIC TRACK SEEK WITH VERIFICATION
- ACCOMMODATES SINGLE AND DOUBLE DENSITY FORMATS
  - IBM 3740 Single Density (FM)
  - IBM System 34 Double Density (MFM)
  - Non IBM Format for Increased Capacity
- READ MODE
  - Single/Multiple Sector Read with Automatic Search or Entire Track Read
  - Selectable 128, 256, 512 or 1024 Byte Sector Lengths
- WRITE MODE
  - Single/Multiple Sector Write with Automatic Sector Search
  - Entire Track Write for Diskette Formatting
- SYSTEM COMPATIBILITY
  - Double Buffering of Data 8 Bit Bi-Directional Bus for Data, Control and Status
  - DMA or Programmed Data Transfers
  - All Inputs and Outputs are TTL Compatible
  - On-Chip Track and Sector Registers/Comprehensive Status Information
- PROGRAMMABLE CONTROLS
  - Selectable Track to Track Stepping Time
  - Side Select Compare
- INTERFACES TO WD1691 DATA SEPARATOR
- WINDOW EXTENSION
- INCORPORATES ENCODING/DECODING AND ADDRESS MARK CIRCUITRY
- FD1792/4 IS SINGLE DENSITY ONLY
- FD1795/7 HAS A SIDE SELECT OUTPUT

179X-02 FAMILY CHARACTERISTICS

FEATURES	1791	1792	1793	1794	1795	1797
Single Density (FM)	X	X	X	X	X	X
Double Density (MFM)	X		X		X	X
True Data Bus			X	X		X
Inverted Data Bus	X	X			X	
Write Precomp	X	X	X	X	X	X
Side Selection Output					X	X

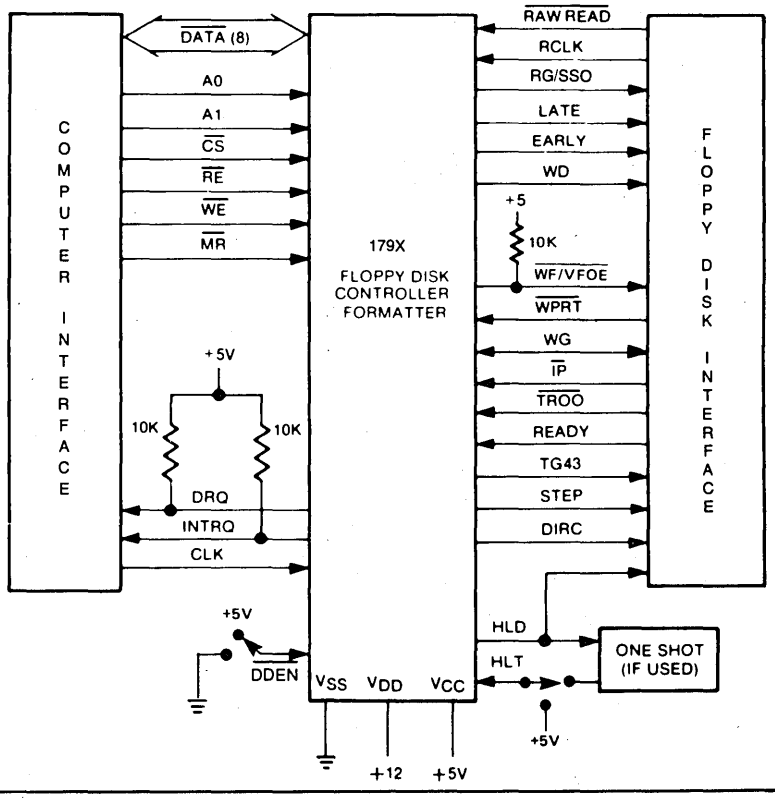
APPLICATIONS

8" FLOPPY AND 5¼" MINI FLOPPY CONTROLLER
SINGLE OR DOUBLE DENSITY
CONTROLLER/FORMATTER



*1791/3 = RG 1795/7 = SSO
**1793/7 TRUE BUS
***1792/4 OPEN

PIN DESIGNATION



FD179X SYSTEM BLOCK DIAGRAM

© IC MASTER 1983

ADVANCE INFORMATION

WD1011 Winchester Data Separator Device

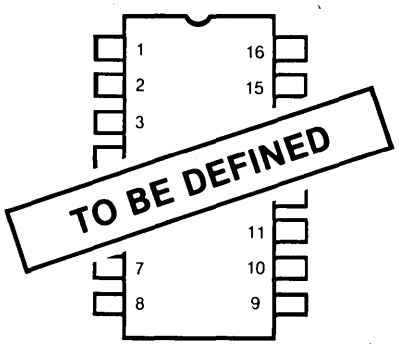
FEATURES

- 4.34 OR 5.0 MBIT/SEC DATA RATE
- INTERNAL CRYSTAL OSCILLATOR
- SINGLE +5V SUPPLY
- FM OR MFM OPERATION
- COMPATIBLE WITH THE WD1010
- WRITE CLOCK GENERATOR
- HIGH FREQUENCY DETECTION

GENERAL DESCRIPTION

The WD1011 Winchester Data Separator has been designed to replace the complex analog/digital circuitry required for data recovery by Winchester disk drives. Directly interfacing to the WD1010 Winchester Controller device, an on-chip crystal oscillator allows operation of 4.34 Mbit/sec or 5.0 Mbit/sec transfer rates. In addition to data recovery, the device provides Write Clock signals for the WD1010 as well as high frequency detection for pre-amble search. Output levels on data pins swing close to the supply rails for increased noise immunity and to minimize layout restrictions.

The WD1011 operates from a single 5 volt supply and is available in a 16 pin plastic or ceramic Dual-in-Line package.



PIN DESIGNATION

© IC MASTER 1983

ADVANCE INFORMATION

WESTERN DIGITAL
CORPORATION

WD1012 Write Precompensation Device

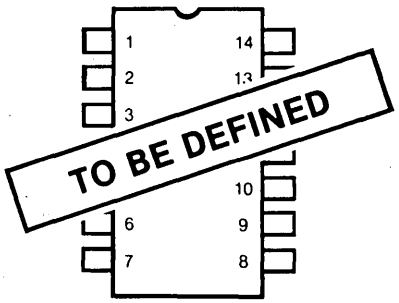
FEATURES

- DIRECT INTERFACE TO THE WD1010
- 12 NS. TYP. DELAY FROM EARLY
- PROVIDES TIMCLK FOR SA1000 TYPE DRIVES
- SINGLE +5V SUPPLY
- TTL COMPATIBLE INPUT/OUTPUTS
- COMPANION CHIP TO THE WD1011 DATA SEPARATOR

GENERAL DESCRIPTION

The WD1012 Write Precompensation device provides delayed data necessary for inner cylinder recording on Winchester disk drives. It is a companion chip to the Western Digital WD1010, utilizing signals from both the WD1010 and WD1011 data separator device. The WRITE DATA output, as well as EARLY, LATE, and RWC are applied to produce a pre-determined bit shift. Assertion of EARLY or LATE will cause a 12 ns. typ. shift of data based upon the precompensation algorithm internal to the WD1010. In addition, a divide-by-sixteen timing clock output is available for use by the SA1000 and other drives requiring a TIMCLK input.

The WD1012 operates from a single 5 volt supply and is available in a 14 pin plastic or ceramic package.



PIN DESIGNATION

© IC MASTER 1983

ADVANCE INFORMATION

WD1002 Winchester Disk Controller

GENERAL DESCRIPTION

The WD1002 is next generation of Winchester Controllers. It utilizes the WD1010 Winchester controller chip, and provides for floppy disk back up using the WD279X series of single chip floppy controllers.

Incorporated in this controller is all the circuitry needed for Hard disk control with floppy backup.

The firmware is incorporated in the WD1010 and the controller is compatible with previous WD1000 and WD1001. Additional software is needed for the floppy disk backup. Users of the WD1000/WD1001 need not use the floppy controller.

FEATURES

- SINGLE 5V SUPPLY
- FLOPPY DISK BACKUP
- ECC/CRC
- ST506 OR SA1000 INTERFACE
- COMPACT SIZE
- SECTOR SIZES TO 1024
- DATA RATES TO 5MBS
- AUTOMATIC FORMATTING
- WD1000 COMPATIBILITY

© IC MASTER 1983

FD1771-01 Floppy Disk Formatter/Controller

FEATURES

- SOFT SECTOR FORMAT COMPATIBILITY
- AUTOMATIC TRACK SEEK WITH VERIFICATION
- READ MODE
  - Single/Multiple Sector Write with Automatic Sector Search or Entire Track Read
  - Selectable 128 Byte or Variable Length Sector
- WRITE MODE
  - Single/Multiple Sector Write with Automatic Sector Search
  - Entire Track Write for Diskette Formatting
- PROGRAMMABLE CONTROLS
  - Selectable Track-to-Track Stepping Time
  - Selectable Head Settling and Head Engage Times
  - Selectable Three Phase or Step and Direction and Head Positioning Motor Controls
- SYSTEM COMPATIBILITY
  - Double Buffering of Data 8-Bit Bi-Directional Bus for Data, Control and Status
  - DMA or Programmed Data Transfers
  - All Inputs and Outputs are TTL Compatible

APPLICATIONS

FLOPPY DISK DRIVE INTERFACE

SINGLE OR MULTIPLE DRIVE CONTROLLER/FORMATTER

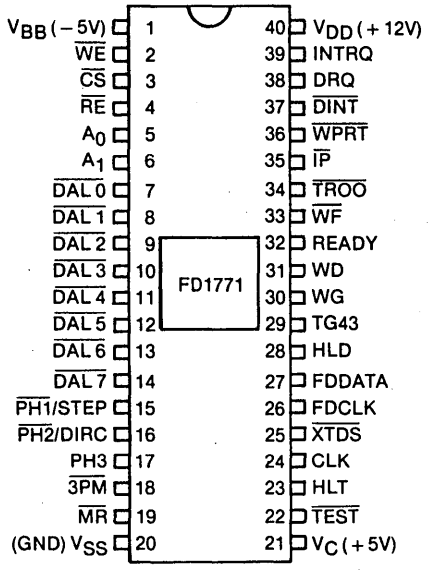
NEW MINI-FLOPPY CONTROLLER

GENERAL DESCRIPTION

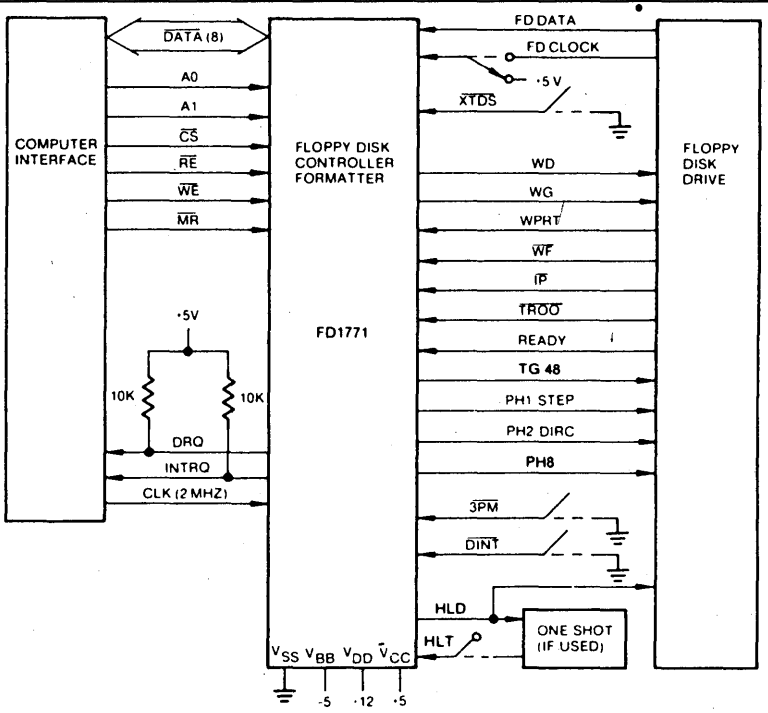
The FD1771 is a MOS/LSI device that performs the functions of a Floppy Disk Controller/Formatter. The device is designed to be included in the disk drive electronics, and contains a flexible interface organization that accommodates the interface signals from most drive manufacturers. The FD1771 is compatible with the IBM 3740 data entry system format.

The processor interface consists of an 8-bit bi-directional bus for data, status, and control word transfers. The FD1771 is set up to operate on a multiplexed bus with other bus-oriented devices.

The FD1771 is fabricated in N-channel Silicon Gate MOS technology and is TTL compatible on all inputs and outputs. The A and B suffixes are for ceramic and plastic packages, respectively.



PIN DESIGNATION



BLOCK DIAGRAM

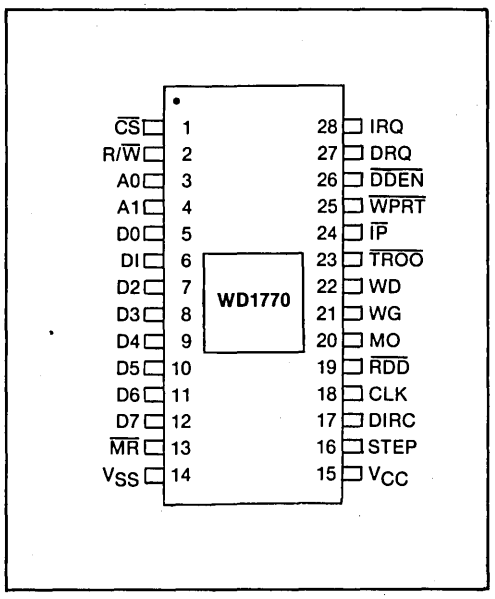
© IC MASTER 1983

ADVANCE INFORMATION

WD1770 Minifloppy Formatter/Controller

FEATURES

- SINGLE OR DOUBLE DENSITY
- ON-CHIP DATA SEPARATOR
- ON-CHIP WRITE PRECOMPENSATION
- MOTOR CONTROL
- 179X SOFTWARE COMPATIBLE
- SINGLE +5V SUPPLY
- 28 PIN PACKAGE
- TTL COMPATIBLE



PIN DESIGNATION

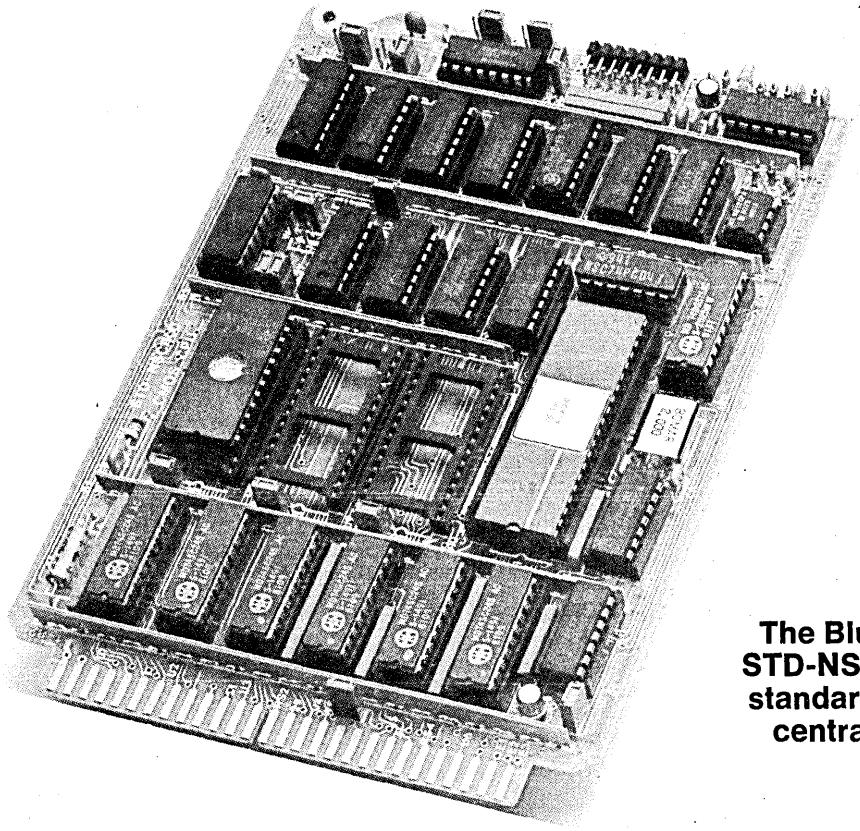
GENERAL DESCRIPTION

The WD1770 Minifloppy Formatter/Controller is a stand-alone MOS/LSI device designed for controlling 5¼" single or double density disk drives. With only a single 8 MHZ clock, the WD1770 performs digital Data Separation and Write Precompensation (125 ns.) without the use of external adjustments or components. It executes the same instructions as its predecessor the WD179X/279X, plus an additional command option of motor control and time-out functions. With only buffers and driver gates, the WD1770 integrates the entire floppy interface.

Available in a 28 pin Dual-in-line package, the WD1770 is implemented in NMOS technology and operates from a single +5 volt supply.

© IC MASTER 1983

For Key Data On Every IC On This Board, The Place To Look Is...



The Blue Chip Computer STD-NSC800 is a CMOS standard bus compatible central processor card.

Equipment and system design often require the use of a wide variety of integrated circuits in order to obtain optimum performance. One way for an engineer to be certain that he hasn't overlooked the best device for his application is to refer to the pages of IC MASTER.

Surveys conducted by IC MASTER, integrated circuit manufacturers, and independent research agencies confirm that four out of five IC MASTER users have specified one or more products as the result of using IC MASTER.

Device No.	Description
NMC27C16	Erasable CMOS PROM
NSC800	8-bit Microprocessor
74SC245	3-State Octal Bus Driver
MD74SC373	Noninverted D-Type Transparent Latch
ICL8212C	Micropower Voltage Detector
MM74PC00	Quad 2-Input NAND Gate
MM74PC32	Quad 2-Input OR Gate
MM74PC08	Quad 2-Input AND Gate
MD74SC139	Octal Decoder/Demultiplexer
MM74PC74	Dual Type-D Flip-Flop
MSC74PC07	Hex Inverter
MM74C30	8-Input NAND Gate

Representative list of ICs on the Blue Chip Computer STD-NSC800 card. Key specifications for all of these ICs can be found in IC MASTER.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

Zilog

Zilog Product Guide

Zilog
an affiliate of
EXXON Corporation

I. **Z80 Family** **1583**
Z8400 and Z8400L CPUs 1583
Z8108 Z800 MPU 1584
Z8410 DMA 1585
Z8420 PIO 1585
Z8430 CTC 1585
Z8440 SIO 1586
Z8470 DART 1586

For Zilog's complete Product Data Book contact Zilog, Inc., Components Publications, 1315 Dell Avenue, Campbell, CA 95008, Attn: Z80 IC Master.

II. **Z8000 Family** **1587**
Z8001/2 CPU 1587
Z8003/4 VMPU 1588
Z8010 Z-MMU 1589
Z8015 PMMU 1589
Z8016 DTC 1590
Z8030 Z-SCC 1590
Z8031 Z-ASCC 1591
Z8036 Z-CIO 1591
Z8038 Z-FIO 1592
Z8060 FIFO 1592
Z8065 Z-BEP 1592
Z8068 Z-DCP 1593
Z8090 Z-UPC 1593

For Zilog's complete Product Data Book contact Zilog, Inc., Components Publications, 1315 Dell Avenue, Campbell, CA 95008, Attn: Z8000 IC Master.

III. **Z8500** **1594**
Z8530 SCC 1594
Z8531 ASCC 1594
Z8536 CIO 1594
Z8038 Z-FIO (See Z8000 Family) 1592
Z8060 Z-FIFO (See Z8000 Family) 1592
Z8581 CGC 1595
Z8590 UPC 1595

For Zilog's complete Product Data Book contact Zilog, Inc., Components Publications, 1315 Dell Avenue, Campbell, CA 95008, Attn: Peripheral IC Master.

© IC MASTER 1983

Zilog Product Guide (Continued)

IV. Z8 Family 1596
Z8601/03 MCU 1596
Z8611/12/13 MCU 1597
Z8671 MCU 1597
Z8681 MCU 1597
Z8090 Z-UPC (See Z8000 Family) 1593
Z8590 UPC (See Z8500 Peripherals) 1595

For Zilog's complete Product Data Book contact Zilog, Inc., Components Publications, 1315 Dell Avenue, Campbell, CA 95008, Attn: Z8 IC Master.

V. Development Systems 1598
Software Information 1598
System 8000 1599
EMS 8000 Emulator Subsystem 1600
Z-SCAN 8000 Emulator 1600
Z8000 Development Module 1601
Z8000 Software Development Package 1601
PDS 8000 Development System 1601
Z8000 Dual-Processor System Upgrade Package .. 1602
ZDS 1/40 Z80 Development System 1602
Z-SCAN 8 Emulator 1602
Z8 Development Module 1603
Z8 Software Development Package 1603

For Zilog's complete Product Data Book contact Zilog, Inc., Components Publications, 1315 Dell Avenue, Campbell, CA 95008, Attn: Development Products IC Master.

VI. Hi-Reliability Microcircuits 1604

For Zilog's complete Product Data Book contact Zilog, Inc., Components Publications, 1315 Dell Avenue, Campbell, CA 95008, Attn: Hi-Rel IC Master.

© IC MASTER 1983

Z8400
Z80® CPU Central Processing Unit

Zilog
an affiliate of
EXXON Corporation

Features

- The instruction set contains 158 instructions. The 78 instructions of the 8080A are included as a subset; 8080A software compatibility is maintained.
- Six MHz, 4 MHz and 2.5 MHz clocks for the Z80B, Z80A, and Z80 CPU result in rapid instruction execution with consequent high data throughput.
- New 8 MHz Z8400H Z80 CPU extends throughput capability even more.
- Z8400L Low Power CPU offers the standard Z80 features in addition to requiring less power. 1 MHz, 1.5 MHz, or 2.5 MHz clock rates available.
- The extensive instruction set includes string, bit, byte, and word operations. Block searches and block transfers together with indexed and relative addressing result in the most powerful data handling capabilities in the microcomputer industry.
- The Z80 microprocessors and associated family of peripheral controllers are linked by a vectored interrupt system. This system may be daisy-chained to allow implementation of a priority interrupt scheme. Little, if any, additional logic is required for daisy-chaining.
- Duplicate sets of both general-purpose and flag registers are provided, easing the design and operation of system software through single-context switching, background-foreground programming, and single-level interrupt processing. In addition, two 16-bit index registers facilitate program processing of tables and arrays.
- There are three modes of high speed interrupt processing: 8080 compatible, non-Z80 peripheral device, and Z80 Family peripheral with or without daisy chain.
- On-chip dynamic memory refresh counter.

The Z80, Z80A, and Z80B CPUs are third-generation single-chip microprocessors with exceptional computational power. They offer higher system throughput and more efficient memory utilization than comparable second- and third-generation microprocessors. The internal registers contain 208 bits of read/write memory that are accessible to the programmer. These registers include two sets of six general-purpose registers which may be used individually as either 8-bit registers or as 16-bit register pairs. In addition, there are two sets of accumulator and flag registers. A group of "Exchange" instructions makes either set of main or alternate registers accessible to the programmer. The alternate set allows operation in foreground-background mode or it may be reserved for very fast interrupt response.

The Z80 also contains a Stack Pointer, Program Counter, two index registers, a Refresh register (counter), and an Interrupt register. The CPU is easy to incorporate into a system since it requires only a single +5 V power source. All output signals are fully decoded and timed to control standard memory or peripheral circuits, and it is supported by an extensive family of peripheral controllers. The internal block diagram shows the primary functions of the Z80 processors. Subsequent text provides more detail on the Z80 I/O controller family, registers, instruction set, interrupts and daisy chaining, and CPU timing.

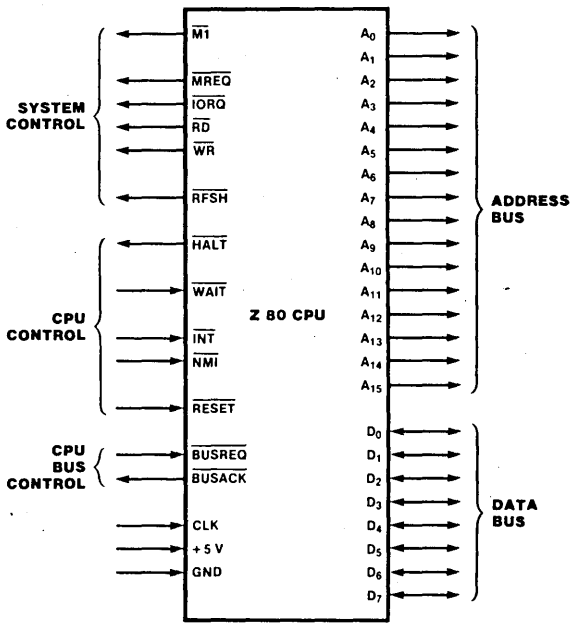


Figure 1. Pin Functions

© IC MASTER 1983

For Zilog Product Selector Guide, See Pages 1581-1582.

Z8108
First MPU of the Z800™ Family

Zilog
an affiliate of
EXXON Corporation

Features

- Object code compatible with Z80, plus Multiply, Divide, and other instructions, and new addressing modes.
- 512K byte memory address space with on-chip paged memory management.
- 6-25 MHz CPU.
- On-chip clock oscillator with programmable scaler for bus timing.
- Z80-bus compatible.
- Supports the three Z80 interrupt modes, plus a new fourth mode that allows trap handling and interrupt nesting.
- Breakpoint and single step implemented as traps to facilitate debugging.
- System and User modes.
- Optional separation of program and data.
- On-chip refresh with 10-bit addressing.

The Z8108 is a 40-pin microprocessor that operates on the Z80 bus. It incorporates advanced architectural features for greater throughput and increased memory addressing, while maintaining Z80 object code compatibility. These new features provide a continuing growth path for present Z80-based designs and a high-performance microprocessor for future designs.

The Z8108 is an enhanced version of the Z80 Central Processing Unit (CPU). Advanced features such as dual mode (System/User) operation and a sophisticated interrupt and trap handling mechanism are supported by the CPU architecture. The Z80 instruction set has been retained to provide binary code compatibility with the present Z80. The augmented instruction set provides enhancements and extensions to many Z80 instructions. Four new addressing modes have been added to increase the flexibility and power of the instruction set. The Z8108 also contains an on-chip clock oscillator and a refresh controller that provides 10-bit refresh addresses for dynamic memories.

One important requirement for today's microprocessor-based system design is to increase memory address space beyond 64K bytes for 8-bit machines. The Z8108 provides this capability with its on-chip Memory Management Unit (MMU). The MMU dynamically translates memory addresses to allow the microprocessor to address 512K bytes. In addition to enabling an expanded address space, the MMU performs other memory management functions previously handled by dedicated off-chip memory management devices.

For Zilog Product Selector Guide, See Pages 1581-1582.
© IC MASTER 1983

Z8410
Z80® DMA Direct Memory Access Controller

Zilog
an affiliate of
EXXON Corporation

Features

- Transfers, searches and search/transfers in Byte-at-a-Time, Burst or Continuous modes. Cycle length and edge timing can be programmed to match the speed of any port.
- Dual port addresses (source and destination) generated for memory-to-I/O, memory-to-memory, or I/O-to-I/O operations. Addresses may be fixed or automatically incremented/decremented.
- Next-operation loading without disturbing current operations via buffered starting-address registers. An entire previous sequence can be repeated automatically.
- Extensive programmability of functions. CPU can read complete channel status.
- Standard Z80 Family bus-request and prioritized interrupt-request daisy chains implemented without external logic. Sophisticated, internally modifiable interrupt vectoring.
- Direct interfacing to system buses without external logic.

The Z80 DMA (Direct Memory Access) is a powerful and versatile device for controlling and processing transfers of data. Its basic function of managing CPU-independent transfers between two ports is augmented by an array of features that optimize transfer speed and control with little or no external logic in systems using an 8- or 16-bit data bus and a 16-bit address bus.

Z8420
Z80® PIO Parallel Input/Output Controller

Features

- Provides a direct interface between Z80 microcomputer systems and peripheral devices.
- Both ports have interrupt-driven handshake for fast response.
- Four programmable operating modes: byte input, byte output, byte input/output (Port A only), and bit input/output.
- Programmable interrupts on peripheral status conditions.
- Standard Z80 Family bus-request and prioritized interrupt-request daisy chains implemented without external logic.
- The eight Port B outputs can drive Darlington transistors (1.5 mA at 1.5 V).

The Z80 PIO Parallel I/O Circuit is a programmable, dual-port device that provides a TTL-compatible interface between peripheral devices and the Z80 CPU. The CPU configures the Z80 PIO to interface with a wide range of peripheral devices with no other external logic. Typical peripheral devices that are compatible with the Z80 PIO include most keyboards, paper tape readers and punches, printers, PROM programmers, etc.

Z8430
Z80® CTC Counter/ Timer Circuit

Features

- Four independently programmable counter/timer channels, each with a readable downcounter and a selectable 16 or 256 prescaler. Downcounters are reloaded automatically at zero count.
- Selectable positive or negative trigger initiates timer operation.
- Three channels have Zero Count/Timeout outputs capable of driving Darlington transistors.
- Interfaces directly to the Z80 CPU or—for baud rate generation—to the Z80 SIO.
- Standard Z80 Family daisy-chain interrupt structure provides fully vectored, prioritized interrupts without external logic. The CTC may also be used as an interrupt controller.

The Z80 CTC four-channel counter/timer can be programmed by system software for a broad range of counting and timing applications. The four independently programmable channels of the Z80 CTC satisfy common microcomputer system requirements for event counting, interrupt and interval timing, and general clock rate generation.

© IC MASTER 1983
For Zilog Product Selector Guide, See Pages 1581-1582.

Z8440
Z80® SIO Serial Input/Output Controller

Zilog
an affiliate of
EXXON Corporation

Features

- Two independent full-duplex channels, with separate control and status lines for modems or other devices.
- Data rates of 0 to 500K bits/second in the x1 clock mode with a 2.5 MHz clock (Z80 SIO), or 0 to 800K bits/second with a 4.0 MHz clock (Z80A SIO).
- Receiver data registers quadruply buffered, transmitter registers doubly buffered.
- Asynchronous protocols: everything necessary for complete messages in 5, 6, 7 or 8 bits/character. Includes variable stop bits and several clock-rate multipliers; break generation and detection; parity; overrun and framing error detection.
- Synchronous protocols: everything necessary for complete bit- or byte-oriented messages in 5, 6, 7 or 8 bits/character, including IBM Bisync, SDLC, HDLC, CCITT-X.25 and others. Automatic CRC generation/checking, sync character and zero insertion/deletion, abort generation/detection and flag insertion.
- Highly sophisticated and flexible daisy-chain interrupt vectoring for interrupts without external logic.

The Z80 SIO Serial Input/Output Controller is a dual-channel data communication interface with extraordinary versatility and capability. Its basic functions as a serial-to-parallel, parallel-to-serial converter/controller can be programmed by a CPU for a broad range of serial communication applications.

Z8470 Z80® DART Dual Asynchronous Receiver/Transmitter

Features

- Two independent full-duplex channels with separate modem controls. Modem status can be monitored.
- In x1 clock mode, data rates are 0 to 500K bits/second with a 2.5 MHz clock, or 0 to 800K bits/second with a 4.0 MHz clock.
- Receiver data registers are quadruply buffered; the transmitter is doubly buffered.
- Programmable options include 1, 1½ or 2 stop bits; even, odd or no parity; and x1, x16, x32 and x64 clock modes.
- Break generation and detection as well as parity-, overrun- and framing-error detection are available.
- Interrupt features include a programmable interrupt vector, a "status affects vector" mode for fast interrupt processing, and the standard Z80 peripheral daisy-chain interrupt structure that provides automatic interrupt vectoring with no external logic.
- On-chip logic for ring indication and carrier-detect status.

The Z80 DART (Dual-Channel Asynchronous Receiver/Transmitter) is a dual-channel multi-function peripheral component that satisfies a wide variety of asynchronous serial data communications requirements in microcomputer systems. The Z80 DART is used as a serial-to-parallel, parallel-to-serial converter/controller in asynchronous applications. In addition, the device also provides modem controls for both channels. In applications where modem controls are not needed, these lines can be used for general-purpose I/O.

© IC MASTER 1983

Z8001/2
Z8000™ CPU Central Processing Unit

Zilog
an affiliate of
EXXON Corporation

Features

- Regular, easy-to-use architecture
- Instruction set more powerful than many minicomputers
- Directly addresses 8M bytes
- Eight user-selectable addressing modes
- Seven data types that range from bits to 32-bit long words and byte and word strings
- System and Normal operating modes
- Separate code, data and stack spaces
- Sophisticated interrupt structure
- Resource-sharing capabilities for multi-processing systems
- Multi-programming support
- Compiler support
- Memory management and protection provided by Z8010 Memory Management Unit
- 32-bit operations, including signed multiply and divide
- Z-BUS compatible
- 4, 6 and 10 MHz clock rate

The Z8000 is an advanced high-end 16-bit microprocessor that spans a wide variety of applications ranging from simple stand-along computers to complex parallel-processing systems. Essentially a monolithic minicomputer central processing unit, the Z8000 CPU is characterized by an instruction set more powerful than many minicomputers; abundant resources in registers, data types, addressing modes and addressing range; and a regular architecture that enhances throughouput by avoiding critical bottlenecks such as implied or dedicated registers.

CPU resources include sixteen 16-bit general-purpose registers, seven data types that range from bits to 32-bit long words and word strings, and eight user-selectable addressing modes. The 110 distinct instruction types can be combined with the various data types and addressing modes to form a powerful set of 414 instructions. Moreover, the instruction set exhibits a high degree of regularity: most instructions can use any of the five main addressing modes and can operate on byte, word and long-word data types.

The CPU can operate in either the system or normal modes. The distinction between these two modes permits privileged operations, thereby improving operating system organization and implementation. Multiprogramming is supported by the "atomic" Test and Set instruction; multiprocessing by a combination of instruction and hardware features; and compilers by multiple stacks, special instructions and addressing modes.

The Z8000 CPU is offered in two versions: the Z8001 48-pin segmented CPU and the Z8002 40-pin non-segmented CPU. The main difference between the two is in addressing range. The Z8001 can directly address 8 megabytes of memory; the Z8002 directly addresses 64 kilobytes. The two operating modes - system and normal - and the distinction between code, data and stack spaces within each mode allows memory extension up to 48 megabytes for the Z8001 and 384 kilobytes for the Z8002.

To meet the requirements of complex, memory-intensive applications, a companion memory-management device is offered for the Z8001. The Z8010 Memory Management Unit manages the large address space by providing features such as segment relocation and memory protection. The Z8001 can be used with or without the Z8010. If used by itself, the Z8001 still provides an 8 megabyte direct addressing range, extendable to 48 megabytes.

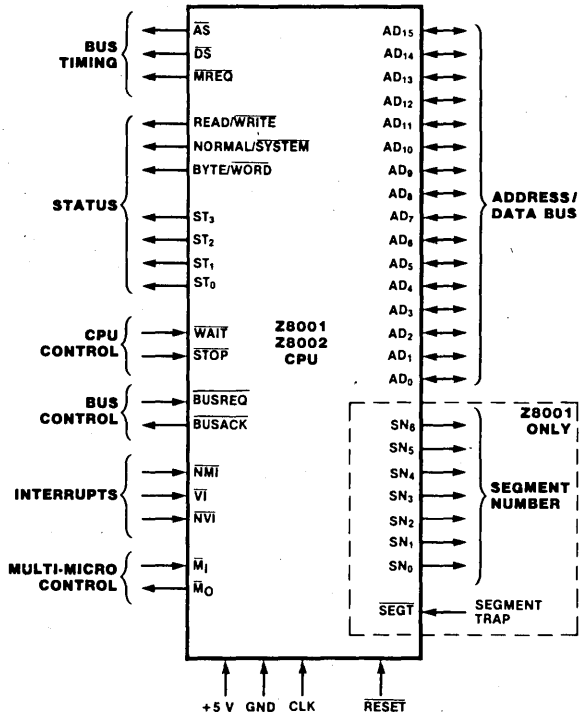


Figure 1. Z8000 CPU Pin Functions

© IC MASTER 1983

For Zilog Product Selector Guide, See Pages 1581-1582.

Z8003/4 Z8000™ VMPU Virtual Memory Processing Unit

Zilog
an affiliate of
EXXON Corporation

Features

- Binary, function, and pin compatibility with the Z8001/2 microprocessors.
- Designed-in compatibility with present and future Zilog Memory Management Units (MMUs).
- Operates with up to a 10 MHz clock.
- Status lines indicate the read/write phase of the Test and Set instruction for use in multiprocessor systems.
- 23-bit segmented addresses for Z8003.
- 16-bit non-segmented addresses for Z8004.

The Z8003/4 Virtual Memory Processor Unit (VMPU), a 16-bit MOS microprocessor, offers integral provisions for operation in a virtual memory environment, in addition to the features of the Z8001 CPU. The Z8003 VMPU generates 23-bit addresses. The address space is organized into 128 segments, each up to 64K bytes in length. The Z8004 generates 16-bit addresses. The Z8003/4 VMPU addressing scheme distinguishes between memory space for program, data, and stack in each of two modes, System and Normal.

For use in shared-memory multiprocessor systems, the Z8003/4 VMPU provides an output on the status lines (ST_0-ST_3), indicating the read/write phase of the Test and Set (TSET) instruction. This status output can be used externally for arbitration of bus control.

In a virtual memory environment, the programs and data being operated on need not reside simultaneously in main memory. Thus, provision must be made for retrieving parts of a program or data located in "secondary" storage (such as a disk). Attempts by the microprocessor to access instructions or data not in main memory are called "accesses to nonresident data." When this is done, the transaction accessing the nonresident data must be interrupted, the state of the microprocessor saved, the program or data in secondary storage moved to main memory, the state of the microprocessor restored, and the interrupted instruction restarted.

The Z8003/4 VMPU provides an external abort pin to permit the interruption of instruction execution before the instruction completes. Internal logic preserves the contents of the status and working registers when an instruction is aborted (interrupted).

When the Z8003/4 VMPU is used in a multiprocessor system, there may be dual-ported memories used by the processors. In this type of system, a resources manager arbitrates simultaneously attempted accesses to shared resources. When a processor tests to see if a resource is in use, the read/write portion of the test transaction must not be interrupted or the probability of a collision increases greatly. The Z8003/4 VMPU provides features that help to avoid collisions during accesses to shared resources via the enhanced TSET instruction.

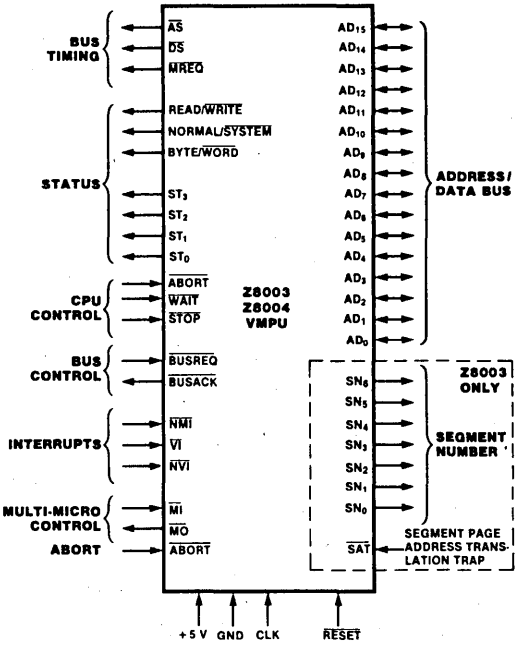


Figure 1. Pin Assignments

© IC MASTER 1983

Z8010
Z8000™ Z-MMU Memory Management Unit

Zilog
an affiliate of
EXXON Corporation

Features

- Dynamic segment relocation makes software addresses independent of physical memory addresses.
- Sophisticated memory-management features include access validation that protects memory areas from unauthorized or unintentional access, and a write-warning indicator that predicts stack overflow.
- For use with both Z8001 and Z8003 CPU.
- 64 variable-sized segments from 256 to 65,536 bytes can be mapped into a total physical address space of 16M bytes; all 64 segments are randomly accessible.
- Multiple MMUs can support several translation tables for each Z8001/3 address space.
- MMU architecture supports multi-programming systems and virtual memory implementations.

The Z8010 Memory Management Unit (MMU) manages the large 8M byte addressing spaces of the Z8001 CPU. The MMU provides dynamic segment relocation as well as numerous memory protection features.

Dynamic segment relocation makes user software addresses independent of the physical memory addresses, thereby freeing the user from specifying where information is actually located in the physical memory. It also provides a flexible, efficient method for supporting multi-programming systems. The MMU uses a translation table to transform the 23-bit logical address output from the Z8001 CPU into a 24-bit address for the physical memory. (Only logical memory addresses go to an MMU for translation; I/O addresses and data, in general, must by pass this component.)

Z8015 Z8000™ PMMU Paged Memory Management Unit

Features

- PMMU architecture supports paged, virtual memory systems for the Z8003 VMPU.
- Dynamic page relocation makes software addresses independent of physical memory addresses.
- Memory-management features provide access validation to protect memory areas from unauthorized or unintentional access, and a write-warning indicator to prevent stack overflow.
- 64 pages, each 2048 bytes in length, can be mapped into a total physical address space of 16 megabytes.
- PMMU can be used to implement systems with larger or smaller page sizes.
- The number of accessible pages can be increased by using multiple PMMUs to support separate translation tables for each Z8003 VMPU address space.

The Z8015 Paged Memory Management Unit (PMMU) is designed to support a paged virtual memory system for the Z8003 Virtual Memory Processor Unit (VMPU). Although designed primarily for the Z8003, the PMMU can also be used to support the other CPUs in the Z8000 Family. Memory-management features allow access validation for memory protection and a write-warning to prevent stack overflow. An instruction abort for accesses to pages not in main memory allows restarting of instructions in the Z8003 VMPU. Each PMMU can manage a basic memory area of sixty-four 2048-byte, fixed-size pages. The VMPU's 8M byte logical address space is translated by the PMMU into a 16M byte physical address space. Page size can be easily changed and multiple PMMUs can be combined to support more pages. The PMMU is produced in a 64-pin package.

© IC MASTER 1983
For Zilog Product Selector Guide, See Pages 1581-1582.

Z8016 Z8000™ DTC Direct Memory Access Transfer Controller

Zilog
an affiliate of
EXXON Corporation

Features

- Memory-to-peripheral transfer up to 2.66M bytes/second at 4 MHz.
- Memory-to-memory transfer up to 1.33M bytes/second at 4 MHz.
- Two fully independent, multi-function channels.
- Masked data pattern matching for search and search-and-transfer operations.
- Funneling option permits mixing of byte and word data during transfer operations.
- May be operated in logical address space in conjunction with the Z8010 Memory Management Unit.
- Programmable chaining operation provides automatic loading of control parameters from memory by each channel.
- Software- or hardware-controlled Wait state insertion.
- Automatic loading from base registers on each channel for efficient repetitive operations.
- Z-BUS daisy-chain interrupt hierarchy and bus-request structure.

The Z8016 DMA Transfer Controller (DTC) is a high-performance data transfer device designed to match the power and addressing capability of the Z8000 CPUs. In addition to providing block data transfer capability between memory and peripherals, each of the two DTC channels can perform peripheral-to-peripheral and memory-to-memory transfers.

Z8030 Z8000™ Z-SCC Serial Communications Controller

Features

- Two independent, 0 to 1M bit/second, full-duplex channels, each with a separate crystal oscillator, baud rate generator, and Digital Phase-Locked Loop for clock recovery.
- Multi-protocol operation under program control; programmable for NRZ, NRZI, or FM data encoding.
- Asynchronous mode with five to eight bits and one, one and one-half, or two stop bits per character; programmable clock factor; break detection and generation; parity, overrun, and framing error detection.
- Synchronous mode with internal or external character synchronization on one or two sync characters and CRC generation and checking with CRC-16 or CRC-CCITT preset to either 1s or 0s.
- SDLC/HDLC mode with comprehensive frame-level control, automatic zero insertion and deletion, I-field residue handling, abort generation and detection, CRC generation and checking, and SDLC Loop mode operation.
- Local Loopback and Auto Echo modes.

The Z8030 Z-SCC Serial Communications Controller is a dual-channel, multi-protocol data communications peripheral designed for use with the Zilog Z-Bus. The Z-SCC functions as a serial-to-parallel, parallel-to-serial converter/controller. The Z-SCC can be software-configured to satisfy a wide variety of serial communications applications. The device contains a variety of new, sophisticated internal functions including on-chip baud rate generators, Digital Phase-Locked Loops, and crystal oscillators that dramatically reduce the need for external logic.

For Zilog Product Selector Guide, See Pages 1581-1582.
© IC MASTER 1983

Z8031 Z8000™ Z-ASCC Asynchronous Serial Communications Controller

Zilog
an affiliate of
EXXON Corporation

Features

- Two independent, 0 to 1M bit/second, full-duplex channels, each with a separate crystal oscillator, baud rate generator, and Digital Phase-Locked Loop for clock recovery.
- Programmable for NRZ, NRZI, or FM data encoding.
- Asynchronous communications with five to eight bits per character and one, one and one-half, or two stop bits per character; programmable clock factor; break detection and generation; parity, overrun, and framing error detection.
- Local Loopback and Auto Echo modes.

The Z8031 Z-ASCC Asynchronous Serial Communications Controller is a dual-channel data communications peripheral designed for use with the Zilog Z-BUS. The Z-ASCC functions as a serial-to-parallel, parallel-to-serial converter/controller. The device contains a variety of new, sophisticated internal functions including on-chip baud rate generators, Digital Phase-Locked Loops, and crystal oscillators that dramatically reduce the need for external logic.

Z8036 Z8000™ Z-CIO Counter/Timer and Parallel I/O Unit

Features

- Two independent 8-bit, double-buffered, bidirectional I/O ports plus a 4-bit special-purpose I/O port. I/O ports feature programmable polarity, programmable direction (Bit mode), "pulse catchers," and programmable open-drain outputs.
- Four handshake modes, including 3-Wire (like the IEEE-488).
- REQUEST/$\overline{\text{WAIT}}$ signal for high-speed data transfer.
- Flexible pattern-recognition logic, programmable as a 16-vector priority interrupt controller.
- Three independent 16-bit counter/timers with up to four external access lines per counter/timer (count input, output, gate, and trigger), and three output duty cycles (pulsed, one-shot, and square-wave), programmable as retriggerable or nonretriggerable.
- Easy to use since all registers are read/write and directly addressable.

The Z8036 Z-CIO Counter/Timer and Parallel I/O element is a general-purpose peripheral circuit, satisfying most counter/timer and parallel I/O needs encountered in system designs. This versatile device contains three I/O ports and three counter/timers. Many programmable options tailor its configuration to specific applications. The use of the device is simplified by making all internal registers (command, status, and data) readable and (except for status bits) writable. The Z-CIO is directly Z-BUS compatible.

© IC MASTER 1983
For Zilog Product Selector Guide, See Pages 1581-1582.

Z8038 Z8000™ Z-FIO FIFO Input/ Output Interface Unit

Zilog
an affiliate of
EXXON Corporation

Features

- 128 byte FIFO buffer provides asynchronous bidirectional CPU/CPU or CPU/peripheral interface; expandable to any width in byte increments by use of multiple FIOs.
- Interlocked 2-wire or 3-wire handshake logic port mode; Z-BUS or non-Z-BUS interface.
- Pattern-recognition logic stops DMA transfers and/or interrupts CPU; preset byte count can initiate variable-length DMA transfers.
- Seven sources of vectored/nonvectored interrupts which include pattern-match, byte count, empty or full buffer status; a dedicated "mailbox" register with interrupt capability provides CPU/CPU communication.
- REQUEST/$\overline{\text{WAIT}}$ lines control high-speed data transfers.
- All functions are software controlled via directly addressable read/write registers.

The Z8038 FIO provides an asynchronous 128-byte FIFO buffer between two CPUs or between a CPU and a peripheral device. This buffer interface expands to a 16-bit or wider data path and expands in depth to add as many Z8060 FIFOs (and an additional FIO) as are needed.

The FIO manages data transfers by assuming Z-BUS, non-Z-BUS microprocessor (a generalized microprocessor interface), Interlocked 2-Wire Handhsake, and 3-Wire Handshake operating modes. These modes interface dissimilar CPUs or CPUs and peripherals running under differing speeds or protocols, allowing asynchronous data transactions and improving I/O overhead by as much as two orders of magnitude.

Z8060 Z8000™ FIFO Buffer Unit and Z-FIO Expander

Features

- Bidirectional, asynchronous data transfer capability
- Large 128-bit-by-8-bit buffer memory
- Two-wire, interlocked handshake protocol
- Wire-ORing of empty and full outputs for sensing of multiple-unit buffers
- 3-state data outputs
- Connects any number of FIFOs in series to form buffer of any desired length
- Connects any number of FIFOs in parallel to form buffer of any desired width

The Z8060 First-In First-Out (FIFO) Buffer Unit consists of a 128-bit-by-8-bit memory, bidirectional data transfer and handshake logic. The structure of the FIFO unit is similar to that of other available buffer units. FIFO is a general-purpose unit; its handshake logic is compatible with that of other members of Zilog's Z8 and Z8000 Families.

Z8065 Z8000™ Z-BEP Burst Error Processor

Features

- Detects errors in serial data up to 585,442 bits in length
- Implements correction of a detected error burst of up to 12 bits in length
- Handles effective data rates of up to 20M bits per second
- Provides four industry-standard polynomials for error detection
- Provides three correction algorithms:
  - ☐ Full-period clock-around method for conformance to current practices
  - ☐ Chinese remainder theorem, which reduces correction time by orders of magnitude
  - ☐ Reciprocal polynomial, which allows correction with 48-bit code
- Designed for use in both microprocessor and microprogrammed disk-controlled systems

For Zilog Product Selector Guide, See Pages 1581-1582.

© IC MASTER 1983

Features (Continued)

The Z8065 Burst Error Processor (BEP) provides error detection and correction facilities for high-performance, high-density disk systems and any other system in which high-speed serial data transfers occur.

For error detection, the BEP provides a selection of four standard polynomials, including the more popular 56-bit and 48-bit versions, to satisfy a broad range of applications. During write operations, the BEP generates check-bit words, which are appended to the record being written onto the disk. These check-bit words are then used in subsequent reads and, if necessary, in correction operations.

Z8068
Z8000™ Z-DCP Data Ciphering Processor

Features

- Encrypts and decrypts data using the National Bureau of Standards encryption algorithm.
- Supports three standard ciphering modes: Electronic Code Book, Chain Block and Cipher Feedback.
- Three separate registers for encryption, decryption, and master keys improve system security and throughput by eliminating frequent reloading of keys.
- Three separate programmable ports (master, slave, and key data) provide hardware separation of encrypted data, clear data, and keys.
- Data rates greater than 1M bytes per second can be handled.
- Key parity check.

The Z8068 Data Ciphering Processor (DCP) is an n-channel, silicon-gate LSI device, which contains the circuitry to encrypt and decrypt data using National Bureau of Standards encryption algorithms. It is designed to be used in a variety of environments, including dedicated controllers, communication concentrators, terminals, and peripheral task processors in general processor systems.

The DCP provides a high throughput rate using Cipher Feedback, Electronic Code Book, or Cipher Block Chain operating modes. The provision of separate ports for key input, clear data, and enciphered data enhances security.

The Z8068 DCP is designed to interface directly to Zilog's Z-BUS®.

Z8090
Z8000™ Z-UPC Universal Peripheral Controller

Features

- Complete slave microcomputer, for distributed processing Z-BUS use.
- 2K bytes of on-chip ROM.
- 256-byte register file, accessible by both the master CPU and Z-UPC, using a fail-safe message-passing protocol.
- Three programmable I/O ports, two with optional 2-Wire Handshake.
- Z8 architecture and instruction set.
- Six levels of priority interrupts from eight sources: six external sources and two internal sources.
- Two programmable 8-bit counter/timers each with a 6-bit prescaler. Counter/Timer T0 is driven by an internal source, and Counter/Timer T1 can be driven by internal or external sources. Both counter/timers are independent of program execution.

The Z8090 Universal Peripheral Controller (Z-UPC) is an intelligent peripheral controller for distributed processing applications. The Z-UPC unburdens the host processor by assuming tasks traditionally done by the host (or by added hardware), such as performing arithmetic, translating or formatting data, and controlling I/O devices. Based on the Z8 microcomputer architecture and instruction set, the Z-UPC contains 2K bytes of internal program ROM, a 256-byte register file, three 8-bit I/O ports, and two counter/timers.

© IC MASTER 1983
For Zilog Product Selector Guide, See Pages 1581-1582.

Z8530 SCC Serial Communications Controller

Zilog
an affiliate of
EXXON Corporation

Features

- Two independent, 0 to 1M bit/second, full-duplex channels, each with a separate crystal oscillator, baud rate generator, and Digital Phase-Locked Loop for clock recovery.
- Multi-protocol operation under program control; programmable for NRZ, NRZI, or FM data encoding.
- Asynchronous mode with five to eight bits and one, one and one-half, or two stop bits per character; programmable clock factor; break detection and generation; parity, overrun, and framing error detection.
- Synchronous mode with internal or external character synchronization on one or two synchronous characters and CRC generation and checking with CRC-16 or CRC-CCITT preset to either 1s or 0s.
- SDLC/HDLC mode with comprehensive frame-level control, automatic zero insertion and deletion, I-field residue handling, abort generation and detection, CRC generation and checking, and SDLC Loop mode operation.
- Local Loopback and Auto Echo modes.

The Z8530 SCC Serial Communications Controller is a dual-channel, multi-protocol data communications peripheral designed for use with conventional non-multiplexed buses. The SCC functions as a serial-to-parallel, parallel-to-serial converter/controller. The SCC can be software-configured to satisfy a wide variety of serial communications applications. The device contains a variety of new, sophisticated internal functions including on-chip baud rate generators, Digital Phase-Locked Loops, and crystal oscillators that dramatically reduce the need for external logic.

Z8531 ASCC Asynchronous Serial Communications Controller

Features

- Two independent, 0 to 1M bit/second, full-duplex channels, each with a separate crystal oscillator, baud rate generator, and Digital Phase-Locked Loop for clock recovery.
- Programmable for NRZ, NRZI, or FM data encoding.
- Asynchronous communications with five to eight bits per character and one, one and one-half, or two stop bits per character; programmable clock factor; break detection and generation; parity, overrun, and framing error detection.
- Local Loopback and Auto Echo modes.

The Z8531 ASCC Asynchronous Serial Communications Controller is a dual-channel, multi-protocol data communications peripheral designed for use with conventional non-multiplexed buses. The ASCC functions as a serial-to-parallel, parallel-to-serial converter/controller. The device contains a variety of new, sophisticated internal functions including on-chip baud rate generators, Digital Phase-Locked Loops, and crystal oscillators that dramatically reduce the need for external logic.

The ASCC also has facilities for modem controls in both channels. In applications where these controls are not needed, the modem controls can be used for general-purpose I/O.

Z8536 CIO Counter/Timer and Parallel I/O Unit

Features

- Two independent 8-bit, double-buffered, bidirectional I/O ports plus a 4-bit special-purpose I/O port. I/O ports feature programmable polarity, programmable direction (Bit mode), "pulse catchers," and programmable open-drain outputs.
- Four handshake modes, including 3-Wire (like the IEEE-488).
- REQUEST/$\overline{\text{WAIT}}$ signal for high-speed data transfer.
- Flexible pattern-recognition logic, programmable as a 16-vector interrupt controller.

For Zilog Product Selector Guide, See Pages 1581-1582.

© IC MASTER 1983

Features (Continued)

- Three independent 16-bit counter/timers with up to four external access lines per counter/timer (count input, output, gate, and trigger), and three output duty cycles (pulsed, one-shot, and square-wave), programmable as retriggerable or nonretriggerable.
- Easy to use since all registers are read/write.

The Z8536 CIO Counter/Timer and Parallel I/O element is a general-purpose peripheral circuit, satisfying most counter/timer and parallel I/O needs encountered in system designs. This versatile device contains three I/O ports and three counter/timers. Many programmable options tailor its configuration to specific applications. The use of the device is simplified by making all internal registers (command, status, and data) readable and (except for status bits) writable. In addition, each register is given its own unique internal address, so that any register can be accessed in two operations. All data registers can be directly accessed in a single operation. The CIO is easily interfaced to all popular microprocessors.

Z8581 CGC Clock Generator and Controller

Features

- Two independent 20 MHz oscillators.
- Clock output drivers meet the high capacitance clock input requirements of NMOS microprocessors.
- Outputs directly drive the Z80 and Z8000 microprocessor clock inputs.
- Oscillator input frequency reference source can be either crystals or TTL-compatible oscillators.
- System Clock oscillator provides a TTL-compatible timebase signal at source frequency;provides an NMOS-compatible clock signal at a programmable percentage of the source frequency; provides ability to stretch High or Low phase of clock signal under external control.
- General-Purpose Clock oscillator that provides an NMOS clock signal at half source frequency.
- System Reset output that is synchronized with System Clock output; power up reset period is maintained for a minimum of 30 ms; and external input initiates system reset.
- 18-pin slimline package used; single +5 V dc power required.

The Z8581 Clock Generator and Controller is a versatile addition to Zilog's family of Universal microprocessor components. The selective clock-stretching capabilities and variety of timing outputs produced by this device allow it to easily meet the timing design requirements of systems with microprocessors and LSI peripherals. The clock output drivers of the Z8581 also meet the non-TTL voltage requirements for driving NMOS clock inputs with no additional external discrete transistors.

Z8590 UPC Universal Peripheral Controller

Features

- Complete slave microcomputer, for distributed processing use.
- Unmatched power of Z8 architecture and instruction set.
- Three programmable I/O ports, two with optional 2-Wire Handshake.
- Six levels of priority interrupts from eight sources: six from external sources and two from internal sources.
- Two programmable 8-bit counter/timers each with a 6-bit prescaler. Counter/Timer T0 is driven by an internal source, and Counter/Timer T1 can be driven by internal or external sources. Both counter/timers are independent of program execution.
- 256-byte register file, accessible by both the master CPU and UPC, as allocated in the UPC program.
- 2K bytes of on-chip ROM for efficiency and versatility.

© IC MASTER 1983
For Zilog Product Selector Guide, See Pages 1581-1582.

Features (Continued)

The Z8590 Universal Peripheral Controller (UPC) is an intelligent peripheral controller for distributed processing applications. The UPC unburdens the host processor by assuming tasks traditionally done by the host (or by added hardware), such as performing arithmetic, translating or formatting data, and controlling I/O devices. Based on the Z8 microcomputer architecture and instruction set, the UPC contains 2K bytes of internal program ROM, a 256-byte register file, three 8-bit I/O ports, and two counter/timers.

Z8 FAMILY

Z8® Family of Microcomputers Z8601•Z8603

Features

- Z8601 Single-Chip Microcomputer with 2K ROM; Z803 Prototyping Device with EPROM interface.
- Complete microcomputer, 2K bytes of ROM, 128 bytes of RAM, 32 I/O lines, and up to 62K bytes addressable external space each for program and data memory.
- 144-byte register file, including 124 general-purpose registers, four I/O port registers, and 16 status and control registers.
- Average instruction execution time of 2.2 μs, maximum of 4.25 μs.
- Vectored, priority interrupts for I/O, counter/timers, and UART.
- Full-duplex UART and two programmable 8-bit counter/timers, each with a 6-bit programmable prescaler.
- Register Pointer so that short, fast instructions can access any of nine working register groups in 1.5 μs.
- On-chip oscillator which accepts crystal or external clock drive.
- Low-power standby option which retains contents of general-purpose registers.
- Single +5 V power supply—all pins TTL-compatible.

The Z8601 microcomputer introduces a new level of sophistication to single-chip architecture. Compared to earlier single-chip microcomputers, the Z8601 offers faster execution; more efficient use of memory; more sophisticated interrupt, input/output and bit-manipulation capabilities; and easier system expansion.

Under program control, the Z8601 can be tailored to the needs of its user. It can be configured as a stand-alone microcomputer with 2K bytes of internal ROM, a traditional microprocessor that manages up to 124K bytes of external memory, or a parallel-processing element in a system with other processors and peripheral controllers linked by the Z-BUS. In all configurations, a large number of pins remain available for I/O.

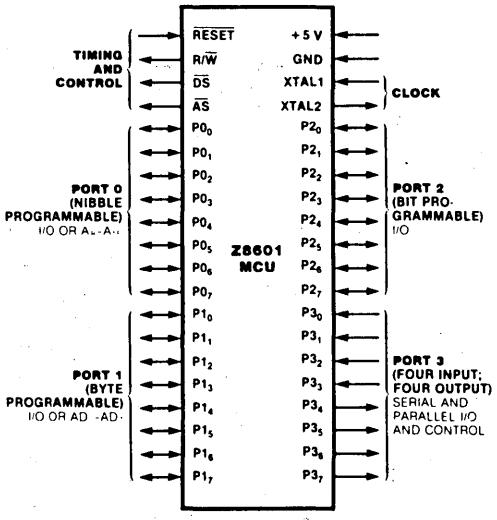


Figure 1. Pin Functions

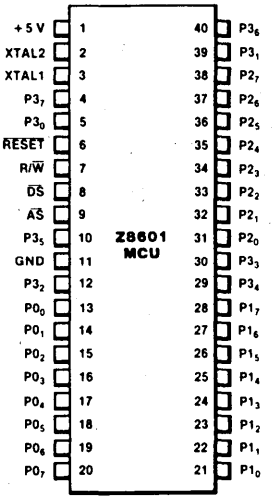


Figure 2. Pin Assignments

For Zilog Product Selector Guide, See Pages 1581-1582.

© IC MASTER 1983

Z8® Family of Microcomputers Z8611•Z8612•Z8613

Zilog
an affiliate of
EXXON Corporation

Features

- Z8611 Single-Chip Microcomputer with 4K ROM; Z8612 Development Device with memory interface; Z8613 Prototyping Device with EPROM interface.
- 4K ROM version of the Z8601 MCU, with 128 bytes of RAM, 32 I/O lines, and up to 60K bytes addressable external space each for program and data memory.

A 4K ROM version of the Z8601 chip, the Z8611 offers all the features of the Z8601.

Under program control, the Z8611 can be tailored to the needs of its user. It can be configured as a stand-alone microcomputer with 4K bytes of internal ROM, a traditional microprocessor that manages up to 120K bytes of external memory, or a parallel-processing element in a system with other processors and peripheral controllers linked by the Z-BUS. In all configurations, a large number of pins remain available for I/O.

Z8® Family Z8671 Microcomputer BASIC/Debug Interpreter

Features

- The Z8671 MCU is a complete microcomputer preprogrammed with a BASIC/Debug interpreter. Interaction between the interpreter and its user is provided through an on-board UART.
- BASIC/Debug can directly address the Z8671's internal registers and all external memory. It provides quick examination and modification of any external memory location or I/O port.
- The BASIC/Debug interpreter can call machine language subroutines to increase execution speed.
- The Z8671's auto start-up capability allows a program to be executed on power-up or Reset without operator intervention.
- Single +5 V power supply—all pins TTL-compatible.

The Z8671 Single-Chip Microcomputer (MCU) is one of a line of preprogrammed chips—in this case with a BASIC/Debug interpreter in ROM—offered by Zilog. As a member of the Z8 Family of microcomputers, it offers the same abundance of resources as the other Z8 microcomputers.

Because the BASIC/Debug interpreter is already part of the chip circuit, programming is made much easier. The Z8671 MCU thus offers a combination of software and hardware that is ideal for most industrial control applications. The Z8671 MCU allows fast hardware tests, and bit-by-bit examination and modification of any memory location, I/O port, or register. It also allows bit manipulation and logical operations. A self-contained line editor supports interactive debugging, further speeding up program development.

Z8® Family Z8681 Microcomputer

Features

- "ROMless" version of the Z8601 single-chip microcomputer, capable of addressing up to 128K bytes of external memory space.
- Up to 24 programmable I/O lines.
- 40-pin package, single +5 V supply, all pins TTL compatible.

The Z8681 MCU is the "ROMless" version of the Z8601 single-chip microcomputer and offers all the outstanding features of the Z8 Family architecture. Using the Z8681, it is possible to design a powerful microprocessor system incorporating a minimum number of support devices.

Port 1 is configured to function as a multiplexed Address/Data bus (AD_0–AD_7), while Port 0 is software configurable to output address bits A_8–A_{15}. This provides for program memory and data memory space of up to 64K bytes each.

Located on-chip are 144 bytes of RAM, organized as a register file of 124 general-purpose registers, 16 control and status registers, and three I/O port registers. (Port 1 cannot be utilized as an I/O register.) This file is divided into groups of working registers in such a way that short format instructions may be used to quickly access a register within a certain group.

© IC MASTER 1983

For Zilog Product Selector Guide, See Pages 1581-1582.

Software Information

Zilog
an affiliate of
EXXON Corporation

To facilitate program development, Zilog offers the complementary PLZ application languages, PLZ/SYS and PLZ/ASM. Similar constructs within the PLZ languages permit the user to combine high-level, machine-independent modules together with machine-dependent modules.

PLZ/SYS is a procedure-oriented language with a style that blends elements of other well known languages such as Pascal, ALGOL, PL/I and C.

PLZ/ASM is a structured assembly language that provides all the capabilities needed to manage the microprocessor resources such as registers, memory accesses, and I/O operations.

This modular programming technique enables the programmer to concentrate on program design rather than on development system software.

The Z8000 Cross-Software Package, running on UNIX, enables multi-user access for enhanced software development. The package consists of a complete set of software tools for developing Z8000 programs on DEC's PDP 11/44, 11/45, and 11/70 systems. The C language, including compiler and code optimizer, protects the user's software investment by permitting program transportability.

The ZRTS Kernel, a small executive program, saves software development time by providing the core of a real-time multitasking operating system in PROMable form. Using ZCL, a high-level configuration language, the designer can define the target system and produce a memory-efficient, cost-effective end product.

Even more software products include the RIO Electric Blackboard, a multi-window full-screen text editor, and software development packages with utility programs that aid and simplify software development for the Z8 MCU and for Z8000 programs on the Z8000 Development Module.

*UNIX is a trademark of Bell Laboratories.

For Zilog Product Selector Guide, See Pages 1581-1582.
© IC MASTER 1983

System 8000™

- 6 MHz Z8001A CPU, three 6 MHz Z8010 MMUs for dynamic segment relocation, plus 6 MHz Z80B CPUs.
- ZEUS, Zilog's enhanced UNIX operating system:
  - ☐ hierarchical file system
  - ☐ compatible file, device and interprocess I/O
- Selection of high-level languages: C, FORTRAN 77, BASIC, Pascal, COBOL, PLZ/SYS.
- System 8000 and ZEUS can be upgraded for use with 32-bit microprocessors to assure next-generation compatibility.
- Free-standing modular unit built as a multistation computing facility for office and laboratory environment.

The System 8000 Family members are fully-compatible "supermicros" whose high-performance, multiuser, multitasking capabilities are based on the Z8000 CPU. System 8000 incorporates a high-performance Winchester disk, as well as intelligent disk and tape controllers to further improve performance. All models have a common CPU board and peripheral controllers, and use identical operating system software (ZEUS). A UNIX-based operating system, ZEUS is specifically designed for software development and text processing. Numerous development tools are available, including the programming languages PLZ/ASM, PLZ/SYS, C, Pascal, and FORTRAN 77. Because ZEUS treats emulators as System 8000 peripherals, System 8000 can combine with EMS 8000, Z-SCAN 8000, ZDS 1/40, or non-Zilog emulators to provide total product development suport for multiple microprocessors.

Models 10 and 11. System 8000 Models 10 and 11 have been specially designed for the business and office environment. Each system is small enough to fit under a desk yet can provide computing power for up to eight users. The basic Model 10 and 11 have 256K bytes of parity RAM, and a 5-1/4" Winchester disk providing 18MB of storage. To back up the Winchester disk, Model 10 offers a 5-1/4" floppy disk drive with 1MB of storage, and Model 11 uses a 17MB cartridge tape drive for backup.

Models 21 and 31. System 8000 Models 21 and 31 are high-performance, high-capacity systems for 8 to 24 users. Model 21, designed for user growth, offers a standard 10-card slot cage; expansion to 18 slots is possible with an Expansion Chassis option. Model 21 offers 1MB of error-correcting memory (expandable to four MB), an 8" Winchester disk with 32MB storage capacity (expandable to 128MB), and a 17-MB tape cartridge drive for backup. Model 31 substitutes an 80MB SMD-compatible Winchester disk for the Model 21's 32-MB drive. Using as many as four such drives, the unit can offer up to 320MB of storage capacity.

© IC MASTER 1983
For Zilog Product Selector Guide, See Pages 1581-1582.

EMS 8000
Emulator Subsystem

Zilog
an affiliate of
EXXON Corporation

Features

- Modular architecture can be easily expanded to support emulation of future Zilog microprocessors.
- A unique "snapshot" feature permits partitioning of a large real-time trace module into many small trace memories.
- Three parallel trigger comparators are provided.
- Logic-state analysis is provided for target CPU address, data, status, control and external probe bits.
- Up to 126K bytes of high-speed, static mappable memory can be accessed by the target system.
- A pulse output feature permits use of a high-end logic analyzer.
- Network debugging is supported.
- Full access is permitted to the target microprocessor's registers, memory and I/O space.
- A "transparent" mode allows the same terminal to be used for host and EMS user interface.

EMS 8000 is a high-end, emulation management system. The EMS 8000, together with Zilog's UNIX -based System 8000™ Z-LAB™, provides the developer of Z8000 microprocessor-based products with a complete set of tools for speeding up the product development cycle.

The emulator provides the link between the application software developed on a host system and the target system. It also aids in the integration of the software into the target system. Emulator to target system hookup is simple and immediate. A CPU pod/cable assembly directly replaces the target CPU. The emulator preserves the full capability of the target microprocessor. The emulator can start or stop program execution or it can perform single-step execution. Individual registers or memory can be examined and modified upon demand. Newly developed programs may be loaded into the development (target) hardware and executed in a real-time environment.

Z8000™ Emulator
Z-SCAN 8000

- **Provides Real Time Emulation up to 4 MHz of the Z8001 and Z8002 CPUs.**
- **Two RS-232C Serial Ports Make It a Peripheral Usable with Most Standard CRTs and Software Hosts.**
- **Transparent Operation Permits Direct Communication Between CRT and Host without Physical Disconnect.**
- **Highly Interactive, Screen-Oriented User Interface Makes Z-SCAN Easy To Use.**
- **Shadow Monitor Removes All Restrictions on Target System Memory Space, Making It Fully Available To the User.**
- **High-Speed Mappable Memory (no wait states) Is Available to Simulate Target System RAM/ROM.**

OVERVIEW

The Z-SCAN 8000 Emulator is an in-circuit emulator that has been designed as a peripheral unit for Zilog's Z8001 and Z8002 16-bit microprocessors. Interfacing via two RS-232C Serial ports to host and CRT terminal, Z-SCAN 8000 can work with Zilog's family of development hosts.

Because it employs a standard serial interface, Z-SCAN 8000 can also be used with virtually any software host system that runs a cross assembler or cross compiler capable of generating Z8000 code. Communication between the host system and Z-SCAN 8000 is with a standard serial format requiring only a simple upload and download utility to operate. For PROM-based target systems, Z-SCAN can operate stand-alone with a CRT terminal because the monitor and debug software is EPROM-resident.

For Zilog Product Selector Guide, See Pages 1581-1582.
© IC MASTER 1983

Z8000™ Development Module

Zilog
an affiliate of
EXXON Corporation

- **Z8001/Z8002 CPU Evaluation and Debug Support**
- **16K Words Dynamic RAM (Expandable to 32K for User Code Execution and Debug**
- **32 Programmable I/O Lines**
- **EPROM Monitor and Debugger**
- **Transparent Operation Allows Software Development without Disconnection from CRT and Host System**
- **RS-232C Standard Serial Interfaces Compatible with Most CRT Terminals and Development Hosts**
- **Wire-wrap Area for Prototyping**

OVERVIEW

The Z8000 Development Module is a complete, single-board microcomputer that is used as a tool for the evaluation and debug of Z8000-based microprocessor systems. The Development Module is used in the first stages of the design and development process, not only as a tool for evaluating Z8000 microprocessor capabilities, but also as an environment in which code can be executed and debugged.

Z8000™ Software Development Package

- **Structured assembly language with high-level constructs.**
- **Relocatable and absolute object code format.**
- **Free format statements allow indentation and spacing for readability.**
- **External symbol references.**
- **Global symbol definitions.**

OVERVIEW

The Z8000 Software Development Package consists of five utility programs which aid and simplify the development of Z8000 programs. PLZ/ASM from Zilog's PLZ family bring all the advantages of modular programming to the Z8000 software developer and ensure transportability to future processors. The Z8000 LINKER, IMAGER, LOAD/SEND and ZPROG simplify the testing and production stages of new software. Each program facilitates a single step towards completing a segmented or nonsegmented program; together they guarantee a smooth, logical, and manageable software development process.

PDS 8000™ Development Systems

Features

- Supports entire family of Zilog microprocessors—Z8, Z80, and Z8000.
- Speeds program development with high-level, structured assembler.
- Extends system capability with an intelligent CRT console.
- Optional screen-oriented text editor.

System Hardware. The PDS 8000 Series consists of several models of single-user systems for the design, development, and debugging of Zilog microprocessor-based systems. The PDS 8000 is a Z80-based microcomputer system with 64K bytes of RAM, a disk controller, parallel printer interface, and an intelligent CRT console. Dual, floppy-disk drive with 600K bytes of hard-sectored storage capacity is standard with the PDS 8000.

The floppy disk drive is interfaced to the microcomputer via the Z80 Memory Disk Controller (MDC), which provides the Z80 microcomputer with all the data formatting required for reading and writing onto the floppy disks from RAM storage. Disk read/write accuracy is ensured by 16-bit CRC-code circuitry. The MDC also provides 48K bytes of dynamic RAM memory for programs or data storage.

System Software. The PDS 8000 System provides all the necessary software to handle software development tasks, from inputting source code to printing listings and creating EPROM's.

RIO Operating System. The PDS 8000 utilizes Zilog's field-proven RIO Operating System for the creation, editing, assembly, and debugging of software. RIO, with relocatable modules and I/O management, is a general-purpose computing system with architecture designed to facilitate the development process. RIO provides straightforward linking to various system routines and enables expansion of system features to meet the particular needs of individual user.

© IC MASTER 1983
For Zilog Product Selector Guide, See Pages 1581-1582.

Z8000™ Dual-Processor System Upgrade Package

Zilog
an affiliate of
EXXON Corporation

Features

- Upgrades an MCZ™ or PDS system to a 16-bit system with 256K bytes of memory.
- Provides complete Z8000-based software development tools that execute at 6MHz: screen editor, translator, compiler/assembler, debugger.
- All software supplied in source code form to allow customization for applications.
- Existing Z80 programs continue to run.

The Z8000 Dual-Processor System Upgrade Package provides 16-bit processing power, 256K bytes of random access memory, and software development tools for Zilog's Z80-based MCZ and PDS systems. The package consists of a Z8000 Microprocessor Board (MPB/256), a screen editor, Z80 to Z8000 translator, and a Z8000 assembler and debugger.

ZDS-1/40 Development System

- **Full Development Support for the Z80® and Z80A Microprocessors**
- **64K Bytes of Memory to Support Large Programs**
- **600K Bytes Floppy Disk Storage**
- **In-Circuit Emulation up to 4 MHz**
- **Memory Mapping Allows Borrowing of System Memory Before Prototype Memory Is Built**
- **ZAP Package Provides Interactive, Symbolic Debugging With Disassembly**

OVERVIEW

The ZDS-1/40 Development System provides total development support for Z80 and Z80A CPU-based system designs. This support begins with a complete Z80-based microcomputer system that includes 64K bytes of RAM, dual single-sided, single density floppy disk drives and system software to assist in every phase of software development.

Included with the powerful microcomputer is an in-circuit emulation subsystem which connects to the user's prototype to monitor the execution of the software, control the behavior of the microprocessor in the prototype, and minimize the problems encountered in integrating software with hardware. Interactive debug software—the ZAP package, provided with the emulation system—allows debugging of the prototype, full disassembly of memory data and trace information, the use of symbolic references, and the capability of placing all debug commands on disk for execution.

Z8® Emulator Z-SCAN 8

Features

- Z-SCAN 8 provides full capacity, real-time emulation for the 2K and 4K Z8 Microcomputers.
- Designed to facilitate software/hardware debugging, Z-SCAN 8 uses standard RS-232 links and is compatible with many standard CRTs and software hosts. This includes Zilog's ZEUS and MCZ systems and others with user-supplied load/save routines and cross-software support.
- Debugging is fast and convenient. Two screens display the status of the Z-SCAN 8 monitor and Z8 target resources. Target memory can be displayed and modified in a scrollable window.
- Z-SCAN 8 is interactive and easy to learn. Commands are selected from menus; command arguments are self-prompting.
- Z-SCAN 8 fulfills the user's essential real-time debugging needs with its real-time trace, two complex breakpoints, single step, and four blocks of mappable memory.

The Z-SCAN 8 Emulator is a combination of hardware and sophisticated software that allows the efficient, interactive emulation of the Z8 Microcomputers. By the simple exchange of target devices, the Z8601 (2K) and Z8611 (4K) MCUs can be emulated in a realistic mode that allows the user inspection and control over the environment being tested. Real-time trace, two breakpoints, single-step capability, and extensive mappable memory ensure the user a tool that accurately simulates the anticipated Z8 operating environment.

For Zilog Product Selector Guide, See Pages 1581-1582.
© IC MASTER 1983

Z8® Development Module

Zilog
an affiliate of
EXXON Corporation

- **Two Z8-02 Devices Offer Complete Configuration Choice for Any Application.**
- **2048 Bytes Static RAM for Convenient Execution and Debug of User Code.**
- **On-board 2716 Socket to Test User Code in EPROM Without Additional Hardware.**
- **As Many as 2048 Hardware Breakpoints on Address Compare Cover the Entire Internal ROM Space.**
- **Versatile Monitor Software for Debugging, Register and Memory Manipulation, and File Upload and Download.**
- **'Transparent' Operation Allows Software Development Without Disconnecting from CRT and Host. Industry-Standard Interface Compatible with Most CRT Terminals and Development Hosts.**
- **Wire-Wrap Area for Prototyping.**

OVERVIEW

The Z8 Development Module is a single-board microcomputer system specifically designed to assist in the development and evaluation of hardware and software designs based on the Z8 microcomputer. It allows system prototyping in hardware with the Z8-02 prototyping device, thereby developing code that will eventually be mask programmed into the Z8 on-chip ROM.

Z8® Software Development Package

- **Structured Assembly Language with High-Level Constructs.**
- **Relocatable and Absolute Object Code Format.**
- **Free Format Statements Allow Indentation and Spacing for Readability.**
- **External Symbol References.**
- **Global Symbol Definitions.**

OVERVIEW

The Z8 Software Development Package consists of five utility programs which aid and simplify software development for Z8-based systems. Z8 PLZ/ASM, part of Zilog's PLX family, brings all the advantages of modular programming to Z8 software development. The programming task can be broken into easily managed modules, giving more work assignment options to the engineering manager and a clear-cut structure to the individual programmer. The Z8 linker completes the task by combining the modules and resolving any external references.

© IC MASTER 1983

For Zilog Product Selector Guide, See Pages 1581-1582.

High-Reliability Microcircuits

Zilog
an affiliate of
EXXON Corporation

Zilog offers high-reliability versions of the Z8, Z80, and Z8000 Families of logic circuits, processed in accordance with the requirements of MIL-STD-883 Level B (Test Methods and Procedures for Microelectronics). These three families of parts are currently being qualified for inclusion in the MIL-M-38510 Qualified Products List (QPL).

General Considerations. Zilog high-reliability microcircuits are designed to meet the full military temperature range (−55°C to +125°C) and are packaged in hermetic dual-in-line packages. These packages can reliably withstand the thermal shock requirements of MIL-STD-883, Method 1011, Condition C (−65°C to +150°C). For industrial users, Zilog also offers an extended operating temperature range of −40°C to +85°C. All of Zilog's high-reliability microcircuits receive 5005 processing in accordance with the requirements of MIL-STD-883 Level B or C (as specified).

Zilog's high-reliability microcircuits are processed and assembled in accordance with the Zilog Product Assurance Program Plan, which conforms to the requirements of Appendix A of MIL-M-38510.

Zilog's Z-REL program is dedicated to the production of high-reliability components that fulfill the requirements of the Joint Army-Navy (JAN) certification program.

Along with production of state-of-the-art microprocessors, microcomputers, and peripheral components, Zilog has an on-going program to have each part JAN qualified at the earliest possible date after introduction of the commercial devices.

The Defense Electronic Supply Center (DESC) has certified Zilog as a manufacturer of JAN components. The design, manufacturing, and processing methods, screening, and exhaustive testing techniques at Zilog comply with the very stringent reliability objectives of the JAN program.

Zilog's component production tests are run on the logic test systems, with full hardware and software capabilities for accurate functional, ac and dc parametric testing. These test systems reduce the required test time, lowering the overall production costs and increasing throughput, while providing the versatility to test all LSI and VLSI components.

Once qualified, the product configuration cannot be changed unless the cognizant government agencies permit exception. Lot-oriented quality conformance inspections and periodic tests, both die- and package-oriented, are performed to maintain the product qualification.

Maintaining Reliability Levels. The high standard of reliability needed for MOS components manufactured by Zilog is assured in both the design and manufacture of each product. Zilog maintains an overall line tolerance percent defective (LTPD) of 5, or acceptance quality level (AQL) of 0.25, over the full temperature range. To ensure this continued high level of reliability, a system of quality asessment with appropriate feedback to design and process engineering on a real-time basis has been developed. The implementation of this system is an integral part of the manufacturing process.

For Zilog Product Selector Guide, See Pages 1581-1582.
© IC MASTER 1983

Authorized IC Master International Distributors

ARGENTINA, COLOMBIA, ECUADOR, VENEZUELA, MEXICO, PERU
Intectra
2629 Terminal Blvd.
Mt. View, CA 94043
Tel. (415) 967-8818

AUSTRALIA
A J Distributors Pty Ltd.
P.O. Box 71
Prospect, S. Australia 5082
Tel. 269-1244
Telex (790) 82635

AUSTRIA
LBG GmbH
Tichtelgasse 10/2/12
A-1120 Vienna, Austria
Tel. (0222) 83 41 01
Telex (847) 134106

BELGIUM
J. P. Le Maire
Rampe Gaulouise Ia
1020 Bruxelles, Belgium
Tel. 02 478 4847
Telex (846) 24610

BRAZIL
Filcres Importacao
Rua Auroraigs
CEP 01209
Caixa Postal 18767
Sao Paulo, Brazil
Tel. (011) 223 7388
Telex 113298

CYPRUS
MOR Electronics Ltd.
P.O. Box 4155
Ramat Gan 52141, Israel

DENMARK
Advanced Electronik
55, Mariendalsvej
DK2000, Copenhagen F, Denmark
Tel. 01 194433
Telex (855) 22431

ENGLAND
Paterson/Steadman & Partner
4 Gold Street
Saffron Walden, Essex CB10 IEP
England
Tel. 27067
Telex 81653

J. B. Tratsart Ltd.
Dogmersfield Nr. Baskingstoke
Hampshire RG27 8SU, England
Tel. 02514 3334
Telex (851) 8814136

FRANCE
Conseilet Promotion
1 Rue Damiens
92100 Boulogne, France
Tel. 621-30-77
Telex 250030F

OFFILIB
48 Rue Gay-Lussac
75240 Paris, Cedex 05, France
Tel. 329-2132
Telex: None

HOLLAND
Manudax-Nederland B. V.
54732G Heeswijk (N.B.)
Meerstraat 7, Holland PB25
Tel. 04139 2901
Telex (844) 50175

HONG KONG
Conmos Products, Ltd.
Haynein Bldg., 11th Floor
1 Tai Yip Street
Keun Tong, Kowloon
Tel. 3-684572
Telex 85448

INDIA, MALAYSIA, SINGAPORE, THAILAND
Radio & Craft Publications
4794/23 Bharat Ram Road
Daryanganj, New Delhi 2, India
Tel. 277147
Telex: None

ISRAEL
STG International Ltd.
10 Huberman Street
P.O. Box 1276
61012 Tel-Aviv, Israel
Tel. 248231
Telex 342229

ITALY
Gruppo Editoriale Jackson
Technoclub
Direzione Redacione e
Amministrazione
Via Rosellini 12
20124 Milano, Italy
Tel. 688-0951

JAPAN
Asahi Glass Company, Ltd.
Electronic Components Group
1-2 Marunouchi 2-chome
Chiyoda-ku, Tokyo 100, Japan
Tel. (03) 218-5813
Telex TK4616

JAPAN (Continued)
Overseas Data Service Co., Ltd.
Shugetsu Building, No. 12-7
Kita-Aoyama 3-chome
Minato-ku, Tokyo 107, Japan
Tel. (03) 400-7090
Telex (781) J26487

Tokyo International
Communications, Inc.
Miyajima Blvd.
28 Yoyogi 1-chome, Shibuya-ku
Tokyo 151, Japan
Tel. 379-2561
Telex: 33106

NORWAY, FINLAND, SWEDEN
Ingenioerforlaget A/S
Kronprinsens Gate 17
Boxs 2476 Solli
Oslo 2, Norway
Tel. (02) 11-51-70
Telex 72400Y

SOUTH AFRICA
Suntronika PTY Ltd.
P.O. Box 46268 Orange Grove
Johannesburg 2119, South Africa
Tel. 725-1210

SPAIN
Sagitron
Castello 25, 2, °
Madrid 1, Spain
Tel. 402 6085
Telex (831) 43819

SWITZERLAND
W. Stolz AG
Taefernstrasse 15
CH-5404 Baden-Daettwil
Switzerland
Tel. 056 840151
Telex (845) 54070Z

TAIWAN
Alfred M. L. Pien
IBS Publications Ltd.
P.O. Box 55-879
Taipei, Taiwan

TURKEY
EEMPA Elektronik
Tersane Cad. Kuthan 38/408
TR/Kara Koy, Istanbul
Turkey
Tel. (11) 49-6249
Telex 24429

WEST GERMANY
Astronic GmbH
Winzererstrasse 47d
8000 Munich 40
West Germany
Tel. (089) 309031
Telex (841) 5216187

INTRODUCTION TO MICROPROCESSOR DEVELOPMENT SYSTEMS

This section describes the tools used in developing software programs for microprocessors. Microprocessors supported range from 2-bit slice families and 4-bit processors to 32-bit machines. Development systems described in the Master Selection Guide range from simple, single-user text-editing stations to multiuser computers dedicated to software development. Manufacturers are sequenced alphabetically, and each system is described by a listing of performance parameters. These parameters include supported microprocessors, maximum user RAM, mass-memory size and type, number of user stations, and available peripheral equipment. Software tools listed range from standard executive programs to high-level language compilers and interpreters.

Detailed Product Information provided by:

Advanced Micro Devices	1701
American Automation	1706
Emulogic	1708
Fairchild	1711
Hilevel Technology	1719
Intel	1721
Motorola Semiconductor	1729
Signetics	1739
Synertek	1747
Texas Instruments	1748

The manufacturers listed above have provided detailed information on their latest and most significant products.

© IC MASTER 1983

EINFÜHRUNG MIKROPROZESSOR— ENTWICKLUNGS-SYSTEME

Deiser neue Abschnitt beschreibt alle verwendeten Hilfsmittel zur Entwicklung von Software für Mikroprozessoren. Die unterstützten Mikroprozessoren reichen von 2-Bit-Slice und 4-Bit Prozessoren bis zu 32-Bit Maschinen. Die im Master Selection Guide beschriebenen Entwicklungssysteme reichen von einfachen, Single-user Textedition-Stationen bis zu Multiuser-Computern für die Software-Entwicklung. Die Hersteller sind in alphabetischer Reihenfolge aufgeführt, und jedes System wird durch eine Auflistung de Funktionsparameter beschreiben. Diese Parameter umfassen die unterstützten Mikroprozessoren, die Größe von verwendbarem RAM, die Massenspeicher-Größe und Art, die Anzahl der anschließbaren Stationen und verfügbare Peripheriegeräte. Die Software-Hilfsmittel reichen von Standard Executive Programmen bis zu Compilern und Interpretern für höhere Programmiersprachen.

© IC MASTER 1983

INTRODUCTION AUX SYSTEMES DE DEVELOPPEMENT DES MICRO-ORDINATEURS

Cette Section est nouvelle cette année. Elle décrit les outils utilises dans le developpement des programmes software pour micro-ordinateurs. Les micro-ordinateurs considérés a'echelonnent des familles à 2 bits aux ordinateurs de 4 bits, et aux appareils de 32 bits. Les systèmes de développement décrits dans le Guide Général de Sélection vont de la simple station d'édition de texte pour un utilisateur, aux ordinateurs à utilisateurs multiples et dedies au developpement du software. Les fabricants sont énumérés par ordre alphabétique, et chaque système est décrit au travers d'une liste de paramètres de performance. Ces paramètres comprennent les micro-ordinateurs supportés, la RAM avec maximum d'utilisateurs, la taille et le type de mémoire de masse, le nombre de stations utilisatrices, et l'équipement périphérique disponible. Les outils software considérés s'etendent des programmes standards d'exécution aux programmes plus puissants de traduction de language et de compilation.

© IC MASTER 1983

INTRODUCCIÓN A LOS SISTEMAS DE DESARROLLO DEL MICROPROCESOR

Esta sección, nueva para este año, describe las herramientas usadas en el desarrollo de programas para microprocesores.

Microprocesores con radio de acción de familias de 2-bit y 4-bit a equipo de 32-bit. Sistemas de desarrollo descritas en la Guía Maestra de Selección abarca de una simple estación editora, a computadoras de uso múltiple dedicadas al desarrollo de programas. Los fabricantes aparecen en sequencia alfabética, y cada sistema es descrito con una lista de parámetros de rendimiento. Estos parámetros incluyen apoyo a microprocesores, uso máximo de RAM, tamaño y tipo de memorias, número de estaciones de operadores, y equipo periferal disponsible. Programas mencionados abarcan de programas ejecutivos standard a lenguaje de alto nivel para compiladores e intérpretes.

© IC MASTER 1983

マイクロプロセサー開発システムへの案内

本年から新たに加わったこのセクションにはマイクロプロセサーのソフトウエアプログラムを開発する為の情報が記載されています。カバーされているマイクロプロセサーは２ビットスライスファミリー，４ビットプロセサーから３２ビットマシーン迄あります。マスターセレクションガイド中の開発システムは簡単な個人が使用するテキスト編集ステーションからソフトウエア開発用多人数使用のコンピュータ迄と広くカバーされています。メーカーはＡＢＣ順に，各システムはその性能パラメーターの記載毎に説明しています。このパラメーターは必要なマイクロプロセサー，マキシマムユーザーＲＡＭ，マスメモリーサイズ，形名，ユーザーステーションの数，週辺機器等を網羅しています。

記載されているソフトウエア情報は標準エクザクティブプログラムから高級なランゲージコンパイラー，インタープリターに及んでいます。

© IC MASTER 1983

MDS: Dedicated or Universal?

Microprocessor development systems (MDSs) have evolved from simple design aids to dedicated computer systems. The variety of MDS hardware now available ranges from simple PROM programmers for entering hand-assembled code to sophisticated multiuser systems representing a sizeable capital investment.

High-end software tools generally are of no concern to designers who use microprocessors primarily for logic replacement. Many programs for these applications can be hand-written in machine code or in very simple assembly language, hand-assembled and edited manually with scissors and paste. But choosing a more sophisticated system requires understanding the relationships between the MDS, the processor it supports and the software tools available for assisting in program development.

Until recently, the choice was limited between a dedicated system supporting a single processor or a family of processors, and a universal system supporting several different processor families. Dedicated-system supporters argue that most of the 50 or more existing microprocessor companies can introduce at least one new processor each year, with each new processor often program-compatible with its predecessor. And it is more desirable to upgrade existing software for these new devices than to start a massive software redesign project.

Moreover, the argument continues, dedicated system suppliers (who also supply the microprocessors supported) can provide software development tools for new processors at least a year before they are available in universal systems. Finally, it is generally acknowledged that universality in an MDS often requires some sacrifice in depth of coverage. Implicit in these arguments, of course, is user commitment to a specific processor or vendor.

On the other hand, universal systems offer a repertoire of multivendor chip support, generally centered about 8-bit processors. The strongest argument for using these systems appears to be the freedom to evaluate the parade of new processor chips emerging from various semiconductor houses. For example, in addition to facilitating hardware/software integration of prototype design, available universal systems can compare the performance of an 8085 (Intel Corp.) against the Z80 (Zilog Inc.), 6800 or 6802 (Motorola Semiconductor Products Inc.), 3872 (Fairchild Camera and Instrument Corp.), the TMS9900 (Texas Instruments Inc.), and the 3870 and 3872 (Mostek Corp.).

To counter the threat posed by universal systems, some vendors are offering systems described as vertical rather than universal (horizontal) or dedicated. These systems support only one vendor's processors, but the devices supported represent a wide performance range. To illustrate, one MDS vendor's system supports 12 of the company's processors, which range from a 2-bit slice up through a 16-bit processor. A user can upgrade a basic system by adding an assembler, high-level language, and an in-circuit emulator module for any of the 12 processors.

Sometimes universality can be acquired with an existing dedicated MDS by upgrading the system with emulators and other development tools. Typically, the instrument connects between the host computer (or dedicated development system), using a different personality pod to provide real-time emulation for a variety of MPUs.

Multistation development systems become another option as program sizes grow. One programmer typically can generate 10 debugged and documented lines of code per day, each line representing from 2 to 10 bytes of machine code. If a time-critical project requires a 100-kbyte application program to be completed within 3 months, then at least 8 programmers are required, each generating 100 bytes of machine code per day. Such requirements need systems resembling a full-fledged computer. with price tags upwards of $100,000 and with as many as 8 programming stations.

Alternatively, several simple development systems can be linked to a mainframe to perform dedicated development functions such as compiling and debugging. The mainframe performs project management functions such as file-sharing and maintenance. If a universal system is needed, cross-software is available from both software houses and MDS vendors. Cross-software allows a program for one processor to be written on a machine containing a different processor. For example, a cross-assembler for the 6800 produces 6800 code, but it executes on a PDP-11 computer.

MDS Hardware

A typical MDS consists of a central processor, mass memory, control console, and software development tools — such as editors, assemblers, compilers and linkers — for translating the programming (source) language and revising the source text. Most systems also provide a printer for generating hard copy.

The CPU executes the control functions necessary for software development and can execute the editor, assembler or program under development.

Mass memory, also called the "file," stores operating programs, developed programs and data. Main system memory

© IC MASTER 1983

MDS: Dedicated or Universal

stores data and host programs (editor, compiler, etc.) or developed programs. Stored data include editor workspace, symbol tables, input/output (I/O) buffers, and data generated during program development. Main memory can be extended by mass memory.

The lowest level of mass-memory media is punched paper tape in which data are entered by teletypewriter. Because of its low speed, this type of storage is recommended for developing programs having less than 100 lines of code.

Next is magnetic tape cassette with read/write speeds ranging up to 400 characters per second. Tape-cassette systems are economical for programs between 100 and 1000 lines of code.

Long programs require the speed of flexible-disc storage with data-transfer rates exceeding 1000 characters per second. Flexible-disc storage is recommended for programs with between 1000 and 10,000 lines of code. Longer programs require the megabit-per-second transfer rates of hard-disc systems which can store up to tens of megabytes of data. These systems are, of course, the most expensive.

Control consoles provide the means to input source programs, debugging commands, operating system commands and data, and they provide operator feedback such as assembly listings and register displays. Controlled by interactive software, these terminals provide continually updated CRT displays of register content and entire segments of the program under development.

CRT terminals are classified as either dumb, smart or intelligent. Dumb terminals are nonprogrammable and have a limited number of functions. Smart terminals contain an MPU, memory, or both, and they have text-editing capability. Intelligent terminals contain one or more MPUs that can be user-programmed.

To facilitate text editing, CRT displays generally provide information highlighting on the screen, blinking displays, insert/delete capability and smooth scrolling. Console keyboards provide 128 ASCII character code, and keyboard life typically is about 300-million operations. Intelligent keyboards usually have self-diagnostics displayed on the CRT.

As more logic signals formerly accessible for test procedures become buried within the microprocessor chip, the various debugging tools become also increasingly important elements of an MDS.

An in-circuit emulator is a logic card or module cable-connected to the microprocessor socket of the prototype system. The emulator duplicates the processor function and relays indications of system operation to the MDS console or terminal. Usually the MDS RAM simulates ROM or PROM in the system under test. After RAM content is debugged, it is transferred to the prototype's memory.

Single-step facility is a hardware debugging aid that allows the MDS operator to step through the program one instruction at a time while concurrently monitoring system operation.

A logic analyzer can set up breakpoints in the program (such as an address) that stop program execution when encountered. The analyzer stores a block of bus transactions in a limited amount of memory that is refreshed each cycle. When a breakpoint stops program execution, the analyzer displays a number of logical events occurring prior to the breakpoint. Thus the operator can determine if events leading to the breakpoints are correct and modify the program as required, or continue execution.

Printers provide hard-copy records of the developed program. Mechanical types are relatively slow, generating from 150 to 1800 lines per minute, and providing multiple copies of the printout. Higher speeds are provided by thermal, optical, chemical or electrical printers with speeds ranging up to about 21,000 lines per minute. Serial printers produce one character at a time, and line printers generate one line at a time in parallel-character format.

Many systems provide options for linking the MDS with other systems for data exchange. These include paper tape punch and reader, and a modem (modulator-demodulator) that connects an MDS to a large computer via telephone lines. Finally, most systems have either a standard or optional PROM programmer for entering developed programs into prototype memory.

Software Tools

MDS software-tool sophistication has become similar to that of minicomputer software. Many software tools are common to any MDS.

Executive programs (also called operating systems) control the interaction between the MDS peripherals and other software tools by keeping track of time, enforcing correct event sequencing, and controlling I/O functions. An operating system also provides user commands for editing, assembling, compiling, relocating, executing, and debugging the user-developed program from the control console. Some operating systems can perform file-management tasks on floppy or hard-disc memory. Other systems provide this capability in a separate software package called a "file-management system," or include it in the text editor.

Text editors, or simply editors, are programs that allow an

© IC MASTER 1983

operator to enter a source code (assembly or higher-level language) into the MDS memory through an interactive terminal with a keyboard. Through the editor the operator can add, delete, move, change, and display or list selected portions of the source program.

Assemblers are programs that convert source code generated with an editor to machine language (object or binary code). The source code is the assembly language (alphabetic symbols called mnemonics) of the processor for which the program is being written. Assemblers vary in their ability to handle macros (blocks of often-used instruction sequences activated by a single instruction), to generate relocatable code, and to allow certain pseudo-operations. The latter is an instruction that gives information to the assembler instead of causing machine code to be generated.

Compiler and interpreter programs translate high-level programming languages into machine language. Each approach has advantages and drawbacks. Both tools translate each high-level statement into a series of binary instructions. However, a compiler translates the entire program before execution can take place. On the other hand, an interpreter translates and immediately executes each high-level statement before proceeding to the next translation.

Interpreters are more efficient for making program changes since each instruction is executed as it is typed. Therefore, an instruction can be entered, executed, changed, and executed again without the need to exercise the rest of the program. With a compiler, each change requires a retranslation of the entire program.

Although interpreters require more memory than compilers and take more time to execute the final code, they usually provide better real-time error diagnostics. However, microprocessor applications seldom require extensive programmer interaction or program debugging. As a result, a compiler generally is preferred over interpreters for time-critical microprocessor programming applications, and an interpreter is recommended for intensive interfacing or debugging requirements. Many microprocessor development systems provide both tools for overall programming flexibility.

Linkers tie together program segments and subroutines of machine code to form the finished program. Linkers calculate all module address locations so they will interface properly with one another and fit into memory.

Debuggers interactively execute and debug the object program by allowing the programmer to set breakpoints in the routine, control program execution, and examine processor register and memory content. Combined with in-circuit emulators, debuggers also allow control-line and memory-content transfer between host and prototype systems, thereby controlling the degree of emulation. Most debuggers include single-stepping and program-trace capability.

High-Level Languages

Using high-level languages (HLLs) simplifies program coding and debugging since a single statement can be translated by an interpreter or compiler into its equivalent of 20 or more assembly-language statements. Moreover, HLL statements resemble natural English and thus are easily read, documented and understood. The result is high overall programming efficiency.

Although highly convenient for a programmer, using an HLL imposes a penalty. All of the object code statements that the compiler generates for each HIL statement may not be required for every application. Consequently, high-level programs are typically 15 to 20% longer than efficient assembly-language programs. The result is wasted memory space and computer time.

However, the trends toward higher microprocessor speeds and lower memory cost tend to minimize these disadvantages, which are further offset by high programming efficiencies. Moreover, compilers based on so-called implementation languages have assembler-like characteristics, allowing programming in both high-level and assembly languages. Thus a programmer can use an HLL to design the overall program, resorting to assembly language for coding time or space-critical functions, or for coding functions that the HLL is not designed to execute.

High-level language is an increasingly fundamental consideration for selecting an MDS, the more sophisticated of which support several HLLs. In general, an HLL for microprocessor applications should have several characteristics. Foremost of these is block structuring which allows several design teams to work independently on program modules of a large project.

The language should also allow assembly-coded modules to be integrated into the basic program; provide data and register-bit handling capability such as shift and rotate; provide logical operations such as AND, OR, NAND and NOR; provide access to I/O ports and handle interrupts in real time. Also, since microprocessors are not well-suited for computation, they usually require languages that use integer arithmetic instead of floating point or decimal. Available HLLs provide these characteristics in various combinations and degrees of effectiveness.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS

Manufacturer Model FOR DETAILED DATA SEE:	Adaptive Science Corporation 802	Adaptive Science Corporation 809	AMD AMSYS29	AMD AMSYS29/10 (Page 1701)
Supported CPUs	6802	6809	Bipolar Bit-Slice	AM2900 family
Hardware User Stations	One	One	One	One
Communication Ports	2/RS232C 1/Parallel	2/RS232C 1/Parallel	3 serial/1 parallel; RS232	4 Serial, 1 Parallel
User RAM	61.5K bytes	61.5K bytes	32K bytes expandable to 64K bytes	64K bytes
Mass Storage	8-in floppy disk (2)	8-inch floppy disk (2)	Dual floppies; 512K bytes expandable to 1M bytes	1M byte floppy disk
Logic Analyzer	No	No	Optional	Optional
PROM Programmer	Optional	Optional	Software support only	Support for Pro-Log and Data I/O
Printer	Customer purchase	Customer purchase	Optional, Centronix 702 or Teletype 40	Yes
Software Support Standard	Flex disk operating system. Editor and assembler. Programming is done in assembly language.	Flex disk operating system. Editor and assembler. Programming is done in assembly language.	CP/M-compatible disc operating system; Meta assembler; line-oriented editor, debuggers; self-test on power-up.	AMDOS operating system compatible with CP/M 2.2; AMDASM META assembler; DDT29 debugger.
Optional	Basic, Pascal, Forth.	Basic, Pascal, Forth.	Real-time trace.	29/6310 high-speed trace, 1K x 64 writeable control stores.
Comments	Provides 7 additional slots for expansion with Modulas One modules. Select from 25 modules.	Provides 7 additional slots for expansion with Modulas One modules. Select from 25 modules.	Writable control store for microcoded emulation.	29/6310 provides 10 MHz real-time trace buffer of 256 x 48-bit; eight trigger registers for complex triggering.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	AMD AMSYS8/8	AMD AMSYS8/8000 Series	AMD AMSYS8/8112 (Page 1702)	AMD AMSYS8/8116 (Page 1702)
Supported CPUs	Std: 8080, 8085, Z80 Opt: 8048, Z8000	Std: Z8000 Opt: Z8001, Z8002	Z8001, Z8002	Z8001, Z8002
Hardware User Stations	One	One	One	One
Communication Ports	3 serial/1 parallel; RS232	2 serial/1 parallel; RS232	2 Serial, 1 Parallel	2 Serial, 1 Parallel
User RAM	32K bytes expandable to 64K bytes	64K bytes	128K bytes	128K bytes
Mass Storage	Dual floppies; 512K bytes expandable to 1M bytes	Dual floppies; 1M bytes expandable to 2M bytes	1M byte floppy disk, expandable to 11M bytes	10.5M byte of disk storage on 8-inch Winchester and double-density floppy drive
Logic Analyzer	Optional	No	No	No
PROM Programmer	Software support only	No	No	No
Printer	Optional, Centronix 702 or Teletype 40	No	No	No
Software Support Standard	CP/M-compatible disc operating system, macroassemblers, translators, linking loaders, editors, debuggers; self-test on power-up.	CP/M-compatible disc operating system, macroassemblers, translators, linking loaders, editors, debuggers; self-test on power-up.	AMDOS operating system compatible with CP/M 2.2; Macro ASM and Linkers for 8080, 8085, Z80, Z8001/2; editor, debugger.	CP/M compatible AMDOS8 operating system, relocatable macroassemblers for 8080A, 8085A and Z80A. Z8000 software support, including a relocatable macroassembler, linker, and 8-bit to 16 bit source code translator.
Optional	Fortran, extended Basic, Pascal, Cobol; 8085, Z80 macroassemblers.	Pascal, C, Fortran and Basic; 8048 assembler.	RTE/8050 Real-time emulator for AMZ8001 or AMZ8002, C compiler for AMZ8002, Pascal to C translator.	RTE16/8050A,real-time emulator support package for Z8000.
Comments	Optional paper-tape reader/punch and Z8000 in-circuit emulator.	Optional in-circuit emulation for 8080, Z80, 8085, 8048 family and 8014; four serial I/O lines optional; 10M byte cartridge disc optional.	RTE16/8050 real-time emulator provides no-wait state emulation for AMZ8001 and AMZ8002. Emulation memory expandable to 264K bytes. Real-time trace holds 25646- to 96-bit events.	Self-test diagnostics. Uses 4-MHz 8085A-2 CPU.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	American Automation EZ-PRO (Page 1706)	American Automation EZ-PRO (Page 1706)	American Automation EZ-PRO (Page 1706)	Applied Microsystems EM-Series
Supported CPUs	All bit slice devices, both TTL and ECL	Over 30 different types, both 8 and 16 bit,v including: 6502, Z8001/2, 8048, 68000, 146805E2, 6809, 6809E, 8051, NSC800, 8085, 8086	8X300 and 8X305	Z80, Z80B, 8080, 8085, 6800, 6802, 6808, 6809, 6809E, 8035, 8039, 8040, 8048, 8049, 8050, 8748, 8749
Hardware				
User Stations	Up to 8	Up to 8	Up to 8	One
Communication Ports	Two serial; RS232	Two serial; RS232	Two serial; RS232	1-RS232C
User RAM	Modular to 128 x 2K bits	64K bytes	8K x 16; expandable to 8K x 48 bits	8K, 16K or 64K
Mass Storage	Dual floppies (5″ and 8″) and Winchester	Dual floppies (5″ and 8″) and Winchester	Dual floppies (5″ and 8″) and Winchester	None
Logic Analyzer	No	Optional	Yes	No
PROM Programmer	Optional, both ECL and TTL	Optional, 2716 and 2732	Optional	No
Printer	Optional	Option	Yes	No
Software Support				
Standard	Resident monitor, Disk operating system, Editor, Disk formatter, Meta assembler, Debugger.	Resident monitor, Disk operating system, Editor, Disk formatter. With each in-circuit Emulator: Relolcating macroassembler, linking editor, and debugger.	Relocating macroassembler, linking editor — debugger.	
Optional	PROM programmers, bipolar.	EPROM programmers; Pascal compiler and assembler to generate P code and P code disassembler; Pascal P code interpreters and debuggers.	Pascal	Remote control and symbolic debug package for ISIS and CP/M operating systems.
Comments	Provides writable control store for microcoded emulation. Minimum clock cycle time is 60 ns. 256 word trace capability is standard in all systems.	Total memory capacity is 80Kb; 16Kb is reserved for master processor.		Stand-alone in-circuit emulator. Real time trace: 32 bits wide, 256 traces deep with disassembly. Diagnostic functions: standard and user-defined for debugging hardware in design, test and service.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	Applied Microsystems ES-Series	Burr-Brown CS450	Burr-Brown CS460	CGRS Microtech 6502PDS-Mini
Supported CPUs	Z8001, Z8002, Z8003, 68000	8080	8080	6502
Hardware User Stations	One	One	One	One
Communication Ports	2-RS232C	Up to 8 optional	Up to 8 optional	Two
User RAM	32K or 64K	64K bytes	64K bytes	48K
Mass Storage	None	Dual minicassettes approx. 45K bytes each Dual single-sided single density disks 67.K bytes each	Dual double-sided double-density disks 275K bytes each	5-inch disk, dual
Logic Analyzer	Optional	No	No	No
PROM Programmer	No	No	No	Yes
Printer	No	Optional internal electrostatic or external Centronics	Optional internal electrostatic or external Centronics	Yes
Software Support Standard		Enhanced Micro-soft Basic	UCSD "p" system including Pascal and assembler	Editor, assembler.
Optional		Analog and digital I/O boards.	Analog and digital I/O boards.	Basic, Forth.
Comments	Stand-alone in-circuit emulator. Real time trace: 72 bits wide by 2048 deep.	Laboratory development system for process control and data acquisition.	Laboratory development system for process control and data acquisition.	S100 mainframe readily convertible to Z80, 6802, 6809.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	CGRS Microtech 6502PDS-8"	Cromenco System One	Cromemco System Two	Cromemco System Three
Supported CPUs	6502	Z80	Z80	Z80
Hardware				
User Stations	One	To 3	To 6	To 6
Communication Ports	Two	Optional	Optional	Optional
User RAM	48K	Up to 512K	Up to 512K	Up to 512K
Mass Storage	8-inch disk, dual	2-floppy disks 390K bytes each, optional 5 megabyte	2-5¼" floppy disks 390K bytes each	2-8" floppy disks 1-2 megabytes each
Logic Analyzer	No			
PROM Programmer	Yes	Optional 2708 or 2716 PROM prog.	Optional 2708 or 2716 PROM prog.	Optional 2708 or 2716 PROM prog.
Printer	Yes	Optional Dot Matrix or Full Letter	Optional Dot Matrix or Full Letter	Optional Dot Matrix or Full Letter
Software Support				
Standard	Editor, assembler.			
Optional	Basic, Forth.	CDOS or CROMIX operating system, macro assembler, Cobol, Fortran, Lisp, Structured Basic, Ratfor, Data Base Management, Writemaster, Spellmaster, Planmaster, "C" Compiler.	CDOS or CROMIX operating system, macro assembler, Cobol, Fortran, Lisp, Structured Basic, Ratfor, Data Base Management, Writemaster, Spellmaster, Planmaster, "C" Compiler.	CDOS or CROMIX operating system, macro assembler, Cobol, Fortran, Lisp, Structured Basic, Ratfor, Data Base Management, Writemaster, Spellmaster, Planmaster, "C" Compiler.
Comments	S100 mainframe readily convertible to Z80, 6802, 6809.	Capable of high-resolution graphics using SDI graphics interface and RGB monitor.	Capable of high-resolution graphics using SDI graphics interface and RGB monitor.	Capable of high-resolution graphics using SDI graphics interface and RGB monitor.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	Cromemco Z-2H	Cromemco CS-1D5E	Cromemco CS-3D5E	Computer Automation 4/10, 4/30, 4/90, 4/95
Supported CPUs	Z80	Z80/68000	Z80/68000	4/40, 4/10, 4/30, 4/90, 4/95
Hardware User Stations	To 6	To 6	To 6	To 8
Communication Ports	Optional	Optional	Optional	To 16
User RAM	Up to 512K	Comes with 512K. Up to 2 megabytes optional	Comes with 512K.Up to 4 megabytes optional	64K to 2M bytes
Mass Storage	2-5¼" floppy disks 390K bytes each and 11-megabyte hard disk	2-5¼" floppy disks 390K bytes each 5-megabyte hard disk optional	2-8" floppy disks 1.2M bytes each	To 300M bytes
Logic Analyzer				Bus Monitor
PROM Programmer	Optional 2708 or 2716 PROM prog.	Optional 2708 or 2716 PROM prog.	Optional 2708 or 2716 PROM prog.	Yes
Printer	Optional Dot Matrix or Full Letter	Optional Dot Matrix or Full Letter	Optional Dot Matrix or Full Letter	Yes
Software Support Standard				RTX, OS4 operating system, Fortran, Cobol, Pascal, BCPL, Coral 66.
Optional	CDOS or CROMIX operating system, macro assembler, Cobol, Fortran, Lisp, Structured Basic, Ratfor, Data Base Management, Writemaster, Spellmaster, Planmaster, "C" Compiler.	CDOS or CROMIX operating system, macro assembler, "C" Compiler, Cobol, Fortran 77, Pascal, Structured Basic.	CDOS or CROMIX operating system, macro assembler, "C" Compiler, Cobol, Fortran 77, Pascal, Structured Basic.	
Comments	Capable of high-resolution graphics using SDI graphics interface and RGB monitor.			

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	DEC MDE	Distributed Computer Systems DCS/80	Distributed Computer Systems DCS/86	Diversified Technology EiComp μMOS
Supported CPUs	MICRO/T-11 Upgradeable to MICRO/J-11	8080	8086	1802
Hardware User Stations	One	Single/Multiple	Single/Multiple	Expandable
Communication Ports	Two-RS232	Two	Three	Dual RS232, expandable to 4
User RAM	32K bytes, expandable to 64K bytes (limited by host)	To 256K bytes	Up to 1M byte	16K bytes
Mass Storage	None integral to MDE	Floppy disk, 2M bytes	Floppy disk, 2M bytes	Dual floppies
Logic Analyzer	Real time state analyzer (trace, stop, flag)	No	No	No
PROM Programmer	No	Yes	Yes	Optional for EPROMs
Printer	Optional (terminal stand video)	Yes	Yes	Optional
Software Support Standard	MDE software is supported on VAX/VMS RSZ-11M+, and RT-11 operating systems. MACRO/11 Symbolic Debugger. Support DEC command language standard. User-defined symbols.	CPM/80, complete disk operating system with editor, assembler, debugger and utilities.	Complete disk operating system with editor, assembler, debugger and utilities.	MicroForth compiler, disk operating system, macro-assembler, interactive debug, emulation string and line editor.
Optional	Up to 2 memory simulators (1 standard). Up to 3 logic analyzer boards (1 standard).	Fortran, Pascal, Basic, PL/I, "C," Cobol, PLMX; Cross-assemblers for all 8-bit microprocessors; multi-tasking operating system.	High-level language, Fortran, Cobol, Pascal, Basic, PL/I Cross-assemblers for all 8-bit microprocessors; multi-user, multi-tasking operating system.	
Comments	MDE provides comprehensive real-time emulation of Digital's MICRO/T-11 functions in a target system before an actual microprocessor is configured in hardware.	Hardware options include ½-inch magnetic tape, Winchester drive, in-circuit emulation, cassette tape, modem.	Hardware options include ½-inch magnetic tape, Winchester drive, in-circuit emulation, cassette tape, modem.	Self diagnostics, in-circuit emulator.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	E & L Instruments MMD-2	Emulogic, Inc. ECL-3211 (Page 1708)	Emulogic, Inc. ECL-3211 (Multi-user) (Page 1708)	Fairchild Formulator Mark III
Supported CPUs	8080	8048, Z80, 8085, NSC800, 8051, 6809, 8088, 8086/87, 68000, 9900, COPS400, 8080, 6802	8048, Z80, 8085, NSC800, 8051, 6809, 8088, 8086/87, 6800, 9900	F8, F3870 family
Hardware				
User Stations	One	One	To 6	One
Communication Ports	One RS232/20mA	Two standard, more optional	Two standard, more optional	Quad I/O
User RAM	4.25K bytes, expandable to 64K bytes	64K bytes (128K bytes optional)	Up to 256K bytes	16K bytes, expandable
Mass Storage	Cassette	1 dual floppy and/or up to four 10M byte cartridge disks.	Centralized virtual disk connected to each station via high speed multi-drop data link.	Dual floppies optional
Logic Analyzer	No	Yes	Yes	
PROM Programmer	Yes	Software support	Software support	Optional for EPROMs
Printer	No	Optional	Optional	Optional
Software Support				
Standard	Proprietary operating system.	Operating system, assembler, cross-assemblers, symbolic debugger, and KED screen-oriented keypad editor.	Operating system, assembler, cross-assemblers, symbolic debugger, and KED screen-oriented keypad editor.	Assembler, editor, debug package.
Optional	Expansion via any STD peripherals.	PASCAL and "C" cross-compilers for several chips — compile directly to target language. Non-emulation software: All standard DEC software options.	PASCAL and "C" cross-compilers for several chips — compile directly to target language. Non-emulation software: All standard DEC software options.	
Comments	Single-user bench-top development system; full monitor for debugging Machine language, Assembly language and Basic programs; memory mapping.	Full speed in-circuit emulation of all chips supported. Real-time trace captures all bus activity including instruction, data, DMA, and co-processor transactions. Trace disassembler accurately identifies each bus transaction, including instructions fetched but not executed. Eight 78-line prioritized hardware breakpoints with up to 20 simultaneous actions each. Two 31bit multi-source counters.	Single-user ECL-3211 systems can be integrated directly into the multi-user/multi-emulator systems as a simple upgrade.	Options: In-circuit emulator, PROM board, communications boards, floppy disc interface.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	Fairchild Microflame I	Fairchild FS-1 (Page 1711)	Fairchild PEP68 (Page 1718)	Hewlett-Packard HP64000
Supported CPUs	9440, 9445	F8, F3870, F6800, F9445 F16,000	6802, 6808 or 6809	8080, 8085, 6800, Z80
Hardware User Stations	One, expandable	Single/Multiple	One	To 6
Communication Ports	RS232	Two, expandable	2 RS-232, 1 parallel printer	—
User RAM	64K bytes	128K bytes, expandable to 4M bytes	8K bytes	—
Mass Storage	Dual floppies, 1.25M bytes	Dual floppies, 1M byte	Customer-supplied. Two high-speed audio cassette tape interfaces provided.	Optional
Logic Analyzer	No	No	No	Optional
PROM Programmer	Communication link to programmer only.	Optional	Programming socket for 2716 or 2732 EPROM	Optional
Printer	150 cps	Optional	No	Optional
Software Support Standard	Multitasking, time-share oriented disc operating system; macroassembler, text editor, utilities, debuggers; real-time executive.	IMDOS multi-user disk operating system and Basic language packages.	ROM-based debugging monitor with utility routines and friendly prompts.	Operating system, editor, assemblers, linkers, relocating macroassemblers.
Optional		Fortran, Pascal, Cross-assemblers, PEPLINK, loaders, debugger, and EMUTRAC control software for F8, F3870, F6800 and F16000 families.		Assembler for 8080, 8085, 6800, Z80.
Comments	Peripherals purchased from independent vendors.	Optional Real-Time Executive Operating System for multitasking in F9445-based systems. Optional video terminal, peripheral controller boards and I/O boards.	Six 8-bit parallel I/O ports with control signals. 50 thru 19.2K bps, independentally selectable, serial ports. 16 memory map configurations, switch selectable. Six sockets for ROM/PROM 2K, 4K or 8K types. Requires serial display terminal and 5V power. Asynchronous multibus compatible.	Processor emulation boards, emulation memory, disk units tape drives optional.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	Hilevel Technology DS270 Emulyzer (Page 1719)	HiLevel Technology DS570 Emulyzer (Page 1719)	Hilevel Technology DP9445 Emulyzer	Hilevel Technology DS1610 Emulyzer
Supported CPUs	All bit slices, 2901, 2903, 29203, 29501, 29116, 8X300, 8X305, 74S481, 3000, and Macrologic. Also ECL10800, 100220. 1 to 4 WCS arrays	All bit slices, 2901, 2903, 29203, 29501, 29116, 8X300, 8X305, 74S481, 3000, and Macrologic. Also ECL10800, 100220, 1 to 4 WCS arrays	F9445 to clock speed of 24 MHz, 40-pin or chip-carrier probe, for 9445 socket	CP1600/A, 1610, 60-pin probe for 1610 socket, runs full speed
Hardware				
User Stations	One, uses any ASCII CRT terminal. Loads from host CPU, tape, or keyboard	One to 4 WCS and TRACE plus 1 to 8 Assembly and UNIX services	One. Uses any ASCII CRT Terminal. Loads from host CPU, tape, or keyboard	One, uses any ASCII CRT terminal, load from host CPU, tape or keyboard
Communication Ports	4 serial RS232 and 1 IEEE-488 Parallel	IEEE-488 and 4 basic RS232 serial parts, expandable to 12	4 serial RS232 and 1 IEEE-parallel	4 serial RS232 and 1 IEEE-488 parallel
User RAM	WCS 16 to 128 by 1K to 64K, 20 ns and up	Same as WCS DS270. User RAM (60K to 440K)	WCS: 16 bits by 4K to 64K, 35ns	WCS: 16 bits by 4K to 64K, 120 ns
Mass Storage	Assemblies downloaded to DS270, from host. Optional micro-cassette mag tape	10 Megabyte hard disk with 8" DD archival floppy. Optional mag tape	Assemblies are downloaded. Optional micro-cassette mag tape	Assemblies are downloaded. Optional micro-cassette mag tape
Logic Analyzer	80 bits by 4K, 20MHz 2 levels of triggering	806 x 4K with 16,000 break points, arming	16 bits to 80, 4K deep, 8,000 breakpoints	16 bits to 80, 4K deep, selective snapshot
PROM Programmer	Dedicated port, dump or load	Dedicated port, dump or load	Dedicated port, dump or load	Dedicated port, dump or load
Printer	Dedicated port, many options	Dedicated port, many options	Dedicated port, many options	Dedicated port, many options
Software Support				
Standard	MENU Prompts: Editing, Target Control, Remote operation, Display formatter, Diagnostics, Download models, TRACE dump, Multiple arrays.	UNIX time-sharing op system, Pascal, Fortran, "C", Editor, Debugger, Word Processor, utilities. Built-in diagnostic tests, plus DS270 features.	Same as Model DS270. Breakpoints can be from data on the TRACE probes, or address.	Same as Model DS270. Model programs for host to download, run, get TRACE upload as feedback.
Optional	Universal meta-assembler for up to 128-bit words, full cross-references, MACRO's, Fortran IV compatible, or CP/M version.	Upgrade of DS270. Adds the ability to do fast assemblies on the built-in 68000 host.	Same as Model DS270. Downloads from Fairchild cross-assemblers.	Same as Model DS270. Downloads from General Instrument cross-assembler.
Comments	Menus and prompts, histogram or WCS address frequency. Compatible with any assembler, BSO, TMI, MICROTEC. Trace has nesting and data break, search and dump, 8192 breakpoints.	Performance analysis, measures target activity in 16 user categories. TRACE has 16-level trigger logic. Superset of DS270 in all ways. CRT menus have help feature.	Converts to full RS270 configuration by changing cables, adding any needed WCS memory. Basic DP9445 has all DS270 specs except WCS width.	Converts to full RS270 or DP9445 by changing cables, adding any needed WCS memory. Basic DP1610 has all DS270 specs except WCS width.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	Intel iMDX225 (Page 1724)	Intel iPDS (Page 1721)	Intel Intellec II Model 245	Intel Intellec Series III
Supported CPUs	MCS-86, MCS-85, MCS-80 and MCS-48 families	8080, 8085, 8088, 8048, 8051, all 8-bit Intel microprocessors or microcontrollers	8080A, 8085A, 8086 (iAPX86), 8088 (iAPX88), 8089, 8021, 8022, 8041A, 8741A, 8035, 8048, 8748, 8039, 8049, 8051	8080A, 8085A, 8086 (iAPX86), 8088 (iAPX88), 8089, 8021, 8022, 8041A, 8741A, 8035, 8048, 8748, 8039, 8049, 8051
Hardware				
User Stations	One	One	One	1
Communication Ports	—	Two RS232C Serial Ports	2 serial RS232/4 parallel I/O	2 serial RS232/4 parallel I/O
User RAM	64K bytes	64K bytes	64K bytes	
Mass Storage	250K byte floppy disk, expandable to over 2M bytes of floppy disc storage and 22M bytes of hard disk storage	640K byte integral floppy disk drive, expandable to 1.28M bytes	Floppy disk, 250K bytes Hard disk, 7.3M bytes	Floppy disk, 250 Kb, 2.5 Mb Hard disk, 7.3 Mb, 14.6 Mb
Logic Analyzer	No	No	No	No
PROM Programmer	Optional	Optional	Optional	Optional
Printer	Optional	No	No	Optional
Software Support				
Standard	ISIS-II disk operating system with relocating macro-assembler, linker, locater, and CRT-based CREDIT editor.	ISIS-PDS disk operating system with relocating macro-assembler, and CRT-based editor.	ISIS II disk operating system; ASM-80 macroassembler for 8080, 8085; credit editor; link and locate utilities.	ISIS operating system, credit full screen copier, macro-assembler for 8086/88 and 8080/85, linker and loader, debug-86 debugger.
Optional	iPDS-FTRANS option enables file transfer between iPDS and any Intellec Development System. PL/M, Fortran, Basic, Pascal and Cobol software packages available.	CP/M operating system on disc. Fortran/80, PL/M80, PL/M88/86 and Basic. Multiprocessor emulator functions.	PL/M-80, Fortran, Pascal, Basic, Cobol, Utilities FSP arithmetic package for 8080 and 8085; AMS-86 macroassembler, PL/M-86, link and locate utilities for 8086; assemblers for 8048 and 8089.	Pascal, Fortran, PL/M, Cobol, Basic, assemblers for 8089, 8048, 8051 families, utility packages for 8080/85/86/87/88/89 support mainframe link software.
Comments	Self-test diagnostic capability, built-in interfaces for high-speed paper tape reader/punch, printer and universal PROM programmer. iMDX557, iAPX resident processor card package is available to upgrade existing iMDX225 series II Development System to Series III. This package supports development of iAPX86/88 processors.	Portable, dual processing capability, expandable using multimodule cards. Bubble memory option.	In-circuit emulators for all CPUs.	

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	Intel NDS-I Network Development	Intel NDS-II (Page 1723)	Kontron/Future Data KDS	Kontron/Future Dat 2300
Supported CPUs	8081A, 8085A, 8086, (iAPX86), 8088 (iAPX88), B089, 8021, 8022, 8041A, 8741A, 8035, 8048, 8748, 8039, 8049, 8051	Work station dependent	8086, 8087, 8088, 8085, 8080 68000, 6809, 6809E, 6502, 6507, Z80B, Z8001, Z8002, NSC-800	8086, 8087, 8088, 8085, 8080, 68000, 6809, 6809E 6802, 6800, 6502, 6507, Z8001, Z8002, Z80B, NSC-800
Hardware				
User Stations	1 network manager, 8 workstations (Series II/III)	One network manager and up to 8 work stations (Series II/III and Model 800 development systems) per link	16	8
Communication Ports	2 serial RS232/4 parallel I/O per station	Two Centronics type parallel ports, 1 RS232C serial port and 1 expansion port for additonal hard disk	4 RS-232, 1 Parallel	2 RS-232, 1 Parallel
User RAM			256K bytes	596K
Mass Storage	Central hard disk, 7.3 Mb, 14.6 Mb Floppy disk, 250 Kb, 2.5 Mb	35M byte Winchester hard disk, expandable up to 320M bytes. Model 740 cartridge disk 10M byte (5M byte fixed, 5M byte removable)	Dual floppies, 1.2M byte, Hard Disk, 5, 10M byte	Dual floppies, 2M byte, Hard Disk, 35M byte
Logic Analyzer	No	No	64 Channel, State and 100 MHz Timing	64 Channel State
PROM Programmer	Optional	No	Universal	Universal
Printer	Optional	No, parallel ports supplied for hardware interconnect	Optional	Optional
Software Support				
Standard	ISIS operating system at workstations, MDS-I operating system at network manager.	High level language debugging network, management tools, export/import software, Ethernet Protocall.	CP/M operating system, macro assembler, editor linker, emulation support, mainframe link.	UDOS operating system, editor, macro assemblers emulation support, mainframe link.
Optional			Basic, Fortran, Pascal for system programming; PASCAL compiler for development; 3rd party CP/M software.	Basic, Pascal compilers for development.
Comments	Network manager provides shared hard disk and printer spooling for use by up to 8 stations.	Network resource manager provides shared Winchester hard disc, Model 740 cartridge disks and spooled line printer interface for work stations. All existing Intel development systems can be upgraded to be NDS-II work stations. Work stations communicate with the network resource manager via 10M bit Ethernet or local net interconnected with coax.	Ergonomic terminal, distributed computing and central mass storage for multi-users, multi-processor emulation.	Simultaneous multi-position emulation.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	Monolithic Systems MSC8801	Monolithic Systems MSC8802	Motorola EXORciser II (Page 1735)	Motorola EXORset DS35 (Page 1735)
Supported CPUs	8089, Z80	8080, Z80	6800 or 6809. Opt. 6801, 6802, 6805, 146805, 3870, 141000	M6800, M6801, M6805, M6809. Optional hardware for M6805/M146805 families
Hardware				
User Stations	One	One	One	One
Communication Ports	Two RS232C serial	5 serial, 1 parallel	1 serial expandable by 1 serial/2 parallel modules	RS232C
User RAM	64K bytes	80K bytes	64K bytes	56K bytes RAM
Mass Storage	Two 8-inch double-density floppy disk drives solid state disk simulation	Solid state disk emulation two 8-inch double-density floppy disk drives optional Winchester	Floppy disk, 2M bytes	328K bytes minifloppy disk storage
Logic Analyzer	No	No	No	
PROM Programmer	No	No	Optional for over 6 types of PROM, EPROM	Optional
Printer	Yes	Yes	Centronix 702, 703	Optional
Software Support				
Standard	CP/M 2.2.	CP/M 2.2.	MDOS disk operating system, macroassembler with linking and loading editor, cross-assemblers, cross-simulators available for each MPU.	XDOS operating system, linking loader, CRTeditor, Basic-M, compiler/interpreter, Basic-M run-time package, disk resident.
Optional	XY Basic, Microsoft Basic, Pascal/M, Z-SID, MAC, 32 or 64 floating point APU. Any CP/M compatible.	CP/NET, MP/M, XY Basic, Microsoft Basic, Pascal/M, Z-SID, MAC, 32 or 64 floating point APU, 8-inch Winchester drive package. Any CP/M compatible.	Fortran, Cobol, Basic, MPL, Pascal.	Pascal, Setcom (serial communications.
Comments	Includes power supply, 7-slot multibus chassis, MSC-8009A Z80 CPU, 64K byte RAM, up to 32K EPROM, floppy disk controller, two Shugart 801R disk drives.	Includes power supply, 7-slot multibus chassis, up to 32K EPROM, floppy disk controller, two Shugart 801R disk drives. MSC-8009, Z80 CPU, 16K RAM; MSC8007A, Z80 CPU, 64K RAM.	Optional real-time trace. EXORterm 155 adds video display and keyboard entry capabilities to the basic EXORciser.	EXORset fills the gap existing between very low-cost evaluation kits and high-end EXORciser-based systems.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	Motorola HDS-200 (Page 1731)	Motorola HDS-400 (Page 1732)	Motorola M68000 (EXORmacs) (Page 1733)	National Starplex
Supported CPUs	M6805P2, P3, P4, R2, R3, U2, U3, T2, M146805E2, F2, G2	MC68000	MC68000, 68010, 6800, 6809, 6802, 6805, 146805, 6801, 68120	8080, 8085, 8048, 3049, 3050, 3070, Z8
Hardware User Stations	One	One	Two standard; up to 8 optional	One
Communication Ports	1 Host, 1 Terminal	1 Host, 1 Terminal	2 serial RS232	N/A
User RAM	8K bytes	32K bytes	256K bytes expandable to 16M bytes	64K bytes
Mass Storage	In host	In host (EXORmacs)	Floppy disk, 1M bytes, 2M bytes. 16, 32, 96M bytes hard disk	Dual floppy, 512K bytes
Logic Analyzer	No	Yes	Optional	No
PROM Programmer	In host	In host (EXORmacs)	Optional for over 60 types of PROM, EPROM	Optional
Printer	In host	In host (EXORmacs)	Optional	No
Software Support Standard	In host.	Same as host (EXORmacs).	VERSAdos multitasking, real-time, multiuser, logical I/O file management; Pascal compiler; macro and linking assembler; page, screen and file-oriented editor, symbolic debugger.	Disk operating system; Fortran compiler; Basic interpreter; on-board ROM diagnostics, utilities.
Optional			Fortran IV.	Text editor, cross-assemblers.
Comments	Operates as a remote hardware/software development station to a host such as EXORmacs, EXORset, EXORciser.	Operates as a remote hardware/software development station to EXORmacs.	Optional real-time trace; ROM, RAM and disk autotest at power-on; board-level fault isolation.	Optional in-circuit emulators for 8048, Z80; personality modules; Starplex-to-Intel MDS link.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	National Starplex II	Quay 500T	Quay 99/94F MWS	RCA Solid State CDS IV
Supported CPUs	NSC800, INS8070, INS8048, INS80C48, 8080, 8085, Z80, COP400	Z80-A	Z80, NMOS	1802, 1804, 1805, 1806, 6805C
Hardware User Stations	One	One		One
Communication Ports	Two RS232	3 Serial, 1 Parallel	2 or 3 (8 bit Parallel) 1 or 3 (RS232C)	RS232
User RAM	128K bytes	64K byte Standard	16 to 65K byte	64K bytes
Mass Storage	1 Mb dual double-density floppy disk	400K byte (two 5¼ floppys)	Optional 400K byte/100M byte	Dual floppy, 512K bytes
Logic Analyzer	No	—	No	Optional
PROM Programmer	Optional	Yes (consult factory)	Yes	Yes
Printer	Optional	Optional	Interface optional	Yes Centronics interface included
Software Support Standard	Disk-based operating system, debugger, text editor, assembler, linker, Fortran, Basic, utilities and diagnostics.	CP/M 2.2 disk operating system with Quay utilities.	Monitor; including display & alter memory contents, dynamic breakpoints with register dumps, program countertracts single stepper and PROM programming.	Disk operating system, level I, II assemblers, macro-assembler, full-screen editor.
Optional	PL/M, Pascal.	⅝ converter cable for 8" drive IBM 3740 format compatibility. Number of Developmental and Applications software pcakages available.	Basic, Cobol, Fortran, CP/M operating system, assembler, text editor.	CDSIV Resident: Basic 1: Fixed-point interpreter/compiler; Basic 2; floating-point interpreter. PL/M 1800: Compiler microconcurrent Pascal compiler/interpreter (cross-software). 6805C Assembler.
Comments	Starplex II support packages are identical to those of Starplex.	Packaged system with CRT/terminal included.		Includes micromonitor, real-time in-circuit debugger; interface to CRT/keyboard terminal.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	RCA Solid State CDP18S693 (Page 1960)	RCA Solid State CDP18S694 (Page 1960)	RCA Solid State CDP18S605 (Page 1960)	RCA MS2000 (Page 1960)
Supported CPUs	1802, 1804, 1805, 1806, 6805C	1802, 1804, 1805, 1806, 6805C	1802, 1804, 1805, 1806, 6805C	1802, 1804, 1805, 1806, 6805C
Hardware				
User Stations	One	One	One	One
Communication Ports	RS232; 20 mA	RS232; 20 mA	RS232; 20 mA	RS232C
User RAM	4K (expandable to 40K)	4K (expandable to 40K)	4K (expandable to 40K)	60K bytes
Mass Storage	One cassette drive	Two cassette drives	Two cassette drives	Dual 3½" floppy, 736K bytes expandable to four drives
Logic Analyzer	Optional	Optional	Optional	Microemulator (Optional)
PROM Programmer	Optional	Yes	Yes	Optional
Printer	No	No	No	No
Software Support				
Standard	System monitor and floating point Basic interpreter firmware.	System monitor, floating point Basic interpreter, 1802 assembler/text editor firmware. Cassette based PROM programmer software.	System monitor, floating, point Basic interpreter, 1802 assembled/text editor firmware. Cassette-based PROM programmer software and video interface system (VIS) interpreter.	Microdos operating system, macroassembler, utilities, 1800 series assemblers.
Optional	System expandable in memory and I/O using any CDP186600 series microboard. Optional 1802, 1804, 6805C ROM-based Assemblers.	Same as CDP18S693.	Same as CPD18S693.	Full-screen editor; 6805C Assembler; Basic 1 fixed point interpreter/compiler; Basic 2 floating point interpreter; PLM 1800 compiler; micro concurrent Pascal compiler/interpreter (cross-software).
Comments			Includes 10" color monitor, VIS microboard and interpreter software for user programmable color graphics.	Microemulator, real-time in-circuit emulator, supports emulation of 1802, 1804, 1805, 1806, 6805C.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	Relms Icebox	Relms Icebox	Rockwell System 65	Rockwell 6500
Supported CPUs	Z80A, NSC800 with emulation. Those listed below for software support.	Z80A, B & L; NSC800; 6809A, E; 8085 in-circuit emulators available	6500 family	6500 family
Hardware				
User Stations	One	One	One	One
Communication Ports	RS449, two RS232C, RS422A	2 RS423 (232C) 1-RS449, 1-Centronics	RS232, TTY	RS232, TTY
User RAM	256K bytes (minimum)	48K dedicated to O.S. 256K bytes	16K bytes	16K bytes
Mass Storage	512K bytes (dual type)	128K EPROM 256K bytes (tape) cartridge	Dual mini floppies	Dual mini floppies
Logic Analyzer	Contact mfg.	Optional	No	No
PROM Programmer	Yes	Yes	Optional	Optional
Printer	Centronics-Anadex 150cps dot matrix	Yes	No	No
Software Support				
Standard	ROS operating system, redit, screen oriented text editor with macro command capability, PROM programmer utility, link/locater, self-test, and file management.	Debug utilities, ROS operating system.	Text editor, two-pass assembler, debugger/monitor in ROM.	Text editor, two-pass assembler, debugger/monitor in ROM.
Optional	Relocatable assemblers (macro) ROM based Z80, NSC800, Z8, Z8000, 6800/01/02, 6805, 6809, 1802/04, F8/3870, 9900, 6500/01/02,8051.	Z80, Z8, Z8000, 6800/01/02, 6500/01/02, 1802/05, NSC800, 9900/95, F8/3870/72, 8051, 880/85, 6805/146805, 6809.	PL/65 compiler.	PL/65 compiler.
Comments	In-circuit emulation available for: Z80A, NSC800, 6809A, 6809E. Modems available for remote communications. Links available for complete utilization of Intel Intellec and DEC DPD-11 (RSX-11M) peripherals. Useful for lab, production and field test.	Communictaions links available for: DEC, VAX, Intel, some CP/M systems. Contact factory. Portable. Support 8 and 16 bit processors.	Single-step, real-time trace; software breakpoints; optional in-circuit emulator.	Single-step, real-time trace; software breakpoints; optional in-circuit emulator.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	Signetics SMDEV10000 (Page 1739)	Synertek MDT-1000	Synertek MDT-2000 (Page 1747)	Tektronix 8002A
Supported CPUs	68000, 8 MHz	6500	Z8, 6500	8080A 8085A, Z80A, 1802, 6800, 6802, 0900, F8, 3870, 3872, 8048, 8049, 8021, 8035, 8039-6, 8086/88, Z800
Hardware				
User Stations	One minimum, additional depend on host computer capability	One	One	One
Communication Ports	4 Serial RS-232, Serial Printer Interface, Centronics Parallel Printer Interface	For printer, video, serial communications RS232	3 serial/2 parallel	Standard I/O port, 3 RS232-compatible ports
User RAM	64K bytes, mappable to system under development	4K bytes	2K bytes	32K bytes expandable by 16 or 32K byte modules
Mass Storage	None	—	Two 8-inch floppy disks	Floppy disk, 630K bytes
Logic Analyzer	No	No	No	Optional
PROM Programmer	Optional, Interface Supplied	EPROM	Optional for 2716, 2737, 2532 EPROMs	Optional for 2704/2708
Printer	Optional, Interface Supplied	No	No	Optional
Software Support				
Standard	Routines to execute and debug software for the 68000. ROM resident debugger features include execution of breakpoints, examine and modify registers, modify program via line oriented assembler/disassembler.	Monitor with debug, assembler/editor in ROM.	Pascal-based operating system with screen-oriented editor and file-management system; universal assembler with macro and conditional directives; ROM-based mini-debugger.	Disk operating system; text editor, assembler, debuggers; file utilities; linker supervision.
Optional	SMSFT16000 S68000 cross software/Pascal cross compiler and SMSFT10000. S68000 cross software/macroassembler available for VAX-11, PDP-11 or LSI-11/23 host computers.	Floating-point Basic.	Debug cards with 4 breakpoint registers; assemblers for 6800, 6809, Z80, 8080, 9900 and LSI-11.	Assembler for all MPUs; debuggers for 8086, Z8000, 68000; HHL for 8080, 8085, Z80, 6800; MDL/U compiler.
Comments	Host computer generated object code is downloaded to the SMDEV1000 RAM memory via host resident upload/download software. SMDEX10000 resident assembler/disassembler allows translation of existing hex values of machine code into readable mnemonics or creation and insertion of new 68000 instructions into the routine being tested. Final program is uploaded to host computer. RAM memory test executed on power on.	Hardware compatible with EXORciser bus.	ROM-based RAM/disk diagnostics.	Extension English diagnostics; optional TTY, CRT, computer display terminals.

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer	Tektronix	Tektronix	Texas Instruments	Texas Instruments
Model	8540	8550	FS990/10	TMAM9000
FOR DETAILED DATA SEE:				(Page 1748)
Supported CPUs	8086, 8085A, 8080A, 8048, 8049, 8035, 8039, 8021, 8041A, 8022, 6800, 68000, 6802, 6808, Z8000, Z80A	8086, 8085A, 8080A, 8048, 8049, 8035, 8039, 8021, 8041A, 8022, 6800, 68000, 6802, 6808, F8, 3870, 3872, 3874, 3876, Z8001, Z8002, Z80A, TMS9900, SBP9900, 1802, 6500/1	9900 family	TMS9900
Hardware				
User Stations	One	One	One	One
Communication Ports	Two RS232C 1 High Speed	Two RS232C		—
User RAM	To 128K bytes	To 128K bytes	64K bytes	64K bytes
Mass Storage		2 Mbyte floppy disk	Dual floppy, 480K bytes	2.3M bytes on two DSDD 8-inch floppy disks
Logic Analyzer	Optional	Optional	Optional	Yes, software logic trace analyzer
PROM Programmer	Optional for 2716/2732 or 8748/8755/8741A	Optional for 2716/2732 or 8748/8755	Optional PROM/EPROM	Optional, software utility supplied
Printer	Optional	Optional	Optional, 150 cps	Optional, RS232C I/F included
Software Support				
Standard	OS/40 ROM-based operating system; communications firmware; simulated I/O support.	DOS/SO disc based operating system; line-oriented editor; macro assembler with English language diagnostics; linker supervision; communications S/W; simulated I/O support.	Disc operating system; assembler, text editor, linking editor, file-management utilities.	9000 AMPLUS includes: 9900 family assembler, 9900 family linker, screen editor system, AMPL debug high level language, AMPL debug procedure library, disk directory and file utilities, PROM programmer utilities.
Optional	Assemblies/compiles performed on host.	Assemblers for all supported CPUs; Pascal and MDL/u compilers: advanced CRT-oriented editor.	Pascal, Basic, Fortran.	Microprocessor, Pascal, TMS7000 Assembler, linker and PROM utilities, TMS-7000 AMPL Emulator utilities, TMS9995 and TMS-9900 Assembler, real time. Executive, file manager, HDLC data communications.
Comments	Optional emulator processors and prototype control probes; system designed as a peripheral for a host system.	Optional emulator processors and prototype control probes; ROM-based power-up systems test; real-time trace.	Optional in-circuit emulator for 9900/9980 and 9940.	88 key typewriter style keyboard. 12 inch (diagonal) CRT with 80 character line x 24 line capability. One termnal included.

© IC MASTER 1983

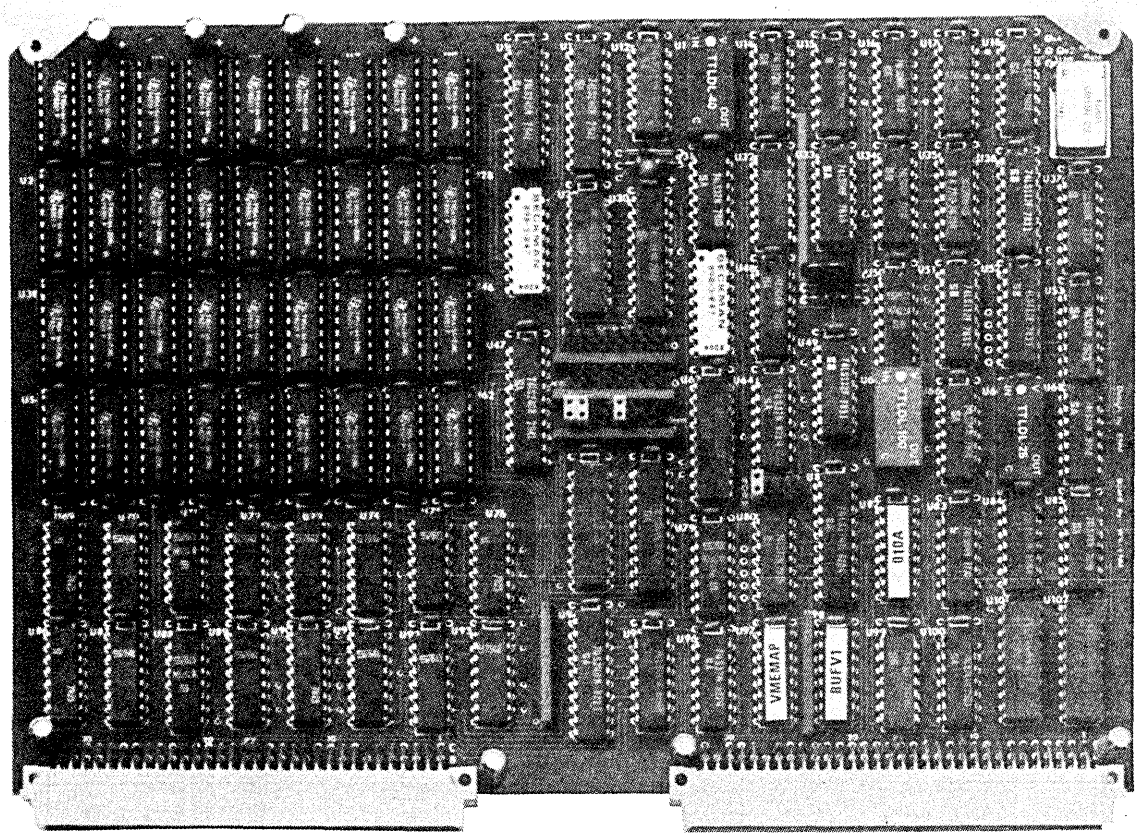
MICROPROCESSOR DEVELOPMENT SYSTEMS (cont)

Manufacturer Model FOR DETAILED DATA SEE:	Texas Instruments TMAM9010 (Page 1749)	Texas Instruments TMAM 9021 (Page 1749)	Texas Instruments TMAM9041 (Page 1749)	Zilog PDS8000, Model 30
Supported CPUs	Any 1 of the following: TMS9900/9900-40, TMS9980/9981, TMS9940, TMS7000, SBP9900	Any 2 of the following: TMS9900/9900-40, TMS9980/9981, TMS9940, TMS7000, SBP9900	Any 4 of the following: TMS9900/9900-40, TMS9980/9981, TMS9940, TMS7000, SBP9900	Z8000, Z80, Z8
Hardware User Stations	Two	Four	Eight	One
Communication Ports	—	—	—	Optional I/O boards
User RAM	256K bytes	256K bytes	320K bytes	64K bytes
Mass Storage	9.4M bytes, hard disk, formatted	32M bytes, hard disk, formatted	96M bytes, hard disk, formatted	10M bytes hard disk, expandable to 40M bytes
Logic Analyzer	Yes, software logic trace analyzer	Yes, software logic trace analyzer	Yes, software logic trace analyzer	Optional
PROM Programmer	Yes	Yes	Yes	Optional for PROM/EPROM
Printer	Yes	Yes	Yes, choice of two types	Optional
Software Support Standard	Multi-Amplus operating system, macroassembler, AMPL Utility, Diagnostic, Text, Link editor, and PROM Programming Utility.	Multi-Amplus operating system, macroassembler, AMPL Utility, Diagnostic, Text, Link editor, and PROM Programming Utility.	Multi-Amplus operating system, macroassembler, AMPL Utility, Diagnostic, Text, Link editor, and PROM Programming Utility.	RID operating system; disk file management; Z8000 PLZ/ASM assembler, Z80/Z8000 translator; Z80 relocating assembler, text editor; monitor.
Optional	Microprocessor Pascal, Memory-Mapped Pascal, Realtime Executive, and File Manager.	Microprocessor Pascal, Memory-Mapped Pascal, Realtime Executive, and File Manager.	Microprocessor Pascal, Memory-Mapped Pascal, Realtime Executive, and File Manager.	Z80 PLZ, Z8 software.
Comments	88 key typewriter style keyboard. 12 inch (diagonal) CRT with 8 character line x 24 lines capacity. Multiprocessor emulation, multitask operation. One terminals included.	88 key typewriter style keyboard. 12 inch (diagonal) CRT with 8 character line x 24 lines capacity. Multiprocessor emulation, multitask operation. Two terminals included.	88 key typewriter style keyboard. 12 inch (diagonal) CRT with 8 character line x 24 lines capacity. Multiprocessor emulation, multitask opertaion. Four terminals included.	Expandable system; optional in-circuit emulator.

© IC MASTER 1983

Last Page This Section. Next Page 1701.

For Key Data On Every IC On This Board, The Place To Look Is...



This Signetics Memory Module provides 256K bytes of dynamic random access memory, plus parity protection.

Equipment and system design often require the use of a wide variety of integrated circuits in order to obtain optimum performance. One way for an engineer to be certain that he hasn't overlooked the best device for his application is to refer to the pages of IC MASTER.

Surveys conducted by IC MASTER, integrated circuit manufacturers, and independent research agencies confirm that four out of five IC MASTER users have specified one or more products as the result of using IC MASTER.

Device No.	Description
74LS00	Quadruple 2-Input NAND Gate
74LS08	Quadruple 2-Input AND Gate
74LS04	Hex Inverter
74LS20	Dual 4-Input NAND Gate
74LS32	Quadruple 2-Input OR Gate
74LS37	Quadruple 2-Input NAND Buffer
74LS24	Schmitt Trigger
74LS74	Dual D-Type Edge-Triggered Flip-Flop
74LS132	Quadruple 2-Input Schmitt Trigger
74LS112	Dual J-K Edge-Triggered Flip-Flop
74LS10	Triple-3-Input NAND Gate
74LS244	Octal Buffer/Line Driver
74LS645	Octal Bus Transceiver
AM25LS2521	8-Bit Equal-to Comparator
74S38	AND/NAND Gate
N7411	Triple-3-Input AND Gate
N74S40	Dual 4-Input NAND Buffer
TMS4164	64K Dynamic RAM
7641	512 x 8 PROM
7642	1K x 4 PROM

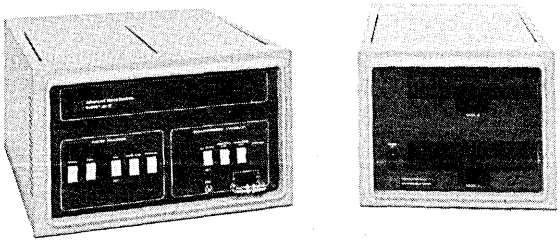
Representative list of ICs on Signetics SMVME3100 Memory Card. Key specifications for all of these ICs can be found in IC MASTER.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

MICROPROCESSOR DEVELOPMENT SYSTEMS

AmSYS™ 29/10
Microprogram/Bit Slice Development System

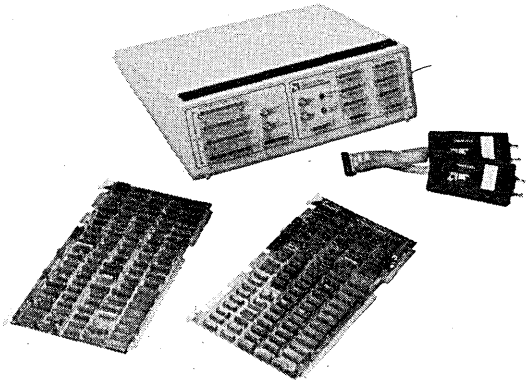


Features

- ☐ Complete floppy-disk based Microprogram/Bit Slice Development System
- ☐ AMDASM meta-assembler for microcode language definition and source file assembly
- ☐ Full speed (10MHz) Microprogrammed Controller for microcode and hardware integration
- ☐ Higher speed (35ns) writable control store for real-time microcode emulation
- ☐ Optional High-Speed Trace provides integrated 10MHz logic state analyzer with 48-bit input
- ☐ AMDOS29 disk operating system (CP/M† 2.2 compatible)
- ☐ Dual single/double density floppy disk system provides 1M byte storage

†CP/M is a trademark of Digital Research

Am29/6310
High-Speed Trace



Features

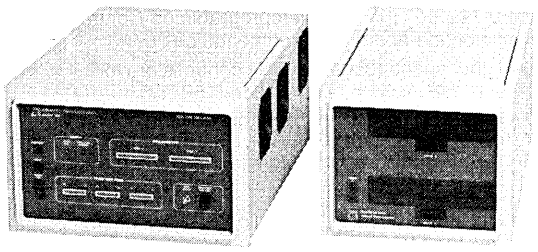
- ☐ Provides logic analyzer capability for 2900 Family bipolar designs
- ☐ Plugs into AmSYS™29/10 Microprogram Development System
- ☐ 10MHz (100nsec) event storage capability
- ☐ Event storage unit of 48 x 256 words, expandable to 96 bits
- ☐ 32-bit Trace Time Tag records event occurrence time
- ☐ Eight general purpose 48-bit triggers, expandable to 96 bits
- ☐ Adds eight hardware breakpoints to AmSYS29/10 clock control logic
- ☐ Software integrated with microprogram debug software (DDT29) on AmSYS29/10

© IC MASTER 1983

Advanced Micro Devices

MICROPROCESSOR DEVELOPMENT SYSTEMS

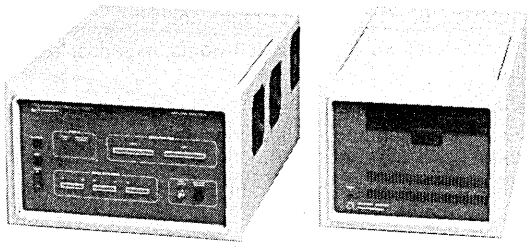
AmSYS™ 8/8112
AmZ8000 Microprocessor Development System



Features

- ☐ Complete microprocessor development system for AmZ8001 and AmZ8002 microprocessors
- ☐ High-performance 4MHz 8085A-2 CPU
- ☐ 128K bytes RAM
- ☐ 1M byte (expandable to 11M bytes) of disk storage on two double-density floppy disk drives
- ☐ Serial interfaces for optional CRT, printer, or PROM programmer
- ☐ Built-in parallel interface for printer
- ☐ Self-test diagnostics
- ☐ Accomodates the RTE16/8050A Real-Time Emulator Support Package for the AmZ8000
- ☐ Complete AmZ8000 software support, including a relocatable macroassembler, linker, and 8-bit-to-16-bit source code translator
- ☐ Powerful CP/M-compatible AMDOS8 operating system
- ☐ Supports C and PASCAL high-level languages for AmZ8000 microprocessors
- ☐ Includes relocatable macroassemblers for 8080A, 8085A, and Z80A microprocessors

AmSYS™ 8/8116
AmZ8000 Microprocessor Development System



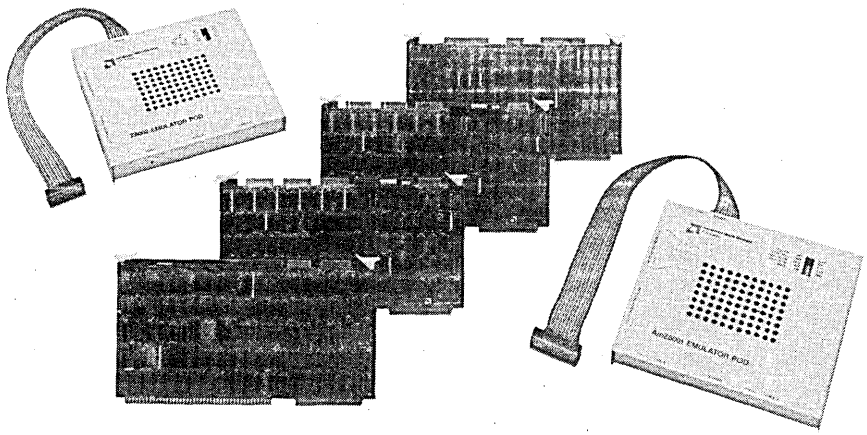
Features

- ☐ Complete microprocessor development system for AmZ8001 and AmZ8002 microprocessors
- ☐ High-performance 4MHz 8085A-2 CPU
- ☐ 128K bytes RAM
- ☐ 10.5M bytes of disk storage on 8" Winchester and double density floppy drive
- ☐ Serial interfaces for optional CRT, printer, or PROM programmer
- ☐ Built-in parallel interface for printer
- ☐ Self-test diagnostics
- ☐ Accomodates the RTE16/8050A Real-Time Emulator Support Package for the AmZ8000
- ☐ Complete AmZ8000 software support, including a relocatable macroassembler, linker, and 8-bit-to-16-bit source code translator
- ☐ Powerful CP/M-compatible AMDOS8 operating system
- ☐ Supports C and PASCAL high-level languages for AmZ8000 microprocessors
- ☐ Includes relocatable macroassemblers for 8080A, 8085A, and Z80A microprocessors

© IC MASTER 1983

MICROPROCESSOR DEVELOPMENT SYSTEMS

RTE 16/8050A
Real-Time Emulator Support Package



Features

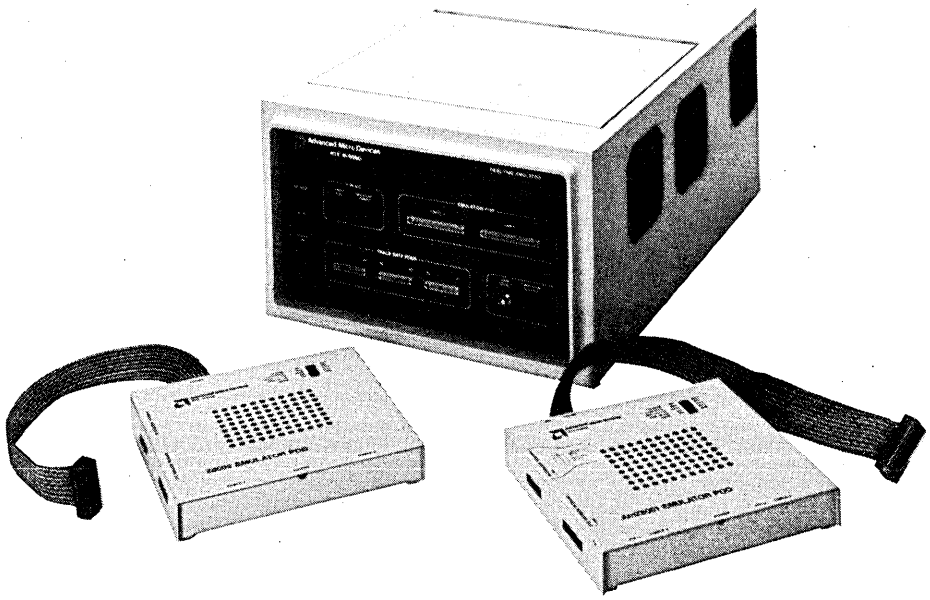
- ☐ 6MHz real-time in-circuit emulation for segmented AmZ8001 and nonsegmented AmZ8002 microprocessors
- ☐ Full-speed emulation and single-step program execution with or without target hardware
- ☐ Concurrent display of CPU status, registers, PC, NPSA pointer, stacks, and memory
- ☐ Powerful screen-oriented operator interface with single-keystroke commands
- ☐ User-selectable memory wait states
- ☐ 1M byte memory map located within a 16M byte address range that allows intermixing of target and emulation memories on any 1K byte boundary
- ☐ Four high-speed state comparators for simple address equal breakpoints and ROM program patch
- ☐ Eight multipurpose high-speed state comparators for complex breakpoints and real-time trace control
- ☐ Multilevel sequences and three trigger modes for complex control of real-time trace
- ☐ Trace snapshot capability without stopping emulation

© IC MASTER 1983

Advanced Micro Devices

MICROPROCESSOR DEVELOPMENT SYSTEMS

RTE 16/8060
Real-Time Slave Emulator



Features

- ☐ Attaches to any foreign host having RS-232 port
- ☐ UNIX™ and RSX11M™ has resident file download/upsave programs, written in C and Fortran, respectively, provided in source and object form on 9 track 800 bpi tape and 8″ DEC RX01 floppy disks
- ☐ Communications protocol fully documented in User Manual
- ☐ Separate emulator programs provided to support AMD or Zilog, Z8000 instruction Syntax
- ☐ Intel HEX to AMD BIN file format conversion program provided for UNIX and RSX11M hosts
- ☐ Users provide cross-compilers and/or cross-assemblers that output Intel HEX files
- ☐ Cross-software available from third party sources
- ☐ Full speed 6MHz real-time, in-circuit emulation of segmented AmZ8001A or unsegmented AmZ8002A target system microprocessor with no wait states
- ☐ Screen-oriented single-key commands with concurrent displays of CPU status, registers, NPSA pointers, program counter, and memory
- ☐ 8 to 264K Bytes of no-wait-state SRAM or up to 512K Bytes of two wait state DRAM expansion with user-selectable wait state commands
- ☐ 1 MByte memory map within 16 MByte address range allows intermixing of target and emulation memory on any 1K Byte boundary
- ☐ Four 16 or 23-bit high-speed state comparators for simple address equal breakpoints and ROM patches
- ☐ Eight 46-bit multi-purpose comparators for breakpoints, trace triggers, and event qualification
- ☐ Up to eight ordered sets of logically OR'd comparators compared with sequential bus events and three trigger modes to start and stop trace
- ☐ Comparator qualified bus bit-patterns recorded in 46-bit wide by 256 circular trace buffer
- ☐ Trace expansion option adds 48 external probes, increases trace buffer and comparators to 94-bits, and allows 16 of these bits for time-stamping
- ☐ Separate system, emulator, and trace buses allow tracing without inducing extra emulation wait states

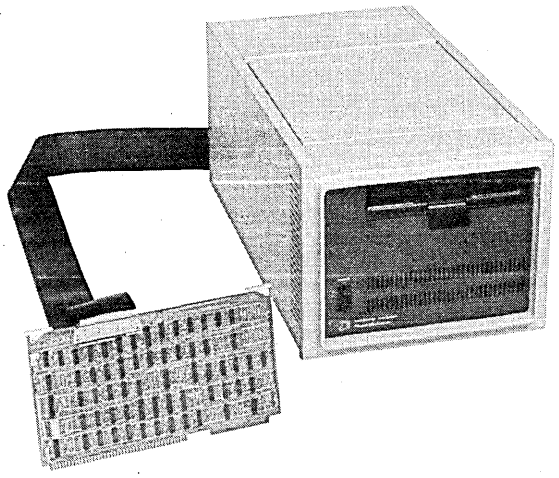
UNIX and RSX11M are trademarks of Bell Labs and DEC, respectively.

© IC MASTER 1983

Advanced Micro Devices

MICROPROCESSOR DEVELOPMENT SYSTEMS

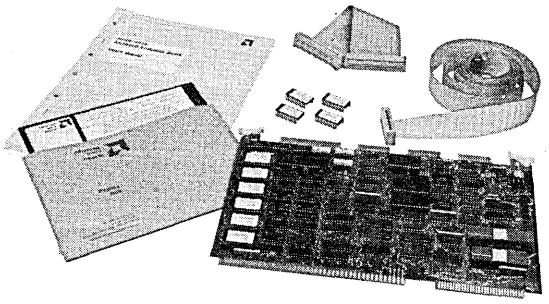
Am8/9016
Winchester Mass Storage Subsystem



Features

- ☐ Includes 10M byte 8" Winchester drive, 8" double-density floppy, integrated controller and Multibus† adapter
- ☐ Software and hardware compatible with AmSYS™8/8 Development Systems
- ☐ Fixed drive
  - 10.7M byte (unformatted) storage capacity
  - Same physical size as floppy disk drive
  - Same environmental characteristics as floppy disk drive
  - Winchester head and media technology
  - 4.34M bits/second transfer rate
- ☐ Floppy drive
  - 256K or 512K byte storage capacity
  - Used as back-up for Winchester
- ☐ Disk drive controller
  - Controls up to four drives
  - Data error sensing and autonomous correction
  - Resident microdiagnostics
  - 256 data byte sectors standard for fixed disks
  - IBM compatible track formats for floppies
  - Software density selection

Am96/4018
AmZ8000 Evaluation Package



Features

- ☐ AmZ8001 Microprocessor (4MHz)
- ☐ AmZ8002 Microprocessor (4MHz)
- ☐ 8K bytes on-board RAM
- ☐ AmZ8001 and AmZ8002 monitors with breakpoint, single step, up/download commands
- ☐ Buffered CPU bus available at edge of board
- ☐ 2 programmable serial I/O ports (RS 232C and 20mA)
- ☐ Programmable counter/timer
- ☐ 24 programmable I/O lines
- ☐ Line-by-line assembler/disassembler in EPROM
- ☐ I/O cable and diskette for up/download to AMD Development System
- ☐ Multibus† form factor
- ☐ Cable to connect CRT terminal

© IC MASTER 1983

Development Support where you Need It.

EZ-PRO™ is a microprocessor development system designed for pros by pros.

EZ-PRO Building Blocks. Our modular system supports your development project, small or large. For 8- or 16-bit processors, start with our Basic Development Unit (32 KB of 100 ns SRAM) and appropriate In-Circuit Emulator (totally transparent, no wait states), and add the Memory Expansion Modules, Dual Disk Unit, and EPROM Programmer you need.

For bit-slice processors of any type, assemble a system that meets your exact specs. Our line includes a Bit-Slice Kit, Interface Modules, ECL or TTL User Interface Modules, Memory Modules, and ECL or TTL PROM Programmers.

EZ-SOFT™**User-friendly Programs.** Our menu-driven operating software is included with the hardware. In addition to a sophisticated DOS, the Basic Development Unit comes with a PROM-resident monitor, superlative screen editor, and disk formatter. Each emulator is provided with a relocating macro-assembler, linking editor, and debugger.

EZ-PRO Production Testing. Your development system can also be used for unattended final test of manufactured units, as they come off the assembly line. And that's cost-effectiveness.

EZ-PRO has the Edge. It's the growing edge. Our elegant systems **support more processors than any competitor.** And because microprocessor development technology is our only business, we offer customers complete hardware and software support for their EZ-PRO systems.

Call to discuss a single- or multi-user system, or write today for complete technical data. American Automation, 14731 Franklin Avenue, Tustin, California 92680, (714) 731-1661. Telex II: 910 595-2670 AMAUTO TSTN.

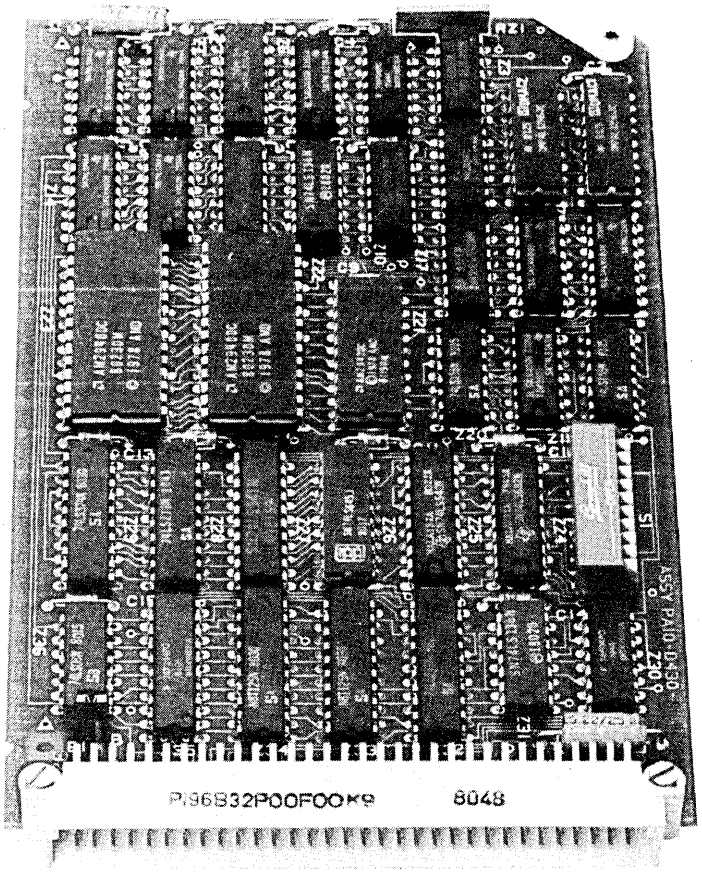
PROCESSORS SUPPORTED	
16 BITS	
Z8001	68000
Z8002	8086
8 BITS	
6502/12	8051
6503/4/5/6/7/13/14/15	(NMOS & CMOS)
6802/8	8035/39/48/49
146805E-2	(NMOS & CMOS)
6809E	Z80
6809	8X300
8085	8X305
8088	NSC800
All types of bit-slice processors	

American Automation

µP Development Made **EZ**

© IC MASTER 1983

For Key Data On Every IC On This Board, The Place To Look Is...



This Rockwell RM65-5104(E) card is used to transfer data between memory and peripheral circuits.

Device No.	Description
74LS08	Quad 2-Input AND Gate
74F244	Octal Buffer/Line Driver
74LS240	Octal Bus Driver (Schmitt Trigger)
74LS136	Quad 2-Input Exclusive-OR Gate
74F04	Hex Inverter
74LS374	Octal D-Type Edge-Triggered Flip-Flop, 3-State
74LS273	Octal Edge-Triggered Flip-Flop with Clear
74LS541	Octal Bus Driver, Noninverting
74LS645	Octal Bus Transceiver
74LS540	Octal Bus Driver, Inverting

Device No.	Description
74LS682	8-Bit Magnitude Comparitor
AM2940	DMA Address Generator
AM2942	Programmable Timer
74LS155	Decoder/Demultiplexer
74LS148	Priority Encoder
74LS74	Dual D-Type Edge-Triggered Flip-Flop
74LS32	Quadruple 2-Input OR Gate
74LS112	Dual J-K Flip-Flop
74LS126	Quadruple Bus Buffer Gate
74LS00	Quadruple 2-Input NAND Gate
PAL12H6	Field Programmable Array

Representative list of ICs on Rockwell Direct Memory Access Card.
Key specifications for all of these ICs can be found in IC MASTER.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

The Emulogic® ECL-3211.

The ECL-3211 is a high performance, universal microprocessor development system. It incorporates all basic functions necessary for software development and high speed in-circuit emulation for virtually any microprocessor from 4-bits to 32-bits.

The ECL-3211 uses a standard DEC PDP-11 16-bit minicomputer for control, computation, display, and system communication functions. All emulation functions, map, offset, break, and trace, are performed by Emulogic hardware and software.

Building on standard DEC CPU's, peripherals, and operating systems, the ECL-3211 offers field-proven DEC hardware/software, worldwide service, and Emulogic's high-performance general emulator system.

System Configurations.

Single-User. The standard ECL-3211 is a stand-alone system with VT101 terminal, LSI-11/2 CPU, 64KB, 1MB dual floppy disks (and/or RL02 hard disks). This basic unit can accommodate any of the emulation support packages, and includes RS-232 serial line units for communication with other systems.

Multi-User—Host/Satellite System. The ECL-3211 may be used as a hardware/software workstation on a DEC or non-DEC host. It can function both as a dumb terminal on the host via a pass-through feature and as an independent workstation with file transfer capabilities between host and satellite. Use of a non-DEC host may require the user to provide some driver software.

Multi-User—Virtual Disk System. A multi-station hardware and software development system can be configured using any of several DEC host computers with standard multi-user operating systems and several hardware/software and software-only workstations. The exact number depends upon the operating system capabilities and the type of usage.

Software stations (VT101 terminals) are connected to the host via RS-232 lines. Hardware/software stations, consisting of ECL-3211 systems equipped with virtual disk interfaces instead of local disk storage, are connected to the host via a 1-megabaud multi-drop coaxial cable bus.

The virtual disk link between workstation and host gives each hardware station high speed access to the common hard disk storage of the DEC host.

Multi-Chip Emulation Systems. Simultaneous emulation of multiple chips can be accomplished in two ways:

1. Cross-connecting external inputs and outputs of pods in multiple ECL-3211 systems—breakpoints in one system activated by trap conditions in other systems.

2. Specifying the ECL-3211 Single-Terminal Multi-Chip Emulation System. This system, a simple upgrade for standard ECL-3211 single emulator systems, performs full-feature simultaneous emulation of up to 4 chips of any type.

Chips Supported.

Support is offered for the following chip families:*

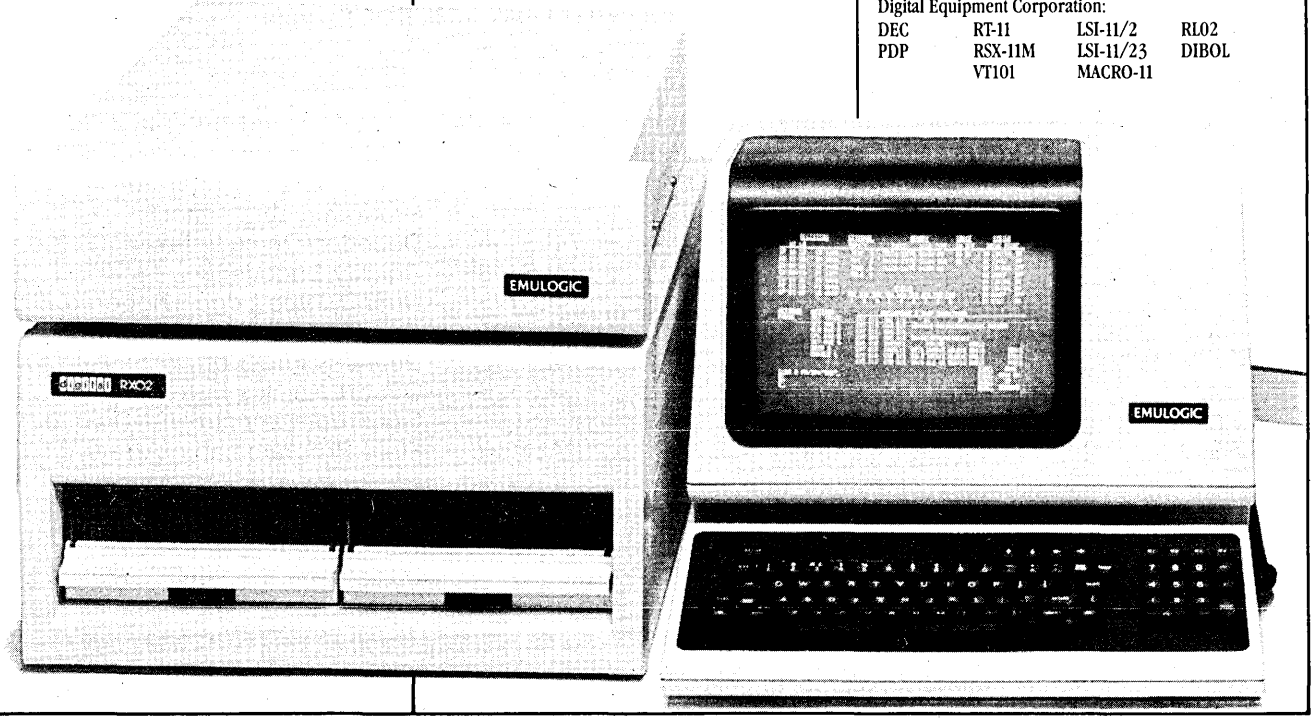
8-bit		16-bit
8048	6502	8086/87
Z80	6809	68000
8085	8088/87	
NSC800	8080	

Additional chip support packages will be introduced in 1983. Check Emulogic for your particular chip.

*Check Emulogic for availability.

The following are registered trademarks of Digital Equipment Corporation:

DEC	RT-11	LSI-11/2	RL02
PDP	RSX-11M	LSI-11/23	DIBOL
	VT101	MACRO-11	



.© IC MASTER 1983

The best microprocessor development system you can get.

Any speed. There is simply no other development system today that can offer the speed and performance of the ECL-3211. It can achieve true, full-speed emulation of any target system today, regardless of chip. It will not degrade target performance or require compromise or interpretation of results during emulation. It is genuinely transparent to the target.

Lots of emulation memory. ECL-3211 systems are supplied with at least 65KB DEC dynamic RAM, some of which may be used for emulation memory, and some high speed static RAM emulation memory.

Extra high speed static RAM may be added in 8KB or 16KB modules. For low-cost emulation memory, an extra 65KB of DEC dynamic RAM may be specified.

Full-range mapping. The full address range of each chip can be used for mapping, breakpoints, and trace. And with proper memory you can run at full rated speed in any mapping configuration.

World's most powerful breakpoints. Eight independent hardware breakpoints are standard with every system. Each can perform multiple, simultaneous actions whenever a set of logical trap functions is met. And all breakpoint functions are transparent to your target. Prioritization of breakpoints lets you "break on non-event" or set up "safety net" trap conditions.

Phantom injection. A "phantom" breakpoint feature allows the user to jump to program patches with no in-line code changes. Eight phantoms are provided (one per breakpoint).

Intelligent, real-time trace. A 511 x 72-bit breakpoint-controlled trace buffer captures all bus activity including instruction, data, DMA, and co-processor transactions—in real time and at full speed of the chip. The trace disassembler accurately and unequivocally identifies each item, including instructions purged from a queue.

Counters. Two high-speed counters count from +31-bits to −31-bits. The counters can be independently sourced by target machine cycles, instruction cycles, target time base, or breakpoint actions. Each can be independently enabled/disabled/decremented as a breakpoint action, and the status of each may be sensed as a logical breakpoint condition. In addition, each may be automatically re-initialized at the start of each emulation cycle.

Target Time Base. Target time base can be sourced from either the internal synthesizer in the ECL-3211, or the user's time base. The setting resolution of the synthesizer is 0.1% typical. Long term standard deviation is less than 100 ppm. The synthesizer is a convenient tool for stress-testing the user's target.

Full-Screen Auto-Update Display. Automatically updated full-screen displays present all status information to the operator at the end of each step or emulation cycle. Split-screen smooth scrolling lets the operator scan through the trace buffer in easy-to-read form.

Cursor Control Screen Editing. Keypad cursor control permits the operator to alter the contents of registers, memory, or breakpoint conditions directly on the screen as an alternative to keyboard command entry.

Software.

DEC Operating Systems. RT-11 is standard for single-user systems and RSX-11M is optional for some systems. Other standard DEC software, such as FORTRAN, BASIC, DIBOL, etc., is available for non-emulation functions.

Keypad Editor. The editor is a full screen-oriented keypad editor.

Cross-Assemblers. Emulogic macro-relocatable cross-assemblers are supplied for each chip supported. Each uses the mnemonics of the chip manufacturer and the pseudo-ops and directives of MACRO-11.

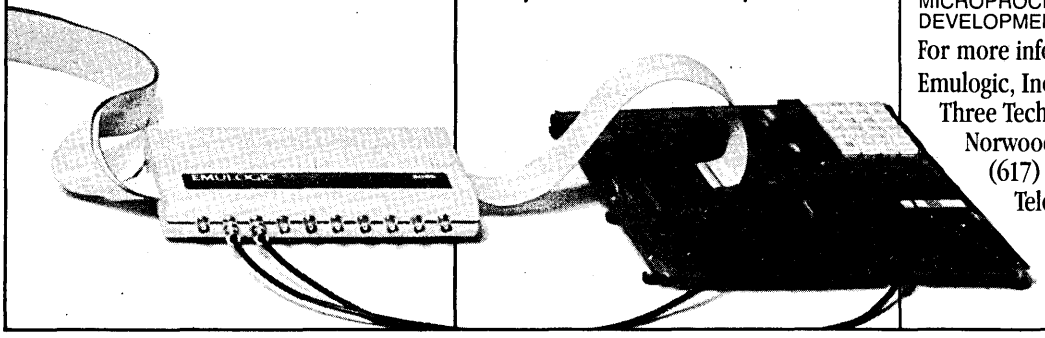
Linker. Linker converts relocatable object modules into run-time format, converts relative addresses to absolute addresses, and links global references.

Symbolic Debugger. A symbolic debugger is provided for each chip supported.

PROM Burner Utility. Providing for printing and editing of ROM MAP files, the PROM burner utility converts object code to a variety of formats for various PROM programmers.

Memory Disassembler. Included with each chip package, this utility displays disassembled instructions as they appear in memory—a convenient tool for checking a patch or for reading a program from memory. The disassembled code can also be output to a printer.

Cross Compilers. PASCAL and "C" cross-compilers are available for several chip families.



EMULOGIC

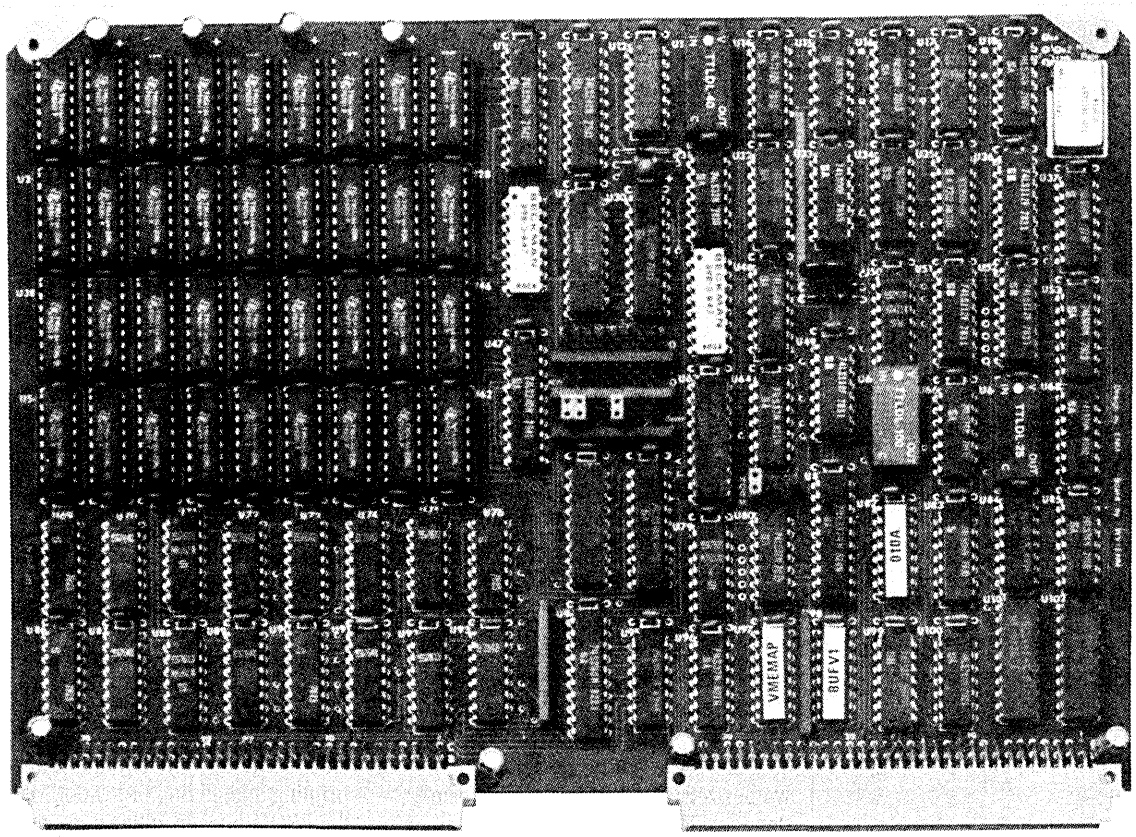
MICROPROCESSOR
DEVELOPMENT SYSTEMS

For more information, call or write to:

Emulogic, Inc.
Three Technology Way
Norwood, MA 02062
(617) 329-1031
Telex 710-336-5908

© IC MASTER 1983

For Key Data On Every IC On This Board, The Place To Look Is...



This Signetics Memory Module provides 256K bytes of dynamic random access memory, plus parity protection.

Equipment and system design often require the use of a wide variety of integrated circuits in order to obtain optimum performance. One way for an engineer to be certain that he hasn't overlooked the best device for his application is to refer to the pages of IC MASTER.

Surveys conducted by IC MASTER, integrated circuit manufacturers, and independent research agencies confirm that four out of five IC MASTER users have specified one or more products as the result of using IC MASTER.

Device No.	Description
74LS00	Quadruple 2-Input NAND Gate
74LS08	Quadruple 2-Input AND Gate
74LS04	Hex Inverter
74LS20	Dual 4-Input NAND Gate
74LS32	Quadruple 2-Input OR Gate
74LS37	Quadruple 2-Input NAND Buffer
74LS24	Schmitt Trigger
74LS74	Dual D-Type Edge-Triggered Flip-Flop
74LS132	Quadruple 2-Input Schmitt Trigger
74LS112	Dual J-K Edge-Triggered Flip-Flop
74LS10	Triple-3-Input NAND Gate
74LS244	Octal Buffer/Line Driver
74LS645	Octal Bus Transceiver
AM25LS2521	8-Bit Equal-to Comparator
74S38	AND/NAND Gate
N7411	Triple-3-Input AND Gate
N74S40	Dual 4-Input NAND Buffer
TMS4164	64K Dynamic RAM
7641	512 x 8 PROM
7642	1K x 4 PROM

Representative list of ICs on Signetics SMVME3100 Memory Card. Key specifications for all of these ICs can be found in IC MASTER.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

16-Bit High-Speed Microprocessor Design Aids-Software

Device	Pkg Type	Features
Design Aids		
PEP 45 Prototyping Microcomputer	Board	• Prototyping Microcomputer — Stand-Alone Prototyping, Evaluation, and Programming Board — F9445 CPU — 8KB RAM — Up to 32KB ROM — External Memory Expansion to Address up to 132K Bytes — Cycle Time of 50 ns (24 MHz F9445) — Multibus Compatible (IEEE-796)
FS-I Development Station	Basic System	• Complete Microprocessor Software Development Station — FS-I CPU with 128KB Memory — Two 8-Inch Floppy Disk Drives (2MB) — CRT Terminal
	Options	• Multi-User Option • Memory Expansion Option to 4MB • I/O Option — Eight Asynchronous RS-232 Ports — One Synchronous Communications Port — One PROM Programmer Port — One Parallel DMA Port • EMUTRAC™ Option — Complete Emulation and Tracing System for F9445, F6800, and F3870 Microprocessor Families • Pascal, BASIC, MICROFORTRAN, Real-Time Executive
Software		
Operating Systems		• IMDOS with All Utilities — Multitasking, Interactive Multi-User Disk Operating System • REX — Multitasking Real-Time Executive
Compliers		• Pascal Complier • BASIC Interpreter • MICROFORTRAN Complier • F9445 Diagnostics • F9445 PEPBUG — Comprehensive Debugging Tool • F9445 Timer • EMUTRAC Control

™EMUTRAC is a trademark of Fairchild Camera and Instrument Corporation.

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

FS-I
Fairchild System-I

Microprocessor Product

Description

The Fairchild System-I (FS-I) is a versatile, multi-user development system designed to support software development and hardware prototyping for applications using Fairchild microprocessors, including the F8, F3870, F6800, F6809, F9445, F16000, and such upcoming microprocessors as the F9450.

Three principal versions of the FS-I are available: The FS-I Standard System, the FS-I Multi-User System, and the FS-I Entry-Level System. Numerous software and hardware options are available that operate under Fairchild's Interactive Multi-User Disk Operating System (IMDOS). The FS-I also supports the in-circuit emulation and tracing (EMUTRAC™) system for the F3870, the F6800, F6809, and the F9445 microprocessors.

Standard System

System features include:

- **CPU with 128K-Byte RAM and F9445 Instruction Set.**
- **A Winchester and a Double-Density Floppy Drive Provide Approximately 10M-Byte of Mass Storage.**
- **I/O Controller Board Provides Winchester/Floppy Disk Controller Interface.**
- **Nine Asynchronous Serial RS-232C Ports (Up to 19.2K Baud) Provide Support for CRT Terminal, Optional Letter-Quality Printer, Modem, and Other Serial Devices.**
- **One Synchronous Serial RS-232C Port (Up to 19.2K Baud) and Selectable Protocols, such as BISYNC, DDCMP, SDLC, and HDLC.**
- **PROM Programmer Port to Interface to the Optional Fairchild PROM Programmer Unit.**
- **Parallel Printer Port (Centronics-Compatible Interface).**
- **Programmable Real-Time Clock.**
- **One CRT Terminal.**
- **Single-User Version of IMDOS, System Processors, and System Utility Programs (see "System Software").**
- **BASIC Language Interpreter with Interface to Custom F9445 Assembly Language Programs.**
- **FS-I Diagnostic Programs.**
- **Provides Full Support for the F9445 and for the PEP 45 Microcomputer System.**
- **Hardware and Software Upgradable to Multi-User System.**
- **EMUTRAC Can Be Added to the Standard System.**

Multi-User System

System features include:

- **Fully Equipped for Four Timesharing Users (Expandable to Eight Simultaneous Users with Additional Terminals and Cables).**
- **A 16-Bit CPU with 128K-Byte RAM and F9445 Instruction Set.**
- **A Winchester and a Double-Density Floppy Drive Provide Approximately 10M-Byte of Mass Storage.**
- **Memory Management and Protection Unit (MMPU) Board with 384K Bytes of RAM (Gives the System 512K Words of RAM).**
- **I/O Controller Board Provides Winchester/Floppy Disk Controller Interface.**
- **Nine Asynchronous Serial RS-232C Ports (Up to 19.2K Baud) Provide Support for CRT Terminals, Optional Letter-Quality Printer, Modem, and Other Serial Devices.**
- **One Synchronous Serial RS-232C Port (Up to 19.2K Baud) and Selectable Protocols, such as BISYNC, DDCMP, SDLC, and HDLC.**
- **PROM Programmer Port to Interface to the Optional Fairchild PROM Programmer Unit.**
- **Parallel Printer Port (Centronics-Compatible Interface).**
- **Programmable Real-Time Clock.**
- **Four CRT Terminals.**
- **Multi-User Version of IMDOS, System Processors, and System Utility Programs (see "System Software").**
- **BASIC Language Interpreter with Interface to Custom F9445 Assembly Language Programs.**
- **FS-I Diagnostic Programs.**
- **Provides Full Support for the F9445 and for the PEP 45 Microcomputer System.**
- **EMUTRAC Can Easily Be Added to the Multi-User System.**

Entry-Level System

System features include:

- **A 16-Bit CPU with 128K-Byte RAM and F9445 Instruction Set.**
- **Two Double-Density Floppy Disk Drives Provide Approximately 1M-Byte of Mass Storage.**
- **I/O Controller Board Provides Floppy Disk Controller Interface.**
- **Nine Asynchronous Serial RS-232C Ports (Up to 19.2K Baud) Provide Support for CRT Terminal, Optional Letter-Quality Printer, Modem, and Other Serial Devices.**

™ EMUTRAC is a trademark of Fairchild Camera and Instrument Corp.

© IC MASTER 1983

- One Synchronous Serial RS-232C Port (Up to 19.2K Baud) and Selectable Protocols, such as BISYNC, DDCMP, SDLC, and HDLC.
- PROM Programmer Port to Interface to the Optional Fairchild PROM Programmer Unit.
- Parallel Printer Port (Centronics-Compatible Interface).
- Programmable Real-Time Clock.
- One CRT Terminal.
- Single-User Version of IMDOS, System Processors, and System Utility Programs (see "System Software").
- BASIC Language Interpreter with Interface to Custom F9445 Assembly Language Programs.
- FS-I Diagnostic Programs.
- Full Support for the F9445 and for the PEP 45 Microcomputer System.
- Hardware and Software Factory-Upgradeable to Standard or Multi-User System.
- EMUTRAC and MMPU Can Be Added to System.

System Hardware

The hardware comprising the FS-I development system is housed in a single enclosure that contains the mainframe CPU, I/O board, optional boards, and disk drives.

The mainframe consists of:

- Single-Board 16-Bit CPU with 128K Bytes of RAM, 4K-Byte PEPBUG45 PROMs for Bootstrapping the System, Real-Time Clock, an RS-232C-Compatible Port, and a Centronics-Parallel Compatible Port.
- Power Supplies.
- I/O Controller Board with the Following:
  - Eight Asynchronous Serial RS-232C Ports, with Four Ports Having Full Modem Control and All Ports Having Data Rate Selectable Up to 19.2K Baud, that Allow Timesharing by Up to Eight Concurrent Users on Systems Equipped with MMPU Board and Multi-User Operating System Software.
  - One Synchronous Serial RS-232C Port (Up to 19.2K Baud) and Selectable Protocols, such as BISYNC, DDCMP, SDLC, and HDLC.
  - A Parallel Data Channel Interface Compatible with Shugart Associates System Interface for Communicating with Disk Units.
  - 8-Bit Parallel Port to Interface with Optional Fairchild PROM Programmer.
- A Total of Nine Asynchronous Serial Ports (RS-232C-Compatible, DB25-Pin Female Connectors).
- One Parallel Printer Port (Centronics-Compatible Interface, DB25-Pin Connector).
- Expansion Slots for Fairchild's Optional I/O Controller Boards, Optional EMUTRAC Controller Board, Memory Expansion Boards, MMPU Board, and Industry-Standard, Nova® I/O-Compatible Interface Boards.
- Depending Upon System Configuration, the Mainframe Contains a Single 10M-Byte Winchester and a Single 0.5M-Byte Double-Density Floppy Disk Drive or Two 0.5M-Byte Double-Density Floppy Disk Drives.

The MMPU board expands the physical address space of the FS-I to 4M words by performing logical-to-physical address translation. This board is required for multi-user system software. With its 384K bytes of RAM, the MMPU board extends the FS-I memory to 256K words.

Hardware Options

The FS-I systems support the following Fairchild-supplied hardware options:

- Additional I/O Controller Boards that Provide Asynchronous RS-232C Ports (Up to 19.2K Baud) in Sets of Eight, a Synchronous RS-232C Port for each I/O Controller Board, Data Channel Interface to Disk Units, and a PROM Programmer Port for each I/O Controller Board.
- Fairchild's PROM Programmer Unit.
- MMPU Board that Provides Memory Mapping and Protection Expansion in Increments of 384K Bytes, Optional Multi-User Software Allows the MMPU Board to Support Eight Simultaneous Users.
- Memory Expansion Board that Provides 384K Bytes of Additional RAM (Requires an MMPU Board in the Chassis).
- EMUTRAC System Controller Board that Provides the Hardware Interface Between the CPU Board in the FS-I and Processor-Specific EMUTRAC Modules.
- EMUTRAC Modules and EMUTRAC Control Software that Support the F3870, the F6800, the F6809, and the F9445 Microprocessors.
- Additional CRT Terminals.
- Dot Matrix Printer—Texas Instruments Model 810 Basic RO Terminal (150 CPS), Centronics Parallel Interface, and Cable.
- Daisywheel Letter-Quality Printer—Qume Model Sprint 9145 with Bidirectional Forms Tractor (45 CPS), Serial Interface, and Cable.

® Nova is a registered trademark of Data General Corp.

© IC MASTER 1983

System Software

The interactive multi-user disk operating system (IMDOS) is the principal operating system for the FS-I. In addition to being an operating system, the IMDOS includes the following features that are useful for developing F9445-based systems:

IMDOS	Single-User Supervisor—The supervisor manages the FS-I resources and controls the I/O. Multi-User Supervisor—The supervisor manages the FS-I resources for up to eight simultaneous users, controls the I/O, and interfaces transparently to the MMPU board (included only with the multi-user system). Executive—The executive provides the command language interface between the user and the supervisor.
EDIT	The EDIT program provides the ability to create and modify text files.
MACRO	The MACRO program is the macroassembler for F9445 macro assembly language.
RELOAD	The RELOAD program is used to link relocatable macro assembly language programs to create executable F9445 absolute assembly language programs.
PEPBUG-45	The PEPBUG-45 program is a virtual console and debugging tool for F9445 absolute assembly language programs. The PEPBUG-45 program is also available in PROM.
PEPLINK	Provides capability to download programs from the FS-I to PROM or RAM on the PEP38, PEP45, and PEP68 microcomputer systems.
Utility Library	Implements the utility functions listed in the IMDOS and utility library users guides.
PHONE	The PHONE program establishes communication between the FS-I and a modem or telephone line. Software switches govern communication protocols.
SCRIPT	The SCRIPT program processes a text file that contains SCRIPT commands to produce an aesthetically pleasing document.
TYPESET	The TYPESET program processes a text file that contains TYPESET commands to produce an aesthetically pleasing document.
TESTS	A series of programs that test the FS-I hardware. The diagnostic programs are available on diskette in a version suitable for downloading to an F9445-based system.
BASIC	Language interpreter with interface to custom F9445 assembly language programs.

This powerful software package, which is included with the standard, multi-user, and entry-level systems, offers advanced capabilities that the user would normally expect from a much larger system, such as:

- **Multi-User Timesharing**
- **System Executive, Including File Management System with Version Numbers for Automatic Backup**
- **Memory Management and Protection by Memory Mapping**
- **Password Protection**
- **Interactive Command Language and Command Files**
- **Multiple Directory Devices**
- **Device-Independent I/O**
- **Hard Disk, Magnetic Tape, Modem, and Real-Time Clock Support**
- **Documentation Aids**
- **Concurrent Processing and Spooling**

© IC MASTER 1983

Software Options

F9445 MICROFORTRAN	An extended subset of FORTRAN66 that interfaces with custom F9445 assembly language subroutines. MICROFORTRAN produces "ROMable" F9445 code and can be operated under the real-time executive (REX).
F9445 PASCAL	A Jensen and Wirth-compatible PASCAL. The F9445 PASCAL compiler generates F9445 code and interfaces with custom F9445 assembly language subroutines.
FS-I/PEP 38 System Software	Includes F8/F3870 cross assembler and program for downloading to the PEP 38 system.
FS-I/PEP 68 System Software	Includes F6800 cross assembler, F6809 cross assembler, F6800-to-F6809 translator program, and program for downloading to the PEP 68 system.
F16000 Cross Software	Assembler, debugger, and downloader allow the FS-I to generate 16000 code that can be downloaded to an F16000-based system.
F9445 REX	A real-time executive for F9445-based systems. The REX system allows creation of custom REX programs, linkable using RELOAD.
F9445 PEPBASIC	A diskette version of PEPBASIC (supplied on PROM with the PEP 45 system). A 2K-word subset of BASIC, which accepts abbreviations, that is extendable with custom F9445 assembly language subroutines.
EMUTRAC Control Software	Optional EMUTRAC control software packages provide support for each processor-specific EMUTRAC module.

In addition, all Fairchild software for the FS-I is independently available without system purchase under an appropriate software license agreement.

Dimensions and Power Requirements

The FS-I standard mainframe enclosure measures only 26 inches long by 19 inches wide by 13 inches high. It requires a 115 V, 60 Hz ac power source. A 50 Hz system is also available.

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

PEP-45
Prototyping, Evaluation and Programming Board

Microprocessor Product

Description

The Fairchild PEP-45 is a single-board microcomputer for Prototyping, Evaluation, and Programming of microprocessor-based system applications using the F9445 microprocessor. When used with the Fairchild System-I (FS-I) development system, the PEP-45 board provides capability for executing and debugging software directly on the F9445 microprocessor.

- **Stand-alone Prototyping, Evaluation, and Programming Board.**
- **Provides a Powerful Development Tool to Support F9445 Microprocessor-based System Development.**
- **Utilizes All the Advantages of the F9445 Microprocessor, with Its Powerful Instruction Set and High Throughput.**
- **Memory Options for Bipolar and NMOS Memories.**
- **Interfaces with IEEE 796 Standard Bus.**
- **Buffered F9445 bus.**
- **On-board EPROM Programmer.**
- **Adapts to 16K or 32K Byte EPROMs or 64K Byte Masked ROMs.**
- **Standard- and High-Speed RAM Options.**
- **Console Commands.**
- **Two Serial I/O Ports.**
- **16-Bit Parallel Input/Output.**
- **Four Interrupt Sources.**
- **Five Status Lines.**
- **On-board +12 V and +25 V Voltage Converter.**
- **Requires Single +5 V Power Supply.**

The PEP-45 board is primarily intended for use in hardware prototyping and software development applications. It may also be tied to a host computer, such as the FS-I, for large program editing, assembling/compiling, and general file storage and handling. Cross-assembler software packages are available for creating machine-executable programs in formatted form. These programs may be down-loaded from the host computer system into the PEP-45 board via one of the two serial I/O channels. Since the PEP-45 board can operate in a transparent fashion, it may be placed in-line between the user's in-house terminal and the host computer, giving the PEP-45 the power of the host.

Also useful for incoming inspector of F9445 parts and as a microcomputer training tool, the PEP-45 interacts with the user at the control terminal, with prompts that assist programming. The control terminal may be a video terminal, printer terminal, or from a microcomputer control console.

Software Support

In addition to serving as an efficient stand-alone evaluation module, the PEP-45 is designed to operate as a key module of the FS-I development system. A PEPLINK utility transparently couples the FS-I video terminal to the PEP-45 board.

A powerful PROM-based PEPBUG debugging monitor provides commands for trouble-shooting assembly language programs and for developing and testing peripheral circuits and custom interfaces. A PROM-based PEPBASIC language allows programming in a high-level language.

Hardware Specifications

Microprocessor	
CPU	F9445
Data word size	16 bits
Instruction word size	16 bits
Address capability	128K bytes
Console controller	F9470
Memory	
RAM	8K bytes (4K words) static RAM (or optional high-speed RAM)
ROM	Eight sockets for 16K bytes of F2716 EPROMs (8K words), or up to 32K bytes using F2732 EPROMs (16K words), or masked 64K byte ROMs using F3564
Expansion	External memory in any combination of RAM or ROM up to 64K bytes maximum (in 16-bit-wide only)
Input/Output	
Parallel I/O	Two TTL-compatible, 16-bit I/O ports (one input, one output)
Serial I/O	Two programmable, asynchronous channels, with RS-232 interfaces. Each channel is software-selectable to a baud rate of 110, 300, 1200, 1800, 2400, or 4800 baud
Real-Time Clock	Continuously selectable real-time clock interrupts from approximately 200 μs to 200 ms

© IC MASTER 1983

System Buses

Dual backplane buses	PI — An 86-pin asynchronous system bus compatible with standard Multibus 16-bit slave boards and multi-master option
	P2 — A 60-pin buffered F9445 bus that allows complete expansion of processor capabilities and faster operating speeds
I/O buses	J1 — A 9-pin RS-232C serial I/O interface for control terminal
	J2 — A 9-pin RS-232C second serial I/O interface for a serial printer or a host computer
	P3 — A 40-pin applications connector with two parallel I/O ports (one input and one output), and with status and control bits. May be used for connection to the microcomputer control console or to a high-speed parallel printer (Centronics-type)
Connectors	P1 — An 86-contact, double-sided edge connector on 0.156″ centers
	P2 — A 60-contact, double-sided edge connector on 0.100″ centers
	J1, J2 — 9-pin, D-type subminiature right-angle connectors
	P3 — A 40-pin, double-sided edge connector on 0.100" centers.

Power Supply Requirements[1]	+5 V ±5% at 3.5 A (typ)
Environmental Requirements	
Temperature	0°C to +50°C
Humidity	0% to 90% (noncondensing)
Physical Envelope Dimensions[2]	
Height	10.0 (254)
Length	12.0 (305)
Thickness	0.75 (19.05)
Weight	17 oz. (approximately)

Notes
1. Power may be applied to the board either through the card-edge backplane connector or by connection of discrete wires to the board.
2. All dimensions are in inches and millimeters (in parentheses).

Fairchild cannot assume responsibility for use of any circuitry described other than circuitry embodied in a Fairchild product.

Fairchild reserves the right to make changes in the circuitry or specifications at any time without notice.

© IC MASTER 1983

FAIRCHILD
A Schlumberger Company

PEP 68 System Single-Board Microcomputer Development System

Microprocessor Product

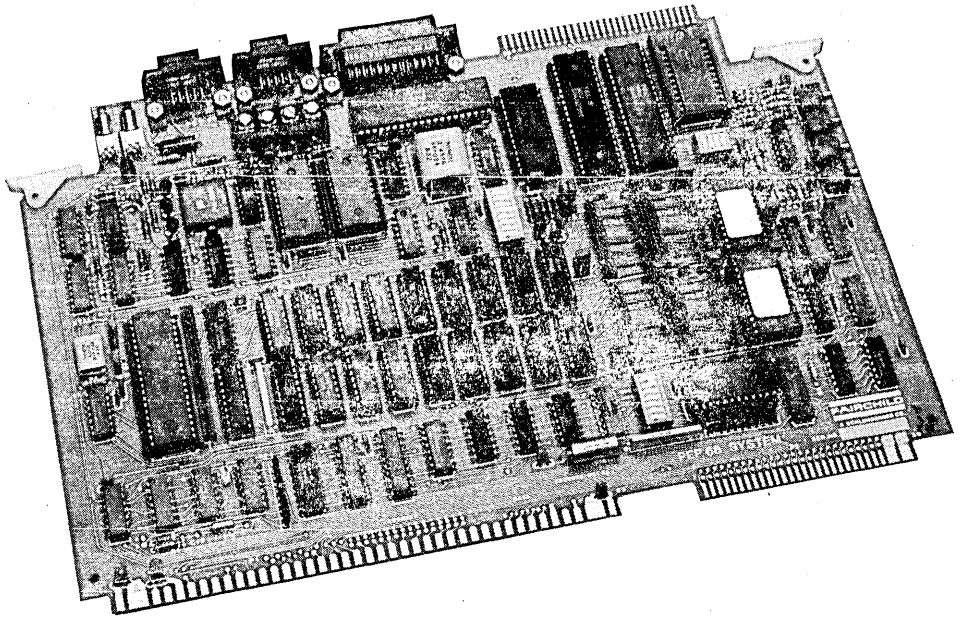
Description

The PEP 68 System is a single-board microcomputer specifically designed to aid microprocessor hardware/software designers in designing, prototyping, and debugging their 6802-, 6808-, or 6809-based system. A powerful, ROM-based debugging monitor provides commands for trouble-shooting machine-language programs. Other monitor commands provide for easy development and testing of peripheral circuits and custom interfaces. The monitor includes a full complement of utility routines to make the hardware/software/firmware design cycles as easy as possible.

The PEP 68 System is useful as a microcomputer training tool. Its friendly interaction with the user at the control terminal, through its liberal use of prompting, makes procedures easy to learn for the beginner. The system can be operated using only a serial display terminal and a power supply.

Since the system possesses two separate bus connectors, expansion with external memory or peripheral boards is simply a matter of providing a backplane connection. Thus, the PEP 68 System can act as a *bus master* in a multicard system.

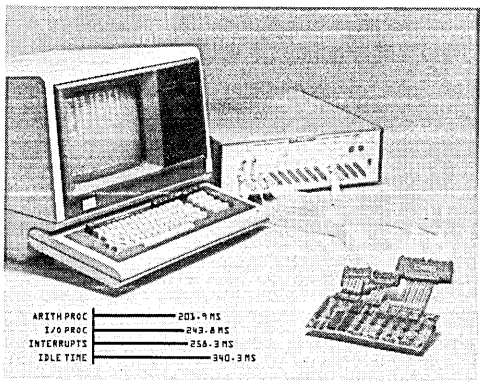
- Single-Board, Stand-Alone System
- Processor Options—6802, 6808, or 6809
- Asynchronous Multibus* Compatible
- Auxiliary Synchronous 680X Bus
- Programming Socket for 2716 or 2732 EPROMs
- 8K-Byte System Monitor in ROM
- 9K Bytes of Static RAM—8K User, 1K System (Write-Protectable Segments)
- Six Sockets for User-Supplied ROM/EPROM (2K, 4K, or 8K Types)
- Sixteen Possible Memory Map Configurations (Switch-Selectable)
- Two High-Speed Audio Cassette Tape Interfaces
- Two Independent Serial I/O Channels—RS-232-C
- Independent Baud Rate Selection—50 Through 19.2K bps
- Connector for Parallel Printer (Centronics Type)
- Six 8-Bit Parallel I/O Ports Plus Controls
- Three Programmable 16-Bit Binary Timers
- +5 Volt-Only Operation



*Multibus is a trademark of Intel Corporation.

© IC MASTER 1983

MICROPROGRAMMING?
. . . THAT'S THE HILEVEL LANGUAGE!



HILEVEL builds two powerful development systems for your work. Both are configurable for all of today's hardware implementations, PROM-BASED or RAM-BASED.

Microcode development is demanding work. Wide words, high speeds, and complex micro-instructions make test and debug a challenge. So, designers must have the best tools for development.

Because firmware fine-tuners need excellent visibility of target activity, HILEVEL introduced the 80-bit 4K deep real-time TRACE. Now, with 16-level conditional triggering and 8 independent patterns per level, plus selective snapshot, visibility at full clock rate gets even better.

Virtual In-Circuit Emulation lets you see registers, flags. . .the total status of all your processor chips, instantly. Whatever your architecture.

The newest HILEVEL development system for microcode is the multi-station DS570 shown. It has all features of the downloaded DS270, expands many, and adds assembly in 440K and a 10 megabyte hard disk, supporting the UNIX* multi-user operating system.

The DS570's performance-analysis histogram feature allows you to define 16 tasks, then run tests to measure the efficiency of your design.

Affordable at any configuration level, the DS570 grows to 4 DS270-like emulation stations (rear of photo) plus 8 UNIX* terminals, menus, Help, PASCAL, e, and FORTRAN. HILEVEL's columns in the Master Selection Guide show more features.

*UNIX is a trademark of Bell Laboratories.

Speeding the development of microprogrammed processors from SSI/MSI to bit-slice to gate arrays, the HILEVEL EMULYZERS™ contain:

MACRO-ASSEMBLER
- 8 to 256 bit microword
- 160K to 440K user space

WRITABLE CONTROL STORE
- 16 to 256 bits
- 1K to 65K words
- 20 ns to 120 ns
- Multiple arrays

TARGET CONTROL
Halt ■ Run ■ Clear
Goto ■ Force ■ Jam

LOGIC STATE ANALYZER
Unlimited Breakpoints ■ Selective Trace
Change While Run ■ Data-Pattern Breaks

DS270 NEW DS570

HILEVEL TECHNOLOGY INC. 18902 BARDEN WAY, IRVINE, CALIFORNIA 92715 • PHONE (714) 752-5215

AUSTRIA (0222) 235555
BENELUX (040) 533725
FRANCE (03) 956.81.31
GERMANY (089) 852063
ISRAEL (03) 483-2115
ITALY (02) 498-2451
JAPAN (03) 279-0771
SWEDEN (08) 7390045
SWITZERLAND (01) 7241410
TAIWAN (02) 7699945
U.K.(0851)837187

© IC MASTER 1983

ARROW ELECTRONICS, INC.
ELECTRONICS DISTRIBUTION DIVISION

900 BROAD HOLLOW ROAD
FARMINGDALE, NEW YORK 11735

516/694/6800
510/224/6126—TWX

Computer Products

components/board level systems/development systems/terminals/ computer peripherals

Arrow is your source for computer products, stocking a complete line of 8 & 16 bit processors, disc drives, terminals, printers, modems and media from the world's leading manufacturers. We can assist you with your design or show you the latest in technology at any of our local computer products demonstration centers.

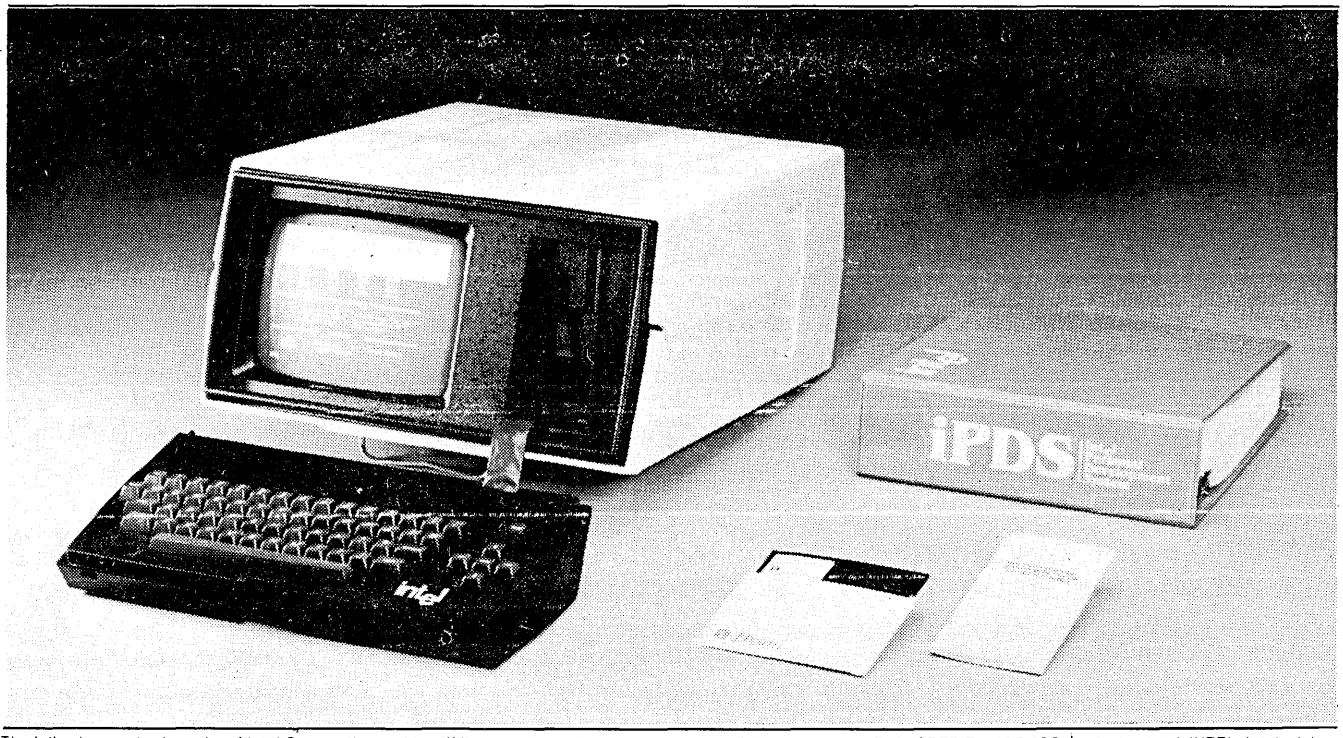
Computers	☐ TeleVideo	single and multiuser desk top computers, CP/M based operating system (MmmOST)
Software	☐ MicroPro	Wordstar™, Datastar™, Mailmerge™, Spellstar™, Supersort™
Development systems and processors supported	☐ AMD system 8, system 29	2900, 8048, 8080, 8085, Z80, Z8000
	☐ AMI Phoenix I, II, III	6800, 2000, 9900
	☐ Intel MDS series II, III	2920, 8048, 8051, 8085, 8086, 8088, 8089
	☐ Mostek matrix system	F8/3870, Z80
	☐ RCA COSMAC series	1800
	☐ Texas Instruments AMPL	9900, 9980, TMS1000
Board level computer products	☐ AMD	Multibus® compatible family of 8 and 16 bit products
	☐ Analog Devices	A/D boards compatible with DEC, TI, Intel, and Motorola single board computers
	☐ Intel	8 and 16 bit Multibus® boards, industrial packaging and packaged systems
	☐ Intersil	STD BUS and RemDAC boards
	☐ Mostek	MDX series Z80 STD BUS micro boards
	☐ RCA	CMOS based battery operable micro boards and packaged systems
	☐ Texas Instruments	TM990 16 bit family with speech board
Terminals	☐ ADDS	Viewpoint Terminals
	☐ Arrow•ACS/2200	WANG 2236 emulation
	☐ IBM	3101/212 and 3101 ASCII Terminals with and without autoanswer/autodial
	☐ TeleVideo	CRT Terminals with and without autoanswer/autodial
	☐ Texas Instruments	Omni 800® series
Printers	☐ Dataproducts	matrix, band and solid font printers
	☐ NEC Information Systems Printer Products	letter quality printers
	☐ Texas Instruments	Omni 800® series
Disk Drives	☐ Control Data	5¼, 8" flexible disk drives IBM and Shugart compatible 8" Winchester
	☐ Quantum	8" Winchester
	☐ Seagate Technology	5¼ micro-Winchester
Disk Controllers	☐ Data Technology	multidrive controllers and bus interfaces (Intel, LSI-11, TI, S-100, Motorola STD)
	☐ OMTI	controllers
Add-in memory boards	☐ Intel	compatible with DEC, DG
	☐ Texas Instruments	compatible with DEC, Multibus®
Media	☐ Control Data	flexible diskettes, hard disk packs and cartridges
	☐ Verbatim	flexible diskettes, casette tapes, cartridge tapes
Modems	☐ Prentice	acoustic data couplers, direct connect modems

© IC MASTER 1983

iPDS™
PERSONAL DEVELOPMENT SYSTEM

- Completely integrated computer system packaged in a compact rugged enclosure for portability
- Comprehensive design tool for 8 bit Intel microprocessors
- Microprocessor Emulator (EMV) functions
- Dual processing capability
- Expandable using standard Multimodule™ cards
- Desk top computer for CP/M* based applications
- 640 K byte Integral flexible disk drive; expandable to 1.28 million bytes
- Powerful ISIS-PDS disk operating system with relocating macro-assembler, and CRT-based editor
- Optional high level languages Fortran 80,PL/M 80, PL/M 88/86 and Basic
- Software compatible with previous Intellec systems
- PROM programming functions
- Bubble Memory option.

The iPDS Development System is a completely integrated computer system supporting the development of products incorporating Intel 8 bit microprocessors or microcontrollers. Used with its optional emulation vehicles (EMVs) and iUP PROM Programming Personality Modules, the iPDS system provides comprehensive support for integrated hardware and software development, product testing during manufacture, and customer support after the product is in the field. The unit is designed with portability in mind permitting the iPDS Development System to be conveniently transported around the laboratory and into the field. Extensive software is available thereby simplifying and speeding up product development. The software is designed to make the iPDS system easy to use for the novice as well as satisfying the needs of the experienced user. Used with the optional CP/M operating system, the iPDS system becomes a desk top computer that can execute CP/M compatible application programs.



The following are trademarks of Intel Corporation and its affiliates and may be used only to identify Intel products: BXP, CREDIT, i, ICE, ICS, ¹m, Insite, Int$_e$l, INTEL, Intelevision, Intellec, iPDS, iSBC, iSBX, Library Manager, MCS, MAIN MULTIMODULE, Megachassis, Microamp, MULTIBUS, Plug-A-Bubble, PROMPT, Promware, RMX, UPI, μScope, System 2000, Micromainframe, and the combination of MCS, ICE, iSBC, iRMX or iCS and a numerical suffix. Intel Corporation Assumes No Responsibility for the use of Any Circuitry Other Than Circuitry Embodied in an Intel Product. No Other Patent Licenses are Implied.

AUGUST 1982
Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051 © Intel Corporation, 1982
Order Number: 210390-002
AFN-02220B

iUP-200/iUP-201 UNIVERSAL PROM PROGRAMMERS

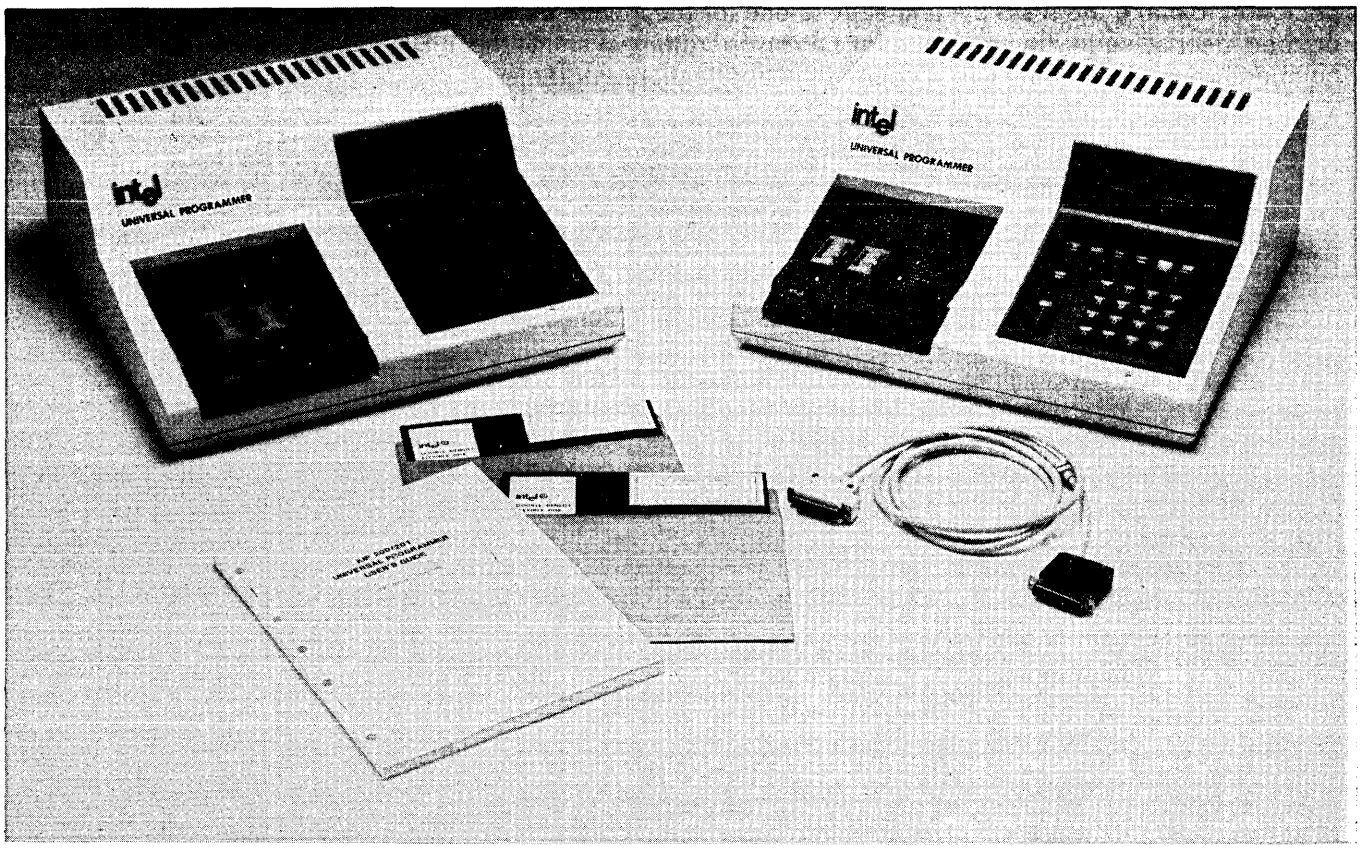
MAJOR iUP-200/iUP-201 FEATURES:

- Serial interface to all INTELLEC® - Development Systems
- Powerful PROM Programming Software utility (iPPS)
- Support for all Intel PROM families through multiple device Personality Modules
- iUP system self-tests plus device integrity checks

ADDITIONAL iUP-201 FEATURES:

- 24-character alpha-numeric display
- Full hexadecimal plus 11-function keypads
- Off-line editing and device duplication
- 16K bytes RAM expandable to 32K bytes

The iUP-200 and iUP-201 Universal Prom Programmers provide programming and verification of data in all the Intel programmable ROMs (PROMs). They can also be used for programming the PROM memory portions of Intel's single-chip microcomputer and peripheral devices. When used with any INTELLEC Development System, the iUP-200 and iUP-201 provide on-line programming and verification with the aid of the Intel PROM Programming Software utility (iPPS). In addition, the iUP-201 supports off-line, stand-alone, program editing and PROM duplication. The iUP-200 is completely expandable to the iUP-201.



The following are trademarks of Intel Corporation and may be used only to describe Intel products: Intel, Intellec, MCS and ICE, and the combination of MCS or ICE and a numerical suffix. Intel Corporation assumes no responsibility for the use of any circuitry other than circuitry embodied in an Intel product. No other circuit patent licenses are implied.

Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051 © Intel Corporation, 1982
AFN-02138A

December 1981
210319

© IC MASTER 1983

NETWORK DEVELOPMENT SYSTEM II (NDS-II)

NDS-II is a network of development systems which share public resources provided by a Network Resource Manager (NRM). The NRM and workstations are connected using 10Mbit/s Ethernet* technology. All existing Intel development systems can be upgraded to be NDS-II workstations.

The NRM provides:

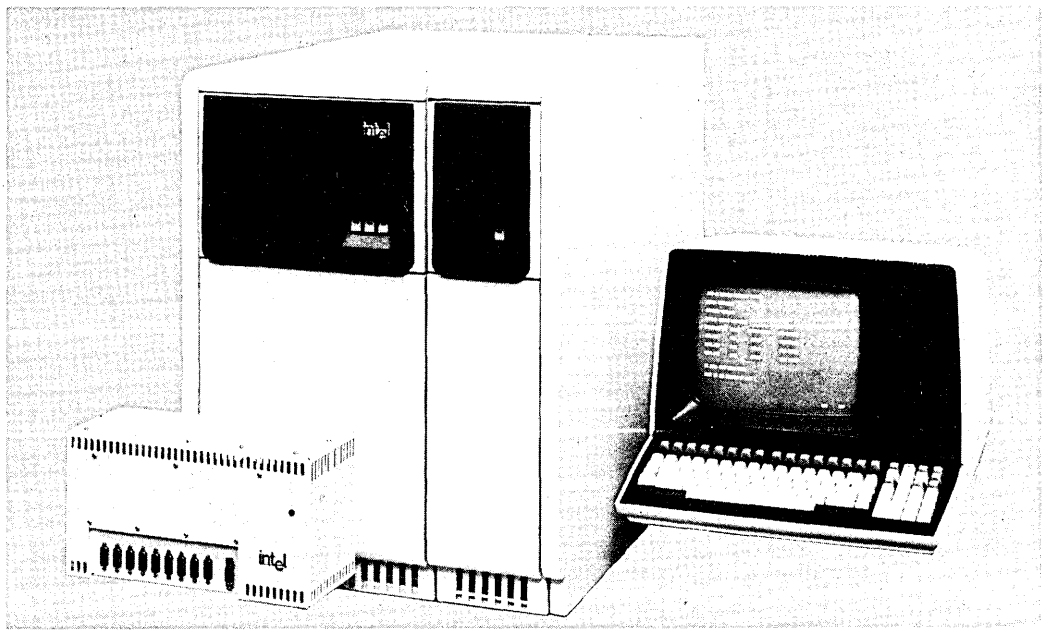
- **Central Mass Storage Using Winchester Technology and Existing Model 740 Cartridge Disks**
- **A Spooled Line Printer Interface Shared Among All Workstations**
- **A Protected Hierarchical File System**
- **Job Queues That Allow Network Users to Export Jobs to Available Network Station Resources**
- **Support for All Existing Intellec® Development Systems to be used as Workstations: Intellec® Model 800, Series II and Series III Systems**

The network provides the ideal environment for microcomputer development, hosting software and hardware engineering tools. The tools are designed to efficiently accomplish the following tasks:

- **Program Creation and Compilation**
- **High-Level Language Debugging**
- **Software Version Control**
- **Management of Software Generation**
- **Hardware/Software Integration**
- **Debugging of Software Running in User Designed Systems**

The entire spectrum of Intel microcomputer architectures is supported by a complete range of tools: languages, debuggers, in-circuit emulators, PROM programmers, and system tools.

*Ethernet is a trademark of Xerox Corporation.



The following are trademarks of Intel Corporation and its affiliates and may be used only to identify Intel products BXP, CREDIT, i, ICE, ICS, I^2m, Insite, $Int_e l$, INTEL, intelevision, Intellec, iSBC, iSBX, Library Manager, MCS, MAIN MULTIMODULE, Megachassis, Micromap, MULTIBUS, Plug-A-Bubble, PROMPT, Promware, RMX, UPI, μScope, System 2000, Micromainframe, and the combination of MCS, ICE, iSBC, iRMX or iCX and a numerical suffix. Intel Corporation Assumes No Responsibility for the use of Any Circuitry Other Than Circuitry Embodied in an Intel Product. No Other Patent Licenses are Implied.

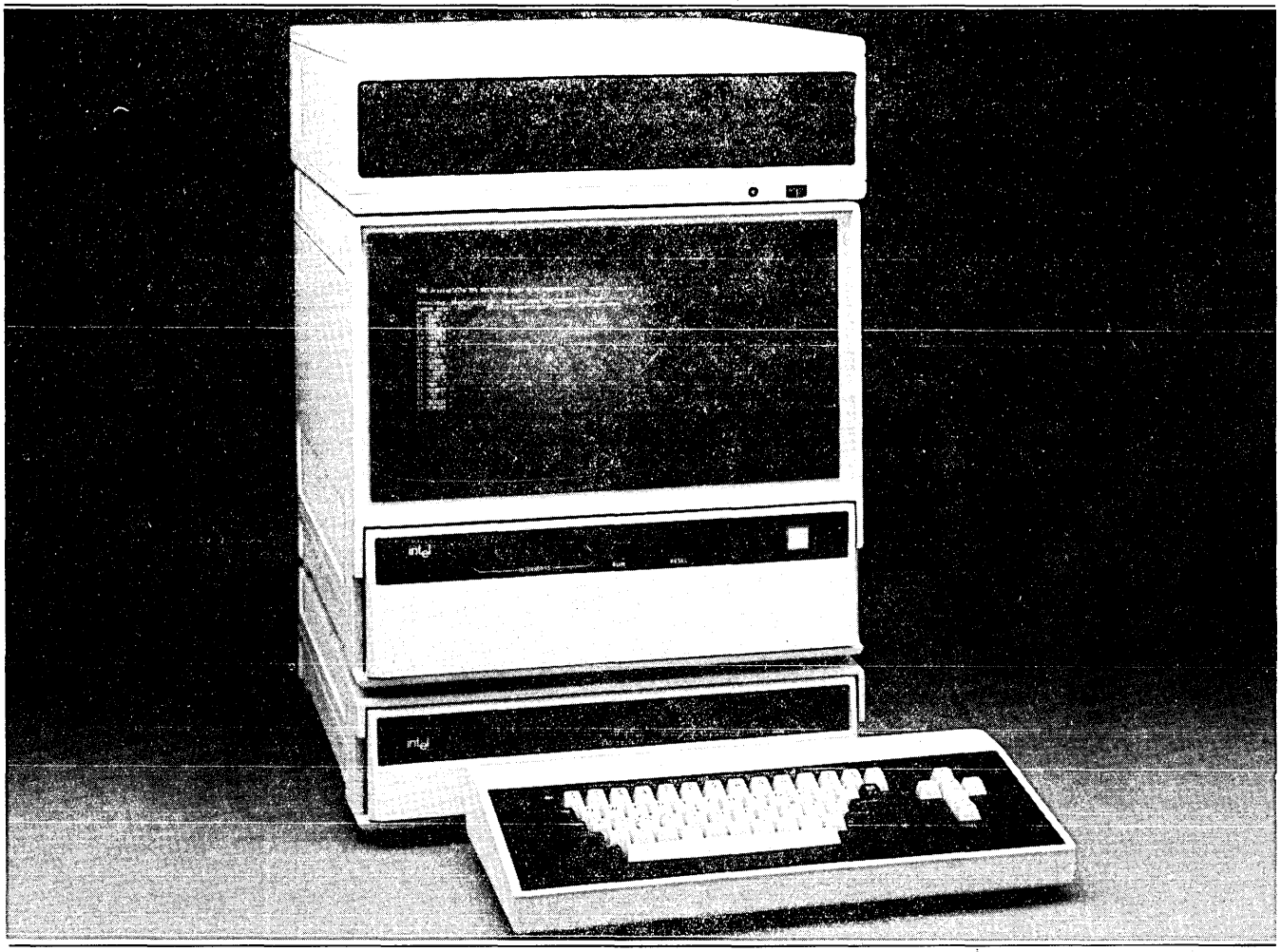
ORDER NUMBER: 210349-003
Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051 © Intel Corporation, 1982
SEPTEMBER 1982

© IC MASTER 1983

iMDX 225
INTELLEC® SERIES II/85
MICROCOMPUTER DEVELOPMENT SYSTEM

- Complete Microcomputer Development System for MCS®-86, MCS®-85, MCS®-80, and MCS®-48 Microprocessor Families
- "Soft Key" Keyboard
- High Performance 8085A-2 CPU, 64K bytes RAM Memory, and 4K bytes ROM Memory
- Command Line Recall, Edit, and Repeat
- Self-test Diagnostic Capability
- Enhanced Operator "Useability"
- Built-in Interfaces for High Speed Paper Tape Reader/Punch, Printer, and Universal PROM Programmer
- Integral 250K byte Floppy Disk Drive with Total Storage Capacity Expandable to Over 2M Bytes of Floppy Disk Storage and 22M Bytes of Hard Disk Storage
- Powerful ISIS-II Disk Operating System with Relocating Macroassembler, Linker, Locater, and CRT-based CREDIT™ Editor
- Supports PL/M, FORTRAN, BASIC, PASCAL and COBOL High Level Languages
- Software Compatible with Previous Intellec® Systems
- Fully Integrated into the NDS-II Network Development System
- iPDS™-FTRANS Option Enables File Transfer Between iPDS™ and Any Intellec® Development System

iMDX-225 Enhanced Series II Development System with iMDX-201 Expansion Chassis and iMDX-720 Flexible Disk System.



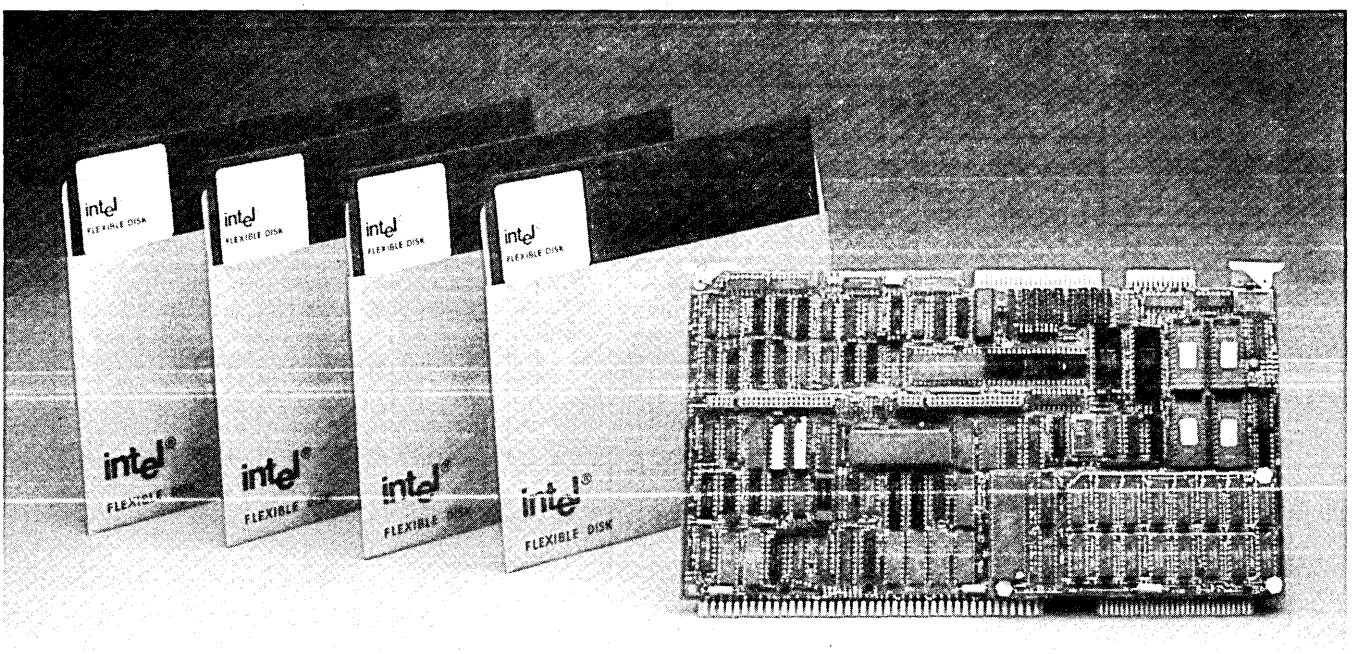
The following are trademarks of Intel Corporation and its affiliates and may be used only to identify Intel products: BXP, CREDIT, i, ICE, ICS, ^{i}m, Insite, Int$_{e}$l, INTEL, Intelevision, Intellink, Intellec, iMMX, iOSP, iPDS, iRMX, iSBC, iSBX, Library Manager, MCS, MULTIMODULE, Megachassis, Micromainframe, MULTIBUS, Multichannel, Plug-A-Bubble, PROMPT, Promware, RUPI, RMX/80, System 2000, UPI and the combination of iCS, iRMS, iSBC, iSBX, ICE, I^2ICE, MCS or UPI and a numerical suffix. Intel Corporation Assumes No Responsibility for the use of Any Circuitry Other Than Circuitry Embodied in an Intel Product. No Other Patent Licenses are Implied.
OCTOBER 1982
Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051 © Intel Corporation, 1982
ORDER NUMBER: 210533-001

© IC MASTER 1983

iMDX 557
iAPX Resident Processor Card Package

- **High-Performance 8086-Based CPU Board for Increased Intellec® Development System Performance and Improved iAPX 86/88 Development Environment**
- **Upgrades Intellec® Series II and Model 800 Microcomputer Development Systems to the Functionality of Series III Systems**
- **224K Bytes of User Program RAM Memory Available for iAPX 86/88 User Programs**
- **Software Applications Debugger for iAPX 86/88 User Programs**
- **Supports Full Range of iAPX 86/88-Resident, High-Level Languages: PL/M-86/88, PASCAL-86/88, and FORTRAN-86/88**
- **Includes iAPX 86/88-Resident Relocating Macro Assembler, Linker, Locator, and Librarian**
- **Dual Processor Disk Operating System Software with 16-bit ALTER™ Editor**
- **Supports PSCOPE™ Advanced 86/88 Software Debugger**

The iMDX 557 is a performance enhancement package for Intellec® Series II and Model 800 Development Systems, specifically designed for iAPX 86/88 microprocessor development. The iMDX 557 includes an iAPX-based CPU board with 256K RAM memory, CRT-based menu-driven editor, iAPX 86/88-Resident Relocating Macro Assembler, Linker, Locator and Librarian, software applications debugger for iAPX 86/88 user programs, and complete user documentation. The DX-557I kit includes an iMDX 557 plus an IPC-85.



The following are trademarks of Intel Corporation and its affiliates and may be used only to identify Intel products: BXP, CREDIT, i, iCE, iCS, im, Insite, Intel, INTEL, Intelevision, Intelink, Intellec, iMMX, iOSP, iPDS, iRMX, iSBC, iSBX, Library Manager, MCS, MULTIMODULE, Megachassis. Micromainframe, MULTIBUS, Multichannel, Plug-A-Bubble, PROMPT, Promware, RUPI, RMX/80, System 2000, UPI, and the combination iCS, iRMX, iSBC, iSBX, ICE, I²ICE, MCS, or UPI and numerical suffix. Intel Corporation Assumes No Responsibility for the use of Any Circuitry Other Than Circuitry Embodied in an Intel product. No Other Patent Licenses are implied.
Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051 © Intel Corporation, 1982
OCTOBER 1982
ORDER NUMBER: 210534-001

© IC MASTER 1983

PSCOPE
HIGH-LEVEL PROGRAM DEBUGGER

- **Source-Level Debugging for High Productivity**
- **Breakpoint, Single-Step and Execution Trace by Statement Numbers, Procedure Names and Labels**
- **High-Level Code Patching**
- **Operates with Intel's Next Family of In-Circuit Emulators for Target System Debugging**
- **Native CPU Execution for iAPX 88 and 86 Architectures**
- **Supports PL/M, Pascal, and FORTRAN Program Debugging**

PSCOPE is an interactive, symbolic debugger for high-level language programs. It allows users to scrutinize program execution at the source level, using high-level statement numbers, procedure and variable names and labels. This is typically a more productive way of debugging high-level language (HLL) programs than at the machine level.

Source-level debugging means that traditional functions, such as setting breakpoints or tracing execution flow, are more powerful in PSCOPE. For example, tracing procedure entry (or exit) points conveys much more information than tracing machine instructions. Single-step execution is more powerful, using statements and procedures, as well.

The productivity improvement from debugging in a high-level language is analogous to programming in a high-level language, when compared to assembly-level programming and debugging.

PSCOPE users may define high-level code patches, which are "compiled" and patched into the user's program. Code patches may be stored on disk, so they may be later incorporated into the program source file.

PSCOPE is an integral part of the advanced 12 MHz instrumentation product line (next generation of ICE). This allows a smooth migration from *program* debugging to *target system* debugging.

PSCOPE's symbol capacity is virtually unlimited. Symbols are paged to disk when necessary.

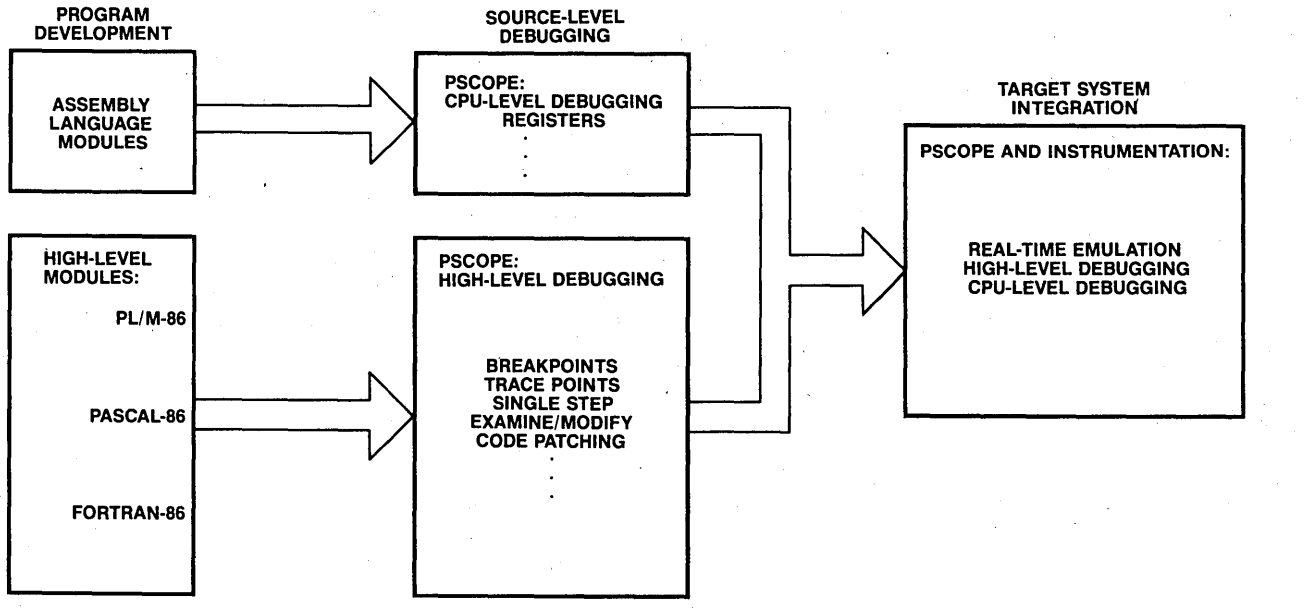


Figure 1. Debugging Methodology with PSCOPE

The following are trademarks of Intel Corporation and its affiliates and may be used only to identify Intel products: BXP, CREDIT, i, ICE, ICS, ²m, Insite, Int$_e$l, INTEL, Intelevision, Intellec, iSBC, iSBX, Library Manager, MCS, MAIN MULTIMODULE, Megachassis, Micromap, MULTIBUS, Plug-A-Bubble, PROMPT, Promware, RMX, UPI, μScope, System 2000, Micromainframe, and the combination of MCS, ICE, iSBC, iRMX or iCS and a numerical suffix. Intel Corporation Assumes No Responsibility for the use of Any Circuitry Other Than Circuitry Embodied in an Intel Product. No Other Patent Licenses are Implied.
APRIL 1982
Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051 © Intel Corporation, 1982
ORDER NUMBER: 210350-002

© IC MASTER 1983

PROGRAM MANAGEMENT TOOLS

- **Increases Time Available for Software Engineering**
- **Decreases the Overhead of Software Administration**
- **PMT's Let Users Control, Automate, and Examine the Evolution of a Software Project**
- **SVCS Maximizes Control of Program Changes and Versions of all Software Modules**
- **MAKE Saves Time by Automatically Generating New Releases of a Software System**
- **Enhances the Capability of Networked (NDS-II) and Standalone Development Systems**
- **Fits Easily Into Current Software Development Methodology, Using Existing Tools and Conventions.**

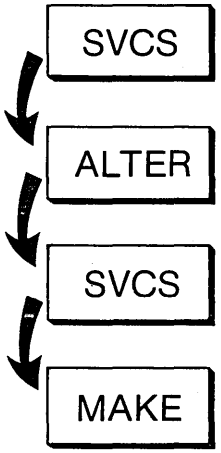
Intel's Program Management Tools provide the essential ingredient to manage large software development projects. By decreasing the time spent on tracking program changes and manually generating a new system, Intel PMT's give engineers more time for software design, development, and debugging.

This package consists of a "Software Version Control System" (SVCS), and an automated software generation facility (MAKE). These tools work together to control, examine, and automate the management of a software system containing many versions of hundreds of modules.

SVCS lets users track changes to source modules, showing who made a particular change, what changed, when it was made, and why. It also allows different versions and "flavors" of a module to be uniquely identified. This simplifies managing an application that is "customized" for different end users.

MAKE is used for generating new releases of a software system, using the latest versions of the various modules in the system. Only the modules that have been changed need to be recompiled and relinked; MAKE determines exactly what operations are to be performed, saving generation time.

Incorporating the PMT's into an existing project is easy. They work with the existing operating systems and software tools (editors, compilers, utilities), requiring very little relearning. The program management tools are ideal in a networked (NDS-II) environment, where multi-man software control is critical. (They fully utilize the protected, hierarchical file system.) The PMT's are extremely useful on standalone systems (with winchester disk) as well.



OPTIMAL CONTROL OF A SOFTWARE PROJECT.

The following are trademarks of Intel Corporation and its affiliates and may be used only to identify Intel products: BXP, CREDIT, i, ICE, iCS, im, Insite, Intel, INTEL, Intelevision, Intellec, iMMX, iOSP, iRMX, iSBC, iSBX, Library Manager, MCS, MULTIMODULE, Megachassis, Micromainframe, Micromap, MULTIBUS, Multichannel, Plug-A-Bubble, PROMPT, Promware, RMX/80, System 2000, UPI, and the combination of iCS, iRMX, iSBC, iSBX, ICE, MCS, or UPI and a numerical suffix. Intel Corporation Assumes No Responsibility for the use of Any Circuitry Other Than Circuitry Embodied in an Intel Product. No Other Patent Licenses are implied.
JULY 1982
Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051 © Intel Corporation, 1982
ORDER NUMBER: 210567-001

© IC MASTER 1983

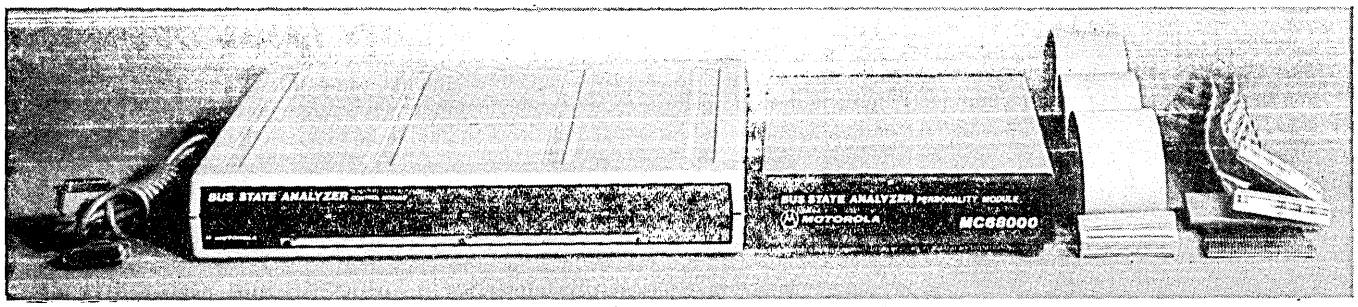
PRODUCT SUPPORT SUMMARY

TYPE	CPU	SUPPORT	
		Software Evaluation Development	Debug Tools
Analog	2920	ASM-2920, SPAS-20 Compiler	Software Simulator
Single-Chip	8048, 8049, 8020, 8021	ASM-48	ICE-49, HSE-49, EM1
	8022	ASM-48	ICE-22, EM2
	8041A	ASM-48	ICE-41A
	8051A	ASM-51, PL/M-51	ICE-51
8-bit	8080, 8085	ASM-80/85, PL/M, Pascal, Fortran, COBOL, Basic	ICE-80, ICE-85B Multi-ICE
	iAPX-88 (8088)	ASM-86/88, PL/M, Pascal, Fortran	ICE-88A, PSCOPE
	iAPX-88/11 (8088, 8089)	ASM-89	
	iAPX-88/20 (8088, 8087)		
	iAPX-88/21 (8088, 8087, 8089)		
16-bit	iAPX-86 (8086)	ASM-86, PL/M, Pascal, Fortran	ICE-86A, PSCOPE
	iAPX-86/11 (8086, 8089)	ASM-89	
	iAPX-86/20 (8086, 8087)		
	iAPX-86/21 (8086, 8087, 8089)		
	iAPX-186 (80186)	ASM-86, PL/M, Pascal, Fortran	ICE-186* PSCOPE
	iAPX-286 (80286)	ASM-86, PL/M, Pascal, Fortran	ICE-286*, PSCOPE

*Available late 1982

Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051 © Intel Corporation, 1982

© IC MASTER 1983



REAL-TIME BUS STATE ANALYZER

The Real-Time Bus State Analyzer (BSA) is a highly intelligent diagnostic tool that is designed specifically for use with microprocessors. It consists of a Control Module plus one of several "Personality Modules." The Control Module contains the analyzer hardware, control firmware, and I/O ports. The Personality Modules interface to selected MPU/MCU, EXORbus, or VERSAbus signals. The BSA stores data which appears on between 55 and 79 different lines.

In order to facilitate the gathering of pertinent data from the MPU/MCU or bus, a set of qualified triggering modes are provided. These modes can be broken into three categories: Continuous Trace Mode, Sequential Trigger Mode, and Window Trigger Mode.

CONTINUOUS TRACE MODE samples signals and stores signal information continuously on each occurrence of the clocking signal. It is primarily a default mode which the BSA automatically enters when power is first applied. There are no qualifications for the BSA to begin gathering information, so it will always be storing the signal states. This default mode is particularly useful when a sudden catastrophic failure occurs during a debugging session, before the user is able to configure the BSA. It is very likely that the events leading up to the failure will be stored in the BSA's trace store buffer.

SEQUENTIAL TRIGGER MODE requires that a series of events occur before the instrument triggers and starts to gather data; or conversely triggers and stops gathering data. Sequence Terms, as these events are called, must occur in order of specification, or triggering will not take place. A Sequence Reset Term can also be specified to reset the BSA and cause the instrument to begin looking for the Sequence Terms again. Sequential triggering will be most useful for debugging complex software, including loops, nested subroutines and complex branches.

WINDOW TRIGGER MODE provides a means of causing signal states to be stored if address accesses occur inside or outside of a particular address range. Both the upper and lower bounds of the range are programmable, and the size is variable from a single address to the full range of the memory map. Window triggering is useful for following programs that suddenly and unexpectedly leave the memory area in which they should be operating. It is also applicable for observing access violations in a multiple user environment.

SOFTWARE PERFORMANCE HISTOGRAMS are also provided to give an indication of the relative frequency of memory accesses within a particular memory range, with the exact range specified by the user. This histogram provides a means of determining where a program spends the greatest amount of time. The resulting information can then be used to compress inefficient code. A hardware performance histogram is provided to display the relative frequency of combinations of four user-selected signals within a user system.

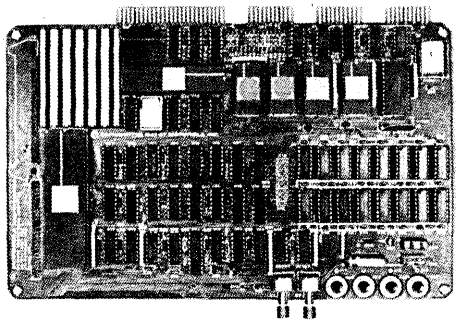
In order to service these triggering modes and provide a complete set of operating features, an MC6809 microprocessor is located on the Control Module with local intelligence running from an operating system based in ROM. This operating system provides the data analysis and formatting functions for the operator including the interface to the hardware sampling the bus.

To reduce system redundancy, the terminal used by the operator to communicate with the development system will also serve to link him to the intelligence aboard the analyzer (it is a requirement of the CRT-based analyzer operating system that the terminal used be an EXORterm 155 Display Console). This communication will be achieved by means of a phantom or transparent serial link feeding from the terminal through the Bus State Analyzer control board and then to the normal terminal input channel of the development system. The logic onboard the BSA determines whether the information traveling over the link is destined for the development system, the Bus State Analyzer or the terminal. This allows the operating system or the user's software to run in the development system while analysis is being performed. Additionally, a means is provided for the BSA to operate in a stand-alone mode with only a terminal connected.

Part Number	Description
M68BSAC	BSA Control Module for use with BSA Personality Modules
M68BSA1-1	BSA Personality Module for MC68000 and MC68451
M68BSA2	BSA Personality Module for MC6800, MC6809, and MC6829
M68BSA4	BSA Personality Module for MC6801 and MC68120
M68BSA5	BSA Personality Module for VERSAbus
M68BSA6	BSA Personality Module for EXORbus

© IC MASTER 1983

LOW COST MPU/MCU EVALUATION MODULES



A series of inexpensive evaluation modules are available for Motorola's line of microprocessors and microcomputers. Evaluation modules allow the user to prepare, debug, and run software in the resident microcomputer. Even though the cost is low, an onboard ROM contains extensive commands for controlling I/O and debug operations, including down-up load S-record transfers.

Memory, internal registers, and I/O registers may be displayed and modified. Program execution may be traced one step at a time or breakpoints may be inserted for program interruption. Circuitry and firmware are included to allow the MCU's EPROM to be programmed.

MC68000 Educational Computer Board MEX68KECB

The MC68000 Educational Computer Board (ECB) serves as an economical introduction to systems based on the M68000 family of microcomputer products.

The ECB is based around a 4 MHz MC68000 MPU. Also provided are 32K bytes of RAM, arranged as 16K x 16. The firmware is contained in two 8K by 8 ROMs, addressed as an 8K by 16 block of memory. Two RS-232C serial ports are implemented with MC6850 ACIA's and an MC14411 baud rate generator, allowing selection of data rates from 110 to 9600 baud.

One of the M68000 peripherals, the MC68230 Parallel Interface and Timer (PI/T), provides a Centronix-type parallel printer interface and an audio cassette interface. An audio cassette recorder may be used to store and retrieve user programs.

The ECB uses a terminal, interfaced via one RS-232C port. Also, a small wirewrap area is provided for system I/O modification and buffering.

MC6801 Evaluation Module MEX6801EVM

The MC6801 Microcomputer Evaluation Module is a completely self-contained microcomputer on a single printed circuit card, providing the user with the means of evaluating the MC6801 microcomputer. As configured, the MC6801 may be evaluated in the Single-Chip mode by attaching an RS-232C-compatible terminal to the serial port of the module. Thus, the minimum functioning system consists of only the MC6801 and an MC1488 and MC1489 (RS-232C interface).

In the Expanded mode, the customer may add an ACIA, PTM, 4K bytes RAM or 2K EPROM and a programmable gate array for address configuration.

MC68701 Programming Module MEX6801EV1

This module has the same features as the MC6801 module but is also populated with an MC68701, 2K bytes of RAM, a programmed gate array, and a DEbug monitor (PRObug) which also provides the programming capability for the MC68701 EPROM device. It, also, can be used to evaluate the MC6801 microcomputer.

MC68120 Evaluation Module M68120EVM

The M68120 Evaluation Module is designed to assist the potential user of an MC68120 Intelligent Peripheral Controller (IPC) chip in developing software, performing limited circuit emulation, and operating as a serially-linked design on an EXORbus compatible board format.

All data communications are accomplished via two RS-232C ports. Consequently, the Evaluation module can be operated in a stand-alone configuration with only power brought in on the EXORbus connector. An optional operating configuration allows the M68120 Evaluation Module to be plugged into an EXORciser II or an EXORmacs VERSAbus System via a VERSAbus Adapter Module (VAM). The dual-ported 128-byte RAM can then be mapped into a local map or system map.

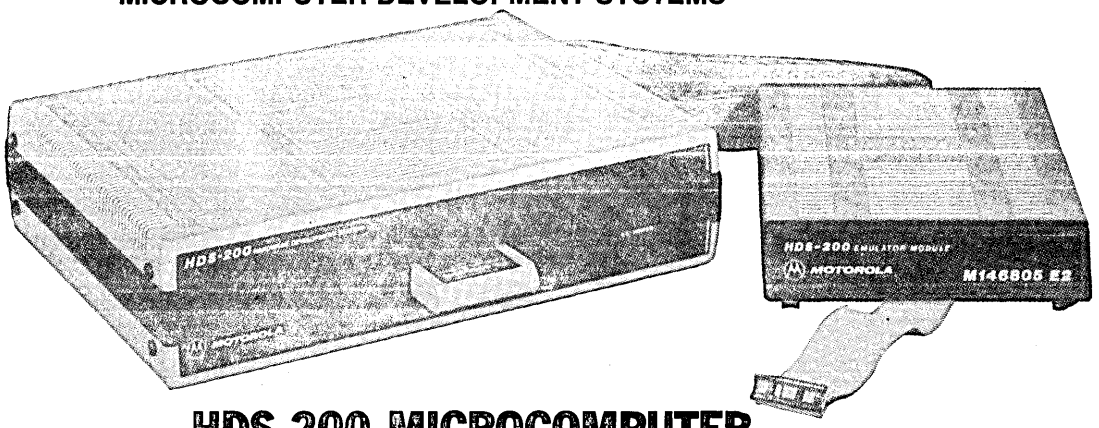
There is 4K of RAM populated on the board local bus along with decoding to permit an additional 4K RAM to be implemented in the user wirewrap area. The RAM allows user software development and debug for future programming of 2K, 4K, and 8K EPROMs to be inserted on the M68120 Evaluation Module. The Module has 64K bytes of address space on the local bus and 256 bytes of address space on the system bus.

MC68705 Evaluation Module M68705EVM
MC1468705 Evaluation Module M1468705EVM

Operation of an MC68705 or MC1468705 is simulated by the resident MC6805 or MC146805 MCU. Data transfer within the EVM is controlled by the monitor ROM firmware. In turn, this ROM is controlled from an external RS-232C compatible user terminal. User object code may be down-loaded to the user program RAM via the host port; a cassette port is also provided for this purpose. The host and terminal port ACIAs are baud rate strap-selectable from 110 bps to 19.2 Kbps in eight steps.

The MCU parallel I/O ports allow the user to connect externally to the simulated MCU I/O lines. These lines are also used to control the MC68705 or MC1468705 MCUs on-chip EPROM programmer. This is accomplished by inserting the MCU into the programmer socket and executing the appropriate monitor commands.

© IC MASTER 1983



Control Station
M68HDS201

Emulators
M6804P2HM
M6805P234HM
M6805RU23HM
M6805S2HM
M6805T2HM
M146805E2HM
M146805F2HM
M146805G2HM

HDS-200 MICROCOMPUTER HARDWARE/SOFTWARE DEVELOPMENT SYSTEM

Design Features

- Real-time emulation for M6804/M6805/M146805 MCUs.
- Sixteen programmed breakpoints.
- Prioritized breakpoints.
- Line-by-line assembler/disassembler.
- Program trace commands.
- Commands displayed for operator HELP.
- Memory map display.
- Macro commands stored for re-use.
- Transparent mode for best communication.

Operating Features

- Compatible with EXORmacs, EXORciser and EXORset software development systems.
- Low cost.
- Stand alone operation — frees software development system for parallel use.
- Easy to use.

The HDS-200 Hardware Development System, in conjunction with a Motorola EXORset, EXORmacs or EXORciser software development system, provides a complete hardware/software development system for the Motorola M6804/M6805/M146805 families of microprocessors. It consists of a Control Station, with all the functional circuitry to complete MCU emulation, and a separate Emulator Module with an internal microcomputer and memory capacity to match that of the particular MCU it is expected to emulate.

Two major factors contribute to the HDS-200's usefulness as a systems development tool. The first is the ability to serve as a fully functional substitute for the selected MCU in the target system. By plugging the HDS-200 into the socket on the prototype hardware, it allows efficient testing of hardware as well as software debugging. The second factor is its powerful list of analysis commands. These easy-to-use, plain language commands enable the user to rapidly debug, integrate the target system and produce prototype systems.

Systems Development and Integration

The initial stages of developing an MCU-based system normally involve two parallel, rather independent, efforts. One is the hardware design — the other the software design. These efforts are frequently accomplished by two different teams of personnel, resulting in debugging problems that are often difficult and time-consuming. The HDS-200 simplifies this process because of its ability to bring the hardware and software development processes into intimate relationship with each other throughout the development cycle. Moreover, with the HDS-200 it becomes economically feasible to test alternate design approaches in order to determine the best solution.

The complete HDS-200 Hardware/Software Development System consists of three separate items — the HDS-200 Control Station, the Emulator Module, and an associated Firmware Cartridge.

HDS-200 Control Station

The station contains an internal power supply, logic circuits, clock and an MC6809 MPU. The MPU runs the monitor, controls the ports and interfaces with the emulators. It has two RS-232C communication ports for interconnecting with a host computer and a suitable terminal. Another cable connects the station to an associated outboard Emulator Module.

The Emulator Module

The module's output to the user's system is by a short, noisefree ribbon cable terminating in a plug to mate with the target hardware MCU socket. The emulator contains the target processor and various I/O interfaces to provide a compatible link between the Control Station and target hardware MCU/MPU socket.

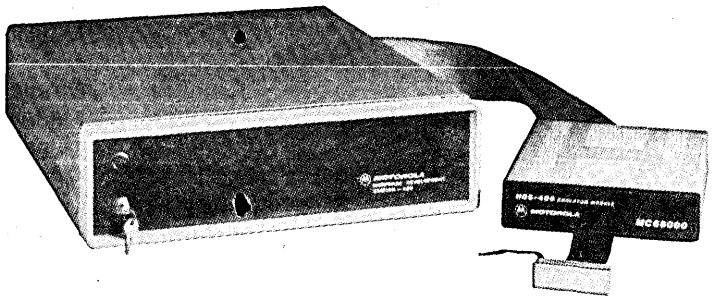
Different modules are available for specific microprocessor family types. The various MCU Emulator Modules available include the M6804, M6805, M68705, and M146805 families. Each module comes with a matching Firmware Cartridge and an emulator cable/connector assembly.

The Firmware Cartridge

Paired with each Emulator Module is a small cartridge which is easily plugged into the HDS-200 station. This cartridge contains the necessary programs on ROM to enable the HDS-200 to adapt to the specific "personality" of the selected MCU type.

© IC MASTER 1983

MOTOROLA
MICROCOMPUTER DEVELOPMENT SYSTEMS



Control Station
M68KHDS400

Family Board
M68KHDS16FB

Emulators
M68000HDS4
M68008HDS4
M68010HDS4

EXORmacs SDLC Link
M68KHDSDLC

HDS-400 MICROPROCESSOR HARDWARE/SOFTWARE DEVELOPMENT SYSTEM

Design Features

- Guaranteed 10 MHz real-time emulation with no wait states for M68000 MPUs
- No user target system restrictions
- Full symbolic debug
- Unrestricted user memory map
- Maps memory to target system or Emulator Module
- One-line assembler/disassembler

Major Benefits

- Reduces development costs
- Shortens product development cycle
- Brings product to market faster
- Versatility protects against obsolescence

The HDS-400 Microprocessor Hardware/Software Development System is used with a host EXORmacs Development System. It allows debugging of hardware and software in equipment using microprocessors within the Motorola M68000 family.

The HDS-400 simplifies the sytem debugging process by bringing the hardware and software development processes into intimate relationship with each other throughout the development cycle. The HDS-400 has the ability to serve as a fully functional substitute for the selected MPU in the user's target system. By plugging the HDS-400 into the socket on the prototype hardware, it allows efficient testing of hardware as well as software debugging. It also has a powerful list of analysis commands. These easy-to-use plain language commands enable the user to rapidly debug, integrate the target system, and produce prototype systems. The user may execute the commands by sequentially depressing function keys which provide a "fill-in-the-blanks" format with particulars such as file name, address, data, etc. A command code is entered and the command syntax is displayed by the system when combinations of two function keys are pressed.

Typical System Configuration

The HDS-400 Hardware/Software Development System includes a four-slot Control Station with a built-in 30 A power supply and an Emulator Module for the specific MPU which will be used in the target system. Emulators are available for the MC68000, MC68008, and MC68010 MPUs.

A 9.6K-bit/s RS-232C serial link connects a terminal to the HDS-400, which is in turn linked to the host EXORmacs through a 56K-bit/s serial interface. The Control Station chassis uses two of its four slots for a Control Board and an MPU Family Board. Two card slots are available to accommodate such options as a Real-Time Bus State Analyzer.

The Family Board has 32K bytes of 100 ns RAM which the designer can map in 4K byte blocks to replace or expand the target system's RAM. The HDS-400 RAM can also be used to replace the target system's ROM, and may be fully protected against inadvertent writing. The MPU's entire memory map, including all vectors and interrupts, is also available.

System Performance

The HDS-400 can perform real-time emulation and analysis of the microprocessor system at clock speeds up to 10 MHz with no wait states. The Hardware/Software Development System places no restrictions on the user's target system, and up to four breakpoints may be entered by the designer to provide control of program flow.

Using the terminal as a command console, the host EXORmacs can be commanded to edit, assemble, or compile the target software, which is then downloaded to the HDS-400 and into either the target system or emulator RAM. Once this has been accomplished, the HDS debugging commands are used to execute, trace, and debug the target system's code. In addition to the assembled object code, a user's symbol table is available from the EXORmacs. This table provides the symbolic names for the physical addresses of memory, variables, and data.

Symbolic Debug and Assembly

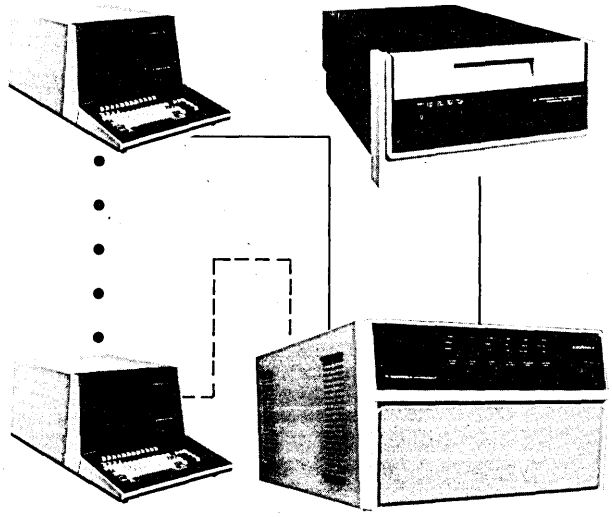
The system designer can use symbolic names to refer to data, program, and subprogram labels, and variables. This eliminates conversions between symbols and hex code. A variable can be changed or displayed on the terminal merely by referring to its name rather than a specific address location. When tracing or displaying MPU program code, it is displayed using assembler mnemonics and user symbols for both operands and labels rather than hex code.

Symbolic assembly capability is also provided by the HDS-400. This means that the user may enter MPU assembler mnemonics and the symbolic debugger will automatically convert it to machine code.

© IC MASTER 1983

M68000 DEVELOPMENT SYSTEM

EXORmacs



- Complete Development System for MC68000 MPU
- Up to Eight User Stations
- Multi-Processor Bus Arbitration
- Multi-Tasking Real-Time Operating Sytem
- Resident Pascal High-Level Language
- Diagnostic Firmware
- Up to 192 Megabyte Fixed/Removable Hard Disk
- And Up To 2 Megabyte Dual Drive Floppy Disk
- Provisions For Future 32-Bit Microprocessors
- Optional Cross-Development Software for 8-Bit MPUs

EXORmacs is a state-of-the-art development system for designing and developing advanced 16-bit microprocessor based systems using Motorola families of microprocessors, microcomputers, and peripheral parts. It is also ideally suited for developing applications using the VERSAmodule family of 16-bit board level application products and accessories.

Designed for flexibility and ease of use, EXORmacs takes advantage of the power and features of the MC68000 microprocessor unit (MPU). EXORmacs reduces system cost and development time by incorporating features which support 16-bit and future 32-bit microprocessor designs, as well as providing high-level language support through Pascal. With additional terminals and communications modules, up to eight users may simultaneously develop M68000 programs.

System Expansion Modules

Multichannel Communications Module (MCCM) — M68KMCCM
VERSAbus Adapter Module — M68KVAM
VERSAbus RAM 128K Byte — M68KVM10-3
VERSAbus RAM 256K Byte — M68KVM11-1
VERSAbus RAM 512K Byte — M68KVM11-2
VERSAbus Extender — M68KEXTM
VERSAbus Wirewrap — M68KWW

M68KEXOR
M68KEXOR16
M68KEXOR32
M68KEXOR96

EXORmacs Basic System Configurations

EXORmacs Hard Disk Based Basic System — 110 Volts
EXORmacs Floppy Disk Based System — 110 Volts
Each system includes:

- Hardware Chassis — with Power Supply and 15-slot Backplane
  Resident Module Complement
  MC68000 MPU/MMU Module
  DEbug Module
  256K Dynamic RAM
  Disk Controller Module
- Software
  Operating System (VERSAdos-E)
  CRT Editor
  Macro Assembler
  Linkage Editor
  Symbolic Debug
- Peripherals
  EXORterm 155 Display Console
  Choice of Mass Storage:
  1 Megabyte Floppy Disk — M68KEXOR
  8/8 Megabyte Hard Disk — M68KEXOR16
  16/16 Megabyte Hard Disk — M68KEXOR32
  16/80 Megabyte Hard Disk — M68KEXOR96

EXORbus, EXORciser®, EXORmacs, EXORset, EXORterm, UNIDOS and VERSAbus are trademarks of Motorola Inc.

© IC MASTER 1983

M68000 System Development Software

VERSAdos-E and UNIDOS Operating Systems

VERSAdos-E

The M68000 Real-time Operating System (VERSAdos) provides complete real-time, multitask support for the EXORmacs User. Features included in the VERSAdos are:

- Real-time multitasking executive
- Device independent I/O
- Floppy and hard disk support
- Sequential, random, and index sequential file capabilities.

CRT Text Editor

The EXORmacs CRT-oriented Text Editor runs under the supervision of the Operating System and provides the capability to create and modify source programs. The editor supports both command and cursor editing, utilizing the cursor, control characters and function keys of the EXORterm 155.

Structured Assembler

The M68000 Structured Macro Assembler translates source statements into relocatable machine code, assigns storage locations to instructions and data, performs auxiliary assembler actions designated by the programmer, and optionally produces a cross-reference listing. The M68000 resident assembler includes macro and conditional assembly capabilities plus certain control constructs that permit structured programming at the assembly language level.

Linkage Editor

The Linkage Editor provides the capability of merging two or more separately-compiled object units into a loadable object module file.

Symbolic Debug

The SYMbug/A program is used to debug other programs, whose source code may have been written in Motorola-provided assembler language, for execution on the M68000. The language processors, in cooperation with the Linkage Editor, supply symbolic information to SYMbug/A. This permits the user to describe the debugging requirements to SYMbug in terms close to the language in which the source program was written.

Pascal Compiler (Optional) M68K0PASCALH

Pascal is a block structured high order language that promotes good programming technique, is self-documenting, and simplifies program writing.

FORTRAN Compiler (Optional) M68K0FORTRNH

Motorola's FORTRAN exceeds ANSI FORTRAN 77 subset language specification, providing real-time processing capabilities.

UNIDOS M68K0UDOSH

UNIDOS is Motorola's multiprogramming, timesharing operating system designed to run on the MC68000-based EXORmacs Development System. It is compatible with UNIX* Version 7.

Program Development Tools

UNIDOS offers its users a large selection of features. Some of these are: an assembler, a text editor, a linking loader, and a "C" compiler. A wide variety of operating system functions, program development tools and text processing functions are available in UNIDOS. UNIDOS also supports UNIX version 7 system calls and is compatible at the source level.

UNIDOS program development tools include a symbolic debugger and a disassembler which facilitates program debugging by providing an interactive assembly level window to object code.

Operating Environment

UNIDOS minimum hardware requirements are an EXORmacs Development System with 256K RAM and a 16MB, 32MB or 96MB hard disk system. This combination of hardware will support two users. Up to six users can be supported with the addition of the appropriate communications module.

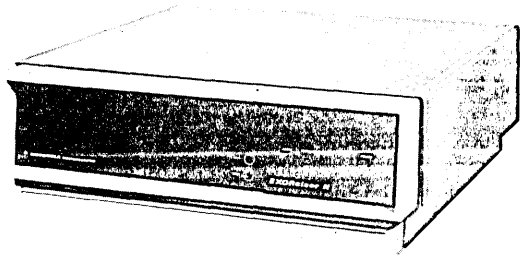
* UNIX is a trademark of Bell Laboratories

© IC MASTER 1983

Development Systems

EXORciser For 8-Bit Prototype Development

M6800 EXOR
M6809 EXOR



The EXORciser is an expandable development system that allows development of any 8-bit Motorola microprocessor or microcomputer configuration, from the simplest to the most elaborate. It comes with an MPU Module that provides system timing and a DEbug Module that contains system firmware. Both MC68B00 or MC68B09 MPU versions are offered in the EXORciser Development System.

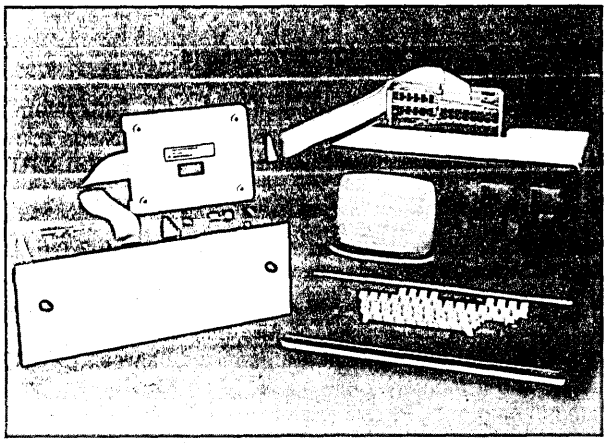
With optional accessories, the EXORciser design and diagnostic functions can be extended to other members of the Motorola family of microprocessors and microcomputers.

The EXORciser with a USE (User System Emulator) option can be used to test and evaluate equipment external to its chassis. By removing the microprocessing unit from the user's system and connecting the USE cable from the EXORciser into the MPU's socket, the EXORciser with its EXbug firmware can be used to debug and troubleshoot microprocessor systems.

The basic EXORciser consists of a rugged cabinet with a built-in power supply, and a prewired bus-oriented 14-slot Backplane with MPU and DEbug Modules. Together these elements form a development microcomputer, with the capability of adapting the unit to a specific design problem by adding optional I/O and memory modules. Additional Motorola memory modules for the EXORciser can be selected to suit varying system configurations; for example, to meet the increased memory requirements of sophisticated high order language based systems. The concept of add-on modules permits the user to match the functional requirements of the systems being developed. Using one slot each for a floppy disk and printer function, ten slots remain for memory and I/O expansion. The EXORciser is a system that is never out-of-date, being at all times upgradable when new and expanded microcomputer functions become available.

EXORset DS35 For Low Cost Hardware/Software Development

M68SETDS351
M6801DS351N



The EXORset DS35 Microcomputer Development System is a compact desk-type computer that is powerful enough to handle major development projects and, at the same time, is simple and economical enough to serve the needs of the first-time microcomputer system designer. It's a direct MC6809 system emulator that can be converted instantly into an MC6805 or MC146805 (CMOS) emulator simply by plugging in the appropriate conversion module through an access opening in the top cabinet. It can be used for both hardware and software design, and when the design is finished, it can often serve as a cost-effective end product of the very system it helped design.

All you need, for most projects, is built right into the handsome 26.7" x 18.5" desktop cabinet. There's a full ASCII keyboard with 16 additional function keys that help speed up program development and applications. A 9-inch high-resolution CRT display is ideal for both alpha-numerics and graphics. Built-in dynamic RAM provides 56K bytes of electronic memory to hold large executable programs and two front-panel-accessible mini-floppy drives make available an additional 328K bytes of memory storage.

The powerful EXORbug monitor controls the keyboard and displays operations and offers complete debugging facilities. The XDOS operating system takes care of all operations and file management. Resident BASICM compiler with Micromodule 19 runtime package, a CRT Editor, Relocatable Macro-Assemblers for M6800, M6801, M6805 and M6809 and a linking loader are included.

An M6809 Pascal compiler is available as an option, part number M6809SETPAS.

© IC MASTER 1983

Resident System Software

8-Bit Assemblers, Editors and Monitors

M6800 and M6809 Development System Software Package

Supplied with the Motorola floppy disk subsystem, EXORdisk, is a basic software development package consisting of the Motorola Disk Operating System (MDOS), CRT Editor, Macro Assembler and Linking Loader.

M6800/01/09 UP/Down Load **M6800UPDWNLD, M6809UPDWNLD**

Permits a user to download software developed in a host system into an EXORciser or Micromodule; alternatively, memory-to-memory uploads are permitted between EXORcisers, and a memory-to-file upload to an EXORmacs; provided in both a 2K PROM and two 1K PROMS.

8-Bit High Level Languages and Cross Assemblers

M6800/M6809 MPL Compiler **M68MPLR020M/ M6809MPL**

A high-level, user-oriented system programming language for the MC6800 and MC6809 MPU's, MPL is a block-structured language with features chosen for applicability to the microprocessor environment. This compiler is designed to operate in an EXORterm or EXORciser floppy disk-based environment with MDOS.

M6800/M6809 FORTRAN **M68FTNR012M/ M6809FORTRN**

Resident FORTRAN is a high-level programming language widely used for scientific and engineering problem solving. This FORTRAN Compiler, which is a subset of the ANSI standard FORTRAN IV, translates the source program into a relocatable object module. The Linking Loader converts the relocatable object code into an executable object file.

M6800 Real-Time FORTRAN Compiler **M68RTFR02M**

This FORTRAN Compiler enables the user to write real-time software in a high-level language for use in M6800-based Micromodule systems. It also contains an execution-time operating system, allowing several queues of tasks to be performed, with an ability to respond to real-time interrupts and to generate delays.

M6800 Resident BASIC Interpreter **M68BASR010M**

The Resident BASIC Interpreter provides another problem-solving tool to the M6800 microcomputer family of products. BASIC is high-level programming language widely-used for education, general-purpose, and certain business-related applications. Decimal arithmetic, string variables and arrays, string functions, and printer output are several of the features.

M6809 BASIC-M Interactive Compiler **M6809BASMR**

The BASIC-M Interactive Compiler provides an extension over standard BASIC in two major directions. It improves considerably the capabilities of the BASIC programming language and generates executable codes that can be used independently of the compiler itself. The compiler is available for M6809-based EXORciser.

M6809 Pascal **M6809PASCLC**

M6809 Pascal produces relocatable object modules that may be linked with other separately compiled Pascal modules and/or assembly language modules. The object code is position independent, re-entrant and ROMable. Both a Compiler which produces a relocatable object module, and an Interpreter version are available for M6809-based EXORciser systems.

EXORciser CRT Editor **M68EDITM**

EDITM is a memory resident record key oriented text editor that can do CRT editing on a line-by-line basis using only the left and right cursor functions and a few easy to remember control key sequences. EDITM can edit up thru a 132 character line, can be run under CHAIN command control, has error recovery procedures, and is USER configurable for different CRTs and default conditions. 6800 and 6809 versions of EDITM are included. 32K RAM minimum.

EXORset/EXORciser Document Processor **M68XDOC/ M68MDOC**

DOC is a powerful text processing program. Any editor may be used to imbed the DOC processor commands with DOC interprets and formats in the output text. Among the many features are: file concatenation (book chapters), multiple file input (form letter/address file), automatic table of contents generation, automatic page numbering, left/right/center text justification, conditional text, and multiple line spacing. 24K RAM minimum.

© IC MASTER 1983

Accessories for System Diagnosis and Manufacturing

The EXORciser EXORset and their basic options are very versatile development instruments. Through emulation of a user system, they take the guesswork out of hardware and software design. And with these additional modular options, they become highly sophisticated post-design centers.

MEX68SA2 (6800)

System Analyzer — M6809SA (6809)

This unique instrument can be used to enhance the capabilities of the EXORciser as a design tool, or as an independent, portable, low-cost unit for field service of bus-compatible equipment.

In field service applications, the System Analyzer derives operating power and I/O signals directly from the system under test. It can stop the system at any point in its program, step through the program, change the contents of the system memory, and monitor and record the MPU's operation during a selected portion of the program without shutting down the operation.

In EXORciser applications, it complements the system's inherent program development capabilities. In conjunction with the EXORciser and USE, it offers the most powerful combination of development and diagnostic tools available for microcomputer work.

PROM Programmer — M68PP3

This module plugs into the EXORciser or EXORset and is compatible with firmware and disk operating systems. The PROM Programmer is designed to program a variety of MOS PROMs, EPROMS and bipolar PROMs. It can verify data from the PROM, transfer data from the PROM to the development system RAM memory, and transfer blocks of data from one memory location to another. Programming time depends upon the PROM used.

In order to accommodate Motorola's 32K and 64K byte EPROMs, an optional package is offered for the PROM Programmer. It consists of an adapter board, and is available as a separate option for those needing this additional capability (M68PP3-1).

Software on diskette for both M6800 and M6809-based systems is included with the PROM Programmer.

EXORciser/EXORset Conversion Systems

Through hardware and corresponding software options, the EXORciser or EXORset can be transformed into a dedicated design and evaluation tool for microprocessors such as the MC6801, MC6802 and MC6805.

MC6801 Development System — MEX6801

This product upgrades EXORciser and EXORset for development of MC6801-based systems. All three modes of MC6801 operation — single-chip, expanded multiplexed and expanded non-multiplexed — are supported by this system.

This system is fully compatible with all current supporting hardware and software and includes the USE function. It allows real-time emulation of the MC6801 application hardware and facilitates the debugging of software.

MC6805 Family Development System — MEX6805, MEX6805R2

These products adapt EXORcisers and EXORsets to the development of systems based on the MC6805P2 and MC6805R2/U2 microcomputers. Included in the support system are the printed circuit board module, extended cables for USE for both HMOS MC6805 versions, and an diskette containing the M6805 Cross Macro Assembler and FIVEbug (the system debug/monitor program).

A two-processor philosophy is utilized, in which an MC6805 microcomputer on the module operates in concert with an MC6800 or MC6809 microprocessing unit in the host.

M146805E2, F2, G2 Development System M146805E2EM, M146805F2EM, M146805G2EM, M6805FIM

These 8-bit CMOS system provide an EXORset or EXORciser with the capability to debug MC146805E2, F2, or G2 applications in the actual hardware and software configuration of the user's final system.

It emulates all M146805 inputs and examines all the corresponding outputs via software control, or controls the inputs and outputs via external user hardware. Thus, this development system offers an economical and expedient means for developing new applications prior to committing the programs to the final production masks.

The 6805 Family Interface Module resides in the EXORset or EXORciser card cage and provides the EXORbus interface to the MCU emulator module via two cables that are included.

Each emulator includes a User System Evaluation (USE) cable 6805 Macro Assembler and MCU debug software on XDOS mini-diskette and 6800/6809 MDOS diskettes.

Microcomputer Analyzer — M68UCANA1

This analyzer is an advanced, portable test instrument for use in locating faults in M6800-based systems. An M6800 In-Circuit Emulator with 40-pin connector, Signature Analysis Probe and Time Domain Analysis Probe is included with this analyzer. The Signature and Time Domain analysis features permit fault location at the component, module and system level. The compact size and relatively low cost of the Microcomputer Analyzer make it an ideal tool for field maintenance, production testing and depot repair.

© IC MASTER 1983

Peripherals

Use of appropriate peripheral devices can generate savings by affording faster program development. Each Motorola peripheral is supplied with the necessary circuitry to perform the necessary development system interface function.

EXORterm 155 — M68SXD10155

EXORterm 155 is a video terminal which facilitates the exchange of data between the user and the development system via a high quality video interface in combination with keyboard entry and a serial communications link using speeds up to 9600 baud.

EXORterm 155 uses LSI components of the M6800 family to provide control of the display attributes, communication facility, terminal switch/indicator control, and keyboard inputs. The keyboard provides cursor control keys and special keys to invoke functions unique to the EXORciser and EXORmacs Operating Systems. These keys can also be used by the designer for special routines. An additional Text Edit mode feature permits multiuser editing.

EXORterm 155 may be connected for either RS-232C or 20/60 mA current loop operation. Like the EXORterm Development System, this display console contains a high-quality CRT with a full 1920-character screen and 7 x 9 ASCII characters.

The EXORdisk — M68DSK2, M68DSK3, M68KFD1102

The EXORdisk is a dual floppy disk storage system with its own package of development software. EXORdisk is designed to support either MDOS (the EXORciser Disk Operating System) or VERSAdos (the EXORmacs Disk Operating System). It facilitates high-speed data transfers through fast headsettling time and logical sector arrangement. An interface card connects this storage system to the EXORmacs, EXORciser or EXORterm Development Systems.

EXORdisk is available in various storage capacities. EXORdisk II offers 512K bytes of storage. It is a single-sided/single-density dual drive system with up to 256K bytes of memory per diskette. EXORdisk III is a double-sided/single-density dual drive system with total storage of 1 million bytes. An expansion unit is available for EXORdisk III which adds one additional disk drive and interconnecting cable to increase storage to 2 million bytes.

Hard Disk — M68KHDS16-1, M68KHDS32-1, M68KHDS96-1

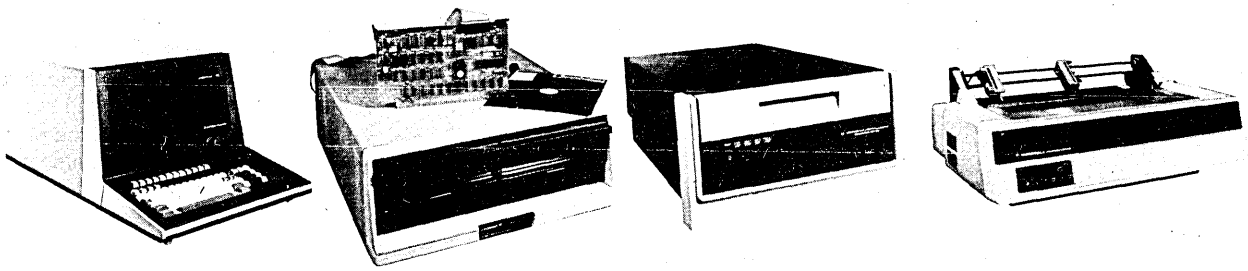
The longer, more complex programs written for advanced 16-bit processors like the MC68000 make much higher data transfer speed and larger storage capacity a necessity. New Hard Disk systems offer the EXORmacs user a choice of high speed mass storage.

For multiuser operation in the EXORmacs system, Hard Disk is required to provide rapid storage and retrieval for a large number of files. Hard Disk storage greatly enhances and increases file access performance over a floppy disk-based system.

Dot-Matrix Printers — M68SP702C10, MPRINT703

Motorola dot-matrix printers are equipped with an interface module and/or an interconnection cable assembly that specifically adapts them to the various Motorola microcomputer development systems, including the EXORmacs, EXORciser, EXORterm and EXORset. In addition these interface accessories permit the printers to be used with Motorola Micromodules to provide more complete availability of microcomputer system components. Printer specifications are as follows:

FUNCTION	703	702
Print Speed (cps)	180	120
Lines-per-Minute (80 characters)	90	65
Bidirectional Printing	Yes	Yes
Dot-Matrix	7 x 7	7 x 7
ASCII Character Set	96	64
Tractor Feed	Yes	Yes
Condensed Print (10–16.5 cpi)	—	—

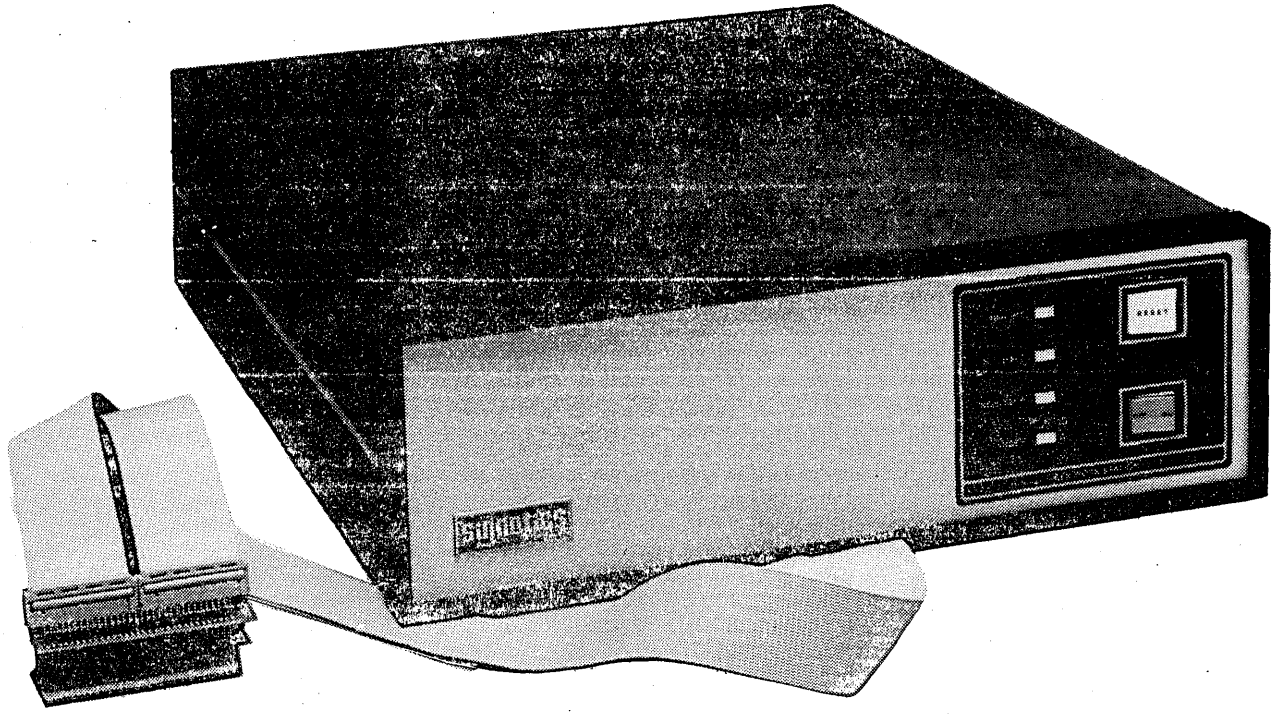


© IC MASTER 1983

Signetics

SMDEV10000
S68000 USER WORK STATION (UWS)

PRODUCT BRIEF
PRELIMINARY



FEATURES

- **Permits existing support equipment to be utilized**
- **8MHz Hardware in-circuit emulation via Signetics Footprint**
- **Includes ROM resident debugger and confidence tests**
- **8MHz SCN68000 microprocessor**
- **64Kb of the total RAM complement mappable to the system under development**
- **4 serial communications ports as well as serial and Centronics parallel printer interfaces**
- **Designed to function with Signetics cross software products**

DESCRIPTION

The Signetics User Work Station (UWS) is a low cost, but powerful, tool designed to work with Signetics language translators in a cross development environment. The UWS provides the capabilities required to execute and debug software for the SCN68000 microprocessor. Software is first entered via the host computer text editor and then assembled or compiled utilizing Signetics cross development software tools. The generated object code is downloaded to the UWS via a serial communications link. The engineer proceeds to test and debug the software using the UWS ROM resident debugger to set execution breakpoints, examine and modify registers, and make changes to the software utilizing the resident line oriented assembler/disassembler. The debugging process may be accomplished entirely within the UWS or the available UWS memory may be mapped into the system under development. The connection to the system under development is accomplished with the emulation cable and Footprint™ probe which makes all pins of the SCN68000 available for connection of oscilloscope and logic analyzer probes in addition to providing full 8MHz hardware emulation of the SCN68000.

™Footprint is a trademark of Signetics Corporation.

© IC MASTER 1983

SMDEV10000 S68000 USER WORK STATION (UWS)

PERIPHERAL SUPPORT

The UWS firmware supports a variety of peripheral devices that are normally required in the development process. The primary peripheral device supported by the UWS is the console terminal. It can be of nearly any type but must transmit serial data in the speed range of 110 to 19,200 bits per second and have an interface which conforms to the RS-232 interface definition. The UWS supports a serial printer interface and a Centronics parallel printer interface. These hard copy devices may be used to maintain a permanent record of trace data, breakpoint lists, PROM contents, and other information that the UWS firmware can provide. A serial port connection is provided for a PROM programmer interface. The firmware contains drivers for the DATA I/O Model 19 and Kontron PROM programmers. In addition, commands are present to allow reading, writing, and verifying of PROMs. The host computer interface is designed to be compatible with standard modems or short distance line drivers that support the RS-232 interface. The UWS firmware supports transparent terminal to host operation, downloading of object code from the host to the UWS and uploading of debugged or partially debugged object code from the UWS to the host.

CONFIDENCE TESTS

A set of ROM resident confidence tests are included in the UWS. These tests are intended to provide a set of known operations on the serial and the parallel interfaces that the UWS may be commanded to execute to aid in the installation of the unit. In addition, a test of the RAM memory is executed each time the UWS power is turned on. If any errors are encountered in RAM memory, the "Power Fail" LED on the front panel will remain lit and the UWS will halt. The execution of the confidence tests is controlled by switch settings in the UWS and is not dependent on a functioning console terminal or other peripheral devices.

ASSEMBLER/DISASSEMBLER

One of the most useful features of the Signetics UWS is a resident line oriented assembler and disassembler. This feature facilitates the debugging process by permitting the engineer to translate existing Hex values of the machine code into readable mnemonics, or to create and insert new SCN68000 instructions into the routine being tested. The assemble (AS) command causes the UWS debugger to enter a line assembler mode at a user specified address. the engineer may begin entering SCN68000 assembler instructions from the keyboard. The instructions will be assembled and stored at consecutive address locations until a null line or a control Z is entered. Each instruction is verified as it is stored in memory. As each line is entered, both the relative and absolute addresses of the generated code, as well as the resultant machine code, is displayed on the CRT. The disassemble (DI) command allows the UWS to accept a range of addresses where code is to be disassembled. As a result of this operation, the engineer will be able to display the relative and absolute instruction address, a Hex translation of the machine code, the instruction mnemonic, and the instruction operands within the specified range.

The following is an example of the assemble command:

```
MA 1
>AS 10000
*CLR.L D0
010000 010000 INS = 4280                    CLR.L D0
*CLR.L D1
010002 010002 INS = 4281                    CLR. L D1
*CRL.L D2
010004 010004 INS = 4282                    CLR.L D2
*MOVEA.L 10200,A0
010006 010006 INS = 207900010200            MOVEA.L 10200^.L,A0
*MOVEA.L 10204,A1
01000C 01000C INS = 227900010204            MOVEA.L 10204^.L,A1
*MOVEA.L 10208,A2
010012 010012 INS = 247900010208            MOVEA.L 10208^.L,A2
*MOVE.L D0,[A0]
010018 010018 INS = 2080                    MOVE.L D0,[A0]
*MOVE L D1,[A1]
01001A 01001A INS = 2281                    MOVE L D1,[A1]
*MOVE.L D2,[A2]
01001C 01001C INS = 2482                    MOVE.L D2,[A2]
*ADD.L #1,[A0]
01001E 01001E INS = 5290                    ADDQ.L #1,[A0]
*ADD.L #2,[A1]
010020 010020 INS = 5491                    ADDQ.L #2,[A1]
*ADDQ.L #3,[A2]
010022 010022 INS = 5692                    ADDQ.L #3,[A2]
*JMP 10000^.L
010024 010024 INS = 4EF900010000            JMP.L 10000^.L
*
```


© IC MASTER 1983

SMDEV10000 S68000 USER WORK STATION (UWS)

COMMAND SUMMARY

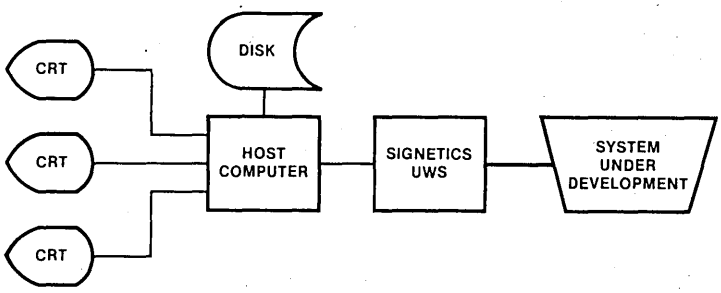
Abort	Manual Breakpoint
Assemble	Map
Auto Dtack	Mode
Clock	Patch Memory
Configure	Patch Registers
Delete Breakpoint	Read PROM
Delete Offset	Record
Delete Trace	Set Breakpoint
Disassemble	Set Offset
Display Memory	Set Trace
Display Registers	Single Step Mode
Download	Single Step
Go	Start Output
Host	Stop Output
List Breakpoint	Trigger
List History	Upload
List Offset	Verify PROM
List Trace	Write PROM

FEATURES

- The UWS is designed to allow software development to occur on mainframes or minicomputers
- The UWS has incorporated the most desirable features of more expensive emulation systems
- The UWS provides the capability for both hardware emulation and software execution
- Both the serial and parallel ports may be reconfigured to match available peripherals
- The UWS upload/download utility accepts object records in Motorola S-record format
- The UWS permits object code to be either downloaded or uploaded
- The UWS can use an internal or external clock
- Up to 10 concurrent breakpoints are supported

BENEFITS

- Hardware which already exists in the work environment can continue to be used and shared for software development
- Provides a low cost solution for 68000 code development
- Reduces development and debugging time and increases user productivity



- Does not restrict the user to one specific peripheral device
- Uses an established 68000 format
- The results of a debug session can be stored and retrieved at a later time
- Offers increased timing flexibility and permits debugging to occur with or without a target system
- Gives a user greater control of the debugging environment

OPERATING ENVIRONMENT

User Supplied Required Hardware

One asynchronous CRT terminal with EIA RS-232 interface.

One modem or suitable substitute that provides an EIA RS-232 interface for asynchronous communication with the host computer.

User Supplied Optional Hardware

One Data I/O Model 19 PROM programmer or Kontron PROM programmer.

One asynchronous serial printer with RS-232 interface.

One Centronics parallel interface printer.

Required Software

One or more Signetics language translators.

Host resident upload/download software (included with Signetics language translators).

Equipment Supplied

UWS with power cord
User Manual
CRT Cable
Test/PROM Programmer Cable
Centronics Parallel Printer Cable
Emulation Cable
Footprint™ probe
Coaxial Clock Cable

Physical Characteristics

Height:	5.22 inches
Width:	16.88 inches
Depth:	22 inches
Weight:	21 pounds
Shipping weight:	31 pounds

Electrical Requirements

117 Volts AC ± 10%, 60Hz ± 15%

Environmental Characteristics

Operating temperature range: 0° to 40°C

Operating humidity range: 0 to 95% relative humidity with no condensation.

ORDERING INFORMATION

SMDEV10000	S68000 User Work Station (UWS), 110-120 volt 60Hz
SMDEV10010	S68000 UWS Footprint™ probe, spare
SMDEV10015	S68000 UWS 8MHz Emulation Cable, spare
SMDEV10020	S68000 UWS Cable Set, spare. Includes: Power Cable, CRT Cable, Test/PROM Programmer Cable, Centronics Parallel Printer Cable, Coaxial Clock Cable

DOCUMENTATION ORDERING INFORMATION

SMMAN3100	S68000 UWS User Manual
SMMAN7100	S68000 UWS Reference Card

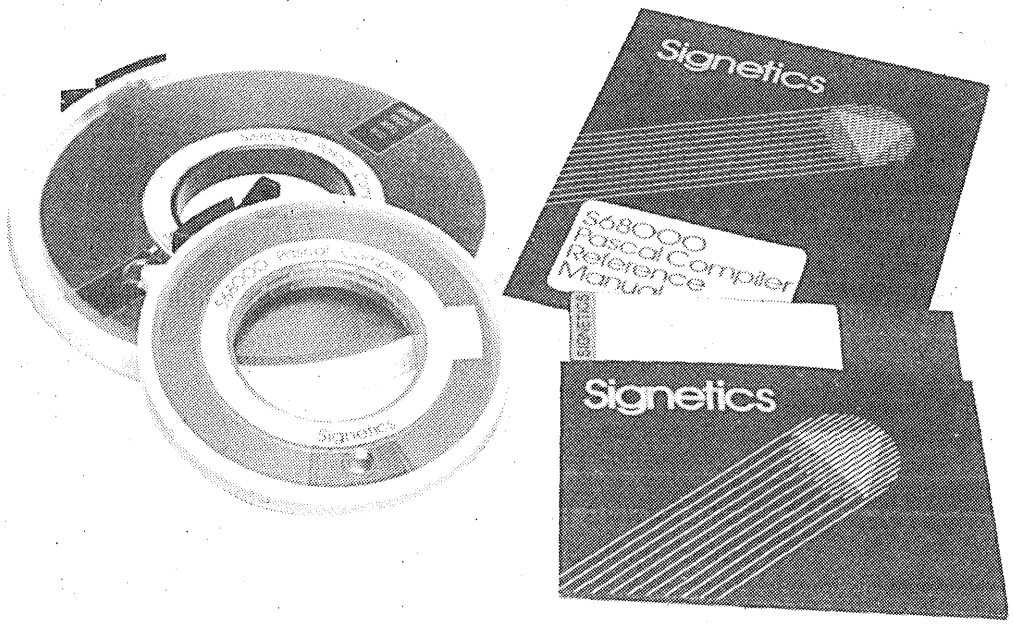
© IC MASTER 1983

Signetics

OCTOBER 1982

SMSFT16000
S68000 CROSS SOFTWARE
PASCAL CROSS COMPILER
PRODUCT BRIEF

Preliminary



FEATURES

- **High level structured programming language**
- **Structured data types**
  - **— Array, string, record, boolean, character**
  - **— User-defined data types**
- **Modular programming extensions**
- **Assembly language program interface**
- **Complies with IEEE 770-81 standard**
- **Generates 68000 native code**
- **PROM-able run-time code**
- **Full listing format control**
- **Flexible compiler option control**
- **Cross linkage editor and upload/download software included**

DESCRIPTION

The Signetics 68000 Pascal Cross Compiler is a powerful, flexible, high level programming language. It complies with the IEEE 770-81 standard which is based on the Pascal language developed by Niklaus Wirth in 1968. The compiler provides a highly structured environment that simplifies program development, produces more reliable code, and increases the productivity of the software engineer. Programming errors are minimized by complete checking of data types within modules including user defined data types.

The Signetics 68000 Pascal Cross Compiler is designed to be extremely modular with an emphasis on portability. The compiler, itself, is a result of utilizing truly state-of-the-art compiler design techniques to produce a superior language translator.

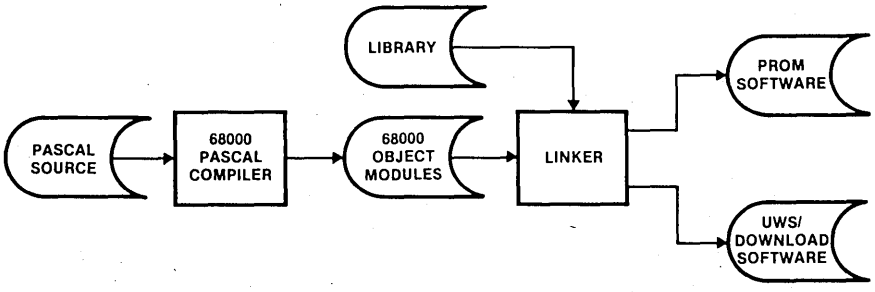
The Pascal Cross Compiler allows the mass storage and development tools available on minicomputers and mainframes to be used in the creation of microprocessor software. It is not necessary to purchase expensive, special purpose computers that are typically used only for microprocessor software development. The upload/download software provides a convenient path for object code to be sent from the host computer to the Signetics User Work Station (UWS) and for partially or completely debugged object code to be saved on the disk of the host computer. All object code is sent utilizing a protocol that includes error detection and control facilities to insure the validity of the transmitted data.

© IC MASTER 1983

SMSFT16000 S68000 CROSS SOFTWARE PASCAL CROSS COMPILER

BENEFITS

- Signetics Pascal provides a standardized environment for developing software for the 68000.
- It allows individuals familiar with Pascal to be immediately productive.
- It is easy to learn since the IEEE 770-81 standard it adheres to is based on the Niklaus Wirth software engineering teaching vehicle.
- It has few machine specific extensions to maximize portability.
- It improves productivity by allowing multiple programs and projects to share both source and object code.
- An assembly language interface is provided to allow direct manipulation of hardware and maximize the performance of time critical modules.
- The Pascal compiler can optionally generate assembly language with source code interlisted as comments to minimize the task of performance tuning in real time systems.
- A full range of listing controls is provided to enhance maintainability of the source code.
- The compiler generated code is optimized in constant and sub-expression usage, array indexing, jumps, and storage allocation for maximum use of target system resources.
- An object module linker with library capability is included with the Pascal, which links together Pascal and assembly language modules and allows specification of starting addresses of all modules.



OPERATING ENVIRONMENT

Operating System	Computers	Requirements
VMS	any VAX-11 computer	(a.) 64Kb of real memory per active compiler user (b.) VMS V2.4 or later (c.) 10Mb of disk storage
RSX-11M	any PDP-11 computer; any LSI-11/23 series computer	(a.) RSX-11M operating system V3.2 or later (b.) minimum 128Kb total system memory to support one compiler user; 64Kb for each additional compiler user (c.) 10Mb of disk storage

ORDERING INFORMATION

Order Number	Product	Operating System	Media
SMSFT16000	PASCAL 68000* S68000 Macro Assembler*	VMS	Half-inch magnetic tape 800 BPI
SMSFT16300	PASCAL 68000* S68000 Macro Assembler*	RSX-11M	Half-inch magnetic tape 800 BPI
SMSFT16390	PASCAL 68000* S68000 Macro Assembler*	RSX-11M	8-inch double density diskette

Other host computers, operating systems, or alternate media contact factory.

DOCUMENTATION ORDERING INFORMATION

Order Number	Product
SMMAN5200	S68000 Pascal Language Reference Manual
SMMAN5205	S68000 Macro Assembler Reference Manual
SMMAN7200	S68000 Pascal Installation Guide, VMS Operating System
SMMAN7210	S68000 Macro Assembler Installation Guide, VMS Operating System
SMMAN7201	S68000 Pascal Installation Guide, RSX-11M Operating System
SMMAN7211	S68000 Macro Assembler Installation Guide, RSX-11M Operating System
SMMAN3230	S68000 Pascal Compiler User Guide
SMMAN3231	S68000 Macro Assembler User Guide

*Requires software license agreement.

Signetics

© IC MASTER 1983

SMSFT16000 S68000 CROSS SOFTWARE PASCAL CROSS COMPILER

SIGNETICS PASCAL EXTENSIONS

Separate Compilation — Allows modular programming and facilitates sharing of routines by multiple programs and projects.

Assembly Language Interface — Permits mixing Pascal and assembly language routines for maximum performance and ease of direct hardware control.

INCLUDE Facility — Facilitates sharing of source code and declarations of constants and variables by multiple programs and projects.

Compile Time Switches — Provides control of compiler options such as array index checking.

Assembly Code Generation — Simplifies performance tuning of critical program modules.

EXAMPLE

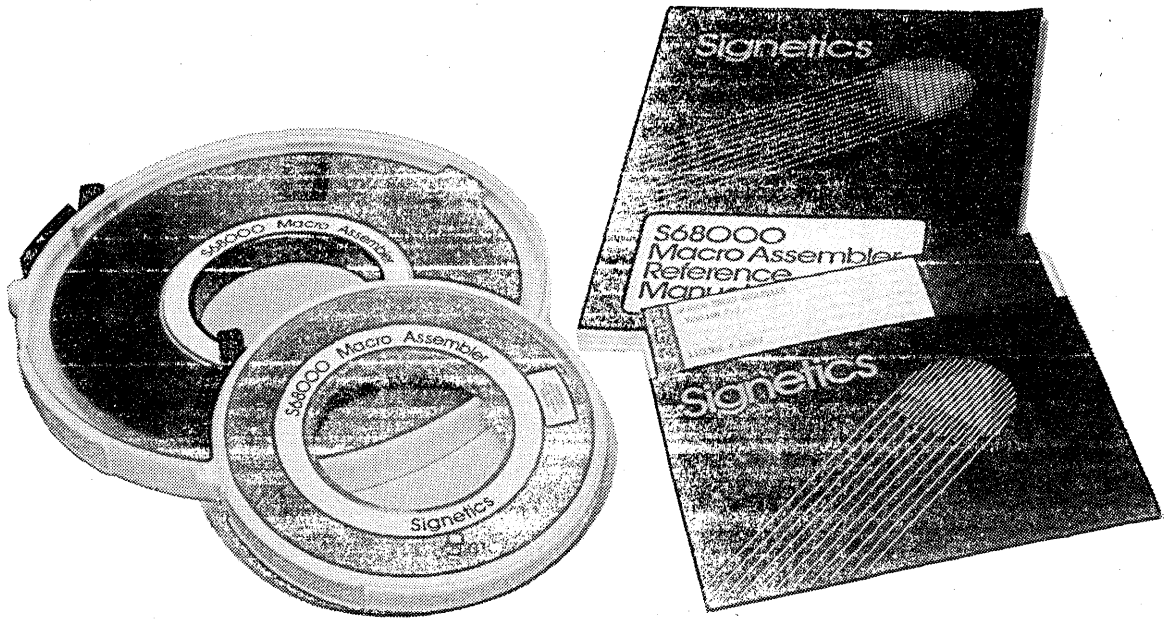
The following Pascal program is an example of the structure of a Pascal program. This program is designed to eliminate all trailing blanks from the end of each line within a file such that the line termination character occurs after the last non-blank character in the line. It illustrates the use of subroutines, typing of variables, and loop structures. The actual implementation of input and output routines is system dependent, but the read and write statements used are those of the IEEE 770-81 standard .

```
program compact (source, destination);

const   BLANK = ' ';
        LINESIZE = 140;

type    linerange = 1..LINESIZE;
        linetype = packed array[linerange] of char;

var     source, destination : text;
        line : linetype;
        length, cur, lastnonblank : linerange:
        c : char;

        procedure getsourceline;

        begin   length := 1;
                line[length] := BLANK;
                while not (eoln (source)) and (length < LINESIZE) do

                begin   read (source, c);
                        line[length] := c;
                        length := length + 1

                end;
                readln (source);
                if length > 1 then length := length - 1

        end;

begin   reset (source);
        rewrite (destination);
        while not eof(source) do
        begin   getsourceline;
                lastnonblank := 1;
                for cur := 1 to length
                do      if line[cur] < > BLANK
                        then lastnonblank := cur;
                for cur := 1 to lastnonblank
                do      write (destination, line[curl]);
                writeln (destination)

end     end.
```


© IC MASTER 1983

Signetics

SMSFT10000
S68000 CROSS SOFTWARE MACRO ASSEMBLER
PRODUCT BRIEF
Preliminary



FEATURES

- **Powerful, Motorola-compatible assembly language**
- **Interfaces directly to Signetics 68000 Pascal**
- **Unambiguous source language definition**
- **Registers may have symbolic names**
- **Highly flexible constant definition**
- **Both symbolic and mnemonic logical operators are supported**
- **Jump instruction format is optimized automatically**
- **Full complement of assembler directives**
- **"Section" directive allows complete control of code and data placement**
- **Record and Field capabilities for highly structural data definitions**
- **Structured conditional assembly directives**
- **Modular programming support**
- **Source library facility**
- **Powerful macro facility**
- **Linkage editor and download software included**

DESCRIPTION

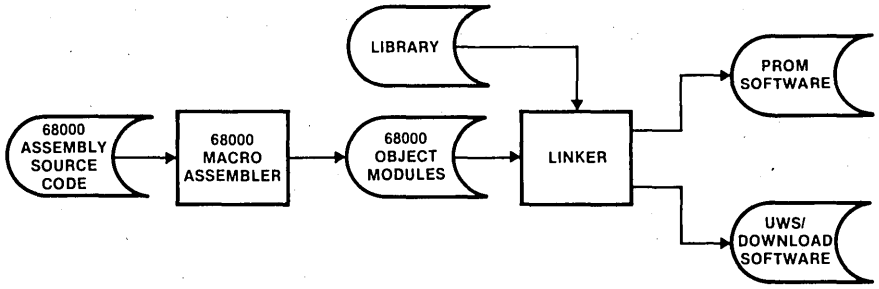
The Signetics 68000 Macro Assembler is a powerful assembler that combines the convenience of Motorola compatible instruction mnemonics with an unambiguous language definition and many useful constructs usually found only in high level languages. The Signetics 68000 Macro Assembler is a perfect complement to high level languages and an excellent implementation language with capabilities such as modular programming support, record and field data definition ability, a source library facility that includes source only when referenced, and assembler directives that minimize the task of parameter passing to subroutines. The Signetics macro facility offers normal macro features such as parameter substitution and nesting but is not a character oriented facility and does not support concatenation of symbols. The linkage editor for linking separately assembled modules is included in the package. This linkage editor may also be used with the object modules generated by the Pascal cross compiler, or to link Pascal and assembler generated modules together. The upload and download software that allows host communication is also included in the package. It is designed to interface with the Signetics User Work Station (UWS) and allows transfer of object code between the host computer and the UWS as well as between the UWS and the host computer.

© IC MASTER 1983

SMSFT10000 S68000 CROSS SOFTWARE MACRO ASSEMBLER

BENEFITS

- The Signetics 68000 Macro Assembler is Motorola instruction compatible, so no extensive retraining is required for software engineers.
- The modular programming support allows sharing of program modules generated by the assembler or by high level languages such as Pascal.
- Sections of source code identified as libraries by the "LIB" and "ENDLIB" assembler will process automatically if they are referenced.
- The conditional and duplicated assembly capabilities allow maximum flexibility in source code structure.



- The use of subroutines is encouraged by the availability of assembler directives that support the definition and manipulation of parameter lists.

OPERATING ENVIRONMENT

Operating System	Computer	Requirements
VMS	any VAX-11 computer	(a.) VMS V2.4 or later
		(b.) 64Kb of real memory per active assembler user
		(c.) 10Mb of disk storage
RSX-11M	any PDP-11 computer; any LSI-11/23 series computer	(a.) RSX-11M V3.2 or later
		(b.) minimum 128Kb total system memory to support one assembler user; 64Kb for each additional assembler user
		(c.) 10Mb of disk storage

Contact Rikki Kirzner for further product information on computers, operating systems, media, or formats not shown.

ORDERING INFORMATION

Order No.	Product	Operating System	Media
SMSFT10000	S68000 Macro Assembler*	VMS	Half-inch magnetic tape 800 BPI
SMSFT10300	S68000 Macro Assembler*	RSX-11M	Half-inch magnetic tape 800 BPI
SMSFT10390	S68000 Macro Assembler*	RSX-11M	8-inch double density diskette

DOCUMENTATION ORDERING INFORMATION

Order Number	Product
SMMAN5205	S68000 Macro Assembler Reference Manual
SMMAN7211	S68000 Macro Assembler Installation Guide, RSX-11M Operating System
SMMAN7210	S68000 Macro Assembler Installation Guide, VMS Operating System
SMMAN3231	S68000 Macro Assembler User Guide

*Requires software license agreement.

© IC MASTER 1983

Synertek.

MDT 2000
Microprocessor Development System

Features

- Supports the Z8 and 6500 Microprocessors
- 2K User RAM for Z8 Internal ROM Emulation
- Intelligent Floppy Disk Controller with two 8" drives
- Three Serial and Two Parallel Interfaces
- Supports up to Two Debug Cards (optional), Providing four Breakpoint Registers
- Optional EPROM Programmer Card with Two Sockets for Programming 2716, 2732, 2532 EPROMS
- PASCAL Disk Based Operating System with Command Prompting
- Powerful CRT Screen-Oriented Editor
- Versatile Disk File Operations with Wildcard Selection
- ROM-based RAM/Disk Diagnostics
- Operator Control of PBOS Boot Operation
- Supports "User Operating System" Disk Booting
- User Configuration of CRT Terminal/Printer Attributes
- PASCAL Access to Serial or Parallel Printer (mutually exclusive)
- Emulation Supervisor (PASCAL-based) Control of Target System
- Universal Assemblers with Macro and Conditional Assembly Directives for Z8 and 6500 Microprocessors
- ROM-based Mini-Debugger
- Supports Double Density 8" Data Disks
- Disk File Hexadecimal Patch Utility
- Optional Assemblers Available for 6800, 6809, Z80, 8080, 9900 and LSI-11
- 220 Volt Option Available

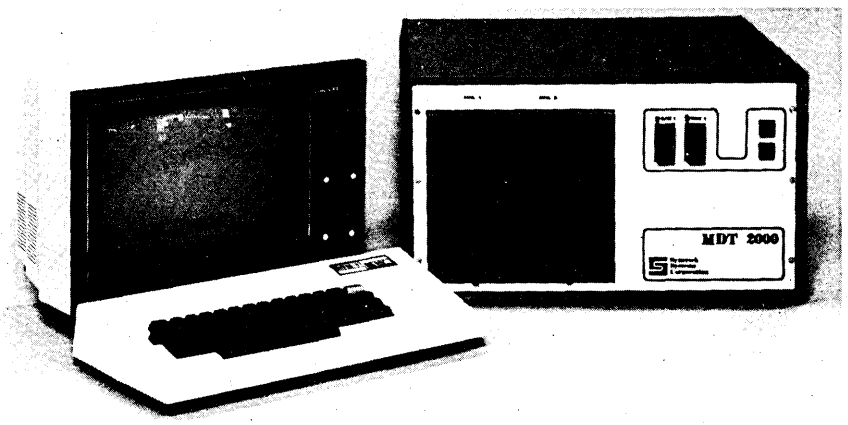
Description

The MDT 2000 Micro Development System provides the user with a flexible, powerful, development and emulation system for Z8 series microprocessors. Debugging is facilitated with in-circuit emulation environment allowing a separate and nonconflicting memory address-space. With an optional debug (Breakpoint) card, the user program may execute in real-time avoiding execution interference from the Emulation Supervisor software. Alternatively, oscilloscope trigger signals can be generated via complex BREAK conditions which do not cuase the user emulation system to halt.

Assembly language source and object program generation is supported with a PASCAL-Based Operating System (PBOS). PBOS provides a powerful screen-oriented editor and floppy disk file manager with user-controlled operations on file name families (i.e., wildcards). User-adaptable CRT terminal and printer configuration utilities are available to tailor the system to various terminal and printer characteristics.

A versatile ROM Bootstrap provides power-up access to RAM and/or disk diagnostics, user-controlled booting of PBOS, and an elementary RAM-oriented debugger for pre-disk boot utilization. Hexadecimal object code may be transferred from a serial RS232C port directly into RAM for disk-independent program loading.

The intelligent floppy disk controller maintains a log of soft (recoverable) disk errors for user request via a PBOS utility. Self-test of ROM and RAM is automatically performed at power-up and system reset time and the results are reported to the host RAM Bootstrap.



© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

TMAM9000 AMPL Development System

Designed for the single user, the TMAM9000 AMPL* System can cut program development time by as much as two-thirds, compared to similar systems. Reason: this tabletop, floppy-disk development lab combines extreme ease of use with extensive, preprogrammed test and debug procedures.

Ease of use stems from the AMPLUS* software which prompts the user as he goes. Included are a screen editor, text formatter, directory/file manager, assembler, linker, and other utilities. Even inexperienced designers will feel comfortable with the TMAM9000 System after only a short time.

AMPL high-level debug tools provide extra capability to analyze hardware or software problems via the full speed emulation and comprehensive logic trace analyzer functions. Emulation and control functions can be called from high-level control sequences written in Pascal-derived constructs, allowing design tests to be automated and repeated with a single command, a capability that facilitates production and field testing.

The TMAM9000 supports a variety of programmable-function devices: the TMS99000 16-bit microprocessors and the TM990 microcomputer modules, the TMS1000 4-bit microcomputers, and the TMS7000 8-bit microcomputers.

TMAM9000 System Specifications

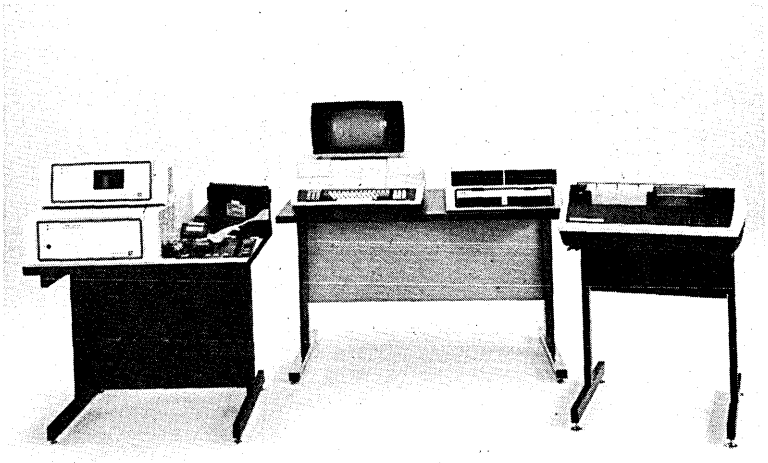
Main Memory (Bytes)	64K
Total Disk Storage (Formatted Bytes)	2.3MB
No. of Disk Drives	2
Type	Double-side, Double-density (DSDD) 8-inch floppy disk (20.32mm)
Capacity Per Diskette	1,152K Bytes
Max. Data Transfer Rate	500K B.P.S.
Terminal Keyboard	88 Key, typewriter style plus numeric, cursor control and function key clusters. N-key rollover
CRT	12-inch (305mm) diagonal
Screen Capacity	80 Character Line—24 lines, 1720 total
Character Set	96 ASCII, upper and lower case
Printer (EIA)-RS232C	Interface included in system
AMPL Station	Interface included in system
Software Package	AMPLUS software system operating system
Features Included	Function key menus, self prompting interactive user interface
Utilities Included	• 9900 Family assembler • 9900 Family linker • Screen editor system • AMPL debug high-level language • AMPL debug procedure library including trace • Disk directory and file utilities • PROM programmer utilities

TMAM9000 Software Products

DESCRIPTION	LICENSE PART NO.
9000 AMPLUS (included with system)	TMAM4014-21
Microprocessor Pascal	TMSW755P-21
TMS7000 Assembler, Linker, PROM utilities	TMAM4016-21
TMS7000 AMPL Emulator utilities	TMAM4017-21
TMS9995, TMS9900 Assembler	TMAM4015-21

Component Software Products

DESCRIPTION	LICENSE PART NO.
Realtime Executive File Manager HDLC Data Comm.	TMSW33OR-21 TMSW34OF-21 TMSW344H-21



Optional Processor Support Tools

AMPL Station for:	Part #
TMS7000	TMAM6059
TMS9900	TMAM6001
SBP9900A	TMAM6003
TMS9980/9981A	TMAM6002
TMS9940	TMAM6004
TMS1000	Contact factory
SBP9989	Contact factory

PROM/EPROM Programmer

Kit	TMAM6058

Additional Support Tools

TMS9995 Evaluation Module	TMAM6095
TMS7000 Evaluation Module	TMAM6100A-1
TI 810 Printer	TMAM7010

*Trademark of Texas Instruments Incorporated

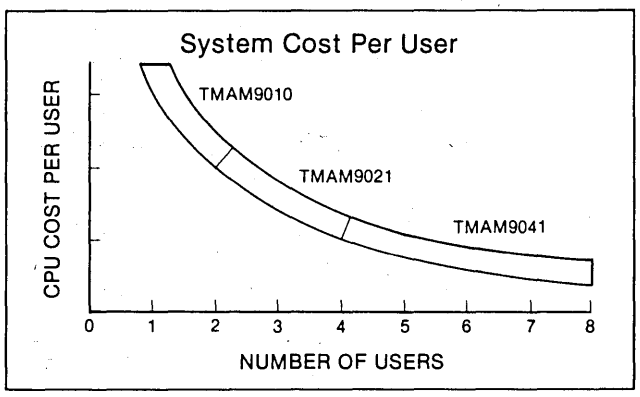
© IC MASTER 1983

TEXAS INSTRUMENTS
INCORPORATED
PROGRAMMABLE PRODUCTS DIVISION • M/S 6432
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

Multi-AMPL Systems: Highest performance ... lowest cost per user

An entire team can now develop software and hardware simultaneously using a single system. The hard-disk Multi-AMPL Systems from Texas Instruments allow as many as eight program designers to work at the same time. You reduce software investment per user by maintaining a single data base. You cut program development time drastically and achieve the lowest possible cost per user.

Each Multi-AMPL System—there are three configurations from which to meet your particular needs—is a complete set of software and hardware development tools. Providing multiple processor emulation. And concurrent multi-task operation: compile, assemble, debug, edit, printing. Also included: data and address trace. Data and address breakpoints. A high-level debug and test procedure language. EPROM and PROM programming. Microprocessor Pascal, Component Software, and Fortran languages supported.



Hardware

DESCRIPTION	TMAM9010	TMAM9021	TMAM9041
Maximum Number of Users	2	4	8
Terminal Expansion for Maximum Number of Users	(1) TMAM7003	(1) TMAM7005	TMAM7005
Printers	(1) TMAM7001	(1) TMAM7001 or (1) TMAM7002	(1) TMAM7002 or (2) TMAM7001
AMPL Station for:	Choose 1:	Choose 1-2:	Choose 1-4:
TMS9900, 9900-40	TMAM6001	TMAM6001	TMAM6001
TMS9980/9981	TMAM6002	TMAM6002	TMAM6002
SBP9900	TMAM6003	TMAM6003	TMAM6003
TMS9940	TMAM6004	TMAM6004	TMAM6004
TMS7000	TMAM6059	TMAM6059	TMAM6059
EPROM Programmer Kit	TMAM6058	TMAM6058	TMAM6058

Software

Multi-AMPLUS	TMAM4004-10	TMAM4004-22	TMAM4004-22
Microprocessor Pascal	TMSW754P-10	TMSW754P-22	TMSW754P-22
Memory Mapped Pascal 2MB	TMAM757-22	TMAM757-22	TMAM757-22
Component Software:			
Realtime Executive	TMSW33OR-10	TMSW33OR-22	TMSW33OR-22
File Manager	TMSW34OR-10	TMSW34OR-22	TMSW34OR-22

Contact factory for other language support

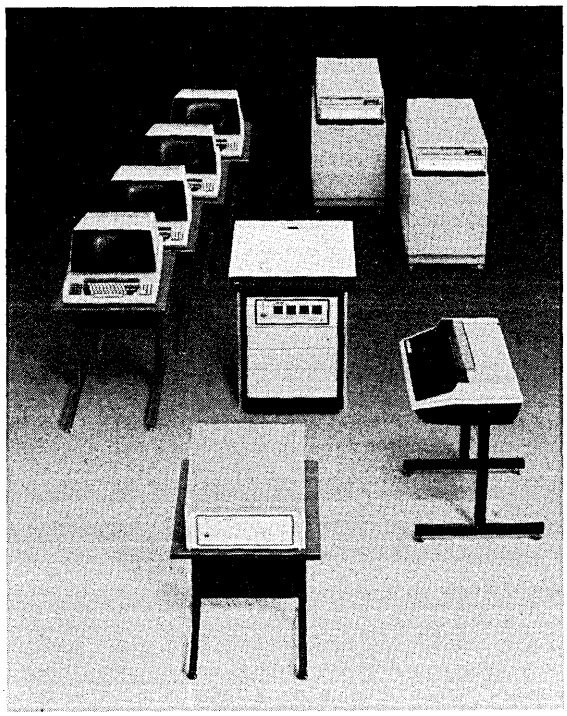
The modular AMPL Station is the key to system capability and flexibility. Each user can have his own station with access to the computer via video terminals (VDTs). The trace module with 10-MHz capability is the invaluable companion for faster, easier design.

The Multi-AMPL Systems supports a variety of programmable-function devices: the TMS99000 16-bit microprocessors, the microcomputer modules and the TMS7000 8-bit microcomputers.

Multi-AMPL Packaged Systems

DESCRIPTION	TMAM9010	TMAM9021	TMAM9041
Main Memory (Bytes)	256K	256K	320K
Total Disk Storage (Formatted Bytes)	9.4M	32M	96M
No. of Disk Drives	1 (DUAL)	2	2
Fixed Disk Storage (Bytes)	1-4.7M	16M	80M
Removable Disk Storage (Bytes)	4.7M	16M	16M
No. Terminals Included	1	2	4
AMPL Station Link	YES	YES	YES
Software Included	Multi-Amplus OS Macro Assembler AMPL Utility Diagnostic Text Editor Link Editor PROM Programming Utility		

Included in all systems: (1) Installation; (2) System generation; (3) Tuition for RTC training; (4) 90-day warranty on parts and labor, (5) One-year software update service.



© IC MASTER 1983

INTRODUCTION TO MICROCOMPUTER BOARDS

In this section single and multiple board microcomputers are arranged in alphabetic sequence by manufacturer. Under each manufacturer boards are grouped in sequence according to data word size and, within that grouping, according to the microprocessor on which they are based. Hardware and software support are listed for each available board.

A supplementary selection guide is included for microcomputer support boards. The boards are grouped according to supported computer systems.

Detailed Product Information provided by:

Advanced Micro Devices	1901
Creative Micro Systems	1911
Cromemco	1913
Datel-Intersil	1933
Motorola Semiconductor	1935
National Semiconductor	1946
RCA	1956
Signetics	1962
Synertek	1980

The manufacturers listed above have provided detailed information on their latest and most significant products.

© IC MASTER 1983

EINFÜHRUNG MIKROCOMPUTER-PLATINEN

In deisem Abschnitt finden Sie Einplatinen- und Mehrplatinen-Mikrocomputer in der Reihenfolge ihrer Wortgröße und, innerhalb dieser Gruppierung, in der Reihenfolge der Mikroprozessoren, auf denen sie basieren. Hardware und Software-Unterstützung ist für jede verfügbare Platine aufgelistet.

Neu in diesem Jahr ist ein weiterer Selection Guide für Mikrocomputer-Zusatzplatinen. Die Platinen sind nach den unterstützten Computersystemen geordnet.

© IC MASTER 1983

INTRODUCTION AUX MICRO-ORDINATEURS SUR CIRCUITS IMPRIMES

Dans cette Section les micro-ordinateurs à circuits imprimés simples ou multiples sont regroupés suivant la taille du "mot de données", et, à l'interieur de chaque groupe, suivant le type de microprocesseur sur lequel, ils sont basés. Les supports hardware et software sont indiqués pour chaque circuit.

Une nouveauté cette année : l'existence d'un Guide de Sélection supplémentaire pour les circuits supports pour micro-ordinateurs. Les circuits sont regroupés d'après les systèmes ordinateurs utilisés.

© IC MASTER 1983

INTRODUCCIÓN A MICROCOMPUTADORAS DE TABLEROS DE CIRCUITOS IMPRESOS MÚLTIPLES

En esta sección microcomputadoras de tablero individual o múltiple están agrupadas en secuencia de acuerdo al tamaño de palabra para datos y, dentro de ese grupo, por medio del microprocesor en el cual están basados. Apoyo por medio de equipos y programas aparecén para cada tablero de circuitos impresos.

Nueva para este año es la guía de selección suplementaira para suporte de tableros de microcomputadoras. Estos tableros están agrupados de acuerdo al sistema de computadora al que sostienen.

マイクロコンピューターボード への案内

このセクションでは単数，複数ボードコンピューターがデータ，ワードサイズによってグループにまとめられ，そのグループ中ボードコンピューターの基になっているマイクロプロセサ順に記載されています。ハードウエア，ソフトウエア共各ボード毎にのせてあります。本年新たに加わったのはコンピューターサポートボード用の補足セレクションガイドでボードはコンピューターシステム毎にグループになっています。

© IC MASTER 1983

MICROCOMPUTER BOARDS

General					I/O		Memory		
Data Word Size (bits)	Instruction Word Size (bits)	CPU Type	Clock Freq. Min/Max (MHz)	Bus Type	Serial Ports	Parallel Lines	Directly Address. Words (K bytes)	Supplied/Extra Capacity (K bytes) RAM	(P)ROM
8	8	AM8085A	4	Multibus	2	24	1M	0/0	0/4
8	8	AM9080A	4	Multibus	1	48		4/0	0/16
8	8-24	F3850	2	Proprietary	1	64	64	1	1/10
8	16	INS8070	4	STD	1	0	64	1/8	2/24
8	16	INS8073	4	Proprietary	1	24	64	4	2/6
8	16	INS8073	4	Proprietary	1	19	64	4	2/6
8	8-24	NSC800	2	CIM	0	16	64	2	0/4
8	16	NSC800	2.5/4	Multibus	1	44	64	4	0/32
8	16	NSC800	2.5/4	Multibus	1	44	64	8	0/32
8	16	NSC800	2.5/4	Multibus	1	44	64	16	0/32
8	16		2	C-44	0	22	64	1.1	0/2
8	16	TMS9995	12	Proprietary	1	16	28	4/24	24/26
8	8	Z8	3.7	Proprietary	1	40	64	0/8	16
8	8-32	Z80	2/4	Proprietary	4	0	64	1	2
8	8-32	Z80	2/4	Multibus	2	32	64	64	64
8	8-32	Z80	2/4	Multibus	2	32	64	1	0/8
8	8-32	Z80	2/4	Multibus			64		
8	8-32	Z80	2.5	Proprietary	1	16	64	16	0/4
8	8-32	Z80	2.5	Proprietary	1	16	64	4	0/4
8	8	Z80	2.5	MCZ	1	16	64	2/8	0/4
8	18	Z80	2.5/4	Cyberbus	0	0	256	0/1	0/2
8	16	Z80	2.5/6	STD	0	0	64	0/2	0/4
8	8	Z80	4	S-100	1	24	64	1	0/8
8	8	Z80	4	S-100			64	0	0
8	8-32	Z80	4	FlexibusIII	2		64	1/8	0/8
8	8-32	Z80A	2/4	Multibus	2	8	64	64/1	0/32
8	8-32	Z80A	2/4	Multibus	4	8	64	64/1	0/32
8	8-32	Z80A	2/4	Multibus	2	0	64	128/16	0/64
8	8-32	Z80A	2/4	Multibus	1	48	64	16/64	0/40
8	8-32	Z80A	2.5	STD	2	72	64	16	8
8	8-32	Z80A	2.5	STD	0	0	64	1/4	8
8	8-32	Z80A	2.5/4	STD	0	0	64	8	32
8	16	Z80A	2.5/6	STD	1	24	64	0/2	0/6

Sequenced alphanumerically by data word size, CPU type and increasing clock frequency.

© IC MASTER 1983

MICROCOMPUTER BOARDS

Software Support					Hardware Support	Comments	Model	Source	Line
Assembler	Debug/ Monitor	Editor	Language	Operating System					
						Programmable read and write protect attributes for memory, 5 16-bit programmable counter/timers.	**AM95/4010**	**AMD (1902)**	
						Programmable real time clock, memory shadow.	**AM95/4006**	**AMD (1902)**	
	x	x			x	One-megabyte address capability, memory-mapping RAM, byte-wide memory, on-card floppy disk interface, arithmetic processor and DMA.	DCM-1	Fairchild	
x	x	x	x	x	x	STD-compatible controller and development system with Basic.	SYS-10	Octagon	
x	x	x	x	x	x	Process controller and development system with Basic interpreter.	SYS-1A	Octagon	
x	x	x	x	x	x	Similar to SYS-1A, bus has analog inputs and 500 mA output.	SYS-2A	Octagon	
x	x	x	x	x	x	CMOS. NSC801, 802, and 804 have 1, 2 and 4MHz NSC800, respectively.	**CIM-802**	**National (1946)**	
x	x	x	x	x	x	CMOS. Power dissipation is less than 1 W.	CBC800/204	Divers Tech	
x	x	x	x	x	x	CMOS. Power dissipation is less than 1 W.	CBC800/208	Divers Tech	
x	x	x	x	x	x	CMOS. Power dissipation is less than 1 W.	CBC800/216	Divers Tech	10
x	x					CMOS, on-board regulator, allows extremely low-power mode of operation.	CPU-800	Synapse	
x	x	x	x		x	Designed for industrial environment. Various combinations of RAM and EPROM.	CPU205	Tau Zero	
x	x	x		x	x		**Z8-SCB**	**Zilog (1582,1603)**	
x	x	x	x	x	x	TTL-compatible serial ports with maximum baud rate of 9.6 kbits/s asynchronous, 64 kbits synchronous.	MM1-MSC	Cont Logic	
x	x	x	x	x	x	Floppy controller, streaming tape interface, hard-disk interface, DMA, IEEE-488 controller.	MLZ-90	Heurikon	
x	x	x	x	x	x	Software-programmable dual baud-rate generator, 4 counter-timers, 12-bit analog input channels.	MLZ-DAQ	Heurikon	
x	x	x	x	x	x	Replaces 8080 CPU board in Intellec 800, 888. Supports all Z80 software and architectural features. ISIS-11 compatible.	Z80SAM	RELMS	
x	x	x	x	x	x		**Z80-MCB/16**	**Zilog (1581)**	
x	x	x	x	x	x		**Z80-MCB/4**	**Zilog (1581)**	
x	x	x	x	x	x	Baud rates are software programmable from 50 to 38.4 baud. 4 8-bit counter/timer channels 128 vectored interrupts, complete bus buffering.	**Z80MCB**	**Zilog (1581)**	20
x	x	x	x	x	x	On-board vectored interrupt controller and memory-mapped I/O.	1080	Cybersys	
	x			x	x	Two I/O ports are occupied by on-board functions, one of which is a DMA controller.	ST4101	APT	
x	x	x	x	x	x	Five programmable timers, 110 to 76,800 baud serial port.	**SCC**	**Cromemco (1917)**	
x	x	x	x	x	x		**ZPU**	**Cromemco (1916)**	
x	x	x	x	x	x	High-speed hardware floating point math optional 1862A. Master/slave mode capability for multiprocessor applications. Supports digital, analog systems.	1862+A	Xycom	
x	x	x	x	x	x		MLZ-91A	Heurikon	
x	x	x		x	x	Floppy controller, streaming-tape interface, hard-disk interface, DMA, Multimaster capability.	MLZ-92A	Heurikon	
x	x	x	x	x	x	DMA, modem and SDLC/HDLC signals.	MLZ-93	Heurikon	
x	x	x	x	x	x	High-speed math processor, 16-level interrupt controller, 6 counter/timers, Multimaster bus arbitration logic, accepts floating-point processors.	ZBC-80	Matrox	
			x	x	x	Cassette interface, video interface, on-board PROM programmer, real-time clock, keyboard interface.	BC2A	Action Ins	30
	x				x	Optional external clock input. Three state bus drivers may be disabled for DMA observation single +5v operation. Addressable expansion to 116 kbytes.	7803A	Pro-Log	
	x				x	Counter/timer with 6channels, 2frequency options single +5v operation, DMA compatibility to memory, compatible with all Z80 interrupt modes.	7804	Pro-Log	
	x			x	x	Commercial and industrial packaging option available with PC backplane. Expandable I/O system for communications, display and control.	ST4102	APT	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROCOMPUTER BOARDS

General					I/O		Memory		
Data Word Size (bits)	Instruction Word Size (bits)	CPU Type	Clock Freq. Min/Max (MHz)	Bus Type	Serial Ports	Parallel Lines	Directly Address. Words (K bytes)	Supplied/Extra Capacity (K bytes) RAM	(P)ROM
8	8-24	Z80A	3.69	Multibus	1	48	64	16	0/8
8	8-32	Z80A	4	Proprietary	1	0	32	4/8	0/28
8	16	Z80A	4	Proprietary	4	32	64	64	1/2
8	19	Z80A	4	Multibus	4	32	512	0	1/2
8	8-32	Z80A	4	Multibus	4	2	64	256	0/32
8	8-32	Z80A	4	STD	1	24	1000	64/0	0/32
8	16	Z80A	4	Multibus	1	48	64	4/8	2/4
8	8-24	Z80A	4	Multibus	1	48	64	32/64	4/32
8	8-24	Z80A	4	Multibus	3	24	64	32/64	4/32
8	8-24	Z80A	4	Multibus	2	0	64	32/64	4/32
8	16	Z80A	4	LSI-11	2	24	40	16	2/24
8	8-32	Z80A	4	LSI-11	1	24	32	1/16	2/16
8	8-32	Z80A	4	STD	0	0	64	2	8
8	4-16	Z80A	4	Proprietary	1	32	64	16/64	1/14
8	4-16	Z80A	4	Proprietary	1	64	64	4/64	1/14
8	4-16	Z80A	4	Proprietary	1	36	64	16/65	1/14
8	8	Z80A	6	Multibus	2	16	16K	32	16
8	16	146805E2	5	C-44	0	8	64	1.1	0/2
8	8-16	1802	.3/2.5	Microboard	1	1	64	2	0/4
8	8-16	1802	2	Microboard	1	20	64	4	0/8
8	8-16	1802	2	Microboard	1	20	64	1	0/8
8	8-16	1802	2	Microboard	1	1	64	1	0/4
8	8	1802	2.46	Microboard	1	0	64	2	0/4
8	8-16	1805	.3/2.5	Microboard	1	16	64	2	0/4
8	8-16	1805	2	Microboard	1	20	64	4	0/8
8	8-16	1805	2	Microboard	1	20	64	1	0/8
8	8-16	1805	2	Microboard	1	16	64	1	0/4
8	8-16	1805	2.5	Microboard	1	0	64	2	0/4
8	8-16	6501	1	AIM-65	2	40	64	1/3	2/10
8	16	6502	1	AIM-65	0	72	64	1/4	0/20
8	8-24	6502	1	STD	2	20	64	0/40	0/40
8	8-24	6502	1		1	0	56	20/4	10.5

Sequenced alphanumerically by data word size, CPU type and increasing clock frequency.

© IC MASTER 1983

MICROCOMPUTER BOARDS

Software Support					Hard-ware Sup-port	Comments	Model	Source	Line
Assem-bler	Debug/ Monitor	Editor	Lang-uage	Oper-ating System					
x	x	x	x	x	x	ROM/RAM shadowing. Battery backup.	BLC-80/316	National	
x	x	x	x	x	x		CCS-1143A	Cont Logic	
x	x	x	x	x	x	CPU board with RAM and floppy-disk controller. Forms heart of HiNet local computer network.	DSC-3	DGM	
x	x	x	x	x	x	Multibus-compatible CPU with memory management. Interface with HiNet.	DSC-4	DGM	
			x	x	x	On-card video graphics controller	MLZ-VDC	Heurikon	
	x		x		x	Memory mapping and I/O expansion line, programmable serial port.	MCPU-800	Miller	
x	x	x		x	x	High-memory industrial controller or low-end computer board.	MSC8001	MonSys	
x	x	x		x	x	Multimaster logic, PROM memory maps, math chip for floating-point processing.	MSC8004/A	MonSys	
x	x	x		x	x	Multimaster logic and optional APU, single/dual address maps available with custom RAM/ROM and I/O mapping.	MSC8007/A	MonSys	
x	x	x	x	x	x	WD1793 floppy-disk controller on board, optional APU, single/dual address maps available with custom RAM/ROM and I/O mapping.	MSC8009/A	MonSys	10
x	x		x		x	One of 2 serial RS423 ports has full modem control. Optional dialer and automatic calling unit interfaces. Communications protocol software.	PCP-11E	Nortek	
x	x		x		x	Slave communications processor, DEC LSI-11 family. Parallel, asynch or synch serial, color video. Optional 801 dialer interface.	PCP-11L	Nortek	
	x				x	10 msec. timer w/ interrupt capability. DMA compatibility to external memory. Compatible with Z80 interrupt modes. Addressable exp. to 128 kbytes.	7880	Pro-Log	
x	x	x	x	x	x	DMA based, multi-density floppy disk controller, 4 counter/timers, PROM programmer, CPU bus available for system expansion.	90F/MPS	Quay	
	x		x		x	PROM programmer, 4 counter/timer channels, CPU bus for expansion.	90MPS	Quay	
x	x	x	x	x	x	Complete floppy disk controller, single, double, or quad density and PROM programmer on board.	94F/MPS	Quay	
x	x		x	x	x	Intended as superviser for multiprocessor system. Communications options.	RSBC-Z80SP	RELMS	
x	x					Low-power, on-board regulator.	CPU-6805	Synapse	
x	x	x	x	x	x	UART has 14 selectable baud rates. High noise immunity, I/O lines on edge connectors, dedicated expandable through universal backplane.	**CDP18S602**	**RCA**	**(1956)**
x	x	x	x	x	x	High noise immunity, I/O lines on edge connectors, CMOS individually programmable and expandable through universal backplane. Powered through exp. or I/O connector.	**CDP18S601**	**RCA**	**(1956)** 20
x	x	x	x	x	x	See CDP18S601	**CDP18S603**	**RCA**	**(1956)**
x	x	x	x	x	x	High noise immunity. I/O lines on edge connectors, expandable through universal backplane. Powered through exp. or I/O connectors. On-board breadboard area.	**CDP18S604**	**RCA**	**(1956)**
x	x	x	x	x	x	Same as CDP18S602	**CDP18S605**	**RCA**	**(1956)**
x	x	x	x	x	x		**CDP18S607**	**RCA**	**(1956)**
x	x	x	x	x	x	Same as CDP18S601 plus additional 22 CPU instructions and on-board counter/timer.	**CDP18S606**	**RCA**	**(1956)**
x	x	x	x	x	x		**CDP18S608**	**RCA**	**(1956)**
x	x	x	x	x	x		**CDP18S609**	**RCA**	**(1956)**
x	x	x	x	x	x		**CDP18S610**	**RCA**	**(1956)**
x			x	x		Compatible with AIM-65. Includes breadboard area.	SBC651	IMS	
x	x	x	x	x	x	Software compatible with AIM-65.	6500	Cubit	30
				x		Primary serial port is RS232, secondary is TTL simplex. Two 16-bit timer-counters.	ACS15/65	Datricon	
x	x		x	x	x	See Superboard II. Nine-digit disk extended Basic and software I/O distribution. RS-232 or cassette interface.	CIPMF	Ohio Sci	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROCOMPUTER BOARDS

General					I/O		Memory		
Data Word Size (bits)	Instruction Word Size (bits)	CPU Type	Clock Freq. Min/Max (MHz)	Bus Type	Serial Ports	Parallel Lines	Directly Address. Words (K bytes)	Supplied/Extra Capacity (K bytes) RAM	(P)ROM
8	8-24	6502	1	Proprietary	1	0	56	4/4	10
8	17	6502	1	RM65	2	52	128	16/48	4/32
8	8-24	6502	1	Dedicated	1	16	64	1/4	0/12
8	17	6502	1	Proprietary	2	16	128	2	0/16
8	8-24	6502	1	Dedicated	3	28	64	1	1/5
8	8-24	6502	1	KIM	1	51	60	1/4	0/28
8	19	6502	1/2	Cyberbus	0	0	512	0	0
8	19	6502	1/2	Cyberbus	0	0	512	0/1	0/2
8	8	6502	4	Proprietary	1	32	64	1/2	0/16
8	8	6508	1/2	6500	0	32	32	1280	32
8	8	6508	1/2	6500	1	48	32	1280	32
8	8-24	6512	1/2	EXORciser	1	20	64	3072	0/32
8	8-24	6512	1/2	EXORciser	1	20	64	3072	0/32
8	8-24	68ATX	1	STD	2	20	64	2/40	8/40
8	8-16	6800	0.1/1	EXORciser	1	16	64	1	1/4
8	16	6800	1	STD	0	0	64	0/2	0/8
8	8-24	6800	1	EXORbus	1	60	64	1	0/4
8	8-24	6800	1	EXORbus	1	40	64	1	0/8
8	8-24	6800	1	EXORbus	1	8	64	0/10	0/10
8	8-24	6800	1	Proprietary	1	40	64	1/2	0/32
8	8-24	6800	1	Proprietary	2	20	64	1/2	0/32
8	8-24	6800	1	Proprietary	1	40	64	1/2	0/16
8	8-24	6800	1	EXORciser	1	32	64	1/4	0/32
8	8-24	6800	1	EXORciser	1	32	64	1/4	0/32
8	8	6800	1	Bus-44	1	32	64	0.5	4
8	8	6800	1	Bus-44	1	32	64	0.5	4
8	8-24	6800	1/2	STD	2	20	64	2/40	8/40
8	8-24	6800	1/2	EXORciser	1	20	64		
8	8-24	6800	1/2	EXORciser	1	20	64		
8	8-24	6800	2	Proprietary	1	40	64	1/2	0/32
8	8-24	6800	4	STD	0	0	64	1/4	8
8	16	6801	1	EXORciser	2	8	64	0.13/3	2/8

© IC MASTER 1983

MICROCOMPUTER BOARDS

Software Support					Hardware Support	Comments	Model	Source	Line
Assembler	Debug/ Monitor	Editor	Language	Operating System					
x	x		x	x	x	Built-in Basic in ROM, machine code monitor, 1 cassette interface, video interface and full keyboard.	Superboard II	Ohio Sci	
x	x	x	x		x	Industrial, laboratory, and test equipment applications use with large memory. Supported by software and peripherals.	A65/40-1000	Rockwell	
x	x	x	x		x	On-board 20-column thermal printer, alpha-numeric 20 char. display, 54 key terminal style keyboard, connector for cassette and TTY.	AIM65	Rockwell	
x	x	x	x		x	Card cage and variety of expansion boards available. Software can be developed with AIM 65. Available in Euroconnector or edge connector style.	RM65-1000	Rockwell	
x	x		x		x	64 bytes of interrupt vector RAM.	CP110	Synertek	
x	x	x	x		x	Built-in audio cassette interface, I/O parallel expandable to 71 lines, built-in keyboard display. SM100 comes without this addition.	SYM-1	Synertek	
x	x	x	x	x	x	Memory-mapped I/O	1010	Cybersys	
x	x	x	x	x	x	On-board vectored interrupt controller and memory-mapped I/O.	1012	Cybersys	
x	x	x	x		x	Provision for on-board power supply, buffers/terminators on parallel lines. RS232,422 or loop serial. Optional CMOS RAM.	CMC65/04	RCI Data	
						Five priority interrupts.	MMS6508-1	CSG	10
						Five priority interrupts, 2 timers and time-of-day clock.	MMS6508-2	CSG	
x	x	x	x		x	Buffered data and address lines, DMA controls, power-on reset.	MBC010-65	Synertek	
x	x	x	x		x	Complete video interface with separate and composite sync/video outputs.	**MBC020-65**	**Synertek**	**(1981)**
			x	x	x	6801 instruction set. Primary serial port is RS232, secondary is TTL simplex. Two 16-bit timer-counters on board.	ACS14/64	Datricon	
x	x	x	x	x	x	Process control software available using PIO algorithm. Firmware-compatible compiler.	DK-6800	Digitek	
x	x	x	x			Fuse-link PROMs used for memory, I/O and DMA control.	ACS/68	Appl Sys	
x	x	x	x	x	x	Crystal-controlled clock, interrupt, DMA, power-on reset, buffered bus, 3 PIAs.	**M68MM01**	**Motorola**	**(1939)**
x	x	x	x	x	x	Crystal-controlled clock, interrupt, DMA, power-on reset, buffered bus, 2 PIAs.	**M68MM01A2**	**Motorola**	**(1939)**
x	x	x	x	x	x	Three 16-bit timers, parallel printer I/O interface, buffered bus, 5 sockets for 2K EPROM, ROM or RAM.	**M68MM01D**	**Motorola**	**(1939)**
x	x	x	x		x	DMA controller, separate on-board/off-board buffers, field programmable gate array device, decode, 8-level vectored interrupt, controller.	CMC68/15	RCI Data	20
x	x	x	x		x	Communications version of CMC68/15.	CMC68/15C	RCI Data	
x	x	x	x		x	IEEE 488(GPIB) interface, DMA controller, separate on-board, off board buffers, field programmable gate array device decode,modem leads.	CMC68/15G	RCI Data	
					x	Replacement for Motorola's M68MM01A2 with additional capacity. 2-MHz special operation available. Four mating connectors.	MBC01-A2-1	Synertek	
					x	Replacement for Motorola's M68MM01A2 with additional capacity. 2-MHz special operation available. Four mating connectors.	**MBC01A2**	**Synertek**	**(1982)**
x	x	x	x	x	x	Serial port is programmable to 9600 baud.	MCL45	Wintek	
x	x	x	x	x	x	Serial port is programmable to 9600 baud. Single 5V supply.	MCV45	Wintek	
			x	x	x	Primary serial port is RS232, secondary is TTL simplex. Two 16-bit timer-counters.	ACS12	Datricon	
x	x	x	x			Buffered data and address lines, DMA controls, composite sync/video outputs.	MBC010-68	Synertek	
x	x	x	x			Complete video interface with separate and composite sync/video outputs.	**MBC020-68**	**Synertek**	**(1981)**
x	x	x	x		x	2 MHz version of CMC68/15.	CMC68/15B	RCI Data	30
x	x		x		x	Optional external clock input. Tri-State bus drivers may be disabled for DMA operation. Programmable memory for I/O.	7802	Pro-Log	
x	x	x		x	x		MBK6801	MRC	

MICROCOMPUTER BOARDS

General					I/O		Memory		
Data Word Size (bits)	Instruction Word Size (bits)	CPU Type	Clock Freq. Min/Max (MHz)	Bus Type	Serial Ports	Parallel Lines	Directly Address. Words (K bytes)	Supplied/Extra Capacity (K bytes) RAM	(P)ROM
8	8	6801	1	Proprietary	1	16	2176	128	2048
8	8-16	6802	0.5	EXORciser	2	24	64	1	0/6
8	16	6802	0.5/1	EXORciser	2	40	56	1.2	6
8	8-24	6802	1	Proprietary	1	40	64	0/2	0/8
8	8-24	6802	1	EXORbus	0	26	64	128	0/4
8	8-24	6802	1	EXORbus	1	26	64	128	0/4
8	8-16	6802	1	System-50	1	8	1K	1	0/1
8	8-24	6802	1	Proprietary		16	64	0.256	0/16
8	16	6802	1	Proprietary	1	32	64	1.4	0/16
8	8-24	6802	1	KIM	1	51	60	1/4	0/28
8	8-24	6802	1/2	Proprietary	0	0	64	0/4	0/32
8	19	6802	1/2	Cyberbus	0	0	512	0/1	0/2
8	8-16	6802	4	—	4	8	64	1	0/8
8	16	6803	4/9	STD	1	24	64	2	0/4
8	16	6808	1/2	Proprietary	1	20	64	1152b	0/4
8	8	6808	1/2	Proprietary	—	—	64	1	0/4
8	8-16	6808	1/2	Proprietary	1	20	64	2048	0/8
8	8	6808	1/2	Proprietary	—	—	64	1	0/4
8	8-24	6809	1	Proprietary	1	40	64	0/2	0/8
8	16	6809	1	EXORciser	2	40	64	1	6
8	8-24	6809	1	EXORbus	2	20	64	0/10	0/20
8	8-24	6809	1	EXORbus	1	20	64	2	2/14
8	8-24	6809	1	KIM	1	51	60	1/3	0/28
8	8-40	6809	1/2	Proprietary	0	0	64	0/4	0/16
8	16	6809	1/2	EXORbus	2	40	1048	2/8	2/32
8	8-24	6809	1/2	STD	1	0	64	4/40	8/40
8	8-24	6809	1/2	Multibus	2		64	8.2	6
8	16	6809	1/2	STD	1	0	128	0/8	0/32
8	8-16	6809	1/2	Multibus	1	48	64	9	0/16
8	8-24	6809	1/2	Proprietary	1	40	64	2	0/16
8	16	6809	1.5	Proprietary	1	32	64	1	0/16
8	8-24	6809	2	EXORbus	1	20	64	2	2/14

Sequenced alphanumerically by data word size, CPU type and increasing clock frequency.

© IC MASTER 1983

MICROCOMPUTER BOARDS

Software Support					Hardware Support	Comments	Model	Source	Line
Assembler	Debug/ Monitor	Editor	Language	Operating System					
x	x	x	x		x	Hardware/software system designed for use as a remote unit for distributed data acquisition and control.	MCC14	Wintek	
x	x	x	x	x	x	Includes 3 programmable timers, eight levels of priority interrupt control, power-fail sensing, battery back-up option renders RAM non-volatile.	SBC/9EX	Percom	
	x				x	ACIA, PIA, bit-rate generator, interrupt vector generator, power-failure protect restart, triple programmable timers.	**CMS-9600A**	**CreMicro (1911)**	
x	x	x	x				560	Adapt Sci	
x	x	x	x	x	x	Three 16-bit timers, programmable baud rate.	**M68MM01B**	**Motorola (1939)**	
x	x	x	x	x	x	Audio cassette interface, dynamic RAM refresh, buffered bus, 3 16-bit timers.	**M68MM01B1A**	**Motorola (1939)**	
x	x		x	x	x	May address 16M bytes via parallel port. Includes ROM operating system, data terminal monitor.	SBC/9	Percom	
x	x	x	x		x	Provisions for on-board power supply and timer.	CMC68/04	RCI Data	
x	x	x	x		x	Possible complete microcomputer with on-board power supply and RS-422 communications adapter.	CMC68/04A	RCI Data	
x	x	x	x		x	Built-in audio cassette interface, I/O parallel expandable to 71 lines, built-in keyboard display.	SYM-1/68	Synertek	10
x	x	x			x	Crystal-controlled clock, DMA, power-on reset, mapping PROM for on-board EPROM/RAM, 2 interrupts.	1020	Adapt Sci	
x	x	x	x	x	x	On-board vectored interrupt controller and memory-mapped I/O.	1082	Cybersys	
						On-board jumper selection of interrupt priorities.	SBC681	IMS	
	x						7911CP3	Matrix	
x	x	x	x	x	x	On-board decoding for 8 pages of off-board I/O. PROM, RAM, on-board I/O and off-board enables addresses are user definable. Buffered bus.	OB8001A	Omnibyte	
x	x	x	x	x	x	Sockets for two arithmetic processing units, one uncommitted triple 16-bit timer/counter unit, fully buffered bus.	OB8800	Omnibyte	
x	x	x	x	x	x	M6800 instruction set, on-board decoding for 8 pages of off-board I/O. Addresses are user-defineable. Buffered bus.	OB8802	Omnibyte	20
x	x	x	x	x	x	Same as OB8800	OB8900	Omnibyte	
x	x	x	x			Three programmable counter/timers. Crystal-controlled clock, 3 interrupts, power-on reset.	590	Adapt Sci	
	x				x	ACIA, PIA, bit-rate generator, interrupt vector generator, power failure protect restart, hardware compatible with CMS 9600A.	**CMS-9609**	**CreMicro (1911)**	
x	x	x	x	x	x	Can use RAM in ROM sockets.	**M68MM17**	**Motorola (1939)**	
x	x	x	x	x	x	Three 16-bit timers, DMA buffered bus.	M68MM19	Motorola	
x	x	x	x		x	Built-in audio cassette interface, I/O parallel expandable to 71 lines, built-in keyboard display.	SYM-1/69	Synertek	
x	x	x			x	Crystal-controlled clock, DMA, power-on reset, mapping PROM for on-board EPROM/RAM, 3 interrupts.	1010	Adapt Sci	
	x			x	x	Resident monitor. Has 2 Kbytes of nonvolatile RAM with space for RAM or ROM expansion.	**CMS-9619**	**CreMicro (1911)**	
x	x	x	x	x	x	Software support is OS9 or Sphere. Serial port is RS232 or RS422 with modem control.	ACS09	Datricon	
x	x	x	x			Programs 2716, 38E70. Emulates 3870 family, cross-assembler for 8080- and 6800-based systems. On-board keyboard and display.	F68-PEP	Fairchild	30
	x						7911-SP9	Matrix	
x	x	x	x	x	x	ROM, RAM, on-board I/O and off-board I/O addresses are user defineable, 3 16-bit timers, 8 levels of vectored, maskable interrupts.	OB6000	Omnibyte	
x	x	x	x		x	Separate on-board, off-board buffers, field programmable gate array device decode, 3 channel timer, modem control leads, small wire wrap area.	CMC69/15	RCI Data	
x	x	x	x		x	Provision for on-board power supply, RS-422.	CMC69/04	RCI Data	
x	x	x	x	x	x	Three 16-bit timers, DMA buffered bus.	**M68MM19A**	**Motorola (1939)**	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROCOMPUTER BOARDS

General					I/O		Memory		
Data Word Size (bits)	Instruction Word Size (bits)	CPU Type	Clock Freq. Min/Max (MHz)	Bus Type	Serial Ports	Parallel Lines	Directly Address. Words (K bytes)	Supplied/Extra Capacity (K bytes) RAM	(P)ROM
8	8-32	6809	4	STD	0	0	64	2	8
8	8	6809	4	Proprietary	1	32	64	1/2	0/16
8	16	8X300	8	Proprietary		4		0.256	
8	12	80C35	0/3	Proprietary	1	27	4	0.25/2	2/4
8	8-24	8080	2	Multibus	1	48	64	16	0/16
8	8-24	8080A	0.75	Proprietary	0	24	64	0.5	0.5
8	8-24	8080A	0.75/2	STD	2	32	64	4	4/4
8	8-24	8080A	1.02	MCS	0	24	32	1	0/7
8	8-24	8080A	2	MCS	3	0	32	1	0/7
8	8	8080A	2	S-100	2	24	64	4	4
8	8-24	8080A	2	Multibus	1	48	64	1/4	0/16
8	8-24	8080A	2	Multibus	0	24	64	0.512	0/4
8	8-24	8080A	2	Multibus	1	48	64	1	0/4
8	8-24	8080A	2	Multibus	1	48	64	1	0/8
8	8-24	8080A	2	Multibus	1	48	64	1/4	32
8	8-24	8080A	2	Multibus	1	48	64	2	0/8
8	8-24	8080A	2	Multibus	1	48	64	1/4	32
8	8-24	8080A	2	Multibus	1	48	64	4	0/8
8	8-24	8080A	2	Multibus	1	48	64	1/4	32
8	8-24	8080A	2	Multibus	1	48	64	1/4	16
8	8	8080A	2	FlexibusII	1	16	64	1	0/7
8	8	8080A	2	FlexibusII	1	32	64	1	0/3
8	8-24	8080A	2.05	Multibus	1	48	64	1	0/8
8	8-24	8080A	2.15	Multibus	1	48	64	4	0/8
8	8-24	8080A	2.76	Multibus	1	24	64	16/16	0/8
8	8-24	8080AF	2	Proprietary	2		64	1/4	2/8
8	8-24	8080A-2	2.15	Multibus	1	48	64	4	0/8
8	8-24	8080A-2	4.8	Multibus	1	48	64	4/8	0/32
8	16	8085	3/5	Multibus	2	12	64	0	6
8	19	8085	4	Cyberbus	0	0	512	0/1	0/2
8	16	8085	5	Multibus	1	48	64	6/6	0/16
8	16	8085A	0.5/5	STD	1	0	64	0.25/2	0/8
8	8-24	8085A	2	None	1	22	64	0.25	2/4
8	8-24	8085A	2	Multibus	1	22	64	0.5	2/4

Sequenced alphanumerically by data word size, CPU type and increasing clock frequency.

© IC MASTER 1983

MICROCOMPUTER BOARDS

Software Support					Hard-ware Sup-port	Comments	Model	Source	Line
Assem-bler	Debug/ Monitor	Editor	Lang-uage	Oper-ating System					
					x	10 msec. timer w/ interrupt control. DMA control to external memory. Dynamic RAM refresh clock. Single +5v operation.	7889	Pro-Log	
x	x	x	x		x	Provision for on-board power supply, buffers/terminators on parallel lines, RS232, 422, or loop on serial. Optional CMOS RAM.	CMC69/04A	RCI Data	
					x	Single step control, instruction insertion from DIP switches, and Wire-Wrap development area.	8X300KT100SK	Signetics	
x	x	x		x		Has 28-key keypad and 7-digit display. Tutorial and development tool versions.	Concept-48	Intersil	
x	x	x	x	x	x	Two BLX connectors for modular expansion	BLC-80/116	National	
	x				x	Accessories available for memory expansion, teleprinters, CRT terminal cassette interface.	MMD-1	EL Instr	
x	x	x	x	x	x	Handles hex or octal data entry and display. Includes single-step register examination, breakpoints cassette load/dump, PROM programming.	MMD-2	EL Instr	
			x		x	Expansion capability without backplane.	MCS80-0013	Bedford	
			x		x	Flexible packaging and cabling.	MCS	Bedford	
	x	x	x			Real-time basic training system with RS232 printer/terminal interface. Basic editor/interpreter with utilities and additional 4K of RAM.	AMTS	IntCompSys	10
x	x	x	x	x	x	Sockets for interchangeable line drivers and terminators, programmable communications interface, single-level interrupt.	iSBC80/10B	Intel	
x	x	x	x	x	x	Four interrupts.	BLC-80/07	National	
x	x	x	x	x	x		BLC-80/10	National	
x	x	x	x	x	x	Extended temperature (-40°C to 85°C) version available.	BLC-80/11	National	
x	x	x	x	x	x	Two BLX connectors for modular expansion	BLC-80/11A	National	
x	x	x	x	x	x	Extended temperature (-40°C to 85°C) version available.	BLC-80/12	National	
x	x	x	x	x	x	Two BLX connectors for modular expansion	BLC-80/12A	National	
x	x	x	x	x	x	Extended temperature (-40°C to 85°C) version available.	BLC-80/14	National	
x	x	x	x	x	x	Two BLX connectors for modular expansion	BLC-80/14A	National	
x	x	x	x	x	x		CLB-80/11B	National	20
x	x		x	x	x	RS-232, on-board battery	1806A	Xycom	
x	x		x	x	x	RS-232, on-board battery	1810Z	Xycom	
x	x	x	x	x	x	For severe environmental operation conditions: -55°C to 85°C, 5 G vibration — 5 Hz to 2 kHz, 15 G shock — 11 ms, 0 to 95% humidity.	SECS80/10A	EMM	
x	x	x	x	x	x	Programmable USART, two programmable 16-bit BCD and binary timers. Eight-level priority interrupt logic, Multimaster control.	iSBC80/20-4	Intel	
x	x	x	x	x	x	Sockets for 8041/8741A interface, 12 levels of programmable interrupt control, RAM battery backup, Multimaster control.	iSBC80/30	Intel	
x	x	x			x	Keyboard, tape cassette interface, 8 digit display.	TK-80A	NEC-Micro	
x	x	x	x	x	x	Eight vectored interrupts, 3 on-board timers, multi-processor capability, RAM and ROM can share same address space, battery backup logic.	BLC-80/204	National	
x	x	x	x		x	Two programmable 16-bit BCD and binary timers, eight-level programmable interrupt control, memory protected.	iSBC80/24	Intel	
x	x					Has both 8085 and 8088 processors, only one of which operates at a time. Optional battery-backed calendar clock, math chip.	8108	ETI Micro	
x	x	x	x	x	x	CPU card, 2 or 4 MHz clock is switch-selectable.	1085	Cybersys	30
x	x	x	x	x	x	Includes CRT display controller and ASCII keyboard input port.	MC85	Comark	
x	x	x	x		x	Memory and peripheral I/O cards are available for systems.	ACS/80	Appl Sys	
x	x	x	x		x	Sockets for 4K bytes of EEPROM. Four-level vectored interrupt, sockets for 4K bytes of EEPROM. TTL serial I/O interface. Multimaster control.	iSBC80/04	Intel	
x	x	x	x		x	Programmable 14-bit timer, four-level vectored interrupt, TTL serial I/O interface, Multimaster control.	iSBC80/05	Intel	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROCOMPUTER BOARDS

General					I/O		Memory		
Data Word Size (bits)	Instruction Word Size (bits)	CPU Type	Clock Freq. Min/Max (MHz)	Bus Type	Serial Ports	Parallel Lines	Directly Address. Words (K bytes)	Supplied/Extra Capacity (K bytes) RAM	(P)ROM
8	8-24	8085A	2	Multibus	1	22	64	0.512	0/8
8	8-24	8085A	2.45	Multibus	1	—	64	16	0/16
8	16	8085A	2.5/5	Multibus	1	48	64	4	0/12
8	8-24	8085A	2.76	Multibus	1	42	64	16	0/8
8	8-24	8085A	2.76	Multibus	4	10	64		0/8
8	8-24	8085A	2.76	Multibus	4	10	64	16	0/8
8	8-24	8085A	2,45	Multibus	1	—	64	16	0/16
8	16	8085A	3	Proprietary	1	44	64	1.28	0/4
8	16	8085A	3	Multibus	3	48	64	4	0/128
8	16	8085A	3	Proprietary	1	44	64	1.28	0/4
8	8-24	8085A	3/3.125	STD	1	0	64	1/4	8
8	16	8085A	3/5	SMP	1	16	64	2/10	0/16
8	16	8085A	3/5	Proprietary	3	16	64	2/10	0/16
8	8-24	8085A	3.07	Multibus	1	48	64	2	0/16
8	8-16	8085A	5	CAMAC	2	16	64	16/16	0/16
8	8-16	8085A	5	Proprietary	1	0	64	0.256	0.256
8	8-24	8085A	6.144	STD	1	0	64	2	8
8	16	8085A-2	2/5	Multibus	1	22	64	0.5/9	0/32
8	8-24	8085A-2	2.4/4.8	Multibus	1	48	128	4	0/32
8	8-24	8085A-2	2.4/4.8	Multibus	1	48	128	8	0/32
8	16	8085A-2	5	Multibus	2	0	64	64	4/32
8	20	8088	3/5	LSI-11	4	8	1000	16/64	2/24
8	8-32	8088	4.2/5	Multibus	1	24	1000	4/16	0/32
8	8-32	8088	4.8	Multibus	0	24	1000	4/4	0/64
8	20	8088	5	Multibus	4	0	1000	8	0/16
8	16	8088	5	Proprietary	4	16	64	4	0/32
8	20	8088	5	Multibus	2	0	1000	64	4/32
8	8-16	8748	6.11					64/128	1/2
8-16	8	F387X	2	F8	1		64	2/4	2
8-16	8-24	6809	1/2		1	16	64		0/8
8-16	16	8080A	2.05	Multibus	2	48	64	1/4	0/16
8-32	8-48	68000	10	Multibus	2	40	16K	32/128	0/64

Sequenced alphanumerically by data word size, CPU type and increasing clock frequency.

© IC MASTER 1983

MICROCOMPUTER BOARDS

Software Support									
Assembler	Debug/ Monitor	Editor	Language	Operating System	Hardware Support	Comments	Model	Source	Line
x	x	x	x	x	x	Four vectored interrupts, on-board timer, multiprocessor capability.	BLC-80/05	National	
					x	Accepts low-level signal down to 10 mV.	DT3754	Data Trans	
x	x		x	x		Seven CPU boards in series. DS board has math processor and 12 interrupt inputs.	AMSSeries	Siemens	
					x	For severe environmental operation conditions: -55°C to 85°C, 5 G vibration — 5 Hz to 2 kHz, 15 G shock — 11 ms, 0 to 95% humidity.	SECS80/30	EMM	
					x	Has both 8085 and 8088 processors, only one of which operates at a time. Optional battery-backed calendar clock, math chip.	SECS80/544	EMM	
x	x	x	x	x	x	Four-channel communications computer or intelligent slave for communications expansion. Twelve levels of programmable interrupt control.	iSBC544	Intel	
					x	Accepts high-level analog inputs to ± 10V.	DT3752	Data Trans	
	x					256 bytes of CMOS RAM battery backup. SMP-80 is Eurocard version.	SKC-85	Siemens	
x	x	x	x	x	x		AMS-D11	Western	
	x						SKC-85	Western	10
x	x		x		x	Optional external clock input. Tri-State bus drivers may be disabled for DMA operation. Addressable words expandable to 116K bytes.	7801	Pro-Log	
x	x		x	x		Seven CPU board versions with 8080, 8085, or 8088 CPUs.	SMPSeries	Siemens	
x	x	x	x	x	x		SMP-E6	Western	
x	x	x	x	x	x	Three sockets for distributed digital I/O processing, 12 levels of programmable interrupts, three programmable counters.	iSBC569	Intel	
x	x	x	x	x	x	Three real-time clocks, 28 interrupt sources, optional hardware math package. System is designed for process-control applications.	3885-ZIA	Kinetic Sys	
					x	Milertronics will do programming and interfacing, if desired.	PDC-102	MilerTron	
	x				x	10 msec. timer w/ interrupt control. Control port for memory expansion. RS232C interface for CRT terminal. Selectable DTE/DCE configuration.	7885	Pro-Log	
x	x	x	x	x	x	Software-transparent to Intel SBL90/05, has three SBX connectors, fast-mode selection for CPU clock, needs ± 12V for RS-232.	ZX-80/15	Zendex	
	x	x	x	x	x		BLC-80/24	National	
	x	x	x	x	x		BLC-80/28	National	20
x	x	x	x	x	x	Hardware and software-compatible with Intel Series II IPC-85. Runs all development systems.	ZX-85	Zendex	
x	x		x		x	DMA access to LSI-11 bus. Has external STD bus and minimum of 4 RS423 serial ports with full modem control.	FEP-11L	Nortek	
x	x	x	x	x		See iSBC86/14. ROM/PROM expandable to 64K bytes with iSBC 341 Multimodule.	iSBC88/25	Intel	
x	x	x	x	x	x	Measurement and control computer. On-board A/D converter, 3 iSBX connectors, 3 programmable timers, 4 EPROM sockets.	iSBC88/40	Intel	
x	x	x	x	x	x	Intended as coprocessor for DCS 86/16 or as 8-bit processor for Multibus systems. Three timers.	DCS86/8	Dist Comp	
x	x	x	x	x	x		SMP-E8	Western	
x	x	x	x	x	x	Convertible to ZX-85. Runs CP/M-86.	ZX-88	Zendex	
							IMC100	MCC	
x	x	x	x	x	x	Includes teletypewriter operating system and programmable baud rates.	**F3870-PEP**	**Fairchild (1253.1254)**	
	x				x	On-board decoding for 8 pages of off-board I/O. PROM, RAM, on-board I/O and off-board enables addresses are user definable. Buffered bus.	OB8902	Omnibyte	30
x	x	x	x	x	x	48 individually programmable parallel I/O lines. Available built to MIL883 Standard.	DCS8010A	Dist Comp	
x	x	x	x	x	x	ROM, RAM, on-board I/O and off-board addresses user defineable. Contains 3 16-bit timers and 7 levels of vectored interrupts.	OB68K1	Omnibyte	

Bold face indicates additional data is provided on the page noted.

MICROCOMPUTER BOARDS

General					I/O		Memory		
Data Word Size (bits)	Instruction Word Size (bits)	CPU Type	Clock Freq. Min/Max (MHz)	Bus Type	Serial Ports	Parallel Lines	Directly Address. Words (K bytes)	Supplied/Extra Capacity (K bytes) RAM	(P)ROM
12	12	6100	0/2	Proprietary	0	18	384	0	0
12	12	6100	0/2.46	Proprietary	0	32	48	4	12
12	12	6100	2.5	Dedicated	2	12	4	0.256/1	1
12	12	6100	3.3	Multibus	1	36	32	4x12	4x12
12	12	6100	5.7	Proprietary	1	24	4	0.256	1/1
16	16		2	Proprietory	1	0	256	256/0	0/0
16	16	AMZ8002	4	Multibus	2	24	512K	32K/0	0/8K
16	18	Custom		512	1	0	512	0	0
16	24	Custom		4000	1	0	4000	0	0
16	16-32	Custom	4	Scout-bus		16/32	128	0	0
16	16-32	Custom	4	Maxi-bus		32	128	2/6	0/6
16	16	Custom	8.3	Proprietary	1		32	0	0
16	16	F9445	16/20	Multibus	2	32	64	8	0/32
16	16	Macrologic	10	NOVA	1	8	32	32	2
16	16	mN602	8.3	Proprietory	2	16	20	8/0	0/16
16	16	mN602	8.3	Proprietory	2	16	32	16/0	0/16
16	16	mN602	8.3	Proprietary	1		32	0	0
16	24	NS16032	10	Multibus	1	24	16000	32/128	1/8
16	15	TMS9900	3	Proprietary	1	16	64K	0	0
16	16	TMS9900	3	Proprietary	1	16	64K	2/4	2/8
16	16	TMS9900	3	Proprietary	1	16	64K	2/4	2/8
16	16	TMS9900	3	TM990	1	16	64K	0/128	4/16
16	16	T-11	4.91	LSI-11	2	4	64	4/8	0/32
16	16-32	WD9000	2.5	Internal	2	24	128K	64	0
16	8-32	WD90008	3	Internal	2		64K		
16	16	Z8001	2.5/3.9	Proprietary	2	32	16M	32/48	4/16
16	16-24	Z8001	4	Multibus	0	0	16K	0	0/2
16	16	Z8001	4	FlexibusIII	2	0	100K	20	16
16	16	Z8001	4	Z-bus	2	0	8M	32	0/8
16	16	Z8002	2.5/3.9	Proprietary	2	32	64K	32/48	4/16
16	32	68000	2	VERSAbus	2	60	16000	16	8/64
16	16	68000	4/8	S-100			16K	0	0
16	16	68000	8	VERSAbus	2		16000	32/128	0/64
16	8-32	68000	8	EXORciser	2	32	16000	32	8/64

Sequenced alphanumerically by data word size, CPU type and increasing clock frequency.

© IC MASTER 1983

MICROCOMPUTER BOARDS

Software Support									
Assembler	Debug/ Monitor	Editor	Language	Operating System	Hardware Support	Comments	Model	Source	Line
x	x		x	x		Similar to LP-12 but omits on-board memory. Addresses 32K words of external memory.	LP-12P	IntCyber	
x	x		x	x		CMOS. Two-latched 12-bit ports and two 4-bit ports.	LP-12	IntCyber	
x	x				x	16 key pad, 8 digit LED display, Kansas City cassette interface. Separate Vcc with LED display for CMOS applications. PDP-8 compatible instruction set, power supply included.	HB61000-1	Harris	
x	x		x	x		CMOS. Real-time clock and on-board monitor. Software compatible with PDP-8 microcomputer.	PPS-1201	PC/M	
x	x	x	x	x	x	Keyboard, 2 4-digit LEDs on card.	InterceptJr.	Intersil	
x	x	x	x	x	x	Also available as complete system	S/20	Data Gen	
						5 programmable counter/timers; vectored maskable and nonmaskable interrupts.	**AM96/4116A**	**AMD (1901)**	
x	x		x	x			2106AK	HP	
x	x		x	x			2108MK	HP	
x	x	x	x	x	x	Isolite auto self test, floating point option, real-time clock. Hardware multiplication and division.	NM4/04	Comp Auto	10
x	x	x	x	x	x	Floating point option, real-time clock, 8 channels of I/O from on-board I/O distributor. Intelligent cable interfaces, Pascal.	NM4/10	Comp Auto	
x	x	x	x	x	x	Memory and I/O device communicate with two independent buses.	MP/200	Data Gen	
x	x		x	x		Prototyping evaluation and programming board, on-board EPROM programmer, ± 12V supply used for P-S-232C operation only, 25V supply for EPROM programming only.	**PEP-45**	**Fairchild (1711,1716)**	
x	x	x	x	x	x		2103LK	HP	
x	x	x	x	x	x	Programmed priority interrupts. Fortran, Pascal, Basic. MP/OS operating system.	MBC/2	Data Gen	
x	x	x	x	x	x	Programmed priority interrupts. Fortran, Pascal, Basic. MP/OS operating system.	MBC/3	Data Gen	
x	x	x	x	x	x		MP/100	Data Gen	
x	x	x	x	x	x		**B16000**	**National (1365)**	
x	x		x	x			CPU201	Tau Zero	
x	x	x	x	x	x	Two interval timers.	TM9900/100MA	TI	20
x	x	x	x	x	x	Three interval timers.	TM9900/101MA	TI	
x	x	x	x	x	x	Memory mapped address space to 1M bytes.	TM9900/102	TI	
x	x		x	x	x	Has full instruction set of PDP-11.	SCB11/21	DEC	
x		x	x	x		Single board Pascal Micro Engine, 64K bytes on-memory expansion board.	WD0900	Western	
	x	x	x	x	x	Includes floppy disk controller, DMA, switch selectable for single or double density. Standard or mini-size up to 4MB storage. Baud rate selectable.	WD/900	Western	
x	x	x	x	x	x		05-6168-01	Zilog	
x	x	x	x	x	x	Has unique memory management circuit on-board to map logical 2K pages to physical pages. Optional 9511 math processor speeds calculations.	B1017	Cent Data	
x	x	x	x		x		1868+A	Xycom	
x	x	x		x	x		**Z8000MPU**	**Zilog (1581,1601)**	
x	x	x	x	x	x		05-6101-01	Zilog	30
	x		x				VMC68K/15	National	
x	x	x	x	x	x	Dual processor unit, 8 MHz 68000 and 4 MHz Z-80A, 32-bit wide architecture, software-controlled switching.	**DPU**	**Cromemco (1914)**	
x	x	x	x	x		Shared RAM permits DMA operation with VERSAbus intelligent peripheral controller modules. Has local 8-bit I/O bus and three 16-bit timers.	**M68KVM02**	**Motorola (1937,1938)**	
x	x	x	x	x	x	3 16-bit timers, user Wire Wrap area, 6 prioritized interrupt levels.	MEX68KDM	Motorola	

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROCOMPUTER BOARDS

General					I/O		Memory		
Data Word Size (bits)	Instruction Word Size (bits)	CPU Type	Clock Freq. Min/Max (MHz)	Bus Type	Serial Ports	Parallel Lines	Directly Address. Words (K bytes)	Supplied/Extra Capacity (K bytes) RAM	(P)ROM
16	16	68000	8	VMEbus	1		16000	0/64K	0/128
16	16	68000	8	VERSAbus	2	40	16000	32/64	0/64
16	8-32;16	68000;SNC68000	8	VMEbus;VME	2	16	16000;16M	8;8K/0	48;0/48K
16	16-64	68000	8/10	Multibus	4	8	16000	0.256/16	0/64
16	15	74S481	5	TM990	1	0	64K	0	0
16	8-48	8080A	5	Multibus	1		1000		0/32
16	20	8086	2.5/5	Proprietary	1	48	1000	2/4	8
16	8-48	8086	4.92	Multibus	1	24	1000	32/64	0/64
16	8-40	8086	5	Multibus	2		1000		0/32
16	8-48	8086	5	Multibus	1	24	1000	32/32	0/16
16	8-48	8086	5/8	Multibus	1	24	1000	8/16	0/32
16	16-40	8086	5/10	Multibus	3	24	1000	2/12	0/24
16	8-32	8086	5/10	Multibus	1	24	1000	32/128	0/32
16	20	8086	5/10	Multibus	2	24	1000K	8/16	0/64
16	20	8086	8	Multibus	3	48	64K	8	0/32
16	20	8086-2	5/8	Multibus	1	24	1000	32/64	0/128
16	20	8086-2	5/8	Multibus	1	24	1000	128/256	0/128
16	8-48	8086-2	5/8	Multibus	1	24	1000	8K	0/128
16	16	9440	12	NOVA	2	8	32	32	4
16	16	9440	8/12	Proprietary	1	0	32	4	2

Sequenced alphanumerically by data word size, CPU type and increasing clock frequency.

© IC MASTER 1983

MICROCOMPUTER BOARDS

Software Support					Hardware Support	Comments	Model	Source	Line
Assembler	Debug/ Monitor	Editor	Language	Operating System					
				x	x	Supports I/O channel for large variety of peripheral and I/O functions.	**MVME110**	**Motorola (1936)**	
x	x	x	x	x		Programmable timer/counter VERSAbus interface, system controller functions include bus arbitration, system interrupt processing, test signal, and self-test.	VERSAmodule	Motorola	
x	x	x	x	x	x	CPU module, optional memory management unit, programmable real-time clock, 7 levels of interrupt.	**SMVME2000**	**Signetics (1966)**	
x	x	x	x	x	x	On card 4 channel DMA hard disk and streaming tape interface, BYTE-swap buffer, twin expansion connectors, and memory management unit	MLZ-68	Heurikon	
x	x	x	x	x	x	High performance CPU module software compatible with 100MA or 101M. Supports floating point and extended integer arithmetic instructions.	**TM990/1481**	**TI (1564)**	
x	x	x	x	x	x	For severe environment: operating temperature 55° to 85°C vibration 5g 5 Hz to 2kHz, meets MIL-E5400, 16400, and 4158.	SECS86/05	EMM	
x	x	x	x	x	x		SDK-86	Intel	
x	x	x	x	x	x	2 BLX connectors	BLC-86/1213	National	
				x		Two programmable timers, nine level vectored priority interrupts.	SECS80/86	EMM	
x	x	x	x	x	x	Two programmable timers, nine-level vectored priority interrupts, ROM/PROM expandable to 64K with iSBC Multi-Module.	iSBC-86/12A	Intel	10
x	x	x	x	x	x	Two programmable timers, nine-level vectored priority interrupts, ROM/PROM expandable to 64K with iSBC Multi-Module.	iSBC-86/05	Intel	
x	x	x	x	x		Three serial I/O channels. Two allow use of high-level bit protocols.	DCS86/16	Dist Comp	
x	x	x	x	x	x	Two programmable timers, programmable interrupt controller, ROM/PROM expandable to 32K bytes on board.	MBC-86/12	Matrox	
x	x	x	x		x		ZX86	Zendex	
x	x	x	x	x			AMS-DB	Western	
x	x	x	x	x	x		iSBC-86/14	Intel	
x	x	x	x	x	x		iSBC-86/30	Intel	
	x	x	x		x	2 BLX connectors	BLC-86/05	National	
x	x	x	x	x	x	Compatible with industry standard 15" x 15" I/O controllers. Up to 8K bytes of program autoload PROMS. Memory control and parity logic.	GLOW-16	Fairchild	
x	x		x	x		Nova instruction set, PROM resident entry and debugging program. Up to 4 I/O controller boards memory expansion to 64K bytes.	SPARK-16	Fairchild	20

Bold face indicates additional data is provided on the page noted.

© IC MASTER 1983

MICROCOMPUTER SUPPORT BOARDS

Supported System	Manufacturer	Function	Part Number	Source	For Additional Data, See Page
BLC-80/— Series	National	Analog I/O	BLC-8737 BLC-8715	National	
		I/O Expansion	BLC-508 BLC-517 BLC-519 BLC-556 BLC-8534 BLC-8538		
		I/O Memory Expansion	BLC-104 BLC-116		
		Memory	BLC-8016 BLC-032 BLC-048 BLC-064 BLC-0128 BLC-0256 BLC-0384 BLC-0512 BLC-8016(A/B) BLC-8032(A/B) BLC-8048(A/B) BLC-8064(A/B) BLC-411 BLC-8432 BLC-464		
		Peripheral Controllers	BLC-8201 BLC-8221 BLC-8222 BLC-8224 BLC-8225 BLC-8488 BLC-8545		
CDP18S00	RCA	A/D or D/A Converters	CDP18S642-44 CDP18S647-48 CDP18S654 CDP18S657-58	RCA	1958 1958 1958 1958
		Digital I/O	CDP18S640A, A1 CDP18S646 CDP18S650-52 CDP18S660 CDP18S662-63		1957 1957 1957 1957 1957
		Memory	CDP18S620-622 CDP18S623A CDP18S625-632		1957 1957 1957
		Peripheral Interface	CDP18S661B CDP18S661V3		1958 1958
		Serial/MODEM Interface	CDP18S641A CDP18S663V1, V2, V3, V4		1957 1957
EXORbus	Motorola	Digital I/O	9620A 9622 9650A 9657 96103	Creative Micro Systems	1912 1912 1912 1911 1912
		Floppy Disc Controller	9671		1912
		Memory	9616 9635/9636/9637A 9634/9638 9670		1911 1911 1911 1911
		Programming Heads	9614/9617/9618		1912
		Prototyping	9610/9612		1912
		Relay	96702		1912
		Timers	9640A 9661		1912 1912
EXORbus	Motorola	A/D or D/A	ST-6800, -DA, -ADX	Datel-Intersil	

© IC MASTER 1983

Supported System	Manufacturer	Function	Part Number	Source	For Additional Data, See Page
EXORbus (Cont.)	Motorola	Memory	M68MM04, 04A	Motorola	1940
			M68MM06		1940
			M68MM09		1940
			M68MM21, 21-1		1940
			MEX6808-22		1940
			MEX6816-1HR, -22D, -22S		1940
			MEX6832-1HR, -22		1940
			MEX6848-1HR, -22		1940
			MEX6864-1HR, -22		1940
			MEX68RR		1940
EXORciser Micromodule bus	Motorola	Memory	MBC016D	Synertek	1983
			MBC032D		1983
			MBC048D		1983
			MBC064D		1983
iSBXbus	Intel	Analog Input Module	iSBX311	Intel	
		Analog Output Module	iSBX328		
		Bit Serial Communication	iSBX352		
		EPROM Module	iSBC341		
		GPIB Module	iSBX488		
		Numeric Data Processor	iSBC337		
		Parity Module	iSBC303		
		Memory	iSBC301		
			iSBC302		
LSI-11, -11/2 PDP-11/23	DEC	A/D or D/A	ST-LSI, -ADX, -DA	Datel-Intersil	1933
			ST-LS12, -ADX, DMA, RLY		1933
			ST-LSI2		1933
			ST-728		1933
LSI-11	DEC	Memory	TMM10010	TI	
PDP-11			TMM20000		
VAX			TMM30000		
M68MM01 Monoboard CPU	Motorola	D/A Converters	M68MM05C	Motorola	1939
			M68MM15CV		1939
			M68MM15CI		1939
		A/D Converters	M68MM15A, A1, B, BEX		1939
			M68MM05A, B		1939
		ACIA Module	MEX6850, 50-2		1940
		GPIB	M68MM12, 12A, 12-1		1940
		24 Channel Optoisolator	M68MM13C, D		1940
		Memory	MEX6815-3		
		Memory Expansion	M68MM16-1, -2, -3		1940
		Parallel Interface	M68MM22		1940
		32IN/32OUT	M68MM03		1940
		PIA I/O	MEX6820, 21-2		1940
		16/32 Relay Output	M68MM13A, B		1940
		RS232C to TTY Adaptor	M68MM11		1940
		Serial I/O	M68MM07		1940
			M68MM18		1940
Microsystem I/O Channel	Motorola	A/D Module	M68RAD1	Motorola	1941
		Analog Input	MVME600		1941
		Analog Output	MVME605		1941

© IC MASTER 1983

Supported System	Manufacturer	Function	Part Number	Source	For Additional Data, See Page
Microsystem I/O Channel (Cont.)	Motorola	Floppy Controller	M68RFDC1	Motorola	1941
		Magnetic Tape Adapter	MVME435		1941
		Opto Isolated I/O Modules	MVME610/615/620 MVME620/625		1941 1941
		Parallel Port	MVME410		1941
		Remote I/O	M68RI01		1941
		RS232 Port	MVME400		1941
		SASI Bus Interface	MVME420		1941
		Winchester Controller	M68RWIN1-1, -2		1941
Multibus	Intel	AmZ8000 Evaluator	Am96/4018	AMD	1705
		Board Set	PS/1110 PS/1210		1907 1907
		Communication and I/O	AM95/3310		1905
		Floppy Disk Controllers	AM95/6120 AM95/6110		1904 1904
		Memory	AM97/0064 AM97/0128 AM97/0256 AM97/0512 AM96/1000A Series		1903 1903 1903 1903 1903
		Memory and I/O	AM95/5132		1905
Multibus	Intel	A/D or D/A	ST-711 ST-711RLY8D ST-711RLY16D ST-716 ST-724 ST-732 ST-800, DA, ADX, DAX	Datel-Intersil	1933 1933 1933 1933 1933
Multibus	Intel	Analog I/O	CBC8730 Series	Diversified Technology	
		Memory	CBC064		
		Memory and I/O	CBC104 CBC108 CBC116		
Multibus	Intel	Communications Expansion	iSBC534	Intel	
		Digital Controller	iSBC569		
		Diskette Controller	iSBC204		
		Disk Controllers	iSBC208 iSBC215X iSBC218 iSBC220		
		EPROM Expansion	iSBC340 iSBC416 iSBC464		
		Ethernet Controller	iSBC550		
		I/O Expansion	iSBC517 iSBC519		
		Intelligent Communications Controller	iSBC544		

© IC MASTER 1983

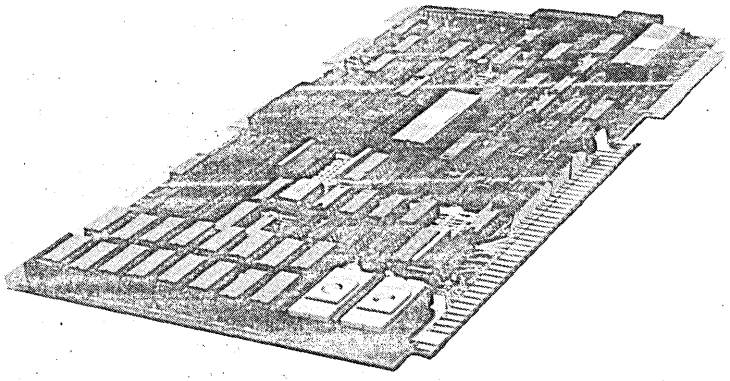
Supported System	Manufacturer	Function	Part Number	Source	For Additional Data, See Page
Multibus (Cont.)	Intel	Memory	iSBC012B iSBC016A/028A/ 032A/056A/064A iSBC064 iSBC090 iSBC094	Intel	
		Memory and I/O Expansion	iSBC108A/116A		
		Optically Isolated I/O	iSBC556		
		RAM Expansion	iSBC300		
		Vidio Display Controller	iSBC270		
Multibus	Intel	Non Volatile RAM Memory	NVR8010	Stynetic Systems	
Multibus	Intel	Memory	TMM40010	TI	
S100 Bus	Cromemco	Analog I/O	D+7A I/O ADC-12 DAC-12	Cromemco	1922 1927 1927
		Digital I/O	4PIO 8PIO IOP GPIB TU-ART PRI		1928 1929 1921 1924 1923 1930
		Graphics	SDI		1931
		Memory	16KZ 32KBS 64KZ 256MSU 512MSU MCU		1918 1920 1919 1915 1915 1915
		Digital	QUADART CSP		1925 1926
Series/800 CIMBUS	National	Memory Expansion	CIM-100/104/108	National	1950
		Serial I/O	CIM-201		1950
		CIMBUS/ Distributed I/O Bus Interface	CIM-230		1951
		Analog Input	CIM-411		1952
		Analog Output	CIM-421		1952
STD Bus	Micro Link	A/D or D/A Converter	STD081 STD139	Micro Link	
		Calculator	STD102		
		Calendar/Time	STD074		
		Controller	STD141		
		CRT Controller	STD098		
		Development Card	STD130		
		Event Counter	STD081		
		Floppy Disk	STD101		
		Keyboard Controller	STD072		
		MODEM	STD138		
		Opto Isolator	STD100		
		Output Driver	STD140		
		Printer Controller	STD096		
		PROM Programmer	STD114		
		TTL I/O card	STD129 STD134		

© IC MASTER 1983

Supported System	Manufacturer	Function	Part Number	Source	For Additional Data, See Page
STD Bus (Cont.)	Micro Link	USART	STD073 STD135 STD136	Micro Link	
TM990	TI	Analog I/O	TM990/1241	TI	1564
		Digital I/O Module	TM990/C310		1564
		Digital and Analog I/O Termination Panel	TM990/56X		1564
		48 TTL I/O Lines	TM990/310		1564
		48 TTL I/O 24 ma Lines	TM990/311		1564
		Asynchronous Communication Module	TM990/C307		1564
		X.25/HDLC Communication Module	TM990/C308		1564
		Floppy Disk Controller	TM990/303A		1564
		High Power Interface	TM990/309		1564
		IEEE 488 Controller	TM990/314		1564
		Memory Expansion Module	TM990/C201		1564
		RAM/EPROM Memory	TM990/201		1564
		RAM/EPROM/ CMOS RAM Memory	TM990/202-X		1564
		DRAM Memory	TM990/203 TM990/203A-XX		1564
		CMOS RAM Memory	TM990/204		1564
		Low-level Analog Input for Instrumentation Gauges	TM990/315		1564
		Microcomputer Module	TM990/C101MA		1564
		Pulse Timer/Event Counter	TM990/317		1564
		RS232/RS422 Expansion	TM990/307		1564
		Speech Output	TM990/306		1564
VERSAbus	Motorola	Color Graphic Controller	VM40	Motorola	1938
		Communications Controller	VM30 VM31		1938 1938
		Disk Controller	VM21		1938
		Floppy Disk Controller	VM20		1938
		Memory	VM10 VM11 VM80		1938 1938 1938
		Peripheral Controller	VM60		1938
VMEbus	Motorola	GPIB Controller	MVME300/301	Motorola	1936
		Memory	MVME200/201 MVME210		1936 1936
VMEbus	Motorola	Disk Controller	SMVME4300	Signetics	1970
		Memory	SMVME3100		1968
		System Controller	SMVME1500		1964

© IC MASTER 1983

Am96/4116A
AmZ8000 16-Bit
MonoBoard Computer



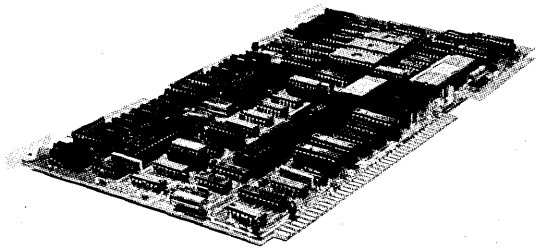
Features

- ☐ One of the Supercomponent™ family of LSI-intensive boards
- ☐ AmZ8002 CPU with 4.0MHz operation: a powerful instruction set; eight addressing modes; a wide variety of data types ranging from bits to long words
- ☐ 32K bytes of dual-ported high-speed memory supporting Advanced Acknowledge (AACK) signal
- ☐ 8K bytes of PROM/ROM space
- ☐ Addresses up to 512K bytes of memory with internal paging arrangement
- ☐ Two RS232 serial I/O ports (Am9551)
- ☐ 24 parallel I/O lines (Am8255A)
- ☐ Five programmable counter/timers (Am9513)
- ☐ Multimode interrupt control (23 sources, 10 lines): vectored interrupts (eight lines); non-maskable interrupts (four OR-ed sources); maskable interrupts (one line, multiple sources)
- ☐ Power-fail capability
- ☐ Compatible with Multibus† standard, SBC-80 card format
- ☐ 100% burned in for enhanced reliability

© IC MASTER 1983

MICROCOMPUTER BOARDS

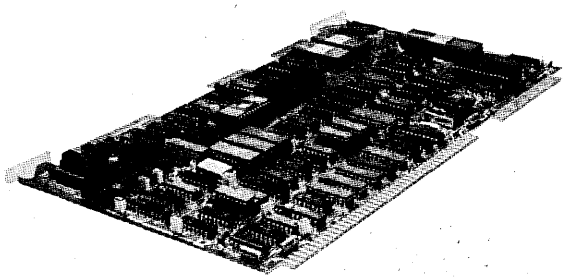
Am95/4006
MonoBoard Computer



Features

- ☐ One of the Supercomponent™ family of LSI-intensive boards
- ☐ Am9080A CPU* – 4MHz
- ☐ Am9511A or Am9512 Arithmetic Processing Unit – high-speed arithmetic computations concurrent with CPU operation (optional)
- ☐ 4K bytes of high-speed static RAM (Am9114)
- ☐ Sockets for up to 16K bytes of ROM/EPROM
- ☐ 8-channel programmable interrupt controller with vectored priority
- ☐ Programmable real-time clock for interrupt-driven systems
- ☐ Am9513 system timing controller
- ☐ 48 programmable I/O lines (two Am8255As) with sockets for line drivers and terminators
- ☐ Serial interface for RS232C interface (Am9551), with program-selectable baud rate (50 to 19,200 baud)
- ☐ Memory shadow: bootstrap program can be selected by power-on or reset and then be program-disabled for RAM space
- ☐ MultiMaster bus control logic allows one to three CPUs to share the system bus
- ☐ Compatible with Multibus† standard, SBC-80 card format
- ☐ Complemented by a family of board products, card cages, and rack-mountable system chassis
- ☐ 100% burned in for enhanced reliability

Am95/4010
MonoBoard Computer



Features

- ☐ One of the Supercomponents™ family of LSI-intensive boards
- ☐ Am8085A CPU @ 4.0MHz operation
- ☐ Extended addressing and memory mapping to 1M byte in 1K byte segments under dynamic program control
- ☐ System/user capability with privileged instructions
- ☐ Programmable read protect and write protect attributes for memory
- ☐ Two serial I/O ports
- ☐ 24 lines of parallel I/O
- ☐ Up to 4K bytes of PROM space
- ☐ Five 16-bit programmable counter/timers
- ☐ Eight-channel programmable interrupt controller
- ☐ Multibus† SBC-80 compatible with MultiMaster bus logic

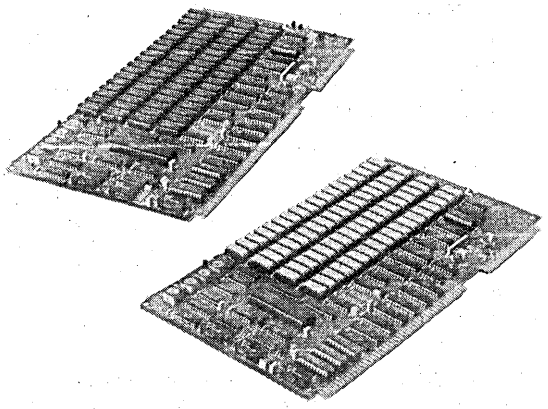
*Am9080A is a high-speed, pin-compatible version of the 8080A.

© IC MASTER 1983

Advanced Micro Devices

MICROCOMPUTER BOARDS

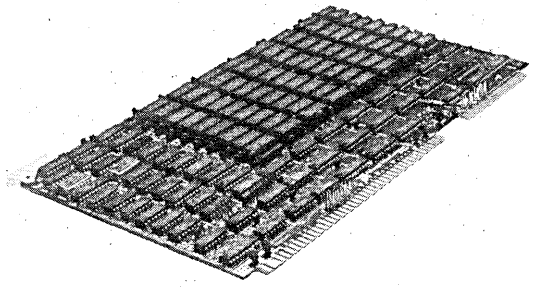
Am97/0064 • Am97/0128
Am97/0256 • Am97/0512
Random-Access Memory Boards



Features

- ☐ Meets proposed IEEE 796 specifications for full Multibus† compatibility
- ☐ Plug compatible with Intel's iSBC* 064A/028A/056A/012B RAM Memory Boards
- ☐ Compatible with Intel's iSBC* and AMD's Supercomponent™ lines of CPU boards or any processor that uses Multibus† interface
- ☐ 8- or 16-bit word size byte-swapping capability
- ☐ Parity with latching error registers and interrupt generation
- ☐ On-board refresh circuitry with optional external refresh control
- ☐ Auxillary connector for back-up power with memory protect control line as provided by Multibus†
- ☐ Supports 16-, 20- and 24-bit addresses
- ☐ Board memory starts on any 4K byte boundary within the 16M byte addressing range
- ☐ Three 16-position switches select 1 of 4096 possible start addresses
- ☐ 200ns max access time for Am97/0064 and Am97/0128; 250ns max access time for Am97/0256 and Am97/0512
- ☐ 350ns and 450ns max R/W cycle times
- ☐ Refreshes every 14 microseconds with a 400ns minimum worst case cycle time
- ☐ Single 5V supply for Am97/0256 and Am97/0512
- ☐ On-board PAL and Am2964B advanced memory controller reduce part count, simplify testing, and enhance reliability
- ☐ 100% burn-in for industrial reliability

Am96/1000A Series
Random-Access Memory Boards



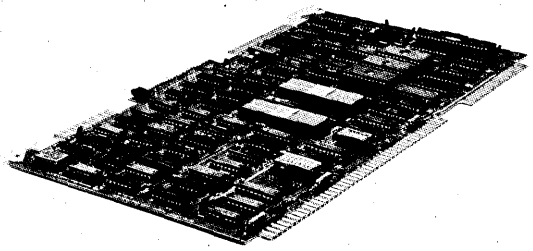
Features

- ☐ One of the Supercomponent™ family of LSI-intensive boards
- ☐ 64K and 128K byte storage options available
- ☐ High-speed operation supports up to 6.0MHz operation with high-performance AmZ8000 CPUs
- ☐ 8-bit/16-bit data bus compatibility for 8- or 16-bit microcomputers
- ☐ On-board transparent refresh
- ☐ Jumper option for advanced acknowledge (AACK) signal to improve response time and throughput
- ☐ Parity in byte mode with interrupt capability
- ☐ Dual bus accesses provide a global RAM link between P1 MultiMaster connector and P2 auxiliary connector
- ☐ Address space in 4K byte boundaries
- ☐ Multibus† and SBC-80 compatible
- ☐ 100% burned in for enhanced reliability

†iSBC is a registered trademark of Intel Corporation.

© IC MASTER 1983

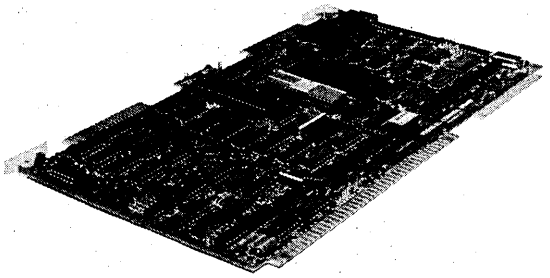
Am95/6120
Intelligent Floppy Disk Controller



Features

- ☐ ONE OF THE SUPERCOMPONENT™ FAMILY of LSI-intensive boards.
- ☐ CONTROLS up to 4M bytes of floppy disk storage.
- ☐ HANDLES FOUR DRIVES. 8-in. or 5¼-in.
- ☐ INTERMIXED single- and dual-density plus single- and double-sided drives managed by one controller.
- ☐ COMPATIBLE with Shugart, Memorex, CDC, Siemens, Remex, Pertec 8-in. drives and Shugart and MPI 5¼-in. drives.
- ☐ DISTRIBUTED I/O PROCESSOR ARCHITECTURE. Performs all disk I/O without host CPU intervention by means of its own microprocessor, control firmware, RAM buffer and LSI peripheral circuits.
- ☐ CONTROL FIRMWARE provides program code for read, write, execute and initialize, plus commands for error checks, status words and operation verification.
- ☐ HIGH THROUGHPUT. Supports maximum disk read/write data rates. Provides high-speed DMA transfers (up to 1.8M bits/sec) in programmable block, burst, or byte mode.
- ☐ 20-BIT ADDRESSING. Handles transfers up in a 1M byte address space.
- ☐ CONFIDENCE CHECK. Automatically provides a diagnostic check on start-up of RAM, ROM, FDC and DMA. Provides status word response to CPU. Visual LED fault indicator.
- ☐ AUTOMATIC SYSTEM BOOT capability on disk.
- ☐ Multibus† SBC-80 COMPATIBLE.

Am95/6110
Intelligent Floppy Disk Controller



Features

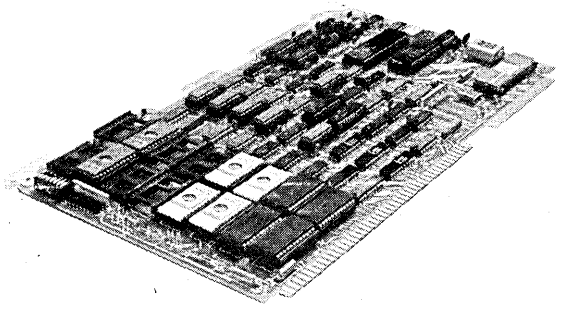
- ☐ ONE OF THE SUPERCOMPONENTS™ family of LSI-intensive boards.
- ☐ CONTROLS FOUR DRIVES, 8-Inch Flexible Disk Drives, Single or Double-Sided, IBM 3740 Soft Sector Media Format, Single Density. Compatible with Shugart, Memorex, CDC, Siemens Drives.
- ☐ DISTRIBUTED I/O PROCESSOR ARCHITECTURE. Performs all Disk I/O without Host CPU Intervention by means of its own Dedicated Processor, Control Firmware and RAM Buffer.
- ☐ CONTROL FIRMWARE. Provides Program Code for READ, WRITE, EXECUTE and INITIALIZE plus several Other Commands for Error Checks and Status Words.
- ☐ HIGH THROUGHPUT by means of On-Board DMA Controller, Programmable for Either Block or Byte Mode Transfers. 20-Bit Addressing Allows Transfers Up to 1M Byte.
- ☐ CONFIDENCE CHECK. Automatically Provides a Diagnostic Check on Start-Up of RAM, ROM, FDC and DMA . . . and Provides Status Word Response to CPU.
- ☐ AUTOMATIC SYSTEM BOOT. Provides a Selectable System Boot Capability with the Booting Routine Residence on Disk and Automatically Read into Memory on Start-up, Initialization or Reset.
- ☐ VERSATILE INTERFACE. SBC/Multibus† Compatible, Single or Multimaster Environment; Operates as an Intelligent Slave; Interfaces to Both 8-Bit and 16-Bit CPU.
- ☐ MULTIBUS SBC-80 COMPATIBLE.

© IC MASTER 1983

Advanced Micro Devices

MICROCOMPUTER BOARDS

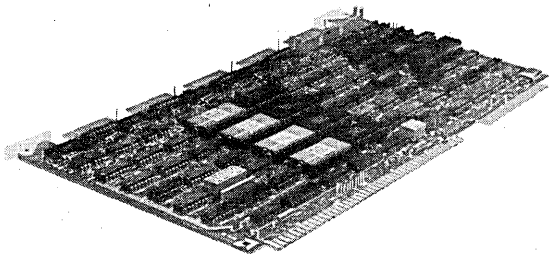
Am95/5132
PROM/ROM/RAM and I/O Board



Features

- ☐ One of the Supercomponent™ family of LSI-intensive boards
- ☐ Sockets for up to 64K bytes of PROM and up to 32K bytes of RAM in a Multibus† compatible board
- ☐ Allows intermixed combinations of Am2716 and Am2732 E-PROMs as well as 1K x 8 and 2K x 8 static RAMs
- ☐ Total versatility for mapping the board's memory space via bipolar PROMs; assures the integrity of the memory map and eliminates the potential problems from multiple banks of DIP switches
- ☐ 20-bit address decoding
- ☐ Compatible with 8-bit and 16-bit CPUs
- ☐ Permits RAM/PROM to coexist in the same memory space
- ☐ Programmed control to enable/disable all combinations of PROM/RAM sockets; permits multiple independent program modules to occupy the same memory area
- ☐ Supports all types of Multibus data transfers under automatic firmware control
- ☐ I/O section includes:
  - RS-232 serial I/O port under USART control
  - Three 8-bit (or 24-line) parallel ports
  - Timing controller (Am9513) with five 16-bit high-speed counters
  - Nine interrupt sources jumper-selectable to bus interrupt lines
- ☐ 100% burned in for enhanced reliability

Am95/3310
Communication I/O Expansion Board

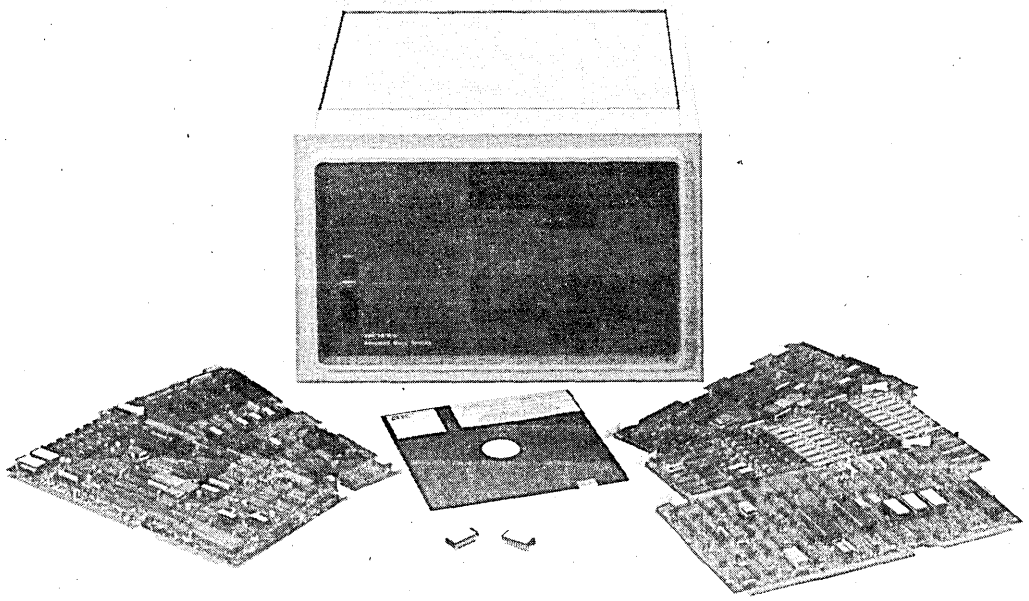


Features

- ☐ One of the Supercomponent™ family of LSI-intensive boards
- ☐ Four synchronous/asynchronous serial I/O communication channels with programmable baud rates to 38,400 baud
- ☐ Versatile parallel interface:
  - 24 TTL-compatible I/O lines or
  - 8 RS-232 driver and 16 RS-232 receiver lines
- ☐ Supports up to four modems and one Bell 801-type automatic call/answer unit
- ☐ Sixteen programmable interrupt lines for serial I/O or automatic call/answer support
- ☐ Two programmable 16-bit counter/timers
- ☐ Direct addressing of I/O ports on 20H boundaries
- ☐ Serial ports jumper selectable for 20mA current loops with opto-isolator sockets
- ☐ Compatible with 8-bit and 16-bit microprocessors
- ☐ 100% burned in for enhanced reliability
- ☐ Multibus† compatible

© IC MASTER 1983

Preconfigured Solutions



Preconfigured Solutions eliminate the tedious time-consuming tasks of system integration and test. AMD currently offers three configured solutions which allow the OEM to select the solution specific to his application needs.

Features

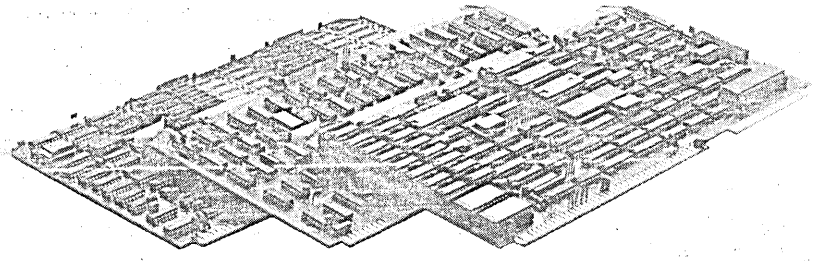
- ☐ Fully configured board sets
- ☐ Preconfigured Real-Time Multitasking Operating System from Hemenway Corporation
- ☐ Program Development on native processor
- ☐ Z8002 16-bit processing power
- ☐ Real-Time interrupt response
- ☐ Choice of memory only or disk-based systems
- ☐ Chcice of board sets or packaged systems
- ☐ Applications Prototyping on target hardware

© IC MASTER 1983

Advanced Micro Devices

MICROCOMPUTER BOARDS

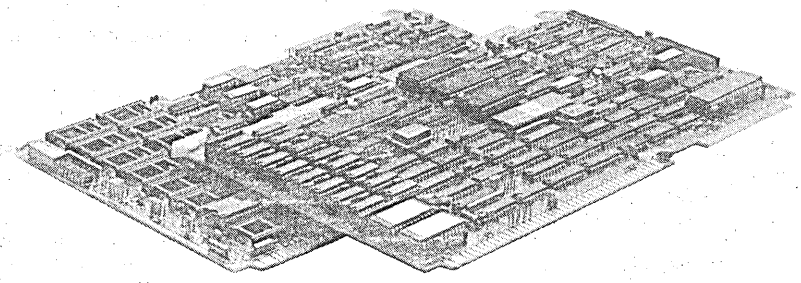
PS/1110
Configured Board Set



Features

- ☐ Configured to support the disk-based version of real-time multitasking operating system from Hemenway Corporation
- ☐ 4MHz Z8002 CPU board with 32KB dual-ported high-speed memory, two RS232 serial I/O ports and 24 parallel I/O lines
- ☐ 32KB high-speed dynamic RAM board with on-board memory refresh
- ☐ Intelligent single/double density floppy disk controller for 8" single sided floppy drives
- ☐ Compatible with our full line of Multibus† compatible card cages and system chassis

PS/1210
Configured Board Set

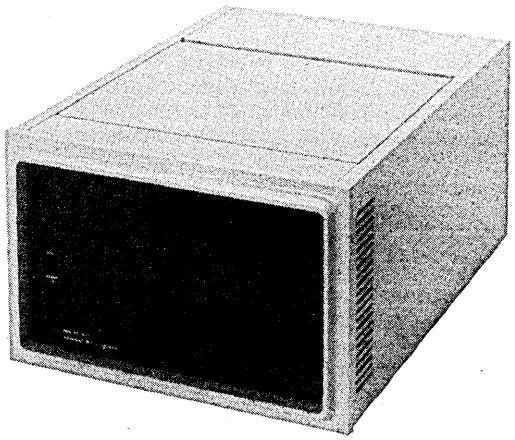


Features

- ☐ Configured to support the memory resident version of the real-time multitasking nucleus from Hemenway Corporation
- ☐ 4MHz Z8002 CPU board with 32KB dual-ported high-speed memory, two RS232 serial I/O ports and 24 lines parallel I/O lines
- ☐ PROM/ROM/RAM and I/O board with sockets for up to 64KB of PROM and up to 32KB of RAM, plus one RS232 serial I/O port and 24 lines of parallel I/O
- ☐ Compatible with our full line of Multibus† card cages and system chassis

© IC MASTER 1983

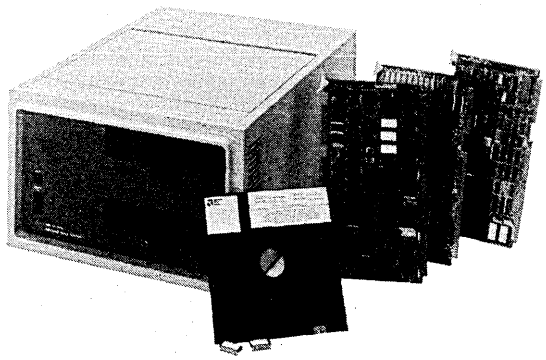
PS/1410
System Chassis



Features

- ☐ Compact desk-top or rack-mountable system chassis
- ☐ Seven slot Multibus† compatible backplane
- ☐ Two Shugart SA 800/801 floppy disk drives
- ☐ 25 amp 5 volt switching power supply
- ☐ Power and reset switches
- ☐ Rear connector panel and cable routing channel
- ☐ Top access for easy board installation, removal and inspection
- ☐ Cooling fans
- ☐ Optional slide mount rack kit

PS/1000
Packaged System

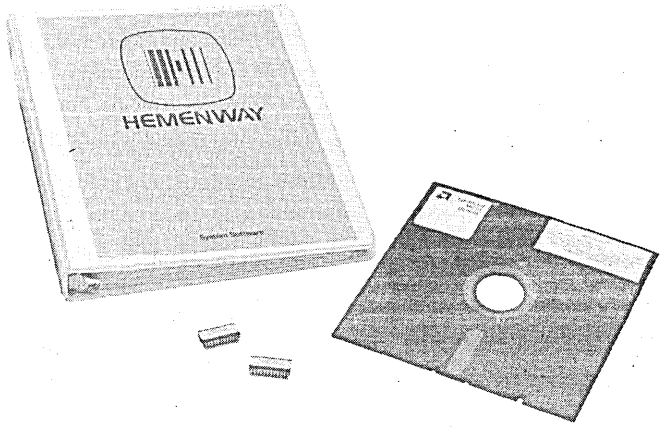


Features

- ☐ Compact desk-top or rack-mountable integrated system
- ☐ 4MHz Z8002 CPU board with 32KB dual port RAM, 2 serial I/O ports and 24 parallel I/O lines
- ☐ 32KB dynamic RAM board with on-board memory refresh
- ☐ Intelligent single/double density floppy disk controller for 8" single sided floppy drives
- ☐ Seven slot Multibus† compatible backplane
- ☐ Two Shugart SA 800/801 floppy disk drives
- ☐ 25 amp 5 volt switching power supply
- ☐ Real-Time Multitasking Operating System including text editor and file management system from Hemenway Corporation
- ☐ Z8002 relocatable macroassembler and linking loader
- ☐ Optional PASCAL/I compiler
- ☐ Optional ROMable Floating Point library

© IC MASTER 1983

PS/1310
Real-Time Multitasking
Operating System



This Real-time Multitasking Operating System (MSP/Z8002™) from Hemenway Corporation is the most powerful interrupt-driven operating system available for the Z8002* microprocessor. MSP/Z8002 has been specifically tailored to take advantage of the unique features available in the PS/1110 and PS/1210 Multibus† board sets. The Operating System also includes a text editor, relocatable macroassembler and linker, plus a comprehensive file management structure allowing dynamic allocation of file space as well as sequential and random file access.

Features

- ☐ Real-time clock (including dated files)
- ☐ Tasks may start/stop other tasks
- ☐ Mailbox facilities for simple inter-task communication
- ☐ Programmable delay control for task start/stop
- ☐ Dynamic task priorities
- ☐ Display task status execution
- ☐ Suspend task execution and restart commands
- ☐ Monitor entries for building user specified device handlers
- ☐ Complete device-independent I/O
- ☐ Memory-resident and transient commands for system flexibility and efficiency
- ☐ Command files
- ☐ Chaining and Overlaying of user programs
- ☐ Real-time multitasking nucleus fits in 8K and can be relocated anywhere in memory
- ☐ Supports serial or parallel printer

*Z8000 is a trademark of Zilog.

MSP/Z8002 is a trademark of Hemenway Corporation.

© IC MASTER 1983

PS/1320
PASCAL/I – An Industrial Pascal Compiler

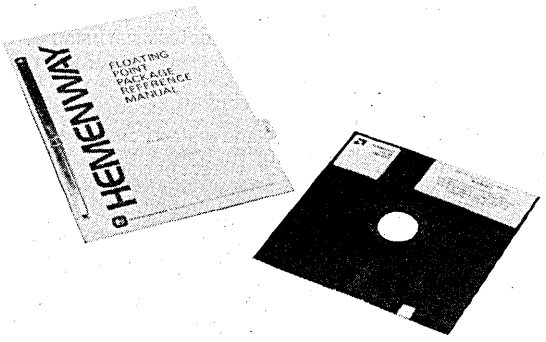
PASCAL/I™ is an industrial version of Pascal which supports all of the functions of PL/M-like compilers, but with Pascal syntax. The compiler is a true compiler that produces native code for the Z8002 microprocessor.

Features

- ☐ Port I/O
- ☐ 32-Bit arithmetic
- ☐ Access to memory on a byte or word basis
- ☐ Assembler routines callable for time-critical applications
- ☐ Entire set of Pascal control structures
- ☐ Allows interrupt or real-time operations
- ☐ Debugging using the MSP/Z8002 monitor
- ☐ ROMable object code
- ☐ High-efficiency code production
- ☐ Supports separate module compilation
- ☐ Floating point package optional

PS/1330
Floating Point Package

This package provides a unified set of floating-point support subroutines for the Z8002 microprocessor. The floating-point format used gives between 6 and 7 digits of precision and an exponent range from 1. E – 20 to 1.E + 20.



Features

- ☐ Fast execution
- ☐ Position-independent, ROMable code
- ☐ Re-entrant subroutines
- ☐ Integer to float, and float to integer conversion routines
- ☐ ASCII to float with free-format input conversion
- ☐ Float to ASCII string conversion
- ☐ Standardized calling sequence

PASCAL/I is a trademark of Hemenway Corporation.

© IC MASTER 1983

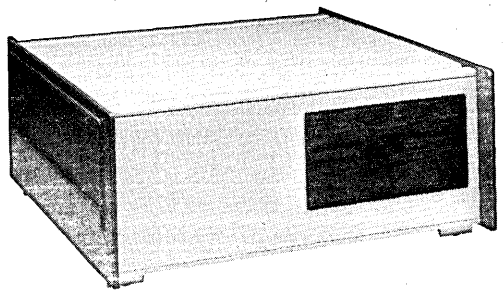
CREATIVE CMS MICRO SYSTEMS

6800/6809 BASED MPU MODULES AND SUPPORT HARDWARE

GENERAL PRODUCT OVERVIEW

Creative Micro Systems manufactures a broad line of support modules for microprocessor-based systems designed to fill the needs of a wide variety of applications. These modules are pin and outline compatible with the EXORbus standard as defined by Motorola, Inc. in publication M68EBS-(D1). These versatile modules are currently in extensive use in th fields of data acquisition, data communication and encryption, materials testing, automatic test equipment, process control, energy management systems, agricultural instrumentation, and small business data processing systems. Creative Micro Systems can provide the best hardware devices. The user simply adds the appropriate software.

The heart of each system is one of our Single Board Microcomputers. Three such modules are available offering the user a choice of the MC6802 or MC6809 processor. For applications that are heavy in mathematical operations, our 9611A Arithmetic Processor/Memory Module eliminates the need for arithmetic software and offers dramatic improvement in system through-put. As system requirements grow, they can be accommodated by our line of memory and Input/Output expansion modules.



New products are in development at Creative Micro Systems. If your system design requires a module not shown, please contact us to see if the capability has been recently added. Additional detailed technical data for each product is available on request.

1 9670 SERIES MAGNETIC DISC STORAGE MODULES

The 9670 series of Storage Modules is a family of mass storage subsystems that utilize flexible diskette and Winchester disc technologies. The modules are available in a variety of configurations and capacities. The 9670-100 series modules feature 8 inch Winchester drives with formatted capacities of 10, 20, or 40 megabytes and companion 8 inch diskette drives with 5 inch Winchester drives with formatted capacity of 14 megabytes and 5 inch diskette drives with formatted capacity of .65 megabytes. The 9670-500 series are similar to the 300 series modules with 14 megabyte Winchester drives but do not provide the companion diskette drive. The 9670-600 modules feature twin 5 inch diskette drives with formatted capacity of .65 megabytes each.

Each Storage Module is a complete subsystem with power supply and controller. A uniform interface to the processor bus is provided by the 9670 EPDT Host Adapter which provides data transfer efficiency approaching that of direct memory access while maintaining compatibility with all existing and future EXORbus systems. The diskette track formats are selectable by software control and include most of the popular one and two sided formats with FM or MFM encoding.

The Storage Modules are supported with the OS-9 operating system from Microware Systems Corporation. A software interface is also available to operate MDOS on these high performance systems.

2 9600A/9609/9619 SINGLE BOARD MICROCOMPUTERS

The 9600A and the 9609 are each complete microcomputers on a single card. The two modules are essentially identical except for the type of processor used. The 9600A utilizes the MC6802 while the 9609 utilizes the MC6809. The modules provide an optimized balance of features to fill the needs of most small systems and can be expanded as required to answer larger system demands. Both modules provide 1024 bytes of static RAM and 6144 bytes of single voltage EPROM which can be converted to static RAM in 2K byte blocks.

The I/O devices provided on each of the modules include two MC6850 ACIA's with RS-232C conditioning and two MC6821 PIA's. One of the MC-6850 device positions can be configured to accommodate an MC6852 for systems requiring a synchronous channel. An on-board bit rate generator provides fourteen standard rates for selection by the user. A triple programmable timer, MC6840, is also provided on both modules.

The 9619 Advanced Microcomputer provides upward compatibility with the 9609 and 9600A and offers many additional features. The onboard memory is available in many configurations from 2K of EPROM and 8K of RAM to 48K of EPROM and 4K of RAM. One 2K section of RAM is non-volatile. The 9619 also provides a non-volatile quartz-referenced time/date subsystem. Standard clock frequency is 2 mHz. The serial channels on the 9619 feature software selectable bit rate.

All of these single board microcomputers feature a power failure detection circuit and a priority interrupt vector generator. The modules are shipped with a resident monitor and debugger programmed in a portion of the EPROM for standalone use.

3 9611A ARITHMETIC PROCESSOR/MEMORY MODULE

The 9611A is a specialized support module which provides a dedicated binary fixed/floating point arithmetic processor and 16K bytes of memory on a single card. The processor section of the module utilizes the C8231A Arithmetic Processor to perform forty-three arithmetic operations in 16 or 32 bit precision. The module can also accommodate the AM9512 Floating Point Processor for use in systems which require greater levels of precision. The memory section of the module accommodates single voltage EPROMS or static RAMS of the 2K by 8 configuration and is arranged as two independent 8K blocks.

4 9616 32K EPROM/RAM MODULE

The 9616 is a 32,768 byte memory module configured as four independent 8K blocks. Each block can be individually placed at any 8K boundary by an onboard switch. Within each block the user may install any mix of EPROM or static RAM in 2K byte increments.

The 9616 is normally provided without memory devices. The desired arrangement of devices can be installed by the user in the sockets provided. The memory devices can also be ordered with the module if desired.

5 9635/9636/9637A NON-VOLATILE STATIC RAM MODULES

The 9635, 9636, and 9637A are static random access memory modules intended for use with either 1 mHz or 2 mHz systems. These modules provide storage that is protected from loss of data during periods of loss of system power. These modules utilize CMOS static memory devices that are supported by onboard batteries. Data guard is generated on the card and no external signals are required to maintain data integrity during system power transitions. The modules can be removed from the system chassis and transported without loss of data. The service life of the batteries is sufficient to provide three years of data retention before battery replacement is necessary.

The 9635 provides 64K bytes of storage arranged in 8 blocks of 8K each. The blocks can be individually selected for read-accesses and write accesses. The 9636 provides 32K bytes of storage also arranged in 8K blocks. The 9637A provides 16K bytes of storage arranged in 8K blocks with switch selectable boundaries. The 9637A can be write protected at the card level.

All of the Non-Volatile RAM modules can accommodate 20 address lines for use in memory-management systems. They are completely compatible with Standard EXORbus systems that use 16 address lines.

6 9634/9638 STATIC RAM MODULES

The 9638 is a 65,536 byte static random access memory module. It is configured as eight independent 8K blocks and each block can be individually enabled or disabled by onboard switches. The 9638 accommodates 20 address lines for use in memory-management systems but can also be used in standard 16 line systems. In addition to the 64K version, the 9638 is also available in partially populated versions of 32K and 56K capacity.

The 9634 is a 128K byte static random access memory module designed specifically for use in memory-management systems. It accommodates 20 address lines and is structured as a single 128K block. It can be intermixed with the 9635, 9636, 9637, and 9638 modules in a memory-management system.

The 9634 and the 9638 are suitable for use in 1 or 2 mHz systems. The modules are optimized for low power consumption, requiring less than three Watts of power from a single 5 Volt supply.

7 9657 INTELLIGENT PARALLEL I/O MODULE

The 9657 is an intelligent MC6802-based module that provides two parallel addressable channels that are under the control of the local processor. The module can perform as a bus-compatible peripheral controller and can assume much of the burden normally handled by the main processor. Each of the I/O ports can be cabled to multiple slave modules in bus fashion. The 9657-501, for example, is a slave module that provides optically isolated inputs for 64 contacts. One of the parallel addressable ports can accommodate 16 of these slave modules.

The 9657 ports can be bussed directly to the Opto 22 PAMUX II line of industrial interface products. Operations such as polling and sequencing of the external controls can be performed by the local processor with only the initial commands being generated by the main processor.

© IC MASTER 1983

8 9661 INTELLIGENT TIME-DATE SUBSYSTEM

The 9661 is a self-contained microprocessor-based system configured as a peripheral for use on the EXORbus. It provides a quartz referenced, non-volatile source of time and date information, and offers a variety of time-keeping and interrupt generation features. The 9661 is especially useful in real time process control applications and provides the main processor with extensive relief from the overhead of many timekeeping tasks. It can be used in 1 mHz or 2 mHz systems.

9 9671 INTELLIGENT FLOPPY DISC CONTROLLER

The 9671 is an intelligent controller for 8 inch diskette drives. This module is a 6809-based subsystem that responds to high level commands of SCSI (Small Computer Systems Interface, also known as the SASI or Shugart Associates Systems Interface). The 9671 combines the functions of the SCSI controller and host adaptor on a single EXORbus card. The unit will control a maximum of four drives with a variety of track formats, one or two sided, FM or MFM encoding.

The 9671 is normally used as a peripheral controller in the EXORbus chassis. It is equipped with a serial I/O port with RS-232C conditioning. This feature, along with an additional firmware package, will allow standalone operation of the controller.

10 9620A 16 CHANNEL PARALLEL I/O MODULE

The 9620A is a parallel interface module which utilizes 8 MC6821 Peripheral Interface Adapters mounted in sockets, each with its own flat cable connector. Sixteen 8-bit parallel I/O ports with control lines are therefore provided on a single card.

The 9620A occupies 32 sequential memory addresses. This address arrangement permits the use of a very tight polling loop for interrupt-driven systems and allows indexed addressing techniques to improve coding efficiency for multi-channel I/O.

The 9620A I/O lines are arranged in the cable according to the CMS parallel port standard. Any two such ports may be interconnected with standard ribbon cable connectors to perform as a full duplex parallel channel with handshaking protocol. This module is available in 1 mHz and 2 mHz versions.

11 9622 COMBINATION SERIAL-PARALLEL I/O MODULE

The 9622 is an interface module which utilizes six MC6821 Peripheral Interface Adapters, each with its own flat cable connector, and two MC6850 Asynchronous Communications Interface Adapters with RS-232C conditioning. Twelve parallel and two serial I/O channels are therefore provided on one card. An onboard bit rate generator allows the user to select any of fourteen standard rates for each serial channel.

The PIA I/O lines are unbuffered to allow the user unrestricted choice of data direction. The pin assignments conform to the standard order of other CMS modules. The arrangement is such that two PIA's can easily be interconnected for full duplex handshaking data exchange. The 9622 is available in 1 mHz and 2 mHz versions.

12 9640A MULTIPLE PROGRAMMABLE TIMER MODULE

The 9640A is a multiple programmable timer module which provides an array of eight MC6840 triple programmable timers. Each timer occupies eight locations of memory address space. The starting address for the array can be strap selected to any 64 byte boundary in system memory. The timer I/O lines are buffered and are available to the user at two flat cable connectors on the top edge of the card. The 9640A is available in 1 mHz and 2 mHz versions.

13 9650A 8 CHANNEL DUPLEX SERIAL I/O MODULE

The 9650A is an asynchronous serial interface module which utilizes 8 MC6850 Asynchronous Communications Interface Adapters with full RS-232C signal conditioning. An on-board bit rate generator simultaneously provides 14 standard rates that can be individually strapped to each ACIA.

The 9650A occupies 16 consecutive memory addresses. The lowest 8 of these access the 8 control/status registers and the next 8 access the transmit/receive data registers. This map arrangement allows optimum use of indexed addressing in I/O intensive systems and permits the use of a very tight polling loop in interrupt driven systems. The module is available in 1 mHz and 2 mHz versions.

14 96103 32/32/I/O MODULE

The 96103 is a parallel I/O module which provides 32 terminated TTL compatible inputs and 32 TTL compatible latched and buffered outputs. This module emulates the function of the Motorola M68MM03 Micromodule*.

The 96103 can be placed at any four-byte boundary of memory by setting the starting address in DIP switches on the card. The I/O lines are available at two edgeboard connectors at the top of the card. Input termination and output pullup resistors are in separate packages allowing additional flexibility for systems configuration.

15 96702 CONTACT CLOSURE MODULE

The 96702 is a 32-point reed relay contact closure module which features 32 form A contact sets terminated at two edgeboard connectors at the top of the card.

This module emulates the output function of the Motorola M68MM13B Micromodule*. It occupies four consecutive byte locations. Each bit of each byte controls the state of a contact. The 96702 also provides read-back of the relay driver states and allows initialization of all contacts to the open state after a system reset.

The 96702 can be placed at any four-byte boundary of memory by setting the starting address in DIP switches on the card. Varistor contact protection is available as an option for applications involving other than resistive loads.

16 9610/9612 UTILITY PROTOTYPING BOARD

Two utility prototyping boards are available in the 9600 family to provide the user with a convenient means to produce breadboards and low volume special purpose modules. Both boards feature +5 VDC and ground distribution in generalized pattern and pads to allow the installation of any mix of dual-inline devices with row spacings of 0.3 inch or 0.6 inch. The boards provide mounting positions for flat cable headers at the top edge and access to all system bus pins at the card edge connector.

The 9610 Utility Proto Board provides the greatest area for user construction while the 9612 Buffered Utility Proto offers the additional convenience of a prewired bus interface. This "front end" provides switch selectable address decoding and data bus buffering.

The 9612 has been optimized for use with Scotchflex+ Breadboard Plug Strip System. This system utilizes an insulation displacement technique to achieve component interconnections which dramatcally reduces construction time.

17 9614/9617/9618/EPROM PROGRAMMING HEADS

The 9614, 9617, 9618 are utility modules for use with M6800/6809 systems. They provide a convenient means for programming single-voltage EPROMS from data resident in the system memory. The Programming Heads are designed to derive all signals and power directly from the parallel I/O connector, P3, of any CMS Single Board Microcomputer. They can also be interfaced to any system which provides two unbuffered MC6821 Parallel Interface Adapters (PIA's), and a source of +5 VDC. The Programming Heads are designed for tabletop use and are connected to the system I/O port by a 50 conductor flat cable.

The Programming Heads are supported by firmware that provides convenient operator control over the programming process. Single voltage EPROMS of type 2716, 2732, and 2732A are accommodated by the 9614. Types 2716 and 2532 are programmable with the 9617. The 9618 accommodates the 28 pin 2764 and 27128 devices. Data in memory can be inspected and changed prior to programming.

The firmware is normally supplied in EPROM intended for use with 9600A, 9609, and 9619 Single Board Microcomputers. The source listing is provided to assist the user in adapting the programming heads to other system interfaces. Disc resident software for the OS-9 operating systems is also available and can be specified at order entry time.

18 9601A/9603A MOTHER BOARD

The 9601A Mother Board is available to provide convenient bus interconnection for multi-card systems. Sixteen connector positions are provided to distribute all power and signal lines to the cards. The 9610A also provides a ground plane, which is recommended for systems operating at 2 mHz. Threaded terminals are provided for attachment of power lines. An 8-position board, the 9603A is also available. Overall dimensions for the 9601A are 13 inches by 7.65 inches by 0.750 inches, and for the 9603A they are 6.5 inches by 7.65 inches by 0.750 inches. The connectors are located at 0.750 inch intervals.

The mother boards can optionally be equipped with a data bus termination resistor network. This option can be specified at the time of purchase or can be installed by the user.

19 9602B CARD CAGE

The 9602B Card Cage is designed for RETMA rack mounting requiring 10.5 inches of rack height and 8 inches of depth. The 9602B may also be used for platform mounting if it is assembled with the end plates reversed. The card cage is equipped with plastic card guides to accommodate a 9601A 16 slot mother board. The cage also provides mounting space for a 9604 System Power Supply.

20 9604 SYSTEM POWER SUPPLY

The 9604 System Power Supply is configured for mounting in the 9602B Card Cage. It is a switchmode-regulated supply providing four isolated outputs:

+ 5 VDC	1 Amp	−12 VDC 1 Amp
+12 VDC	15 Amps	− 5 VDC 1 Amp

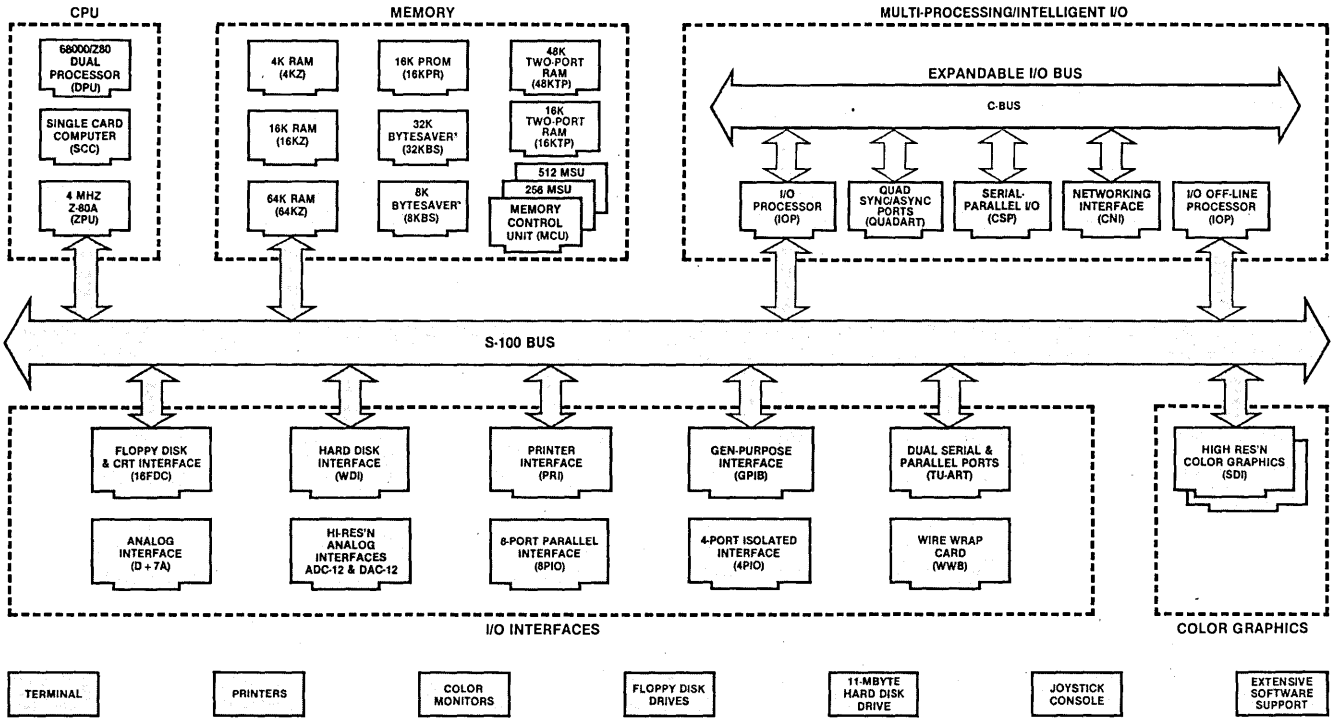
A restriction of these currents, typical for switch-mode supplies is that the total regulated power form the supply is limited to 75 Watts. Efficient regulation is provided with an input variation from 92 to 138 VAC, 47 to 440 Hz. A combined switch and circuit breaker is provided on the power supply.

21 9630 CARD EXTENDER

The 9630 is a passive card extender to be used as a trouble-shooting aid. It extends any of the card family members to a position external to the card cage for easy access. The 9630 is equipped with labeled test point terminals on each of the system bus lines for ease of measurment or attachment of probes.

* Trademark of Motorola, Inc.
† Trademark of 3M

© IC MASTER 1983



CROMEMCO COMPUTER CARD CAPABILITY

MULTI-PROCESSING AND INTELLIGENT I/O

The range of capabilities and versatility these cards give you is **impressive indeed.**

In processors, for example, you have a choice of CPU's including our new I/O Processor. This can be used as a satellite processor to do off-line processing, multi-processing, and to form intelligent I/O. It opens the door to a whole new group of applications and tasks.

HIGH RESOLUTION COLOR GRAPHICS

You can have beautiful high-resolution color graphics with our color graphics interface (SDI). You can select from over 4000 colors and have a picture with a resolution at least equal to that of quality broadcast-TV pictures.

You also have an unprecedented selection of memory including our unusual 48K and 16K **two-port** RAMs which allow high-speed color graphics.

POWERFUL SOFTWARE AND PERIPHERAL SUPPORT

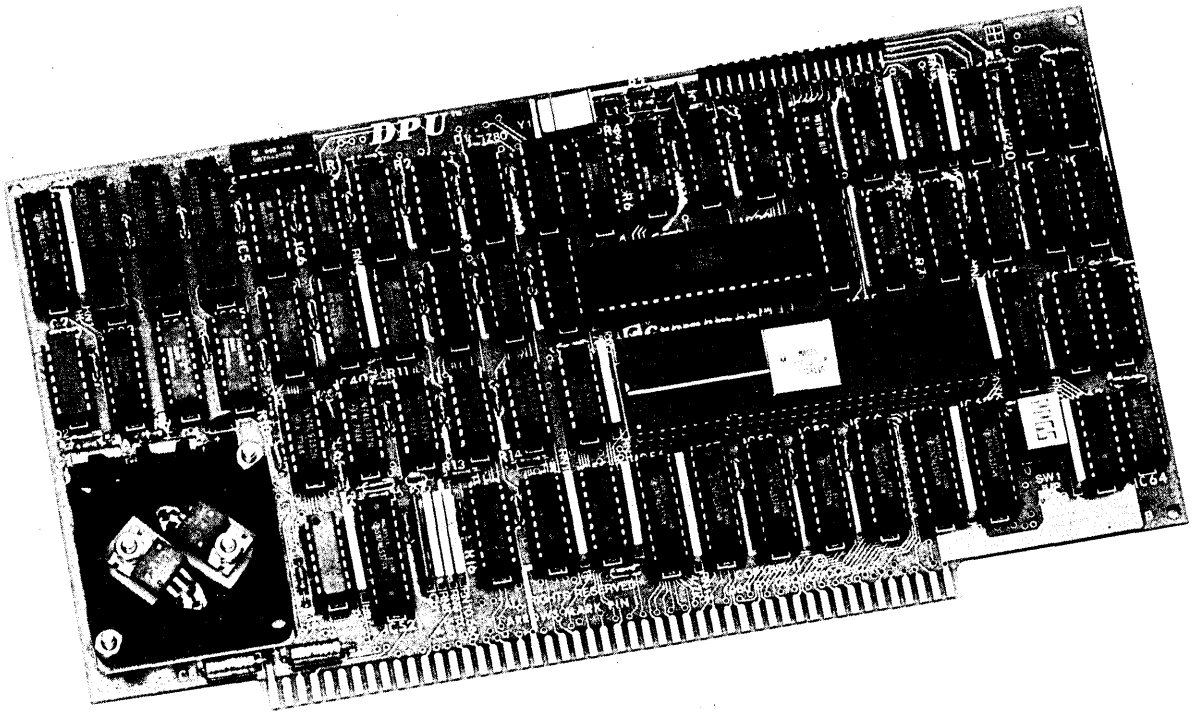
There's much more yet you can do with the cards shown in this catalog, all made easy with our card cages and power supply.

Cromemco also offers the strongest software support in the industry (see next section in this catalog). In addition, there is a wide choice from independent vendors.

Cromemco
280 Bernardo Ave.
Mountain View, CA 94043
(415) 964-7400
TWX 910-379 6988

© IC MASTER 1983

Dual Processor Unit with companion memory



- **68000-based**
- **Low-priced**

A FAST, EASY WAY TO START WITH THE 68000

This new Dual Processor Unit gives you an easy way to get started with the impressive 68000 processor.

The 68000 is widely accepted as the most powerful of the new processors, having a 32-bit wide architecture, and enormous 16 megabyte addressing range, 56 main instruction types, five main data types, and 14 addressing modes.

8-BIT AND 68000 SOFTWARE

The Dual part of the DPU refers to its on-board Z-80A processor. This gives access to existing CP/M* and other 8-bit software as well as having available a family of new 68000 software. This includes a wide range of high-level software such as a 68000 Assembler, FORTRAN 77, Pascal, BASIC, COBOL, and C.

Cromemco further offers our widely-admired CROMIX† operating system. This is like UNIX‡ but has even more features and gives multi-tasking and multi-user capability.

Switching between the 68000 and the Z-80A on the DPU is software-controlled.

Present customers can field-upgrade their Cromemco systems to use the DPU and still be able to run their present software with the Z-80A on the DPU.

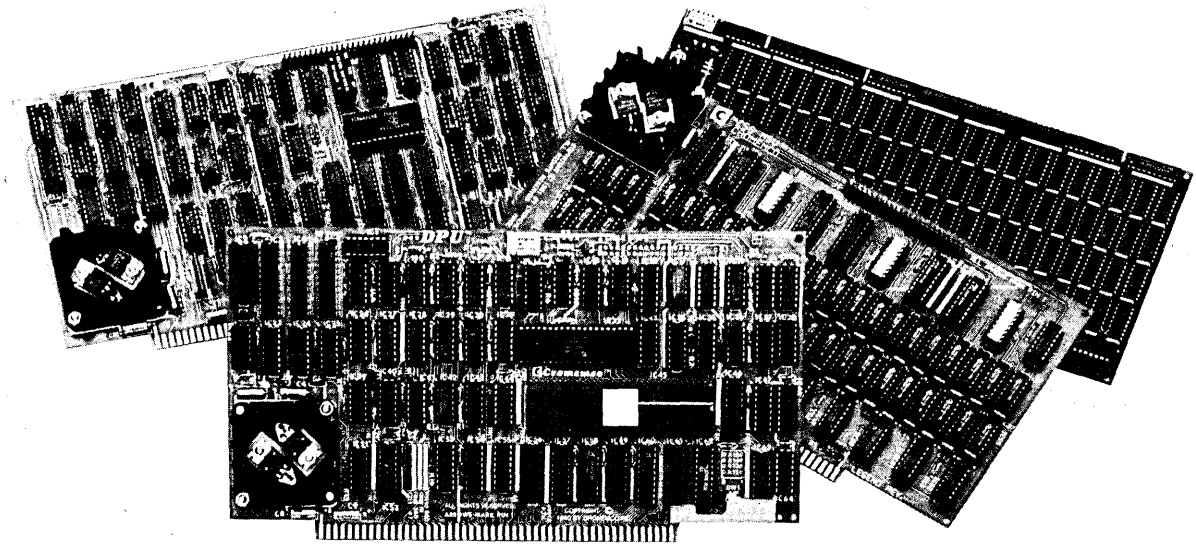
MEMORY

For use with the DPU, Cromemco offers a new group of RAM memory units. These are available in both 256-kilobyte and 512-kilobyte sizes. These units work under the control of a new Memory Controller Unit which supports either byte or word-width operation.

Cromemco

© IC MASTER 1983

Dual Processor Unit with companion memory (cont'd)



DPU card with memory and controller unit

A special feature of the memory units is their built-in error checking and correction capability. In concert with this capability the Memory Controller Unit has an error-logging feature which stores the location of errors encountered and identifies the particular RAM chip on a particular MSU that had the error. This feature is very helpful in system diagnostic and maintenance work.

Each Memory Controller Unit can control up to four Memory Storage Units—a total of 2 megabytes of RAM using the 512 kilobyte units.

For error checking and correcting, the memory units are designed to use 22 bits to encode each 16-bit word. A modified Hamming code is used which allows transparent detection and correction of single-bit errors and detection of double-bit errors.

* CP/M is a trademark of Digital Research

† CROMIX is a trademark of Cromemco, Inc.

‡ UNIX is a trademark of Bell Telephone Laboratories

TECHNICAL SPECIFICATIONS

Model DPU
Dual Processor Unit

Processors: MC68000 and Z-80A.
Clock Rate: MC68000: 8 MHz.
Z-80A: 4 MHz.
Instruction Set: MC68000: over 1000 instructions in 56 main types.
Z-80A: 158 instructions including the 78 instructions of the 8080 processor.
Power-on jump: Cromemco processor standard system, as well as user selectable jumps to any 4K memory boundary.
Processor control: Software controlled switching between MC68000 and Z-80A.
Bus: S-100 (Jumper selectable to IEEE-696)
Power requirements: +8 volts @ 2.0 amps.
Operating environments: 0-55°C.

Model MCU
Memory Controller Unit

Support Capacity: Up to four MSU memory cards.
Address Space: 16 Megabytes.
Bus: S-100, IEEE-696 compatible.
Power Requirements: +8 volts @ 1.5 amps.
Operating Environment: 0-55°C.

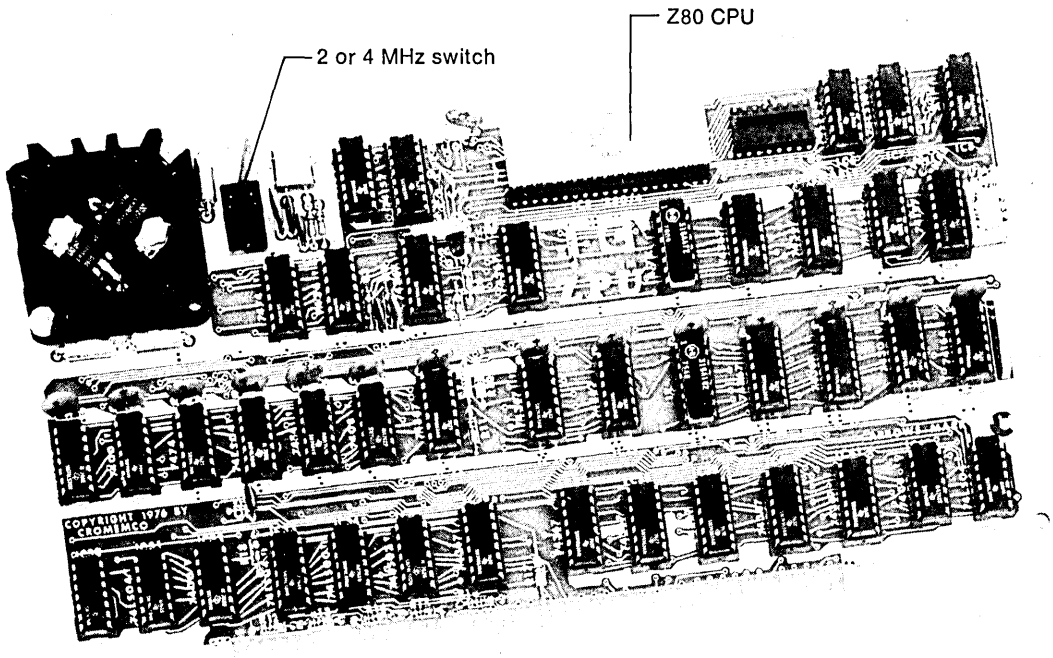
Models 256MSU and 512MSU
Memory Storage Units

Memory Capacity: 256MSU: 128K by 22 bits; 256K bytes.
512MSU: 256K by 22 bits; 512K bytes.
Memory Type: 64K dRAMs;
150 nanosecond access time.
Bus: S-100, IEEE-696 compatible.
Power Requirements: +8 volts @ 1.5 amps.
Operating Environment: 0-55°C.

Cromemco

© IC MASTER 1983

4 MHz CPU card



- Uses special Z-80 microprocessor
- Fast—4 MHz clock rate
- Does not require front panel for operation

2-5X MORE THROUGHPUT

Here is by far the most powerful CPU card now available. (It is the heart of our computer systems.)

It uses the Z-80 chip — in fact, it uses a high-speed version of the Z-80 certified by its manufacturer for 4 MHz operation.

The Z-80 has all the advantages of the 8080 and 6800—and enormously more.

And Cromemco's new Z-80-CPU card does enormously more.

4 MHz CLOCK RATE

First, this CPU lets you choose either a 2 or 4 MHz crystal-controlled clock rate. Right away that means you can have twice the throughput. Cuts program running time in half. Then the instruction set of the Z-80 reduces software even more.

The 2 or 4 MHz clock rate is switch-selectable as shown in the above photo.

POWER-ON MEMORY JUMPS

Cromemco's CPU also has some neat design innovations of its own.

For example, you'll like the simplified operation you get because upon power turn-on the CPU will jump to any desired 4K boundary in memory. No switch flipping to go through to begin your program. So you can also use this CPU card in stand-alone systems — and it can be operated without need of a front panel.

80 ADDITIONAL INSTRUCTIONS

You've probably heard that the Z-80 with its 80 new additional instructions is by far the most powerful chip around. It's true.

That means with our CPU you will be able to devise much more powerful (as well as faster) software than before.

MODEL	
Z-80-CPU assembled	Model ZPU

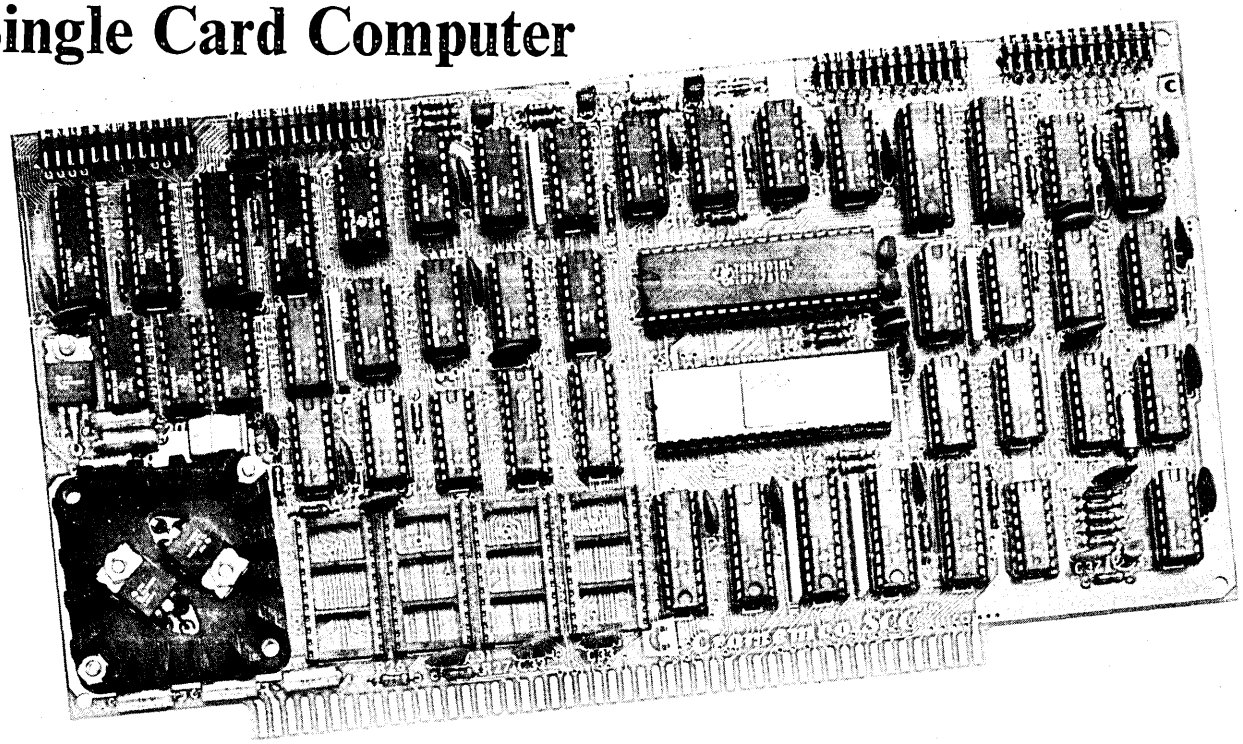
TECHNICAL SPECIFICATIONS
Z-80 Microprocessor Card

Processor: 4 MHz version of the Z-80.
Clock rate: 2/4 MHz (switch selectable)
Instruction set: 158 instructions including the 78 instructions of the 8080.
Power-on jump: jumper wire enabled.
Power-on jump locations: 16 locations switch selectable.
Wait State generation: 0-4 wait states jumper wire selectable.
M1 Wait State: Jumper wire selectable.
BUS: S-100.
Power requirements: +8 volts @ 1.1 A.
Operating environment: 0-55°C.

Cromemco

© IC MASTER 1983

4 MHz
Single Card Computer



A COMPLETE 4 MHz COMPUTER

With our new Single Card Computer, Cromemco brings the power of the Z-80 and the flexibility of the S-100 bus to the dedicated computer environment.

This card was designed to get your application up and running fast. Naturally you get a 4 MHz operation. You also get up to 8K bytes of on-board 2716 PROM, and 1K byte of static RAM memory. Interfacing is a snap through the RS-232 (or 20 mA current loop) serial interface with programmable baud rates to 76,800 baud. This stand-alone card also gives you 24 bits of bidirectional parallel I/O, 5 programmable timers, vectored interrupts, and complete compatibility with all Cromemco cards.

Our Single Card is a complete computer. Only a power supply and your PROM software are required for operation. Yet the Single Card can be the core of an enormously expandable S-100 bus system since you can add additional memory, I/O, or even floppy disk drives as your application requires.

MONITOR/3K BASIC

Our well-known Z-80 Monitor and our 3K Control BASIC are available in 2316 ROM for use in your Single Card Computer. With this two-ROM set you are ready to begin using a single Card right away — no other memory or I/O is required. The monitor has 12 commands to aid you in program development. Our Control BASIC has 36 commands/functions and can directly access I/O ports and memory locations as well as call machine language subroutines.

MODELS

Single Card Computer assembled — Model SCC
Monitor and Control BASIC in two ROMs — Model MCB-216

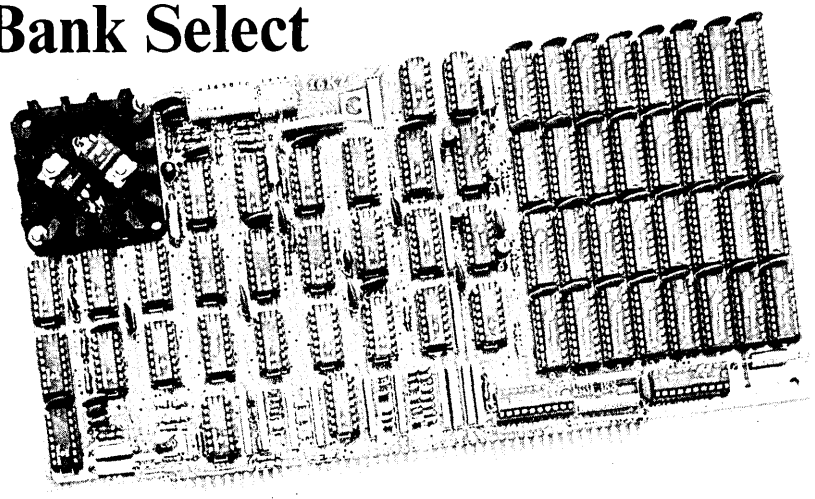
TECHNICAL SPECIFICATIONS
SCC Single Card Computer

Processor: 4 MHz Z-80
Instruction Set: 158 instructions including the 78 instructions of the 8080.
ROM Capacity: 8K Bytes located from address 0000 to 1FFF
ROM Type: Intel 2716 PROM or equivalent
RAM Capacity: 1K Bytes located from address 2000 to 23FF
RAM Type: 4045, Static
Serial I/O Ports:
I/O levels: RS-232 or 20 mA current loop
Baud rate: 110 to 76,800 (software selectable)
Parallel Ports:
Input Port: 24 bits bidirectional
Output Port: 24 bits bidirectional
Input Load: One TTL equivalent
Output Drive: 20 TTL loads
Interval Timers:
Number of timers: 5
Timer Range: 0-16.32 milliseconds (software selectable)
Timer resolution: 64 microseconds
Vectored Interrupts:
Number of restart locations (Z-80 mode): 65,536
General Information:
UART type: 5501
Bus: S-100
Power requirements: + 8 volts at 1.4 A
+18 volts at 70 mA
−18 volts at 25 mA
Operating environment: 0-55°C

Cromemco

© IC MASTER 1983

16K RAM card with Bank Select



- The fastest available
- No wait states required at either 2 or 4 MHz operation
- Offers expandability to a half megabyte with Bank Select
- Can be used for time-sharing
- Dynamic refresh fully transparent

FAST, EXPANDABLE

Not only is this the fastest 16K RAM card available but it is expandable to a half megabyte.

It will operate at 4 MHz *with no wait states.*

TIME SHARING

One of the best examples of the power of the Bank-Select feature is that it will let you achieve a time-share system with minimum software overhead.

Each user (there can be up to 6) will be confined to his own bank of memory.

S-100 BUS COMPATIBILITY

This memory can be plugged into any S-100 bus computer. That includes the entire family of Cromemco computer systems.

START WITH THE BEST

Sooner or later you'll inevitably want larger memory. So start with Cromemco and be sure you'll have the expandability and high-speed performance you'll need.

MODEL

16K RAM Memory assembled, burned-in and tested
Model 16KZ

TECHNICAL SPECIFICATIONS
Model 16KZ RAM Card

Memory capacity: 16K bytes.
Memory type: 4050-2 RAM.
Memory access time: 200 nanoseconds.
Wait States at 2 MHz: none required.
Wait States at 4 MHz: none required.
BUS: S-100.
Power requirements: + 8 volts @ 0.8 A
+18 volts @ 0.5 A
−18 volts @ 10 mA
Operating environment: 0-55°C.

MEMORY BANK SELECT

Memory bank select is a feature incorporated on Cromemco memory boards that allows the expansion of memory-space beyond 64K bytes. With bank select, memory space may be organized into 8 banks of 64K bytes each for a total of one-half megabyte of memory.

With bank select each memory board may reside in one or more of the 8 possible memory banks. An 8-position DIP switch on the board is used to select each of the banks in which the board resides.

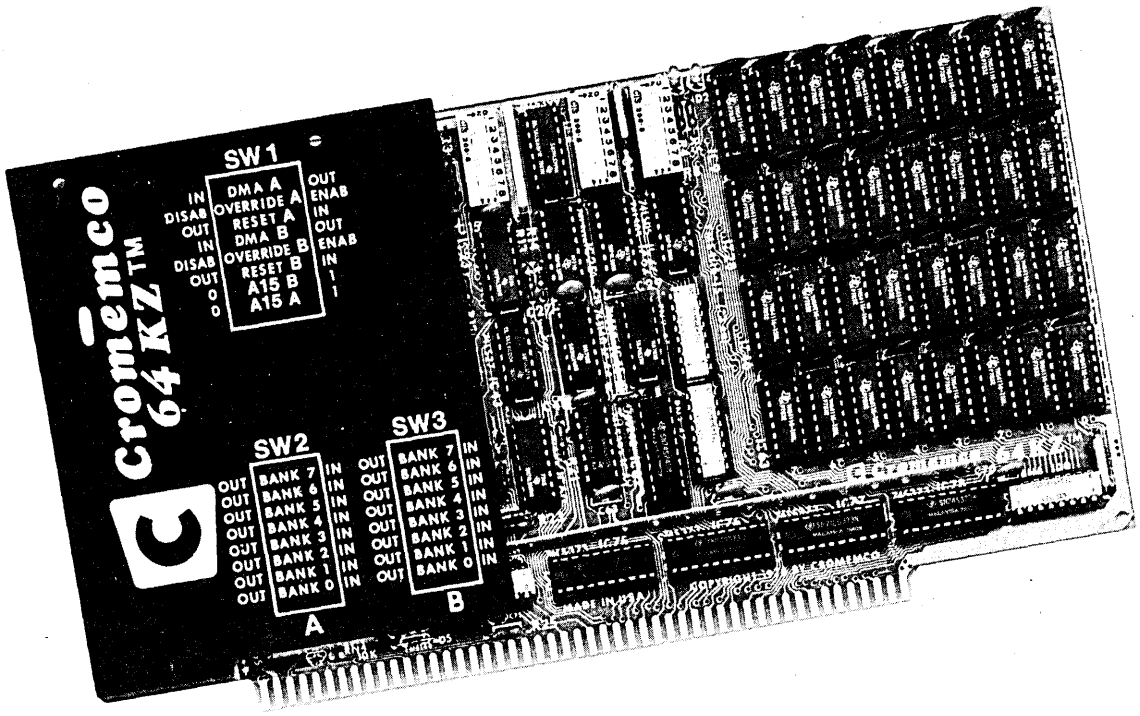
The active bank or banks of memory are selected under software control. Output port 40H is dedicated to this function. Each of the 8 bits of data of output port 40H is used to turn on or off the corresponding bank of memory. A "1" in the corresponding bit position will turn on the memory bank. A "0" will turn it off. All circuitry required to detect the output of port 40H is included on the memory card itself.

Bank select provides a convenient method by which to expand system memory space beyond 64K. Bank select also permits the implementation of time-sharing systems with a minimum of software overhead—up to 6 users can use the system simultaneously with each confined to his own bank of memory.

Cromemco

© IC MASTER 1983

64K RAM card with Extended Bank Select



- Enormously expandable
- Guaranteed 4 MHz operation from 0-55°C
- Low power

This new 64-kilobyte RAM card is fast and tremendously expandable in keeping with Cromemco's objective of providing you with obsolescence insurance.

The Model 64KZ is organized as two 32K blocks of memory. Each block can be placed either in high-memory space (address 8000-FFFF) or low-memory space (address 0000-7FFF).

Each block can further be placed in any of 8 different memory banks. Address and bank assignment of each 32K block is switch selectable.

Another feature is that each 32K block can be independently switched to be selected or de-selected after reset.

ENORMOUSLY EXPANDABLE

With our Bank Select feature you can expand memory space from 64K to 512K in eight banks.

Now with the Extended Bank Select feature in this new card you can expand to as much as 16 megabytes.

The 64KZ is fully tested to be compatible with all Cromemco products.

MODEL

64KZ High-Speed RAM Memory; factory assembled, burned-in and tested Model 64KZ

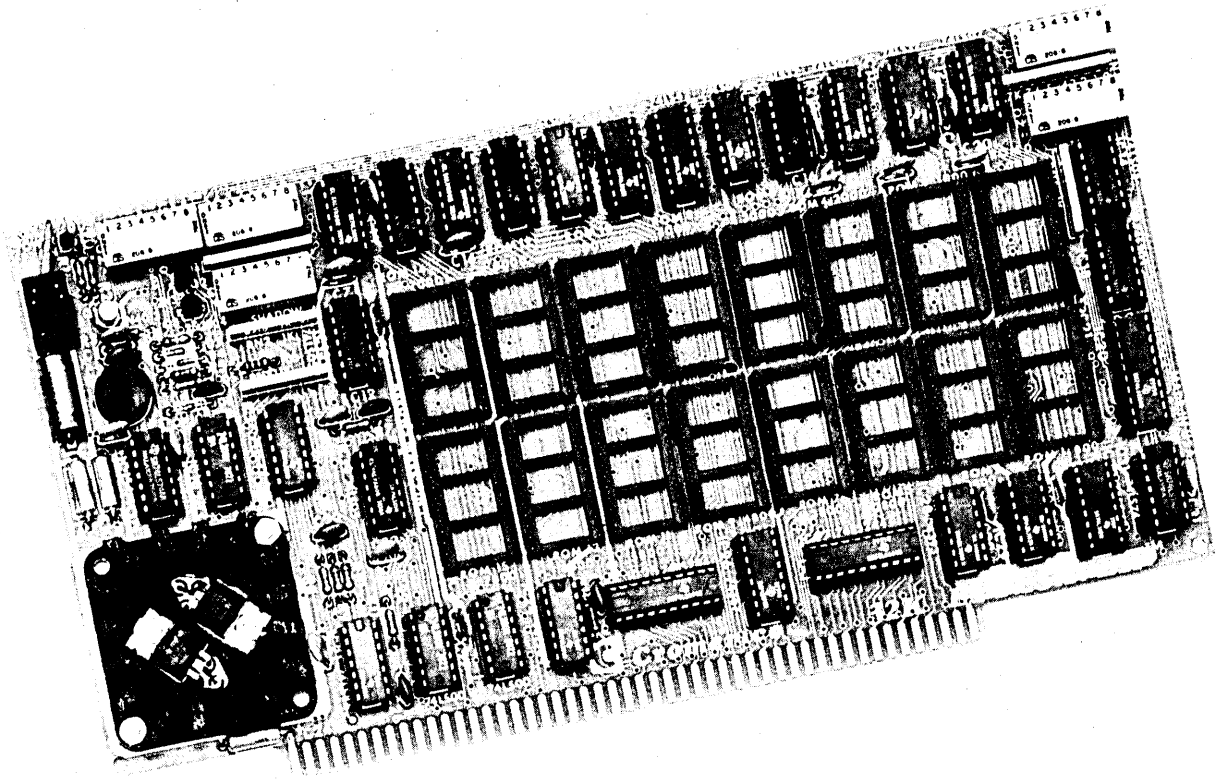
TECHNICAL SPECIFICATIONS
Model 64KZ RAM Card

Memory capacity: 64K bytes.
Memory type: 4116
Memory access time: 150 nanoseconds.
Wait States at 2 MHz: none required
Wait States at 4 MHz: none required.
BUS: S-100.
Power requirements: + 8 volts @ 1.5 A
+18 volts @ 0.2 A
Operating environment: 0-55°C

Cromemco

© IC MASTER 1983

32K BYTESAVER® memory board with 2716 PROM programmer



32K BYTESAVER® PROGRAMS THE NEW, HIGH DENSITY 2716 PROM

Many customers have asked for a card that has the ease of use and high flexibility of our popular BYTESAVER® 2708 PROM card but one that could use the new 2716 2-kilobyte PROM.

Now Cromemco's 32K BYTESAVER® card gives you a full 32-kilobyte capacity of non-volatile storage for those ROM-intensive applications.

You also get the convenience of an on-board 2716 programmer.

The new 32K BYTESAVER® holds up to 16 of the 2716 PROMs. Switches are provided to: (1) protect and un-protect PROMs individually or in groups for programming (2) shadow ROM socket pairs (allows external RAM to overlap portions of ROM address space) (3) select card address, and (4) control the powerful Bank-Select and DMA IN-OUT features.

NO SPECIAL SOFTWARE NEEDED

A simple, one-time write of the desired data into an erased PROM with the on-board programmer turned on is all that is required to store information quickly and permanently.

MODEL	
32K BYTESAVER® PROM card assembled, burned in and tested	Model 32KBS

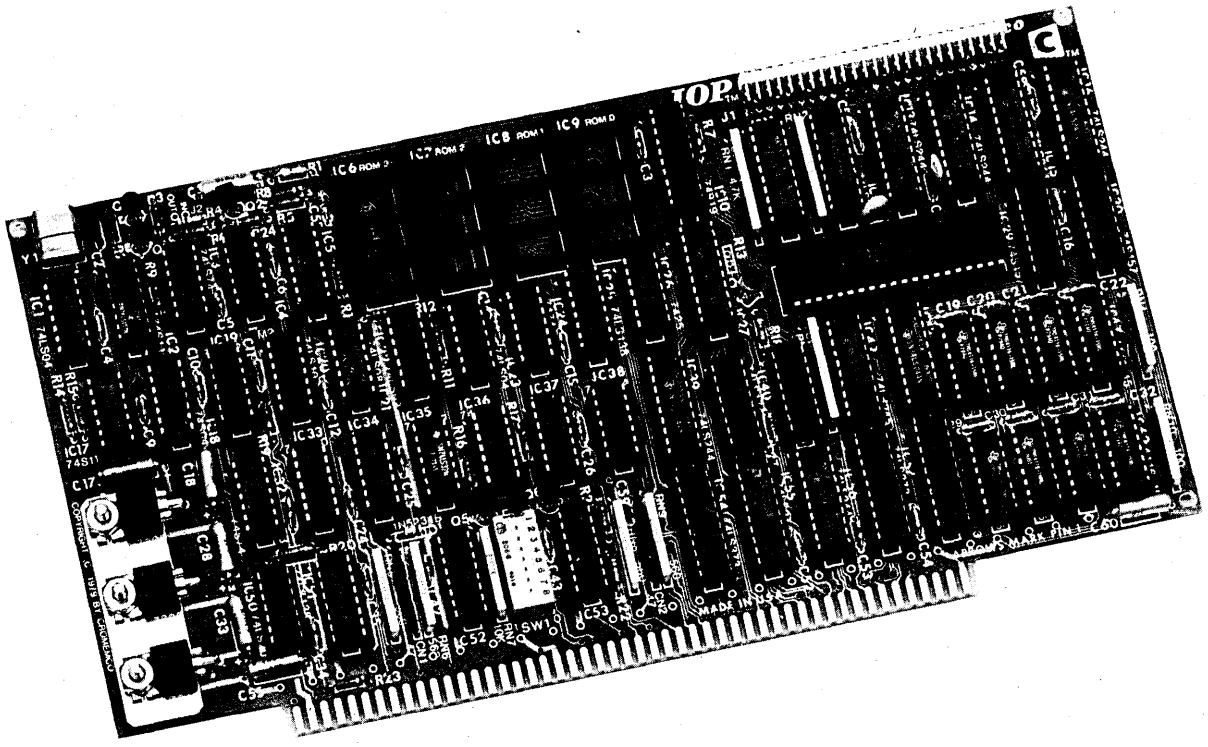
TECHNICAL SPECIFICATIONS
32K BYTESAVER® PROM Card
Model 32KBS

Memory capacity: 32K bytes.
Memory type: Intel 2716 PROM or equivalent.
Memory access time: 450 nanoseconds.
Wait States at 2 MHz: none required.
Wait States at 4 MHz: one per machine cycle.
BUS: S-100.
Power requirements: +8 volts @ 2.1 A, max.
Operating environment: 0-55°C.

Cromemco

© IC MASTER 1983

I/O Processor



MULTI-PROCESSOR CAPABILITY

With this new I/O Processor you can now have multi-processor capability in your S-100-bus system.

The new Model IOP is a true single-card computer — one that has a fast Z-80A processor, 16K bytes of RAM, and up to 16K bytes of PROM capacity.

The IOP interfaces to the S-100 host processor by means of simple "input" and "output" instructions.

SATELLITE PROCESSOR

The IOP can be used either alone or with other IOP cards as a satellite processor on the S-100 bus.

Or the IOP can process I/O channels and interface to other devices such as the Cromemco Quadart through the C-bus connector on the top edge of the card.

The IOP is an advanced development that brings a new dimension of computer architecture to Cromemco computer systems.

MODEL	
I/O Processor assembled, burned in and tested	Model IOP

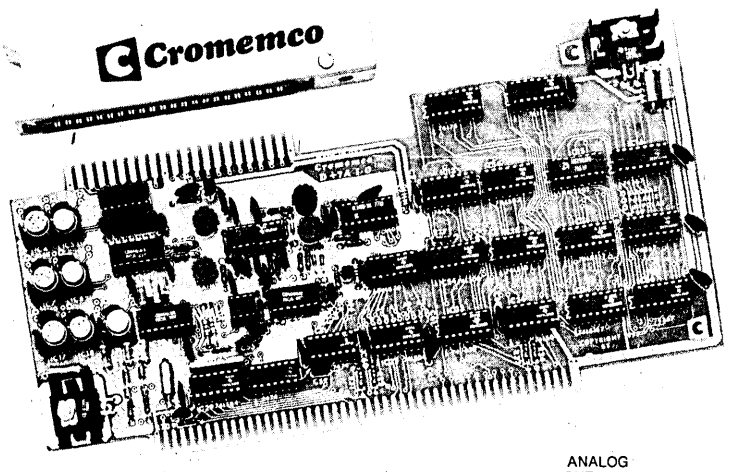
TECHNICAL SPECIFICATIONS
Model IOP
I/O Processor

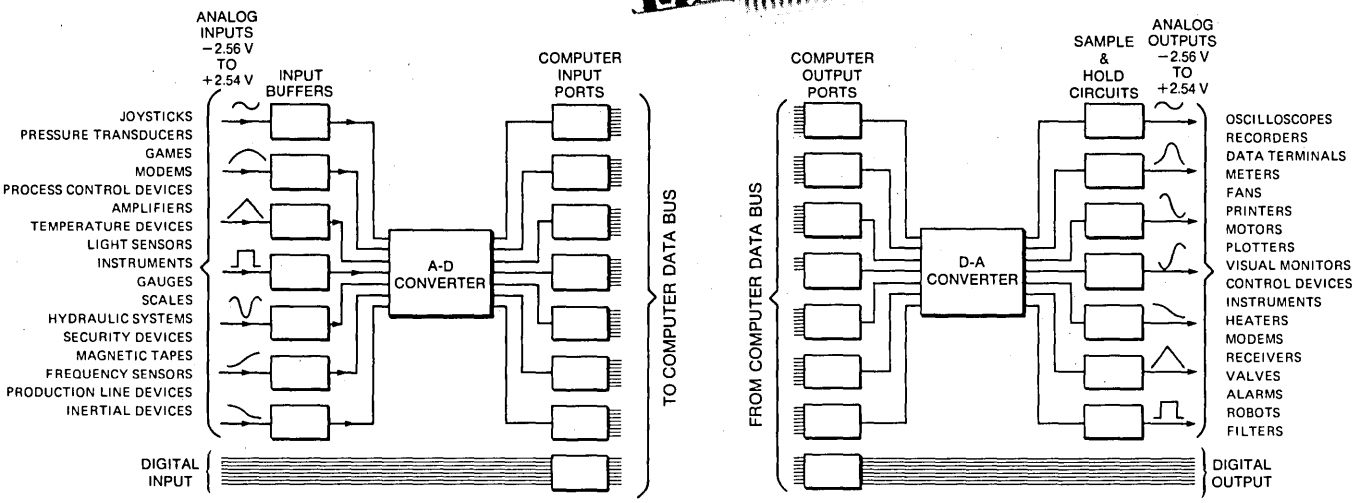
Processor: 4 MHz Z-80A
Instruction Set: 158 instructions including the 78 instructions of the 8080
ROM Capacity: 16K bytes positioned starting on any 2K boundary (selectable by bipolar PROM).
ROM Type: Intel 2716, 2732 or equivalent
RAM Capacity: 16K bytes positioned starting on any 2K boundary (selectable by bipolar PROM)
Standard address configuration:
PROM—0000 to 1FFFH
RAM—4000H to 7FFFH

RAM Type: 4116
Host Interface: S-100 bus input-output ports
Peripheral Interface: C-bus
M1 Wait state generation: 0-1 wait states jumper wire selectable
Power requirements: + 8 volts @ 1.5A
+18 volts @ 100 mA
−18 volts @ 30 mA
Operating environment: 0-55°C

© IC MASTER 1983

D+7AI/O™ Multi-channel microcomputer analog interface





Now you have a way to get analog information into and out of your microcomputer. It's an easy, fast, and unbelievably inexpensive way.

It's Cromemco's new D+7A® high-performance I/O module which gives you:

- 7 channels of 8-bit analog-to-digital conversions (to input analog data to the computer)
- 7 channels of digital-to-analog conversion (to output computer data in analog form)
- an 8-bit parallel I/O port to input and output data in digital form.
- a fast conversion time of 5.5 microseconds.

A MULTITUDE OF USES

The D+7A makes it easy to use your computer for the jobs you want it to do—such as process control, digital filtering, games, oscilloscope graphics, speech recognition, speech and music synthesis.

The D+7A lets you input and output analog data with all sorts of devices: joysticks, ham radio gear, measurement instruments, machine tools, transducers, control systems, motors, recorders, and plotters, to name just a few.

NO FURTHER SOFTWARE NEEDED

The D+7A I/O plugs directly into the Cromemco microcomputers. Analog signal range is from — 2.56 to + 2.54 volts (20-millivolt increments) on both input and output sides.

Simple "Input" and "Output" instructions initiate A/D conversion and read in or out the ensuing 8 bits of data. No further software is required. During conversion the D+7A holds down the computer "Ready" line.

MODEL

D+7A I/O assembled, burned-in and tested — Model D+7A

Each D+7A includes a connector to connect to the 8 input and 8 output ports.

TECHNICAL SPECIFICATIONS
D+7A A/D & D/A Interface

Analog input ports:
- **Number of input ports:** 7
- **Input voltage range:** −2.56 to +2.54 volts
- **Input bias current:** 2 microamps max.
- **Input impedance:** 20 Megohms || .001 μF, 1 KHz sample rate. 2 Megohms || .001 μF, 10 kHz sample rate.
- **Resolution:** 8 bits.
- **Conversion time:** 5.5 microseconds.
- **Accuracy:** ±20 millivolts.

Analog Output Ports:
- **Number of output ports:** 7
- **Output voltage range:** −2.56 to +2.54 volts
- **Output impedance:** 0.25 ohm.
- **Maximum load current:** 1.5 mA
- **Resolution:** 8 bits
- **Conversion time:** 5.5 microseconds
- **Accuracy:** ±20 millivolts
- **Drift rate:** Less than 10 mV/sec at 25°C

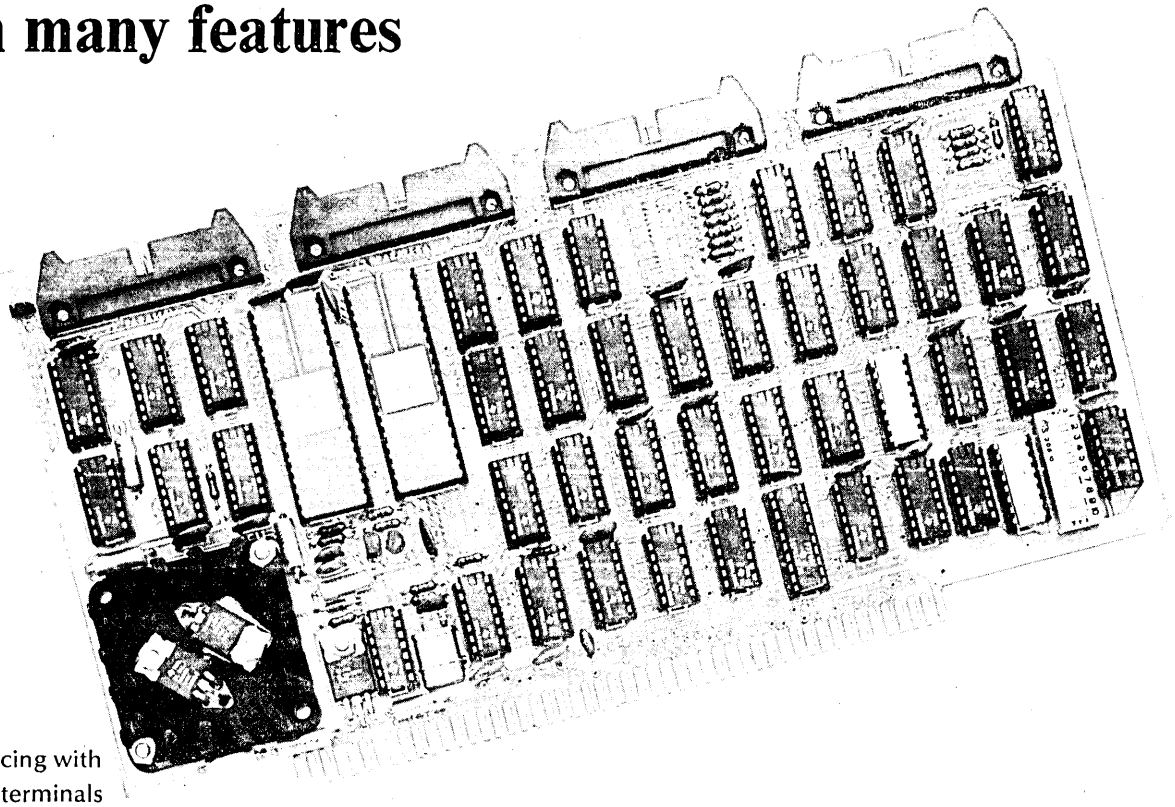
Parallel I/O Port:
- **Input port:** 8 bits.
- **Output port:** 8 bits.
- **Input load:** one TTL equivalent.
- **Output drive:** 10 TTL loads.

General Information:
- **BUS:** S-100.
- **Power requirements:** + 8 volts @ 0.4 A, +18 volts @ 30 mA, −18 volts @ 60 mA

Cromemco

© IC MASTER 1983

TU-ART digital interface with many features



For interfacing with

- CRT terminals
- line printers
- modems
- other devices

FAST — SOFTWARE SELECTABLE BAUD RATES UP TO 76,800 BAUD

Here's a very convenient interface to let you couple not to one but to two terminals or other devices. So we call it a TU-ART.

It has two serial I/O ports, two 8-bit parallel I/O ports, and 10 independent, programmable interval timers.

Baud rates are software-selectable from 110 to 76,800 baud.

VECTORED INTERRUPTS

Yet another special convenience of the TU-ART is its vectored prioritized interrupts. It is able to support powerful vectored interrupt structure of the Z-80 microprocessor.

INTERVAL TIMERS

The 10 interval timers, since they have real-time clock capability, offer a very wide range of control possibilities.

Each timer range is from 0 - 16.32 milliseconds and is software selectable.

MODEL

TU-ART assembled, burned-in and tested — Model TRT

CABLES

For System Zero	CBL-1
For System Two; 62 cm long	CBL-2
For System Three computer; 110 cm long	CBL-3

TECHNICAL SPECIFICATIONS
Model TRT
TU-ART Digital Interface

Serial I/O ports:
- **Number of ports:** 2.
- **I/O levels:** RS-232 or 20 mA current loop.
- **Low baud range:** 100-9600 baud (software selectable).
- **High baud range:** 880-76,800 baud (software selectable).

Parallel I/O ports:
- **Number of ports:** 2.
- **Input ports:** 8 bits.
- **Output ports:** 8 bits.
- **Input load:** one TTL equivalent.
- **Output drive:** 20 TTL loads.

Interval timers:
- **Number of timers:** 10.
- **Timer range:** 0-16.32 msec (software selectable).
- **Timer resolution:** 64 microseconds.

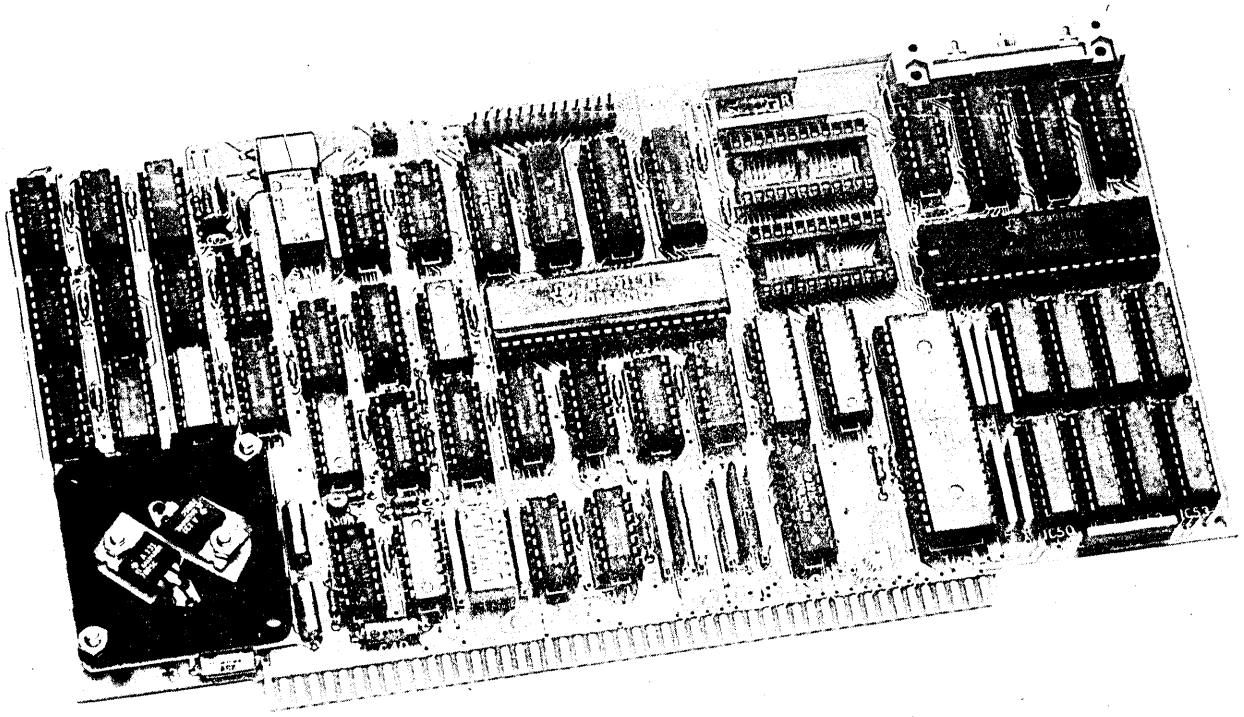
Vectored interrupts:
- **Number of restart locations (8080 mode):** 8.
- **Number of restart locations (Z-80 mode):** 65,536.
- **Prioritization of TU-ART ports:** internally prioritized
- **Prioritization for multiple TU-ARTs:** daisy-chaining

General Information
- **UART type:** 5501.
- **BUS:** S-100.
- **Power requirements:** + 8 volts @ 1.0 A; +18 volts @ 80 mA; −18 volts @ 40 mA
- **Operating environment:** 0-55°C.

Cromemco

© IC MASTER 1983

GPIB



- **General Purpose Interface Bus Card**
- **Provides IEEE 488 Compatibility to S-100 computers**

This card enables you to connect your Cromemco computer to measuring and control equipment that has an IEEE-488 port. By this means such arrangements as a computer-operated measuring and control system can be devised.

The Cromemco GPIB card contains a dedicated Z-80 processor along with 4K of RAM and two 2716 sockets that provide for 4K of EPROM. Connectors at the top of the card are for the IEEE-488 interface. There is also connection for an external TTL parallel I/O port. Switches select the I/O address through which the computer communicates with the card and the address to which the card responds.

The GPIB card can interrupt the host computer over the S-100 bus with either a software maskable or non-maskable interrupt and is equipped with the Cromemco interrupt priority daisy chain. The dedicated Z-80A on the card can be interrupted by the host, the GPIB chip, or the reception of data from the external input port. On-board priority determination is fully software defined, employing a hardware poll of the possible interrupt devices over a single input port.

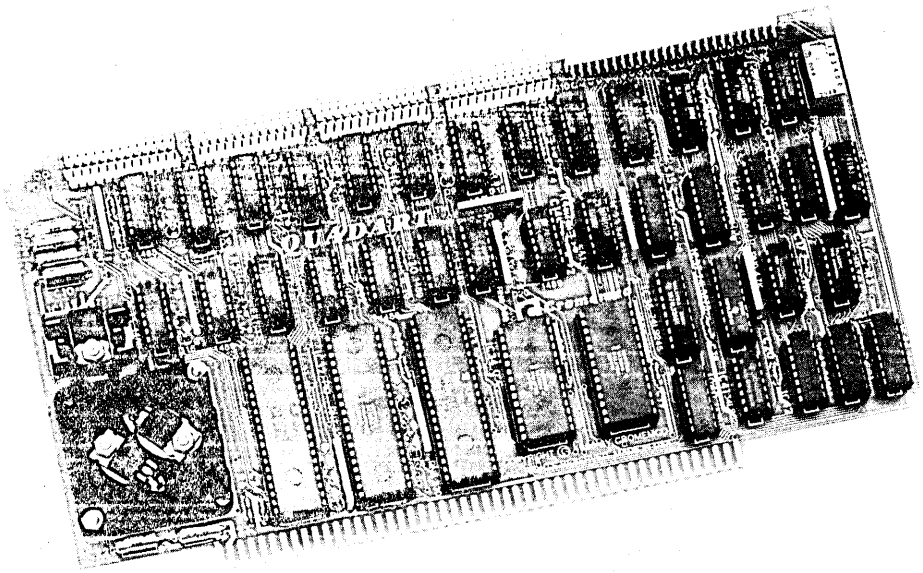
TECHNICAL SPECIFICATIONS

Model GPIB
Interface Bus Card

IEEE-488 Functions: C — Controller with Pass Control capability; T, TE, L, LE — Talker and/or Listener; SH, AH — automatic Source and Acceptor Handshake; DC, DT — Device Clear and Device Trigger; SR — Service Request; PP — Parallel Poll; RL — Remote/Local with Remote Lockout.
Processor: Z-80A clocked at 4.000 MHz.
ROM Memory: Socket space for 4 Kbytes of TI 2516, Intel 2716, or their generic equivalents (user supplied).
RAM Memory: 4 Kbytes of 9124 (1K x 4) static RAM (included).
S-100 Bus Interface: Four 8-bit parallel I/O ports; the GPIB card may issue non-maskable and/or vectored maskable interrupt requests to the Host; the Host may issue maskable interrupt requests to the card.
GPIB Bus Interface: The 24 IEEE 488 bus lines interface to a GPIB card connector.
Utility Interface: One 8-bit parallel input port and one 8-bit parallel output port provide a general purpose interface at a GPIB card connector.
LSI Device Types: Z-80A CPU, TMS 9914 GPIB Adapter.
Power Requirements: +8 VDC @ 1.5 Amps (max).
Operating Environment: 0-55°.

© IC MASTER 1983

Quadart



Supporting Serial Protocols

- **Asynchronous**
- **Synchronous Bit (e.g., SDLC)**
- **Synchronous Byte (e.g., Bisync)**

SIMULTANEOUSLY INTERFACES UP TO FOUR SERIAL CHANNELS

In this versatile new QUADART serial communications interface card you get the power to satisfy virtually any high-speed data communications application.

You get four independent serial channels, each supporting Asynchronous, Synchronous Byte mode (e.g., Bisync), and Synchronous Bit mode (e.g., SDLC) protocols with complete handshaking for modems. Serial protocol is software-selectable for each channel.

Our unique loopback feature gives you the capability to connect data from any channel to any other channel, data from any modem to any other modem, or the capability for any modem/channel combination to be used for diagnostics and selftest.

Baud rates for each may be software-selected from 0 to 300K baud (asynchronous to 19,200 baud).

VECTORED INTERRUPTS

The QUADART also supports the powerful internally-prioritized vectored interrupt structure of the Z-80 microprocessor which has become a trademark of Cromemco interface cards.

INTERVAL TIMERS

You have real-time clocking capability with four interval timers each having periods as small as 4.00 microseconds. Up to three timers can be cascaded to provide a 1.000-second time interval.

The software-selectable time range of each timer is 0-16.384 milliseconds.

C-BUS

The control for the QUADART is from the C-Bus provided by Cromemco's powerful I/O processor computer, Model IOP. The IOP interfaces between your S-100 bus and the C-bus and can support up to four QUADARTS with full interrupt capability.

TECHNICAL SPECIFICATIONS
Model QDRT
QUADART Serial Communications Interface

Serial Channels:
- **Serial Protocols:**
  - Asynchronous Byte
  - Synchronous Byte (Bisync)
  - Synchronous Bit (SDLC)
  - Modem handshaking
- **Number of channels:** 4
- **Diagnostics:** Channel-to-channel diagnostic loopback capability (input/output channels software selectable)

Asynchronous Baud Range: 0 to 19,200 baud (software selectable)

Synchronous Baud Range: 0 to 300K baud (software selectable)

Interval Timers:
- **Number of timers:** 4
- **Timer Range:** 0-16.384 msec (cascadable to 1.0 sec, software selectable)
- **Timer resolution:** 4.0 microseconds

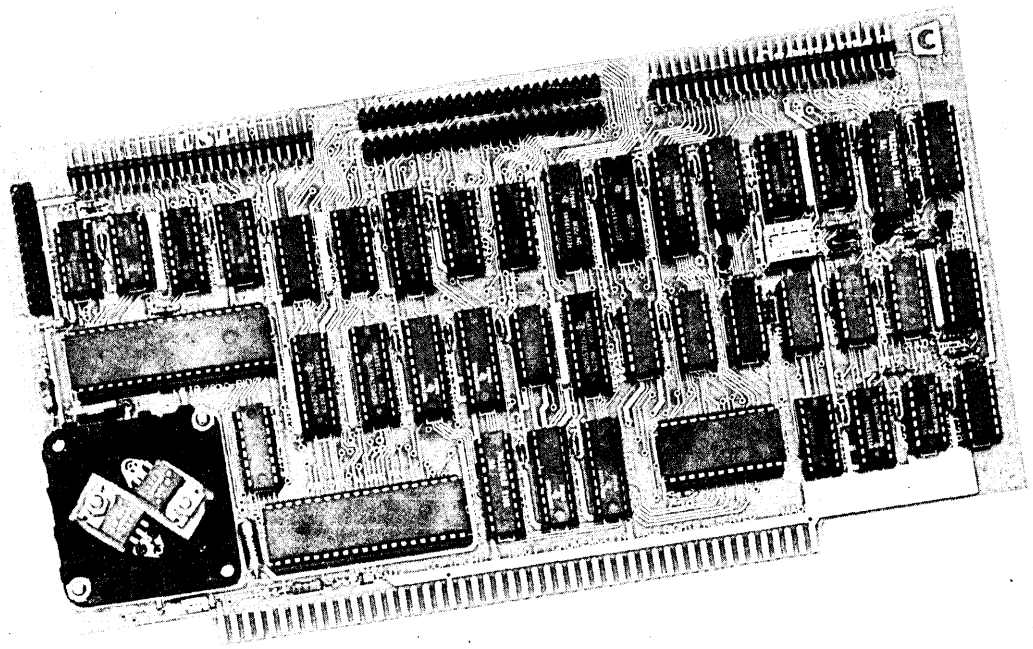
Vectored Interrupts:
- **Number of restart locations (Z-80 mode):** 65,536
- **Prioritization of serial channels and timers:** Internally prioritized
- **Prioritization for multiple QUADARTS:** daisy-chaining

General Information:
- **Serial channel type:** Z80-SIO/2
- **Parallel channel type:** Z80-PIO
- **Timer type:** Z80-CTC
- **Interface:** C-Bus
- **Power requirements:** + 8 volts @ 1.5A
  +18 volts @ 100 mA
  −18 volts @ 100 mA
- **Operating environment:** 0-55°C

Cromemco

© IC MASTER 1983

Serial/Parallel Interface



- **Three parallel I/O ports**
- **Two serial I/O ports**
- **Handles rapid data bursts**
- **Synchronous/asynchronous communication**

This new card interfaces to the C-Bus of our I/O Processor card and provides general-purpose I/O capability as well as serial communications capability.

The card has three parallel I/O ports and two serial ports.

Two of the three parallel ports are TTL-buffered for general usage. The third port is buffered by a FIFO to permit inputting and outputting of rapid bursts of data. For example, up to 16 bytes can be stored in the FIFO at I/O clock rates up to 10 megabytes/second.

The two serial ports are single full duplex serial channels that facilitate communications applications. One port is for synchronous communication (SDLC or HDLC) at rates up to 800K bits/second.

The second serial port is a serial RS-232C interface for asynchronous communication. It has a programmable data rate of up to 9600 bps.

TECHNICAL SPECIFICATIONS
Model CSP
Serial/Parallel Interface

CSP Controller: Cromemco Input/Output Processor (IOP) board.

Parallel Interface: Compatible with Cromemco Model TDS 9 Track Tape Drive.

Parallel Output: Data: 8 bits wide plus an End of Transfer bit; 16 by 9 bit FIFO buffered; approximately 200 Kbytes per second maximum continuous (Z-80A I/O Block Move), approximately 10 Kbytes per second maximum burst (FIFO limited).
General Purpose: 15 control bits in two output bytes.
Drive Capability: TTL levels; 10 meter length twisted pair or ribbon cable with 220/330 ohm termination.

Parallel Input: Data: 8 bits wide; 16 by 8 bit FIFO buffered; approximately 200 Kbytes per second maximum continuous (Z-80A I/O Block Move), approximately 10 Kbytes per second maximum burst (FIFO limited).
General Purpose: 16 status bits in two input bytes; vectored maskable C-Bus interrupt requests generated on software selected bit states.
Termination: TTL levels; 220/330 ohm terminations on all data and status lines.

Cartridge Interface: Compatible with Cromemco Model/CDS Cartridge Tape Drive.

Cartridge Modes: Serial Asynchronous, Byte Synchronous (BiSync) and Bit Synchronous (SDLC/HDLC) under the management of a Z-80 SIO device; vectored maskable C-Bus interrupt requests generated on software-selected status conditions.

Cartridge I/O: Maximum data rate approximately 800 kbits per second;
TxC and RxC clocks supplied by Cartridge peripheral; TTL levels with 220/330-ohm terminations on input lines.

Terminal Interface: RS-232c DTE connection

Terminal Modes: Same as Cartridge Modes above although Asynchronous Mode would typically be selected.

Terminal I/O: Maximum data rate 9,600 bits per second: TxC and RxC supplied by an on-board timer with software selectable bit rate; RS-232C levels; circuits RTS, CTS, DSR and DCD may be used either for modem control or for general purpose RS-232C level I/O.

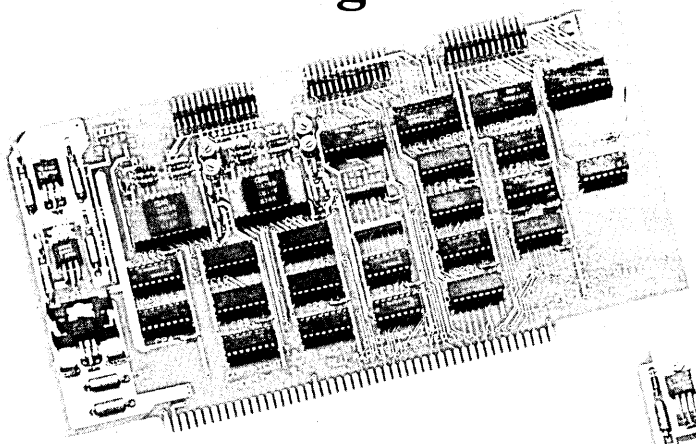
Bus Compatibility: Standard-100 (S-100)
Cromemco Bus (C-Bus)

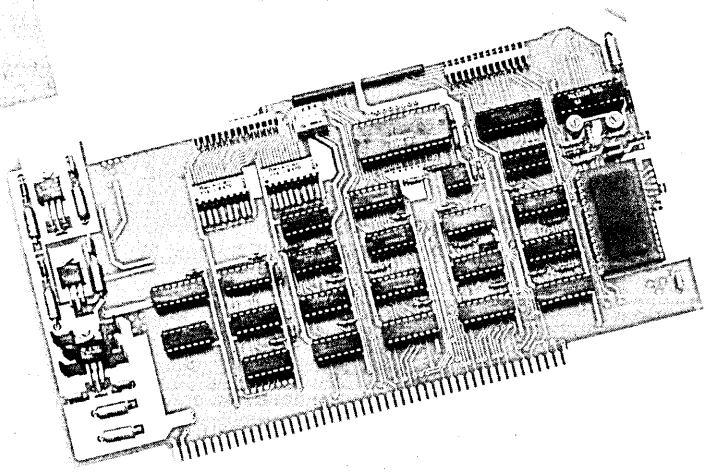
Power Requirements: + 8 VDC @ 1.5 Amps (max)
– 18 VDC @ 25 mAmps (max)
+ 18 VDC @ 25 mAmps (max)

Operating Environment: 0-55°C.

© IC MASTER 1983

12-Bit Analog I/O





- **Digital-analog output**
- **Analog-digital input**

These two cards offer 12-bit analog I/O capability.

The Model DAC-12 provides two independent channels of D-to-A conversion with a conversion time of 5 microseconds.

The Model ADC-12 provides 16 channels of A-to-D conversion with a conversion time of 30 microseconds.

TECHNICAL SPECIFICATIONS

Model DAC12
Digital-to-Analog I/O

D/A converter section:

Resolution: 12 bit.
Analog output:
Bipolar voltage: ±10V, ±5V, ±2.5V.
Unipolar voltage: 0 to 5V, 0 to 10V.
Impedance: 0.05 ohm typical.
Conversion speed (settling time to ±0.01% FSR):
±10V output: 5 microsec.
Accuracy:
Offset error/gain error: adjustable to zero.
Linearity error: ±½ LSB (max.)
Operating temperature range (no missing codes):
0 to 50 Deg. C.
Drift: (0-50 Deg. C)
Gain: ±30 ppm FSR/Deg. C. (max)

Parallel port section:

Number of ports: 2
Output port handshake: output strobe line on each port
Output port drive: 7 TTL unit loads
Sense line input loading: 4 TTL unit loads

Miscellaneous:

Bus compatibility: S-100 (IEEE 696)
Environment: 0 to 55°C.

+8 volts: 350 mA
+18 volts: 120 mA
-18 volts: 100 mA

Model ADC12
Analog-to-Digital I/O

A/D converter section:

Resolution: 12 bit.
Analog input voltage ranges:
Bipolar: ±2.5, ±5, ±10.
Unipolar: 0 to 5, 0 to 10.
Data acquisition time: 30 microseconds.
Transfer characteristics error:
Offset error/gain error: adjustable to zero.
Linearity error: ±½ LSB (max.)
Operating temperature range (no missing codes):
0 to 50 Deg. C.
Drift:
Gain: ±30 ppm/Deg. C.
Linearity (monotonic operation guaranteed):
±3 ppm/Deg. C.

Parallel port section:

Number of sense lines: 4
Number of output ports: 2
Output port handshake: output strobe line on each port.
Output port drive: 7 TTL unit loads.
Sense line input loading: 4 TTL unit loads.

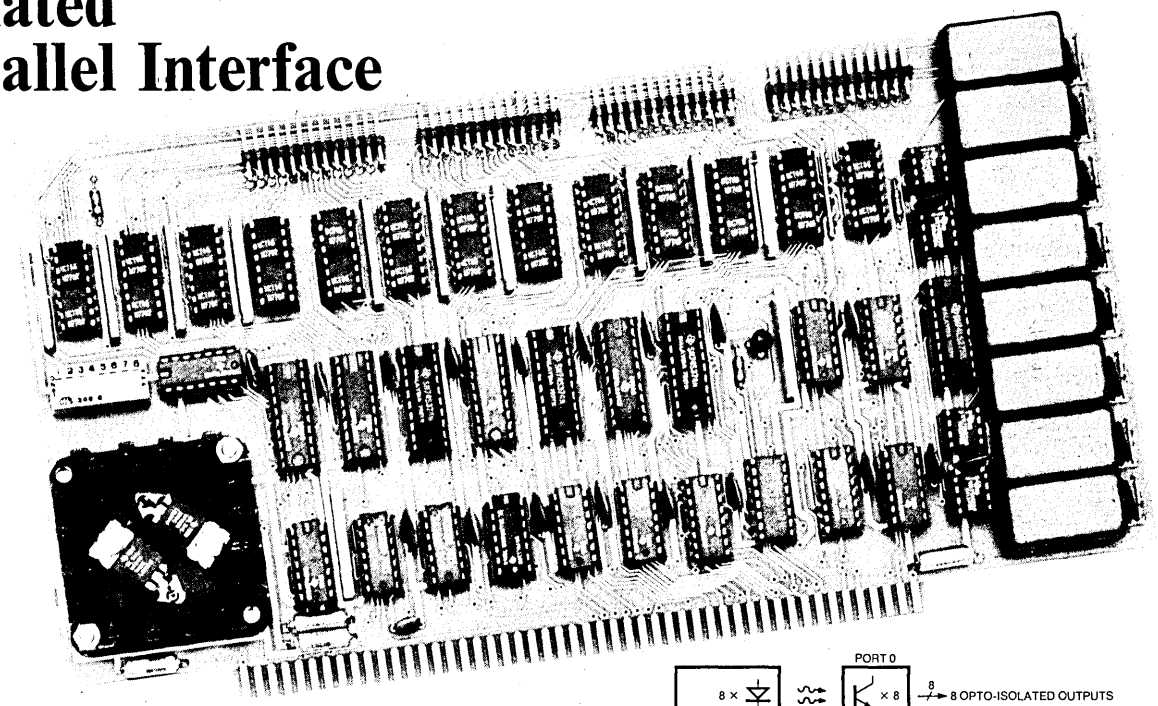
Miscellaneous:

Bus compatibility: S-100 (IEEE 696).
Environment: 0 to 55°C.

+8 volts: 250 mA.
+18 volts: 120 mA.
-18 volts: 100 mA.

© IC MASTER 1983

4 Port I/O Isolated Parallel Interface



- Complete electrical isolation
- Eliminates ground loop problems

Now your interfacing can be achieved with complete electrical isolation from your microcomputer.

Electrical isolation means that problems with ground noise and ground loops can be completely eliminated in your instrumentation, communications, or process control systems.

Electrical isolation also means that potentially damaging transients can be safely isolated from your computer system.

The new Cromemco 4PIO parallel interface card includes:

24 opto-isolated input channels
16 opto-isolated output channels
8 relay-isolated output channels
11 opto-isolated strobe/handshake lines
1 opto-isolated reset line

The 4PIO services these isolated I/O channels through four parallel, 8-bit I/O ports. The addresses of these I/O ports are switch selectable (in blocks of four) by means of a switch located conveniently on the 4PIO interface card.

ISOLATED CONNECTOR PINS

The isolated I/O channels of the 4PIO are brought to four connectors on the top edge of the card. NO PIN ON ANY OF THESE CONNECTORS IS DIRECTLY CONNECTED TO THE COMPUTER CIRCUITRY. Every active pin is electrically isolated either by means of an opto-isolator or relay.

TECHNICAL SPECIFICATIONS
Model 4PIO Isolated Parallel Interface

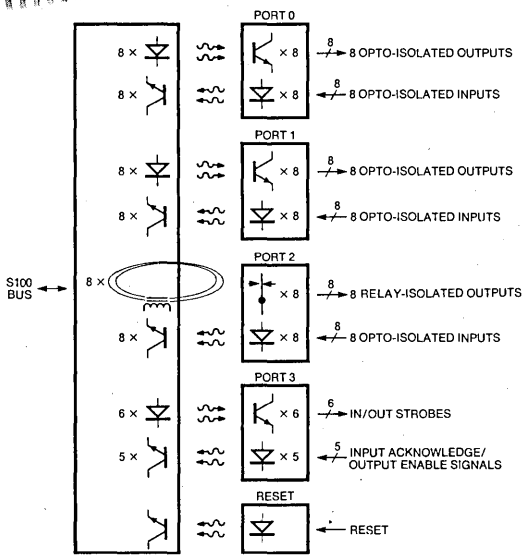
Parallel I/O ports:
- Number of bidirectional ports: 4
- I/O port width: 8 bits wide.
- Number of opto-isolated input ports: 3
- Number of opto-isolated output ports: 2
- Number of relay-isolated output ports: 1

I/O strobe signals and reset:
- Number of I/O strobe bits: 11
- Strobe signal isolation: opto-isolated
- Reset line: opto-isolated

Opto-isolated I/O:
- Number of opto-isolators: 52
- Opto-isolator type: MCT66
- Signal levels: TTL

Relay outputs:
- Number of relay outputs: 8
- Contact type: SPDT
- Contact voltage: 28 V AC or DC
- Contact current: 1 A

General information:
- BUS: S-100
- Power requirements: +8 volts @ 2.3 A
- Operating environment: 0-55°C



Cromemco 4PIO interface. Note that all lines are either optically or magnetically isolated from the computer circuitry.

Cables are available in two convenient lengths to couple from these top connectors to a standard DB-25S socket. Cable model CBL-2 is 62 cm in length and can be used in our Z-2 computer. Cable model CBL-3 is 110 cm in length for use in our System Three computer.

Like all Cromemco cards, the 4PIO is designed to meet the most demanding standards of industrial performance.

MODEL	
4PIO assembled, burned-in and tested	Model 4PIO
CABLES	
15 cm long	CBL-1
62 cm long	CBL-2
110 cm long	CBL-3

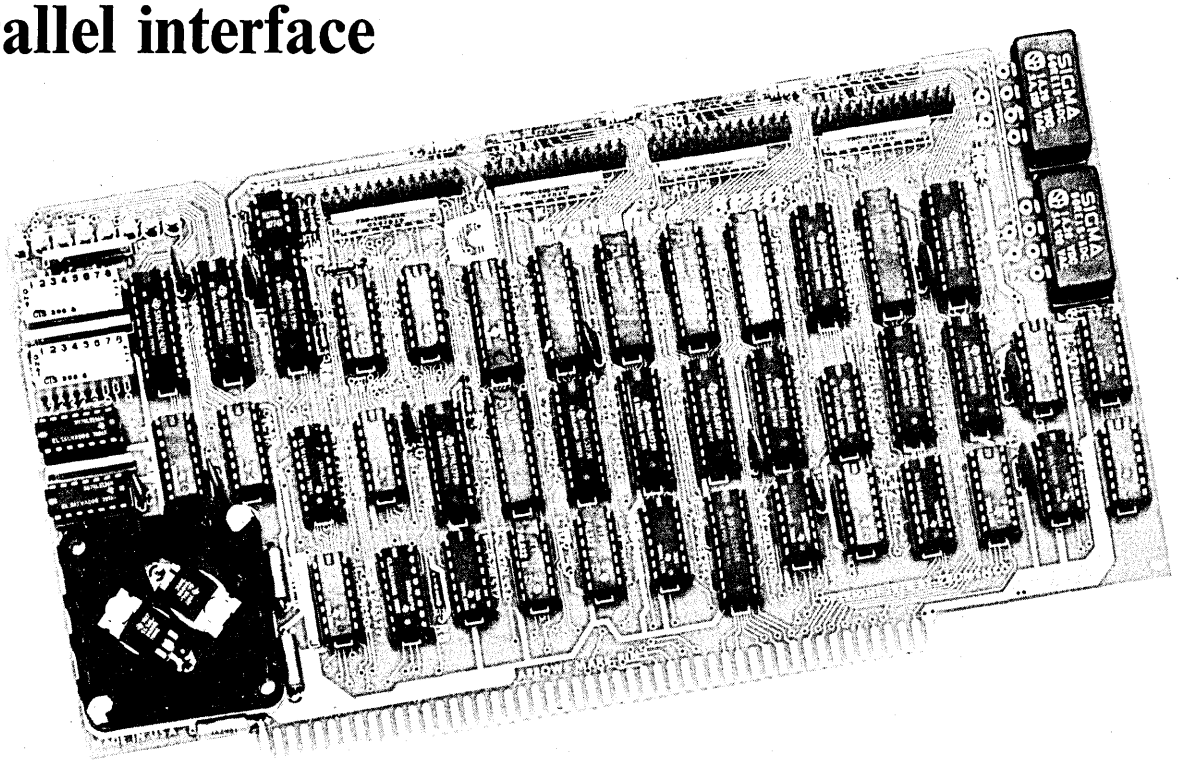
Cromemco

MICROCOMPUTER BOARDS

Cromemco

© IC MASTER 1983

8 Port I/O Multi-channel microcomputer parallel interface



SIMPLIFIED PARALLEL INTERFACING

Parallel interfacing was never easier than with the Cromemco 8PI/O Parallel Interface Card.

You get 8 bidirectional 8-bit I/O ports that can be used either singly or coupled together to form longer word lengths.

For convenience, input and output status flags for handshake purposes are grouped together on one port and may be accessed with one input or output statement.

Strobe pulses can be issued after each 8-bit transfer or may be delayed until the proper word length has been formed.

Other features include 8 sense switches and 8 LEDs on the highest selected I/O port on the card, and 2 bits of opto-isolated input and 2 bits of relay-driven output.

The 8 I/O ports may be located on any 8-port I/O boundary.

MODEL	
8PI/O assembled	Model 8PIO

TECHNICAL SPECIFICATIONS
Model 8PI/O
8-Channel Parallel Interface

Parallel I/O Ports:
- **Number of bidirectional ports:** 8
- **I/O port width:** 8 bits wide.
- **Input load:** 4 TTL loads.
- **Output drive:** 4 TTL loads.

Input strobes: latched.

Output strobes:
- **Delay:** 1 μsec after new data valid.
- **Width:** 1.5 μsec; negative true.
  1 strobe pulse per port.

Opto-Isolator input:
- **Number of Opto inputs:** 2 bits, TTL level inputs.

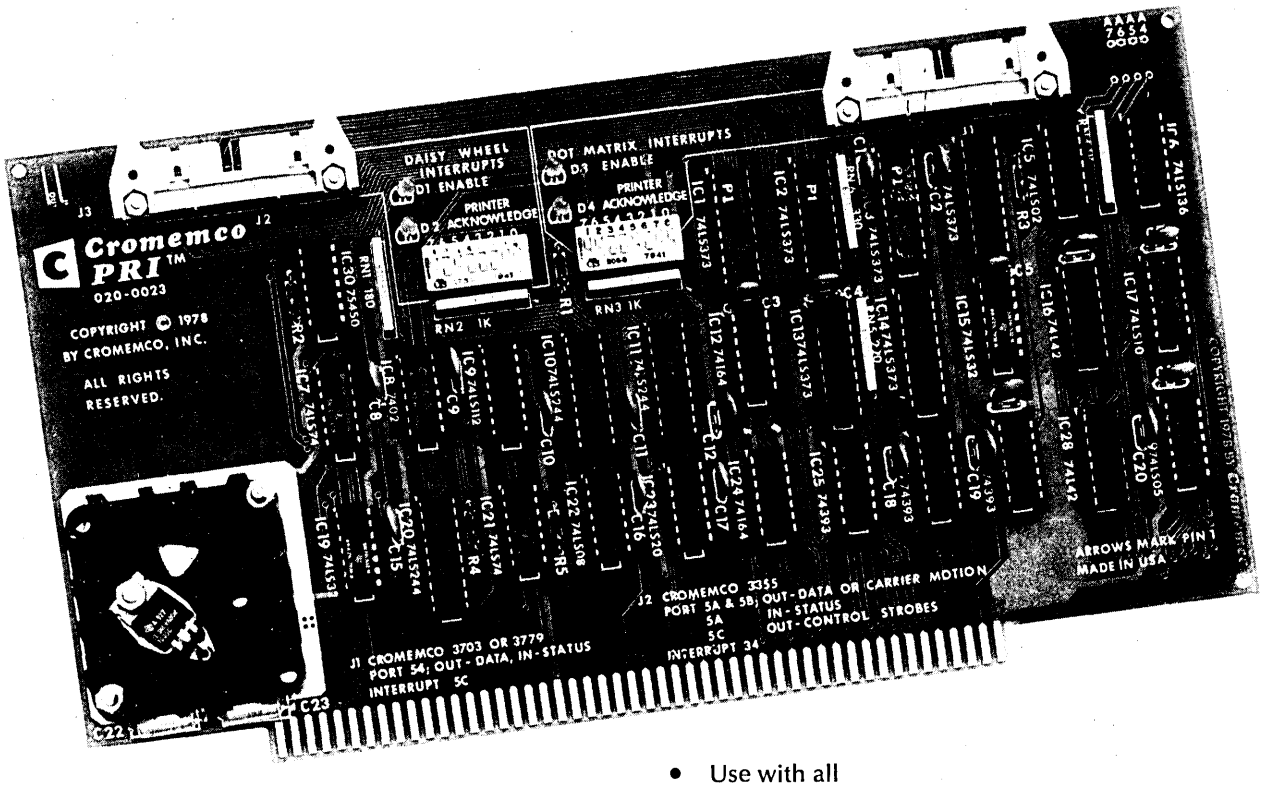
Relay Outputs:
- **Number of relay outputs:** 2 bits.
- **Contact voltage:** 28 V AC or DC.
- **Contact current:** 1 amp.
- **Contact type:** SPDT.

General information:
- **BUS:** S-100.
- **Power requirements:** +8 volts @ 1.5 A
- **Operating environment:** 0-55°C.

Cromemco

© IC MASTER 1983

Printer Interface



- Use with all Cromemco printers

A VERSATILE CARD WITH TWO INTERFACES ON ONE CARD

With this new interface card, it's easy for you to interface either dot-matrix or full letter printers to your computer system.

To be suited to these printers, this card is designed with two actual interfaces. One uses the "Centronix parallel" convention and interfaces the Cromemco Models 3715 or 3703 dot-matrix printers.

The card's second interface interfaces the Cromemco Model 3355B Full-Letter printer.

This second interface has built-in ribbon-lift and ribbon-lowering circuitry to free the software overhead normally required for this function.

NOTE TO CROMEMCO SYSTEM TWO AND SYSTEM THREE PURCHASERS:

The Model PRI interface card described here is now supplied as standard equipment in your system.

You need not purchase this card separately unless you are adding additional printers to your system.

Each of the two interfaces has an individual cable connection on the top edge of the card.

The Cromemco PRI card now also includes full interrupt capability for use in multi-user systems.

MODELS

Printer Interface Card assembled, burned-in and tested ..... Model PRI
Cables for PRI interface: 25-conductor ribbon cable connects from top card connector to DB-25S socket. Lengths as follows:
Cable 62 cm in length for use in Cromemco System Two computers ..... Model CBL-2
Cable 110 cm in length for use in Cromemco System Three computer ..... Model CBL-3

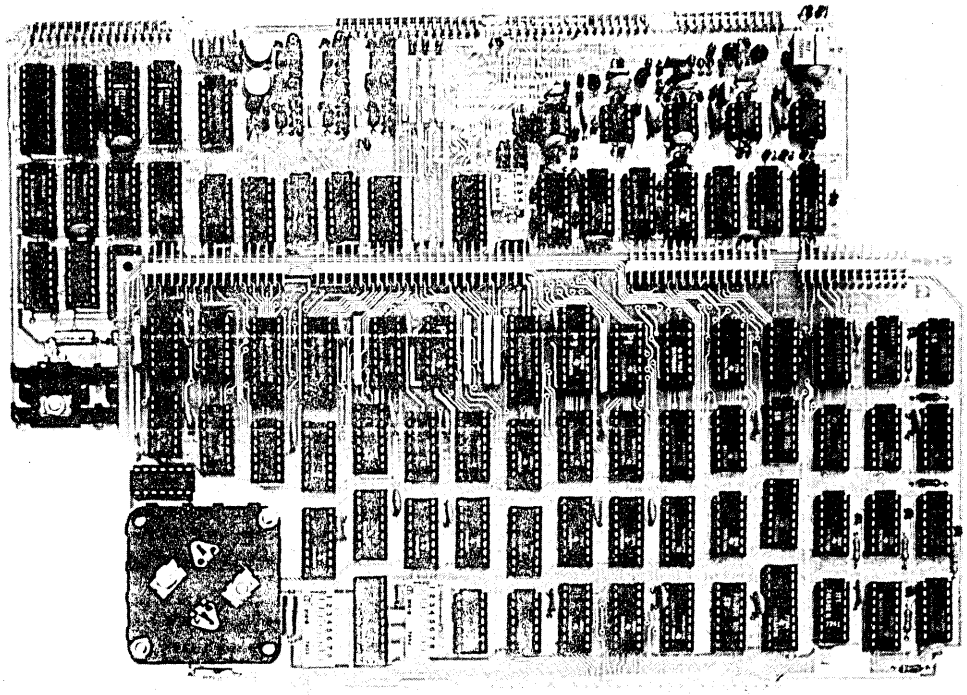
TECHNICAL SPECIFICATIONS

Model PRI
Printer Interface

Output port addresses: 54, 5A, 5B, 5C
Input port addresses: 54, 5A
Alternate port addresses: Optional DIP switch
Software support: Cromemco CDOS
BUS: S-100
Power requirements: +8 volts @ 1.0A
Operating environment: 0-55°C

© IC MASTER 1983

Model SDI
Color Graphics Interface

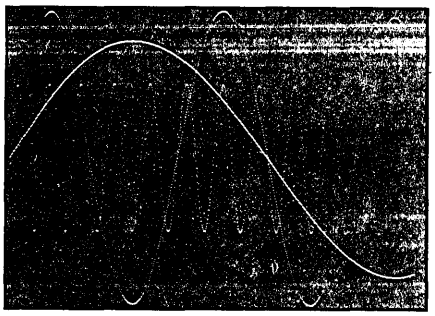


Here's a graphics interface that gives you high resolution, simplicity and an enormous range of color choices unmatched in the industry.

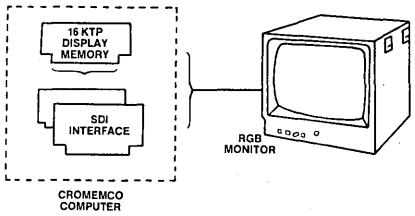
The new Cromemco Model SDI Color Graphics interface is a fully-integrated way to display the memory content of Cromemco computer systems in beautiful and meaningful color choices. Use of color and the high resolution of the image facilitate reading the display by researchers in the field. To simplify examination or discussion, various parts of the scan can be displayed in any of a wide range of colors — 4096 to be specific.

The interface consists of two circuit cards that plug directly into any Cromemco computer. No alteration of the computer is required. All necessary outputs to the monitor are provided by the interface.

The display device is typically an RGB Monitor, used in the industry or available from Cromemco (Model RGB-13).



Very high resolution provided by the new color graphics interface is apparent in this plot of sinusoids.



HIGH RESOLUTION

The new SDI interface can be used to display images with up to 754 x 482-point resolution. As discussed later, this resolution is at least the equal of a high-quality broadcast-TV picture.

COLOR OR B/W

The new interface can be used to display an image in either color or black-and-white — or in both simultaneously.

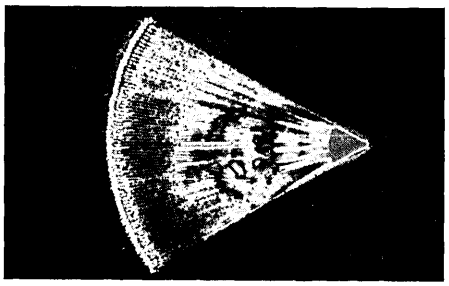
In color any 16 colors from a palette of 4096 colors can be used in the picture. In black-and-white any 16 shades of gray can be used.

HOW THE SDI MAPS

The SDI uses direct memory access to display the content of a display memory. Each pixel of the display may be mapped either from one nybble (4 bits) or one bit of the display memory. The mapping mode (nybble or bit) is software-selectable — in fact, part of a picture may be displayed in one mode and part in the other.

The display memory may consist of either a 12K or 48K memory.

© IC MASTER 1983



Display of cross section of human heart imaged by a 2.25 MHz ultrasonic sector scan through body's intracostal space. The image is displayed using the new SDI interface on an RGB Monitor. This medical application involving the new interface was done at Stanford University.

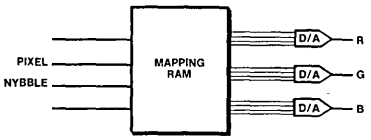
The combination of mapping modes and memory result in four basic modes of operation as shown below.

MODEL SDI RESOLUTION (HORIZONTAL x VERTICAL) IN EACH OF FOUR MODES OF OPERATION.

	Display Memory Size	
	12K	**48K**
Nybble-Mapped	189x121	378x242
Bit-Mapped	377x241	754x482

SDI OUTPUTS

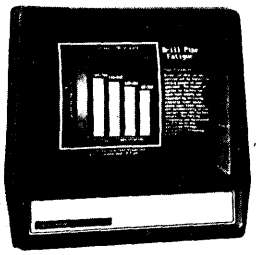
The Model SDI provides three separate analog output signals to drive the Red, Green, and Blue guns of a high-quality RGB monitor. The three separate outputs, rather than one composite output, are used to preserve the full resolution of the picture.



In nybble mapped operations each 4-bit nybble can select one of 4096 colors as determined by a mapping RAM. The contents of the mapping RAM can be changed dynamically, under software control, by issuing OUTPUT instructions to the SDI.

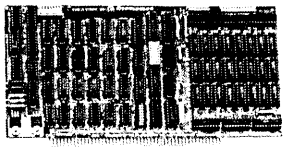
TV COMPATIBILITY

The Model SDI also provides all signals required to serve as input to a colorizer or color modulator in a TV broadcast studio.



RGB MONITOR

New Cromemco RGB (red/green/blue) Color Monitor is specially adapted for use with SDI Interface. Photos shown herein are from this monitor.



48K DISPLAY MEMORY

A new 48K two-port memory card has been developed for use with the SDI. Picture information is accessible by the SDI through a connector on the top of the memory cards. The cards plug directly into the Cromemco computer.

The computer resident memory may also be used as the display memory, although at the expense of mapping speed. This reduction occurs because the CPU must suspend operation when the SDI accesses the resident memory. The result is approximately 55% CPU utilization for a 12K-memory picture and 6% utilization for a 48K-memory picture.

Use of the special two-port memory, however, assures 75% to 100% CPU utilization, depending on the application software.

DESIGNED TO SURPASS TV QUALITY FOR LONG-TERM APPLICATION

In its high-resolution mode, the SDI* displays a picture having a 754 x 482-pixel resolution. This format corresponds to and is compatible with NTSC TV systems practice in that 482 lines are normally displayed in a nominal 525-line system. The 754 points in the horizontal direction give a resolution equal or better than that of the vertical direction.

The horizontal resolution itself far exceeds that of conventional TV displays which have relatively limited bandwidth.

The result of the above approach is that the high-resolution picture displayed using the SDI interface is at least equal in resolution to a 525-line color TV picture.

*U.S. Patent No. 4121283

TECHNICAL SPECIFICATIONS

Model SDI
Color Graphics Interface

Mapping modes: Bit or nybble; software selected.
Resolution: 754 x 482 pixels maximum using 48K display memory. 12K display memory may also be used at lower resolution; see text.
Color: Any 16 of 4096 colors or any 16 shades of gray may be displayed.
Outputs: Three analog outputs for R.G.B. monitor.
Recommended Display Memory: Cromemco **48** KTP two-port memory.
Sync signal: Composite Sync signal is switch-selectable. Separate RS-170 Sync signal available.
System Bus: Industry Standard S-100.
Operating Environment: 0-55°C.

Model RGB-13 Color Monitor

Max. effective screen size: 255 mm x 190 mm
Technology: All solid state except for CRT.
CRT: 13" shadow mask, delta gun
Video signal input: RGB 0.3 - 2.0 v., 75 ohm. Fully compatible with Cromemco model SDI interface outputs.
Video amplifier bandwidth: 50 Hz to 15 MHz ± 3db
Power requirements: 120 or 220 volts, 50/60 Hz.
Power consumption: 250 VA
Dimensions: 18" x 15¼" x 14¾"
Weight: 23 Kg
Operating Environment: -5° to 40°C

Model 48 KTP
Two-Port Memory
Memory Capacity: 48K bytes
Bus: Industry Standard S-100
Operating Environment: 0-55°C

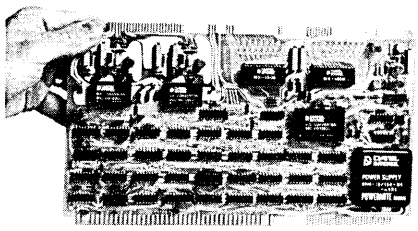
Cromemco

© IC MASTER 1983

SineTrac™

MICROCOMPUTER A/D-D/A BOARDS

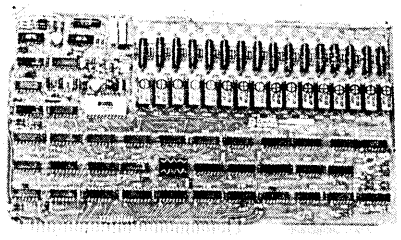
FOR iSBC®-80 MULTIBUS®



iSBC-711/732 PIN-FOR-PIN

- Operates from Intel RMX-80 Software
- ST-711: 32S/16D A/D, no D/A
- ST-732: Same as ST-711 plus 2 4-20 mA D/A loops
- 12 bits binary, 20 μS A/D conversion
- Crystal Pacer interrupt clock, differential PGA

ST-711
ST-732

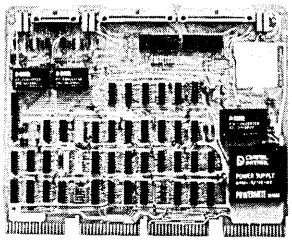


ISOLATED LOW-LEVEL A/D

- 8 or 16 differential A/D channels
- 126 dB CMR, ±250V Isolation
- 10 mV to 2V PGA ranges
- Crystal Pacer Interrupt Start Clock
- Operates from Intel RMX-80 Software

ST-711RLY8D
ST-711RLY16D

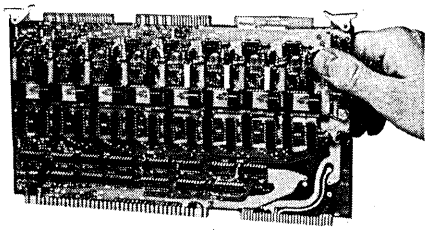
FOR LSI®-11, 11/2 AND PDP®-11/23



HALF AND FULL QUAD A/D-D/A

- ST-LSI: 32S/16D A/D, 2 D/A loops, Full Quad
- ST-LSI2: 16S/8D A/D, Half Quad
- 12 binary bits, 20 μsec A/D
- Pacer Vector Interrupt Start Clock
- X1 to X1K Differential PGA

ST-LSI
ST-LSI2

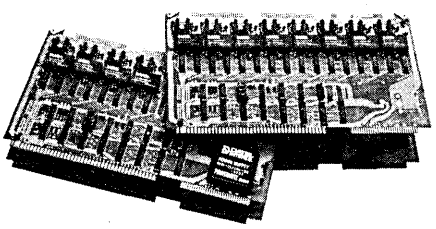


INDUSTRIAL D/A BOARD

- 4 or 8 D/A channels with choice of supplied 4-20 mA loops or voltage output ranges, selectable per channel.
- Directly replaces iSBC-724, 8 or 16 bit bus width, 16 or 20 bit addressing.
- Operates from Intel RMX-80 software.
- Floppy disk Diagnostic and program listing available.
- 12 bit resolution, 0.05% accuracy.

ST-728

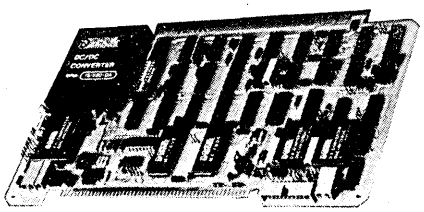
FOR MULTIBUS® iSBC-80 MICROCOMPUTERS



MULTIBUS AND iSBC COMPATIBILITY

- 4 or 8 D/A channels
- Compatible with both 8 and 16 bit CPU's
- 20 bit addressing
- 16 bit resolution, 0.005 accuracy

ST-716



INDUSTRIAL PGA A/D-D/A BOARD

- 32S/16D A/D plus 2 D/A 4-20 mA loops.
- Software-programmed Pacer or event-triggered interrupt/ start clock.
- Software-programmed X1 to X8 or X1 to X1024 instrumentation amplifier.
- Includes diagnostic program manual.

ST-6832

Systems Manuals and Diagnostic Programs are included with all models.

iSBC-80, MULTIBUS and RMX-80 are INTEL Corp. trademarks. LSI and PDP are Digital Equipment Corp. trademarks. Micromodule and EXORciser are Motorola Corp. trademarks.

REQUEST OUR LATEST CATALOG

BE AN EXPERT ON DATA ACQUISITION REQUEST ORDERING DETAILS

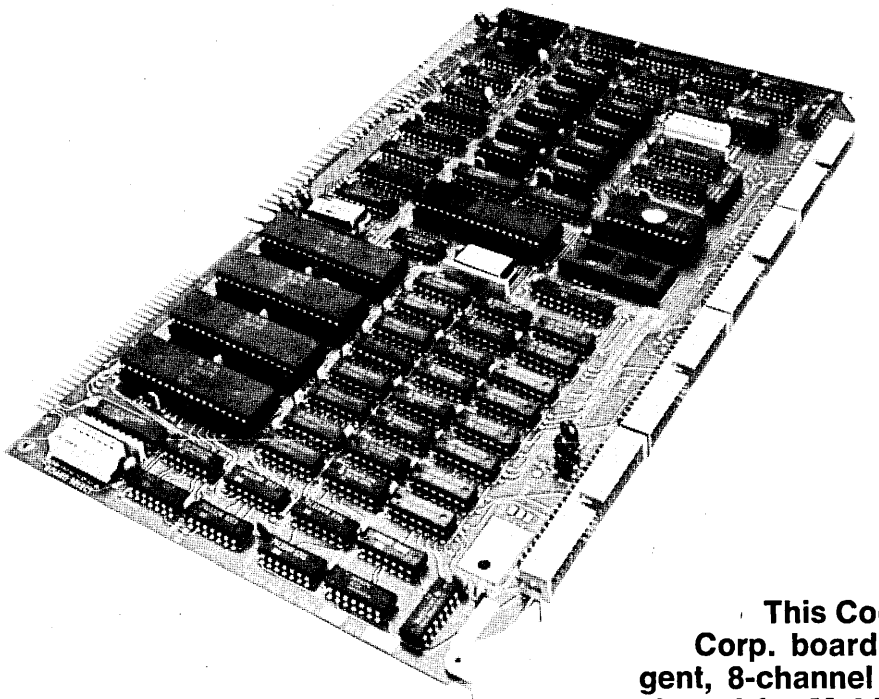
Printed in U.S.A. Copyright © 1982 Datel-Intersil, Inc. All rights reserved.

DATEL INTERSIL
11 CABOT BOULEVARD, MANSFIELD, MA 02048/TEL. (617)339-9341/TWX 710-346-1953/TLX 951340
• Santa Ana, CA (714)835-2751 • Sunnyvale, CA (408)733-2424 • Los Angeles, CA (213)933-7256
OVERSEAS: INTERSIL DATEL (UK) LTD-TEL. BASINGSTOKE (0256) 57361 • INTERSIL DATEL SARL-TEL. 602 57 11
• INTERSIL DATEL GmbH-TEL. (089)530741 • DATEL KK TOKYO-TEL. 793-1031

PRICES AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

© IC MASTER 1983

For Key Data On Every IC On This Board, The Place To Look Is...



This Codata Systems Corp. board is an intelligent, 8-channel serial input/output board for Multibus systems.

Equipment and system design often require the use of a wide variety of integrated circuits in order to obtain optimum performance. One way for an engineer to be certain that he hasn't overlooked the best device for his application is to refer to the pages of IC MASTER.

Surveys conducted by IC MASTER, integrated circuit manufacturers, and independent research agencies confirm that four out of five IC MASTER users have specified one or more products as the result of using IC MASTER.

Device No.	Description
AM25LS2521	8-Bit, Equal-to Comparator
AM26LS29	Line Driver, Single-Ended
AM26LS32	Line Receiver, Differential
74LS02	Quad 2-Input NOR Gate
74LS08	Quad 2-Input AND Gate
74LS32	Quad 2-Input OR Gate
74LS74	Dual D-Type Positive Edge Triggered Flip-Flop with Preset and Clear
74LS138	3 Line to 8 Line Decoder/Demultiplexer
74LS164	8-Bit Gated Serial-In, Parallel-Out Shift Register
74LS244	Octal Bus Driver (Schmitt trigger) Non-Inverting, 3-State, Complementary Control
74LS273	Octal D-Type Edge-Triggered Flip-Flop
MBM2716	Fujitsu 248 by 8 PROM
SN74LS04	Hex Inverter
SN74LS133	13-Input NAND Gate
SN74S240	Octal Buffer/Line Driver/Line Receiver Inverted 3-State Outputs
Z80A	Zilog 8-Bit Microprocessor
Z8530	Zilog Serial Communications Controller

Representative list of ICs on Codata Systems Corp. board for data communications equipment.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

VMEmodules

VMEmodules from Motorola incorporate the high performance MC68000, the internationally accepted Eurocard format, the defacto industry standard 16-bit VMEbus, and the new and flexible I/O Channel, all combined in the most versatile and latest state-of-the-art approach to the modular systems concept.

The MC68000 MPU

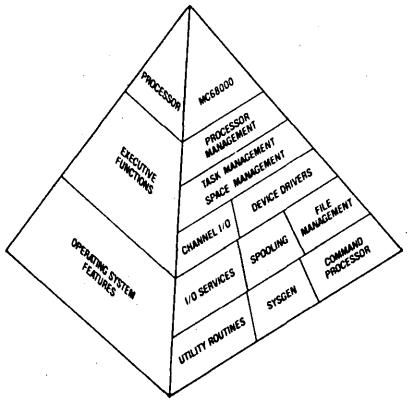
You've seen the benchmarks, and the results — MC68000 has emerged as the acknowledged microprocessor leader in the 16/32 bit performance class. Its architecture is designed for optimal support of the latest high-level languages, and it directly addresses 16 Megabytes of memory (instead of one Megabyte for most of the competition). Its 32-bit internal features mean easy growth to full 32-bit capability as your needs grow into the future. VMEmodule products put the MC68000 MPU to work in a modular structure that has achieved worldwide acceptance and support, both by users and manufacturers of microcomputer subsystems.

Worldwide Standard Package: Eurocard

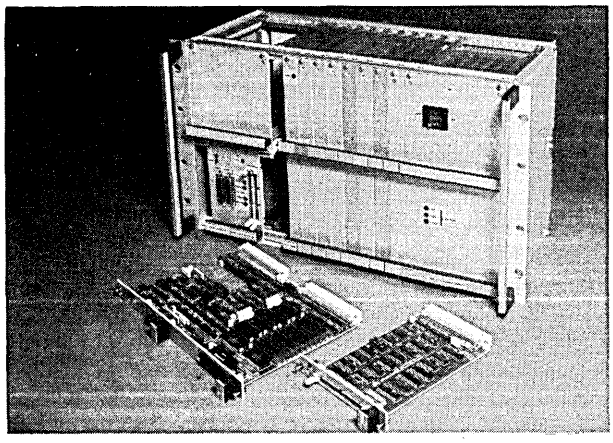
Developed as a de facto standard in Europe, the Eurocard mechanical format is rapidly gaining worldwide acceptance of modular applications in a broad range of laboratory and industrial automation environments. And for good reason — the Single and Double Eurocard circuit boards and card cages in the VMEmodule product line offer a convenient size, plus pin-and-socket bus connectors to give you an extra margin of confidence of reliability in the more severe application environments.

Multiprocessing 16/32 Bit VME Bus

The VME bus doesn't lock you into today's technology. It has the inherent power and capabilities to adapt to any number or types of popular processors for true multiprocessing applications; and, you can use as many bus masters as you need.



BASIC-M, I/Omodule, RMS68K, VMEbus, VERSAbug, VERSAdos, VERSAmodule and VMEmodule are trademarks of Motorola Inc.



With the VME bus, you can mix 8, 16, and 32-bit processors in the VME backplane. It operates asynchronously at high speed, and provides 7 interrupt plus 4 bus arbitration priority levels to allow total flexibility.

I/O Channel Expands Capabilities

The VMEmodule system architecture supports the I/O Channel feature described elsewhere in this publication. Briefly, the I/O Channel is a buffered extension of the on-board processor bus, allowing the system to be easily custom-tailored with the addition of input/output functions in small modular amounts both within and external to the VME card cage. The I/O Channel promotes efficient system utilization by allowing I/O transfers to proceed at rates up to 2 megabytes per second, independently of other on-going activity in the higher-speed VMEbus system interconnect.

Powered by High Performance Software

VMEmodule products are designed for demanding lab and industrial automation environments where quick, accurate response to multiple random events is essential — and Motorola's RMS68K Real-Time Multitasking Executive software for the VMEmodule Monoboard Microcomputer provides the nucleus around which complete real-time applications can be built. For those applications where large data files and mass storage resources must be handled efficiently, there's the full-featured VERSAdos Operating System. Standard device drivers are provided with both VERSAdos and RMS68K for interfaces and devices supplied by Motorola, and both systems make provisions for easy addition of user-supplied device drivers. Both the RMS68K Executive and the full VERSAdos System are rapidly emerging as the standard real-time system structure for MC68000-based applications.

To provide diversified programming capabilities for VMEmodule-based projects, Motorola supplies not only an advanced Structured Macro Assembler, but also efficient Pascal and FORTRAN Compilers.

© IC MASTER 1983

VMEmodules

And to offer streamlined debugging capabilities, the VMEbug Debug Monitor firmware is available either in ROM or on disk for use with the VMEmodule Monoboard Microcomputer.

Modular Subsystems elevate the starting point for microcomputer system design from the "components" level to the board level. And, just as there are variations in microprocessors for different end-use requirements, there are families of modular subsystems to best serve these varying demands. Thus, the VMEmodule family joins the existing Motorola Micromodule 8-bit family and the VERSAmodule 16-bit family of modular microsystem products to let the user tailor his system to his specific needs.

VMEmodules provide a degree of performance and flexibility that bridges the gap between the lower-level 8-bit processing tasks (the Micromodule domain) and the highend computation and memory-intensive challenges that are the domain of the physically larger and more complex 16/32-bit VERSAmodules. This spectrum of microsystem products offers the most cost effective solution to complex systems — perhaps distributed control systems — with the right performance elements at each processing node of the system.

The Intangible Extras —

When you select Motorola microsystem products for your system design, you get not just the hardware and software, but a host of built-in benefits of almost equal importance. Among these:

- A field-proven line of thoroughly tested products that assure highly reliable system operation.
- A time-tested set of support tools and documentation that simplify system design and operation.
- A nationwide field-sales and service network that offers design and applications support before, during and after the sale.

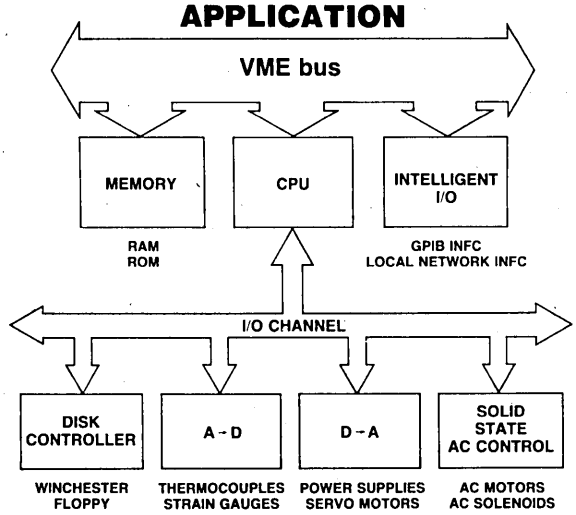
A mature training program at various levels that offers group training at specified locations as well as in the customer's own establishment.

A product line that continues to expand to take full advantage of new developments for increasing capabilities, improving performance and allowing more efficient operation.

Multiple Sources of VME Compatible Products — Worldwide

Development of the VME bus structure represents the combined technical efforts of Motorola and a number of other major international electronics companies. The initial announcement in Europe met with very positive reactions from potential users and vendors the world over, with the result that the original participants are being joined by increasig numbers of companies planning to supply such products. These sources are united through the activities of the VME Bus Manufacturers Group, which meets four times a year in technical forum to help assure the user community of a high degree of technical compatibility between products, and to make available to the public a comprehensive list of suppliers.

TYPICAL VMEmodule APPLICATION



VMEmodule Line*

VMEmodules — VMEbus compatible, Double Eurocard Format.
MVME110 — MC68000 Monoboard Microcomputer with I/O Channel support for extended I/O functions.
MVME200/201 — 64K byte and 256K byte Dynamic RAM Modules with data parity check.
MVME210 — Static RAM/ROM Board providing up to 128K bytes storage capacity.
MVME300/301 — GPIB Controller meeting full IEEE 488-1978 standard.
MVME930 — VMEbus Extender Board
MVME931 — VMEbus Wirewrap Board

*See also the list of I/O modules on another page in this catalog for additional I/O functional elements supporting the VMEmodule line.

Software

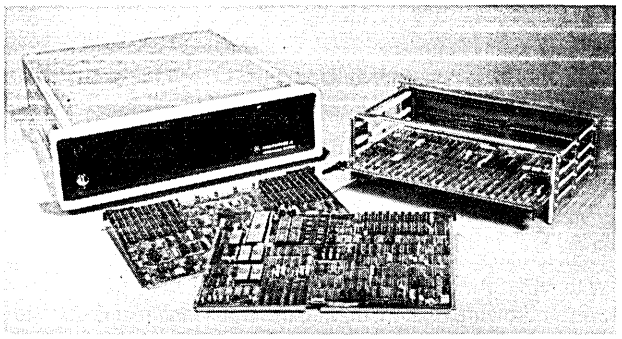
MVMEBUG — Debugging Packages for VMEmodule Monoboard Microcomputer with single-line Assembler/Disassembler.
M68KORMS68K — M68000 Real-Time Multitasking Executive provides task scheduling and synchronization for any number of tasks.
M68KOVDOS — OEM VERSAdos Operating System is a real-time multitasking MC68000 based system oriented to hard disk operation.

Packaging

VMEmodule and I/Omodule Card Cages, Chassis, Power Supplies and Backplanes.

© IC MASTER 1983

VERSAmodules



VERSAmodule circuit boards are microcomputer building blocks from Motorola, based on the state-of-the-art 16-bit MC68000 Microprocessor. They are part of a family of modular building block products that provide the system designer ready-to-run hardware and software. VERSAmodule building blocks drastically reduce the total cost of bringing together a fully configured custom microcomputer-based system . . . by saving development time, engineering talent, and money as well.

With VERSAmodule products, you minimize the risks of design limitations and system obsolescence while keeping your system tied to the leading edge of technology. Your system is built around the most advanced 16-bit microcomputer available today . . . incorporating sophisticated architectural features to enhance system performance. The full range of available software products and applications development tools assure early system completion. And Motorola's experienced support staff is available to help, any time.

Use Today's Most Advanced 16-Bit Microcomputers

The VERSAmodule Monoboard Microcomputers (VM01A and VM02) are the most powerful and versatile 16-bit single-board microcomputers available. They achieve a higher degree of computing power, memory capacity and tailorability by combining the MC68000 MPU with other on-board features. Such on-board features as I/O Channel interface, VERSAbus interface, bus arbitration logic, dual port RAM, multiprotocol serial I/O, parallel I/O, programmable timer/counters, and RAM with battery back-up capability enable these VERSAmodule Monoboards to handle applications ranging from those using a single processor through those requiring complex multiprocessing structures.

VERSAbus Architecture Enhances System Performance

VERSAmodule boards are interconnected in a system using the VERSAbus interconnect standard. The high-speed VERSAbus interconnect is characterized by asynchronous operation supporting direct memory addressing and true multiprocessor operation. Unlike other popular bus structures, VERSAbus architecture does not limit the number or types of processors that can be used in multiprocessing applications. The number of "bus masters" or main processor boards is limited only by the number of card slots in the particular VERSAbus backplane being used. Furthermore, several lines within the VERSAbus structure enhance system reliability and integrity by providing for efficient self-diagnosis . . . resulting in minimum system downtime.

BASIC-M, I/Omodule, RMS68K, EXORmacs, EXORbus, VERSAmodule, VERSAbus, VERSAdos, and VERSAbug are trademarks of Motorola, Inc.

Cost-Effective I/O Channel Increases System Flexibility

The I/O Channel is an advanced architectural feature of VERSAmodule Systems that allows greater system flexibility and low incremental cost for I/O expansion. The I/O Channel has a 12-bit address bus, 8-bit bidirectional data bus, 4K Bytes of memory-mapped I/O, and a data transfer rate of up to 2 Megabytes per second.

VERSAdos Real-Time Disk Operating System

The VERSAdos Operating System Software employs modular design of its major programs to allow easy addition of user functions with minimal cost. It contains a file management package and additional device-independent I/O support. The VERSAdos System is available with software drivers for both floppy and hard disk storage, and incorporates redundant safeguards against system failures. Optimum processor and memory utilization are achieved through true multitasking and dynamic memory allocation/deallocation.

RMS68K Real-Time Multitasking Executive

For real-time applications that do not require auxiliary mass storage (disk), and efficient Real-Time Executive may provide all the required systems functions.

The RMS68K Real-Time Multitasking Executive provides the nucleus around which real-time applications can be built. It allows a wide variety of application systems without large expenditures for complex real-time and multitask control functions. RMS68K is ROMable, meaning that the executable code for your entire system could be placed in ROM. In addition, the RMS68K System customizes your system by allowing you to add your own device drivers and select only those functions that you need. Compatibility with VERSAdos and debug software packages helps reduce the cost of software maintenance over the life of your system.

VERSAbug Debugging Packages

The VERSAbug debug package provides a powerful evaluation and debugging tool for VERSAmodule Systems. It permits full-speed execution of system and user-developed programs operated in a VERSAmodule Monoboard Microcomputer environment under complete operator control.

VERSAbug software is available as a system debug monitor, in a pre-configured EPROM resident package, or as source and relocatable object modules, packaged on diskette or cartridge disk, allowing you to easily create your own application-specific version in a matter of hours. In either package, VERSAbug software gives you a powerful tool for reducing system development and continuing maintenance costs.

© IC MASTER 1983

VERSAmodules

Complete Your System . . . On Schedule

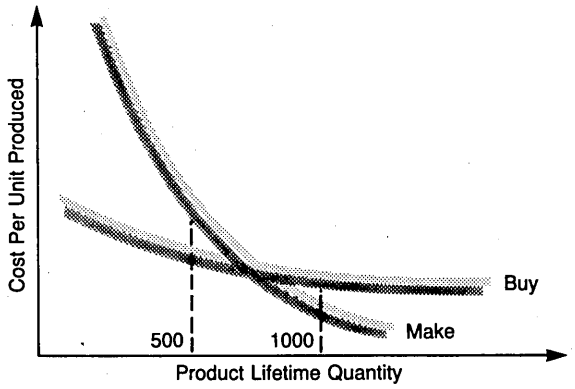
With VERSAmodule products, the lion's share of your system's hardware design, debug, assembly and test is done for you. The mature operating system software is already developed and debugged, too. You can begin developing your applications software immediately, in order to respond faster to customer requirements, penetrate fast moving market windows, or automate a critical activity sooner. The result . . . higher profitability.

Use Your Resources Efficiently

Since your costly and often limited technical resources are not needed to design or debug the basic computer system hardware, you can concentrate on the value-added areas of applications software and any unique hardware requirements. In other words, you apply your scarce resources to the area you know best . . . your application.

Lower Your Non-Recurring Costs

The rising costs to design, develop and debug basic system hardware are reduced by using VERSAmodule products. But the cost savings don't stop here. The powerful applications development tools supporting the VERSAmodule family greatly facilitate the development and debugging of your applications software and any specialized hardware. This allows you to get it right the first time . . . avoiding costly redesigns and project delays.



VERSAmodule CIRCUIT BOARDS

Monoboard Microcomputers

VM01A Monoboard Microcomputer — MC68000 MPU, 32/64K Byte RAM, Sockets for 64K Byte ROM, 4 parallel I/O ports, 2 serial I/O ports.

VM02 Monoboard Microcomputer — MC68000 MPU, 128K Byte dual-port RAM, Sockets for 64K Byte ROM, 2 Multiprotocol serial I/O ports. I/O Channel Interface.

Memory Modules

VM10 Random Access Memory — 64/128K Byte Dynamic RAM, Byte Parity, 16-bit data/word length.

VM11 Random Access Memory — 256/512K Byte Dynamic RAM, Error detection and correction, 16/32-bit data word length.

VM80 Combination ROM/RAM/I-O — 0/128K Byte Dynamic RAM, Sockets for 256K Byte ROM, 6 parallel I/O ports, 2 Multiprotocol serial I/O ports.

Controllers

VM40 Color Graphic Controller — 512 x 384 pixel, Graphics primitives, 8 basic/400 shading colors, I/O Channel Interface.

VM20 Floppy Disk Controller — Up to 4 floppy disks, 2M Byte formatted floppy capacity, On-board IPC with data buffer.

VM60 Universal Intelligent Peripheral Controller — 4K Bytes on-board RAM, Up to 32K Bytes ROM, DMA data transfers, Wire wrap area for custom user interface.

VM21 Universal Disk Controller — Up to 4 floppy disks, Up to 2 SMD compatible hard disks, Up to 516 M Byte formatted disk capacity, On-board IPC with data buffer.

VM30 Multi-Channel Communications Module — 4 RS-232C serial I/O ports, One parallel printer port, On-board IPC with data buffer.

VM31 Eight Channel Intelligent Communications Controller — 8 multi protocol RS-232 serial ports with MC68000 intelligence and 128KB RAM for down-loaded protocol and data buffering, ROM/EPROM initialization and self test.

Support

RSC1 Remote Serial Conversion Module — RS-232C to RS-449 or multidrop port, Synchronous or asychronous operation, Half or full duplex, Eurocard form factor.

System Packaging and Accessories — 5-¼ inch Chassis, Stand-Alone Card Cage, Power Supplies, Cabling Options, I/Omodule Card Cage, Mass Storage Enclosure, Industrial Card Cage System Package, VERSAbus Adapter Module.

Addition I/O

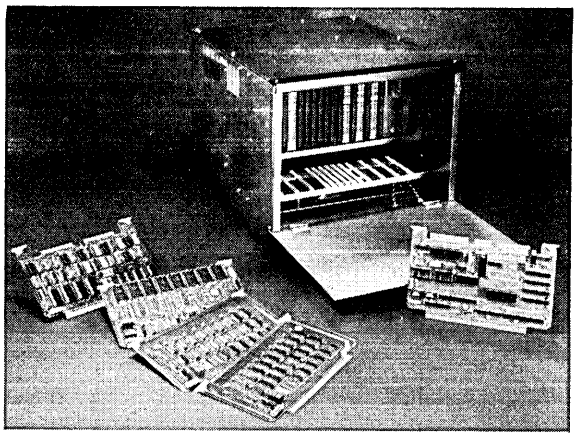
All of the I/Omodules described under I/Omodules in this catalog are compatible with the I/O Channel on VERSAmodule 02 and VM40, thus extending many additional I/O and control functions to the VERSAmodule product family.

FUTURE VERSAmodule PRODUCTS

Motorola currently offers more than 20 individual hardware and software products in the VERSAmodule and I/Omodule product lines. But beyond these, Motorola engineers are at work planning and designing future products to ensure continual expansion of the VERSAmodule product line. New hardware and software products will incorporate the latest technology in easy-to-use building-block form. Future family members will include higher-performance single board computers, higher-density memory modules, and new intelligent device controllers . . . all of which take advantage of advancements in LSI technology. I/Omodule products will expand the offering of popular industry interfaces and new software will bring advanced tools like applications-oriented languages and multiprocessor capability for the VERSAdos Operating System. Other announcements from Motorola, plus those from independent vendors offering VERSAbus-compatible products, will assure an even broader selection of useful products in the future.

© IC MASTER 1983

Micromodules



The Motorola line of Micromodules offers a selection of modular subsystems that permits a high degree of end-product customization. It is supplemented by a sophisticated library of development software with high-level language interface to simplify man-machine interaction. An array of packaging accessories provides the proper physical environment for the system assembly.

Utilizing Motorola's extensive family of 8-bit MPU-compatible chips, Micromodules are tailored to meet the performance objectives of most industrial automation and data acquisition applications. They are priced to compete favorably with in-house development and manufacturing costs and, in many instances, they represent the most cost-effective means for rapid, reliable system implementation (or even for prototyping chip-implemented systems.)

The Modular Building Blocks

The Micromodule Family is based on a selection of differently configured *single-board microcomputers.* These vary in capabilities and applications as a result of differences in on-board microprocessors, as well as memory and I/O content. For some requirements, a single monoboard microcomputer module, supplemented by a suitable enclosure, a power supply and your applications program, will adequately serve your total needs. For other more demanding applications, the Family offers a wide range of expansion modules which tailor the system to your ultimate requirements.

Software Support

To ease programming load and allow programmers to concentrate on the end product application, incorporate the **M6809 Real-time Multitasking System (RMS09)** as the executive kernal around which a real-time applications system can be built. RMS09 is a flexible collection of systems routines from which the user can customize or 'sysgen' supervisor routines and interrupt handling routines tailored as simple or as complex as the application system requires.

Also available for MC6809-based systems is SUPERbug, a high performance monitor which also provides the facility for linking relocatable modular software routines that can be independently written and executed from EPROM, ROM or RAM. For MC6800-based Micromodules, there is MICRObug Monitor, with system software and hardware debugging capability. Also available are Editor/Assembler and Basic Interpreter packages.

MONOBOARD MICROCOMPUTER SELECTION GUIDE

Part No.	Parallel I/O	Serial I/O			Memory		Options
		RS-232C	RS-422	20mA	ROM Capacity	RAM (Bytes)	
MC6800/MC6802 Based, 1 MHz Clock Rate							
M68MM01B	1 PIA 1 PTM				To 4K**		Low Cost, Self-contained Not Expandable
M68MM01	3 PIAs				To 4K**	1K	
M68MM01A2	2 PIAs	1 ACIA		*	To 8K**	1K	
M68MM01B1A	1 PIA 1 PTM	1 ACIA		*	To 4K**	384	Cassette I/O
M68MM01D	Printer Port 1 PTM	1 ACIA	(Opt) +	*	To 10K**		Use 2K RAMs in ROM Sockets
MC6809-Based; Clock Rate 1 MHz, except M68MM19A1-2MHz							
M68MM17	1 PIA 1 PTM	2 ACIA		*	To 64K**	To 64K**	Use RAMs in ROM Sockets
M68MM19-1 19A1	1 PIA 1 PTM	1 ACIA or SSDA	(Opt) +	*	To 32K**	2K	Replace ACIA With SSDA +

NOTES:
+ = Option requires minor board modifications
* = Option requires addition of Micromodule MM11 (RS-232C to 20-mA Current-Loop Adapter)
** = User supplied

D-A Converters—All inputs are TTL compatible.

Part No.	No. of Channels	Input	Analog Output Range		Comments
			Voltage	Current	
M68MM05C	4	12-Bit Binary	0-5, 0-10 ± 2.5, ± 5 ± 10		Output Voltage Range option is strap selectable.
M68MM15CV	1 to 4*	12-Bit Binary or two's complement	0-5, 0-10, ± 5, ± 10		Input Code and Output Voltage Range Options are strap selectable.
M68MM15CI	1 to 4*	12-Bit Binary or two's complement	0-5, 0-10, ± 5, ± 10	4 to 20mA	Voltage or Current output device with strap selectable current or voltage range options.

*Add suffix 1 through 4 to part number to denote number of channels required.

A-D Converters

Part No.	No. of Channels		Resolution	Input Voltage	Comments
	Diff.	S.E.	No. of Bits	(full scale, dc)	
High Level M68MM15A	8	16	12	0-5 Vdc, 0-10 Vdc, ± 5 Vdc, ± 10 Vdc,	V_{in} is strap selectable
M68MM15A1	16	32	12	same as above	
M68MM05A	8		12	± 10mV to ± 10V	
M68MM05B		16	12	same as above	
Low Level M68MM15B	1		15 plus sign	± 25 mV, ± 55 mV, ± 80 mV	Expandable to 16 channels with Expander Circuits
M68MM15BEX	1 to 4		Channel Expander for above		

EXORbug, EXORbus, EXORset, MICRObug, Micromodule, RMS09, BASIC-M and SUPERbug are trademarks of Motorola Inc.

© IC MASTER 1983

Micromodules

EXORbus-Compatible Memory Modules

	Capacity (K Bytes)	Features
RAM-Static, NMOS		
M68MM06	2	Clock Speed—1 MHz
MEX6808-22	8	
MEX6816-22S	16	With Parity, Clock speed = 1 or 2 MHz (with stretched Phase 2)
RAM-Static, CMOS		
M68MM09	4	Clock speed = 1.5 or 2 MHz (with stretched phase 2) On-board ckt. for user-installed parity.
M68MM21	8	Optional parity.
M68MM21-1	16	Optional parity.
RAM-Dynamic, with parity		
MEX6816-22D	16	Jumper selectable 1-, 1.5-,
MEX6832-22	32	or 2- MHz speed;
MEX6848-22	48	Row-addressable in 16K byte blocks.
MEX6864-22	64	
RAM-Dynamic; with hidden refresh; clock speed = 1 MHz; all with parity.		
MEX6816-1HR	16	
MEX6832-1HR	32	Organized into independently addressable rows of 16K bytes each.
MEX6848-1HR	48	
MEX6864-1HR	64	

Unpopulated Modules—User supplies chip set

	Number Of Sockets	EPROM/ROM CAPACITY (Memory Chip Number)	OPTION RAM CAPACITY (Memory Chip Number)
MEX68RR	20	16K (MCM68708/6830)	512 (MCM6810)
M68MM04	16	16K (MCM68708/6830)	0
M68MM04A	16	64K (1K, 2K or 4K capacity)	8K (1K or 2K capacity)

Serial-Format Digital I/O

ACIA Modules — MEX6850, 50-2

Offers both TTY and RS-232C data terminal interface, with eight switch-selectable baud rates between 110 and 9600 baud. MEX6850 operates at 1MHz and is configured with Modem output; 6850-2, at 2MHz, is configured with 20 mA TTY output.

Quad Serial I/O — M68MM07

Supplied with four MC6850 ACIAs, or with user supplied MC6852 SSDAs for either asynchronous or synchronous operation. Strap options permit RS-232C, RS-422, RS-423 or 20mA interface and baud-rate selection for each of the four ports.

RS-232C to TTY Adapter — M68MM11

Converts RS-232C output to 20 mA TTY operation.

8 Channel Serial I/O Module — M68MM18

Provides eight asynchronous RS-232C channels. Each channel is strap selectable to baud rates from 75 to 115K BPS. Memory location is strap selectable in a block of eight channels.

GPIB Modules

Provide interface between various MPUs and the IEEE STD 488-1978 interface bus. MM12A provides Listener/Talker functions for sending and receiving data bytes, requesting service and responding to parallel and serial polls. MM12 and 12-1 add the controller function that permits the system to send commands and conduct serial and parallel polls.

Listener/Talker for MC6800-type systems **M68MM12A**

Listener/Talker/Controller for MC6800-type systems **M68MM12**

Listener/Talker/Controller for MC6809-type systems **M68MM12-1**

Memory-I/O-Timer Expansion Module — M68MM16-1, 2, 3

Provides functional expansion of Monoboard MM01 (version 16-1), or MM19 (version 16-2), and can be used as MM19 Emulator in an EXORset Development System (version 16-3). Includes asynchronous serial data port with strap-selectable RS-232C, RS-422, or RS-423 interface, parallel interface port with 16 data lines and 2K of static RAM, four control lines, three 16-bit programmable counter/timers, and four sockets for user installed, single 5-volt-supply MOS or bipolar memories.

Parallel-Format Digital I/O

Universal PIA-Controlled I/O — MEX6820, 21-2

Contains two MC6820 Peripheral Interface Adapters (PIA's) for a total of four separate 8-bit I/O ports for peripheral interfacing.

32-In/32-Out Expansion Module — M68MM03

Contains 32 bits of parallel input and 32 bits of parallel output in four continguous 8-bit bytes. Used for simultaneous transfer of 4 bytes of informtion between an MPU and an external system to speed up the data transfer cycle.

16/32-Channel Relay Output — M68MM13A, B

Contains 16 (MM13A) or 32 (MM13B) on-board reed relay output channels to isolate the microcomputer from the system(s) being controlled.

24-Channel Optically Isolated Input Modules — M68MM13C, D

Provides three byte-oriented (8-bit) input channels that have high electrical isolation between microcomputer and equipment being monitored. Input voltages in excess of 17 volts are read as logical "1"; 4 volts or less represent logical "0." MM13D provides an on-board wetting source for applications requiring switch and relay inputs.

Quad Parallel Interface Adapter — M68MM22

Utilizes four PIAs in a versatile buffered I/O configuration that allows up to 64 high-voltage (200 Vdc or 280 Vac) or high-current (to 3A) signals to be monitored or controlled.

Packaging Hardware

Part No.	Description
M68MMCC05	5-Card Cardcage
M68MMCC10	10-Card Cardcage
M68MMFLC1	Front Load Chassis, 14 Card, 110 Vac
M68MMLC1	Long Chassis, 10 Card, 110 Vac
M68MMSC1	Short Chassis, 5-Card, 110 Vac
M68MMPS-1	Power Supply, 110 Vac

© IC MASTER 1983

I/Omodules

The I/O Channel is a new system architectural concept supported in Motorola Microsystem products which allows modular I/O expansion on the local processor bus.

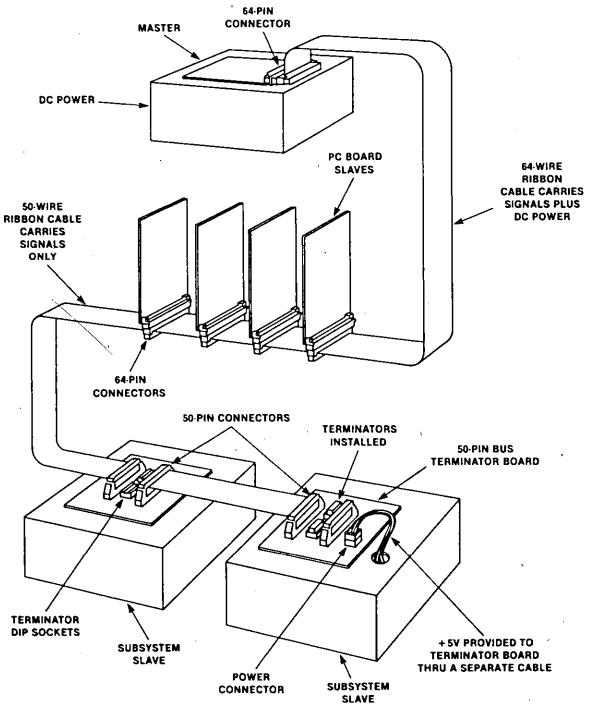
This frees the system bus to handle simultaneous high-speed data exchange and multiprocessor access requirements while permitting most lower speed system I/O activity to take place through the local I/O Channel. Thus, the advanced I/O Channel architecture affords great flexibility in I/O intensive applications such as high speed data acquisition and distributed control.

More than a dozen defined I/Omodule products already support the Motorola modular product line. The family will grow into the future with additional offerings from Motorola, and with a variety of I/O Channel compatible products from other vendors. Should you desire to design custom I/O Channel modules for your specific needs, that task is made easier by a comprehensive I/O Channel Specification Manual available from Motorola. (M68RIO1/D1)

The I/O Channel provides the following features:

- 12-bit address bus
- 8-bit bidirectional data bus
- Asynchronous operation
- Up to 2 megabyte transfer rate
- Four interrupt lines
- Reset line
- 4 MHz free running clock line

The figure below illustrates how a system might be configured using a ribbon cable bus I/O Channel. The bus master is typically a computer, but may also include a DMA controller for transferring blocks of data to or from a slave device at high speed.



I/Omodule Product Line

A. **I/Omodules** — I/O Channel Compatible, Single Eurocard Format.

MVME400 — Dual Channel RS-232C Serial Port providing two independent, full-duplex serial input/output ports.

MVME410 — Dual Channel 16-bit Parallel Port, four independent 8-bit ports jumper or software configurable as inputs or outputs.

MVME420 — SASI™ Peripheral Adapter provides interface to SA1400 Shugart Associates SASI Bus.

MVME435 — Buffered 9-Track Magnetic Tape Adapter to interface industry standard 800/1600 BPI, ½" Magnetic Tape Formatter.

MVME600 — Analog Input Module with 16 channel single-ended or 8 channel differential operation.

MVME605 — Analog Output Module with 4 independent channels and 12-bit resolution.

MVME610/615/616 — Opto Isolated 120V/240V AC Input/Output modules with eight independent I/O Channels.

MVME620/625 — Opto Isolated 3VDC Input/Output modules with eight channels and isolation to 2500 Volts.

MVME932 — I/O Channel Extender Board.

MVME933 — I/O Channel Wirewrap Board.

B. **I/Omodules** — I/O Channel Compatible, Non-Eurocard Format.

M68RWIN1-1, M68RWIN1-2 — Winchester Disk Controller for 5-½" or 8" Winchester and Floppy Disk drive combinations.

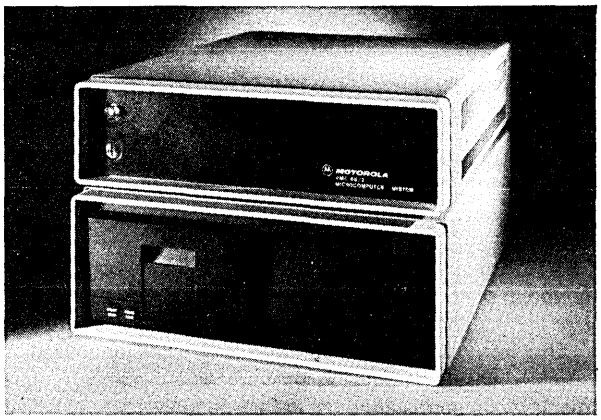
M68RFDC1 — Floppy Disk Controller for up to two 5-¼" or 8" daisy-chained double density single or double sided drives.

M68RI01 — Remote Input/Output Module provides parallel I/O operations and will accept up to 16 compatible solid state relay input and output modules.

M68RAD1 — Remote Intelligent Analog-to-Digital Conversion Module controlled by an on-board Intelligent Peripheral Controller.

© IC MASTER 1983

VMC 68/2 Microcomputer



The VMC 68 Series is a high performance microcomputer system family intended for application by OEM's and system integrators starting from a product integration level formerly available only to the minicomputer user. The VMC 68 System Family will find wide application in industrial process control, automated testing, data acquisition, supervisory control, and many other factory and lab automation uses. The VMC 68 Series is based on the 16-bit M68000-based VERSAmodule Family of modular microcomputer products utilizing the industry and IEEE proposed VERSAbus standard system interconnect providing multiprocessing and intelligent peripheral controller architecture.

Also featured is the I/O channel which provides for the use of a broad selection of I/O modules for I/O flexibility.

VMC 68/2 System Features and Capabilities

Hardware-Only Package	Complete System Package
• MC68000-based VM02 Monoboard Microcomputer — Direct Addressing to 16 Megabytes — 128K Bytes Dual-Port RAM — Multiprocessor Architecture with System Controller Features — I/O Channel Interface for Functional Tailoring — Dual Multiprotocol RS-232C Serial Ports for System Flexibility • Dual 16-Bit Parallel Port I/Omodule — Centronics compatible Printer Interface — General Parallel I/O Applications • VERSAbug Firmware — Debug — Disk Bootstrap Load — Self-Test — Up/Downline Load • MC68120-based VM21 Universal Disk Controller — High-speed DMA data transfer to/from 1 or 2 SMD interface compatible disk drives AND Up to 4 EXORdisk II or III Floppy Disk Drives • VM11 Dynamic RAM Module with 256K Bytes of "global" RAM for program development and efficient multitasking system operation • 4 or 8-slot VERSAbus compatible VMC 68/2 Chassis — Power Fail/Restart Circuitry — 5 or 10 I/Omodule card slots for I/O Channel functional tailoring (Dual Parallel Port module occupies one of these slots) • 0°C to 50°C (32°F to 122°F) Operating Temperature Range • For 115 Vac 60 Hz Operation	In addition to all features of the Hardware-Only package: • MLD-16 Mass Storage Unit incorporating Disk Drive, SMD interface electronic module, and Disk Power Supply • 16 Megabyte (unformatted) 8-inch SMD interface compatible Disk Drive — 8M Bytes Fixed, plus 8M Bytes Removable Cartridge for storage and one-to-one System Backup — Embedded Servo Information to eliminate cartridge interchange problems and the need for head alignment — Simple Installation — Quiet Operation — High Performance — Disk Compartment sealed during operation — Exceptional Reliability (7500 Hour MTBF) — Long Service Life requiring no preventive maintenance in a benign environment • VERSAdos Real-Time Multitasking Operating System with Assembler and Utilities, including: — MC68000 Structured Macro Assembler — Text Editor, Linkage Editor, and Multitasking Debugger — System Diagnostics — System Generation (SYSGEN) capability for feature tailoring of the VERSAdos System • +10°C to +40°C (50°F to 104°F) Operating Temperature Range

Ordering Information

MVMC682-114	Four-slot VMC 68/2 Microcomputer System
MVMC682-118	Eight-slot VMC 68/2 Microcomputer System
MVMC682-114H	Four-slot VMC 68/2 Microcomputer System hardware-only package.
MVMC682-118H	Eight-slot VMC 68/2 Microcomputer System hardware-only package.

EXORdisk, EXORmacs, EXORterm, I/Omodule, VERSAbug, VERSAbus, VERSAdos, VERSAmodule and VMC 682 are trademarks of Motorola Inc.
LARK is a trademark of Control Data Corporation.

© IC MASTER 1983

MOTOROLA
MEMORY SYSTEMS
3501 ED BLUESTEIN BLVD., AUSTIN, TEXAS 78721

SYSTEM 3000

SEMICONDUCTOR MASS MEMORY . . . MUCH MORE THAN JUST BITS IN A BOX

MEMORY INTENSIVE

The System 3000 is a general purpose memory system that is a standard product designed with flexibility for user customizing. It utilizes Motorola's 64K HMOS dynamic RAM technology. Up to 16 memory array cards, containing 288 64K RAMs each, can be installed into a system giving the user a maximum of 32 megabytes of memory.

UNIQUE BUS ARCHITECTURE

The bus architecture of the System 3000 is unique. There are two internal bus structures offering the most efficient and flexible memory system. These are the MEMbus and array bus. The MEMbus is the communication link between the address control card (ACC)/error correction card (ECC) and the intelligent user card (IUC)/user I/O cards. Separate signal lines allow communication between the ACC and ECC. The array bus handles all the timing, control, and data for the memory array cards, based on 64 data bits and 8 error correcting bits. The user simply interfaces to the MEMbus via user I/O cards. This is the only customizing necessary to use the System 3000 for many applications.

BLOCK TRANSFER

The System 3000 has the capability of auto accessing at the rate of 80 megabytes per second.

SCRUBBING AND ERROR LOGGING

There is one address control card (ACC) required for each System 3000. The ACC generates the appropriate addresses, timing control signals, and refresh information. Sequential accesses such as high-speed block transfer are also controlled on the ACC. A scrubber circuit for correcting single bit failures during refresh and an error logger for pinpointing failure locations are other features of the ACC.

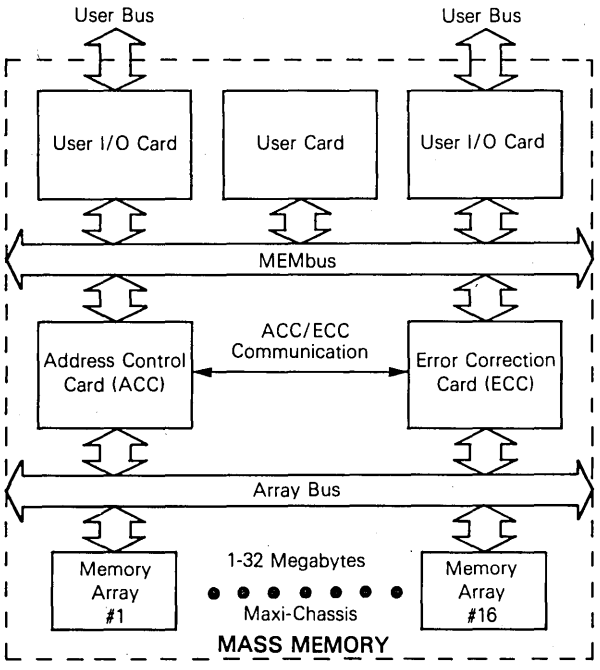
SELF CORRECTING

One ECC card is provided with each system for buffering and detection and correction of errors. A modified hamming code is used to correct all single bit errors and detect all single/double bit errors.

INTERFACING

Interfacing is accomplished with user I/O cards (up to three), and can be customized to handle any word width up to 72 bits. Each user I/O card provides 350 I/O lines. There is no need for extender cables, since 200 of these lines are connected through the motherboard.

SYSTEM 3000 BLOCK DIAGRAM



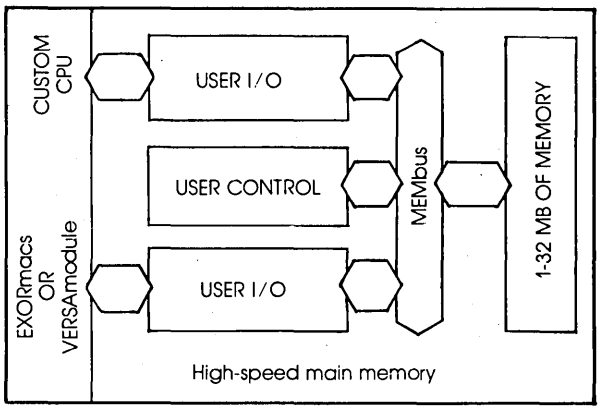
© IC MASTER 1983

SYSTEM 3000 FOR INNOVATIVE APPLICATIONS

Utilizing "standard customizing" for specific applications, the System 3000 becomes much more than just bits in a box. It has flexibility features designed for ease of user customizing.

MAIN MEMORY ADD-ON

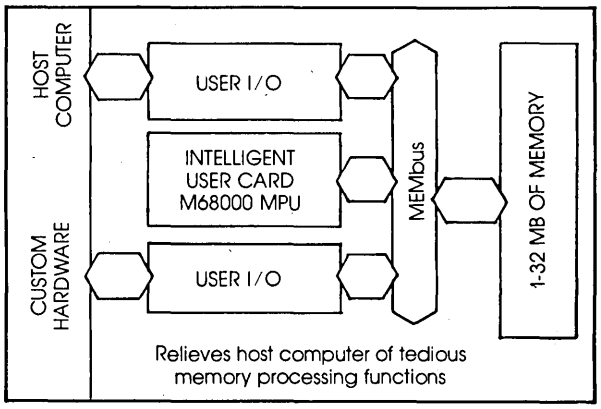
- Cost savings over custom design
- Flexible interface via User I/O boards
- Data integrity through Error Correction Card (ECC)
- Error Logger for preventive maintenance



High-speed main memory

INTELLIGENT MEMORY

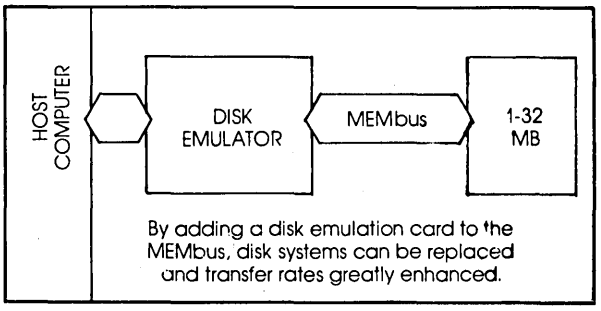
- Distributed processing
- Parallel processing
- Data formatting
- File manipulation
- Data reduction



Relieves host computer of tedious memory processing functions

DISK REPLACEMENT

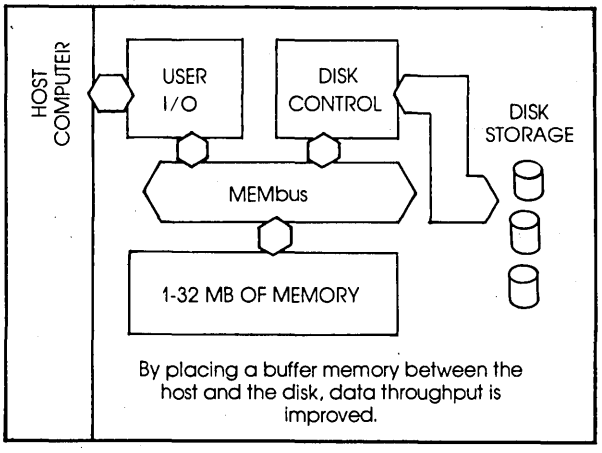
- CPU more efficiently utilized
- Improved reliability
- Random access (latency) improved (x 10,000)



By adding a disk emulation card to the MEMbus, disk systems can be replaced and transfer rates greatly enhanced.

DISK CACHE (DISCACHE™)

- Data transfer rate increased
- Efficient use of CPU
- Special functions such as data formatting and file manipulation



By placing a buffer memory between the host and the disk, data throughput is improved.

DISCACHE, EXORmacs, MEMbus, and VERSAmodule are trademarks of Motorola Inc.

MOTOROLA *Semiconductor Products Inc.*

© IC MASTER 1983

MOTOROLA

MEMORY SYSTEMS

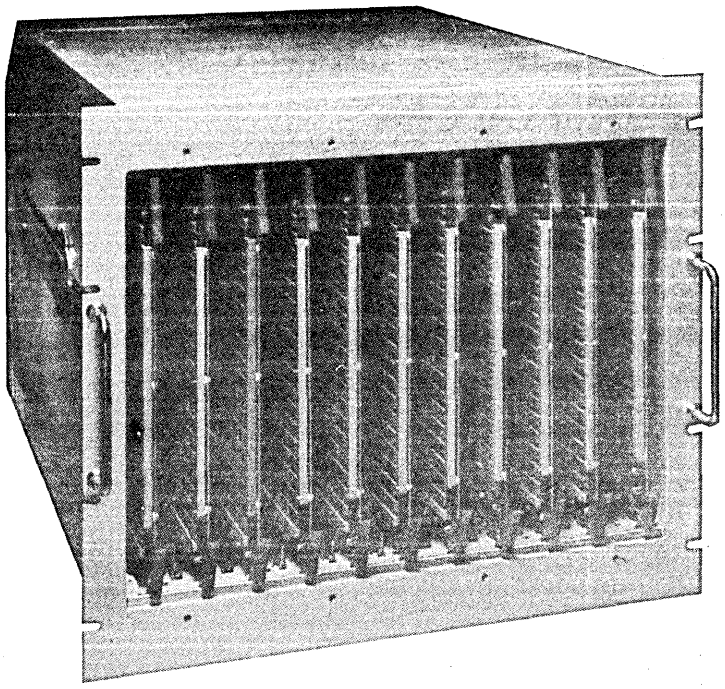
3501 ED BLUESTEIN BLVD., AUSTIN, TEXAS 78721

SYSTEM 4000

"RUGGEDIZED"
MASS MEMORY

Product Preview

SEMICONDUCTOR MASS MEMORY FOR MOBILE ENVIRONMENTS



- 1 to 32M Byte Capacity Utilizing Motorola's 64K Dynamic RAM
- 1 to 128M Byte Capacity Utilizing Motorola's 256K Dynamic RAM
- Meets Vibration and Shock MIL-STD Spec for Mobile Environments
- Block Transfer Rates up to 80 Megabytes/Second
- Customizing Ability with Three Interface Cards
- Flexible Interface via Standardized MEMbus
- Single Bit Error Correct and Double Bit Error Detect
- Error Logger Accessible Through Front Panel Keypad/Display
- Remote Analysis of Error Logger with RS232 Port
- Self-Test Capability with the System Diagnostic Module
- Utilizes the Same Interface and Options as the Commercial SYSTEM 3000

"RUGGEDIZED" MASS MEMORY

The SYSTEM 4000 contains up to 128M bytes of dynamic RAM for use in a mobile environment where reliability is a must, "Ruggedization" is a requirement in applications such as:

- Geophysical Data Acquisition
- Radar Data Analysis
- Communications "Mailbox" Buffers
- Medical X-ray Body Scanners

80 MEGABYTES PER SECOND

For high speed applications, the Block Transfer mode offers a sequential data transfer of a 64 bit data word every 100 ns (80 megabytes per second). This transfer rate is maintained without refresh interruptions creating a smooth synchronous data flow.

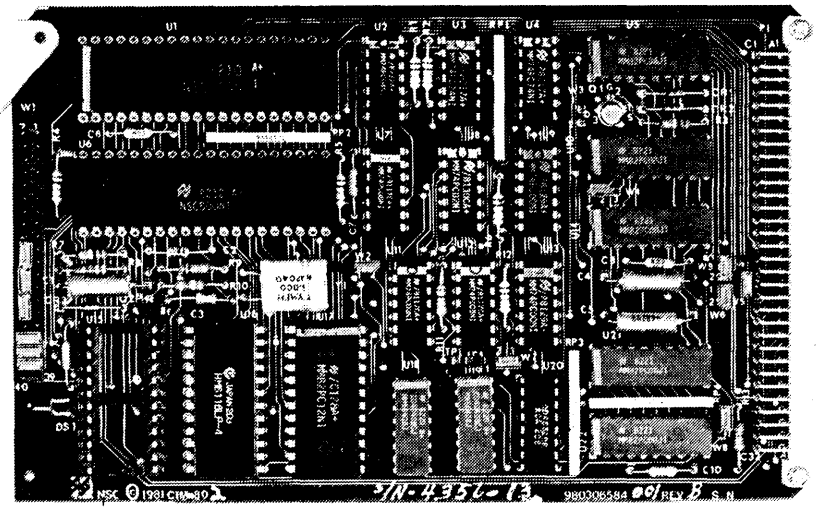
This document contains information on a product under development. Motorola reserves the right to change or discontinue this product without notice.

MOTOROLA INC., 1982

NP-364

© IC MASTER 1983

CIM™-802
Industrial Microcomputer



- **NSC800™-based computer board**
- **P²CMOS™ technology gives NMOS performance at CMOS power consumption levels**
- **NSC800 CPU—more than 158 instruction types programmable in Z80® code**
- **2 MHz operation in harsh environments**
- **−40°C to +85°C (−40°F to +185°F) operating temperature range**
- **Battery backup/operation**
- **2 16-bit counters/timers with prescalers**
- **16 programmable I/O lines**
- **System-level fail-safe timer**
- **2K bytes static RAM; 2K or 4K bytes PROM**
- **12 vectored interrupts**
- **Built solely with components burned in to A+ levels**

Product Overview

The CIM™-802 Microcomputer Board is a member of the SERIES/800™ line of CMOS Industrial Microcomputers (CIM) from National Semiconductor Corporation. SERIES/800 is a complete family, including CPU, memory expansion, and digital and analog I/O boards. Also included is a real-time, multitasking operating system, BLMX-80C. The line uses the P²CMOS™ NSC800 microprocessor, which combines the benefits of the execution speeds of NMOS microprocessors with the power dissipation and environmental characteristics of CMOS, and executes the Z80® instruction set. The complete line is compatible with the CIMBUS™, a documented scheme for board interconnection (see the CIMBUS specification). The CMOS technology employed, combined with the single-wide Eurocard form factor of the boards, makes the SERIES/800 line appropriate for many applications in harsh environments, such as numeric machine control, pipeline monitoring and control, robotics, industrial instrumentation, and uninterruptable power supplies.

The CIM-802 is the board level computer that is the heart of the SERIES/800 CMOS Industrial Microcomputer board line. Featuring NSC's P²CMOS technology, this computer provides highly reliable performance over a wide range of harsh environmental conditions at low power consumption, and is eminently suitable for remote station and process control applications.

SERIES/800™, CIM™, CIMBUS™, DIBTM, P²CMOS™ and NSC800™ are trademarks of National Semiconductor Corp.

Z80® is a registered trademark of Zilog, Inc.

©1982 National Semiconductor Corp. TL/T/5092

Printed in U. S. A.

© IC MASTER 1983

CIM™-802

National Semiconductor

The CIM-802 is a complete computer based on the NSC800 central processing unit, and includes sixteen programmable I/O lines, twelve priority vectored interrupts, 2K bytes of static RAM, provisions for 2K or 4K bytes of ROM, and two 16-bit programmable timers. The NSC800 CPU, which is programmable in Z80 code, has an instruction set containing more than 158 instruction types. The CPU board is easily expandable via the CIMBUS for operation with other products in the SERIES/800 line, such as memory expansion, A/D and D/A conversion, serial I/O, and a battery charger. See the CIMBUS specification manual for a description of CIMBUS characteristics (order as CIMBUSM or Manual #420306681-001).

Power consumption of the computer is very low (less than three-tenths of a watt), which results in increased reliability and eliminates the need for separate cooling fans and filtering systems. CIMBUS connections are made through two-piece, pin-in-socket DIN 41612 connectors, which are highly resistant to vibration and corrosion, and eliminate the card edge connector, a primary failure source in many systems. The CIM-802 board is small, measuring only 100 mm x 160 mm (3.9" x 6.3"), and fits into the CIM-602 (8-slot) or CIM-604 (18-slot) CIMBUS card cages to make a tidy, durable system.

Functional Description

Central Processor

- CPU—NSC800 microprocessor
- Maximum addressing range—64K bytes
- Data word—8 bits
- Instruction word—8, 16, or 24 bits
- Addressing modes—direct, register, indexed register, register indirect, and immediate
- Instruction types—more than 158, programmable in Z80 code
- Registers
  - —14 general purpose, A, B, C, D, E, H, and L and A', B', C', D', E', H', and L'; A (accumulator) and F (flag), A' and F' selected separately. Other registers may be used singly or in pairs; AF, BC, DE, HL and A'F', B'C', D'E', H'L'.
  - —2 16-bit index register pairs IX and IY may be indexed ±255 from symbolic location
  - —1 16-bit program counter (PC)
  - —1 16-bit stack pointer (SP) used discretely or automatically to implement subroutine CALL and RETurn instructions
  - —1 8-bit refresh register (R)
  - —1 8-bit interrupt register (I)

Memory

The 2K private static RAM (6116) is a byte-wide, low power device requiring only a few microwatts to retain data, and uses special write inhibit logic to protect its contents in a power-down or standby mode. An additional 128 bytes of RAM are available from the NSC810 RAM I/O Timer. The 2K static RAM is mapped at addresses F000H-F7FFH; the additional 128 bytes at F800H-F87FH.

Sockets are provided on the CPU board for either the 27C16 (2K bytes) or the 27C32 (4K bytes) EPROM. Two Berg jumpers provide all the logic changes necessary for using either type of EPROM. Assigned addresses for ROM are 0000H-07FFH (27C16) or 0000H-0FFFH (27C32).

Memory expansion to a maximum of 64K bytes is possible using the CIM-100 Series Memory Expansion Boards.

Input/Output

All on-board input/output functions are memory mapped through the NSC810 RAM I/O Timer with a base address of F8XXH.

- Interrupts—arbitrated through a priority interrupt controller
  - —1 nonmaskable interrupt
  - —3 restart maskable interrupts available to user
  - —8 priority vectored interrupts
- Three programmable I/O ports
  - —Port A, 8 lines available to user
  - —Port B, 8 lines, 4 generally reserved for CPU board use
  - —Port C, 6 lines, 2 generally reserved for CPU board use

  (Some system configuration may allow use of all 22 I/O lines)
- Timers
  - —2 16-bit programmable counters/timers; timer prescale 1/2/64 (64 on timer TO only)
  - —8 msec. and 0.5 second timers jumperable as interrupts

Fail-Safe Timer

The fail-safe timer is a software timer implemented through Port B of the NSC810. If the user chooses to implement this feature, the CPU must be programmed to toggle bit 4 of Port B based on the 0.5 second on-board timer. This provides a one Hertz signal to the CIMBUS that is used to retrigger a monostable multivibrator (one-shot) on any expansion board. If the CPU should fail, the CIMBUS signal TMRFS will no longer be output. The expansion board(s) will then set their outputs to a known quiescent state, ensuring an orderly shutdown without a CPU. An on-board LED indicates the state of TMRFS and also allows for a quick visual inspection of the health of the CPU board.

CIM-660 Firmware Monitor

The CIM-660 Firmware Monitor is available in a preprogrammed NMC27C16 EPROM. This compréhensive monitor includes facilities to load, execute, and debug programs based on the CIM-802 CPU board. The monitor allows the user to examine and modify any RAM location or CPU register. It also allows the movement of blocks of data within memory and initiation of user programs with optional breakpoints. The user can employ the monitor to search memory to find the location of an eight- or sixteen-bit string. The CIM-660 will calculate the sum and difference

© IC MASTER 1983

of any four-, eight-, or sixteen-bit set of numbers. Additionally, the monitor can be used to exercise all available I/O ports within the system. The CIM-660, in conjunction with a CIM-201 Serial I/O Board, incorporates a baud rate search to determine the rate at which the CRT/TTY is running. The following commands are supported in the CIM-660 Firmware Monitor:

- D — Display contents of memory
- E — Examine CPU registers
- F — Find bit stream in memory
- G — Execute program (with optional breakpoints)
- H — Calculate the sum and difference of two hex values
- I — Input data from I/O port
- M — Move block of data
- O — Output data to I/O port
- S — Examine and/or substitute value in memory
- V — Verify result of move command

Real-Time Software

The BLMX-80C real-time multitasking executive requires only 2K bytes of EPROM and 512 bytes of RAM in its minimum configuration. Facilities such as the following are included: priority-based system resource allocation, intertask communication and control, interrupt-driven control for standard I/O devices, time-of-day clock, free space memory manager, and interrupt and event handling. Optional linkable and relocatable modules for console control (CRT or TTY), fail-safe timer interface, analog I/O board interface, and interactive system-level debugging are provided with the BLMX-80C package. User configurability is aided on the STARPLEX Development System by the menu-driven SYSCON System Configuration program that is also provided with BLMX-80C.

System Development Capability

The development cycle for CIM-802-based products may be significantly reduced using the STARPLEX Development System from National Semiconductor Corporation. The convenience of a comprehensive operating system combined with system prompts that guide even inexperienced users through complex tasks creates an ideal software development environment. An In-System Emulator (ISE) available for the NSC800 allows the development and debugging of software directly on the CIM-802 board.

Specifications

Microprocessor

CPU — NSC800

Data word — 8 bits

Instruction word — 8, 16, or 24 bits

System Clock — 4 MHz

CPU speed — 2 MHz

Minimum instruction execution time — 2 μsec.

Registers — 14 general purpose
2 index
Program counter
Stack pointer
Refresh register
Interrupt register

Number of instructions — 158 instruction types, providing for more than 600 executable instructions (Z80 code compatible)

Address capacity — Memory - 64K bytes
I/O - 256 input
256 output

Memory

RAM — 2K bytes static RAM (6116) plus 128 bytes in NSC810 RAM I/O Timer

ROM — sockets for 2K bytes (27C16) or 4K bytes (27C32) ROM

Expansion — via memory expansion boards to 64K

Access time — 350 nsec.

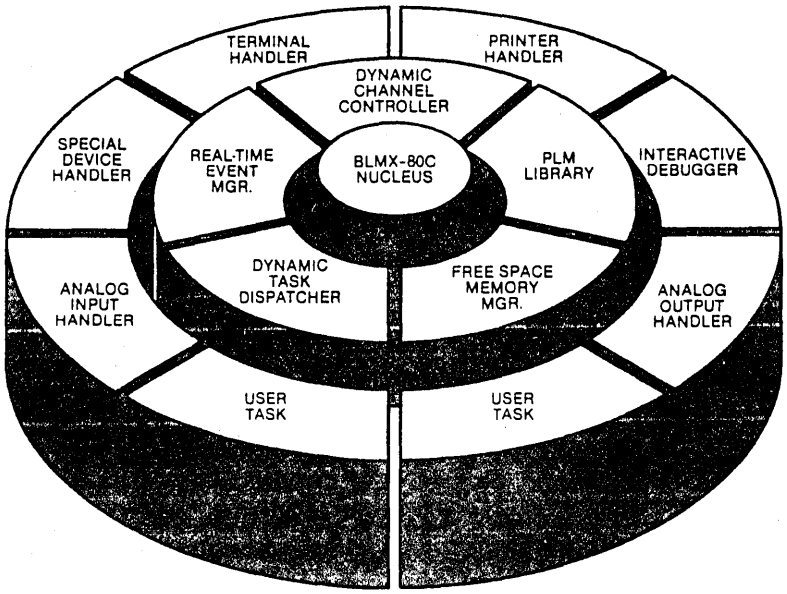
Address assignments —

Address Range	Assignment
0000H-07FFH	On-board PROM (using 27C16)
0800H-0FFFH	Off-board (unassigned) if 27C16 PROM is used. On-board EPROM if 27C32 PROM is used
1000H-EFFFH	Off-board (unassigned)
F000H-F7FFH	On-board RAM (2K byte RAM, battery backup available)
F800H-F87FH	On-board RAM (NSC810 128 byte RAM, not backed up during power failure)
F880H-F8FFH	NSC810 I/O port and timer control access (memory-mapped)
F900H-FFFFH	Reserved

For more information on this and other CIM products, contact your local sales office.

© IC MASTER 1983

BLMX-80C
Board-Level, Multitasking Executive for NSC800™-Based Systems



- **Configurability**
  - Fully user configurable
  - Menu selection procedure
  - Hardware independent
- **Compatibility**
  - NSC800, Z80®
  - Bus-like structure
- **Reliability**
  - Small, efficient nucleus
  - Simple user interface
  - Standard data structures
- **User-Oriented Support**
  - Extensive I/O handlers
  - Analog handlers
  - Linkable interactive debugger
- **Easy-to-Use**
  - Prompting menus guide system configuration
  - Comprehensible system functions
  - Functional similarity for internal and external calls
  - Reconfigurable

Product Overview

The BLMX-80C software system is a real-time, multitasking executive, specifically designed for use with National Semiconductor Corporation's CMOS Industrial Microcomputer (CIM™) products, but is equally usable for any NSC800-based system. It has been optimized for real-time applications such as process control, manufacturing monitoring, and data acquisition systems. The BLMX-80C Executive is fully modular and can readily be configured to suit applications needs. It is completely hardware and location independent, thereby providing a fundamental base upon which users can build a wide range of applications systems. In addition, BLMX-80C provides a bus-like structure that helps to integrate software with its underlying hardware through predefined data structures and interconnect procedures. This concept of software-bus architecture ensures maximum quality of standardization for compatibility and future expandability.

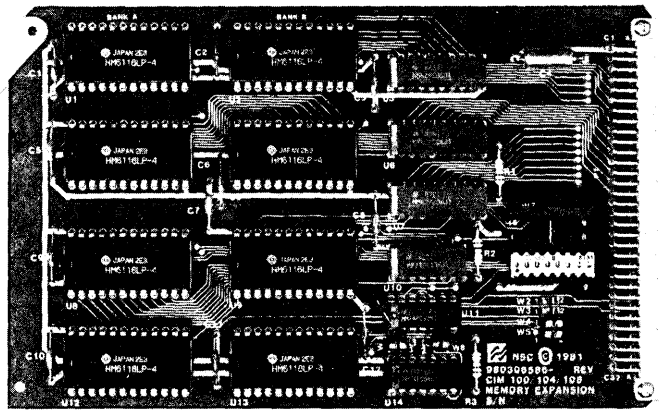
The BLMX-80C nucleus requires only 512 bytes of RAM and 2K bytes of ROM. The system contains all major real-time functions including task scheduling, intertask communication and synchronization, interrupt handling and I/O control, as well as many optional features.

BLMX-80C provides support for all CIM CPU boards: CIM-801, CIM-802, and CIM-804, as well as the CIM-201 Serial I/O Board and the CIM-411 and CIM-421 Analog I/O Boards. Real-time modules include a handler for the System-Level Fail-Safe Timer and cold/warm start initialization. A linkable, interactive, system-level debugger is also supplied.

CIM™, NSC800™, STARPLEX™, and ISE™ are trademarks of National Semiconductor Corp.
Z80® is a registered trademark of Zilog, Inc.

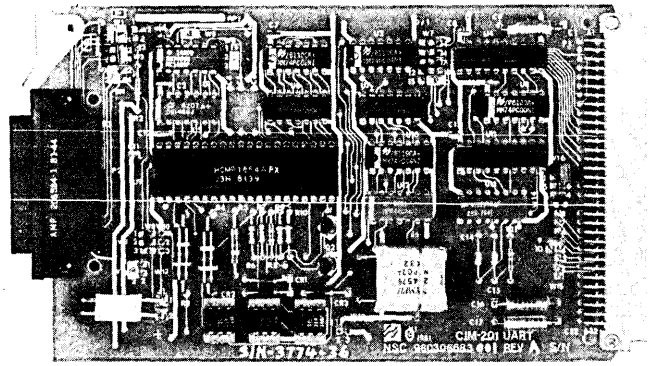
© 1982 National Semiconductor Corp. TL/T5088

CIM™-100/104/108 Memory Expansion Boards



- Adds RAM and/or PROM to a SERIES/800™ system
- Supports 2k x 8 PROM/RAM and 4k x 8 PROM devices
- Address-assignable on 16k boundaries
- High performance, low power P²CMOS™ and CMOS technology
- Fits CIM-602/604 card cage
- All required connections for CIMBUS™ compatibility provided on-board
- Single 5 V_{DC} power supply
- −40°C to +85°C (−40°F to +185°F) operating temperature range
- Built solely with components burned in to A+ levels

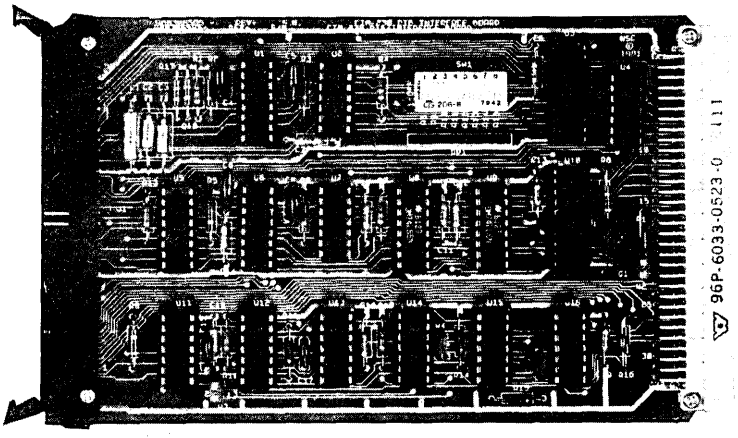
CIM™-201 Serial Input/Output Board



- Single-channel asynchronous transfer of serial data
- RS-232C or optically isolated 20 mA current loop operation
- Interfaces with wide variety of terminals, computers, printers, and other peripheral equipment
- May be configured as either data set (DCE) or data terminal (DTE)
- Can be used in pairs in demand/response mode
- User-selectable baud rates from 50 to 153600
- Standard 25-pin "D" connector for serial data
- CIMBUS™-compatible with SERIES/800™ line
- Small 100 mm x 160 mm Eurocard form fits directly into CIM-602/604 card cages
- P²CMOS™ and CMOS technology give high reliability at low power consumption
- −40°C to +85°C (−40°F to +185°F) operating temperature range
- Designed for demanding use under harsh environmental conditions
- Built solely with components burned in to A+ levels

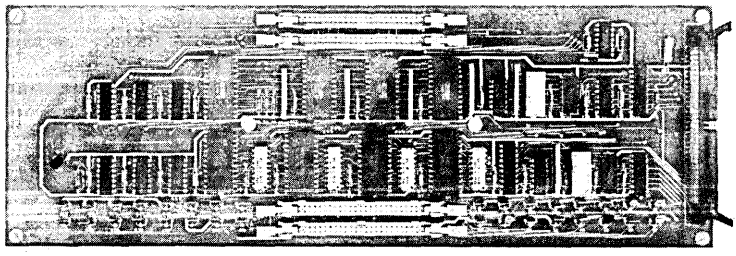
© IC MASTER 1983

CIM™-230
Distributed I/O Bus (DIB™) Interface Board



- **Provides the interface between the CIMBUS™ and the DIB**
- **Small (100 mm × 160 mm) single-wide Eurocard form fits CIM-602/604 card cages**
- **P²CMOS™ and CMOS technology give high reliability at low power consumption**
- **−40°C to +85°C (−40°F to +185°F) operating temperature range**
- **Built solely with components burned in to A+ levels**
- **DIB offers advantages for many applications**
  - —Software I/O routines are the same for all DIB I/O
  - —Single 60-pin flat cable used to interface/multi-drop up to 256 input ports and 256 output ports
  - —Polarized interface hardware ensures correct connections
  - —Switched high voltage/current interfaces remote from card cage
  - —Form factor and mounting method for user-designed DIB boards dictated only by application convenience

CIM™-311
Power I/O DIB™ Board

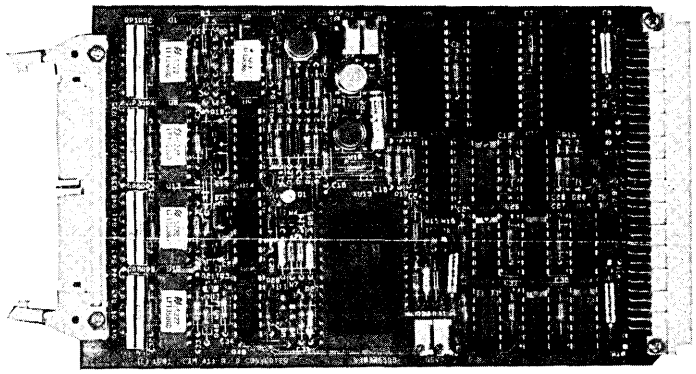


- **Allows the instant addition of popular solid state relay racks to a CIMBUS™ system**
  - Provides high voltage/current switching
  - Isolates switching-induced noise from the computer bus
  - Provides terminal strips for interface connections
- **Four maskable interrupts on positive or negative-going signals, or on any change of state**
- **Interfaces to a CIMBUS system via the Distributed I/O Bus (DIB)**
- **−40°C to +85°C (−40°F to +185°F) operating temperature range**
- **P²CMOS™ and CMOS technology provides high reliability**
- **Built solely with components burned in to A+ levels**

© IC MASTER 1983

National Semiconductor

CIM™-411 Analog Input Board



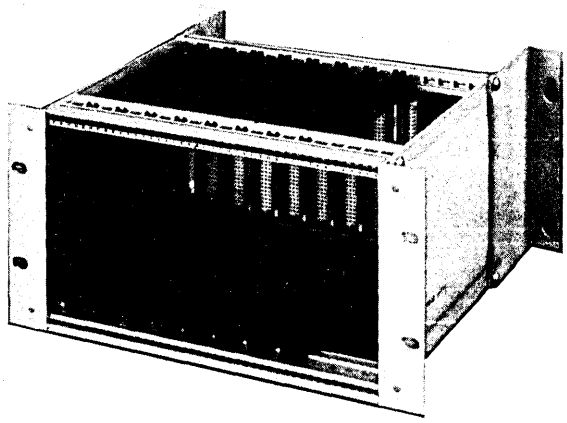
- 32 single-ended, 16 differential, or 8 differential and 16 single-ended channels
- CPU program scan control: interrupt, hold, poll, or hold and poll
- Continuously adjustable input ranges between 1 to 2 and 10 to 20, or 4 mA to 20 mA current loop
- 12-bit resolution
- 50 μs conversion time
- P²CMOS™ and CMOS technology give high reliability at low power consumption
- −40°C to +85°C (−40°F to +185°F) operating temperature range
- CIMBUS™-compatible with SERIES/800™ line
- Small (100 mm × 160 mm) single-wide Eurocard form fits CIM-602/604 card cages
- Built solely with components burned in to A+ levels

CIM™-421 Analog Output Board

- Two output channels
- 12-bit resolution
- Voltage or current-mode outputs
  —0V to +10V
  — −10V to +10V
  —4 mA to 20 mA current loop
- P²CMOS™ and CMOS technology give high reliability at low power consumption
- −40°C to +85°C (−40°F to +185°F) operating temperature range
- CIMBUS™-compatible with SERIES/800™ line
- Small (100 mm × 160 mm) single-wide Eurocard form fits CIM-602/604 card cages
- Built solely with components burned in to A+ levels

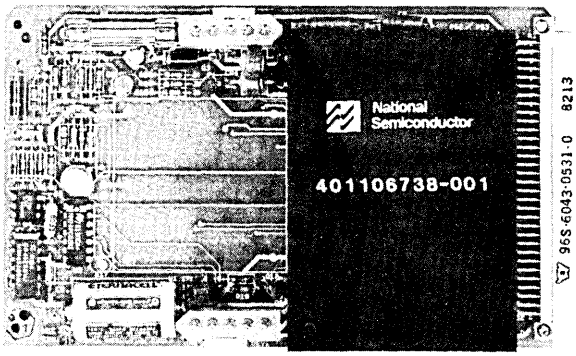
© IC MASTER 1983

CIM™-602/604 CIMBUS™ Card Cages



- Two versions
  - CIM-602: 8 slots, 10.5 inches wide
  - CIM-604: 18 slots, 19 inches wide
- Backplane and power supply connectors included
- Prototyping slots included in CIM-604
- Full access to active system components/ signals available with CIM-640 Extender Board
- Provisions for front or rear mounting
- NEMA enclosure and RETMA chassis-compatible
- −40°C to +85°C (−40°F to +185°F) operating temperature range
- CIMBUS-compatible with SERIES/800™ line

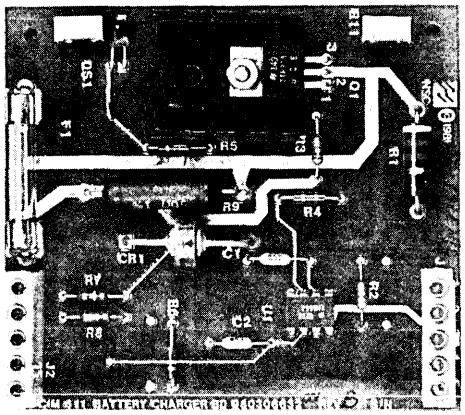
CIM™-610 Voltage Regulator Board



- Supplies +5, +15, and −15 V_{DC} to CIMBUS™ interface
- Accepts unregulated DC input from 10.5 to 17.0 volts
- Detects both AC and DC power failures
- Provides RAM backup power from on-board lithium battery
- Self-protects against overloads, transients, and shorts
- Provides connectors for direct mounting of CIM-611 Battery Charger Board
- P²CMOS™ and CMOS technology give high reliability at low power consumption
- Operating temperatures range from −40°C to +85°C (−40°F to +185°F)
- CIMBUS-compatible with SERIES/800™ line
- Small (100mm x 160mm) single-wide Eurocard form fits CIM-602/604 card cages
- Built solely with components burned in to A+ levels

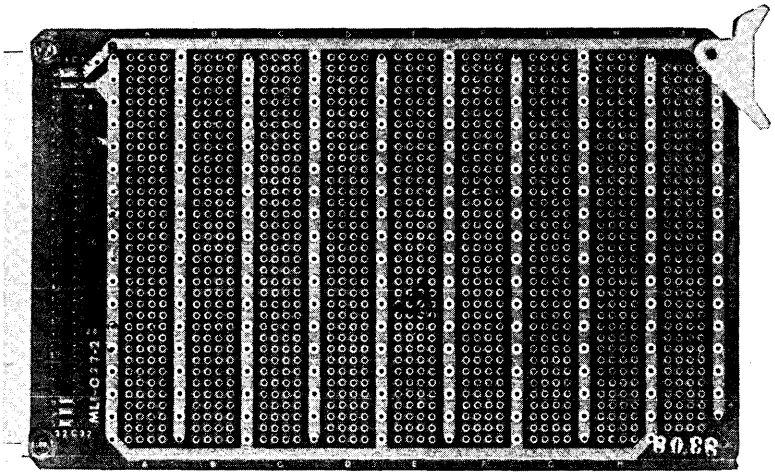
© IC MASTER 1983

CIM™-611
Battery Charger Board



- Mounts directly on CIM-610 Voltage Regulator Board
- Automatically adjusts charge current to state of battery discharge
- Two charge rates — trickle and "fast"
- Operating temperature range from −40°C to +85°C (−40°F to +185°F)
- Built solely with components burned in to A+ levels

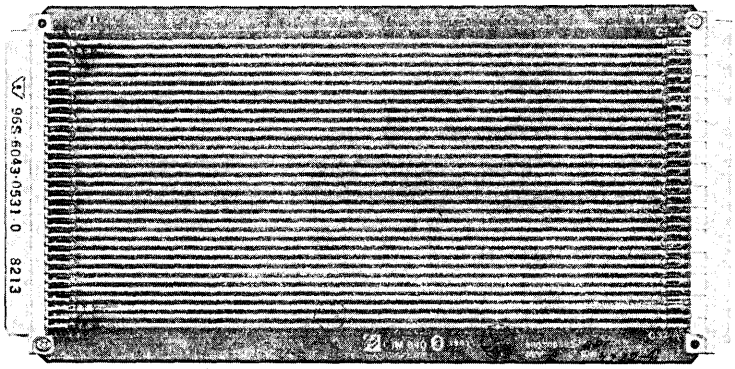
CIM™-630
Prototyping Board



- Permits addition of user-designed circuitry to a CIMBUS™ system
- Capacity for 32 16-pin DIPs
- Plugs directly into CIM-602/604 card cages

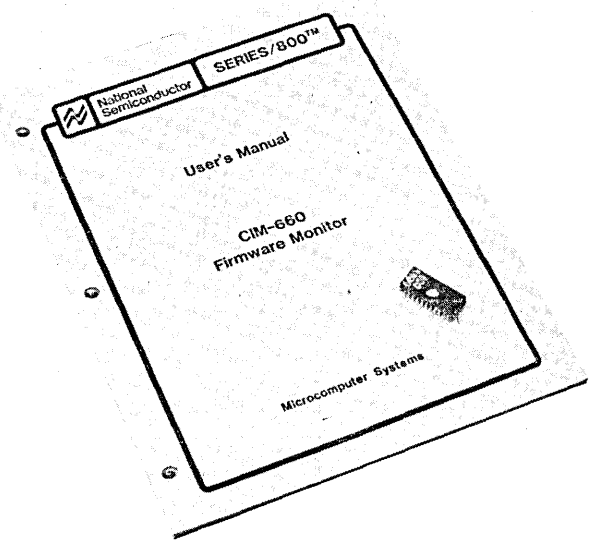
© IC MASTER 1983

CIM™-640 Extender Board



- Complete access to a CIMBUS™ board for troubleshooting or debugging
- Power isolation allows removal/insertion of boards without loss of data or functions as well as current measurement in a powered system
- Easily accessible test points for fast examination of bus and control signals

CIM™-660 Firmware Monitor



- Single-chip system monitor for CIM-800 boards
- Display contents of memory or processor registers
- Modify contents of memory or processor registers
- Modify user programs dynamically
- Move blocks of data
- Perform hexadecimal arithmetic
- Search memory for specified data byte
- Execute user programs from monitor
- Insert breakpoints in user programs
- Input or output a byte of data
- Resides in a single NMC27C16 EPROM

© IC MASTER 1983

Microboard Computer Modules

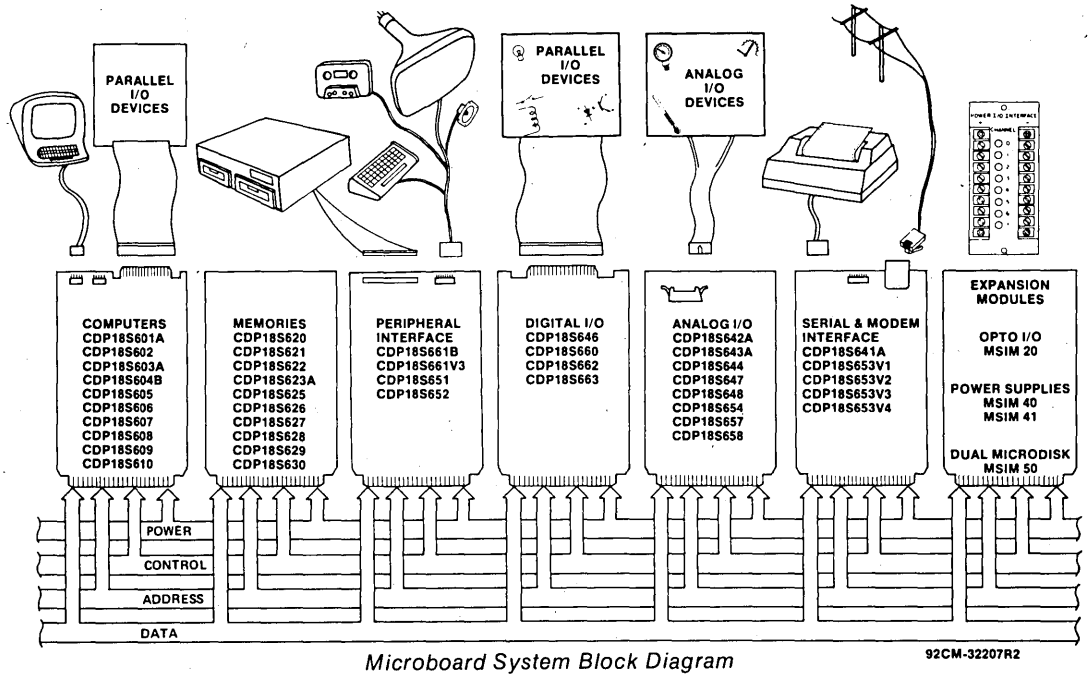
The RCA CDP18S600 series includes a line of single-board computers plus a variety of expansion memory and I/O boards and accessory hardware. These boards may be combined to provide customized microcomputer systems for specific applications.

The CDP18S601 through CDP18S605 are functionally identical to the CDP18S606 through CDP18S610, respectively, except that the latter group of Microboard computers have the CDP1805 CPU which includes a timer/counter.

- **Simple to use**
- **Low-cost power supply**
- **Compact universal bus**
- **Excellent noise immunity**
- **100% testing and burn-in**
- **Wide operating temperature range (-40°C to +85°C for most types)**
- **Low-power operation**
- **Development-system capability**

Microboard Computers

Microboard Computer	Clock Frequency (MHz)	RAM (btyes)	ROM (bytes)	Serial I/O Port	I/O Lines	Ctr. Timer	Power* V	Power* (mA)	Temperature Range (°C)
CDP18S601A CPU:CDP1802 — **CDP18S606** CPU:CDP1805	2	4K	4K (CDP1834) 4K (2708) 4K (2758) 8K (2716)	Software-driven; Q output; flag input	25: 20 programmable I/O (CDP1851); 4 flag inputs, 1 Q output	— / 1	+5	10	-40 to +85
CDP18S602 CPU:CDP1802 — **CDP18S607** CPU:CDP1805	Selectable: 2.4576, 1.2288, 0.6144, or 0.3072	2K	2K (CDP1834) 2K (2758) 4K (2716)	UART: 14 selectable baud rates from 50 to 19200 baud	21: 8 inputs (CDP1852), 8 outputs (CDP1852), 4 flag inputs, 1 Q output	— / 1	+5	8	-40 to +85
CDP18S603A CPU:CDP1802 — **CDP18S608** CPU:CDP1805	2	1K	4K (CDP1834) 4K (2708) 4K (2758) 8K (2716)	Software-driven; Q output; flag input	25: 20 programmable I/O (CDP1851); 4 flag inputs; 1 Q output	— / 1	+5	7	-40 to +85
CDP18S604B CPU:CDP1802 — **CDP18S609** CPU:CDP1805	2.097152	1K	1K (CDP1834) 1K (2758) 2K (2716) 4K (2732)	—	23: 8 inputs (CDP1852), 8 outputs (CDP1852), 4 flag inputs, 1 Q output 1 timer out 1 timer control	1 / 2	+5	4	-40 to +85
CDP18S605 CPU:CDP1802 — **CDP18S610** CDU:CDP1805	Selectable: 2.4576, 1.2288, 0.6144, or 0.3072	2K	2K (CDP1834) 2K (2758) 4K (2716)	UART: 14 selectable baud rates from 50 to 19200 baud	—	— / 1	+5	8	-40 to +85



Microboard System Block Diagram

© IC MASTER 1983

Microboard Computer Modules
Microboard Memories

Microboard	Memory Type	Memory Bytes	Data Rentention	Power* (V)	Power* (mA)	Temperature Range (°C)
CDP18S620	Static CMOS RAM	4K	—	5	4	-40 to 85
CDP18S621	Static CMOS RAM	16 K	—	5	6	-40 to 85
CDP18S622	Static CMOS RAM	8 K	96 h	5	13[1]	-40 to 70
CDP18S623A	Static CMOS RAM	8 K	—	5	6	-40 to 85
CDP18S625	ROM/PROM	8/16/32 K	Permanent	5	10[2]	-40 to 85
CDP18S626	ROM/EPROM, RAM	32/64 K	Permanent (ROM's)	5	100[3]	-40 to 70[6]
CDP18S627	CMOS EPROM	4 K	Permanent	5	8[4]	-40 to 85
CDP18S628	High-Speed RAM/ROM	32/64 K	Permanent	5	1.5[7]	-40 to 85
CDP18S629	Static CMOS RAM	32 K	—	5	27[5]	-40 to 85
CDP18S630	High-Speed RAM	8 K	—	5	13	-40 to 85
CDP18S631	High-Speed RAM	16 K	—	5	13	-40 to 85
CDP18S632	High-Speed RAM	32 K	—	5	13	-40 to 85

*Typical
[1]Operating current with batteries on trickle charge
[2]Populated with eight CDP1834 CMOS ROM's
[3]Populated with sixteen 2716 EPROM's
[4]Populated with sixteen CDP18U42 CMOS EPROM's
[5]Populated with sixteen 6116 CMOS RAM's
[6]For operation at full temperature range the user should select ROM's or RAM's having suitable temperature specifications
[7]Plus memory parts

Digital I/O Expansion Modules

Microboard	Serial I/O Port	I/O Lines	Memory RAM (bytes)	Memory ROM (bytes)	Power* (V)	Power* (mA)	Temperature Range (°C)
CDP18S640A	—	20 Lines Interface for Microterminal CDP18S021	256	1 K UT60	5	350	0 to 70
CDP18S640A1	—	20 Lines Interface for Microterminal CDP18S021	256	1 K UT61	5	350	0 to 70
CDP18S641A	UART:110-19200 baud	—	—	—	5	2.01[1]	-40 to 85
CDP18S646	—	Three 8-bit output ports; one 8-bit input port	—	—	5	3[2]	-40 to 85
CDP18S650	—	8 Counter-Timer Modules; I/O lines on 36-pin header	—	—	5	10	-40 to 85
CDP18S651	—	Handles most floppy disk drives	—	—	+5	250	0 to 70
CDP18S652	2-cassette tape I/O ports	—	1 K	24 K	5	10	0 to 70
CDP18S653V1, V3 CDP18S653V2, V4	300-baud modem 1200-baud modem	—	—	—	5,12	12,34	-40 to 85
CDP18S660	—	40 programmable I/O (2 CDP1851's) input, output, or bidirectional	2 K	8 K	5	8	-40 to 85
CDP18S662	—	24 bidirectional parallel Opto 22 Interface	—	—	5	10	-40 to 85
CDP18S663	—	8 input, 8 output optically Isolated DC lines	—	—	5	85	-40 to 85

*Tyical
[1]Plus additional power required by data terminal
[2]Disk drive and printer connected and reset.

© IC MASTER 1983

Microboard Computer Modules
Microboard Expansion Modules

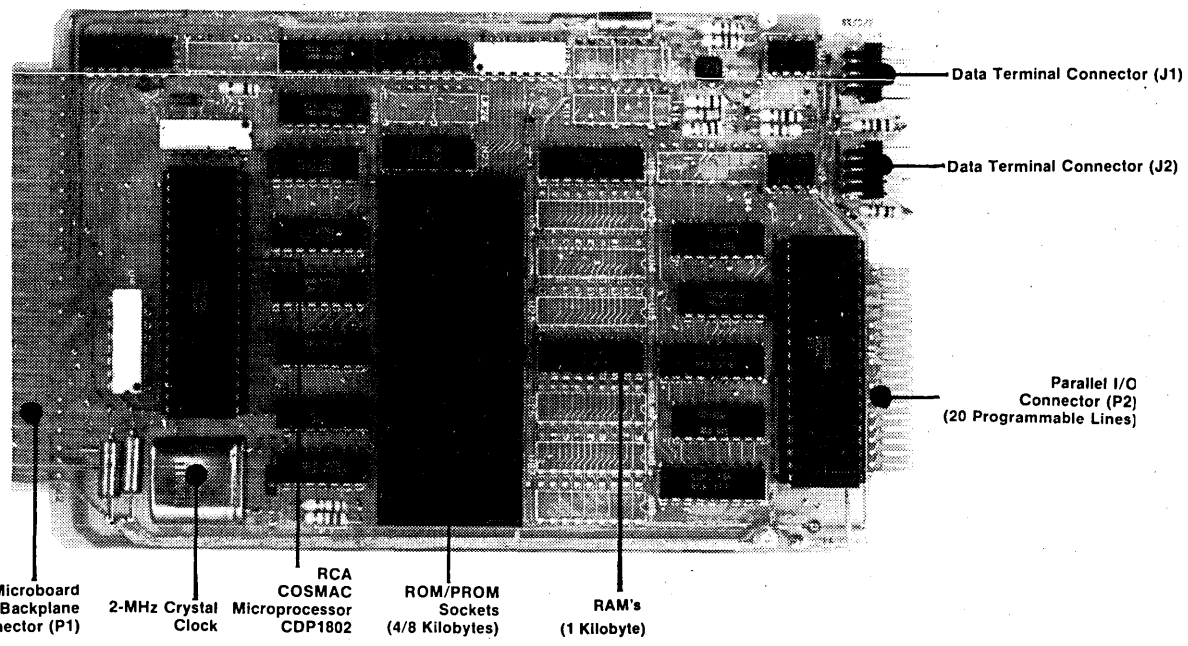
Microboard	Video Signal	Dot Matrix	Page Memory Capacity	Page Memory Address	Character Memory Capacity	Character Memory Address	I/O Addressing	Power (V)	Power (mA)
CDP18S661B	NTSC	6 x 8	1 K	F800 through FBFF	1 K	F400 through F7FF	Two-level group select: 80-F0, link selectable	5	27[1]
CDP18S661V3	PAL	6 x 9	1 K	F800 through FBFF	1 K	F400 through F7FF	Two-level group select: 80-F0 link selectable	5	10[1]

[1]Typical; not including audio output

Microboard A/D and D/A Converters

Microboard	Version	Resolution (bits)	No. of Channels	I/O Voltage Ranges (V)	Accuracy at 25°C[5] (least significant bits) Linearity	Gain	Offset	Settling (S) or Conversion (C) Time (μs)	Power[6] (V)	Power[6] (mA)	Temperature Range (°C)
CDP18S642	D/A[2]	12/8	2	±2.5, ±5, or ± 10 0 to 2.5, 5, 10	±½	±½	±½	5 (S)	+5 +15 -15	26 50 50	-25 to 85
CDP18S643A	A/D[1]	12/8	8/16	±2.5, ±5, or ±10 0 to 2.5, 5, 10	±½	±½	±½	105/275 (C)	+5 +15 -15	85 50 50	-25 to 85
CDP18S644	A/D[1] D/A[2]	8 8	8/16 2	±2.5, or 0 to 2.5 ±2.5, or 0 to 2.5	±¾ ±½	±¾ ±½	±¾ ±½	215 (C) 15 (S)	+5	50	-40 to 85
CDP18S647	D/A[2]	8	2	±2.5, or 0 to 2.5	±½	±½	±½	15 (S)	+5	22	-40 to 85
CDP18S648	A/D[1]	8	8/16	±2.5, or 0 to 2.5	±¾	±¾	±¾	215 (C)	+5	40	-40 to 85
CDP18S654	A/D[3] D/A[4]	8 8	8/16 2	0 to 2.5 0 to 2.5	±¾ ±½	±¾ ±½	±¾ ±½	215 (C) 15 (S)	+5	15	-40 to 85
CDP18S657	D/A[4]	8	2	0 to 2.5	±½	±½	±½	15 (S)	+5	9	-40 to 85
CDP18S658	A/D[3]	8	8/16	0 to 2.5	±¾	±¾	±¾	215 (C)	+5	13	-40 to 85

[6]Typical [1]Binary or unipolar input [2]Binary or unipolar out [3]Unipolar input [4]Unipolar output
[5]Microboards provide offset and gain adjustments permitting the user to null total system error



CDP18S603A Microboard Computer

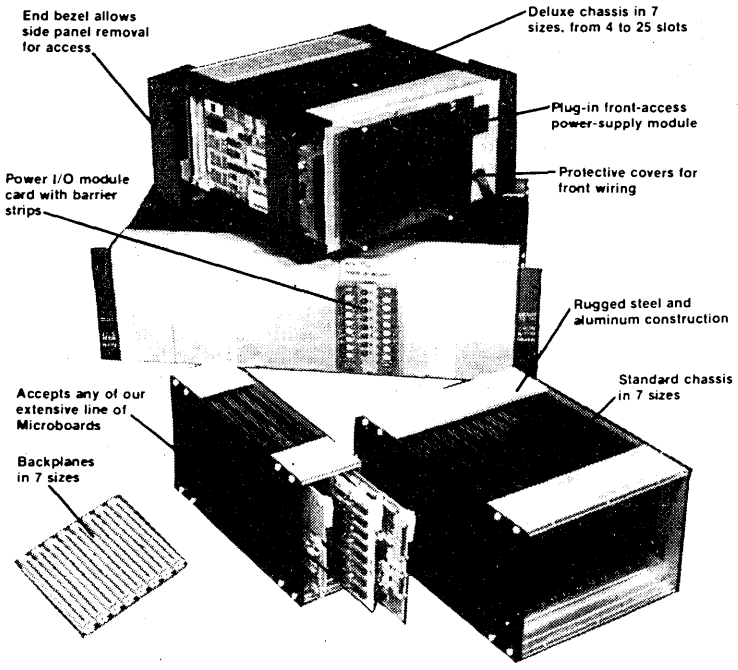
© IC MASTER 1983

Microboard Industrial Chassis and Accessories

Chassis

No. of Slots	Standard Industrial Chassis	Deluxe Industrial Chassis	Backplanes With Connector
4	MSI 804	MSI 8804	MSI 8004
8	MSI 808	MSI 8808	MSI 8008
12	MSI 812	MSI 8812	MSI 8012
16	MSI 816	MSI 8816	MSI 8016
20	MSI 820	MSI 8820	MSI 8020
24	MSI 824	MSI 8824	MSI 8024
25	MSI 825	MSI 8825	MSI 8025
Features Include:	• Rugged steel and aluminum chassis • 44-pin, 0.156-inch pitch card connectors mounted on 6-inch centers Full-length card guides • Card extractor rail • Stick-on rubber feet • Power-supply connector	• All features of standard chassis plus — • Slide-in solid top and bottom covers • Screw-fastened front and rear panels • Standoff mounted see-through front panel guard • Two carrying handle/end bezels • Two mounting angle brackets	• Bare microboard backplane/ connector assembly from Standard chassis with power-supply connector

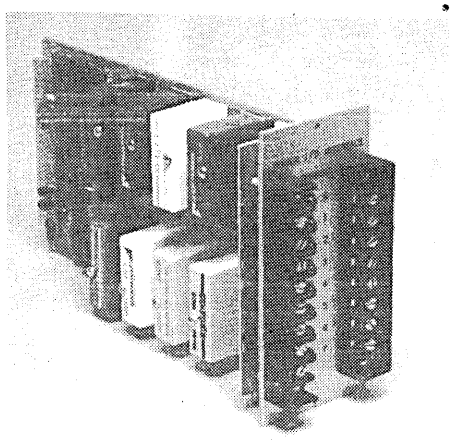
Module	Function	Size (# slots)	Power V	Power A	Temperature Range (deg C)
MSIM20	Power I/O Interface 8 channels of industry-standard optically isolated I/O modules	4	5	0.08	-40 to +85
MSIM40 **MSIM40E**	Triple output supply: +5V @ 3A +15V @ 1.6A, -15V @ 0.8A. Supplies power directly to backplane.	4	90-132 180-264 VAC		-40 to +85 at reduced power
MSIM41 **MSIM41E**	Triple output power supply: +5V @ 2A, +15V @0.4A, -15V @ 0.4A. Supplies power directly to backplane	4	103-127 207-253		0 to +70 at reduced power
MSIM50	Dual 3½" disk drive assembly: Up to 645 kilobytes storage, interfaces with CDP18S651, powered from backplane	8	15 5	0.8 1.2	+5 to +45



Industrial Chassis Series

Accessories

MSIA 0100 series—Solid top and bottom covers
MSIA 0200 series—Perforated top and bottom covers
MSIA 0300 series—Solid rear panels
MSIA 0400 series—Front panel guards
MSIA 06—Mounting angle brackets
MISA 08—Four-card front panel
MSIA 10—Cable conduit
MSIA 11—Card extractor



MSIM 20 Power I/O Interface

© IC MASTER 1983

Microboard Computer Development Systems

The Microboard Computer Development Systems (MCDS), economical and highly versatile, facilitate the design of hardware and software for applications based on the CDP1802 CMOS microprocessor.

The CDP18S693 comes complete with an audio-type cassette unit and full-floating point interpreter BASIC 3 (in firmware).

The CDP18S694 includes the following additional features, (also available as options for the CDP18S693): ROM-based Assembler Editor, a second cassette unit for memory storage, and a PROM programmer module.

The CDP18S695 color MCDS is a complete stand-alone software development system for any CDP1802 application. This system, like the CDP-18S694, offers the user the option of developing with Assembler Editor or in BASIC3 high-level language.

MCDS Systems	CDP18S 693	694	695
System Includes:			
• CDP18S601 Computer	X	X	X
• CDP18S652 Memory and Tape I/O	X	X	X
• CDP18S661 Video/Audio Keyboard Interface			X
• Industrial Chassis	X	X	X
• ROM Monitor Program (2K)	X	X	X
• ROM-based BASIC3 Interpreter (12K)—development version	X	X	X
• Cassette I/O Unit for Memory Storage	X	X	X
• Resident ROM-based (6K) ASSEMBLER/EDITOR program		X	X
• CDP18S480 PROM Programmer Module with software		X	X
• VP601 Keyboard and 12-inch Color Monitor			X
System Features			
• Low Cost	X	X	X
• Line editing	X	X	X
• Powerful 1802 I/O constructs in BASIC	X	X	X
• Full BASIC3 with floating point	X	X	X
• Cold/warm start	X	X	X
• 6656 Multiple character variables (256x26)	X	X	X
• Economical memory storage through audio tapes	X	X	X
• Terminal interface: 20-mA or RS232C serial with baud rates to 1200	X	X	
• Expandable by use of Microboard modules	X	X	X

MicroDisk Development System MS2000

The RCA MicroDisk Development MS2000 is a new microprocessor computer system utilizing 3½-inch, high-density microfloppy disk drives. The disks provide 645 kilobytes of on-line mass memory storage. Featuring higher speeds than its predecessors, the MS2000, with its new DMA controller, has reduced system load time from 45 seconds to 0.6 second. The MS2000 is designed to facilitate the development of hardware and software for applications based on the RCA 1800 series of CMOS microprocessor products.

The MicroDisk Development System is contained in a 20-slot Microboard Industrial Chassis. The chassis is 5.76 x 10.08 x 14.7 inches and contains not only the four Microboards provided, but also the power supply and the complete Dual Microfloppy Disk Drives. The chassis provides four additional spare slots for expansion and enhancements with any of the extensive line of RCA Microboards.

The memory includes 62 kilobytes of RAM, 2 kilobytes of ROM and 645 kilobytes of on-line mass memory storage on microfloppy disks. Software provided includes an augmented resident monitor program UT70 and the MicroDOS operating system. MicroDOS includes an Editor and a MacroAssembler ASM8 that operates not only with all the RCA CMOS Microprocessors CDP1802A, CDP1802AC, CDP1802BC, CDP1804AC, CDP1805C, CDP1805AC, CDP1806C, and CDP1806AC, but with RCA Microprocessors to be added to the expanding line.

Conversion programs are included that provide transportability of source code from all other RCA Development Systems to the MS2000.

Optional add-ons include a PROM Programmer package, BASIC1 and BASIC2.

Hardware Features

- **CMOS Microboard Computer with UART Terminal Interface**
- **CMOS Microboard 32-Kilobyte Memory Modules (2)**
- **Microfloppy Disk LSI Controller with DMA CDP18S651**
- **Dual 3½-Inch, High-Density Microfloppy Disk Drive Module (645 KB) MSIM 50**
- **Switching Power Supply Module with Power-On Reset and Control Functions MSIM 40**
- **20-Slot Industrial Microboard Chassis**
- **4 Spare Slots for Expansion with the Extensive RCA Line of over 70 Microboard Products**
- **Two-Kilobyte ROM for Monitor**
- **Two Spare Diskettes**
- **Interface Cables**
- **Operates with Any Standard Data Terminal**
- **Combining with CDP18S040 CRT Terminal Provides Full-Screen Editing**
- **Combining with MSE3001 MicroEmulator Provides Full-Screen Editing plus Debugging Capabilities for All RCA Microprocessors**

Software Features

- **MicroDOS File Management and Operating Systems**
- **MacroAssembler for All RCA Microprocessors**
- **Editor**
- **Higher Operating Speeds**
- **Expanded Monitor Functions**
- **Self-Test Capability**

© IC MASTER 1983

MicroEmulator MSE3001

The RCA MicroEmulator MSE3001 is a powerful, self-contained, portable emulator for simplifying and augmenting the development of microprocessor software and hardware systems. Its modular design enables it to support other 8- and 16-bit microprocessors by simply changing the personality module. As a debugging tool it is used to stop on a condition, check the status of the system under test, modify its state, and continue executing. It operates without the use of any other equipment. As a data terminal, it provides full-screen editing capability and is particularly suited for operation with the new RCA 3½-inch MicroDisk Development System MS2000.

The MicroEmulator has an 80-character by 24-line **cathode-ray** tube that displays sufficient data for a full analysis. It has a full ASCII keyboard plus special-function keys for full-screen editing and soft keys for command entry. The soft keys are defined on the bottom row of the screen and change labels and functions to suit each new task.

The MicroEmulator is a **"user-friendly"** system. It provides the user with several options for entering commands including full-screen editing. It detects errors instantaneously, flags them with English error messages, and restores the original data for reentry. The user may enter a command word by striking one soft key or, if touch typing is preferred, by abbreviating the command word. The MicroEmulator always prompts the user for command data. Experienced users, however, need not wait for prompts and may proceed as rapidly as desired.

The MSE3001 is a versatile, self-contained instrument that can be used very efficiently not only in system design and development, but also in factory testing and field servicing.

Features

POWERFUL EMULATOR

- **Extensive Set of Debugging Facilities**
- **Debug Software Either With or Without System-Under-Test**
- **Handles Multiple Number Bases**
- **16 Real-Time Breakpoints Definable, 4 Active at Any One Time**
- **Disassembly while Executing**
- **Real-Time Memory Map Option**
- **Logic Analyzer Option**

USERS FRIENDLY

- **Full-ASCII Detachable Keyboard plus Special-Function Keys**
- **Full-Screen Debugging**
- **Soft Key Command Entry**
- **Instantaneous Error Detection**
- **9" by 5" CRT**
- **80-Character by 24-Line Display**
- **CRT Data Terminal Capabilities**

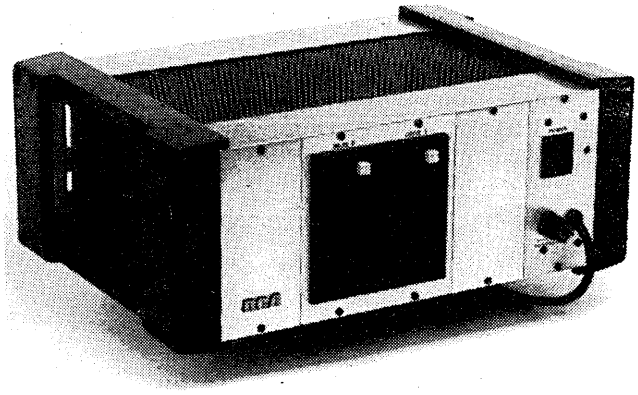
SUPPORTS ALL RCA MICROPROCESSORS

- **Modular**
- **Self Contained**
- **Download and Upload from Most Development Systems and Computers**
- **Portable**

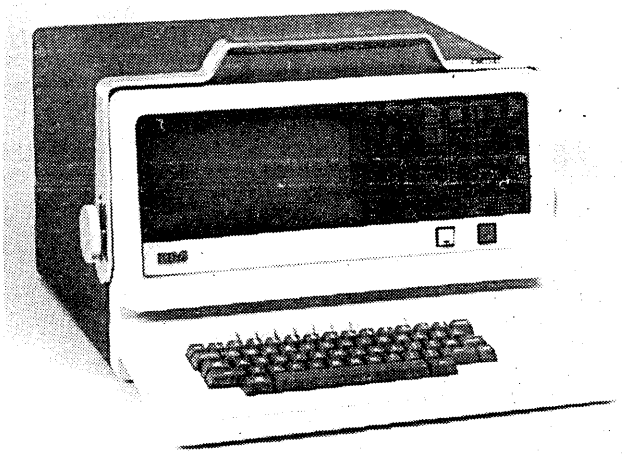
DISPLAYS

Following is a listing of the available screen displays. Each features **full-screen editing** and **soft-key command entry** to modify any and all displayed data.

REGISTERS — All internal CPU registers
MEMORY — Displays full page (256 bytes)
I/O SIGNAL STATUS and control
COUNTER/TIMER — For CDP1804, CDP1805, CDP1806
BREAKPOINT — 4 active breakpoints up to 64 bits wide
RUN — Real time
STEP EXECUTION — Displays address bus, disassembled data bus
CLOCK — Three sources including internal frequency synthesizer
TERMINAL — For any external system including RCA MicroDisk MS2000
MEMORY MAP OPTION — Write-protect capability
LOGIC ANALYZER — Real-time trace data displayed in multiple bases, disassembled or as waveforms



MS2000 MicroDisk Development System

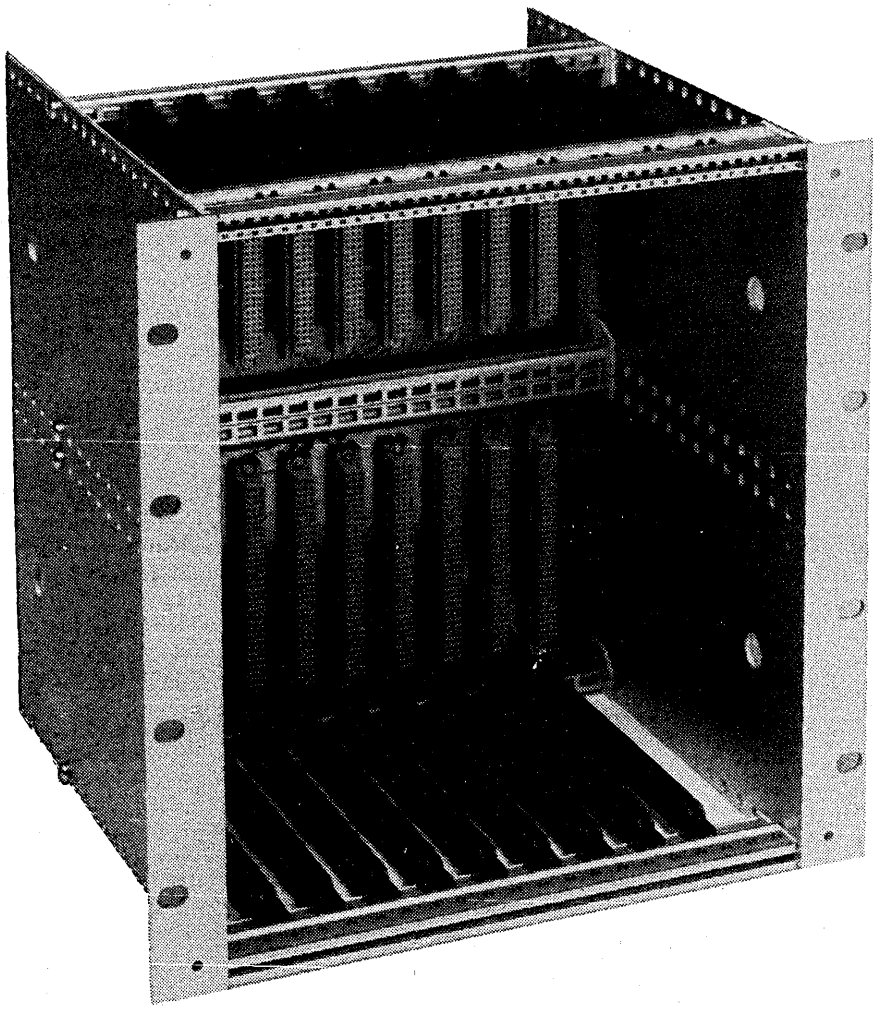


MSE3001 MicroEmulator

© IC MASTER 1983

SMVME0500
CARD CAGE ASSEMBLY

PRODUCT BRIEF
PRELIMINARY



FEATURES

- **Meets all VMEbus specifications**
- **Accommodates up to nine double Eurocard size boards (160mm x 233.4mm)**
- **Includes low noise backplanes with 96 pin J1 and J2 connectors**
- **Compatible with standard VMEbus board front panels and card ejectors**
- **Side flanges for easy mounting**
- **Tapped strips in front permit securing board front panels to cage**

DESCRIPTION

The Signetics nine slot VMEbus card cage is an integral part of the entire Signetics VMEbus product line. It offers the OEM a reliable, low noise, mounting and interconnect facility for configuring VMEbus board based systems to meet the needs of nearly any application. The card cage and associated backplane accommodate up to nine double Eurocard format boards. The card cage allows standard board front panels to be locked in place with screws by utilizing the tapped strips on the front of the cage. The backplanes are resistor terminated at both ends and include both J1 and J2 connectors for all nine slots.

© IC MASTER 1983

SMVME0500 CARD CAGE ASSEMBLY

BACKPLANE FEATURES

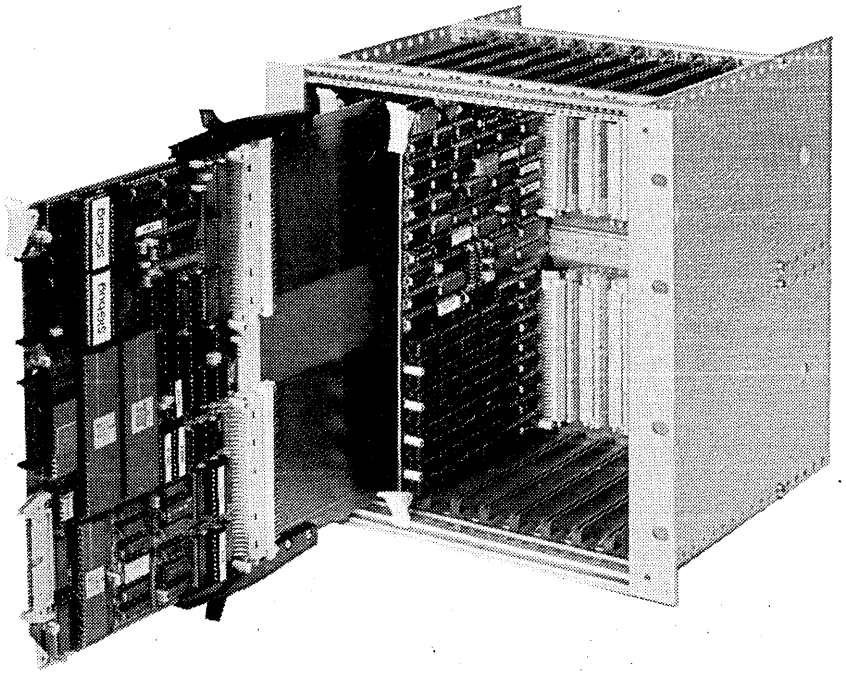
- Meets all VMEbus specifications
- J1 backplane implemented on a five layer board with Signal-Ground-VCC-Ground-Signal designed to insure uniform impedance
- J2 backplane implemented on a two layer board
- 64 pins of user-defined I/O on J2 connector
- Ground lines between adjacent signals to minimize crosstalk
- Terminated at each end as defined in VMEbus specification
- All holes plated through
- Pressfit DIN 41612 connectors with wire wrap tails at each connector position

J1 BACKPLANE SPECIFICATIONS

- Five layer epoxy glass construction
  nominal thickness 2.4mm
  Dialectric to BS4584EP-GC-CU-3 (FR4)
- Copper thickness 35μm finish-plated copper 50μm average
- Tin lead 8μm maximum
- Total 93μm outside layers only
- J1 backplane power connections
  1 - 3 pin polarized "mate-n-lock" (AMP P/N 350776-1)
  3 - 4 pin polarized "mate-n-lock" (AMP P/N 350779-1)
- Power handling capacity of 27 AMPs 5 volts for J1 backplane

J2 BACKPLANE SPECIFICATIONS

- Two layer epoxy glass construction
  nominal thickness 2.4mm
- Copper thickness 35μm finish-plated copper 50μm average
- Tin lead 8μm maximum
- Total 93μm outside layers
- J2 backplane power connections
  1 - 4 pin polarized "mate-n-lock" (AMP P/N 350779-1)
- Power handling capacity of 9 AMPs 5 volts for J2 backplane



CARD CAGE MECHANICAL SPECIFICATIONS

- Overall Dimensions
  Height 278.9mm 10.98 in. (includes wire wrap pins)
  Width 268.6mm 10.575 in. (includes mounting flanges)
  Depth 182mm 7.16 in.
- Number of card slots: 9
- Card format: Double Eurocard (160mm x 233.4mm)
- Weight: 5 lbs.
- Shipping weight: 7 lbs.

ORDERING INFORMATION

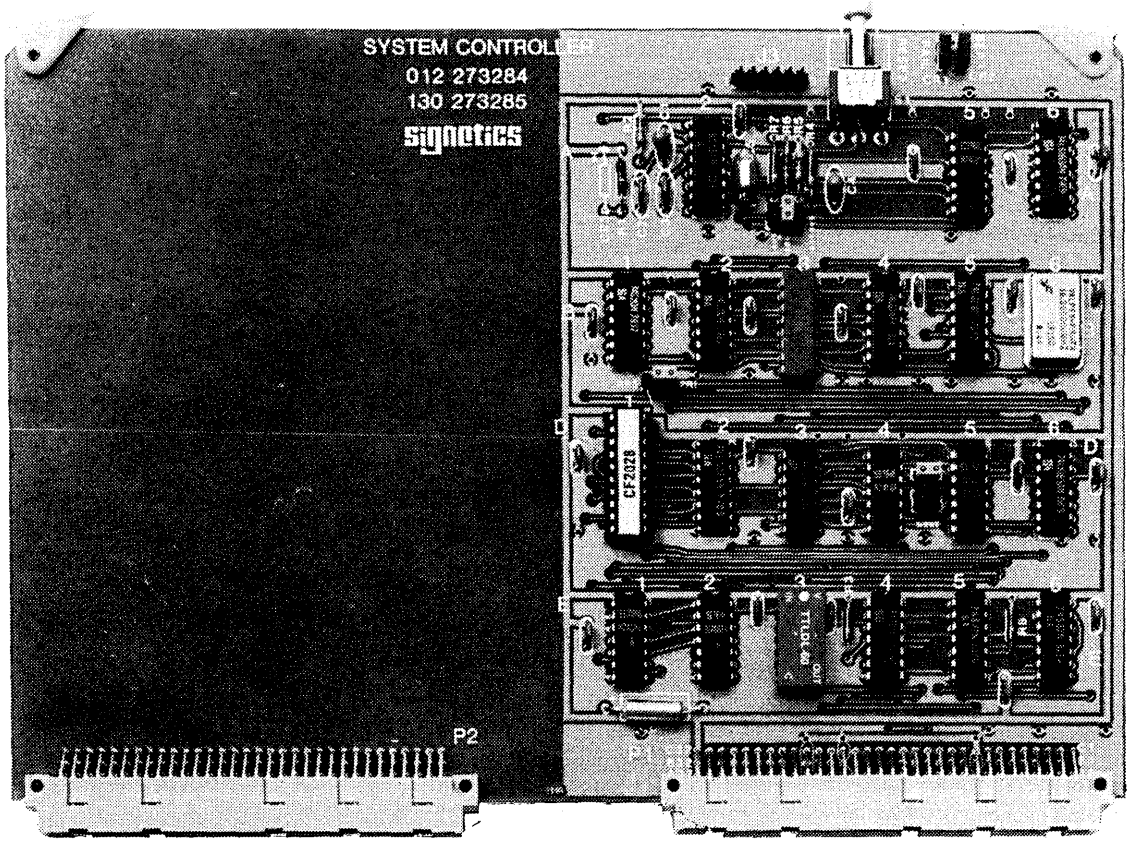
SMVME0500	VMEbus card cage assembly, 9-slot, including backplane assemblies J1 and J2
SMVME0600	VMEbus backplane assembly, 9-slot, J2 PC board with connectors and terminators
SMVME0700	VMEbus backplane assembly, 9-slot, J1 PC board with connectors and terminators
SMMAN6000	VMEbus Specification Manual
SMMAN3005	VMEbus Card Cage Assembly User Manual

© IC MASTER 1983

Signetics

SMVME1500
VMEbus SYSTEM CONTROLLER

PRODUCT BRIEF
PRELIMINARY



FEATURES

- **PROVIDES TOTAL BUS ARBITRATION**
  Selectable for Priority and Round-Robin modes on all 4 arbitration levels
- **SUPPORTS ORDERLY SYSTEM SHUTDOWN**
  Provides early AC power fail notification
- **MONITORS SYSTEM OPERATION**
  Implements selectable watchdog timer and detects improper address conditions
- **PROVIDES ALL SYSTEM UTILITIES**
  Generates 16MHz system clock and 4MHz serial bus clock
- **VMEbus COMPATIBLE**

DESCRIPTION

The VMEbus System Controller Module is one of the fundamental building blocks in the Signetics Modular Board product family. It consolidates, in a single module, all of the bus arbitration, system utilities, and system monitors which the user finds needlessly replicated in other offerings. This implementation allows system designers the flexibility to utilize multiple Central Processing Modules, as their application dictates, without conflict or costly duplication of circuitry. The System Controller Module is particularly well suited to high performance microcomputer systems which require multiprocessing and intelligent DMA facilities.

This product has been specifically designed to provide system level functions for VMEbus based systems while complementing the proven reliability of the DIN connectors and DIN form factor. The System Controller Module provides user selectable options which give the system designer a high degree of flexibility in optimizing the system configuration for a variety of 8, 16, and 32-bit applications.

© IC MASTER 1983

SMVME1500 VMEbus SYSTEM CONTROLLER MODULE

BUS ARBITRATION

The System Controller Module includes all the circuitry necessary to support total bus arbitration in a VMEbus card cage. The arbitration protocol is user selectable for either Priority or Round-Robin modes of operation where the Priority mode grants preference to specific bus masters and the Round Robin mode uniformly distributes bus usage among several bus masters.

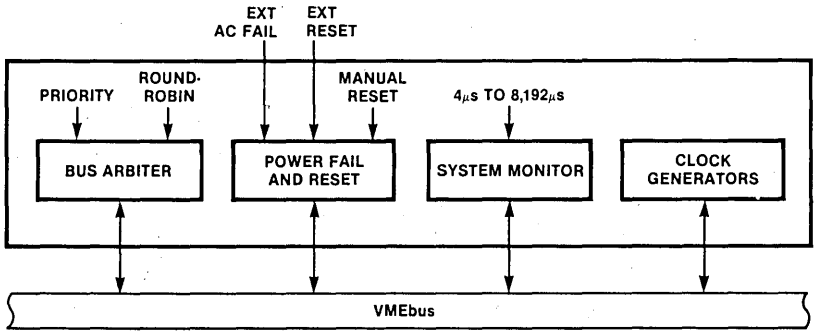
The Priority mode of operation is applicable in a multiple user system where some tasks need more access to the system resources than do others.

The Round-Robin mode of operation is applicable in a multiple user system where all tasks need relatively equal access to the resources of the system.

In either mode a new bus master typically gains control of the system bus within 100ns of release by its predecessor.

AC POWER FAIL AND RESET

In order for systems without battery back-up to support an orderly shutdown, advance notification of AC power loss is necessary. The System Controller module accepts an AC power loss signal as an input and generates the necessary VMEbus signals to allow an orderly and recoverable system shutdown to be implemented. System reset is coordinated with the AC FAIL signal or can be manually initiated by a switch located on the module or from an external source such as a front panel.



SYSTEM CONTROLLER MODULE

SYSTEM OPERATION MONITORS

Application software errors may occur in systems from time to time. These software errors often result in "system hang-up" due to the software accidentally attempting to access a non-existent module or attempting to access a module in an incorrect manner. To aid in recovering from these errors the System Controller Module contains a watch dog timer and address verification circuitry. The watch dog timer is user selectable for a range of timeout values from 4μs to 8,192μs in 12 steps by powers of 2 which, if exceeded, will notify the bus master of an error condition. The address verification function monitors the bus and notifies the bus master of an error condition if an illegal address combination occurs.

SYSTEM UTILITIES

The System Controller Module supplies the independent 16MHz system clock which is available for general clocking functions by other modules in the card cage. This product also supplies the serial bus clock which is required by systems utilizing the serial data communication channel for inter-module information exchange.

ORDERING INFORMATION

SMVME1500	VMEbus System Controller Module
SMMAN3015	VMEbus System Controller Module User Manual

SPECIFICATIONS

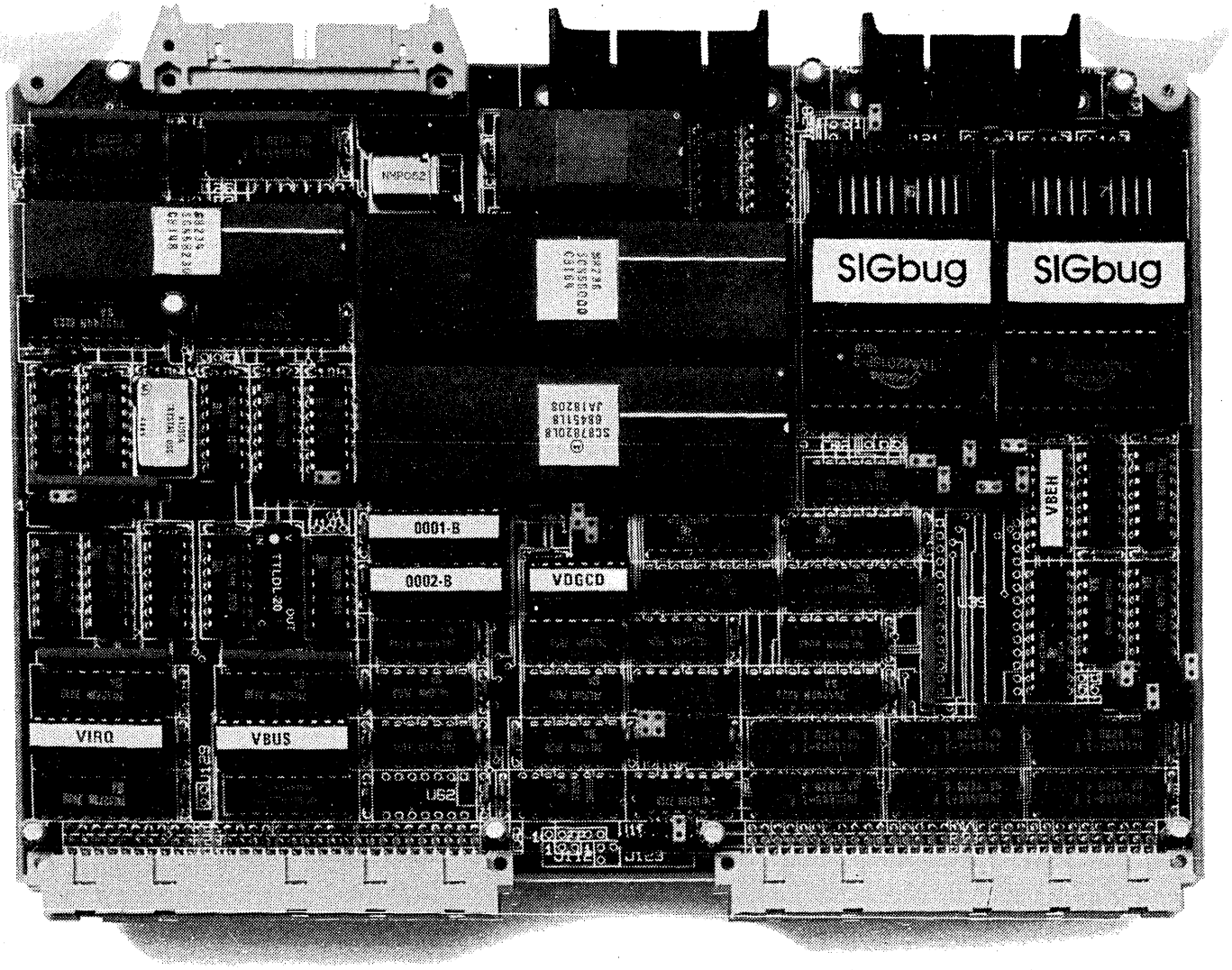
USAGE	— 1 per VMEbus card cage, mounted in SLOT 1
DIMENSIONS	— 160mm x 233.4mm
POWER	— .5A typ (.8A max) at + 5VDC
TEMPERATURE	— 0 to 55 deg C operating
HUMIDITY	— 8% to 80% non-condensing
ALLOCATION SPEED	— 100ns typ, 130ns max
CLOCKS	— 16MHz 50% duty cycle, 4MHz 25% duty cycle
INDICATORS	— BUS ERROR, SYSTEM FAIL
OPTIONS (static)	— BUS ARBITRATION: Priority/Round-Robin TOUT: 4μs to 8,192μs

© IC MASTER 1983

Signetics

SMVME2000
VMEbus CPU MODULE

PRODUCT BRIEF
PRELIMINARY



FEATURES

- **8MHz SCN68000**
- **OPTIONAL MEMORY MANAGEMENT .SCN68451**
- **ON-BOARD MEMORY Up to 48Kb ROM-PROM-EPROM/8Kb RAM**
- **PERIPHERAL I/O PORTS 2 RS232 SCN2681/1-Parallel (SCN68230)**
- **PROGRAMMABLE REAL TIME CLOCK 1-24 bit timer**
- **7 LEVELS OF INTERRUPT**
- **VMEbus COMPATIBLE**

DESCRIPTION

The VMEbus Central Processor Module is one of the high performance building blocks in the Signetics Modular Board product family. It embodies, in a single module, a 68000 based computing function capable of supporting high speed data processing and control environments. This module is ideally suited for a wide range of applications. As a ROM based, single board computer, it is usable in a standalone application requiring no card cage or supporting modules. This provides the user with a compact computing nucleus for dedicated applications. The flexibility extends upward to include memory management for use in more general purpose, disc based, applications requiring multiprogrammed/multitasking solutions. All local I/O devices employ interrupt protocols for programming ease and fast response. This module is designed utilizing multilayer printed circuit techniques with internal power and ground planes in order to minimize noise and provide a reliable, industrial grade product. The Central Processor Module is easily configured to support a wide variety of applications.

© IC MASTER 1983

SMVME2000 VMEbus CPU MODULE

OPTIONAL MEMORY MANAGEMENT

Memory address translation and access protection are provided by the SCN68451 Memory Management Unit (MMU) for the entire addressing range of the SCN68000 CPU. The 16 megabyte address range is partitioned into 32 segments, where each segment can range from 256 bytes to 16 megabytes. The MMU can be bypassed for applications where a single, continuous address space is more appropriate.

CPU

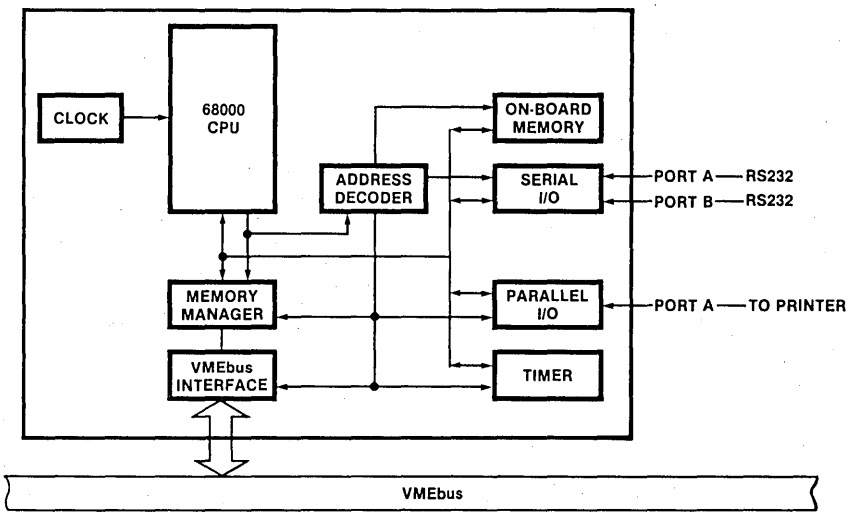
The Processor Module is available with a SCN68000 8MHz CPU. The CPU is configured to fully support up to 1,537 individual interrupting devices. This configuration will support the majority of the applications requiring high performance processing.

ON-BOARD MEMORY

The On-Board Memory is implemented as a local resource to the SCN68000 CPU and, therefore, is protected from other VMEbus modules. Three pairs of sockets are provided. Each pair of sockets are 28 pin JEDEC standard and have sufficient address and data lines for 16K words maximum. VMEbus battery back-up is selectable for each socket pair to support CMOS RAMs and the user can select the memory timing to appropriately match the memory devices used.

ADDRESS DECODER

A decoder PROM selects the on-board resources (Memory, Serial I/O, Parallel I/O, Timer). The PROM is socketed to allow the user the option of repositioning these devices in the address space.



CENTRAL PROCESSOR MODULE

I/O PORTS AND TIMER

Two serial ports are provided and supported by RS232 drivers and receivers. A Signetics SCN2681 DUART is employed. This device provides two independent, full duplex, asynchronous receiver/transmitter channels which are individually programmable for operating mode, data format, and baud rates from 50 to 38.4K.

A parallel port has been provided using a SCN68230 PI/T which is a general purpose, programmable parallel interface device. This interface is user configurable to select up to 16 bi-directional lines under local or external control. This port defaults to support a CENTRONICS printer interface. The SCN68230 also provides the 24-bit programmable timer function.

The timer is program selectable in numerous modes to provide flexible support as a real time clock and all I/O ports are implemented as local resources.

SYSTEM INTERRUPTS

The VMEbus CPU Module can respond to any or all of the seven priority levels of incoming interrupts from the VMEbus and on-board devices.

ORDERING INFORMATION

SMVME2000	VMEbus CPU Module
SMVME2010	VMEbus CPU Module with memory management unit
SMMAN3020	VMEbus CPU Module User Manual

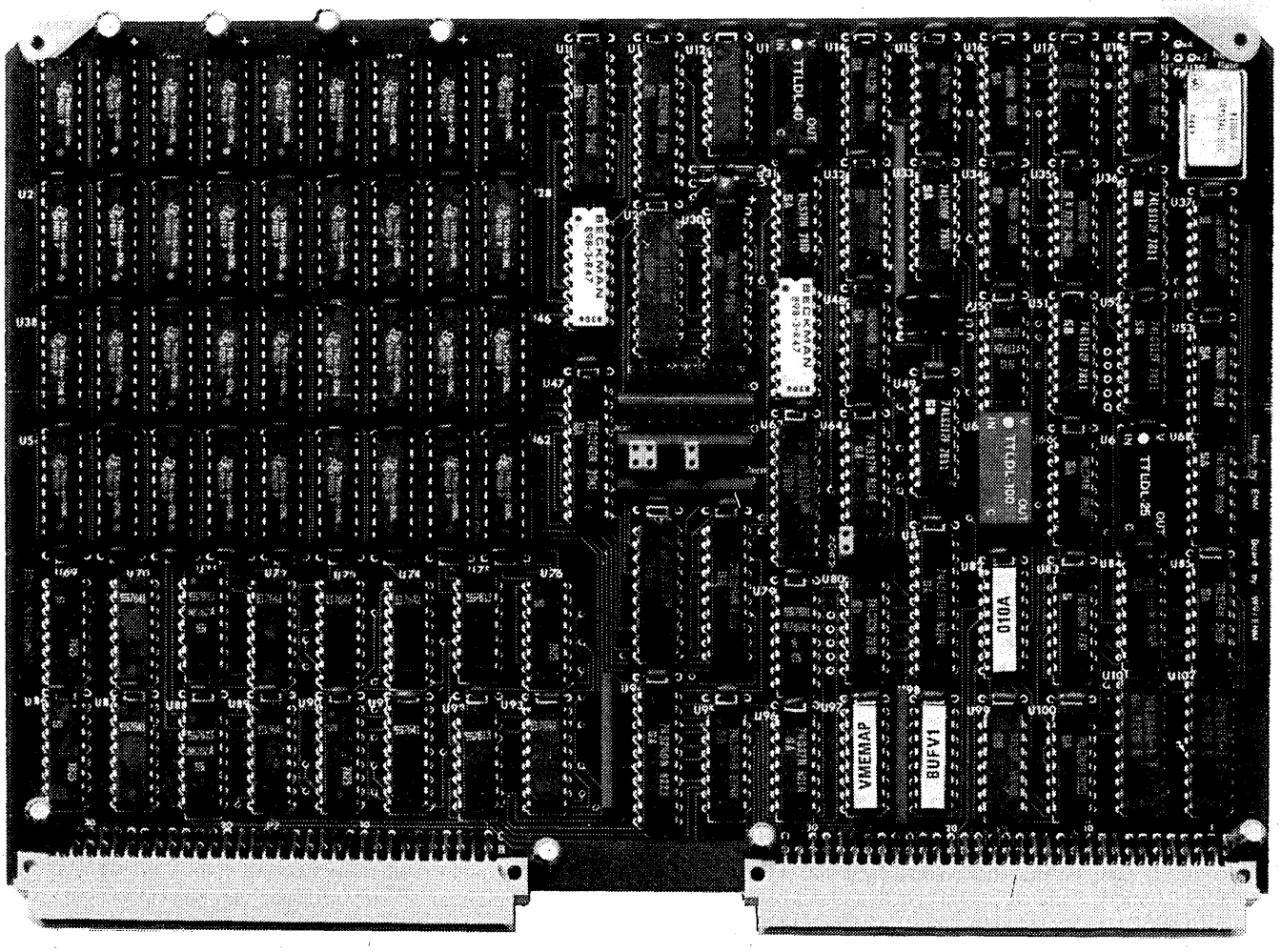
SPECIFICATIONS

CONFIGURATION	DTB Master: A24; D16
USAGE	1 (standalone); 1 or more per VMEbus card cage
DIMENSIONS	160mm x 233.4mm
POWER	2.5a typ (3.0a max) at + 5VDC 40mA typ (50ma max) at + 12VDC 20ma typ (30ma max) at – 12VDC
TEMPERATURE	0 to 55 deg C operating
HUMIDITY	8% to 80% non-condensing
CPU	SCN68000 8MHz
OPTIONS (static)	DTB REQUESTER: any one of levels 1 through 4 INT REQUESTOR: any one of levels 1 through 7 INT HANDLER: all levels 1 through 7 MEMORY: RAM/ROM, type, speed, standby

© IC MASTER 1983

SMVME3100
VMEbus 256K MEMORY MODULE

PRODUCT BRIEF
PRELIMINARY



FEATURES

- **LARGE CAPACITY**
  256K bytes plus parity
- **FLEXIBLE DATA WIDTHS**
  Supports 8, 16, and 32 bit transfers
- **PROTECTION MECHANISMS**
  Selectable for supervisor access only
- **MODERN ARCHITECTURE**
  Supports 2-way interleaving
- **VMEbus COMPATIBLE**

DESCRIPTION

The VMEbus Memory Module is one of the high performance building blocks in the Signetics Modular Board product family. It provides, in a single module, 256K bytes of dynamic random access memory plus parity protection. This module was specifically designed to support 8 bit, 16 bit, and 32 bit data transfers automatically. This feature allows total software flexibility in mixed CPU systems and negates the need to replace memory modules in future system upgrades.

The Memory Module employs modern multilayer, printed circuit techniques with internal power and ground planes in order to minimize noise and provide a reliable, industrial grade product.

© IC MASTER 1983

SMVME3100 VMEbus 256K MEMORY MODULE

MEMORY ARRAY AND PARITY

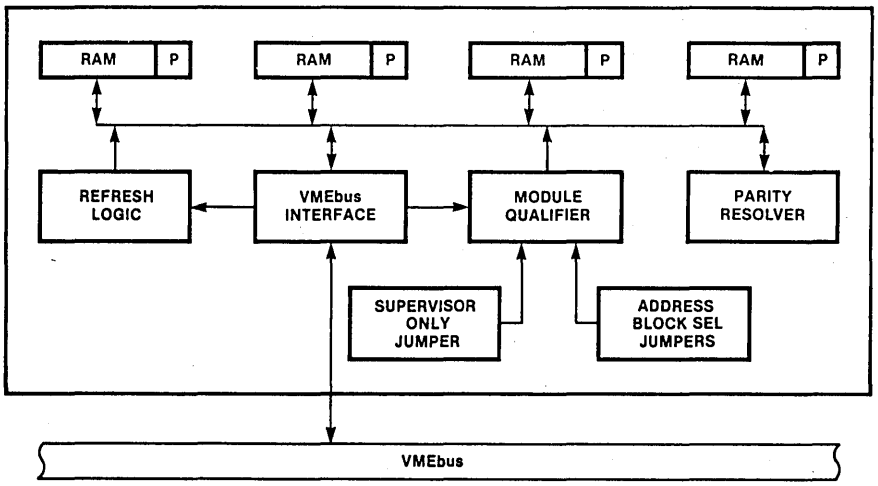
The 256K bytes of dynamic RAM are partitioned into four 64K byte arrays. Parity is generated or checked whenever an array is accessed on an array by array basis. In the D8 mode (byte transfer) only the appropriate array is accessed. In the D16 mode (word transfer) only the appropriate array pair is accessed. In the D32 mode (long word transfer) all arrays are accessed. In every case, the data byte from the accessed array is interfaced to its appropriate byte slot on the VMEbus data lines. Any parity error encountered will result in a bus error (BERR) being returned to the Master.

PROTECTION MECHANISMS

In order to support protected software methodologies, the user may select the supervisor only mode of operation. In this mode the module can only be accessed when the VMEbus address modifier field indicates a supervisor is initiating the access. All non-supervisor accesses will result in a bus error (BERR) return. The memory module may alternately be selected to the supervisor-user mode of access. In this mode the Memory Module will respond to either a supervisor or a user initiated access.

INTERLEAVING

The user may select 2-way interleaving in either the D16 or D32 mode. The effect of interleaving is to decrease the effective memory cycle time. Interleaving can provide a 50% to 100% memory thruput improvement depending on the application. The interleave is accomplished by steering sequential memory accesses to pairs of Memory Modules on an alternating basis. This allows a master (processor or DMA device) access to one of the module pairs while the other module is completing the present cycle and performing refresh. This feature requires Memory Modules using this mode to exist in pairs. The Memory Module is selectable for either D16 or D32 operation which is included specifically for the interleaving mode. Other Memory Modules residing in the VMEbus card cage which do not have the interleaving mode enabled are not affected.



MEMORY MODULE

ADDRESS BLOCK

The Memory Module provides user selection on any 256K byte boundary in the 16M byte address space.

REFRESH LOGIC

The memory arrays are refreshed in one of two modes. The primary mode is to perform a refresh immediately after a memory access cycle (often referred to as "hidden refresh"). In the backup mode, if no memory access occurs for 8 microseconds, the module then "forces" a refresh by self initiating a refresh cycle.

ORDERING INFORMATION

SMVME3100	VMEbus 256K Memory Module
SMMAN3031	VMEbus 256K Memory Module User Guide

SPECIFICATIONS

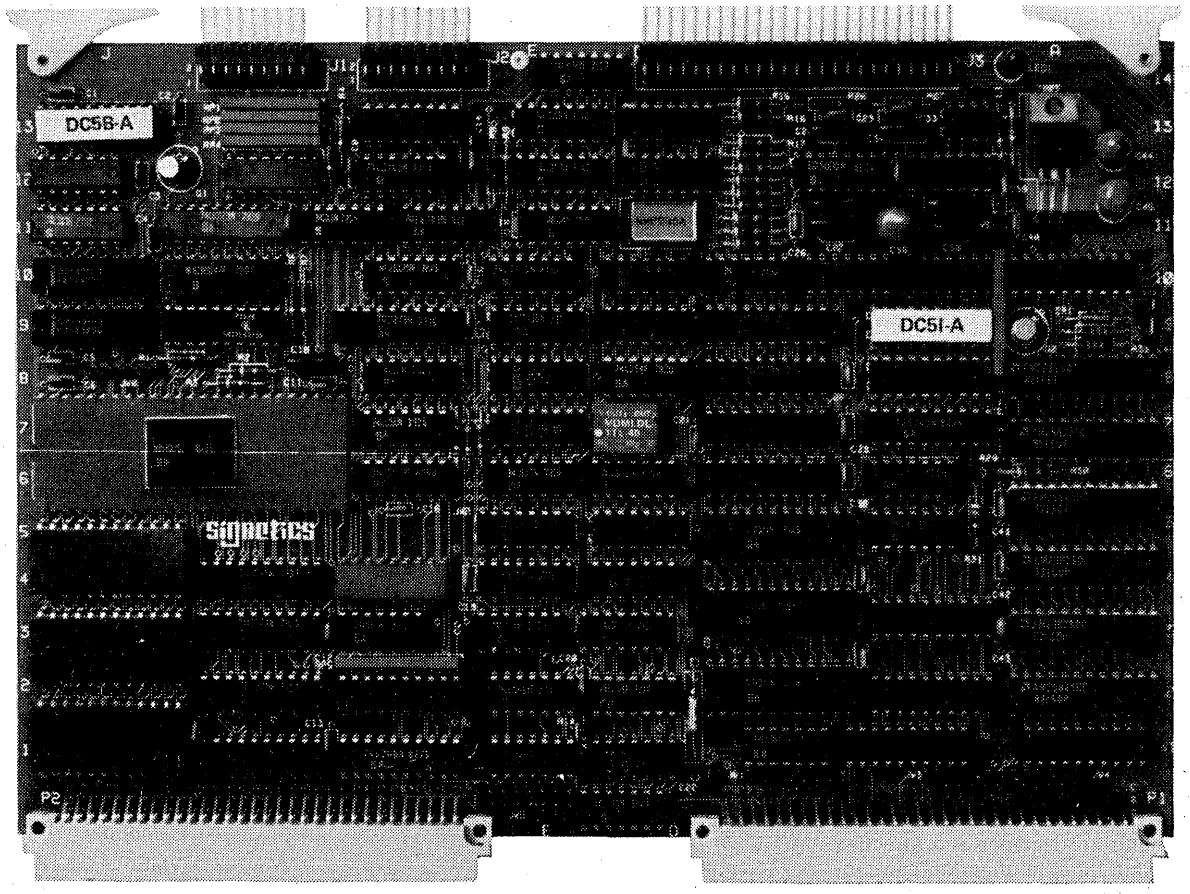
CONFIGURATION	— DTB Slave; A24; D8, D16, D32
USAGE	— 1 or more per VMEbus card cage
DIMENSIONS	— 160mm x 233.4mm
POWER	— 3.1A typ (4.0A max) at + 5VDC
TEMPERATURE	— 0 to 55 deg. C operating
HUMIDITY	— 8% to 80% non-condensing
SPEED	— 195ns WRITE, 265ns READ, 340ns cycle
ERROR	— BUS ERROR (BERR) on parity fail
ORTIONS (static)	— ACCESS: SUPV only/SUPV-USER — ADDRESS BLOCK: 256Kb boundaries — Interleave: non/2-way — MODE: D16/D32

© IC MASTER 1983

Signetics

SMVME4300
VMEbus DISK CONTROLLER MODULE

PRODUCT BRIEF
PRELIMINARY



FEATURES

- **MIXED MEDIA MASS STORAGE CONTROL**
  Supports up to 4 5 1/4″ and 8″ Winchester and floppy disk drives per module
- **BUS MASTER**
  DMA between main memory and disk drives controlled by an on-board Signetics 8X305 bipolar microprocessor
- **FLEXIBLE FORMATS**
  IBM standard or user defined
- **ERROR RECOVERY MECHANISMS**
  Error correction and detection built-in
- **VMEbus COMPATIBLE**

DESCRIPTION

The VMEbus Disk Controller Module is another addition to the high performance building blocks in the Signetics Module Board product family. It contains in a single module, a high speed microprocessor supervised disk controller which interfaces to the industry's most popular hard and floppy disk drives. The Disk Controller Module provides a high performance data channel between multiple disk drives and the VMEbus system main memory. Intended as an intelligent peripheral interface, the Disk Controller includes a straight forward, high level interface to the system software by utilizing device control block (DCB) and direct memory access (DMA) protocols. Designed utilizing multi-layer printed circuit techniques with internal power and ground planes to minimize noise, the Signetics Disk Controller Module provides a reliable, industrial grade product.

© IC MASTER 1983

SMVME4300 VMEbus DISK CONTROLLER MODULE

MICROCONTROLLER

Intelligence for the Disk Controller Module is provided by a Signetics 8X305 low power Schottky microcontroller operating at 200ns per instruction. The 8X305 and associated support devices provide all data handling, DMA, disk drive, and error correction and control functions.

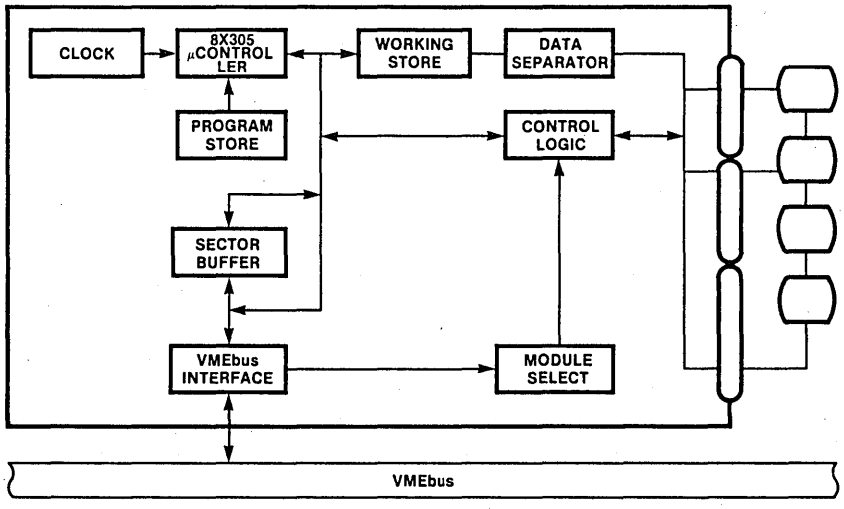
DISK DRIVE INTERFACE

Up to 4 disk drives in mixed configuration are supported. Of the 4 drives, up to 2 drives can be Winchester type 5 1/4" or 8" hard disks. Floppy drives, 5 1/4" or 8", single or double density, single or double sided are supported in any mix but hard drives can only be mixed if they provide the same data transfer rate.

All head positioning (up to 1024 cylinders/drive) and head selection (up to 16 heads/drive) is automatically provided by the Disk Controller in response to a high level command from the VMEbus system software. Serial data rates up to 8 Mbits/sec are supported.

DATA INTERFACE

Data is automatically transferred between any of the 4 disk drives and main memory for read and write operations. The read/write buffers may be located anywhere in the 16 megabyte main memory address space. Transfers can occur in the word (16-bit) or byte (8-bit) mode with odd byte boundary discontinuities automatically compensated for. Data is transferred directly for floppy type disks and buffered for hard disks in a 1024 byte on-board buffer. Multiple sector read/write is supported with automatic head switching and cylinder positioning as necessary.



DISK CONTROLLER MODULE

ERROR DETECTION/ CORRECTION

The user may choose either CRC-16 or ECC-32 to provide data integrity validation. For CRC-16 a data error will be flagged and status returned to the system software. For ECC-32, burst errors of up to 11-bits/sector are automatically corrected and indicated in the return status at the completion of the operation.

COMMAND SET

Read sector(s) with overlapped seek
Write sector(s) with overlapped seek
Write deleted data
Format a track
Read a track
Restore and Recalibrate (to track 0)
Read record ID
Read sector (transparently)

ORDERING INFORMATION

SMVME4300	VMEbus Disk Controller Module
SMMAN3040	VMEbus Disk Controller Module User Manual

SPECIFICATIONS

CONFIGURATION	— DTB Master: A24, D16 DTB Slave: A24, D8
USAGE	— 1 or more per VMEbus card cage
DIMENSIONS	— 160mm x 233.4mm
POWER	— 2.6A typ (3.0A max) at + 5VDC — 20MA typ (30MA max) at + 12VDC — 20MA typ (30MA max) at − 12VDC
TEMPERATURE	— 0 to 55 deg C operating
HUMIDITY	— 8% to 80% non-condensing
MICRO CONTROLLER	— 8X305 5MHz
DRIVE INTERFACE	— Floppy disk: Shugart 800, 850, 400, 450, 460 — Hard disk: Shugart 1000, 600 Seagate ST506/512 Quantum Q 2000
SERIAL DATA RATE	— 8 Mbits/sec (max)
OPTIONS (static)	— DTB requestor any 1 of levels 1 thru 4 INT requestor any 1 of levels 1 thru 7 Module address: 2 Kbyte boundaries

© IC MASTER 1983

Signetics

SMSFT51970
SIGbug MONITOR

PRODUCT BRIEF
PRELIMINARY

FEATURES

- **2764 EPROM Resident VMEbus System Debug Monitor**
- **More than 30 commands for debug**
- **Single line assembler/ disassembler for ease of program modification**
- **Full speed execution of system and user developed programs operating in the VMEbus system environment**
- **Virtual terminal capability for upload/download from a cross development host computer**
- **Powerful software and system debug command set allows access to all VMEbus I/O, control and memory facilities plus the full 16M byte direct address range of the 68000 processor**
- **Includes all required installation and operation documentation**

DESCRIPTION

SIGbug is an EPROM-based resident package ready for installation and immediate use with any Signetics VMEbus CPU installed in a VMEbus-based backplane.

SIGbug provides a powerful evaluation and system debugging tool for VMEbus systems. The 2764 EPROM-based package will operate in 16K bytes of ROM space. SIGbug uses the first 1024 words of system RAM storage for interrupt vectors and temporary storage. The package permits full speed execution and control of system and user developed programs in a Signetics VMEbus system environment. SIGbug may be utilized with a VMEbus CPU board or an entire VMEbus system in a stand alone environment with only a user provided standard RS-232C asynchronous ASCII terminal required as additional equipment. Alternately, it may be used with a second serial I/O port connected to a host computer for up/downline loading of programs in Motorola "S" record format. When connected to a host computer in this manner, the SIGbug console terminal appears as a normal asynchronous ASCII terminal to the host operating system. The second serial I/O port, the host computer interface, would be implemented through the second asynchronous serial I/O port provided on the CPU board.

© IC MASTER 1983

SMSFT51970 SIGbug MONITOR

OPERATIONAL DESCRIPTION

In a typical debug session, the user will download his program to a Signetics VMEbus-based system from the host computer used for software development. After loading, SIGbug commands may be used to examine and modify memory, set breakpoints to control program execution, and track program progress. The user may set up and examine a variety of conditions using any of the powerful commands listed in the table to the right, such as the register display/set series and the memory manipulation commands. The data conversion command serves as an aid in examining and modifying data by converting hexadecimal to decimal, and decimal to hexadecimal. If corrections or program patches are required, these may be performed and checked in the Signetics VMEbus-based board system. The user may save a corrected copy on the host computer file by using the memory dump command for upline load. Creating program patches may be aided by use of the display offsets command to assist with relocatable and position-independent code. The user may also obtain hard copy of all traffic to the SIGbug console terminal on a printer attached to the parallel port by use of the attach printer command. This may be useful for desk debugging following a debug session. The Centronics parallel printer interface is implemented through the CPU board parallel I/O facility.

The user may communicate with the host computer as a terminal for purposes other than up/downline load by executing the transparent mode command or the "send message to port 2" command. By using the port format command, the serial port may be reconfigured for such attributes as baud rate, stop bits and number of data bits. In the transparent mode, the two serial ports must operate at the same baud rate.

SIGbug may be used for debug in total systems environments which include other VMEbus compatible boards.

ORDERING INFORMATION

SMSFT51970	SIGbug, 2764 EPROM, for Signetics 68000 VMEbus-based boards, monitor, object
SMMAN326A	SIGbug User Manual

SIGbug Commands

Command	Description
MD <addr1>[<count>]	Memory Display/Disassembly
MM <address>[;<opts>]	Memory Modify/Disassembly/Assembly
MS <address><data . . . >	Memory Set
.A0 - .A7 [<expression>]	Display/Set Address Register
.D0 - .D7 [<expression>]	Display/Set Data Register
.PC [<expression>]	Display/Set Program Counter
.SR [<expression>]	Display/Set Status Register
.SS [<expression>]	Display/Set Supervisor Stack Pointer
.US [<expression>]	Display/Set User Stack Pointer
DF	Display Formatted Registers (All)
BF <address1><address2><word>	Block Fill (with 16-bit data word) Memory
BM <address1><address2><address3>	Block Move
BI <address1><address2>	Block Initialize
BT <address1><address2>	Block Test of Memory
DC <expression>	Data Conversion
OF	Display Offsets
.R0 - .R6 [<expression>]	Display/Set Relative Offset Register
BR [<address>[;<count>]]	Breakpoint Set (up to 8)
NOBR [<address><address> . . .]	Breakpoint Remove (any or all)
GO [<address>]	Execute Program
GT <breakpoint address>	Go Until Breakpoint (sets temporary breakpoint)
GD [<address>]	Go Direct (No Breakpoint or Track Set, and No Exception Vector Changes)
TR [<count>]	Trace (set for number of instructions)
TT <breakpoint address>	Trace to Temporary Breakpoint
PA	Printer Attach (Print as well as display)
NOPA	Reset Printer Attach
PF [<port number>]	Port Format (set Serial Port Attributes)
TM [<exit character>]	Transparent Mode (Two serial ports transparently connected)
*text . . .	Send Message to Port 2
HE	HELP (Display SIGbug commands)
DU <address1><address2><text . . .>	Dump ("S" Record Upline load)
LO [;<opts>] [=text]	Load ("S" Record Downline load)
VE [=text]	Verify ("S" Record Downline load verify)
Command Line Edit and Control Functions:	
(BREAK)	Abort Command
(DEL)	Delete Character
(CTRL-D)	Redisplay Line
(CTRL-H)	Delete Character
(CTRL-W)	Suspend Output*
(CTRL-X)	Cancel Command Line
(cr)	Command Terminator

*When (CTRL-W) is used, the user can cause the output display to continue by entering any character.

© IC MASTER 1983

FEATURES

- Real-Time Multitasking Capability
- Task Scheduling Based on Task Priority Levels (0-255)
- Task Synchronization Capability Using Semaphores
- Resource Sharing Using Semaphores
- Support For Any Number of Tasks
- Inter-Task Communication
- Server Task Capability
- Memory Management and Allocation
- Fast Interrupt Response
- Serial, Parallel, and Disk Drivers Included
- Exception Monitoring Facility
- System Generation on Several Host Computers
- Trace Table Capability to Ease Debugging of System
- System Initialization Capability
- ROM or RAM Based

DESCRIPTION

The Signetics S68000 Real-Time Multitasking System Software, RMS68K, is a multitasking kernel around which real-time application systems can be built. The powerful and universal characteristics of RMS68K allow a wide variety of application systems without large expenditures for design and programming effort on the complex real-time and multitasking functions.

RMS68K can be used in systems which are built around the Signetics VMEbus board modules or in customer designed hardware incorporating the SCN68000 microprocessor.

See Page 1979 for Ordering Information.

© IC MASTER 1983

S68000 TARGET SOFTWARE RMS68K REAL-TIME MULTITASKING SOFTWARE

REAL-TIME SYSTEM CONCEPTS

A real-time system responds to external events as they occur. Since the precise time of these external events is an unknown factor, a real-time system is said to execute asynchronously.

Unlike a batch system where one operation is started, a real-time system can delay the completion of one operation in order for another operation to be started, continued, or completed. This mechanism (where more than one operation is in progress at a given time) is called concurrent processing. Even though only one operation can be executed at a given time using a single central microprocessing unit, the concurrent processing mechanism of a real-time system gives the illusion of several operations executing simultaneously.

A real-time application system can be broken down into several tasks. A task is a function (or operation) which can execute concurrently with other tasks/functions. A task can be written to process a single type of event, or it can process more than one type of event.

RMS68K FUNCTIONS

RMS68K is comprised of a task controller, an inter-task communication facility, an optional memory management facility, and an initialization facility. These facilities provide the following functions:

- Receive all hardware and software interrupts and dispatch them to the proper task for processing
- Dispatch tasks competing for use of the microprocessing unit
- Provide inter-task communication and synchronization
- Manage and allocate memory
- System initialization capability
- Diagnostic feedback during error conditions

RMS68K STRUCTURE

RMS68K is structured in six levels or layers (see Figure 1), with each level performing a particular range of functions.

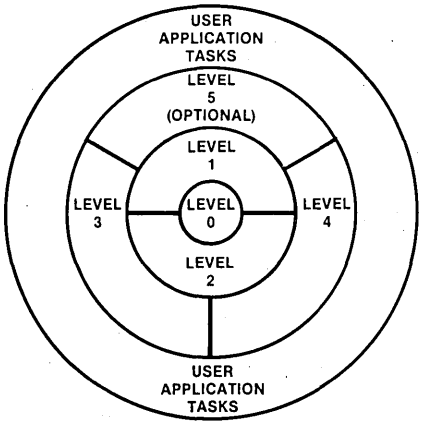


Figure 1 — RMS68K Functional Levels

Level 0 supplies processor management functions including task dispatching, primitive synchronization, exception handling and interrupt dispatching.

Level 1 supplies physical memory management functions.

Level 2 supplies utility functions.

Level 3 supplies task address space and memory segment management functions.

Level 4 supplies task creation, deletion, and execution controlling functions.

Level 5 (an optional layer of RMS68K) provides the channel-oriented, physical I/O functions.

The functions provided by Levels 3, 4, and 5 are directly available to user tasks. The functions provided by Levels 0, 1, and 2 are not directly available to user tasks, but provide support to Level 3, 4, and 5 functions. This multi-layering allows changes to be made within Levels 0, 1, and 2 without affecting the user interface to RMS68K.

User tasks can request RMS68K to perform Level 3, 4, or 5 functions by using executive directives. An executive directive contains all of the information needed by RMS68K to perform the desired function.

MEMORY REQUIREMENTS

RMS68K is supplied in two parts—one part is the Level 0 through 4 software; the other part is optional Level 5. The maximum memory requirements are given in Table 1. The user may elect to exclude certain functions in his particular application system, which would decrease memory requirements.

APPLICATION HARDWARE REQUIREMENTS

The hardware requirements for an RMS68K based application are:

- SCN68000 microprocessor
- Appropriate memory
- Optional real-time clock

The amount of memory required will vary from one application to another, depending upon the environment, user supplied code and data and the RMS68K functions configured in the user system. The maximum memory required can be decreased by including only the necessary RMS68K functions in the system.

If the system is to use the delay task and periodic task activation functions of RMS68K, a real-time clock must be provided. This can be accomplished by means of a software clock mechanism that the user configures as part of RMS68K, or by means of a hardware device such as the Signetics SCN68230 Parallel Interface and Timer.

The requirements listed may be satisfied through use of the Signetics VMEbus CPU module or a user designed SCN68000 microcomputer based board.

TASK CONTROL

Associated with each task existing in the system is a task control block (TCB). The TCB contains information about the task which allows RMS68K to maintain control of the task's execution, account for resources allocated to the task, and ensure task protection. The TCB remains asociated with one task throughout that task's existence.

Table 1 — RMS68K Memory Requirements

FUNCTION	RAM (Parameter Data)	ROM/RAM (Program Code)
Level 0 through Level 4	800 bytes	12K bytes
Level 5	See note below	4.5K bytes

NOTE: Dynamic system tables created by levels are not included

© IC MASTER 1983

See Page 1979 for Ordering Information.

S68000 TARGET SOFTWARE RMS68K REAL-TIME MULTITASKING SOFTWARE

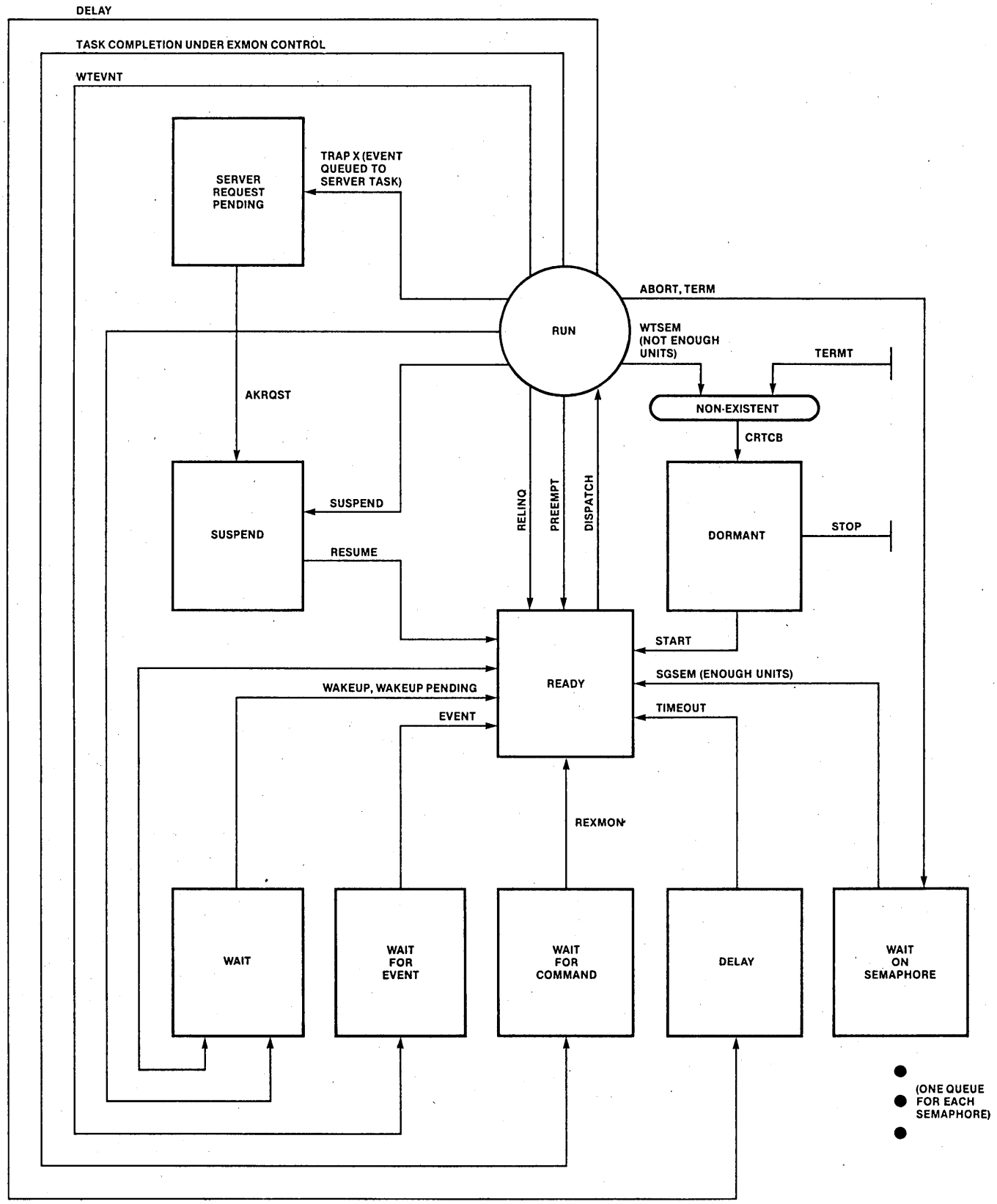


FIGURE 2 — RMS68K Task State Transition Diagram

Signetics

See Page 1979 for Ordering Information.

© IC MASTER 1983

S68000 TARGET SOFTWARE RMS68K REAL-TIME MULTITASKING SOFTWARE

A task can make a transition from one state to another when any of the following actions take place:

- A task control directive is issued by task while it is in the running state
- A task control directive is issued by another task while it is in the running state
- An event is placed in the task's asynchronous service queue
- An exception occurs in the task while in the running state
- Special function handling is initiated by RMS68K (such as timeouts, semaphore signaling, interrupt handling)

TASK MANAGEMENT

Task management is one of the broad functional areas of RMS68K. Levels 3 and 4 of RMS68K software provide this task management function. This task management functional area can be broken down into several smaller service areas:

1. Memory allocation and management
2. Task state control
3. Task event control
4. Task synchronization
5. Special function task control
6. Interrupt service management

There is a set of task management directives which tasks can use to request the performance of task management services by RMS68K.

1. Memory Allocation And Management Directives

A list and brief description of all the directives in the memory allocation and management category:

GTSEQ Allocate a new program code of data memory segment to the target task by placing it in the task's address space

DESEG Delete a program code or code memory segment from the target task

GTASQ Allocate an asynchronous service queue (ASQ) to the target task

DEASQ Deallocate the requesting task's ASQ

DCLSHR Make a memory segment available for shared access

ATTSEG Place an existing memory segment (shareable) into the requesting task's address space.

SHRSEG Place an existing memory segment (shareable) to another task's address space

TRSEG Remove a memory segment from the requesting task's address space and place it in the address space of another task

RCVSA Return a description of the specified segment to the requesting task

2. Task State Control

Directives are provided to control task execution by means of moving a task through various states. A task can control its own state transitions or another task's state transitions. Following is a list and brief description of each of the directives in the task state control category:

CRTCB Create a task control block (TCB) for a new task and place the task in the DORMANT state

START Move the target task to the READY state

TERMT Terminate task by releasing resources and deleting the TCB of the target task so that the task no longer exists in the system

STOP Move the target task to the DORMANT state

RESUME Move the target task from the SUSPEND state to the READY state

WAKEUP Move the target task from the WAIT state to the READY state

ABORT Initiate a task's own abnormal termination. Its TCB is deleted and the task no longer exists in the system

TERM Initiate a task's own normal termination. Its TCB is deleted and the task no longer exists in the system

SUSPND A task moves itself into the SUSPEND state

WAIT A task moves itself into the WAIT state

RELINQ A task moves itself to the READY state so that RTEX can perform a dispatch cycle

SETASQ A task changes the status of its ASQ and/or ASR

DELAY A task moves itself to the DELAY state for a specified period of time

WTEVNT A task moves itself into the WAIT-FOR-EVENT state until an event is placed in its ASQ

SETPRI A task changes its own priority or the priority of another task to the specified value

RQSTPA A task requests the timed periodic activation of itself or another task

EXPVCT A task announces the handling of its own exceptions

TRPVCT A task announces the handling of its own trap instructions

3. Task Event Control

These directives can be used by a task for event queueing and event servicing:

QEVNT An event is placed into the ASQ of the target task

RDEVNT The next event in the requesting task's ASQ is moved into the task's receiving area

RTEVNT Return to the point of interruption of a task upon completion of that task's ASR processing

4. Task Synchronization Directives

Tasks can use semaphores to synchronize activities and control resources. Several task synchronization directives, which tasks can use to control these semaphores, are available.

ATSEM A task attaches to a semaphore and acquires use of that semaphore. The semaphore is created and given an initial signal count if it does not already exist

CRSEM A task creates a new semaphore or resets the initial count of an existing semaphore

SESEM A task releases use of a semaphore

DESEMA A task releases use of all semaphores to which it is attached

WTSEM A task requests and, if necessary, waits for semaphore-controlled access or execution to be granted

SGSEM A task signals release of a semaphore controlled resource or execution

5. Special Function Task Control

The directives in this category are used to control server tasks and exception monitor tasks.

Server Task Control —
A server task is able to receive and process requests from any task in the system. A user task issues a request to a server task by executing a TRAP instruction: thus, a server task appears to function as part of RMS68K.

© IC MASTER 1983

See Page 1979 for Ordering Information.

S68000 TARGET SOFTWARE RMS68K REAL-TIME MULTITASKING SOFTWARE

SERVER A task establishes itself as a server task

AKRQST A server task acknowledges receipt or completion of a request by placing the requesting task into an appropriate state

DERQST A server task controls the receipt of requests for service

DSERVE A server task initiates orderly shutdown of service

Exception Monitor Task Control —
An exception monitor task provides execution control over a target task or emergency processing when a task fails. Exception events which will cause a target task to stop execution and notification to be sent to the target task's exception monitor task are specified in an exception monitor mask associated with the target task. An exception monitor task can also control the operation of a target task in a trace mode.

EXMON A target task becomes associated with an exception monitor task

DEXMON A target task detaches from an exception monitor task

EXMMSK Events of interest to an exception monitor task are specified

RSTATE An exception monitor task receives the current state of one of its target tasks

PSTATE An exception monitor task sets the current state of one of its target tasks

REXMON A target task executes as directed by an exception monitor task

6. Interrupt Service Management

A task can include one or more routines which are activated as the result of an external interrupt (or exception) and execute in the SCN68000 user hardware state at the priority level of the interrupt. Such a routine is called an interrupt service routine (ISR). This mechanism is useful in creating I/O device drivers.

CISR A task configures one of its ISR's to respond to a particular exception

SINT A task simulates an exception (interrupt)

RTE An ISR returns from execution

Miscellaneous RMS68K Functions

Thee are some miscellaneous RMS68K functions which do not fit into the categories discussed in the preceding paragraphs.

STDTIM A system task sets the system date and time

GTDTIM A task gets the current system date and time

MOVELL A task moves date from one logical address to another

PHYSICAL I/O HANDLERS

User tasks running under the control of RMS68K can use the Level 5 portion of RMS68K to interface with standard Signetics memory mapped I/O channels. The Level 5 software consists of a channel management request (CMR) handler and two I/O handlers. The CMR handler logically manages channels, and I/O handlers perform the actual physical I/O. A user device driver task could then be reduced to a processor of the I/O data, and would not have to perform the device management and actual data transfer functions.

The CMR handler and I/O handlers perform extensive validity checks to ensure address space protection against the user device driver tasks. The validity checks allow these device driver tasks to execute in the SCN68000 "user" hardware state.

Alternate methods include writing a device driver as an interrupt service routine (ISR) or as an extension of RMS68K which executes in the supervisor state.

CHANNELS

A channel is considered to be a single contiguous portion of memory mapped I/O space, associated with one or more types of interrupts. A single device may cause an interrupt under two or more different conditions. Up to four types of interrupts for that device could be associated with a single channel. The types of interrupts associated with a channel are defined when the channel is allocated. At least one type of interrupt must be defined to a channel.

Channels are classified into two main types: intelligent peripheral controller channels (IPC) and non-IPC channels.

CMR HANDLER

User task interactions with channels are performed through requests made to the channel management request (CMR) handler. The following CMR functions are available:

ALLOCATE Define a channel to the system

DELETE Remove a channel definition from the system

ATTACH Establish a logical connection between a task and a channel

DETACH Dissolve the logical connection between a task and a channel

PUT ON LINE Remove a channel from off line status, making it available for subsequent CMR ATTACH requests

TAKE OFF LINE Put a channel into off line status, making it unavailable for CMR ATTACH requests until a PUT ON LINE request is made

INITIATE Invoke the appropriate I/O handler which will perform the actual I/O

HALT Terminate the I/O in progress on a channel

RESET Reset interrupts on an IPC channel after an error

NON-IPC HANDLER

The non-IPC handler is invoked when a device driver task makes a request to the CMR handler to initiate I/O on the non-IPC channel. The I/O handler then interpretively executes a sequence of channel commands supplied by the driver task. These channel commands contain all of the device-dependent information required to operate the channel.

The non-IPC I/O handler manages four distinct memory spaces for each channel attached to a driver task. This distinction in memory spaces helps to protect the address spaces since the device driver task does not need direct access to all of the spaces. Only the I/O handler has access to all four memory spaces; i.e., memory mapped I/O space, command space, buffer space and transient space.

ICP I/O HANDLER

The IPC I/O handler is invoked when a device driver user task makes a request to the CMR handler to initiate I/O on an IPC channel. The I/O handler will accept one command packet from the user task, send the command packet to the IPC, supply the user task with an acknowledgment when the command packet has been accepted by the IPC, and inform the user of I/O completion. Essentially the IPC I/O handler performs the handshaking functions with the IPC.

The IPC I/O handler manages three distinct memory spaces for each channel attached to an IPC device driver task. These three memory spaces are: memory mapped I/O space, command space, and buffer space.

See Page 1979 for Ordering Information.
© IC MASTER 1983

S68000 TARGET SOFTWARE RMS68K REAL-TIME MULTITASKING SOFTWARE

ORDERING INFORMATION

SMSFT20000	RMS68K operating system/sysgen utility/boards driver set, half-inch magnetic tape, 800 BPI, for VAX-11 computers, VMS operating system, object
SMSFT20010	RMS68K operating system/sysgen utility/boards driver set, half-inch magnetic tape, 1600 BPI, for VAX-11 computers, VMS operating system, object
SMSFT20300	RMS68K operating system/sysgen utility/boards driver set, half-inch magnetic tape, 800 BPI, for PDP-11 and LSI-11/23 computers, RSX-11M operating system, object
SMSFT20310	RMS68K operating system/sysgen utility/boards driver set, half-inch magnetic tape, 1600 BPI, for PDP-11 and LSI-11/23 computers, RSX-11M operating system, object
SMSFT20390	RMS68K operating system/sysgen utility/boards driver set, double density diskette, for PDP-11 and LSI-11/23 computers, RSX-11M operating system, object
SMSFT20890	RMS68K operating system/sysgen utility/boards driver set, double density diskette, for EXORmacs computers, VERSADOS operating system, object
SMMAN3500	RMS68K User Manual
SMMAN5500	RMS68K Reference Manual

© IC MASTER 1983

Synertek.

KTM-3

Keyboard Terminal Module

Features

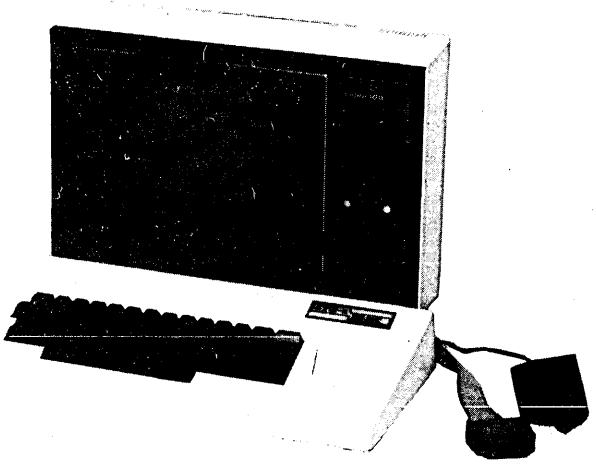
- 110 to 19.2K Baud
- Choice of Character Screen Sizes:
  24 x 80 Character Screen Size (KTM-3/80)
  24 x 40 Character Screen Size (KTM-3/40)
- 7 x 9 Character Matrix in 8 x 10 Field
- Typewriter Style Keyboard — 58 Keys
- CAPS LOCK Key
- Upper and Lower Case Alphanumeric Character Set with Descenders
- Generates and Displays 128 ASCII Characters
- Full and Half Duplex with Modem Controls
- Built-in Power Supply with On/Off Switch
- Scrolling
- Blinking Cursor
- Full Cursor Control
- Absolute and Relative Cursor Positioning
- Clear to End-of-Screen, End-of-Line
- Even, Odd, or No Parity
- One or Two Stop Bits
- Framing and Parity Errors Displayed
- Auto Key Repeat
- Debug Mode (Displays Control Characters)
- Cables Included
- Built-in Diagnostics
- KTM-3/40 Will Attach to Standard TV Set Using RF Modulator
- 50/60 Hz Operation
- 220 Volt Version Available

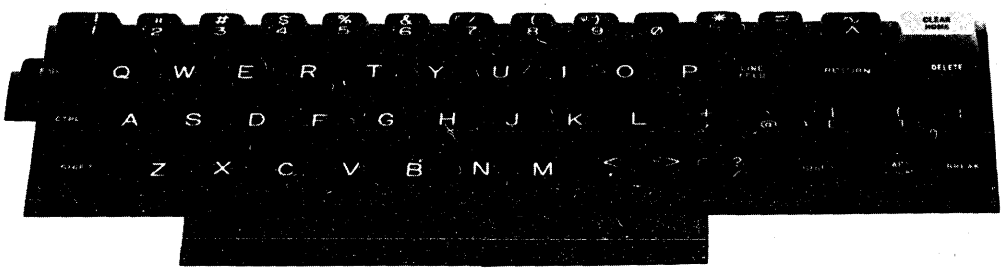
Description

The KTM-3 uses the latest LSI technology with two microprocessors to provide a highly reliable, ready-to-use terminal minus the CRT monitor. The dual microprocessor design is highly cost-effective with great flexibility, providing more features at lower cost than other approaches used today. For volume usage, Synertek Systems can customize the KTM-3 to your O.E.M. specifications.

The display interface provides composite video output and complete video control including scrolling, full cursor control, and absolute and relative cursor positioning. A choice of screen sizes is offered — either 24 x 40 characters, or 24 x 80 characters.

The unit is now in stock and available from your local distributor.





© IC MASTER 1983

Synertek.

MBC020-65
MBC020-68

Single Board Computer/ Video Board

Motorola and System 65 Compatible

Features

- 6512 Microprocessor — MBC020-65
- 1 MHz Crystal Controlled Clock Frequency
- Fully Buffered Data and Address Lines
- 3072 Bytes of Static RAM
- 4 ROM/EPROM Sockets that Accept 2716, 2732, 2316, 2332, 2364
- ACIA (6551) for RS-232 Serial Inteface: Crystal Controlled Programmable Baud Rate
- VIA (6522) Provides 20 I/O Lines and Two 16-Bit Counter/Timers
- Power-On Reset
- Reset Switch
- Refresh Control Logic for Dynamic RAMs
- Control Logic for DMA
- Seven Lines Optionally Buffered for Input or Output
- Full 64K Programmable Memory Map in 2K Increments Using 32 x 8 Bipolar PROM
- Single +5V Operation Using TTL Levels for RS-232. Jumper Option to Use ±12V for Full RS-232 Compatibilty
- Available with 6800 Microprocessor — MBC020-68

Video Features

- Incorporates Complete Video Interface Circuitry to Attach Directly to Video Monitor
- Composite or Separate Sync, Video Output
- Dual Intensity Video Levels
- SY6545 Programmable CRT Controller for User Definable CRT Screen Formats
- SY2316 Character ROM — Compatible with 2716 EPROM
- Light Pen Input
- Displays up to 25 Lines of 80 Characters (Programmable)

Description

The MBC020 provides a complete computer on a single board, including the video interface. In addition, the MBC020 is fully compatible with the Motorola EXORcisor™ and the micromodule buses, and supports all RAM, I/O, and analog boards in those families. The board may be used as a cost effective alternative CPU board, as an SBC or, with the video circuitry, the MBC020 can replace two or more boards and operates as a complete system.

Specifications

Power Requirements
+5 VDC @ 1.9A (max)
+12 VDC @ 50A (max)
-12 VDC @ 50 mA (max)

Bus Signals
Address Bus:
Three-state TTL-compatible buffered outputs
Data Bus:
TTL-compatible buffered inputs/outputs
Control Bus:
R/W, VMA, VUA: Three-state TTL-compatible buffered outputs
BA, REF GRANT, MEMCLK, SYNC, Baud Rate: TTL-compatible buffered outputs
$\overline{IRQ}$, $\overline{NMI}$, $\overline{RESET}$, Halt, $\overline{REF}$ $\overline{REQ}$, $\overline{RDY}$, $\overline{DMA}$: TTL-compatible buffered inputs with 3.3K ohm pull-up resistors
ϕ_1, ϕ_2,: TTL-compatible outputs

Operating Temperature
0°C to +55°C

Physical Characteristics
Width: 9.75 in.
Height: 6.00 in.
Board: 0.062 in.

Connectors
86 pins: Stanford Applied Engineering SAC-43 D/1-2
50 pins: 3M type 3415-0001
20 pins: 3M type 3461-0001

© IC MASTER 1983

Synertek.

MBC01A2/MBC01A2-1

Single Board Computer Motorola Micromodule Replacement

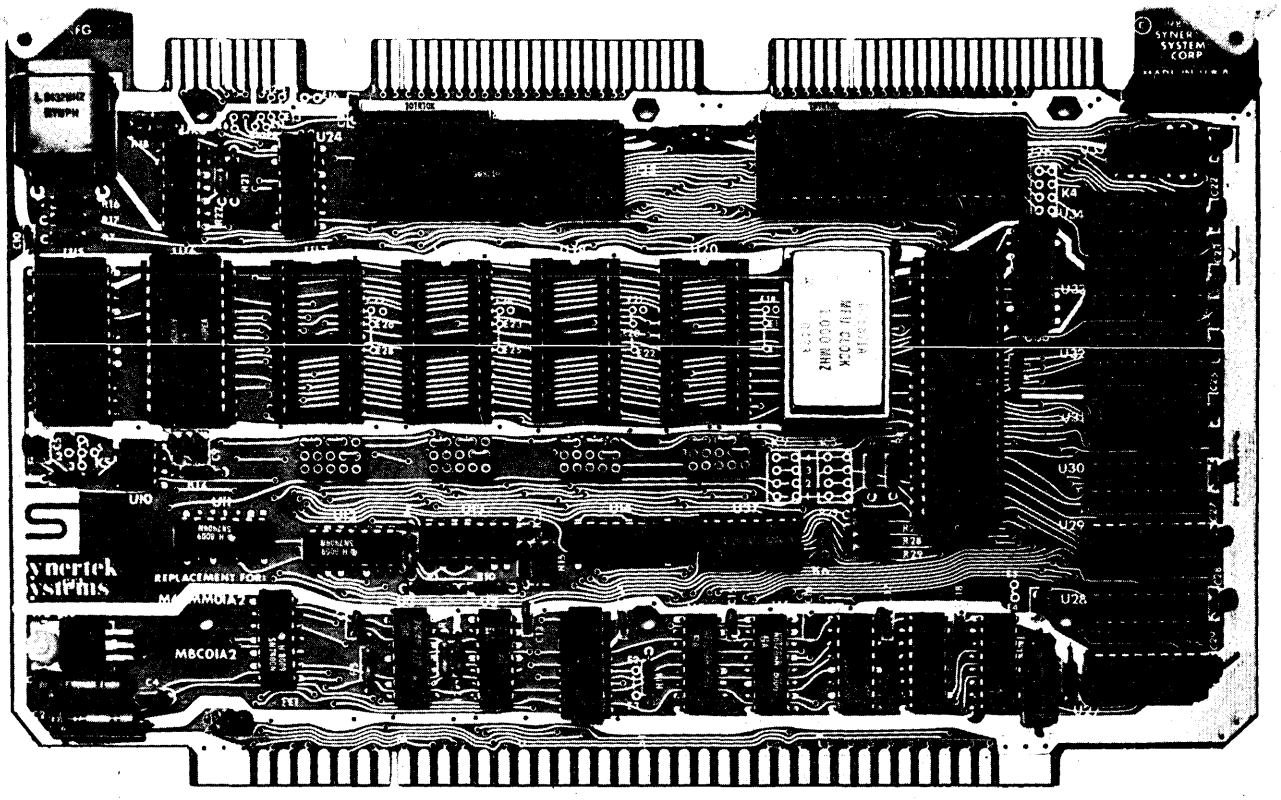
Features

- Exact Replacement for Motorola M68MM01A2 Micromodule with additional RAM and ROM capacity
- EXORcisor™/Micromodule Bus Compatible
- Serial Communication Port using MC6850 ACIA with RS-232-C interface
- Four Parallel Ports using MC6821 PIAs
- 1 MHz operation (2 MHz available on special order)
- 1024 Bytes of Static RAM with Sockets for up to 4096 Bytes total
- Four ROM/EPROM/RAM Sockets for interfacing with 1K-8K ROM's; 1K-4K EPROMs; or compatible 1K and 2K RAM's
- Power-On Reset Circuitry
- Dynamic Memory Refresh Circuitry
- Four mating connectors supplied with MBC01A2-1

Description

The MBC01A2 board is a direct replacement for Motorola's M68MM01A2 Micromodule. Additional ROM and RAM capacity has been added for increased system requirements. Up to 4096 bytes of static RAM and 32K bytes of ROM can be utilized on the MBC01A2 Micromodule.

The MBC01A2 Micromodule includes a serial communications interface using the MC6850 and two MC6821 PIA's for parallel interfacing.



© IC MASTER 1983

Synertek.

MBC016D/MBC048D
MBC032D/MBC064D
Dynamic RAM Boards

Features

- Available in 16K, 32K, 48K or 64K Memory Arrays
- 1 or 2 MHz Versions
- Hidden Refresh (without processor interruption)
- Fully Buffered Address, Data, and Control Lines
- Any 4K Block Memory can be Deselected by Jumpers
- 20 Pin Header for Implementation of Priority Interrupts, Multi-Paged Memory, and I/O Systems
- Even Parity Error Checking with Jumper Selectable Output
- Power Saving Selective Refresh During $\phi 1$ of Every Foruth Processor Cycle

Description

The Dynamic RAM Boards with hidden refresh are available in 16K, 32K, 48K, and 64K memory arrays in either 1 or 2 MHz versions. Memory refresh is performed on-board during $\phi 1$ when the processor is not accessing memory. On-board circuitry generates and detects even parity througth the use of an additional memory bit. Whenever a parity error is detected, a signal is output to the system which is jumper selectable as a parity error or non-maskable interrupt. The memory array can be deselected in 4096 byte blocks to meet any system requirements. As with all SSC Micromodules, the Dynamic RAM Boards are directly compatible with Motorola EXORcisor™-/Micromodule bus.

Specifications

Power Requirements (64K of RAM)
+5 VDC @ 0.7A (max)
+12 VDC @ 0.12A (max)
-12 VDC @ 8 mA (max)

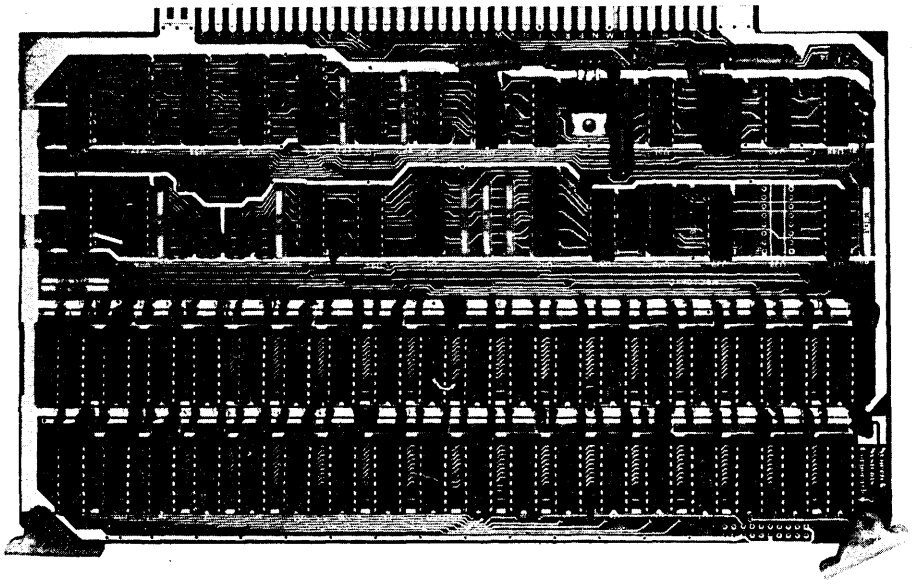
Operating Temperature
0°C to +70°C

Physical Characteristics
Width: 9.75 in.
Height: 6.00 in.
Board Thickness: 0.0625 in.

Connectors
86 pin:
Stanford Applied Engineering
SAC-43D/1-2 or equivalent

Read Access Time
2 MHz operation —
210 ns after leading edge of $\phi 2$
1 MHz operation —
350 ns after leading edge of $\phi 2$

Write Data Available
2 MHz operation —
110 ns after leading edge of $\phi 2$
1 MHz operation —
220 ns after leading edge of $\phi 2$



© IC MASTER 1983

BURR-BROWN®

Everything You Need For Precision Data Acquisition

Data Conversion/Data Acquisition

Analog-to-Digital Converters
8-, 10-, 12-, 16-bit; conversion times to 880nsec
Digital-to-Analog Converters
10-, 12-, 16-bit, linearities to ±0.00075% FSR
Voltage-to-Frequency Converters
0 to 1MHz; linearities to ±0.005% FSR
Data Acquisition Systems
Complete function in one IC package
Microprocessor Interfaced Data Acquisition Systems
Analog Input/Output Systems
Interfaced directly to μP bus
Sample/Hold Circuits – High speed - accurate
Multiplexers – To 16 channels - fast settling

High Performance Operational Amplifiers

General Purpose - FET, bipolar and wide temp range models
Low Drift – As low as 0.1μV/°C
Low Bias Current – To 75fA - voltage drift to 2μV/°C
Low Noise – Guaranteed noise spectral density
Wide Bandwidth – Cost effective wideband op amps
High Voltage – Outputs to ±145V
High Current – Outputs to ±5A peak
Unity-Gain Buffer
Versatile power boosters with impedance buffers

Instrumentation and Programmable Gain Amplifiers

Instrumentation – Accurately amplify low level signals
Programmable Gain
Digitally set gains cover wide dynamic input signal ranges

Isolation Products

Transformer-Coupled Amplifiers
Signal and power isolation in one IC package
Optically-Coupled Amplifiers
Excellent linearity - gain independent of LED output level
DC/DC Converters
1, 2, 4 output channels with high voltage isolation

Analog Circuit Functions

Multipliers/Dividers – Laser-trimmed to 0.25% accuracy
Dividers – High accuracy over wide signal range
Special Functions
Log ratio and logarithmic amps, rms-to-DC and multifunction converters, window and level comparators, peak detectors
Frequency Products – Oscillators and active filters

Modular Power Supplies

AC/DC Converters
DC/DC Converters
Easy to use power sources for Burr-Brown's converters amplifiers, etc.

Special Products

PCM A/D and D/A Converters for audio applications
Low distortion, high speed converters specified in audio terms

Military Products

D/A and A/D Converters
Multipliers
V/F Converters
Operational Amplifiers
All designed, manufactured to MIL-M-38510. Produced in a separate facility. Fully specified from -55°C to +125°C. 100% screened to MIL-STD-883, 10% PDA plus QCI.

Fiber-Optic Data Links

Transmitters/Receivers
Convert TTL or analog input to TTL outputs. Provide total noise immunity for accutrate signal transmission.

Data Entry and Display Terminals

13 Models - Numeric/Alphanumeric
RS-232-C and 20mA current-loop compatible

Microcomputer Compatible Analog and Digital Input/Output Boards

For Intel, DEC, Motorola, Zilog and others.

At Burr-Brown we put technology to work for you by selecting the most efficient, cost effective IC technology to meet a specific product performance goal. Our in-house facility produces superior thick and thin film hybrid IC's and multifunction monolithics under stringent quality control. You get high reliability products that deliver specified performance!

BURR-BROWN®

P.O. Box 11400 Tucson, AZ 85734 (602) 746-1111

Contact sales office in your area for information.

© IC MASTER 1983

ADVERTISERS PRODUCT INDEX

This index shows the page and the line on that page of every device in the Master Selection Guide for manufacturers that have included detailed product information. It is organized alphabetically by manufacturer and for each manufacturer, alpha-numerically by device. Bold face listings lead to data on important products which has been supplied for you by the manufacturers.

how to use the product index

The Product Index includes many of the same references as the Part Number Index, but in this case the listings are sorted by manufacturer.

As in the Part Number Index, the model numbers are sorted alpha-numerically from **left** to **right**. Here the manufacturer's prefixes are included so that devices with alphabetic prefixes appear before those without them (i.e., LM101 would be before 1101). Application note pages are indicated by a ¶ sign and manufacturers' product information pages by a ☆ sign. The numbers preceding the dash are the page numbers, while those following the dash indicate the location of the device on the page.

When you use the Master to find data on a particular manufacturer's products, this index provides the fastest way to find all the information.

© IC MASTER 1983

PRODUKT-VERZEICHNIS VON HERSTELLERN MIT EIGENEN DATEN-BLÄTTERN

Dieses Verzeichnis enthält die Seiten- und Zeilenangabe für jedes Produkt im Master Selection Guide, für das Hersteller ausführliche Produktinformationen übermittelt haben. Es ist alphabetisch nach Herstellern geordnet und, innerhalb jedes Herstellers, alphanumerisch nach Bauteilen. Eintragungen in Fettdruck verweisen auf Datenblätter wichtiger Produkte, die direkt vom Hersteller zur Verfügung gestellt wurden.

GEBRAUCHSANLEITUNG FÜR DAS PRODUKTVERZEICHNIS

Dieses Verzeichnis enthält viele gleichlautende Informationen wie im numerischen Typenverzeichnis, jedoch erfolgt hier die Auflistung nach Herstellern.

Wie beim Typennummern-Verzeichnis erscheinen die Bauteile in alphanumerischer Reihenfolge von links nach rechts. Die Kennbuchstaben der Hersteller sind jedoch mit enthalten, so daß Bauteile mit Buchstaben vor solchen ohne Buchstaben erscheinen (LM101 erscheint z.B. vor 1101). Die Seitennummern der Applikationsberichte sind durch ein ¶ Zeichen und Datenblätter von Herstellern durch ein ★ Zeichen angegeben. Die dem Trennstrich vorgestellten Zahlen sind die Seitenzahlen, die nachgestellten bedeuten die Zeile, in der das Bauteil auf der Seite zu finden ist.

Wenn Sie den Master benützen, um Kenndaten eines Produkts von einem bestimmten Hersteller zu finden, so geht es über dieses Verzeichnis am schnellsten.

© IC MASTER 1983

INDEX DES PRODUITS FABRIQUES PAR LES SOCIETES AYANT PARTICIPE A LA COMPILATION DE CET OUVRAGE

Cet index indique à quelle page et à quelle ligne on a fait mention d'appareils fabriqués per les sociétés qui ont bein voulu inclure dans le Guide Général de Sélection des renseignements détaillés sur leurs produits.

Les fabricants sont énumérés par ordre alphabétique, et sous chaque nom se trouve une liste alphanumérique des produits. Les titres en caractères gras vous indiquent où trouver des renseignements sur des produits d'une certaine importance. Ces informations ont été fournies par les fabricants eux-mêmes pour votre usage personnel.

COMMENT SE SERVIR DE L'INDEX DES PRODUITS

Cet index comprend beaucoup de références apparaissant déja dans l'Index des Numéros de Pièces, il se singularise cependant par le fait que les renseignements sont donnés par fabricant.

Tout comme dans l'Index des Numéros de Pièces, les numéros de modéle sont classés alphanumériquement de gauche à droit. Dans ce cas là, les préfixes des sociétés fabricantes sont inclus de facon à ce que les produits avec préfixes alphabétiques apparaissent avant ceux qui n'en ont pas (par exemple LM101 se trouvera placé avant 1101). Pour renvoi, les numéros de page des notices d'application sont indiqués per le symbole (¶), et les numeros de page contenant les renseignements fournis par les fabricants par une étoile (☆). Les chiffres qui précèdent le titre sont les numéros de page, ceux qui suivent le titre indiquent à quelle ligne il a été fait mention du produit.

Lorsque vous utilisez le Guide pour trouver des renseignements sur les produits d'un fabricant donné, cet Index représente le moyen le plus rapide pour obtenir les renseignements nécessaires.

© IC MASTER 1983

INDICE DEL PRODUCTO DE LOS PUBLICADORES

Este índice denota la linea y página de cada componente en la Guia Maestra de Selección para fabricantes que han incluído información detallada del producto. Está organizada en orden alfabético por fabricante, y para cada fabricante la pieza aparece en orden alfabético y numérico. Las letras más marcadas los conduce a datos de productos importantes suplidos por el fabricante.

MODO DE EMPLEO DEL ÍNDICE DEL PRODUCTO

El índice del Producto incluye muchas de las mismas referencias incluidas en el Indice del Número de Pieza, pero en este caso, la lista está ordenada por fabricante.

Así como en el Indice de Número de Pieza, los números de modelos están en orden alfabético y numérico de izquierda a derecha. Los prefijos del fabricante están includíos de tal manera que las partes con prefijos alfabéticos aparecen antes que las que no lo tienen. (Por ejemplo, LM101 estaría encima de 1101). Páginas con notas de Aplicaciones están identificadas por el símbolo ¶ y las páginas de información del producto del fabricante por el símbolo ☆. Los números que preceden al guión son el número de página, mientras que los que aparacen a continuación indican la ubicación de la pieza en la página.

Cuando usa la guía Maestra para encontrar datos sobre un producto en particular, este índice provee la manera más rápida de encontrar la información deseada.

© IC MASTER 1983

広告掲載メーカー製品インデックス

このインデックスは各マスターセレクションガイドに記載されている詳細な製品情報をのせたメーカー全ての製品のページ数とそのページの行数を示しています。メーカーはＡＢＣ順に，製品はＡＢＣ順と若い数字順にのっています。太字で記載されている製品はメーカーがのせている主要機器のデーターがそこにのっていることを示しています。

使用法

製品のインデックスはパーツナンバーインデックスと同じですがここではメーカー毎に分類されています。パーツナンバーインデックス同様型番はＡＢＣ，若い数字順に左から右へ記載されています。ここではメーカーのプリフィックスがつけられており，アルファベットのプリフィックスが付いている製品がついていない製品の前になっています。（例えばLM101は1101より前に）アプリケーションノートページは　印で又メーカーの製品情報のページは☆印で示してあります。ダッシュ符号の前の数字はページ数，後の数字はそのページの製品の位置を意味します。

利用者皆様が特定メーカーの製品のデータを探される場合，このインデックスが一番速く情報を提供致します。

© IC MASTER 1983

IC MASTER

Advanced Micro Devices

Device	Page-Line
1101A	3472-65
	3472-65
1101A1	3472-63
	3472-63
1101AM	3472-66
	3472-66
1402AC	3488-7
	3488-5
1402AM	3488-8
	3488-6
1403AC	3488-15
1403AM	3488-16
1404AC	3488-23
1404AM	3488-24
1405A	3488-10
	¶ 289-6
1406	3488-3
	3488-1
1407	3488-4
	3488-2
1408-6	2444-6
1408-7	2443-51
1408-8	2442-27
1500C	2894-12
1500L	2893-22
1500M	2893-23
1506	3488-5
	3488-3
1507	3488-6
	3488-4
1508-8	2442-28
1660	2931-40
1702A	3460-17
1702A-1	3460-36
1702A-2	3460-38
1702A-6	3460-20
1702AL	3460-18
1702AL-1	3460-37
1702AL-2	3460-39
222741	2923-31
2708	3463-79
2708-13	3463-72
2841A	3456-37
31013	3471-98
31L01C	3471-102
31L01M	3471-103
3212	1094-153
3216	1094-67
3226	1094-68
3341C	3456-30
	¶ 286-14
3347	3491-71
3514	3484-19
4044-30	3482-65
4044-45	3482-96
4244-30	3482-66
4244-45	3482-97
4702A	3460-21
685L	2891-18
	¶ 270-15
685M	2891-19
	¶ 270-15
686C	507-26
	¶ 270-15
	2891-36
	¶ 270-15
686M	507-27
	¶ 270-15
	2891-20
	¶ 270-15
687AL	2893-12
	¶ 270-15
687AM	2892-58
	¶ 270-15
687L	2893-13
	¶ 270-15
687M	2892-59
	¶ 270-15
8036	★ **1231**
8038	★ **1231**
8041A	1096-59
8048	1093-47
8080A-1	1094-33
8080A-2	1094-34
8080A-4	1094-35
8086	★ **1229**
	★ **1231**
8087	★ **1231**
8088	★ **1231**
8089	★ **1231**
8212C	1094-154
	¶ 247-16
8212M	1094-155
	¶ 247-16
8216	1094-69
8224C	1094-99
8224M	1094-100
8226	1094-70
8228C	1095-84
8228M	1095-85
8231A	★ **1231**
8232	★ **1231**
8237A	★ **1231**
8238C	1095-86
8238M	1095-87
8251A	★ **1231**
8253	★ **1231**
8255A	★ **1231**
8259A	★ **1231**
8275	★ **1231**
8279	★ **1231**
8284A	★ **1231**
8286	★ **1231**
8287	★ **1231**
8288	★ **1231**
8289	★ **1231**
82S62C	★ **1227**
	509-13
82S62M	★ **1227**
	509-14
8304	504-184
8308	3484-78
8530	★ **1231**
8702A	3460-19
9016C	3469-35
9016D	3469-21
9016E	3469-2
90L50C	3468-49
90L50D	3468-43
90L50E	3468-31
90L60C	3468-50
90L60D	3468-44
90L60E	3468-32
9140AC	3482-107
9140AM	3482-108
9140BC	3482-91
9140BM	3482-92
9140CC	3482-79
9140CM	3482-80
9140DC	3482-52
9147-55	3481-56
91L40AC	3482-109
91L40AM	3482-110
91L40BC	3482-93
91L40BM	3482-94
91L40CC	3482-81
91L40CM	3482-82
91L40DC	3482-53
9208BC	3484-75
9208BM	3484-76
9208CC	3484-64
9208D	3484-57
9214C	3484-17
9214M	3484-18
9217AC	3485-56
9217AM	3485-57
9217BC	3485-29
9217BM	3485-30
9218BC	3485-31
9218BM	3485-32
9218C	3485-14
9232BC	3485-117
9232BM	3485-118
9232C	3485-81
9233BC	3485-119
9233BM	3485-120
9233C	3485-82
93S10C	★ **1227**
	480-172
93S10M	★ **1227**
	480-173
93S16C	478-150
93S16M	478-151
93S48C	★ **1227**
	509-47
93S48M	★ **1227**
	509-48
9401C	3488-28
9401M	3488-29
9511	1102-19
9511A	★ **1231**
	510-1
	★ **1231**
	1102-20
9511A-5	510-2
	1102-21
9512	★ **1231**
	1102-22
9513	1102-80
9513A	★ **1231**
9516	★ **1231**
9517A	★ **1231**
	1102-37
9518	★ **1231**
9519A	★ **1231**
	1101-70
9520	★ **1231**
9521	★ **1231**
9702A-1	3460-40
AM100415	3475-26
	3475-37
AM100415A	3475-34
AM100470	3481-35
AM100470A	3481-23
AM100470SA	3481-17
AM100474	3477-33
AM100474A	3477-27
AM10415	3475-27
	3475-60
AM10415A	3475-38
	3475-48
AM10415M	3475-67
AM10415SA	3475-35
	3475-39
AM10470AC	3481-24
AM10470AM	3481-31
AM10470C	3481-36
AM10470M	3481-44
AM10470SAC	3481-18
AM10470SAM	3481-20
AM10474AC	3477-28
AM10474AM	3477-30
AM10474C	3477-34
AM10474M	3477-36
AM2101	3473-36
AM2101-1	3474-97
AM2101-2	3474-119
AM2102	3475-24
AM2102-1	3477-5
AM2102-2	3477-12
AM2111	3473-37
AM2111-1	3474-98
AM2111-2	3474-120
AM2112	3473-38
AM2112-1	3474-91
AM2112-2	3474-121
AM2147-35	3481-42
AM2147-45	3481-47
AM2147-55	3481-57
AM2147-70	3481-87
AM21L47-45	3481-48
AM21L47-55	3481-58
AM21L47-70	3481-88
AM2401	3488-27
AM24LS23M	3490-19
AM24LS299C	3490-17
AM2501C	480-28
AM2501M	480-29
AM2502C	508-105
AM2502M	508-106
AM2503C	508-107
	¶ 232-6
AM2503M	508-108
	¶ 232-6
AM2504C	509-37
AM2504M	509-38
AM2505C	475-138
AM2505M	475-139
AM2506C	474-164
	¶ 228-11
AM2506M	474-165
	¶ 228-11
AM2533	3491-108
AM25LS07C	★ **1227**
	486-89
AM25LS07M	★ **1227**
	486-90
AM25LS08C	★ **1227**
	485-180
AM25LS08M	★ **1227**
	485-181
AM25LS09C	★ **1227**
	499-80
AM25LS09M	★ **1227**
	499-81
AM25LS138C	483-161
	1094-123
AM25LS138M	483-162
	1094-124
AM25LS139C	483-64
AM25LS139M	483-65
AM25LS148C	508-141
AM25LS148M	508-142
AM25LS14C	475-162
AM25LS14M	475-163
AM25LS151C	499-165
AM25LS151M	499-166
AM25LS153C	498-37
AM25LS153M	498-38
AM25LS157C	499-34
AM25LS157M	499-35
AM25LS158C	498-128
AM25LS158M	498-129
AM25LS15C	474-7
AM25LS15M	474-8
AM25LS160C	480-157
AM25LS160M	480-158
AM25LS161C	478-134
AM25LS161M	478-135
AM25LS162C	481-16
AM25LS162M	481-17
AM25LS163M	478-181
AM25LS164C	502-30
	3490-127
AM25LS164M	502-31
	3490-128
AM25LS168AC	481-100
AM25LS168AM	481-101
AM25LS169AC	479-99
AM25LS169AM	479-100
AM25LS174C	486-62
AM25LS174M	486-63
AM25LS175C	485-130
AM25LS175M	485-131
AM25LS181C	475-30
AM25LS181M	475-31
AM25LS18C	485-164
	1086-42
AM25LS18M	485-165
	1086-43
AM25LS190C	482-4
AM25LS191C	479-150
AM25LS191M	479-151
AM25LS192C	481-147
AM25LS192M	481-148
AM25LS193C	480-12
AM25LS193M	480-13
AM25LS194AC	501-156
	3489-29
AM25LS194AM	501-157
	3489-30
AM25LS195AC	501-53
AM25LS195AM	501-54
AM25LS22C	★ **1227**
	476-98
AM25LS22M	★ **1227**
	476-99
AM25LS23C	★ **1227**
	502-154
	★ **1227**
	3490-20
AM25LS23M	★ **1227**
	502-155
AM25LS240C	503-129
	2470-62
AM25LS240M	503-130
	2470-63
AM25LS241C	504-39
	2470-3
AM25LS241M	504-40
	2470-4
AM25LS242C	503-66
	2476-58
AM25LS242M	503-67
	2476-25
AM25LS243C	503-68
	2476-59
AM25LS243M	503-69
	2476-26
AM25LS244C	503-176
	2470-5
AM25LS244M	503-177
	2470-6
AM25LS2513C	★ **1227**
	508-143
	★ **1227**
	1102-63
AM25LS2513M	★ **1227**
	508-144
AM25LS2516C	475-156
AM25LS2516M	475-157
AM25LS2517C	★ **1227**
	475-32
AM25LS2517M	★ **1227**
	475-33
AM25LS2518C	★ **1227**
	485-166
AM25LS2518M	★ **1227**
	485-167
AM25LS2519C	★ **1227**
	486-15
AM25LS2519M	★ **1227**
	486-16
AM25LS251C	500-45
AM25LS251M	500-46
AM25LS2520C	★ **1227**
	486-109
AM25LS2520M	★ **1227**
	486-110
AM25LS2521C	★ **1227**
	474-92
	¶ 228-12
AM25LS2521M	★ **1227**
	474-93
	¶ 228-12
AM25LS2535C	★ **1227**
	500-18
AM25LS2535M	★ **1227**
	500-19
AM25LS2536C	★ **1227**
	484-3
AM25LS2536M	★ **1227**
	484-4
AM25LS2537C	★ **1227**
	483-44
AM25LS2537M	★ **1227**
	483-45
AM25LS2538C	★ **1227**
	484-9
AM25LS2538M	★ **1227**
	484-10
AM25LS2539C	★ **1227**
	483-114
AM25LS2539M	★ **1227**
	483-119
AM25LS253C	497-148
AM25LS253M	497-149
AM25LS2548C	483-163
AM25LS2568C	481-120
AM25LS2568M	481-121
AM25LS2569C	★ **1227**
	479-165
AM25LS2569M	★ **1227**
	479-166
AM25LS257C	498-166
AM25LS257M	498-167
AM25LS258C	498-88
AM25LS258M	498-89
AM25LS273B	★ **1227**
	486-152
AM25LS273C	★ **1227**
	486-153
AM25LS273M	★ **1227**
	486-154
AM25LS299C	★ **1227**
	502-156
AM25LS299M	★ **1227**
	502-157
	★ **1227**
	3490-18
AM25LS373C	★ **1227**
	496-68
AM25LS373M	★ **1227**
	496-69
AM25LS374C	★ **1227**
	487-7
AM25LS374M	★ **1227**
	487-8
AM25LS377B	★ **1227**
	487-42
AM25LS377C	★ **1227**
	487-43
AM25LS377M	★ **1227**
	487-44
AM25LS378C	486-91
AM25LS378M	486-92
AM25LS379C	485-182
AM25LS379M	485-183
AM25LS381C	★ **1227**
	475-34
AM25LS381M	★ **1227**
	475-35
AM25LS399C	499-82
AM25LS399M	499-83
AM25LS533C	★ **1227**
	483-164
AM25LS533M	★ **1227**
	483-165
AM25LS534C	★ **1227**
	483-166
AM25LS534M	★ **1227**
	483-167
AM25S05C	475-142
AM25S05M	475-143
AM25S07C	★ **1227**
	486-105
	¶ 289-8
AM25S07M	★ **1227**
	486-106
	¶ 289-8
AM25S08C	★ **1227**
	486-11
	¶ 289-8
AM25S08M	★ **1227**
	486-12
	¶ 289-8
AM25S09C	★ **1227**
	499-111
	¶ 289-8
AM25S09M	★ **1227**
	499-112
	¶ 289-8
AM25S10C	★ **1227**
	508-65
	¶ 228-2
AM25S10M	★ **1227**
	508-66
	¶ 228-2
AM25S11C	508-33
AM25S12AC	508-34
AM25S12AM	508-35
AM25S12M	508-36
AM25S18C	★ **1227**
	485-170
AM25S18M	★ **1227**
	485-171
AM25S373	★ **1227**
AM25S374	★ **1227**
AM25S533	★ **1227**
AM25S534	★ **1227**
AM25S557	★ **601**
	475-101
AM25S558	★ **601**
	475-102
AM2602C	500-174
AM2602M	500-175
AM26123C	500-152
	¶ 237-8
AM26123M	500-153
	¶ 237-8
AM2614C	2469-28
	¶ 258-7
AM2614M	2469-29
	¶ 258-7
AM2615C	2472-54
	¶ 258-7
AM2615M	2472-55
	¶ 258-7
AM26LS29C	2469-50
	¶ 259-8
AM26LS29M	2469-52
	¶ 259-8
AM26LS30C	2469-63
	2472-24
	¶ 259-8
AM26LS30M	2469-65
	2472-26
	¶ 259-8
AM26LS31C	2472-41
	¶ 259-8
AM26LS31M	2472-42
	¶ 259-8
AM26LS32C	2475-21
	¶ 259-8
AM26LS32M	2475-22
	¶ 259-8

Arranged alphanumerically from left to right.

© IC MASTER 1983

Advanced Micro Devices (Cont'd)

Device	Page-Line
AM26LS33C	2475-33
AM26LS33M	2475-34
AM26S02C	501-7
AM26S02M	501-8
AM26S10C	508-37
	2478-1
AM26S10M	508-38
	2477-59
AM26S11C	2478-2
AM26S11M	508-39
	2477-60
AM26S12AC	2476-6
AM26S12AM	2476-7
AM26S12C	508-40
	2477-53
AM26S12M	2477-54
AM2716	3465-63
AM2716-1	3465-30
AM2716-2	3465-44
AM2716M	3465-64
AM2732	3466-57
AM2732-1C	3466-52
AM2732M	3466-58
AM2764	3466-88
AM2764-2	3466-82
AM2764-20	3466-83
AM2764-25	3466-89
AM2764-3	3466-97
AM2764-30	3466-98
AM2764-4	3467-5
AM2764-45	3467-6
AM27LS00-1M	3473-1
AM27LS00LC	3473-21
AM27LS00LM	3473-24
AM27LS00M	3473-2
AM27LS01LC	3473-20
AM27LS01LM	3473-23
AM27LS02AC	3471-67
AM27LS02C	3471-95
AM27LS02M	3471-100
AM27LS03AC	3471-70
AM27LS03C	3471-96
AM27LS03M	3471-101
AM27LS06C	3471-68
AM27LS06M	3471-73
AM27LS07C	3471-71
AM27LS07M	3471-86
AM27LS184C	3463-121
AM27LS184M	3464-7
AM27LS185C	3464-1
AM27LS185M	3464-8
AM27LS18C	3459-30
	¶ 286-1
AM27LS19C	3459-37
	¶ 286-1
AM27LS19M	3459-52
	¶ 286-1
AM27PS185C	3464-2
AM27PS185M	3464-9
AM27PS191C	3464-68
AM27PS191M	3464-92
AM27PS291AC	3464-69
AM27PS291AM	3464-93
AM27PS291C	3464-70
AM27PS41	3465-100
AM27PS43	3466-12
AM27S02AC	3470-96
AM27S02AM	3470-106
AM27S02C	3471-10
AM27S02M	3471-35
AM27S03AC	3470-101
AM27S03AM	3471-5
AM27S03C	3471-22
AM27S03M	3471-36
AM27S06AC	3470-97
AM27S06AM	3471-1
AM27S06C	3470-98
AM27S06M	3471-2
AM27S07AC	3470-102
AM27S07AM	3471-6
AM27S07C	3470-103
AM27S07M	3471-7
AM27S12AC	3460-42
	¶ 286-1
AM27S12AM	3460-44
	¶ 286-1
AM27S12C	3460-51
	¶ 286-1
AM27S12M	3460-69
	¶ 286-1
AM27S13AC	3460-43
	¶ 286-1
AM27S13AM	3460-45
	¶ 286-1
AM27S13C	3460-55
	¶ 286-1
AM27S13M	3460-75
	¶ 286-1
AM27S15C	3461-42
	¶ 286-1
AM27S15M	3461-88
	¶ 286-1
AM27S180AC	3462-60
AM27S180AM	3462-78
AM27S180C	3462-94
AM27S180M	3463-30
AM27S181AC	3462-64
	¶ 286-1
AM27S181AM	3462-81
	¶ 286-1
AM27S181C	3462-104
	¶ 286-1
AM27S181M	3463-33
	¶ 286-1
AM27S184AC	3463-95
	¶ 286-1
AM27S184AM	3463-104
	¶ 286-1
AM27S184C	3463-109
	¶ 286-1
AM27S184M	3463-115
	¶ 286-1
AM27S185AC	3463-96
	¶ 286-1
AM27S185AM	3463-106
	¶ 286-1
AM27S185C	3463-110
	¶ 286-1
AM27S185M	3463-116
	¶ 286-1
AM27S18AC	3459-10
	¶ 286-1
AM27S18AM	3459-14
	¶ 286-1
AM27S18C	3459-20
	¶ 286-1
AM27S18M	3459-31
	¶ 286-1
AM27S190AC	3464-50
AM27S190C	3464-64
AM27S190M	3464-91
AM27S191	3464-71
AM27S191A	3464-52
AM27S191AM	3464-72
AM27S19AC	3459-12
	¶ 286-1
AM27S19AM	3459-18
	¶ 286-1
AM27S19C	3459-24
	¶ 286-1
AM27S19M	3459-38
	¶ 286-1
AM27S20AM	3459-72
AM27S20C	3459-76
AM27S20M	3459-97
AM27S21AC	3459-71
	¶ 286-1
AM27S21AM	3459-74
	¶ 286-1
AM27S21C	3459-80
	¶ 286-1
AM27S21M	3459-105
	¶ 286-1
AM27S25AC	3460-108
	¶ 286-1
AM27S25AM	3460-109
	¶ 286-1
AM27S25C	3460-110
	¶ 286-1
AM27S25M	3460-111
	¶ 286-1
AM27S27C	3460-106
	¶ 286-1
AM27S27M	3460-107
	¶ 286-1
AM27S280AC	3462-61
AM27S280AM	3462-79
AM27S280C	3462-95
AM27S280M	3463-31
AM27S281AC	3462-65
AM27S281AM	3462-82
AM27S281C	3462-96
AM27S281M	3463-34
AM27S28AC	3460-116
	¶ 286-1
AM27S28AM	3461-4
	¶ 286-1
AM27S28C	3461-19
	¶ 286-1
AM27S28M	3461-47
	¶ 286-1
AM27S290AC	3464-51
AM27S290AM	3464-65
AM27S290C	3464-66
AM27S291	3464-73
AM27S291A	3464-53
AM27S291AM	3464-74
AM27S291M	3464-94
AM27S29AC	3460-119
	¶ 286-1
AM27S29AM	3461-9
	¶ 286-1
AM27S29C	3461-22
	¶ 286-1
AM27S29M	3461-53
	¶ 286-1
AM27S30AC	3460-118
	¶ 286-1
AM27S30AM	3461-7
	¶ 286-1
AM27S30C	3461-20
	¶ 286-1
AM27S30M	3461-57
	¶ 286-1
AM27S31AC	3461-1
	¶ 286-1
AM27S31AM	3461-15
	¶ 286-1
AM27S31C	3461-24
	¶ 286-1
AM27S31M	3461-54
	¶ 286-1
AM27S32AC	3461-101
	3461-101
	¶ 286-1
AM27S32AM	3461-114
	3461-114
	¶ 286-1
AM27S32C	3462-9
	3462-9
	¶ 286-1
AM27S32M	¶ 286-1
AM27S33AC	3461-102
	3461-104
	3461-102
	3461-104
	¶ 286-1
AM27S33AM	3461-117
	3461-117
	¶ 286-1
AM27S33C	3462-11
	3462-11
	¶ 286-1
AM27S33M	¶ 286-1
AM27S37	3462-62
AM27S40	3465-98
AM27S40A	3465-94
AM27S40AM	3465-99
AM27S40M	3466-7
AM27S41	3466-1
AM27S41A	3465-95
AM27S41AM	3466-2
AM27S41M	3466-8
AM27S43	3466-13
AM27S43A	3466-14
AM27S45	3464-42
AM27S45A	3464-43
AM27S47	3464-44
AM27S47A	3464-45
AM27S80C	3484-45
AM27S80M	3484-58
AM27S81C	3484-49
AM27S81M	3484-61
AM27S82M	3484-59
AM27S83C	3484-50
AM27S83M	3484-62
AM2802C	3488-9
	3488-7
	¶ 289-6
AM2802M	3488-10
	3488-8
	¶ 289-6
AM2803C	3488-17
	¶ 289-6
AM2803M	3488-18
	¶ 289-6
AM2804C	3488-25
	¶ 289-6
AM2804M	3488-26
	¶ 289-6
AM2805C	3488-13
	¶ 289-6
AM2805M	3488-11
	¶ 289-6
AM2806C	3488-21
	¶ 289-6
AM2806M	3488-19
	¶ 289-6
AM2807C	3488-14
	¶ 289-6
AM2807M	3488-12
	¶ 289-6
AM2808C	3488-22
	¶ 289-6
AM2808M	3488-20
	¶ 289-6
AM2809C	3491-92
AM2809M	3491-88
AM2810C	3491-89
AM2810M	3491-90
AM2812AC	3456-17
	¶ 286-14
AM2812AL	3456-18
	¶ 286-14
AM2812C	3456-13
	¶ 286-14
AM2812L	3456-14
	¶ 286-14
AM2813AC	3456-22
	¶ 286-14
AM2813AL	3456-23
	¶ 286-14
AM2813C	3456-19
	¶ 286-14
AM2813L	3456-20
	¶ 286-14
AM2814C	3491-93
	¶ 286-14
AM2814M	3491-94
	¶ 286-14
AM2825C	3488-34
AM2825M	3488-32
AM2826C	3488-35
AM2826M	3488-33
AM2827C	3488-38
AM2827M	3488-37
AM2833C	3491-109
AM2833M	3491-110
AM2841C	3456-33
AM2841M	3456-34
AM2847C	3491-77
AM2847M	3491-74
AM2855	3491-95
AM2856	3491-102
AM2857C	3491-105
AM2896C	3491-85
AM2896M	3491-84
AM28S20AC	3459-70
AM29/6310	★ **1701**
AM2901	★ **1201**
	1049-4
	¶ 244-8
AM2901A	★ **1201**
	1049-5
	¶ 244-8
	¶ 244-14
AM2901AC	★ **1201**
	476-23
	¶ 244-8
	★ **1201**
	1085-71
	¶ 244-8
AM2901AM	★ **1201**
	476-24
	¶ 244-8
	★ **1201**
	1085-72
	¶ 244-8
AM2901B	★ **1201**
	1049-6
	¶ 244-8
AM2901BC	★ **1201**
	476-25
	¶ 244-8
	★ **1201**
	1085-73
	¶ 244-8
AM2901BM	★ **1201**
	476-26
	¶ 244-8
	★ **1201**
	1085-74
	¶ 244-8
AM2901C	★ **1201**
	476-27
	¶ 244-8
	★ **1201**
	1085-75
	¶ 244-8
AM2901M	★ **1201**
	476-28
	¶ 244-8
	★ **1201**
	1085-76
	¶ 244-8
AM2902AC	★ **1202**
	1085-127
	¶ 244-8
AM2902AM	★ **1202**
	1085-128
	¶ 244-8
AM2903	★ **1203**
	1049-7
AM2903AC	★ **1203**
	1085-77
AM2903AM	★ **1203**
	1085-78
AM2903C	★ **1203**
	476-29
	★ **1203**
	1085-79
AM2903M	★ **1203**
	476-30
	★ **1203**
	1085-80
AM2904C	★ **1204**
	1085-122
AM2904M	★ **1204**
	1085-123
AM2905C	★ **1205**
	2477-57
	★ **1205**
	1085-91
AM2905M	★ **1205**
	2477-49
	★ **1205**
	1085-92
AM2906C	★ **1205**
	2477-58
	★ **1205**
	1085-93
AM2906M	★ **1205**
	2477-50
	★ **1205**
	1085-94
AM2907C	★ **1206**
	2477-55
	★ **1206**
	1085-95
AM2907M	★ **1206**
	2477-47
	★ **1206**
	1085-96
AM2908C	★ **1206**
	2477-56
AM2908M	★ **1206**
	2477-48
AM2909A	★ **1207**
	506-151
	¶ 244-14
	★ **1207**
	1086-1
	¶ 244-14
AM2909C	★ **1207**
	506-152
	¶ 244-14
	★ **1207**
	1086-2
	¶ 244-14
AM2909M	★ **1207**
	506-153
	¶ 244-14
	★ **1207**
	1086-3
	¶ 244-14
AM2910C	★ **1208**
	1098-131
AM2910M	★ **1208**
	1098-132
AM29112	★ **1223**
	1098-135
AM29116	★ **1224**
	1077-14
AM2911A	★ **1207**
	506-154
	★ **1207**
	1086-4
AM2911C	★ **1207**
	506-155
	★ **1207**
	1086-5
AM2911M	★ **1207**
	506-156
	★ **1207**
	1086-6
AM2912C	★ **1209**
	1085-97
AM2913C	★ **1209**
	508-145
	¶ 244-8
	¶ 244-12
	★ **1209**
	1086-19
	¶ 244-8
	¶ 244-12
AM2913M	★ **1209**
	508-146
	¶ 244-8
	¶ 244-12
	★ **1209**
	1086-20
	¶ 244-8
	¶ 244-12
AM2914C	★ **1210**
	1086-17
	1102-64
	¶ 244-8
	¶ 244-12
AM2914M	★ **1210**
	1086-18
	1102-65
	¶ 244-8
	¶ 244-12
AM2915AC	★ **1211**
	2476-54
	★ **1211**
	1085-98
AM2915AM	★ **1211**
	2476-22
	★ **1211**
	1085-99
AM2916AC	★ **1211**
	2476-55
	★ **1211**
	1085-100
AM2916AM	★ **1211**
	2476-23
	★ **1211**
	1085-101
AM2917AC	★ **1212**
	2476-56
	★ **1212**
	1085-102
AM2917AM	★ **1212**
	2476-24
	★ **1212**
	1085-103
AM2918C	★ **1213**
	485-160
	★ **1213**
	1086-44
AM2918M	★ **1213**
	485-161
	★ **1213**
	1086-45
AM2919C	★ **1213**
	1086-40
AM2919M	★ **1213**
	1086-41

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Advanced Micro Devices (Cont'd)

Device	Page-Line
AM29203	★ 1203 476-31
	★ 1203 1085-81
	★ 1203 1049-8
AM2920C	★ 1214 486-111
	★ 1214 1086-52
AM2920M	★ 1214 486-112
	★ 1214 1086-53
AM2921C	★ 1214 482-121
	★ 1214 1086-64
AM2921M	★ 1214 482-122
	★ 1214 1086-65
AM2922C	★ 1215 500-20
	★ 1215 1086-74
AM2922M	★ 1215 500-21
	★ 1215 1086-75
AM2923C	★ 1215 1086-76
AM2924C	★ 1216 1085-113
AM2925C	★ 1216 1085-110
AM2925M	★ 1216 1085-111
AM2926C	★ 1217 1086-38
AM2927C	★ 1217 1085-104
AM2928C	★ 1217 1085-105
AM2929C	★ 1217 1086-39
AM2940C	★ 1218 1085-114
AM2940M	★ 1218 1085-115
AM2942C	★ 1219 1085-116
AM2942M	★ 1219 1085-117
AM2946C	★ 1220 1085-106
AM2947C	★ 1220 1085-107
AM2948C	★ 1220 1085-108
AM2949C	★ 1220 1085-109
AM29501	★ 602 507-18
AM2950C	★ 1221 1086-70
AM2950M	★ 1221 1086-71
AM29516	★ 601 475-134
AM29517	★ 601 475-135
AM2951C	★ 1221 1086-72
AM2951M	★ 1221 1086-73
AM29520	★ 602 506-168
AM29521	★ 602 506-169
AM2952C	1086-66
AM2952M	1086-67
AM2953C	1086-68
AM2953M	1086-69
AM29540	★ 603 507-6
AM2954C	★ 1222 1086-62
AM2955C	★ 1222 1086-63
AM2956C	★ 1222 1086-56
AM2957C	★ 1222 1086-57
AM2958C	★ 1223 1086-50
AM2959C	★ 1223 1086-51
AM2960C	1085-119
AM2960M	1085-120
AM2961C	1085-124
AM2961M	1085-125
AM2962C	1085-126
AM2964B	1085-118
AM2965C	2483-146 1086-58
AM2965M	2483-147 1086-59
AM2966C	2483-148 1086-60
AM2966M	2483-149 1086-61
AM29700C	3470-99
AM29700M	3471-3
AM29701C	3470-104
AM29701M	3471-8
AM29702C	3470-100
AM29702M	3471-4
AM29703C	3470-105
AM29703M	3471-9
AM29704C	497-34 3471-83 1086-25
AM29704M	497-35 3471-94 1086-26
AM29705C	★ 1225 497-45 ¶ 244-8
AM29705M	★ 1225 3471-57 ¶ 244-8 ★ 1225 1086-27 ¶ 244-8 ★ 1225 497-46 ¶ 244-8 ★ 1225 3471-72 ¶ 244-8 ★ 1225 1086-28 ¶ 244-8
AM29707	★ 1225 1086-29
AM29721M	3473-3
AM29750AC	3459-21
AM29750AM	3459-32
AM29751AC	3459-25
AM29751AM	3459-39
AM29760AC	3459-77
AM29760AM	3459-98
AM29761AC	3459-81
AM29761AM	3459-106
AM29770C	3460-52
AM29770M	3460-70
AM29771C	3460-56
AM29771M	3460-76
AM29800	★ 2601
AM29803A	★ 1226
AM29803AC	1086-77
AM29803AM	1086-78
AM29811A	★ 1226
AM29811AC	1086-11
AM29811AM	1086-12
AM29821	★ 2602 503-16
AM29822	★ 2602 503-17
AM29823	★ 2602 503-8
AM29824	★ 2602 503-9
AM29825	★ 2602 502-63
AM29826	★ 2602 502-64
AM29827	★ 2604 477-50
AM29828	★ 2604 477-51
AM29833	★ 2606 505-118
AM29834	★ 2606 505-119
AM29841	★ 2607 496-144
AM29842	★ 2607 496-145
AM29843	★ 2607 496-142
AM29844	★ 2607 496-143
AM29845	★ 2607 496-138
AM29846	★ 2607 496-139
AM2986	505-122
AM29861	★ 2604 505-123
AM29862	★ 2604 505-124
AM29863	★ 2604 505-121
AM29864	★ 2604 505-120
AM29882C	3484-46
AM29882M	3484-60
AM29883C	3484-51
AM29883M	3484-63
AM29LS18	★ 1213
AM3101	3471-74
AM3101-1C	3471-11
AM3101-1M	3471-37
AM3101AC	3471-12
AM3101AM	3471-38
AM3448A	2476-41
AM35LS190M	482-5
AM4044-15	3482-6
AM4044-20	3482-21
AM4044-25	3482-38
AM4055	3491-96
AM4056	3491-103
AM4057	3491-106
AM4244-15	3482-7
AM4244-20	3482-22
AM4244-25	3482-39
AM5055	3491-97
AM5056	3491-104
AM5057	3491-107
AM5489	3471-75
AM5489-1	3471-39
AM54S189	3471-49
AM54S289	3471-40
AM6012C	★ 3101 2453-11 ¶ 252-8
AM6012M	★ 3101 2453-12 ¶ 252-8
AM6070AC	2444-23 2459-3
AM6070AM	2444-24 2459-4
AM6070C	2444-31 2459-6
AM6070M	2444-32 2459-7
AM6072C	2444-21 2459-1
AM6072M	2444-22 2459-2
AM6080AC	2440-45
AM6080AM	2440-46
AM6080C	2442-8
AM6080M	2442-9
AM6081AC	2440-47
AM6081AM	2440-48
AM6081C	2442-10
AM6081M	2442-11
AM6108	★ 3103 2426-46
AM6112	★ 3105
AM6300	★ 3112 2965-87
AM6301	★ 3115 2960-84
AM6688	★ 3109 2965-147
AM6688L-6	★ 3109 2965-148
AM6688L-7	★ 3109 2965-149
AM6688L-8	★ 3109 2965-150
AM6688M-6	★ 3109 2965-151
AM6688M-7	★ 3109 2965-152
AM6688M-8	★ 3109 2965-153
AM7303	2478-27
AM7304B	2478-13
AM7307	2478-28
AM7308	2478-29
AM7489	3471-41
AM7489-1	3471-13
AM74S189	3471-23
AM74S289	3471-14
AM7838	2477-36
AM7910	★ 3121
AM7990	★ 3127
AM7991	★ 3127
AM8/9016	★ 1705
AM8021	1093-86
AM8031	1094-18 1059-7
AM8035	★ 1232 1093-19 ★ 1232 1059-8
AM8039	★ 1232 1093-20 ★ 1232 1059-9
AM8041A	★ 1235 1094-1 1095-99
AM8048	★ 1232 1093-48 ★ 1232 1059-10
AM8049	★ 1232 1093-49 ★ 1232 1059-11
AM8051	1094-24 1059-12
AM8080A	★ 1233 1094-36 ★ 1233 1059-13
AM8085A	★ 1234 1095-110 ★ 1234 1059-14
AM8085A-2	1095-111
AM8086	1097-138 1077-15
AM8086-1	1097-139
AM8086-2	1097-140
AM8088	1098-58 1059-15
AM8089	1077-9
AM8155	★ 1235 1093-147 1096-36
AM8155-2	★ 1235 1093-148 1096-37
AM8156	★ 1235 1093-149 1096-38
AM8156-2	★ 1235 1093-150 1096-39
AM8251	★ 1236 1095-21 1096-1
AM8251A	★ 1236 1093-124
AM8253	★ 1236 1093-134 1095-53
AM8253-5	★ 1236 1096-25
AM8255A	★ 1237 1093-138 1095-59
AM8255A-5	1093-139 1095-60 1096-31
AM8257	★ 1238 1095-37 1096-9
AM8279	★ 1239 1095-1
AM8279-5	★ 1239 1095-2
AM8279-8	★ 1239 1095-3
AM8303	2478-30
AM8304	2478-14
AM8307	2478-31
AM8308	2478-32
AM8316EB	3485-33
AM8316EC	3485-15
AM8748	1093-10
AM8838	2476-1
AM9080A	★ 1233 1059-16
AM9080AC	1094-37
AM9080AM	1094-38
AM9085A	1095-112 1059-17
AM9101A	3474-99
AM9101AM	3474-100
AM9101B	3474-68
AM9101BM	3474-69
AM9101C	3474-39
AM9101CM	3474-40
AM9101D	3474-17
AM9102	3477-13
AM9102A	3477-6
AM9102AM	3477-7
AM9102B	3476-92
AM9102BM	3476-93
AM9102C	3476-74
AM9102CM	3476-75
AM9102D	3476-54
AM9102M	3477-14
AM9111A	3474-101
AM9111AM	3474-102
AM9111B	3474-70
AM9111BM	3474-71
AM9111C	3474-41
AM9111CM	3474-42
AM9111D	3474-18
AM9112A	3474-92
AM9112AM	3474-93
AM9112B	3474-72
AM9112BM	3474-73
AM9112C	3474-43
AM9112CM	3474-44
AM9112D	3474-19
AM9114B	3479-19
AM9114BM	3479-20
AM9114C	3478-81
AM9114CM	3478-82
AM9114E	3478-13
AM9122-25	3473-60
AM9122-35	3473-63
AM9124B	3479-21 ¶ 287-10
AM9124BM	3479-22 ¶ 287-10
AM9124C	3478-83 ¶ 287-10
AM9124CM	3478-84 ¶ 287-10
AM9124E	3478-14 ¶ 287-10
AM9128	★ 3601
AM9130AC	3479-53
AM9130AM	3479-54
AM9130BC	3479-7
AM9130BM	3479-8
AM9130CC	3478-109
AM9130CM	3479-1
AM9130DC	3478-62
AM9130EC	3478-48
AM9140EC	3482-36
AM9147-55	3481-59
AM9147-70	3481-89
AM9147-70M	3481-90
AM9147-85M	3481-111
AM9148-55	3477-48
AM9148-70	3477-69
AM9149-55	3477-49
AM9149-70	3477-70
AM91L01A	3474-103
AM91L01AM	3474-104
AM91L01B	3474-74
AM91L01BM	3474-75
AM91L01C	3474-45
AM91L01CM	3474-46
AM91L02	3477-15
AM91L02A	3477-8
AM91L02AM	3477-9
AM91L02B	3476-94
AM91L02BM	3476-95
AM91L02C	3476-76
AM91L02CM	3476-77
AM91L02M	3477-16
AM91L111AM	3474-105
AM91L111C	3474-47
AM91L11A	3474-106
AM91L11B	3474-76
AM91L11BM	3474-77
AM91L11CM	3474-48
AM91L12A	3474-94
AM91L12AM	3474-95
AM91L12B	3474-78
AM91L12BM	3474-79
AM91L12C	3474-49
AM91L12CM	3474-50
AM91L14B	3479-23
AM91L14BM	3479-24
AM91L14C	3478-85
AM91L14CM	3478-86
AM91L14E	3478-15
AM91L22-35	3473-64
AM91L22-45	3473-74
AM91L22-60	3473-81
AM91L24B	3479-25
AM91L24BM	3479-26
AM91L24C	3478-87
AM91L24CM	3478-88
AM91L24E	3478-16
AM91L30AC	3479-55
AM91L30AM	3479-56
AM91L30BC	3479-9
AM91L30BM	3479-10
AM91L30CC	3479-2
AM91L30CM	3479-3
AM91L30DC	3478-63
AM91L47	3481-91
AM92128B	3487-35
AM92128C	3487-27
AM92128D	3487-22
AM9218-10	3480-10
AM9218-15	3480-48
AM9218-20	3480-87
AM9218-70	3480-1
AM9264B	3486-112
AM9264C	3486-75
AM9264D	3486-45
AM9265B	3486-121
AM9265C	3486-91
AM9265D	3486-64
AM93412	3473-67
AM93412AC	3473-65
AM93412AM	3473-75
AM93412M	3473-82
AM93415AC	3475-56
AM93415AM	3475-69
AM93415C	3475-79
AM93415M	3475-99
AM93421C	3473-4
AM93422	3473-71
AM93422AC	3473-66
AM93422AM	3473-77
AM93422M	3473-85
AM93425AC	3475-57
AM93425AM	3475-70
AM93425C	3475-83
AM93425M	3475-100
AM93L412	3473-83
AM93L412AC	3473-76
AM93L412AM	3473-79
AM93L412M	3473-91
AM93L415C	3475-92
AM93L415M	3476-5
AM93L422	3473-86
AM93L422AC	3473-78
AM93L422AM	3473-80
AM93L422M	3473-92
AM93L425M	3476-8
AM95/3310	★ 1905
AM95/4006	★ 1902 1755-2
AM95/4010	★ 1902 1755-1
AM95/5132	★ 1905
AM95/6110	★ 1904

Arranged alphanumerically from left to right.

© IC MASTER 1983

Advanced Micro Devices (Cont'd)

Device	Page-Line
AM95/6120	★ **1904**
AM9511A	★ **1240**
	1094-58
	¶ 247-17
AM9511A-1	1094-59
	¶ 247-17
AM9511A-5	1094-60
	¶ 247-17
AM9511ADM	1094-61
	¶ 247-17
AM9512	★ **1241**
AM9513	★ **1242**
	1095-98
	¶ 244-13
AM9517A	★ **1243**
	1095-38
	¶ 247-18
AM9517A-5	1095-39
	¶ 247-18
AM9518	★ **1244**
	1094-121
AM9519A	★ **1245**
	1095-46
	¶ 247-19
AM9520	★ **1246**
	1102-33
AM9551	★ **1236**
	1095-22
AM9555ADM	1095-61
AM9557	★ **1238**
	1095-40
	1096-10
AM96/4018	★ **1705**
AM96/4116A	★ **1901**
	1767-7
AM97/0064	★ **1903**
AM97/0128	★ **1903**
AM97/0256	★ **1903**
AM97/0512	★ **1903**
AM9708	3463-80
AM9716	3465-14
AMPAL16D8	★ **614**
AMPAL16H8	★ **604**
	★ **615**
	★ **612**
AMPAL16HD8	★ **604**
	★ **615**
AMPAL16L8	★ **604**
	★ **615**
	★ **611**
AMPAL16LD8	★ **604**
	★ **615**
	★ **613**
AMPAL16R4	★ **604**
	★ **615**
	★ **610**
AMPAL16R6	★ **604**
	★ **615**
	★ **609**
AMPAL16R8	★ **604**
	★ **615**
	★ **608**
AMSYS29	★ **1228**
	1614-3
AMSYS29/10	★ **1228**
	★ **1701**
	1614-4
AMSYS8/8	1615-1
AMSYS8/8000	1615-2
AMSYS8/8112	★ **1702**
	1615-3
AMSYS8/8116	★ **1702**
	1615-4
AMZ8001	1099-68
	¶ 240-15
	1077-16
	¶ 240-15
AMZ8002	1099-63
	¶ 240-15
	1077-17
	¶ 240-15
AMZ8016	1099-90
AMZ8030	1099-114
AMZ8036	1099-83
AMZ8038	1099-97
AMZ8052	1099-87
AMZ8060	1099-94
AMZ8065	1099-80
	1102-34
AMZ8068	1099-88
AMZ8073	1099-118
AMZ8103	1099-122
AMZ8104	1099-123
AMZ8107	1099-124
AMZ8108	1099-125
AMZ8120	1099-128
AMZ8121	1099-131
AMZ8127	1099-82
AMZ8133	1099-126
AMZ8136	1099-130
AMZ8140	1099-120
AMZ8144	1099-121
AMZ8148	1099-129
AMZ8160	1099-93
AMZ8161	1099-104
AMZ8162	1099-105
AMZ8163	1099-106
AMZ8164B	1099-92
AMZ8165	1099-112
AMZ8166	1099-113
AMZ8173	1099-127
DAC-08	2441-28
DAC-080QF	2440-21
DAC-08A	2440-22
DAC-08C	2443-37
DAC-08E	2441-44
DAC1408A-6	2444-3
DM71LS95	477-38
DM71LS96	478-27
DM71LS97	477-39
DM71LS98	478-28
DM81LS95	477-40
DM81LS96	478-29
DM81LS97	477-41
DM81LS98	478-30
LF111	2892-5
LF155	2909-48
	2918-32
LF155A	2921-57
LF156	2927-10
LF156A	2922-10
LF198	2967-50
LF211	2892-6
LF255	2927-3
LF256	2927-11
LF257	2926-54
LF298	2967-51
LF311	2892-54
LF355	2932-43
LF355A	2922-1
LF356	2932-49
LF356A	2922-11
LF357	2932-37
LF357A	2921-46
LF398	2967-52
LH2101A	2937-3
LH211	2893-15
LH2111	2893-16
LH2201A	2937-4
LH2211	2893-17
LH2301A	2940-15
LH2311	2894-9
LM108	2911-141
	2922-50
LM108A	2918-42
LM111	2891-56
LM112	2911-150
LM118	2910-42
	2926-7
LM119	2893-32
LM139	2894-60
LM139A	2894-29
LM148	2942-27
LM208	2922-51
LM208A	2918-43
LM211	2891-57
LM218	2926-8
LM219	2893-33
LM239	2895-12
LM239A	2894-38
LM248	2943-24
LM302	2908-38
LM308	2931-31
LM308A	2919-17
LM311	2892-50
LM316A	2924-51
LM318	2910-43
	2933-37
LM319	2894-13
LM339	2895-13
LM339A	2894-39
LM348	2943-25
M3212	1094-156
M3216	1094-71
M3226	1094-72
M8216	1094-73
M8226	1094-74
MK1002	3491-87
MM4025	3488-30
MM4026	3488-31
MM4027	3488-36
N8T26	508-8
	2477-8
	1090-26
N8T26A	508-9
N8T28	508-23
N8T28A	2477-23
PS/1000	★ **1908**
PS/1110	★ **1907**
PS/1210	★ **1907**
PS/1310	★ **1909**
PS/1320	★ **1910**
PS/1330	★ **1910**
PS/1410	★ **1908**
RTE16/8050A	★ **1703**
RTE16/8060	★ **1704**
S8T26	508-10
	2477-9
S8T26A	508-11
S8T28A	2477-24
SN25LS2568	★ **1227**
SN54LS138	483-168
SN54LS139	483-66
SN54LS148	508-147
SN54LS151	499-167
SN54LS153	498-39
SN54LS157	499-36
SN54LS158	498-130
SN54LS160	480-159
SN54LS162	481-18
SN54LS163	478-182
SN54LS164	502-32
	3490-101
SN54LS168A	481-102
SN54LS169A	479-101
SN54LS174	486-64
SN54LS175	485-132
SN54LS181	475-36
SN54LS190	482-6
SN54LS191	479-152
SN54LS192	481-149
SN54LS193	480-14
SN54LS194A	501-158
SN54LS195A	501-55
	3488-101
SN54LS240	503-131
	2470-64
SN54LS241	504-41
	2470-7
SN54LS242	503-70
	2476-27
SN54LS243	503-71
	2476-28
SN54LS244	503-178
	2470-8
SN54LS251	500-47
SN54LS253	497-150
SN54LS257	498-168
SN54LS258	498-90
SN54LS273	★ **1227**
	486-155
SN54LS298	499-84
SN54LS299	★ **1227**
	502-158
	★ **1227**
	3489-131
SN54LS322	476-100
SN54LS323	502-159
	3490-21
SN54LS373	★ **1227**
	496-70
SN54LS374	★ **1227**
	487-9
SN54LS377	★ **1227**
	487-45
SN54LS378	466-93
SN54LS379	486-1
SN54LS381	★ **1227**
	475-37
SN54LS384	475-164
SN54LS385	474-9
SN54LS388	485-168
SN54LS399	499-85
SN54LS533	★ **1227**
	496-128
SN54LS534	★ **1227**
	486-133
SN54S138	483-183
SN54S139	483-80
SN54S151	499-182
SN54S153	498-54
SN54S157	499-51
SN54S158	498-145
SN54S160	★ **1227**
	480-174
SN54S161	★ **1227**
	478-152
SN54S174	486-78
	¶ 289-8
SN54S175	485-147
	¶ 289-8
SN54S181	475-54
SN54S189	3471-50
SN54S194	501-170
	¶ 289-8
	3489-33
	¶ 289-8
SN54S195	501-67
	¶ 289-8
	3489-34
	¶ 289-8
SN54S240	503-154
	2470-65
SN54S241	504-69
	2470-9
SN54S242	503-92
	2476-29
SN54S243	503-93
	2476-30
SN54S244	504-13
	2470-10
SN54S251	500-62
SN54S253	498-4
SN54S257	498-182
SN54S258	498-105
SN54S289	3471-42
SN54S350	508-59
SN54S373	★ **1227**
	496-92
SN54S374	★ **1227**
	487-27
SN54S378	486-107
SN54S379	486-13
SN54S388	485-172
SN54S399	499-113
SN54S533	★ **1227**
	496-133
SN54S534	★ **1227**
	486-138
SN74LS161	478-136
SN74LS194A	3488-63
SN74LS240	503-132
	2470-66
SN74LS241	504-42
	2470-11
SN74LS242	503-72
	2476-60
SN74LS243	503-73
	2476-61
SN74LS244	503-179
	2470-12
SN74LS273	★ **1227**
	486-156
SN74LS299	★ **1227**
	502-160
	★ **1227**
	3490-1
SN74LS322	476-101
SN74LS323	502-161
	3490-22
SN74LS373	★ **1227**
	496-71
SN74LS374A	★ **1227**
	487-10
SN74LS377	★ **1227**
	487-46
SN74LS378	486-94
SN74LS379	486-2
SN74LS381	★ **1227**
	475-38
SN74LS384	475-165
SN74LS385	474-10
SN74LS388	485-169
SN74LS399	499-86
SN74LS533	★ **1227**
	496-129
SN74LS534	★ **1227**
	486-134
SN74S138	483-184
SN74S139	483-81
SN74S151	499-183
SN74S153	498-55
SN74S157	499-52
SN74S158	498-146
SN74S160	★ **1227**
	480-175
SN74S161	★ **1227**
	478-153
SN74S174	486-79
	¶ 289-8
SN74S175	485-148
	¶ 289-8
SN74S181	475-55
SN74S189	3471-24
SN74S194	501-171
	¶ 289-8
	3489-35
	¶ 289-8
SN74S195	501-68
	¶ 289-8
	3489-36
	¶ 289-8
SN74S240	503-155
	2470-67
SN74S241	504-70
	2470-13
SN74S242	503-94
	2476-62
SN74S243	503-95
	2476-63
SN74S244	504-14
	2470-14
SN74S251	500-63
SN74S253	498-5
SN74S257	498-183
SN74S258	498-106
SN74S289	3471-15
SN74S350	508-60
SN74S373	★ **1227**
	496-93
SN74S374	★ **1227**
	487-28
SN74S378	486-108
SN74S379	486-14
SN74S388	485-173
SN74S399	499-114
SN74S533	★ **1227**
	496-134
SN74S534	★ **1227**
	486-139
SN93S16	★ **1227**
SSS1408A-7	2443-47
SSS1408A-8	2442-19
SSS1508A-8	2442-20
SSS725A	2911-53
	2915-54
SSS725B	2920-7
SSS741	2923-19
SSS741C	2928-20
SSS747C	2938-18
TMS3114	3491-91
iAPX186	★ **1231**
	1077-18
iAPX286	★ **1231**
	1077-19
iAPX86/10	★ **1229**
	1077-20
iAPX86/20	★ **1229**
	1077-21
iAPX88/10	1059-18
iAPX88/20	1059-19

American Automation

Device	Page-Line
EZ-PRO	★ **1706**
	1616-1

American Microsystems, Inc.

Device	Page-Line
AMU/PR	★ **1251**
	1098-66
	★ **1251**
	1077-22
GA1000	★ **4307**
	4140-1
GA1500	★ **4307**
	4140-2
GA2000	★ **4307**
	4140-3
GA2000D	★ **4307**
	4140-4
GA2500	★ **4307**
	4140-5
GA3000D	★ **4307**
	4140-6
GA4000D	★ **4307**
	4140-7
GA500	★ **4307**
	4140-8
GA5000D	★ **4307**
	4140-9
S10110	2962-68
S10111	2962-69
S10129	2900-9
S10130	2900-10
S10131	2900-11
S10430	2900-22
	¶ 272-15
S1602	2487-58
S23128	★ **3610**
	460-138
	★ **3610**
	3487-23
S2333	★ **3608**
	3485-95
S2350	2487-76
	1092-133
S2364	★ **3609**
	3486-46
S25089	2949-128
S2559A	★ **3138**
	2949-129
	¶ 270-8
S2559B	★ **3138**
	2949-130
	¶ 270-8
S2559C	★ **3138**
	2949-131
	¶ 270-8
S2559D	★ **3138**
	2949-132
	¶ 270-8
S2559E	★ **3138**
	2949-133
	¶ 270-8
S2559F	★ **3138**
	2949-134
	¶ 270-8
S2559G	★ **3138**
	2949-135
	¶ 270-8
S2559H	★ **3138**
	2949-136
	¶ 270-8
S2560A	2948-3
S2561	★ **3139**
	2949-103
	2962-33
S25610	★ **3141**
	2948-49
S2561A	★ **3139**
	2949-104
S2561C	★ **3139**
	2949-105
S2562	2948-50
S2563	★ **3140**
	2948-51
S2567	2900-26
S2600	2901-174
S2601	2901-175
S2602	2901-176
S2603	2901-177
S2604	2901-178
S2605	2902-1
S2610	★ **3148**
S2688	2900-24
	2965-36
	¶ 273-3

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

American Microsystems, Inc. (Cont'd)

Device	Page-Line
S2742	2902-2
S2743	2902-3
S2747	2902-4
S2748	2902-5
S2809	2463-69
S2814	★ **3143**
S2815	★ **3144**
S28211A	★ **3142**
	2949-19
S28211B	★ **3142**
	2949-20
S28214A	1102-40
S28215	2948-55
S28216	2948-59
S2859	2949-137
S2860	2949-138
S3503	2947-63
S3504	2947-64
S3505	2947-84
S3505A	2947-85
S3506	★ **3145**
	2947-59
S3507	★ **3145**
	2947-77
S3507A	★ **3145**
	2947-78
S3508	2947-62
S3509	2947-82
S3509A	2947-83
S3525A	★ **3146**
	2947-19
	2947-36
S3525B	★ **3146**
	2947-20
	2947-37
S3526A	★ **3147**
	2947-21
S3526B	★ **3147**
	2947-22
S3610	2902-94
S3620	★ **3149**
	2902-95
S3630A	★ **3150**
	3487-31
S3630A-1	★ **3150**
	3487-32
S3630B	★ **3150**
	3487-16
S3630B-1	★ **3150**
	3487-17
S4003	★ **618**
	2898-40
	2899-25
S4036	2906-54
S4264	460-139
	3486-76
S4521	★ **2610**
	2466-5
	2480-147
	★ **2610**
	2906-95
S4534	★ **2611**
	2465-129
	2480-146
S4535	★ **2609**
	2466-6
	2480-148
S50240	2900-41
	¶ 272-15
S50241	2900-42
S50242	2900-43
S50243	2900-44
S50244	2900-45
S50245	2900-46
S5101-8	★ **3614**
	3475-1
S5101L	★ **3614**
	460-163
	★ **3614**
	3474-109
S5101L-1	★ **3614**
	3474-80
S5101L-3	★ **3614**
	3474-110
S6501-8	3475-2
S6501L	3474-111
S6501L-3	3474-112
S6501L-8	3475-3
S6501L1	3474-81
S6504	460-140
	3482-83
S6508	460-141
	3477-3
S6508-1	3476-68
S6508A	460-142
	3476-80
S6514	3478-64
S6516	460-143
	3480-36
S6528	460-144
S6551	★ **1249**
	2486-1
S6800	1091-133
	1059-20
S6801	1091-72
	1059-21
S6802	1091-98
	¶ 240-17
	¶ 244-9
	1059-22
	¶ 240-17
	¶ 244-9
S6803	1091-63
	1059-23
S6803N/R	1091-64
S68045	★ **1250**
	1092-21
S68047	2906-44
	¶ 238-1
	1092-146
	1101-106
	¶ 238-1
S6805	★ **1248**
	1091-73
	★ **1248**
	1059-24
S68051	★ **1249**
	2486-2
S6808	1091-125
S6809	★ **1247**
	1091-110
	★ **1247**
	1059-25
S6809(E)	★ **1247**
	1091-89
S6810	3472-59
	3472-59
S6810-1	3472-53
	3472-53
S6821	1092-80
	1102-48
S6831B	3485-34
S68332	★ **3612**
	3485-121
S6840	1092-102
S6846	1092-117
	¶ 244-9
S68488	1092-62
	1102-43
	¶ 245-12
S6850	2486-3
	1091-159
	1102-25
S6852	1092-134
S6854	1091-148
S68A00	1091-134
S68A02	1091-99
	1059-26
S68A045	★ **1250**
	1092-22
S68A08	1091-126
	1059-27
S68A09	★ **1247**
	1091-111
	★ **1247**
	1059-28
S68A09(E)	★ **1247**
	1091-90
S68A10	3472-54
	3472-54
S68A21	1092-81
	1102-49
S68A316	★ **3611**
	3485-35
S68A332	3485-96
S68A364	★ **3613**
	3486-95
S68A40	1092-103
S68A50	1091-160
	1102-26
S68A52	1092-135
S68A54	1091-149
S68B00	1091-135
S68B02	1091-100
S68B045	★ **1250**
	1092-23
S68B08	1091-127
S68B09	★ **1247**
	1091-112
	★ **1247**
	1059-29
S68B09(E)	★ **1247**
	1091-91
S68B10	3472-49
	3472-49
S68B21	1092-82
	1102-50
S68B316	3485-36
S68B364	460-145
	3486-47
S68B40	1092-104
S68B50	1091-161
	1102-27
S68B52	1092-136
S68B54	1091-150
S9900	1098-70
	¶ 238-13
	¶ 239-16
	¶ 246-12
	1077-23
	¶ 238-13
	¶ 239-16
	¶ 246-12
S9901-4	1098-119
S9902	1098-85
S9980	1059-30
S9980A	1098-71
S9981	1098-72
S99C91	★ **1252**
	1098-64
	★ **1252**
	1077-24
S99C922	1098-103
S99C923	1098-104
UA-1	4140-10
UA-2	4140-11
UA-3	4140-12
UA-4	4140-13
UA-5	4140-14
UA-6	4140-15

Analog Devices

Device	Page-Line
AD0042C	2934-50
AD101A	★ **3153**
	2909-17
	2923-54
AD108	★ **3153**
	2911-142
	2922-52
AD108A	★ **3153**
	2918-44
AD111	2891-39
AD1403	★ **3178**
	2966-38
AD1403A	★ **3178**
	2966-39
AD1408-7	★ **3164**
	2443-48
AD1408-8	★ **3164**
	2442-21
AD1408-9	★ **3164**
	2441-7
AD1508-8	★ **3164**
	2442-22
AD1508-9	★ **3164**
	2441-8
AD201A	★ **3153**
	2923-55
AD2020	2436-24
AD208	★ **3153**
	2922-53
AD208A	★ **3153**
	2918-45
AD211	2891-40
AD2700J	★ **3178**
	2966-117
AD2700L	★ **3178**
	2966-118
AD2700S	★ **3178**
	2966-119
AD2700U	★ **3178**
	2966-120
AD2701J	★ **3178**
	2966-121
AD2701L	★ **3178**
	2966-122
AD2701S	★ **3178**
	2966-123
AD2701U	★ **3178**
	2966-124
AD27025	2966-176
AD2702L	★ **3178**
	2966-177
AD2702S	★ **3178**
	2966-178
AD2702U	★ **3178**
	2966-179
AD2710K	★ **3178**
	2966-125
AD2710L	★ **3178**
	2966-126
AD2712K	★ **3178**
	2966-180
AD2712L	★ **3178**
	2966-181
AD2720	★ **3177**
	2967-1
AD301A	★ **3153**
	2931-50
AD301AL	★ **3153**
	2919-30
AD308	★ **3153**
	2931-32
AD308A	★ **3153**
	2919-18
AD311	2892-35
AD351J	2892-31
AD351K	2892-32
AD351S	2892-33
AD3542J	2934-43
AD3554A	★ **3155**
	2921-44
AD3554B	★ **3155**
	2920-41
AD3554S	★ **3155**
	2920-43
AD362K	2963-37
AD362S	2963-38
AD363K	2963-16
AD363S	2963-17
AD364J	2963-18
AD364K	2963-19
AD364S	2963-20
AD364T	2963-21
AD370J	★ **3165**
	2455-44
AD370K	★ **3165**
	2455-45
AD370S	★ **3165**
	2455-46
AD371J	★ **3165**
	2455-47
AD371K	★ **3165**
	2457-11
AD371S	★ **3165**
	2457-12
AD380K	★ **3155**
	2920-58
AD380L	★ **3155**
	2920-59
AD380S	★ **3155**
	2920-60
AD381J	★ **3155**
	2920-37
AD381K	★ **3155**
	2918-5
AD381L	★ **3155**
	2917-25
AD381S	★ **3155**
	2920-29
AD381T	★ **3155**
	2918-3
AD382J	★ **3155**
	2920-36
AD382K	★ **3155**
	2918-4
AD382S	★ **3155**
	2920-28
AD382T	★ **3155**
	2918-2
AD3860K	★ **3166**
	2455-21
AD3860S	★ **3166**
	2455-22
AD390J	★ **3166**
	2456-13
AD390K	★ **3166**
	2455-23
AD5010K	★ **3175**
	2426-5
AD502J	2930-24
AD502K	2927-37
AD502L	2927-36
AD502S	2927-40
AD503J	★ **3153**
	2935-18
AD503K	★ **3153**
	2934-53
AD503S	★ **3153**
	2934-54
AD504B	★ **3153**
	2434-24
AD504J	★ **3153**
	2924-33
AD504K	★ **3153**
	2921-35
AD504L	★ **3153**
	2911-65
	2919-46
AD504M	★ **3153**
	2911-20
	2919-45
AD504S	★ **3153**
	2911-66
	2919-47
AD506J	★ **3153**
	2925-48
AD506K	★ **3153**
	2921-30
AD506L	★ **3153**
	2911-35
	2920-14
AD506S	★ **3153**
	2921-31
AD507J	★ **3155**
	2913-123
	2930-26
AD507K	★ **3155**
	2913-124
	2925-29
AD507S	★ **3155**
	2913-125
	2925-55
AD509J	★ **3155**
	2910-36
	2933-16
AD509K	★ **3155**
	2910-32
	2932-18
AD509S	★ **3155**
	2910-33
	2932-19
AD510J	★ **3153**
	2915-48
AD510K	★ **3153**
	2911-62
	2915-2
AD510L	★ **3153**
	2911-21
	2914-24
AD510S	★ **3153**
	2911-63
	2915-3
AD512K	2925-37
AD512S	2925-39
AD514J	2935-21
AD514K	2934-39
AD514L	2934-36
AD514S	2934-40
AD515J	★ **3153**
	2911-14
	2924-38
AD515K	★ **3153**
	2911-9
	2920-9
AD515L	★ **3153**
	2911-4
	2920-8
AD517J	★ **3153**
	2916-27
AD517K	★ **3153**
	2911-67
	2914-47
AD517L	★ **3153**
	2911-22
	2914-13
AD517S	★ **3153**
	2911-68
	2914-48
AD518	★ **3155**
	2910-44
AD518J	★ **3155**
	2931-18
AD518K	★ **3155**
	2926-5
AD518S	★ **3155**
	2910-45
	2926-6
AD5200	★ **3174**
AD5201	2434-55
AD5201A	2435-41
AD5201B	2434-25
AD5201S	2435-42
AD5201T	2434-26
AD5202	2435-1
AD5202A	2435-43
AD5202B	2434-27
AD5202S	2435-44
AD5202T	2434-28
AD5203	2435-2
AD5204	2435-3
AD5204A	2435-45
AD5204S	2435-46
AD5204T	2434-29
AD5205	2435-4
AD5205A	2435-47
AD5205B	2434-30
AD5205S	2435-48
AD5205T	2434-31
AD5206	2435-5
AD5210	★ **3174**
	2433-35
AD5211	★ **3174**
	2433-36
AD5212	2433-37
AD5213	2433-38
AD5214	★ **3174**
	2433-39
AD5215	2433-40
AD5216	2433-41
AD521J	★ **3158**
	2887-68
AD521K	★ **3158**
	2887-69
AD521L	★ **3158**
	2887-70
AD521S	★ **3158**
	2887-71
AD522A	★ **3158**
	2887-56
	2917-40
	¶ 264-3
AD522B	★ **3158**
	2887-57
	2916-51
	¶ 264-3
AD522S	★ **3158**
	2887-58
	2916-55
	¶ 264-3
AD523J	2911-28
	2935-17
AD523K	2911-17
	2934-35
AD523L	2911-11
	2934-34
AD5240K	★ **3175**
	2431-43
AD5240S	★ **3175**
	2431-44
AD524A	★ **3158**
	2917-26
AD524B	★ **3158**
	2915-47
AD524C	★ **3158**
	2915-1
AD524S	★ **3158**
	2915-52
AD528	2910-46
AD528J	2924-43
AD528K	2920-23
AD528S	2910-47
	2920-24
AD530J	2965-3
	¶ 278-5

Arranged alphanumerically from left to right.

© IC MASTER 1983

Analog Devices (Cont'd)

Device	Page-Line
AD530K	2965-4
	¶ 278-5
AD530L	2965-5
	¶ 278-5
AD530S	2965-6
	¶ 278-5
AD531J	★ 3161
	2965-7
	¶ 278-5
AD531K	★ 3161
	2965-8
	¶ 278-5
AD531L	★ 3161
	2965-9
	¶ 278-5
AD531S	★ 3161
	2965-10
	¶ 278-5
AD532J	★ 3161
	2965-11
	¶ 278-5
AD532K	★ 3161
	2965-12
	¶ 278-5
AD532S	★ 3161
	2965-13
	¶ 278-5
AD533J	★ 3161
	2965-14
	¶ 278-5
AD533K	★ 3161
	2965-15
	¶ 278-5
AD533L	★ 3161
	2965-16
	¶ 278-5
AD533S	★ 3161
	2965-17
	¶ 278-5
AD534J	★ 3161
	2965-18
	¶ 278-5
AD534K	★ 3161
	2965-19
	¶ 278-5
AD534L	★ 3161
	2965-20
	¶ 278-5
AD534S	★ 3161
	2965-21
	¶ 278-5
AD534T	★ 3161
	2965-22
	¶ 278-5
AD535J	2963-53
AD535K	2963-54
AD536A	★ 3161
	2967-38
	¶ 278-5
AD536AJ	★ 3161
	2967-39
	¶ 278-5
AD536AK	★ 3161
	2967-40
	¶ 278-5
AD536AS	★ 3161
	2967-41
	¶ 278-5
AD537J	★ 3176
	2968-61
	¶ 253-2
AD537K	★ 3176
	2968-62
	¶ 253-2
AD537S	★ 3176
	2968-63
	¶ 253-2
AD539J	★ 3161
	2964-150
AD539K	★ 3161
	2964-151
AD539S	★ 3161
	2964-152
AD540J	★ 3153
	2935-22
AD540K	★ 3153
	2934-42
AD540S	★ 3153
	2934-44
AD542J	★ 3153
	2921-42
	¶ 266-7
AD542K	★ 3153
	2920-32
	¶ 266-7
AD542L	★ 3153
	2918-6
	¶ 266-7
AD542S	★ 3153
	2920-31
	¶ 266-7
AD544J	★ 3153
	2921-45
	¶ 266-7
AD544K	★ 3153
	2920-27
	¶ 266-7
AD544L	★ 3153
	2918-1
	¶ 266-7
AD544S	★ 3153
	2920-30
	¶ 266-7
AD545J	★ 3153
	2920-13
AD545K	★ 3153
	2920-12
AD545L	★ 3153
	2917-47
AD545M	★ 3153
	2917-13
AD547J	★ 3151
	★ 3153
	2920-35
AD547K	★ 3151
	★ 3153
	2917-55
AD547L	★ 3151
	★ 3153
	2917-21
AD547S	★ 3151
	★ 3153
	2917-56
AD558J	★ 3164
	2443-1
	¶ 255-7
AD558K	★ 3164
	2441-11
	¶ 255-7
AD558S	★ 3164
	2443-34
	¶ 255-7
AD558T	★ 3164
	2441-16
	¶ 255-7
AD561J	★ 3164
	2445-30
AD561K	★ 3164
	2445-12
AD561S	★ 3164
	2445-31
AD561T	★ 3164
	2445-13
AD562A/BCD	★ 3166
	★ 3168
	2455-9
AD562A/BIN	★ 3166
	★ 3168
	2455-10
AD562K/BCD	★ 3166
	★ 3168
	2460-7
AD562K/BIN	★ 3166
	★ 3168
	2454-7
AD562S/BCD	★ 3166
	★ 3168
	2460-8
AD562S/BIN	★ 3166
	★ 3168
	2450-41
AD563J	★ 3165
	2454-6
AD563J/BCD	★ 3165
	2460-9
AD563J/BIN	★ 3165
	2454-8
AD563K/BCD	★ 3165
	2460-10
AD563K/BIN	★ 3165
	2450-43
AD563S/BCD	★ 3165
	2460-11
AD563S/BIN	★ 3165
	2450-44
AD563T/BCD	★ 3165
	2460-12
AD563T/BIN	★ 3165
	2450-45
AD565AJ	★ 3165
	2451-35
AD565AK	★ 3165
	2450-15
AD565AS	★ 3165
	2451-36
AD565AT	★ 3165
	2450-16
AD565J	★ 3165
	2452-41
AD565K	★ 3165
	2450-27
AD565S	★ 3165
	2452-42
AD565T	★ 3165
	2450-28
AD566AJ	★ 3166
	2452-31
AD566AK	★ 3166
	2450-19
AD566AS	★ 3166
	2452-32
AD566AT	★ 3166
	2450-20
AD566J	★ 3166
	2452-33
AD566K	★ 3166
	2450-21
AD566S	★ 3166
	2452-34
AD566T	★ 3166
	2450-22
AD567J	★ 3166
	2453-17
AD567K	★ 3166
	2450-38
AD567S	★ 3166
	2453-18
AD570J	★ 3174
	2428-12
AD570S	★ 3174
	2428-13
AD571J	★ 3174
	2431-17
AD571K	★ 3174
	2431-3
AD571S	★ 3174
	2431-18
AD572A	★ 3174
	2433-52
AD572B	★ 3174
	2434-1
AD572S	★ 3174
	2434-2
AD573J	★ 3174
	2431-16
AD573K	★ 3174
	2430-40
AD573S	★ 3174
	2430-41
AD574AJ	★ 3174
	2435-33
AD574AK	★ 3174
	2433-49
AD574AS	★ 3174
	2435-34
AD574J	★ 3174
	2435-35
AD574K	★ 3174
	2434-6
AD574L	★ 3174
	2434-7
AD574S	★ 3174
	2434-8
AD574T	★ 3174
	2434-9
AD574U	★ 3174
	2434-10
AD574ZJ	★ 3174
	2435-37
AD574ZK	★ 3174
	2435-38
AD574ZL	★ 3174
	2434-16
AD574ZS	★ 3174
	2434-17
AD574ZT	★ 3174
	2434-18
AD574ZU	★ 3174
	2434-19
AD578J	★ 3172
	★ 3175
	2431-49
AD578K	★ 3172
	★ 3175
	2431-41
AD578L	★ 3172
	★ 3175
	2431-37
AD578S	★ 3172
	★ 3175
	2431-50
AD578T	★ 3172
	★ 3175
	2431-42
AD579B	★ 3175
	2430-23
AD579J	★ 3175
	2430-26
AD579K	★ 3175
	2430-24
AD579T	★ 3175
	2430-25
AD580J	★ 3178
	2966-40
AD580K	★ 3178
	2966-41
AD580L	★ 3178
	2966-42
AD580S	★ 3178
	2966-43
AD580T	★ 3178
	2966-44
AD580U	★ 3178
	2966-45
AD581J	★ 3178
	2966-127
AD581K	★ 3178
	2966-128
AD581L	★ 3178
	2966-129
AD581S	★ 3178
	2966-130
AD581T	★ 3178
	2966-131
AD581U	★ 3178
	2966-132
AD582K	★ 3181
	2967-53
AD582S	★ 3181
	2967-54
AD583K	★ 3181
	2967-55
AD583S	★ 3181
	2967-56
AD584J	2965-161
AD584K	2965-162
AD584L	2965-163
AD584S	2965-164
AD584T	2965-165
AD584U	2965-166
AD585J	★ 3179
	★ 3181
	2967-57
AD585S	★ 3179
	★ 3181
	2967-58
AD589J	★ 3178
	2966-18
AD589K	★ 3178
	2966-19
AD589L	★ 3178
	2966-20
AD589M	★ 3178
	2966-21
AD589S	★ 3178
	2966-22
AD589T	★ 3178
	2966-23
AD589U	★ 3178
	2966-24
AD590I	2968-11
AD590J	2968-12
AD590K	2968-13
AD590L	2968-14
AD590M	2968-15
AD6020K	★ 3175
	2426-6
AD612A	★ 3158
	2887-59
	2916-56
AD612B	★ 3158
	2887-60
	2917-1
AD612C	★ 3158
	2887-61
	2917-2
AD614A	★ 3158
	2887-62
	2917-3
AD614B	★ 3158
	2887-63
	2917-4
AD624A	★ 3156
	★ 3158
	2887-104
	2917-27
AD624B	★ 3156
	★ 3158
	2887-105
	2915-51
AD624C	★ 3156
	★ 3158
	2887-106
	2915-6
AD624S	★ 3156
	★ 3158
	2887-107
	2916-11
AD630	★ 3160
	★ 3161
	2962-89
AD636J	★ 3161
	2967-42
AD636K	★ 3161
	2967-43
AD637J	★ 3159
	★ 3161
	2967-44
AD637K	★ 3159
	★ 3161
	2967-45
AD642J	★ 3153
	2936-39
AD642K	★ 3153
	2936-18
AD642L	★ 3153
	2935-47
AD642S	★ 3153
	2936-19
AD644J	★ 3153
	2936-40
AD644K	★ 3153
	2936-20
AD644L	★ 3153
	2935-46
AD644S	★ 3153
	2935-48
AD647J	★ 3151
	★ 3153
	2936-23
AD647K	★ 3151
	★ 3153
	2935-43
AD647L	★ 3151
	★ 3153
	2935-39
AD647S	★ 3151
	★ 3153
	2935-44
AD647S/883B	★ 3151
	★ 3153
	2935-45
AD650	★ 3176
	2968-64
AD673J	★ 3174
	2428-6
AD673S	★ 3174
	2428-7
AD7110K	★ 3166
	2896-27
AD7111K	★ 3166
	2896-21
AD7111L	★ 3166
	2896-22
AD7111T	★ 3166
	2896-23
AD7111U	★ 3166
	2896-24
AD7115K	★ 3163
	2896-20
AD7118K	★ 3166
	2896-28
AD7118L	★ 3166
	2896-29
AD7118T	★ 3166
	2896-25
AD7118U	★ 3166
	2896-26
AD741	★ 3153
	2909-27
	2929-8
AD741C	★ 3153
	2930-43
AD741J	★ 3153
	2925-38
AD741K	★ 3153
	2924-8
AD741L	★ 3153
	2919-39
AD741S	★ 3153
	2923-53
AD7501J	★ 3176
	2423-106
AD7501K	★ 3176
	2423-107
AD7501S	★ 3176
	2423-108
AD7502J	★ 3176
	2423-38
AD7502K	★ 3176
	2423-39
AD7502S	★ 3176
	2423-40
AD7503J	★ 3176
	2423-109
AD7503K	★ 3176
	2424-1
AD7503S	★ 3176
	2424-2
AD7506J	★ 3176
	2425-10
AD7506K	★ 3176
	2425-11
AD7506S	★ 3176
	2425-5
AD7506T	★ 3176
	2425-6
AD7507J	★ 3176
	2424-72
AD7507K	★ 3176
	2424-73
AD7507S	★ 3176
	2424-65
AD7507T	★ 3176
	2424-66
AD7510DIJ	★ 3176
	2417-5
AD7510DIK	★ 3176
	2417-6
AD7510DIS	★ 3176
	2417-7
AD7511DIJ	★ 3176
	2417-8
AD7511DIK	★ 3176
	2417-9
AD7511DIS	★ 3176
	2417-10
AD7511DJT	★ 3176
	2417-11
AD7512DIJ	★ 3176
	2419-45
AD7512DIK	★ 3176
	2419-46
AD7512DIS	★ 3176
	2419-47
AD7512DIT	★ 3176
	2419-48
AD7519J	2420-1
AD7520J	★ 3164
	2448-29
	¶ 256-18
AD7520K	★ 3164
	2447-38
	¶ 256-18
AD7520L	★ 3164
	2445-47
	¶ 256-18

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Analog Devices (Cont'd)

Device	Page-Line
AD7520S	★ 3164
	2448-30
	¶ 256-18
AD7520T	★ 3164
	2447-39
	¶ 256-18
AD7520U	★ 3164
	2446-1
	¶ 256-18
AD7521J	★ 3164
	2458-26
	¶ 256-18
AD7521K	★ 3164
	2458-12
	¶ 256-18
AD7521L	★ 3164
	2457-23
	¶ 256-18
AD7521S	★ 3164
	2458-27
	¶ 256-18
AD7521T	★ 3164
	2458-13
	¶ 256-18
AD7521U	★ 3164
	2457-24
	¶ 256-18
AD7522J	★ 3164
	2448-45
	¶ 256-18
AD7522K	★ 3164
	2448-3
	¶ 256-18
AD7522L	★ 3164
	2446-16
	¶ 256-18
AD7522S	★ 3164
	2448-46
	¶ 256-18
AD7522T	★ 3164
	2448-4
	¶ 256-18
AD7522U	★ 3164
	2446-17
	¶ 256-18
AD7523J	★ 3164
	2441-39
AD7523K	★ 3164
	2440-36
AD7523L	★ 3164
	2440-3
AD7523S	★ 3164
	2441-40
AD7524A	★ 3164
	2442-1
	¶ 256-18
AD7524B	★ 3164
	2440-40
	¶ 256-18
AD7524C	★ 3164
	2440-7
	¶ 256-18
AD7524J	★ 3164
	2442-2
	¶ 256-18
AD7524K	★ 3164
	2440-41
	¶ 256-18
AD7524L	★ 3164
	2440-8
	¶ 256-18
AD7524S	★ 3164
	2442-3
	¶ 256-18
AD7524T	★ 3164
	2440-42
	¶ 256-18
AD7524U	★ 3164
	2440-9
	¶ 256-18
AD7525K	★ 3166
	2962-81
	2965-83
	¶ 256-18
AD7525L	★ 3166
	2965-84
	¶ 256-18
AD7525T	★ 3166
	2962-82
	2965-85
	¶ 256-18
AD7525U	★ 3166
	2965-86
	¶ 256-18
AD7527B	★ 3164
	2447-31
AD7527C	★ 3164
	2445-34
AD7527GC	★ 3164
	2445-35
AD7527GL	★ 3164
	2445-36
AD7527GU	★ 3164
	2445-37
AD7527K	★ 3164
	2447-32
AD7527L	★ 3164
	2445-38
AD7527T	★ 3164
	2447-33
AD7527U	★ 3164
	2445-39
AD7528J	★ 3164
	2443-45
AD7528K	★ 3164
	2442-13
AD7528L	★ 3164
	2442-14
AD7528S	★ 3164
	2443-46
AD7528T	★ 3164
	2442-15
AD7528U	★ 3164
	2442-16
AD7530J	★ 3164
	2448-31
	¶ 256-18
AD7530K	★ 3164
	2447-40
	¶ 256-18
AD7530L	★ 3164
	2446-2
	¶ 256-18
AD7531J	★ 3164
	2458-28
	¶ 256-18
AD7531K	★ 3164
	2458-14
	¶ 256-18
AD7533A	★ 3164
	2449-1
	¶ 256-18
AD7533B	★ 3164
	2448-8
	¶ 256-18
AD7533C	★ 3164
	2446-21
	¶ 256-18
AD7533J	★ 3164
	2449-2
	¶ 256-18
AD7533K	★ 3164
	2448-9
	¶ 256-18
AD7533L	★ 3164
	2446-22
	¶ 256-18
AD7533S	★ 3164
	2449-3
	¶ 256-18
AD7533T	★ 3164
	2448-10
	¶ 256-18
AD7533U	★ 3164
	2446-23
	¶ 256-18
AD7541A	★ 3164
	★ 3166
	2456-21
	¶ 256-18
AD7541B	★ 3164
	★ 3166
	2453-26
	¶ 256-18
AD7541J	★ 3164
	★ 3166
	2456-22
	¶ 256-18
AD7541K	★ 3164
	★ 3166
	2453-27
	¶ 256-18
AD7541S	★ 3164
	★ 3166
	2456-42
	¶ 256-18
AD7541T	★ 3164
	★ 3166
	2453-28
	¶ 256-18
AD7542A	★ 3166
	2456-45
AD7542B	★ 3166
	2454-18
AD7542J	★ 3166
	2457-1
AD7542K	★ 3166
	2454-19
AD7542S	★ 3166
	2457-2
AD7542T	★ 3166
	2454-20
AD7543A	★ 3166
	2457-3
AD7543B	★ 3166
	2454-21
AD7543J	★ 3166
	2457-4
AD7543K	★ 3166
	2454-22
AD7544A	★ 3166
	2456-18
	¶ 255-11
AD7544B	★ 3166
	2451-28
	¶ 255-11
AD7544BG	★ 3166
	2451-29
	¶ 255-11
AD7544GK	★ 3166
	2451-30
	¶ 255-11
AD7544GT	★ 3166
	2451-31
	¶ 255-11
AD7544J	★ 3166
	2456-19
	¶ 255-11
AD7544K	★ 3166
	2451-32
	¶ 255-11
AD7544S	★ 3166
	2456-20
	¶ 255-11
AD7544T	★ 3166
	2451-33
	¶ 255-11
AD7545A	★ 3166
	2457-13
AD7545B	★ 3166
	2456-14
AD7545C	★ 3166
	2451-4
AD7545GC	★ 3166
	2451-5
AD7545GL	★ 3166
	2451-6
AD7545GU	★ 3166
	2451-7
AD7545J	★ 3166
	2457-14
AD7545K	★ 3166
	2456-15
AD7545L	★ 3166
	2451-8
AD7545S	★ 3166
	2457-15
AD7545T	★ 3166
	2456-16
AD7545U	★ 3166
	2451-9
AD7546A	★ 3166
	2461-18
AD7546B	★ 3166
	2461-6
AD7546J	★ 3166
	2461-19
AD7546K	★ 3166
	2461-7
AD7550B	★ 3174
	2436-26
AD7552	★ 3174
	2436-4
AD7555	★ 3174
	2962-32
AD7570J	2428-8
AD7570L	2431-5
AD7571J	★ 3171
	★ 3174
	2431-27
AD7571K	★ 3171
	★ 3174
	2431-25
AD7571S	★ 3171
	★ 3174
	2431-28
AD7571T	★ 3171
	★ 3174
	2431-26
AD7574A	★ 3174
	2429-1
AD7574B	★ 3174
	2427-45
AD7574J	★ 3174
	2429-2
AD7574K	★ 3174
	2427-46
AD7574S	★ 3174
	2429-3
AD7574T	★ 3174
	2427-47
AD7581A	★ 3174
	2963-30
	★ 3174
	1094-115
	1095-133
	1097-57
AD7581B	★ 3174
	2963-31
	★ 3174
	1094-116
	1095-134
	1097-58
AD7581C	★ 3174
	2963-32
	★ 3174
	1094-117
	1095-135
	1097-59
AD7581J	★ 3174
	2963-33
	★ 3174
	1094-118
	1095-136
	1097-60
AD7581K	★ 3174
	2429-7
	★ 3174
	2963-34
	★ 3174
	1094-119
	1095-137
	1097-61
AD7581L	★ 3174
	2963-35
	★ 3174
	1094-120
	1095-138
	1097-62
AD7583K	2429-38
AD7590DIB	★ 3176
	2416-118
AD7590DIK	★ 3176
	2416-119
AD7591DIB	★ 3176
	2416-120
AD7591DIK	★ 3176
	2416-121
AD7592DIB	★ 3176
	2415-83
AD7592DIK	★ 3176
	2415-84
AD8581B	1097-63
AD8581L	2428-17
AD9685	★ 3157
	2892-9
AD9687	★ 3157
	2892-10
AD9768	★ 3162
	★ 3169
	2439-39
ADADC71J	★ 3173
	2436-45
ADADC71K	★ 3173
	2436-39
ADADC72J	★ 3173
	2436-46
ADADC72K	★ 3173
	2436-40
ADADC80-12	★ 3174
	2433-50
ADADC80-15	★ 3174
	2431-1
ADADC80Z-10	★ 3174
	2431-2
ADADC80Z-12	★ 3174
	2433-51
ADADC84-10	★ 3175
	2430-36
ADADC84-12	★ 3175
	2432-22
ADADC85-10	★ 3175
	2430-38
ADADC85-12	★ 3175
	2432-25
ADDAC-08	★ 3164
	2441-29
ADDAC-08A	2440-23
ADDAC-08C	2443-38
ADDAC-08E	2441-45
ADDAC-08H	2440-24
ADDAC100J	★ 3164
	2447-36
ADDAC100K	★ 3164
	2447-23
ADDAC100L	★ 3164
	2447-24
ADDAC100S	★ 3164
	2447-37
ADDAC100T	★ 3164
	2447-25
ADDAC71-COB-I	★ 3166
	2461-25
ADDAC71-COB-V	★ 3166
	2461-37
ADDAC71-CSB-I	★ 3166
	2461-26
ADDAC71-CSB-V	★ 3166
	2461-38
ADDAC72-COB-I	★ 3166
	2461-27
ADDAC72-COB-V	★ 3166
	2461-39
ADDAC72-CSB-I	★ 3166
	2461-28
ADDAC72-CSB-V	★ 3166
	2461-40
ADDAC80/CBI	★ 3164
	2452-24
	¶ 252-6
ADDAC80/CCD	★ 3164
	2459-12
	¶ 252-6
ADDAC85/CBI	★ 3164
	2452-25
	¶ 252-7
ADDAC85/CCD	★ 3164
	2459-13
	¶ 252-7
ADDAC85C/CBI	★ 3164
	2452-26
	¶ 252-7
ADDAC85C/CCD	★ 3164
	2459-14
	¶ 252-7
ADDAC87/CBI	★ 3165
	2452-22
ADG200A	★ 3176
	2415-58
ADG200B	★ 3176
	2415-74
ADG200C	★ 3176
	2415-75
ADG201A	★ 3176
	2416-116
ADG201B	★ 3176
	2417-12
ADG201C	★ 3176
	2417-13
ADHDD-0810	★ 3169
ADLH0032	★ 3155
	2913-149
	2927-24
ADLH0032C	★ 3155
	2913-150
	2934-19
ADLH0033	★ 3155
	2908-2
ADLH0033C	★ 3155
	2908-5
ADOP-07	★ 3153
	2911-10
	2915-25
ADOP-07A	★ 3153
	2914-15
ADOP-07C	★ 3153
	2916-31
ADOP-07D	★ 3153
	2916-39
ADOP-07E	★ 3153
	2915-31
ADSHC-85	★ 3181
	2967-59
ADSHC-85E	2967-60
ADSP-1008K	★ 3183
	★ 3186
	449-126
ADSP-1008T	★ 3183
	★ 3186
	449-127
ADSP-1010K	★ 3182
	★ 3186
	449-130
ADSP-1010T	★ 3182
	★ 3186
	449-131
ADSP-1016K	★ 3184
	★ 3186
	449-128
ADSP-1016T	★ 3184
	★ 3186
	449-129
ADSP-1080K	★ 3185
	449-124
ADSP-1080T	★ 3185
	449-125
ADVFC32	★ 3176
ADVFG32	2968-65
ADX346	2967-61
HAS-0802	★ 3175
	2426-47
HAS-1002	★ 3175
	2430-20
HAS-1202	★ 3175
	2431-36
HDD-0810	2444-16
HDD-0810C	2444-18
HDD-0810CM	2444-19
HDD-0810M	2444-17
HDD-1015	★ 3169
	2450-1
HDD-1015C	★ 3169
	2450-2
HDD-1015M	★ 3169
	2450-3
HDD-1206J	★ 3169
	2454-26
HDD-1206S	★ 3169
	2454-27
HDG-0405	★ 3169
	2439-4
HDG-0605	★ 3169
	2439-34
HDG-0805	★ 3169
	2444-20
HDH-0802	★ 3169
	2441-3
HDH-0802M	★ 3169
	2441-4
HDH-1003	★ 3169
	2445-16
HDH-1205	★ 3169
	2453-22
HDH-1205M	★ 3169
	2453-23
HDH1003M	2447-22
HDS-060	2935-13
HDS-0810E	★ 3169
	2440-16
HDS-0810EM	★ 3169
	2440-17
HDS-0820	★ 3169
	2441-14
HDS-0820M	★ 3169
	2441-15

Arranged alphanumerically from left to right.

© IC MASTER 1983

Analog Devices (Cont'd)

Device	Page-Line
HDS-1015E	★ 3169
	2447-14
HDS-1015EM	★ 3169
	2447-15
HDS-1025	★ 3169
	2445-10
HDS-1025M	★ 3169
	2445-11
HDS-1240E	★ 3169
	2456-9
HDS-1240EM	★ 3169
	2456-10
HDS-1250	★ 3169
	2451-11
HDS-1250M	★ 3169
	2451-12
HOS-050	★ 3155
	2910-17
HOS-050A	★ 3155
	2910-18
HOS-050	★ 3152
	★ 3155
	2921-5
HOS-050/883	★ 3152
	★ 3155
	2921-6
HOS-100AH	★ 3155
	2887-28
HOS-199SH	2887-29
HTC-0300	★ 3181
	2967-62
HTC-0500	★ 3180
	2967-63
HTS-0025	★ 3181
	2967-64
MAH-0201	★ 3175
	2426-4
MAH-1001	★ 3175
	2426-21
MAS-1202	★ 3175
	2430-9
SDC1740	2967-6
SDC1741	2967-7
SDC1742	2967-8

Burr-Brown Research

Device	Page-Line
3271	2911-69
3291	2911-70
3329	2909-87
3354	2911-71
3456	2887-118
3500A	2928-11
	¶ 265-14
3500B	2923-16
	¶ 265-14
3500C	2921-11
	¶ 265-14
3500E	2911-72
	2919-40
	¶ 265-14
3500MP	2936-53
	¶ 265-14
3500R	2928-12
	¶ 265-14
3500R/MIL	2928-13
	¶ 265-14
3500S	2923-17
	¶ 265-14
3500T	2921-12
	¶ 265-14
3500U/883B	2928-14
	¶ 265-14
3501A	2927-46
3501B	2923-9
3501C	2923-7
3501R	2927-47
3501S	2923-10
3503A	2935-19
3503B	2934-37
3503R	2935-20
3503S	2934-38
3507J	2910-37
	2933-23
3508J	2928-8
3510A	2911-101
	2916-43
3510B	2911-73
	2916-14
3510C	2911-23
	2915-11
3510S	2911-74
	2916-15
3510V	2916-16
3510VM	2911-110
3521H	2917-54
	¶ 265-13
3521J	2917-19
	¶ 265-13
3521K	2917-18
	¶ 265-13
3521L	2911-75
	2917-15
	¶ 265-13
3521R	2917-20
	¶ 265-13
3522J	2920-19
3522K	2911-39
	2917-52
3522L	2911-29
	2926-35
3522S	2911-40
	2917-53
3523J	2911-18
	2920-11
3523K	2911-12
	2917-44
3523L	2911-6
	2917-42
3527A	2911-41
	2917-51
3527B	2911-33
	2917-14
3527C	2911-42
	2911-111
	2917-50
3528A	2917-45
3528B	2917-7
3528C	2911-3
	2917-41
3542J	2934-45
3542S	2934-46
3550J	2910-40
	2920-20
3550K	2910-34
	2920-22
3550S	2910-41
	2920-21
3551J	2913-137
	2920-44
3551S	2913-138
	2920-45
3553	2887-18
	2908-9
3554A	2909-79
	2913-146
	2922-22
3554B	2909-80
	2913-147
	2920-40
3554S	2909-81
	2913-148
	2920-42
3571A	2909-67
	2910-67
	2922-38
3572A	2909-68
	2910-68
	2922-39
3573	2909-66
	2933-13
3580J	2909-86
	2910-82
	2932-30
3581J	2909-96
	2910-66
	2924-40
3582J	2910-1
	2910-63
	2924-39
3583	2910-2
	2910-64
	2924-41
3584	2910-3
	2910-65
	2924-42
3606	2888-35
3607	2888-36
3626A	2887-72
3626B	2887-73
3626C	2887-74
3627	2887-108
3629	2887-75
3629A	2914-30
3629B	2914-27
3629C	2914-28
3629S	2914-29
3630A	2887-76
3630B	2887-77
3630C	2887-78
3630S	2887-79
3650HG	2887-109
	¶ 264-9
3650MG	2887-110
	¶ 264-9
3652HG	2887-111
3652MG	2887-112
3656AG	2887-119
3656BG	2887-113
	2887-120
3656HG	2887-114
3660J	2887-80
	¶ 264-6
3662	2887-81
3712T/R	2963-60
3713T/R	2963-61
3714T	2963-62
4023	2965-42
4025	2965-43
4082/03	2962-125
4085	2965-69
4085M	2965-70
4115/04	2962-127
4127	2887-132
4131	2968-40
4203	2965-23
4203S	2965-24
4204	2965-25
4204S	2965-26
4205	2965-27
4205S	2965-28
4206	2965-29
4213	2965-30
4213S	2965-31
4214	2965-32
4214M	2965-33
4291	2963-55
4301	2964-148
	¶ 278-3
4302	2964-149
4340	2967-46
4341	2967-47
4423	2965-44
722	2960-85
724	2960-86
ADC10HT	2434-38
ADC60-12	2431-40
ADC71J	2437-4
ADC71K	2436-47
ADC72	2436-48
ADC731J	2436-42
ADC731K	2436-36
ADC73J	2436-43
ADC73K	2436-37
ADC76	2436-38
ADC80-12	2434-3
ADC80A-12	2434-4
ADC82A	2427-18
ADC84-10	2430-37
ADC84-12	2432-23
ADC85-10	2430-39
ADC85-12	2432-26
ADC87/MIL	2432-4
ADC87U	2432-5
ATF76	2962-8
CS4460	1617-3
CS450	1617-2
DAC10HT	2451-34
DAC63	2451-10
	¶ 253-9
DAC650-CBI-I	2452-3
DAC650-CBI-V	2452-4
DAC70/CCD	2462-21
DAC70/COB	2462-11
DAC70/CSB	2462-9
DAC70C/CCD	2462-22
DAC70C/COB	2462-12
DAC70C/CSB	2462-10
DAC71/CCD	2462-27
DAC71/COB	2462-1
DAC71/CSB	2462-2
DAC72/COB	2462-3
DAC72/CSB	2462-4
DAC73	2461-13
DAC736	2461-11
DAC73C	2461-14
DAC74	2461-12
DAC80/CBI	2452-18
DAC80/CCD	2459-22
DAC800-CBI-I	2452-5
DAC800-CBI-V	2452-6
DAC82K	2442-25
DAC82S	2442-26
DAC85/CBI	2452-19
DAC85/CCD	2459-23
DAC851-CBI-I	2452-7
DAC85C/CBI	2452-20
DAC85C/CCD	2459-24
DAC862S	2453-1
DAC87/CBI	2452-21
DAC90B	2441-24
DAC90S	2441-25
DIV100	2963-56
DSM856	2963-39
FOR110	2963-69
FOT110	2963-73
INA101AM	2887-48
INA101BM	2887-49
INA101CM	2887-50
INA101SM	2887-51
ISO100AP	2887-115
ISO100BP	2887-116
ISO100CP	2887-117
LOG100	2887-137
MP10	2439-1
	¶ 244-16
	¶ 247-9
	1102-17
	¶ 244-16
	¶ 247-9
MP11	2439-2
	¶ 244-16
	¶ 247-9
	1102-18
	¶ 244-16
	¶ 247-9
MP20	2429-35
	¶ 238-14
	¶ 244-16
	1094-51
	1096-131
	1097-47
	1102-10
	¶ 238-14
	¶ 244-16
MP21	2429-36
	¶ 238-14
	¶ 244-16
	1091-7
	1093-95
	1095-124
	1096-108
	1102-11
	¶ 238-14
	¶ 244-16
MP22	1093-96
	1094-52
	1096-132
	1097-48
	1102-12
MP32	1093-97
	1094-53
	1096-133
	1097-49
	1102-13
MPC16S	2425-22
MPC4D	2423-63
MPC800	2424-83
MPC801	2423-60
MPC8D	2424-84
MPC8S	2424-25
OPA101	2911-47
	2913-139
OPA101AM	2918-36
OPA101BM	2917-16
OPA102	2913-140
OPA102AM	2918-37
OPA102BM	2917-17
OPA103AM	2911-36
	2917-49
OPA103BM	2911-34
	2917-48
OPA103CM	2911-112
	2917-11
OPA103DM	2917-9
OPA104AM	2911-19
	2920-10
OPA104BM	2911-13
	2917-43
OPA104CM	2911-5
	2917-30
OPA105UM	2917-12
OPA105WM/MIL	2917-8
OPA106/MIL	2911-48
OPA11HT	2927-53
OPA12HT	2933-36
OPA27A	2914-39
OPA27B	2915-20
OPA27C	2916-7
OPA27E	2914-40
OPA27F	2915-21
OPA27G	2916-8
OPA37A	2914-41
OPA37B	2915-22
OPA37C	2916-9
OPA37E	2914-42
OPA37F	2915-23
OPA37G	2916-10
OPA600/MIL	2913-168
OPA600N	2922-35
OPA600U	2927-30
OPA600U/883B	2927-31
OPA600V/883B	2922-36
OPA600V/MIL	2922-37
OPA605	2910-35
	2913-155
OPA605A	2920-33
OPA605B	2918-10
OPA605C	2918-8
OPA605H	2920-34
OPA605J	2918-11
OPA605K	2918-9
PCM50K	2461-5
PCM75J	2437-1
PCM75K	2436-44
PGA100AG	2887-98
PGA100BG	2887-99
SDM854	2963-40
SDM857	2963-41
SHC23	2967-67
SHC298AM	2967-68
SHC80	2967-69
SHC85	2967-70
SHC85ET	2967-71
UAF11	2962-9
UAF11H	2962-10
UAF21	2962-11
UAF21H	2962-12
UAF31	2962-13
UAF41	2962-14
VFC32	2963-80
VFC32M	2963-81
VFC32UM	2968-88
VFC32VM	2968-89
VFC32WM	2968-90
VFC42	2963-82
VFC42M	2963-83
VFC52	2963-84
VFC52M	2963-85
XTR100AM	2888-132
XTR100AP	2888-133
XTR100BM	2888-134
XTR100BP	2888-135

California Devices

Device	Page-Line
CDI1100	4140-16
CDI2100	4140-17
CDI3200	4140-18
CDI4200	4140-19
CDI500	4140-20
CDI6100	4140-21
CDI8800	4140-22
CLIC-A	4140-23
CLIC-B	4140-24
CLIC-C	4140-25
CLIC-D	4140-26
CLIC-E	4140-27
CLIC-F	4140-28
CLIC-G	4140-29
CLIC-H	4140-30
CLIC-J	4140-31
CLIC-L	4140-32
CLIC-M	4140-33
HC10000	4140-34
HC12600	4140-35
HC17800	4140-36
HC3100	4140-37
HC4100	4140-38
HC5400	4140-39
HC7700	4140-40
HCS	★ 4309
HCSSeries	4140-41

Computer Aided Engineering

Device	Page-Line
CAE2000	★ 4310
	4140-54

Creative Micro Systems

Device	Page-Line
9600A	★ 1911
9601A	★ 1912
9602B	★ 1912
9603A	★ 1912
9604	★ 1912
9609	★ 1911
9610	★ 1912
96103	★ 1912
9611A	★ 1911
9612	★ 1912
96130	★ 1912
9614	★ 1912
9616	★ 1911
9617	★ 1912
9618	★ 1912
9619	★ 1911
9620A	★ 1912
9622	★ 1912
9634	★ 1911
9635	★ 1911
9636	★ 1911
9637A	★ 1911
9638	★ 1911
9640A	★ 1912
9650A	★ 1912
9657	★ 1911
9661	★ 1912
9670	★ 1911
96702	★ 1912
9671	★ 1912
CMS-9600A	1761-3
CMS-9609	1761-20
CMS-9619	1761-25

Cromemco, Inc.

Device	Page-Line
16KZ	★ 1918
256MSU	★ 1914
2716	★ 1920
32KBS	★ 1920
4PIO	★ 1928
512MSU	★ 1914
64KZ	★ 1919
8PI/O	★ 1929
APC1Z	★ 1927
CBL-1	★ 1923
CBL-2	★ 1923
CBL-3	★ 1923
CS-1D5E	1619-2
CS-3D5E	1619-3
CSP	★ 1926
DAC12	★ 1927
DPU	★ 1914
	1767-32
DT7A	★ 1922
GP1B	★ 1924
IOP	★ 1921
MCB-216	★ 1917
MCU	★ 1914
PRI	★ 1930
QDRT	★ 1925
RGB-13	★ 1931
S-100	★ 1918
SCC	★ 1917
	1755-23
SDI	★ 1931
SystemOne	1618-2
SystemThree	1618-4
SystemTwo	1618-3
TRT	★ 1923
Z-2H	1619-1

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Cromemco, Inc. (Cont'd)

Device	Page-Line
ZPU	★ 1916
	1755-24

Custom MOS Arrays

Device	Page-Line
CMA1550	★ 4311
	4140-55
CMA448	★ 4311
	4140-56
CMA950	★ 4311
	4140-57

Datel-Intersil

Device	Page-Line
ADC-5101	★ 2621
	2426-35
ADC-5101E	★ 2621
	2426-36
ADC-5101H	★ 2618
	★ 2621
	2426-37
ADC-5210	★ 2621
	2433-4
ADC-5210E	★ 2621
	2433-5
ADC-5210H	★ 2618
	★ 2621
	2433-6
ADC-5211	★ 2621
	2433-7
ADC-5211E	★ 2621
	2433-8
ADC-5211H	★ 2618
	★ 2621
	2433-9
ADC-5212	★ 2621
	2433-10
ADC-5212E	★ 2621
	2433-11
ADC-5212H	★ 2618
	★ 2621
	2433-12
ADC-5213	★ 2621
	2432-34
ADC-5213E	★ 2621
	2432-35
ADC-5213H	★ 2618
	★ 2621
	2432-36
ADC-5214	★ 2621
	2432-37
ADC-5214E	★ 2621
	2432-38
ADC-5214H	★ 2618
	★ 2621
	2432-39
ADC-5215	★ 2621
	2432-40
ADC-5215E	★ 2621
	2432-41
ADC-5215H	★ 2618
	★ 2621
	2432-42
ADC-5216	★ 2621
	2433-13
ADC-5216E	★ 2621
	2433-14
ADC-5216H	★ 2618
	★ 2621
	2433-15
ADC-815MC	★ 2619
	2426-32
ADC-815MM	★ 2618
	2426-33
ADC-816MC	★ 2619
	2430-11
ADC-816MM	★ 2618
	2430-12
ADC-817MC	★ 2619
	2431-33
ADC-817MM	★ 2618
	2431-34
ADC-825MC	★ 2619
	2426-44
ADC-825MM	★ 2618
	2426-45
ADC-826MC	★ 2619
	2430-21
ADC-826MM	★ 2618
	2430-22
ADC-827MC	★ 2621
	2431-38
ADC-827MM	★ 2618
	2431-39
ADC-830	2428-26
ADC-830C	★ 2621
ADC-833R	★ 2621
ADC-84-10	★ 2619
	2430-29
ADC-84-12	2432-14
ADC-85-12	2432-15
ADC-856C	★ 2621
	2430-13
ADC-856M	2430-14
ADC-85C-10	★ 2619
	2430-30
ADC-85C-12	2432-16
ADC-87-10	★ 2618
	2430-35
ADC-87-12	2432-17
ADC-EK10B	★ 2619
	2431-11
ADC-EK12B	★ 2619
	2435-22
ADC-EK12DC	2436-22
ADC-EK12DM	2436-23
ADC-EK8B	★ 2619
	2428-46
ADC-ET10BC	★ 2619
	2431-15
ADC-ET10BM	★ 2619
	2431-14
ADC-ET12BC	★ 2619
	2435-49
ADC-ET12BM	★ 2619
	2435-19
ADC-ET12BR	★ 2619
ADC-ET8BC	★ 2619
	2428-50
ADC-ET8BM	★ 2619
	2428-49
ADC-HC12BMC	★ 2619
	2435-17
ADC-HC12BMM	★ 2618
	2435-18
ADC-HS12BMC	2432-8
ADC-HS12BMM	★ 2618
	2432-9
ADC-HS12BMR	★ 2619
ADC-HUEBMC	★ 2619
ADC-HX12BGC	★ 2619
	2433-46
ADC-HX12BMM	★ 2618
	2433-47
ADC-HZ12BGC	★ 2619
	2432-6
ADC-HZ12BMM	★ 2618
	2432-7
ADC-MC8BC	★ 2619
	2429-43
ADC-MC8BM	2429-44
ADC5101	★ 2616
ADC5210	★ 2616
ADC830	★ 2615
ADC833	★ 2615
ADC84	★ 2616
ADC85	★ 2616
ADC87	★ 2616
ADCHU3B	2426-1
AM-410-2C	★ 2622
	2921-32
AM-410-2M	2920-38
AM-411-2C	★ 2622
	2921-33
AM-411-2M	2920-39
AM-427-A	2916-3
AM-427-B	2914-36
AM-427-M	2916-4
AM-427A	★ 2622
AM-430A	★ 2622
	2911-99
	2920-3
AM-430B	2911-54
	2917-23
AM-430M	2911-94
	2920-4
AM-450-2	★ 2622
	2932-20
AM-450-2M	2932-21
AM-452-2	★ 2622
	2933-30
AM-452-2M	2933-31
AM-453-2	★ 2622
AM-453-2C	2926-30
AM-453-2M	2926-31
AM-460-2	★ 2622
	2927-54
AM-460-2M	2927-55
AM-462-1	2927-60
AM-462-1M	2928-1
AM-462-2	★ 2622
	2928-2
AM-462-2M	2928-3
AM-464-2	★ 2622
	2910-69
	2930-31
AM-464-2M	2910-70
	2930-32
AM-470-2C	★ 2623
	2928-16
AM-470-2M	2928-17
AM-490	2915-39
AM-490-2A	★ 2623
	2911-76
	2914-12
AM-490-2B	2911-15
	2914-10
AM-490-2C	2911-8
	2914-9
AM-490-2M	2911-55
	2914-11
AM-500GC	★ 2623
	2910-7
	2913-156
	2925-15
AM-500MC	2910-8
	2913-157
	2925-16
AM-500MM	★ 2620
	2925-18
AM-500MR	2925-17
AM-542MC	★ 2623
	2887-92
	2915-9
AM-542MM	★ 2620
	2887-93
	2915-4
AM-542MR	2887-94
	2915-5
AM-543MC	★ 2623
	2887-95
	2914-45
AM-543MM	★ 2620
	2887-96
	2914-43
AM-543MR	2887-97
	2914-44
AM542	★ 2613
	★ 2614
AM543	★ 2614
DAC-08BC	★ 2621
	2441-42
DAC-08BM	2441-43
DAC-562C	★ 2621
	2452-29
DAC-562M	2450-17
DAC-608	★ 2621
DAC-610	★ 2621
DAC-612	★ 2621
DAC-71-CCD-I	2462-23
DAC-71-CCD-V	2462-25
DAC-71-COB-I	2461-20
DAC-71-COB-V	2461-33
DAC-71-CSB-I	2461-21
DAC-71-CSB-V	2461-34
DAC-72C-CCD-I	2462-24
DAC-72C-CCD-V	2462-26
DAC-72C-COB-I	2461-22
DAC-72C-COB-V	2461-35
DAC-72C-CSB-I	2461-23
DAC-72C-CSB-V	2461-36
DAC-85C-CBI-I	★ 2621
	2451-45
DAC-85C-CBI-V	2454-32
DAC-85C-CCD-I	2459-10
DAC-85C-CCD-V	2459-15
DAC-87-CBI-I	★ 2620
DAC-87-CBI-V	★ 2620
DAC-87-CCD-I	2459-11
DAC-87-CCD-V	2459-16
DAC-87C-CBI-I	2451-46
DAC-87C-CBI-V	2454-33
DAC-HA10BC	★ 2621
	2445-45
DAC-HA10BC-1	2445-43
DAC-HA10BM	★ 2620
	2445-46
DAC-HA10BM-1	2445-44
DAC-HA12BC	★ 2621
	2453-5
DAC-HA12BC-1	2453-9
DAC-HA12BM	★ 2620
	2453-6
DAC-HA12BM-1	2453-10
DAC-HA12DC	2459-29
DAC-HA12DC-1	2459-27
DAC-HA12DM	2459-30
DAC-HA12DM-1	2459-28
DAC-HA14BC	★ 2621
	2460-30
DAC-HA14BC-1	2460-32
DAC-HA14BM	★ 2620
	2460-31
DAC-HA14BM-1	2460-33
DAC-HF10BMC	★ 2621
	2445-19
DAC-HF10BMM	★ 2620
	2445-20
DAC-HF12BMC	★ 2621
	2451-14
DAC-HF12BMM	2451-15
DAC-HF8BMC	★ 2621
DAC-HF8BMM	★ 2620
	2441-20
DAC-HFBMC	2441-21
DAC-HK12BGC	2454-37
DAC-HK12BGC-2	2455-1
DAC-HK12BMM	★ 2620
	2455-2
DAC-HK12BMR	★ 2621
DAC-HK12DGC	2459-17
DAC-HK12DMM	2459-18
DAC-HP16BGC	★ 2621
DAC-HP16BMC	2462-5
DAC-HP16BMC-1	2462-6
DAC-HP16BMM	★ 2620
	2462-7
DAC-HP16BMM-1	2462-8
DAC-HP16DGC	2462-17
DAC-HP16DMC	2462-18
DAC-HP16DMM	2462-19
DAC-HZ12BGC	★ 2621
	2455-7
DAC-HZ12BMM	★ 2620
DAC-HZ12DGC	2459-19
DAC-HZ12DMC	2459-20
DAC-HZ12DMM	2459-21
DAC-IC10B	2445-28
DAC-IC10BC	★ 2621
	2447-30
DAC-IC10BM	2445-29
DAC-IC8BC	★ 2621
	2442-29
DAC-IC8BM	2442-30
DAC-UP10B	★ 2615
	2448-19
DAC-UP10BC	★ 2621
DAC-UP8BC	★ 2621
	2443-4
DAC-UP8BM	2443-5
DAC72	★ 2615
DAC85	★ 2616
DAC87	★ 2616
DAS-952R	★ 2623
	2963-44
FLT-U2	2962-18
FLT-U2-M	★ 2623
FLT-U2M	2962-19
FTL-U2	★ 2623
HAC-HK12BMM-2	2455-3
HAC-HZ12BMM	2455-8
HDAS-16MC	★ 2623
	2432-10
	★ 2623
	2963-42
HDAS-16MM	★ 2620
	2432-11
	★ 2620
	2963-43
HDAS-16MR	★ 2623
HDAS-8MC	★ 2623
	2432-12
	★ 2623
	2963-14
HDAS-8MM	★ 2620
	2432-13
	★ 2620
	2963-15
HDAS-8MR	★ 2623
MV-1606	★ 2622
	2424-102
MV-1606M	★ 2622
	2424-98
MV-808	★ 2622
	2423-88
MV-808M	★ 2622
	2423-89
MVD-409	★ 2622
	2423-16
MVD-409M	★ 2622
	2423-17
MVD-807	★ 2622
	2424-57
MVD-807M	★ 2622
	2424-58
MX-1606	★ 2622
	2425-23
MX-1606M	★ 2622
	2425-21
MX-1616	2425-18
MX-1616C	★ 2622
MX-1616M	2425-19
MX-808	★ 2622
	2424-27
MX-808M	★ 2622
	2424-28
MX-818	2424-21
MX-818C	★ 2622
MX-818M	2424-22
MXD-409	★ 2622
	2423-64
MXD-409M	★ 2622
	2423-65
MXD-807	★ 2622
	2424-85
MXD-807M	★ 2622
	2424-86
SHM-6MC	★ 2622
SHM-6MM	★ 2620
	2967-72
SHM-7MC	★ 2622
	2967-73
SHM-7MR	2967-74
SHM-8MC	2967-75
SHM-HUMC	★ 2622
	2967-76
SHM-HUMM	★ 2620
	2967-77
SHM-HUMR	★ 2622
SHM-IC-1	★ 2622
	2967-78
SHM-IC-1M	★ 2622
	2967-79
SHM-LM-2	★ 2622
	2967-80
SHM-LM-2M	★ 2622
	2967-81
SHM7	★ 2614
SHM9	★ 2614
ST-6832	★ 1933
ST-711	★ 1933
ST-711RLY16D	★ 1933
ST-711RLY8D	★ 1933
ST-716	★ 1933
ST-728	★ 1933
ST-732	★ 1933
ST-LS1	★ 1933
ST-LS12	★ 1933
VF2-1C	★ 2623
VF2-2C	★ 2623
VF2-3C	★ 2623
VFQ-1	2968-66
VFQ-1C	2963-86
VFQ-2	2968-67
VFQ-3	2968-68
VFQ-3C	2963-87
VFV-100K	2968-95
VFV-10K	2968-96
VI-7660C	2968-53
VI-7660M	2968-54
VR-182A	2966-31
VR-182B	2966-32
VR-182C	2966-33

Digelec Corp.

Device	Page-Line
UP-803	★ 4101
	4002-4
UPP-801	4002-3

Emulogic

Device	Page-Line
ECL-3211	★ 1708
	1621-2

Exar Integrated Systems

Device	Page-Line
X100	4140-58
XR-A100	4140-59
XR-B100	4140-60
XR-C100A	★ 4314
	4140-61
XR-C240	2948-150
	¶ 270-13
XR-C262	2948-151
	¶ 270-4
XR-C277	2948-152
	¶ 270-1
XR-CHIP	4140-62
XR-D100	★ 4314
	4140-63
XR-F100	★ 4314
	4140-64
XR-G100	★ 4314
	4140-65
XR-I32L-CHIP	4140-66
XR-J100	★ 4314
	4140-67
XR-X100	★ 4314
	4140-68
XR082	★ 3206
	2939-16
XR082C	★ 3206
	2940-46
XR082M	★ 3206
	2939-17
XR083	★ 3206
	2939-18
XR083C	★ 3206
	2940-47
XR083M	★ 3206
	2939-19
XR084	★ 3206
	2943-11
XR084C	★ 3206
	2944-24
XR084M	★ 3206
	2943-12
XR094	2943-19
XR094C	2944-28
XR094M	2943-20
XR095	2943-21
XR095C	2944-29
XR095M	2943-22
XR096	2943-17
XR096C	2944-27
XR096M	2943-18
XR1310	2901-101
XR13600	2900-7
XR14412F	★ 3187
	2948-146
XR14412V	★ 3187
	2948-147
XR1458	2909-1
	2939-39
XR146	★ 3207
	2912-77
	2928-37
XR1468	2958-74
XR1488	★ 3188
	2469-53
XR1489A	★ 3188
	2473-29
XR1524	★ 3190
	2960-87
XR1525A	★ 3191
	2960-88
XR1527A	★ 3191
	2960-89
XR1543	★ 3192
	2965-89

Arranged alphanumerically from left to right.

© IC MASTER 1983

Exar Integrated Systems (Cont'd)

Device	Page-Line
XR1568	2958-75
XR200	4140-69
XR2001C	★ 3199
	2890-7
XR2002C	★ 3199
	2890-8
XR2003C	★ 3199
	2890-9
XR2003M	★ 3199
	2480-44
XR2004C	★ 3199
	2890-10
XR2011C	★ 3199
	2890-11
XR2012C	★ 3199
	2890-12
XR2013C	★ 3199
	2890-13
XR2014C	★ 3199
	2890-14
XR205	2946-20
XR210	★ 3195
	2945-19
XR210M	★ 3195
	2945-20
XR215	2945-34
	¶ 271-11
	¶ 279-2
XR215M	2945-35
	¶ 271-11
	¶ 279-2
XR2200	2480-24
XR2200M	2480-25
XR2201	★ 3200
	2480-68
	★ 3200
	2890-15
XR2201M	★ 3200
	2480-69
	★ 3200
	2890-16
XR2202	★ 3200
	2480-85
	★ 3200
	2890-17
XR2202M	★ 3200
	2480-86
	★ 3200
	2890-18
XR2203	★ 3200
	2480-45
	★ 3200
	2890-19
XR2203M	★ 3200
	2890-20
XR2204	★ 3200
	2480-29
	★ 3200
	2890-21
XR2204M	★ 3200
	2480-30
	★ 3200
	2890-22
XR2206	★ 3197
	2946-21
	2946-22
	2948-140
	2948-141
	¶ 258-17
	¶ 259-7
	¶ 276-12
XR2206C	★ 3197
	2946-23
	¶ 258-17
	¶ 259-7
	¶ 276-12
XR2206M	★ 3197
	2946-24
	2948-142
	¶ 258-17
	¶ 259-7
	¶ 276-12
XR2207	★ 3198
	2946-8
	2948-143
	¶ 258-17
	¶ 272-6
	¶ 278-13
XR2207C	★ 3198
	2946-9
	¶ 258-17
	¶ 272-6
	¶ 278-13
XR2207M	★ 3198
	2948-144
	¶ 258-17
	¶ 272-6
	¶ 278-13
XR2208	★ 3202
	2964-154
	¶ 276-14
	¶ 278-13
XR2208M	★ 3202
	2964-155
	¶ 276-14
	¶ 278-13
XR2209C	★ 3197
	2946-10
XR2209M	★ 3197
	2946-11
XR2211	★ 3195
	2945-21
	2945-22
	2948-137
	2948-138
	¶ 258-17
	¶ 259-7
	¶ 276-14
XR2211C	★ 3195
	2945-23
	2945-143
	2949-63
	¶ 258-17
	¶ 259-7
	¶ 276-14
XR2211M	★ 3195
	2945-24
	2945-144
	2948-139
	2949-64
	¶ 258-17
	¶ 259-7
	¶ 276-14
XR2212M	★ 3196
	2945-25
	¶ 271-11
	¶ 278-8
XR2213C	★ 3196
	2945-145
XR2213M	★ 3196
	2945-146
XR2216	2947-118
XR2228	★ 3202
	2964-156
	¶ 271-11
XR2228M	★ 3202
	2964-157
	¶ 271-11
XR2230	★ 3191
	2960-50
	2965-146
	2960-90
XR2235	★ 3192
	2960-91
XR2240C	★ 3200
	2951-18
	¶ 272-6
	¶ 282-8
XR2240M	★ 3200
	2951-19
	¶ 272-6
	¶ 282-8
XR2242C	★ 3201
	2951-60
XR2242M	★ 3201
	2951-61
XR2243	★ 3201
	2951-8
XR2264	2967-166
XR2265	2967-167
XR2266	2967-168
XR2271	2465-58
XR2272	2465-56
XR2276	★ 3204
	2463-1
	★ 3204
	2964-77
XR2277	★ 3204
	2463-26
XR2278	★ 3204
	2463-27
XR2279	★ 3205
	2463-28
XR2284	★ 3203
	2464-102
XR2288	★ 3203
	2465-74
XR246	★ 3207
	2912-78
XR2524	★ 3190
	★ 3209
	2960-92
XR2525A	★ 3191
	2960-93
XR2527A	★ 3191
	2960-94
XR2543	★ 3192
	2965-90
XR2556C	2951-65
XR2556M	2951-66
XR2567	2949-72
	¶ 269-15
XR2567C	2946-52
	¶ 269-15
XR2567M	2946-53
	2949-73
	¶ 269-15
XR300	4140-70
XR320	2951-4
XR3403	★ 3207
	2913-85
	¶ 264-1
XR3417	★ 3187
	2947-140
XR3418	★ 3187
	2947-141
XR346	★ 3207
	2912-79
XR346-2	★ 3207
	2943-42
XR3470	★ 3189
	2887-42
XR3503	★ 3207
	2913-86
XR3517	2947-142
XR3518	2947-143
XR3524	★ 3190
	2960-95
XR3525A	★ 3191
	2960-96
XR3527A	★ 3191
	2960-97
XR3543	★ 3192
	2965-91
XR400	4140-71
XR4136C	2943-44
	¶ 264-1
XR4136M	2942-47
	¶ 264-1
XR4151	★ 3193
	2968-97
	¶ 278-8
XR4151C	★ 3193
	2963-88
	¶ 278-8
XR4151M	★ 3193
	2963-89
	¶ 278-8
XR4194M	2960-78
XR4195	2958-76
XR4202	2912-80
	¶ 264-1
XR4202M	2912-81
	¶ 264-1
XR4212	2898-19
XR4212C	2943-41
XR4212M	2942-45
XR4558	2939-63
	¶ 264-1
XR4739	2897-181
	2940-4
XR4739M	2897-182
XR4741C	2942-41
XR4741M	2942-3
XR494	★ 3189
	2960-98
XR495	★ 3190
	2960-99
XR500	4140-72
XR5532	★ 3208
	2937-50
XR5533	★ 3208
	2937-51
XR5534	★ 3209
	2926-23
XR5534C	★ 3209
	2926-24
XR5534M	★ 3209
	2924-14
XR555C	2951-31
XR555M	2951-32
XR556C	2951-67
XR556M	2951-68
XR558C	2951-89
XR558M	2951-90
XR559C	2951-93
XR559M	2951-94
XR567C	★ 3194
	2945-147
	2949-65
	¶ 269-15
XR567M	★ 3194
	2945-148
	2949-66
	¶ 269-15
XR6118	★ 3205
	2465-89
XR6128	★ 3205
	2465-90
XR8038	★ 3198
	2946-25
XR8038A	★ 3198
	2946-26
XR8038M	★ 3198
	2946-27
XR9201	★ 3193
	2442-40
XRCMA	4140-73
XRCMB	4140-74
XRCMC	4140-75
XRCMD	4140-76
XRL555	2951-33
XRL556C	2951-69
XRL556M	2951-70
XRL567C	★ 3194
	2945-149
XRL567M	★ 3194
	2945-150
XRS200	2945-58

Fairchild

Device	Page-Line
0026	2481-93
11C01C	471-36
11C05-2C	471-1
11C05-2M	471-2
11C05C	471-3
11C05M	471-4
11C06C	471-23
11C06M	471-24
11C24C	501-11
	2946-30
11C24M	501-12
	2946-31
11C44C	507-1
	2945-59
11C44M	507-2
	2945-60
11C58C	471-44
	2945-157
11C70C	471-19
11C70M	471-20
11C79	471-17
	2946-84
11C82	471-15
	2946-93
11C83	471-16
	2946-94
11C90C	471-12
	2946-73
11C90M	471-13
	2946-74
11C91C	471-10
	2946-56
11C91M	471-11
	2946-57
21021	3476-99
21021M	3476-100
21022	3477-17
21022M	3477-18
2102F	3476-82
2102FM	3476-83
2102H	3476-55
2102HM	3476-56
2102L1	3476-101
2102L1M	3476-102
2102L2	3477-19
2102L2M	3477-20
2102LF	3476-84
2102LFM	3476-85
2102LH	3476-57
2102LHM	3476-58
2114	3479-27
2114-2	3478-17
2114-3	3478-89
2114-3M	3478-90
2114L	3479-28
2114L-2	3478-18
2114L-3	3478-91
2114M	3479-29
21L021	3476-103
21L022	3477-21
21L02F	3476-86
21L02H	3476-59
2764	3466-90
3245	2483-82
3257	3453-23
3258	3453-18
32581	3453-19
32582	3453-20
3260	3453-56
3262A	2903-35
3262B	2903-36
3341	3456-31
3341A	3456-35
3341M	3456-32
3342	3491-67
3347	3491-72
3348	3491-44
3349	3491-45
3351-3	3456-28
	¶ 288-4
33511	3456-29
33512	3456-25
3351M	3456-26
	¶ 288-4
3357-1	3491-80
3357-2	3491-73
3514	3484-20
3708	2424-53
3814	511-46
3815	510-48
3816	511-115
3850	1096-104
3850M	1096-105
3851	1096-118
3851A	1096-119
3851M	1096-120
3852	1096-111
3853	1096-127
3853M	1096-128
3854	1096-109
3856	1096-121
3856A	1096-122
3857	1096-123
3861	1096-113
3861M	1096-114
3871	1096-115
38T56	1096-124
38T57	1096-125
4049B	★ 668
4050B	★ 668
4104B	★ 668
510480	★ 3623
5116	2947-94
5151	2947-95
5156	2947-42
5400	491-194
5401	491-119
5402	494-81
5403	491-120
5404	477-153
5405	477-55
5406	484-158
5407	484-134
5408	489-122
5409	489-86
5410	490-166
54104	487-94
54105	487-95
54107	487-162
5411	489-36
5412	490-144
54121	500-94
54122	500-118
54123	500-154
54125	476-130
54126	476-106
5413	507-68
54132	507-118
5414	507-148
54141	2464-70
54145	482-139
54150	500-74
54151	499-142
54152	500-3
54153	498-12
54154	484-20
54155	483-120
54156	483-90
54157	499-1
54160	480-125
54161	478-99
54162	480-178
54163	478-156
54164	502-13
	3490-102
54165	502-65
	3490-46
54166	502-86
	3490-56
54167	507-19
5417	484-123
54170	496-167
	3470-44
54173	486-17
54174	486-42
54175	485-111
54176	480-79
54177	478-41
54178	501-103
	3488-64
54179	501-110
	3488-65
54180	508-153
54181	475-1
54182	475-67
54190	481-163
54191	479-122
54192	481-124
54193	479-170
54194	501-139
	3488-66
54195	501-34
	3488-102
54196	480-80
54197	478-42
54198	502-47
	3490-2
54199	502-54
	3490-3
5420	490-82
5421	488-165
5422	490-46
5423	494-4
5425	493-172
5426	484-78
5427	494-30
54279	495-161
54283	476-44
54293	479-23
54298	499-68
5430	492-60
5432	493-120
5437	491-82
5438	491-32
5440	489-186
5442	482-153
5443	482-100
5444	482-93
5445	482-129
5446	2464-5
5447	2463-147
5448	2463-104
5449	2463-79
5450	492-143
5451	492-165
5453	493-75
5454	493-63
5460	493-19
5470	487-59
5472	487-72
5473	487-163
5474	485-54
5475	495-117

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Device	Page-Line
Fairchild (Cont'd)	
5476	488-36
5477	495-149
5480	474-141
5482	474-157
5483	476-45
5485	474-35
5486	495-6
5490	480-37
5491	502-121
	3491-3
5492	482-26
5493	479-24
5494	501-131
	3489-77
5495	501-77
	3488-67
5496	501-178
	3489-101
5497	508-75
54F00	492-21
54F02	494-114
54F04	477-176
54F08	489-149
54F10	490-190
54F109	487-129
54F11	489-51
54F138	483-156
54F139	483-58
54F151	499-161
54F153	498-33
54F157	499-28
54F158	498-122
54F160	480-153
54F161	478-130
54F162	481-12
54F163	478-177
54F175	485-126
54F181 ★	**619**
	475-16
54F182	475-79
54F190 ★	**623**
	481-178
54F191 ★	**623**
	479-146
54F192 ★	**627**
	481-142
54F193 ★	**627**
	480-7
54F194	501-152
54F20	490-105
54F240 ★	**630**
	503-124
★	**630**
	2470-68
54F241 ★	**630**
	504-33
54F242	503-54
54F243	503-55
54F244 ★	**630**
	503-170
54F245	504-178
54F251	500-41
54F253	497-144
54F257	498-160
54F258	498-82
54F280	509-6
54F299	502-148
54F32	493-139
54F322	502-110
54F323	502-149
54F352	497-121
54F353	497-89
54F373 ★	**632**
	496-62
54F374 ★	**634**
	487-1
54F379	485-176
54F381	475-17
54F382	475-18
54F398	499-76
54F399	499-77
54F401 ★	**636**
54F402 ★	**638**
54F403 ★	**643**
54F418 ★	**650**
54F433 ★	**643**
54F500 ★	**655**
54F510	508-63
54F521	474-86
54F524	474-26
54F526	505-114
54F533	496-122
54F534	486-127
54F537	483-40
54F538	484-5
54F539	483-115
54F545	504-179
54F557	476-3
54F558	475-154
54F559	475-93
54F570	497-32
54F571	497-30
54F588	506-110
54F610 ★	**656**
54F612 ★	**656**
54F64	493-99
54F74	485-75
54F86	495-26
54H00	492-27
54H01	491-155
54H04	477-182
54H05	477-74
54H08	489-154
54H09	489-101
54H10	491-1
54H101	487-107
54H102	487-104
54H103	488-98
54H106	488-108
54H108	488-64
54H11	489-56
54H183	474-150
54H20	490-111
54H21	488-173
54H22	490-55
54H30	492-78
54H40	490-13
54H50	492-157
54H51	492-179
54H52	492-135
54H53	493-55
54H54	493-48
54H55	493-42
54H60	507-100
54H61	507-107
54H62	508-2
54H71	487-99
54H72	487-83
54H73	488-3
54H74	485-80
54H76	488-49
54H78	487-150
54H87	508-68
54HC00 ★	**665**
	457-86
54HC02 ★	**665**
	458-149
54HC04 ★	**667**
54HC07 ★	**667**
	450-121
54HC08 ★	**665**
	456-174
54HC10 ★	**665**
	457-45
54HC107 ★	**666**
54HC109 ★	**666**
	456-93
54HC11 ★	**665**
54HC112 ★	**666**
	456-94
54HC125 ★	**667**
	449-152
54HC132 ★	**665**
	464-145
54HC133 ★	**665**
	457-155
54HC138 ★	**666**
	454-76
54HC139 ★	**666**
	454-50
54HC14 ★	**667**
	450-163
54HC147 ★	**666**
	466-17
54HC151 ★	**666**
	461-133
54HC153 ★	**666**
	461-158
54HC154 ★	**666**
	454-152
54HC160 ★	**668**
	452-130
54HC161 ★	**668**
54HC162 ★	**668**
	452-102
54HC163 ★	**668**
	451-22
54HC164 ★	**665**
	463-102
54HC165 ★	**665**
	463-91
54HC173 ★	**665**
	455-120
54HC174 ★	**666**
54HC175 ★	**666**
	455-144
54HC192 ★	**668**
	452-156
54HC193 ★	**668**
	451-72
54HC194 ★	**665**
54HC195 ★	**665**
	463-8
54HC20 ★	**665**
	457-11
54HC221 ★	**668**
	462-43
54HC240 ★	**667**
	465-62
54HC241 ★	**667**
	465-81
54HC242 ★	**667**
	464-121
54HC243 ★	**667**
	464-132
54HC244 ★	**667**
	465-43
54HC245 ★	**667**
	465-126
54HC251 ★	**666**
	461-159
54HC253 ★	**666**
	461-77
54HC257 ★	**666**
	461-112
54HC259 ★	**665**
	460-41
54HC266 ★	**665**
54HC27 ★	**665**
	458-116
54HC273 ★	**665**
	456-4
54HC280 ★	**667**
	449-106
54HC283 ★	**667**
	449-29
54HC299 ★	**665**
	463-132
54HC30 ★	**665**
	457-130
54HC32 ★	**665**
	458-42
54HC365 ★	**667**
	450-88
54HC366 ★	**667**
	449-167
54HC367 ★	**667**
	450-89
54HC368 ★	**667**
	449-168
54HC373 ★	**665**
	459-165
54HC374 ★	**666**
	456-28
54HC390 ★	**668**
	453-38
54HC393 ★	**668**
	451-141
54HC4017 ★	**668**
	452-50
54HC4020 ★	**668**
	452-12
54HC4040 ★	**668**
	451-177
54HC4046 ★	**668**
	462-8
54HC4047 ★	**668**
	462-9
54HC4049 ★	**667**
	450-13
54HC4050 ★	**667**
	450-48
54HC4051 ★	**666**
	466-13
54HC4052 ★	**666**
	464-117
54HC4053 ★	**666**
	464-119
54HC42 ★	**666**
	453-159
54HC4510 ★	**668**
	453-16
54HC4512 ★	**666**
	461-160
54HC4514 ★	**666**
	454-153
54HC4516 ★	**665**
★	**668**
	451-73
54HC4538 ★	**668**
	462-44
54HC4703 ★	**665**
	464-37
54HC533 ★	**665**
	460-4
54HC534 ★	**666**
	456-10
54HC543 ★	**665**
★	**667**
	465-149
54HC544 ★	**665**
★	**667**
	465-150
54HC550 ★	**665**
★	**667**
	465-155
	465-161
54HC551 ★	**665**
★	**667**
	465-156
	465-162
54HC563 ★	**665**
	460-5
54HC564 ★	**666**
	456-11
54HC568 ★	**668**
	453-18
54HC569 ★	**668**
	451-74
54HC573 ★	**665**
	459-166
54HC574 ★	**666**
	456-29
54HC640 ★	**667**
	465-116
54HC643 ★	**667**
	465-114
54HC645 ★	**667**
	465-147
54HC646 ★	**665**
★	**667**
	465-106
	465-157
54HC648 ★	**665**
★	**667**
	465-98
	465-153
54HC688 ★	**667**
	449-104
54HC73 ★	**666**
54HC74 ★	**666**
	455-86
54HC75 ★	**665**
	459-103
54HC76 ★	**666**
	456-95
54HC85 ★	**667**
	449-81
54HC86 ★	**665**
	459-4
54HCT04 ★	**667**
	450-165
54HCT07 ★	**667**
	450-78
54LS00	492-34
54LS02	494-119
54LS03	491-163
54LS04	478-3
54LS05	477-82
54LS08	489-160
54LS09	489-103
54LS10	491-9
54LS109	487-134
54LS11	489-64
54LS112	488-114
54LS113	488-75
54LS114	488-139
54LS126	476-117
54LS13	507-81
54LS133	492-119
54LS136	494-172
54LS138	483-169
54LS139	483-67
54LS14	507-159
54LS15	489-17
54LS151	499-168
54LS152	500-11
54LS153	498-40
54LS155	483-133
54LS156	483-101
54LS157	499-37
54LS158	498-131
54LS161	478-137
54LS164	502-33
	3490-103
54LS165	502-79
	3490-57
54LS168	481-103
54LS169	479-102
54LS170	497-3
	3470-45
54LS173A	486-32
54LS174	486-65
54LS175	485-133
54LS181	475-39
54LS189	3471-65
54LS192	481-150
54LS193	480-15
54LS194A	501-159
	3488-103
54LS195	501-56
54LS195A	3488-104
54LS196	480-108
54LS197	478-71
54LS20	490-119
54LS21	488-181
54LS22	490-63
54LS240	503-133
	2470-69
54LS241	504-43
	2470-15
54LS242	2476-31
54LS243	2476-32
54LS244	503-180
54LS245	504-186
	2479-15
54LS247	2463-148
54LS249	2463-80
54LS251	500-48
54LS253	497-151
54LS256	495-89
54LS259	496-35
54LS26	491-69
54LS260	494-14
54LS266	495-70
54LS27	494-49
54LS273	486-157
54LS279	495-168
54LS28	494-120
54LS283	476-64
54LS289	3471-61
54LS290	480-57
54LS293	479-46
54LS295A	3488-105
54LS298	499-87
54LS299	502-162
	3490-23
54LS30	492-88
54LS32	493-146
54LS323	502-163
	3490-24
54LS33	494-71
54LS347	2463-138
54LS352	497-126
54LS353	497-94
54LS365	178
	485-25
54LS366	477-121
54LS367	179
	485-25
54LS368	477-122
54LS37	491-101
54LS375	495-130
54LS377	487-47
54LS378	486-95
54LS379	486-3
54LS38	491-53
54LS390	481-44
54LS393	479-10
54LS395	3488-106
54LS40	490-23
54LS42	483-26
54LS48	2463-105
54LS490	481-45
54LS503	508-117
54LS51	492-187
54LS54	493-86
54LS540	2471-1
54LS541	2470-16
54LS55	493-31
54LS670	497-14
	3470-62
54LS74	485-88
54LS83	476-65
54LS85	474-36
54LS89	3471-62
54LS93	479-47
54LS95B	501-91
	3488-107
54S00	492-48
54S02	494-142
54S04	478-17
54S05	477-96
54S08	489-174
54S09	489-118
54S10	491-23
54S109	487-148
54S11	489-77
54S112	488-126
54S113	488-89
54S114	488-153
54S132	507-142
54S133	492-126
54S134	492-108
54S135	494-157
54S137	484-15
54S138	483-185
54S139	483-82
54S140	484-52
	2471-49
54S15	489-29
54S151	499-184
54S153	498-56
54S157	499-53
54S158	498-147
54S167	507-24
54S174	486-80
54S175	485-149
54S189	3471-51
54S194	501-172
	3489-37
54S20	490-133
54S22	490-75
54S253	498-6
54S258	498-107
54S260	494-23
54S280	509-15
54S289	3471-43
54S30	492-102
54S32	493-160
54S40	490-37
54S51	493-11
54S64	493-104
54S74	485-102
54S86	495-52
55107A	2474-18
55110A	2472-16
55154	2473-49
55450B	2481-114
55452B	2482-19
55492A	2465-34
55S20	2485-4
55S234	2485-15
55S24	2485-29
73HC42	453-160
7400	491-195
7401	491-121
7402	494-82
7403	491-122
7404	477-154
7405	477-56
7406	484-159
7407	484-135
7408	489-123
7409	489-87
7410	490-167
74107	487-164
7411	489-37
7412	490-145

Arranged alphanumerically from left to right.

© IC MASTER 1983

Device	Page-Line
Fairchild (Cont'd)	
74121	500-95
74122	500-119
74123	500-155
74125	476-131
74126	476-107
7413	507-69
74132	507-119
7414	507-149
74141	2464-71
	3489-78
74145	482-140
74150	500-75
	3488-71
74151	499-143
74153	498-13
	3489-102
74155	483-121
74156	483-91
74157	499-2
7416	484-146
74160	480-126
74161	478-100
74162	480-179
74163	478-157
74164	502-14
	3490-104
74165	502-66
	3490-47
74166	502-87
	3490-58
7417	484-124
74170	496-168
	3470-46
74173	486-18
74174	486-43
74175	485-112
74176	480-81
74177	478-43
74178	3488-68
74179	501-111
	3488-69
74180	508-154
74190	481-164
74191	479-123
74192	481-125
74193	479-171
74194	501-140
	3488-70
74195	501-35
	3488-108
74196	480-82
74197	478-44
74198	502-48
	3490-4
74199	502-55
	3490-5
7420	490-83
7421	488-166
7422	490-47
7423	494-5
7425	493-173
7426	484-79
7427	494-31
74279	495-162
74283	476-46
74290	480-38
74293	479-25
74298	499-69
7430	492-61
7432	493-121
7437	491-83
7438	491-33
7439	491-34
7440	489-187
7441	2464-65
7442	482-154
7443	482-101
7445	482-130
7446	2464-6
7447	2463-149
7448	2463-106
7450	492-144
7451	492-166
7453	493-76
7454	493-64
7460	493-20
7470	487-60
7472	487-73
7473	487-165
7474	485-55
7475	495-118
7476	488-37
7482	474-158
7483	476-47
7485	474-37
7486	495-7
7490	480-39
7491	502-122
	3491-4
7492	482-27
7493	479-26
7494	501-132
	3489-78
7495	501-78
	3488-71
7496	501-179
	3489-102
7497	508-76
74F00	492-22
74F02	494-115
74F04	477-177
74F08	489-150
74F10	490-191
74F109	487-130
74F11	489-52
74F138	483-157
74F139	483-59
74F151	499-162
74F153	498-34
74F157	499-29
74F158	498-123
74F160	480-154
74F161	478-131
74F162	481-13
74F163	478-178
74F175	485-127
74F181	★ 619
	475-19
74F182	475-80
74F190	★ 623
	482-1
74F191	★ 623
	479-147
74F192	★ 627
	481-143
74F193	★ 627
	480-8
74F194	501-153
74F20	490-106
74F240	★ 630
	503-125
	★ 630
	2471-2
74F241	★ 630
	504-34
74F242	503-56
74F243	503-57
74F244	★ 630
	503-171
74F245	504-180
74F251	500-42
74F253	497-145
74F257	498-161
74F258	498-83
74F280	509-7
74F299	502-150
74F32	493-140
74F322	502-111
74F323	502-151
74F352	497-122
74F353	497-90
74F373	★ 632
	496-63
74F374	★ 634
	487-2
74F379	485-177
74F381	475-20
74F382	475-21
74F398	499-78
74F399	499-79
74F401	★ 636
74F402	★ 638
74F403	★ 643
74F418	★ 650
74F433	★ 643
74F500	★ 655
74F510	508-64
74F521	474-87
74F524	474-27
74F526	505-115
74F533	496-123
74F534	486-128
74F537	483-41
74F538	484-6
74F539	483-116
74F545	504-181
74F557	476-4
74F558	475-155
74F559	475-94
74F570	497-33
74F571	497-31
74F588	506-111
74F610	★ 656
74F612	★ 656
74F64	493-100
74F74	485-76
74F86	495-27
74H00	492-28
74H01	491-156
74H04	477-183
74H05	477-75
74H08	489-155
74H09	489-102
74H10	491-2
74H101	487-108
74H103	488-99
74H106	488-109
74H108	488-65
74H11	489-57
74H183	474-151
74H20	490-112
74H21	488-174
74H22	490-56
74H30	492-79
74H40	490-14
74H50	492-158
74H51	492-180
74H52	492-136
74H53	493-56
74H54	493-49
74H55	493-43
74H61	507-108
74H62	508-3
74H72	487-84
74H73	488-4
74H74	485-81
74H87	508-69
74HC00	★ 665
	457-87
74HC02	★ 665
	458-150
74HC04	★ 667
74HC07	★ 667
	450-122
74HC08	★ 665
	456-175
74HC10	★ 665
	457-46
74HC107	★ 666
74HC109	★ 666
	456-96
74HC11	★ 665
74HC112	★ 666
	456-97
74HC125	★ 667
	449-153
74HC132	★ 665
	464-146
74HC133	★ 665
	457-156
74HC138	★ 666
	454-77
74HC139	★ 666
	454-51
74HC14	★ 667
	450-164
74HC147	★ 666
	466-18
74HC151	★ 666
	461-134
74HC153	★ 666
	461-161
74HC154	★ 666
	454-154
74HC160	★ 668
	452-131
74HC161	★ 668
74HC162	★ 668
	452-103
74HC163	★ 668
	451-23
74HC164	★ 665
	463-103
74HC165	★ 665
	463-92
74HC173	★ 665
	455-121
74HC174	★ 666
74HC175	★ 666
	455-145
74HC192	★ 668
	452-157
74HC193	★ 668
	451-75
74HC194	★ 665
74HC195	★ 665
	463-9
74HC20	★ 665
	457-12
74HC221	★ 668
	462-45
74HC240	★ 667
	465-63
74HC241	★ 667
	465-82
74HC242	★ 667
	464-122
74HC243	★ 667
	464-133
74HC244	★ 667
	465-44
74HC245	★ 667
	465-127
74HC251	★ 666
	461-162
74HC253	★ 666
	461-78
74HC257	★ 666
	461-113
74HC259	★ 665
	460-42
74HC266	★ 665
74HC27	★ 665
	458-117
74HC273	★ 665
	456-5
74HC280	★ 667
	449-107
74HC283	★ 667
	449-30
74HC299	★ 665
	463-133
74HC30	★ 665
	457-131
74HC32	★ 665
	458-43
74HC365	★ 667
	450-90
74HC366	★ 667
	449-169
74HC367	★ 667
	450-91
74HC368	★ 667
	449-170
74HC373	★ 665
	459-167
74HC374	★ 666
	456-30
74HC390	★ 668
	453-39
74HC393	★ 668
	451-142
74HC4017	★ 668
	452-51
74HC4020	★ 668
	452-13
74HC4040	★ 668
	451-178
74HC4046	★ 668
	462-10
74HC4047	★ 668
	462-11
74HC4049	★ 667
	450-14
74HC4050	★ 667
	450-49
74HC4051	★ 666
	466-14
74HC4052	★ 666
	464-118
74HC4053	★ 666
	464-120
74HC42	★ 666
74HC4510	★ 668
	453-17
74HC4512	★ 666
	461-163
74HC4514	★ 666
	454-155
74HC4516	★ 668
	451-76
74HC4538	★ 668
	462-46
74HC4703	★ 665
	464-38
74HC533	★ 665
	460-6
74HC534	★ 666
	456-12
74HC543	★ 665
	★ 667
	465-151
74HC544	★ 665
	★ 667
	465-152
74HC550	★ 665
	★ 667
	465-158
	465-163
74HC551	★ 665
	★ 667
	465-159
	465-164
74HC563	★ 665
	460-7
74HC564	★ 666
	456-13
74HC568	★ 668
	453-19
74HC569	★ 668
	451-77
74HC573	★ 665
	459-168
74HC574	★ 666
	456-31
74HC640	★ 667
	465-117
74HC643	★ 667
	465-115
74HC645	★ 667
	465-148
74HC646	★ 665
	★ 667
	465-107
	465-160
74HC648	★ 665
	★ 667
	465-99
	465-154
74HC688	★ 667
	449-105
74HC73	★ 666
74HC74	★ 666
	455-87
74HC75	★ 665
	459-104
74HC76	★ 666
	456-98
74HC85	★ 667
	449-82
74HC86	★ 665
	459-5
74HCT04	★ 667
	450-166
74HCT07	★ 667
	450-79
74LS00	492-35
74LS02	494-121
74LS03	491-164
74LS04	478-4
74LS05	477-83
74LS08	489-161
74LS09	489-104
74LS10	491-10
74LS107	488-13
74LS109	487-135
74LS11	489-65
74LS112	488-115
74LS113	488-76
74LS114	488-140
74LS125	476-143
74LS126	476-118
74LS13	507-82
74LS132	507-129
74LS133	492-120
74LS136	494-173
74LS138	483-170
74LS139	483-68
74LS14	507-160
74LS145	482-150
74LS15	489-18
74LS151	499-169
74LS153	498-41
74LS155	483-134
74LS156	483-102
74LS157	499-38
74LS158	498-132
74LS160	480-160
74LS161	478-138
74LS162	481-19
74LS163	478-183
74LS164	502-34
	3490-105
74LS165	502-80
	3490-59
74LS168	481-104
74LS169	479-103
74LS170	497-4
	3470-47
74LS173A	486-33
74LS174	486-66
74LS175	485-134
74LS181	475.40
74LS189	3471-33
74LS190	482-7
74LS191	479-153
74LS192	481-151
74LS193	480-16
74LS194A	3488-109
74LS195	501-57
74LS195A	3488-110
74LS196	480-109
74LS197	478-72
74LS20	490-120
74LS21	488-182
74LS22	490-64
74LS240	503-134
	2471-3
74LS241	504-44
	2470-17
74LS242	503-74
	2476-64
74LS243	503-75
	2476-65
74LS244	503-181
	2470-18
74LS245	504-187
	2479-23
74LS247	2463-150
74LS248	2463-107
74LS249	2463-81
74LS251	500-49
74LS253	497-152
74LS256	495-90
74LS257	498-169
74LS258	498-91
74LS259	496-36
74LS26	491-70
74LS260	494-15
74LS266	495-71
74LS27	494-50
74LS273	486-158
74LS279	495-169
74LS28	494-122
74LS283	476-66
74LS289	3471-30
74LS293	479-48
74LS295	501-24
74LS295A	3488-111
74LS298	499-88
74LS299	502-164
	3490-25
74LS30	492-89
74LS32	493-147
74LS322	502-112
74LS323	502-165
	3490-26
74LS33	494-72
74LS347	2463-139
74LS352	497-127
74LS353	497-95
74LS365	180
	485-25
74LS366	477-123
74LS367	476-181
74LS368	477-124
74LS37	491-102
74LS373	496-72
74LS374	487-11

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Device	Page-Line
Fairchild (Cont'd)	
74LS375	495-131
74LS377	487-48
74LS378	486-96
74LS379	486-4
74LS38	491-54
74LS390	481-46
74LS393	479-11
74LS395	501-121
	3488-112
74LS40	490-24
74LS42	483-27
74LS447	2463-140
74LS47	2463-151
74LS48	2463-108
74LS49	2463-82
74LS490	481-47
74LS502	508-118
74LS503	508-119
74LS51	492-188
74LS533	496-130
74LS534	486-135
74LS54	493-87
74LS540	503-135
	2471-4
74LS541	504-45
	2470-19
74LS55	493-32
74LS573	496-73
74LS574	487-12
74LS670	497-15
	3470-63
74LS74	485-89
74LS83	476-67
74LS85	474-38
74LS86	495-32
74LS92	482-40
74LS93	479-49
74LS95B	501-92
	3488-113
74S00	492-49
74S02	494-143
74S03	491-185
74S04	478-18
74S05	477-97
74S08	489-175
74S10	491-24
74S109	487-149
74S11	489-78
74S112	488-127
74S113	488-90
74S132	507-143
74S133	492-127
74S134	492-109
74S135	494-158
74S138	483-186
74S139	483-83
74S140	484-53
	2471-50
74S15	489-30
74S151	499-185
74S153	498-57
74S157	499-54
74S158	498-148
74S167	507-25
74S174	486-81
74S175	485-150
74S189	3471-25
74S194	501-173
	3489-38
74S20	490-134
74S22	490-76
74S253	498-7
74S257	498-184
74S258	498-108
74S260	494-24
74S289	3471-16
74S30	492-103
74S32	493-161
74S40	490-38
74S51	493-12
74S64	493-105
74S65	493-113
74S74	485-103
74S86	495-53
75107A	2474-19
75107B	2474-36
75108B	2474-41
75110A	2472-17
75150	2469-20
75154	2473-50
75239	2485-19
75450B	2481-115
75451A	2481-116
75451B	2481-117
75452A	2482-20
75452B	2482-21
75453A/B	2482-94
75461	2481-118
75462	2482-22
75471	2481-119
75472	2482-23
75474B	2482-59
75491	2464-138
75492	2465-35
75492A	2465-36
75S20	2485-5
75S234	2485-16
75S24	2485-30
9000M	487-96
9001C	487-97
9001M	487-98
9024C	487-113
9024M	487-114
91009C	505-150
9300C	501-36
	3488-114
9300M	501-37
	3488-115
9301C	482-155
9301M	482-156
9302C	483-1
9302M	483-2
9304C	474-146
9304M	474-147
9305C	479-27
9305M	479-28
9307C	2463-109
9307M	2463-110
9308C	495-97
9308M	495-98
9309C	497-105
9309M	497-106
9310C	480-127
9310M	480-128
9311C	484-21
9311M	484-22
9312C	499-121
9312M	499-122
9313C	499-138
9313M	499-139
9314C	495-156
9314M	495-157
9316C	478-101
9316M	478-102
93174C	486-44
9317BC	2463-152
9317BM	2463-153
9317CC	2464-7
9317CM	2464-8
9318C	508-126
9318M	508-127
9319C	481-72
9319M	481-73
9320C	508-1
9320M	481-74
9321C	483-48
9321M	483-49
9322C	499-3
9322M	499-4
9324C	474-39
9324M	474-40
932510C	3464-56
932510M	3464-85
932511C	3464-60
9328C	503-1
	3491-31
9328M	503-2
	3491-32
9334C	496-23
	¶ 237-4
9334M	496-24
	¶ 237-4
9338C	496-157
	¶ 236-14
9338M	496-158
	¶ 236-14
93407C	496-159
93407M	496-160
9340C	476-42
9340M	476-43
93410C	3473-6
93410M	3473-15
93411M	3473-11
93415AC	★ **3615**
	3475-58
93415C	★ **3615**
	3475-80
93415M	★ **3615**
	3475-93
93417C	3459-78
93417M	3459-99
93419A	★ **3615**
	★ **3631**
	3472-30
93419C	★ **3615**
	★ **3631**
	3472-32
93419M	★ **3615**
	★ **3631**
	3472-35
	3472-35
9341C	475-2
9341M	475-3
93421M	3473-9
93422AM	★ **3615**
	★ **3634**
	3473-61
93422C	★ **3615**
	★ **3634**
	3473-72
93422M	★ **3615**
	★ **3634**
	3473-87
93425AC	★ **3615**
	★ **3640**
	3475-59
93425C	★ **3615**
	★ **3640**
	3475-84
93425M	★ **3615**
	★ **3640**
	3475-96
93427C	3459-82
93427M	3459-107
9342C	475-68
9342M	475-69
93436C	3460-53
93436M	3460-71
93438C	3461-2
93438M	3461-21
93446C	3460-57
93446M	3460-77
93448C	3461-3
93448M	3461-25
9344M	475-108
93450C	3462-71
93450M	3462-97
93451C	3462-74
93451M	3462-105
93452C	3461-112
	3461-112
93452M	3462-10
	3462-10
93453C	3461-113
	3461-113
93453M	3462-12
	3462-12
93458C	★ **3661**
	3458-16
93458M	★ **3661**
	3458-19
93459C	★ **3661**
	3458-20
93459M	★ **3661**
	3458-27
93460M	3462-98
93471A	★ **3615**
93471C	★ **3615**
	★ **3643**
	3481-52
93471M	★ **3615**
	★ **3643**
	3481-82
93475	★ **3615**
	★ **3646**
	3477-46
93479DC	★ **3615**
	★ **3649**
	3475-14
9348C	509-45
9348M	509-46
93510C	3464-86
93510M	3464-57
93511C	3464-88
93511M	3464-95
93546M	474-72
9368C	2463-74
9370C	2463-70
9374C	2464-57
9386C	495-62
9386M	495-63
93F425	3475-47
93L00C	3488-48
93L00M	3488-49
93L28C	3491-24
93L28M	3491-25
93L415	3475-94
93L420M	3473-5
93L421C	3473-22
93L421M	3473-25
93L422AC	★ **3615**
	★ **3637**
	3473-62
93L422AM	★ **3615**
	★ **3637**
	3473-93
93L422C	★ **3615**
	★ **3637**
	3473-88
93L422M	★ **3615**
	★ **3637**
	3473-94
93L425C	★ **3615**
	3475-97
93L425M	★ **3615**
	3476-9
93L450C	3462-99
93L450M	3463-20
93L451C	3462-106
93L451M	3463-22
93S00C	501-69
	3489-39
93S00M	501-70
	3489-40
93S10C	480-176
93S10M	480-177
93S12C	499-186
93S12M	499-187
93S137C	484-16
93S137M	484-17
93S16C	478-154
93S16M	478-155
93S41C	475-56
93S41M	475-57
93S42C	475-83
93S42M	475-84
93S43C	475-144
	¶ 228-3
93S43M	475-145
	¶ 228-3
93S46C	474-73
93S47C	474-74
93S47M	474-75
93S62C	509-16
93S62M	509-17
93Z450	★ **3652**
	3462-72
93Z450A	★ **3652**
	3462-63
93Z451	★ **3652**
	3462-75
93Z451A	★ **3652**
	3462-66
93Z510C	★ **3655**
	3464-58
93Z510M	★ **3655**
	3464-87
93Z511C	★ **3655**
	3464-61
93Z511M	★ **3655**
	3464-89
93Z564	★ **3658**
	3466-75
93Z565	★ **3658**
	3466-76
9401C	506-11
	2467-4
	1085-11
9401M	506-12
	2467-5
	1085-12
9402C	1085-7
9402M	1085-8
9403AC	1085-4
9403AM	1085-5
9404C	1085-20
9405AC	474-172
	1085-2
9405AM	474-173
	1085-3
9406C	3456-60
	1085-25
9406M	3456-61
	1085-26
9407C	1085-16
9407M	1085-17
9408AC	1085-21
9408AM	1085-22
9408C	1085-23
9408M	1085-24
9410C	497-55
	3470-95
	1085-27
9410M	497-56
	1085-28
9411C	506-13
	2467-6
	1085-13
9411M	506-14
	2467-7
	1085-14
9414STC	506-17
	1085-18
9414STM	506-18
	1085-19
9423C	3456-39
	1085-9
9423M	3456-40
	1085-10
9428	2467-17
	1085-121
9441C	1100-3
9442C	1100-2
9480	4140-77
95H00C	3489-47
95H90C	510-106
	2946-75
95H90M	510-107
	2946-76
95H91C	510-86
	2946-58
95H91M	510-87
	2946-59
9600C	500-133
9600M	500-134
9601C	500-107
9601M	500-108
9602C	500-176
9602M	500-177
96101	484-95
96101C	2469-37
96101M	2469-38
96103M	2476-5
96106	2473-41
9612C	2471-39
9614C	2471-40
9614M	2471-41
9615C	2474-56
9615M	2474-57
9616	2469-25
9616E	2469-26
9616M	2469-27
9617C	2473-12
9624C	505-142
9624M	505-143
9625C	505-126
9625M	505-127
9634C	2472-7
9634M	2472-8
9636AC	2469-16
9636AM	2469-17
9637AC	2474-50
9637AM	2474-51
9640C	508-41
	2478-3
9640M	508-42
	2477-61
9641M	508-43
9643	2481-76
9645	2483-83
9650	2963-8
9665	2480-70
	2890-23
9666	2480-87
	2890-24
9666M	2480-88
	2890-25
9667	2480-46
	2890-26
9667M	2480-47
	2890-27
9668	2480-31
	2890-28
9668M	2480-32
	2890-29
96L02C	500-178
96L02M	500-179
96LS02C	501-5
96LS02M	501-6
96LS32	2481-20
96LS32C	2481-21
96LS42C	2481-23
96LS42M	2481-24
96LS488DC	506-108
	¶ 237-2
	1102-44
	¶ 237-2
96LS488DM	506-109
	¶ 237-2
	1102-45
	¶ 237-2
96S02C	501-9
96S02M	501-10
9LS194C	3488-116
9LS194M	3488-117
9LS195C	3488-118
9LS195M	3488-119
9LS295C	3488-120
9LS295M	3488-121
9LS298C	499-89
9LS298M	499-90
9LS395C	3488-122
9LS395M	3488-123
9LS95C	3488-124
9LS95M	3488-125
CCD111	2964-1
	2964-47
CCD121	2964-52
CCD122	2964-2
	2964-51
CCD133	2964-3
	2964-49
CCD142	2964-4
	2964-54
CCD143	2964-5
	2964-55
CCD221	2963-142
CCD222	2964-48
CCD321	2962-73
	3488-9
CCD321A	2968-52
CCD341A	2963-50
CCD460	3488-39
CET200	2948-52
DCM-1	1755-3
E100422	3473-42
ECL-Array	4140-78
F10000C	469-57
	3489-48
F100101	★ **658**
	470-34
F100102	★ **658**
	470-36
F100107	★ **658**
	470-38
F10010C	467-59
F10010M	467-60
F100112	★ **658**
	470-22
F100113	★ **658**
	470-21
F100114	★ **658**
	470-92
F100117	★ **658**
	470-30
F100118	★ **658**
	470-32
F100122	★ **658**
	470-15
F100123	★ **658**
	470-24
F100124	★ **658**
	470-70
F100125	★ **658**
	470-71
F100126	★ **658**
	470-20

Arranged alphanumerically from left to right.

© IC MASTER 1983

Device	Page-Line
Fairchild (Cont'd)	
F100130	★ **658**
	470-40
F100131	★ **658**
	470-26
F100136	★ **658**
	470-17
F100141	★ **658**
	470-69
F100142	★ **658**
	470-43
F100145	★ **658**
	470-47
	★ **658**
	3470-88
F10014C	469-82
F10014M	469-83
F100150	★ **658**
	470-41
F100151	★ **658**
	470-28
F100155	★ **658**
	470-62
F100156	★ **658**
	470-66
F100158	★ **658**
	470-67
F100160	★ **658**
	470-90
F100163	★ **658**
	470-58
F100164	★ **658**
	470-64
F100165	★ **658**
	470-85
F100166	★ **658**
	470-12
F10016C	467-41
F10016M	467-42
F100170	★ **658**
	470-18
F100171	★ **658**
	470-60
F100179	★ **658**
	470-8
F100180	★ **658**
	470-11
F100181	★ **658**
	470-10
F100182	★ **658**
	470-14
F100183	★ **658**
	470-9
F100194	★ **658**
	470-94
F100220	470-72
	1049-19
F100221	470-80
F100222	470-87
F100223	470-81
F100224	470-79
F1002416	★ **3627**
F100402	★ **658**
	470-46
	★ **658**
	3470-87
F10041	3490-129
F100414	★ **3615**
	★ **3624**
	470-49
F100414C	★ **3615**
	★ **3624**
	3472-69
	3472-69
F100415	★ **3615**
	★ **3625**
	470-52
F100415A	★ **3615**
	★ **3625**
	469-12
F100415C	★ **3615**
	★ **3625**
	3475-32
F100416	★ **3626**
	470-45
F100416C	★ **3626**
	3459-68
F100422	★ **3615**
	470-50
F100422C	★ **3615**
	3473-40
F100470	★ **3615**
	★ **3628**
	470-54
	★ **3615**
	★ **3628**
	3481-39
F100474	★ **3615**
	★ **3629**
	470-53
	★ **3615**
	★ **3629**
	3477-37
F100480	★ **3630**
	470-56
	★ **3630**
	3483-64
F100Z416	470-44
	3459-63
F10100	468-30
F10101	468-51
F10102	468-23
F10103	467-146
F10104	467-126
F10105	468-43
F10106	468-17
F10107	468-89
F10109	468-35
F10110	467-137
F10111	468-1
F10113	468-84
F10114	469-92
F10115	469-108
F10116	469-93
F10117	468-70
F10118	468-58
F10119	468-64
F10121	468-77
F10123	467-88
F10124	469-75
F10125	469-70
F10130	468-96
F10131	467-96
F10132	468-110
F10133	468-120
F10134	468-104
F10135	467-120
F10136	467-45
F10137	467-54
F10141	469-58
	3489-53
F10145A	3470-89
F10145AC	468-152
F10153	468-121
F10158	469-44
F10159	469-39
F10160	469-120
F10161	467-69
F10162	467-61
F10164	469-49
F10165	469-113
F10168	468-116
F10171	467-82
F10172	467-77
F10173	468-130
F10174	469-32
F10175	468-135
F10176	467-113
F10177	469-66
F10179	467-1
F10180	467-9
F10181	467-22
F10186	467-109
F10192	467-92
F10210	467-138
F10211	468-2
F10212	468-12
F10231	467-97
F10410C	★ **3615**
F10414C	★ **3615**
	3472-70
	3472-70
F10414M	★ **3615**
	3472-72
	3472-72
F10415	★ **3615**
	★ **3618**
	469-13
F10415A	★ **3615**
	★ **3618**
	469-14
F10415AC	★ **3615**
	★ **3618**
	3475-40
F10415C	★ **3615**
	★ **3618**
	3475-28
F10416	468-146
F10416C	3459-61
F10422	★ **3615**
	★ **3620**
	3473-43
F10422C	★ **3615**
	★ **3620**
	3473-41
F10470	★ **3615**
	★ **3621**
	469-24
F10470C	★ **3615**
	★ **3621**
	3481-40
F10474C	★ **3615**
	★ **3622**
	469-15
	★ **3615**
	★ **3622**
	3477-38
F10480	469-31
	3483-65
F10501	468-52
F10502	468-24
F10503	467-147
F10504	467-127
F10505	468-44
F10506	468-18
F10507	468-90
F10509	468-36
F10510	467-139
F105100	468-31
F10511	468-3
F10513	468-85
F10514	469-94
F10515	469-109
F10516	469-95
F10517	468-71
F10518	468-59
F10519	468-65
F10521	468-78
F10523	467-89
F10524	469-76
F10525	469-71
F10530	468-97
F10531	467-98
F10532	468-111
F10533	468-122
F10534	468-105
F10535	467-121
F10536	467-46
F10537	467-55
F10541	469-59
F10545A	3470-90
F10545AM	468-153
F10553	468-123
F10558	469-45
F10559	469-40
F10560	469-121
F10561	467-70
F10562	467-62
F10564	469-50
F10565	469-114
F10566	467-29
F10568	468-117
F10570	469-118
F10571	467-83
F10572	467-78
F10573	468-131
F10574	469-33
F10575	468-136
F10576	467-114
F10579	467-2
F10580	467-10
F10581	467-23
F10586	467-110
F10592	467-93
F10610	467-140
F10611	468-4
F10612	468-13
F10631	467-99
F10Z416	★ **3619**
	468-147
	★ **3619**
	3459-64
F10Z416A	★ **3619**
	3459-60
F16000	★ **1253**
	★ **1297**
F16008	1097-120
	1061-3
F16016	1097-121
	1077-26
F16032	★ **1298**
	1100-7
	★ **1298**
	1077-27
F16081	1097-125
F16082	1097-130
F16105	1097-127
F16201	1097-133
F16202	1097-128
F16203	1097-123
F16204	1097-122
F16413	1097-124
F16425	1097-132
F16456	★ **1302**
	1097-131
	1100-14
F16488	★ **1303**
	1097-126
	1100-11
F16802	1097-129
F200	4140-79
F201	4140-80
F232	3468-10
F264	3468-11
F2708	3463-81
F2708-1	3463-73
F2716	3465-65
F2716-1	3465-31
F2732	3466-59
F2847	3491-78
F2847L	3491-79
F2847LM	3491-75
F2847M	3491-76
F2901A	1049-9
F2901AC	476-32
	1085-82
F2901AM	476-33
	1085-83
F2903	1049-10
F2903C	476-34
	1085-84
F2903M	476-35
	1085-85
F2910C	1098-133
F2910M	1098-134
F29704C	3471-84
	1086-30
F29704M	3471-85
	1086-31
F29705C	3471-58
	1086-32
F29705M	1086-33
F3357M	3491-81
F3516-35	3485-17
F3516-45	3485-38
F3528-10	★ **3664**
	3480-11
F3528-12	★ **3664**
	3480-26
F3528-15	★ **3664**
	3480-49
F3528-20	★ **3664**
	3480-88
F3528-35	★ **3664**
	3481-12
F3528L	★ **3665**
F3528L-10	★ **3664**
	3480-12
F3528L-12	★ **3664**
	3480-27
F3528L-15	★ **3664**
	3480-50
F3528L-20	★ **3664**
	3480-89
F35316	★ **1281**
F3532-30	★ **1282**
	3485-84
F3532-35	★ **1282**
	3485-98
F3532-45	★ **1282**
	3485-124
F3533-30	★ **1282**
	3485-85
F3533-35	★ **1282**
	3485-99
F3533-45	★ **1282**
	3485-125
F3564-25	★ **1282**
	3486-48
F3564-35	★ **1282**
	3486-97
F3565-25	★ **1282**
	3486-65
F3565-35	★ **1282**
	3486-98
F3566	★ **1283**
F3568	★ **1283**
F3569	★ **1283**
F3570	★ **1284**
F380	4140-81
F3846	2487-20
F3850	★ **1268**
F3851	★ **1268**
F3853	★ **1268**
F3856	★ **1268**
F3861	★ **1268**
F3864	1091-151
F3870	★ **1253**
	1090-57
	¶ 238-6
	★ **1253**
	1061-4
	¶ 238-6
F3870-PEP	★ **1253**
	1765-29
	¶ 238-6
F3871	★ **1268**
F3872	★ **1254**
	1090-47
	★ **1254**
	1061-5
F3876	1090-48
	1061-6
F3878	1090-58
	1061-7
F38C70	★ **1257**
	1090-59
	★ **1257**
	1061-8
F38E70	★ **1258**
	1090-43
	1090-60
	★ **1258**
	1061-9
F38L72	1090-49
	1061-10
F38L76	1090-50
	1061-11
F40014AM	465-19
F40014BC	465-20
F4001BC	458-151
F4001BM	458-152
F4002BC	458-87
F4002BM	458-88
F4006BC	463-136
	3489-119
F4006BM	463-137
F4006M	3489-123
F4007UBC	450-145
F4007UBM	450-146
F40085BC	449-83
F40085BM	449-84
F4008BC	449-31
F4008BM	449-32
F40097BC	450-92
F40097BM	450-93
F40098BC	450-169
F40098BM	450-170
F4011BC	457-88
F4011BM	457-89
F4012BC	457-13
F4012BM	457-14
F4013BC	455-88
F4013BM	455-89
F4014BC	463-113
	3490-73,
F4014BM	463-114
	3490-85
F4015BC	462-114
	3489-91
F4015BM	462-115
	3489-96
F40160BC	452-132
F40160BM	452-133
F40161BC	451-48
F40161BM	451-49
F40162BC	452-104
F40162BM	452-105
F40163BC	451-24
F40163BM	451-25
F4016C	2417-62
F4016M	2417-63
F40174BC	455-163
F40174BM	455-164
F40175BC	455-146
F40175BM	455-147
F4017BC	452-78
F4017BM	452-79
F4018BC	453-113
F4018BM	453-114
F40192BC	452-158
F40192BM	452-159
F40193BC	451-78
F40193BM	451-79
F40194BC	462-147
	3489-66
F40194BM	462-148
	3489-54
F40195BC	463-10
	3489-67
F40195BM	463-11
	3489-55
F4019BC	457-165
F4019BM	457-166
F4020BC	452-14
F4020BM	452-15
F4021BC	463-44
	3490-74
F4021BM	463-45
	3490-86
F4022BC	453-88
F4022BM	453-89
F4023BC	457-47
F4023BM	457-48
F4024BC	451-151
F4024BM	451-152
F4025BC	458-118
F4025BM	458-119
F4027BC	456-99
F4027BM	456-100
F4028BC	453-161
F4028BM	453-162
F4029BC	453-131
F4029BM	453-132
F4030BC	459-6
F4030BM	459-7
F4031BC	463-164
	3491-46
F4031BM	463-165
	3491-48
F4034BC	463-63
F4034BM	463-64
F4035BC	463-22
	3489-68
F4035BM	463-23
	3489-56
F4040BM	451-179
F4041BC	449-136
F4041BM	449-137
F4042BC	459-105
F4042BM	459-106
F4043BC	459-146
F4043BM	459-147
F4044BC	459-127
F4044BM	459-128
F4046BC	464-47
	2945-43
F4046BM	464-48
	2945-44
F4047BC	462-12
F4047BM	462-13
F4049BC	450-15
F4049BM	450-16
F404BC	451-180
F4050BC	450-50
F4050BM	450-51
F4051BC	2423-90
F4051BM	2423-91
F4052BC	2423-22
F4052BM	2423-23
F4053BC	2419-97
F4053BM	2419-98
F4066BC	2417-37
F4066BM	2417-38
F4067BC	2424-103

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Device	Page-Line
Fairchild (Cont'd)	
F4067BM	2424-104
F4068BC	457-132
F4068BM	457-133
F4069UBC	450-175
F4069UBM	450-176
F4070BC	459-8
F4070BM	459-9
F4071BC	458-44
F4071BM	458-45
F4072BC	458-10
F4072BM	458-11
F4073BC	456-153
F4073BM	456-154
F4075BC	458-24
F4075BM	458-25
F4076BC	455-122
F4076BM	455-123
F4077BC	459-46
F4077BM	459-47
F4078BC	458-191
F4078BM	458-192
F4081BC	456-176
F4081BM	456-177
F4082BC	456-138
F4082BM	456-139
F4085BC	457-183
F4085BM	457-184
F4086BC	458-1
F4086BM	458-2
F4093BC	464-147
F4093BM	464-148
F4104BE	464-1
F4104BM	464-2
F4116-2	3468-91
F4116-3	3469-3
F4116-4	3469-22
F4164	★ **3666**
	3469-66
F4164-12	★ **3666**
	3469-73
F4164-15	★ **3666**
	3469-82
F4164-20	★ **3666**
	3470-9
F4510BC	452-160
F4510BM	452-161
F4511BC	455-44
	2464-25
F4511BM	455-45
	2464-26
F4512BC	461-142
F4512BM	461-143
F4514BC	454-114
F4514BM	454-115
F4515BC	454-116
F4515BM	454-117
F4516BC	451-80
F4516BM	451-81
F4518BC	453-20
F4518BM	453-21
F4519BC	461-126
F4519BM	461-127
F4520BC	451-125
F4520BM	451-126
F4522BC	453-5
F4522BM	453-6
F4526BC	451-116
F4526BM	451-117
F4528BC	462-27
F4528BM	462-28
F4531BC	466-23
F4531BM	466-24
F4532BC	466-1
F4532BM	466-2
F4539BC	461-79
F4539BM	461-80
F4553BC	453-46
F4553BM	453-47
F4555BC	454-27
F4555BM	454-28
F4556BC	454-39
F4556BM	454-40
F4557BC	463-175
	3491-54
F4557BM	463-176
	3491-50
F4582BC	449-70
F4582BM	449-71
F4583BC	464-110
F4583BM	464-111
F464	3488-40
F4702BC	464-13
	2486-28
	1085-41
F4702BM	464-14
	2486-29
	1085-42
F4703BC	460-96
	1085-37
F4703BM	460-97
	1085-38
F4704BC	449-53
	1085-33
F4704BM	449-54
	1085-34
F4705BC	449-58
	1085-29
F4705BM	449-59
	1085-30
F4706BC	460-98
	1085-39
F4706BM	460-99
	1085-40
F4707BC	449-51
	1085-31
F4707BM	449-52
	1085-32
F4708C	1085-35
F4708M	1085-36
F4710BC	460-106
	3471-104
	1085-47
F4710BM	460-107
	3471-105
	1085-48
F4720AC	460-112
	3473-27
F4720AM	460-113
F4720C	460-114
	3473-28
	1085-51
F4720M	460-115
	3473-29
	1085-52
F4721BC	460-164
F4721BM	460-165
F4723BC	459-84
F4723BM	459-85
F4724BC	460-43
F4724BM	460-44
F4725BC	460-100
	1085-49
F4725BM	460-101
	1085-50
F4726BC	1085-53
F4726BM	1085-54
F4731BC	462-145
	3491-65
F4731BM	462-146
	3491-66
F4734BC	455-46
	2464-59
F4734BM	455-47
	2464-60
F4735BC	461-13
	1085-55
F4735BM	461-14
	1085-56
F4736BC	460-146
F4736BM	460-147
F64K-12	3469-74
F64K-15	3469-83
F64K-20	3470-10
F68-PEP	1761-27
F6800	★ **1253**
	★ **1269**
	★ **1278**
	1091-136
	★ **1253**
	★ **1269**
	★ **1278**
	1061-12
F6801	★ **1270**
	1091-74
	★ **1270**
	1061-13
F6801E	★ **1270**
	1091-61
F6802	★ **1278**
	1091-101
	★ **1278**
	1061-14
F6803	★ **1270**
	1091-65
	★ **1270**
	1061-15
F6808	★ **1278**
	1091-128
	★ **1278**
	1061-16
F6809	★ **1272**
	1091-113
	★ **1272**
	1061-17
F6809E	★ **1272**
	★ **1274**
	1091-92
	★ **1272**
	★ **1274**
	1061-18
F6810	★ **1278**
	3472-60
	3472-60
F6820	1092-83
	1102-53
F6821	★ **1279**
	1092-84
	1102-54
F68316	★ **1281**
	3485-18
F68332	★ **1282**
	3486-21
F6840	★ **1279**
	1092-105
F6844	★ **1279**
	1092-42
F6845	★ **1276**
	1092-25
F6845A	★ **1276**
F6846	★ **1280**
	1092-118
F6847	1101-107
F68488	★ **1280**
	1092-63
F6850	★ **1280**
	2486-4
	★ **1280**
	1091-163
	1102-28
F6852	★ **1281**
	1092-137
	1102-78
F6854	★ **1281**
	1091-152
F6856	★ **1277**
	2487-21
	★ **1277**
	1091-153
F68708	3463-82
F68716	3465-66
F6882	★ **1278**
	1091-102
F68A00	1091-137
F68A02	1091-103
F68A09	★ **1272**
	1091-114
	★ **1272**
	1061-19
F68A09E	★ **1272**
	★ **1274**
	1091-93
	★ **1272**
	★ **1274**
	1061-20
F68A10	3472-55
	3472-55
F68A21	1092-85
	1102-55
F68A332	3485-100
F68A40	1092-106
F68A50	1092-1
	1102-29
F68A52	1092-138
F68A54	1091-154
F68B00	1091-138
F68B09	★ **1272**
	1091-115
	★ **1272**
	1061-21
F68B09E	★ **1272**
	★ **1274**
	1091-94
	★ **1272**
	★ **1274**
	1061-22
F68B10	3472-50
	3472-50
F68B21	1092-86
	1102-56
F68B308	3484-54
F68B40	1092-107
F68B50	1092-2
F68B52	1092-139
F68B54	1091-155
F8	★ **1253**
	★ **1268**
	1096-106
	¶ 238-6
	★ **1253**
	★ **1268**
	1061-23
	¶ 238-6
F9440	1077-28
F9440C	1099-132
F9440M	1099-133
F9443	★ **1286**
	1100-1
F9444	★ **1285**
	★ **1287**
	1100-4
F9445	★ **1285**
	★ **1288**
	1099-134
	★ **1285**
	★ **1288**
	1077-29
F9446	★ **1285**
	★ **1292**
	1100-5
F9447	★ **1285**
	★ **1293**
	1100-6
F9448	★ **1285**
	★ **1294**
	1099-135
F9449	★ **1285**
	★ **1295**
	1099-136
	1099-137
F9454	
F9470	★ **1285**
	★ **1296**
	1099-138
F95000	470-3
	3489-49
F95002	469-136
F95003	469-138
F95004	469-134
F95010	469-127
F95016	469-126
F95029	469-129
F95101	469-140
F95102	469-135
F95103	469-131
F95105	469-139
F95106	469-133
F95107	470-1
F95109	469-137
F95110	469-130
F95111	469-132
F95115	470-7
F95116	470-6
F95124	470-5
F95130	470-2
F95231	469-128
F95H00C	470-4
FACT	★ **660**
FAIRCAD	★ **4317**
FCB8010	2898-119
FCM7040	2906-49
FQ3467	2889-154
FQ3468	2889-155
FQ3724	2889-134
FQ3725	2889-135
FS-1	1622-2
FS-I	★ **1711**
Formulator	1621-4
GE0020	★ **4316**
	4140-82
GE0500	★ **4316**
	4140-83
GE0750	4140-84
GE1000	★ **4316**
	4140-85
GE2000	★ **4316**
	4140-86
GLOW-16	1769-19
GT0750	★ **4316**
HD10104	467-128
LM1014	2906-67
LM1014A	2906-68
Microflamel	1622-1
PEP-45	★ **1711**
	★ **1716**
	1767-13
PEP68	★ **1718**
	1622-3
SH123	2952-107
SH1605	2960-100
	¶ 281-2
SH2001C	485-27
SH2001M	485-28
SH2002C	485-29
SH2002M	485-30
SH2200C	485-31
SH2200M	485-32
SH223	2952-108
SH3002C	2419-6
SH3002M	2419-7
SH3003C	2420-25
SH3003M	2420-26
SH323	2952-109
SPARK-16	1769-20
TBA641	2896-76
TBA820	2896-77
UA739	2897-183
ZN54170	3470-48
u78HG	2959-38
u79HGA	2960-22
u79M08C	2957-31
uA0801	2441-30
uA0801C	2443-39
uA0801E	2441-46
uA0802	2442-31
uA0802A	2442-32
uA0802B	2443-49
uA0802C	2444-4
uA101	2929-21
uA101A	2909-18
uA101AM	2923-56
uA105M	2959-124
uA108	2911-151
uA108AM	2918-46
uA108M	2922-54
uA109M	2952-51
uA111M	2891-41
uA117	2959-72
uA118	2910-48
uA124	2913-56
uA139	2894-61
uA139A	2894-30
uA1458	2909-2
uA1458C	2939-40
uA148	2942-28
uA1488	2469-54
uA1489	2473-21
uA1489A	2473-30
uA1558M	2938-48
uA193	2893-43
uA193A	2893-5
uA201	2932-6
uA201AM	2923-57
uA208AM	2918-47
uA208M	2922-55
uA209M	2952-52
uA217	2959-73
uA224	2913-57
uA2240C	2951-20
uA2240M	2951-21
uA239	2895-14
uA239A	2894-40
uA248	2943-26
uA2903	2894-1
uA293	2893-53
uA293A	2893-8
uA301A	2931-51
uA305AC	2960-6
uA305C	2959-28
uA3086M	2889-6
uA308AC	2919-19
uA309C	2952-53
uA311C	2892-36
uA317	2959-74
uA318	2910-49
	2933-38
uA324	2913-58
uA3303C	2913-87
uA339	2895-15
uA339A	2894-41
uA3403	2944-17
uA3403C	2913-88
uA3448A	2476-42
uA348	2943-27
uA376C	2959-114
uA393	2893-54
uA393A	2893-9
uA398	2967-82
uA4136C	2943-45
uA4136M	2942-48
uA431	2959-61
uA494	2960-101
uA494M	2960-102
uA555C	2951-34
uA556C	2951-71
uA709AM	2924-9
uA709C	2932-9
uA709M	2929-4
uA710C	2892-15
uA710M	2891-24
uA711C	2893-47
uA711M	2893-28
uA714	2911-56
	2915-27
uA714C	2911-107
	2916-34
uA714E	2915-33
uA715C	2913-144
	2932-4
uA715M	2913-145
	2929-40
uA723C	2959-90
uA723M	2959-91
uA725A	2911-77
uA725AM	2919-41
uA725C	2924-27
uA725E	2911-78
uA725M	2921-17
uA726C	2968-9
uA726M	2968-10
uA727C	2888-30
uA727M	2888-31
uA7332	2896-140
uA733C	2888-71
uA733M	2888-72
uA734C	2892-22
uA734M	2891-37
uA739	2897-184
	2940-8
uA7392	2906-69
	2964-129
	¶ 276-10
uA741	2909-28
uA741AM	2920-6
uA741C	2930-45
uA741E	2911-95
uA741EC	2920-5
uA741M	2929-9
uA747AM	2937-32
uA747C	2939-41
uA747EC	2937-33
uA747M	2938-49
uA748C	2930-58
uA748M	2929-24
uA749	2897-185
uA749C	2937-39
uA749D	2940-34
uA757	2900-100
uA759	2909-75
	2913-2
	2925-33
uA759C	2909-76
	2913-3
	2930-39
uA760C	2892-29
uA760M	2892-30
uA776	2911-172
uA776C	2911-157
	2912-29
	2939-24
uA776M	2912-30
	2938-13
uA7805C	2952-73
uA7805M	2952-74

Arranged alphanumerically from left to right.

© IC MASTER 1983

Device	Page-Line
Fairchild (Cont'd)	
uA7806C	2953-19
uA7808C	2953-83
uA7808M	2953-84
uA7812C	2954-52
uA7812M	2954-53
uA7815C	2955-14
uA7815M	2955-15
uA7818C	2955-84
uA7818M	2955-85
uA7824C	2956-38
uA7824M	2956-39
uA7885	2953-120
uA78G	2959-37
uA78H	2959-11
uA78H05	2952-128
uA78H05A	2952-129
uA78H08C	2953-111
uA78H12	2954-99
uA78HG	2959-13
uA78L05C	2952-6
uA78L09C	2953-122
uA78L12C	2954-12
uA78L15C	2954-110
uA78L62C	2953-48
uA78L82C	2953-118
uA78M05C	2952-34
uA78M05M	2952-35
uA78M06C	2953-3
uA78M06M	2953-4
uA78M08C	2953-70
uA78M08M	2953-71
uA78M12C	2954-25
uA78M12M	2954-26
uA78M15C	2954-123
uA78M15M	2954-124
uA78M24C	2956-15
uA78M24M	2956-16
uA78MG	2959-36
uA78P05	2952-134
uA78S40	2960-103
	¶ 281-14
uA78S40M	2960-104
	¶ 281-14
uA7905C	2956-111
uA7905M	2956-112
uA7908C	2957-37
uA7908M	2957-32
uA7912C	2957-81
uA7912M	2957-82
uA7915C	2957-126
uA7915M	2957-127
uA791C	2931-14
uA798	2913-52
uA798C	2939-32
uA79E02	2956-85
uA79E02C	2956-86
uA79G	2960-30
uA79M05C	2956-96
uA79M05M	2956-97
uA79M12C	2957-68
uA79M12M	2957-69
uA79M15C	2957-112
uA79M15M	2957-113
uA79MG	2960-29
uA8T26A	2477-10
uA8T26AM	2477-11
uA8T28	2477-25
uA8T28M	2477-26
uA9706C	2439-35
uA9708	2963-13
	1102-9
uA9708C	2429-41
uA9708M	2429-42
uAF198	2967-83
uAF298	2967-84
uAF771	2909-43
	2933-1
uAF771A	2922-40
uAF771AM	2922-41
uAF771B	2927-27
uAF771BM	2927-28
uAF771L	2934-21
uAF772	2940-29
uAF772A	2936-41
uAF772AM	2936-42
uAF772B	2938-9
uAF772BM	2938-10
uAF772L	2940-43
uAF774	2944-13
uAF774B	2942-20
uAF774BM	2942-21
uAF774L	2944-20

Fujitsu America

FBC304D2A	★ 3668
	3468-9
FBC304M1A	★ 3668
	3468-8
FBM31DB	★ 3668
	3468-4
FBM32DA	★ 3668
	3468-5
FBM420	★ 3671
FBM42DA	★ 3671
	3468-7
FBM43DA	★ 3671
	3468-6

Fujitsu Microelectronics, Inc.

B200	4140-87
B2000	4140-88
B500	4140-89
C1275	4140-90
C2000	4140-91
C2000H	4141-130
C3900	4140-92
C3900H	4141-131
C770	4140-93
MB1412A	506-29
	2467-23
MB3759	2960-108
MB3760	2960-109
MB4111	2481-68
MB4112	2481-69
MB425	1093-102
MB426	1093-103
MB6001	2948-62
MB6002	2948-63
MB7072E	★ 3681
	469-5
	★ 3681
	3473-48
MB7072H	★ 3681
	469-6
	★ 3681
	3473-52
MB7121E	★ 3679
	3461-115
	3461-115
MB7121H	★ 3679
	3461-103
	3461-103
MB7122E	★ 3679
	3461-118
	3461-118
MB7122H	★ 3679
	3461-105
	3461-105
MB7123E	★ 3679
	3461-5
MB7123H	★ 3679
	3460-117
MB7124E	★ 3679
	3461-10
MB7124H	★ 3679
	3460-120
MB7127H	★ 3679
	3463-105
MB7128	★ 3679
	497-77
MB7128E	★ 3679
	3463-117
MB7128E-W	★ 3679
	3463-118
MB7128H	★ 3679
	3463-107
MB7130E	3484-30
MB7130H	3484-31
MB7131	★ 3679
	497-71
MB7131E	★ 3679
	3462-87
MB7131H	★ 3679
	3462-73
MB7132	★ 3679
	497-72
MB7132E	★ 3679
	3462-88
MB7132H	★ 3679
	3462-76
MB7132Y	★ 3679
	3462-67
MB7134E	★ 3679
	3485-67
MB7134H	★ 3679
	3485-66
MB7136E	3484-109
MB7136H	3484-108
MB7137H	★ 3679
	3464-59
MB7138E	★ 3679
	3464-90
MB7138E-W	★ 3679
	497-78
	★ 3679
	3484-110
MB7138H	★ 3679
	3464-62
MB7141E	★ 3679
	3466-21
MB7141H	★ 3679
	3466-19
MB7142E	★ 3679
	3466-22
MB7142E-W	★ 3679
	497-79
	★ 3679
	3466-24
	3485-69
MB7142H	★ 3679
	3466-20
MB7143H	★ 3678
	3466-77
MB7144H	★ 3678
	3466-78
MB8116E	3469-4
MB8116H	3468-92
MB8117-10	3468-64
MB8117-12	3468-72
MB8118-10	3468-65
MB8118-12	3468-73
MB8128-10	3480-13
MB8128-15	3480-51
MB8132E	3469-49
MB8132H	3469-48
MB81416-10	★ 3672
	3469-39
MB81416-12	★ 3672
	3469-40
MB81416-15	★ 3672
	3469-41
MB8167A-45	★ 3675
	3483-69
MB8167A-55	★ 3675
	3483-74
MB8167A-70	★ 3675
	3483-81
MB8168-55	★ 3675
	3481-81
MB8168-70	★ 3675
	3483-21
MB8216E	3468-80
MB8264-15	★ 3673
	3469-84
MB8264-20	★ 3673
	3470-11
MB8264A-10	★ 3673
	3469-67
MB8264A-12	★ 3673
	3469-75
MB8265-15	★ 3673
	3469-85
MB8265-20	★ 3673
	3470-12
MB8265A-10	★ 3673
	3469-68
MB8265A-12	★ 3673
	3469-76
MB8266A-10	★ 3673
	3469-69
MB8266A-12	★ 3673
	3469-77
MB8404E	3482-84
MB8414E	3478-65
MB8416	★ 3676
	3480-71
MB8417	★ 3676
	3480-72
MB8418	★ 3676
	3480-73
MB8464-10	★ 3672
	3468-57
MB8464-10L	★ 3672
	3468-58
MB8464-15	★ 3672
	3468-59
MB8464-15L	★ 3672
	3468-60
MB88201	★ 1306
	1087-17
	★ 1306
	1049-24
MB88202	★ 1306
	1087-18
	★ 1306
	1049-25
MB88401	★ 1306
	1087-37
	★ 1306
	1049-26
MB8841	★ 1306
	1087-28
	★ 1306
	1049-27
MB88411	★ 1306
	1087-38
	★ 1306
	1049-28
MB88413	★ 1306
	1087-39
	★ 1306
	1049-29
MB8842	★ 1306
	1087-29
	★ 1306
	1049-30
MB88421	★ 1306
	1087-40
	★ 1306
	1049-31
MB88423	★ 1306
	1087-41
	★ 1306
	1049-32
MB8843	★ 1306
	1087-30
	★ 1306
	1049-33
MB8844	★ 1306
	1087-31
	★ 1306
	1049-34
MB8845	1087-32
MB8846	1087-33
MB8847	1087-34
MB8848	1087-35
MB8849	1087-36
MB88501	★ 1306
	1087-42
	★ 1306
	1049-35
MB88503	★ 1306
	1087-43
	★ 1306
	1049-36
MB8851	★ 1306
	1087-19
	★ 1306
	1049-37
MB8851A	★ 1306
	1087-20
	★ 1306
	1049-38
MB8851L	★ 1306
	1087-21
	★ 1306
	1049-39
MB8853	★ 1306
	1087-22
	★ 1306
	1049-40
MB88535	★ 1306
	1087-44
	★ 1306
	1051-1
MB88536	★ 1306
	1087-45
	★ 1306
	1051-2
MB8854	★ 1306
	1051-3
MB88541	★ 1306
	1087-46
	★ 1306
	1051-4
MB8854A	★ 1306
	1087-23
	★ 1306
	1051-5
MB8854L	★ 1306
	1087-24
	★ 1306
	1051-6
MB8855	1087-25
MB8857	1087-26
MB8858	1087-27
MB8866	1097-111
	1101-26
MB8868A	2487-59
MB8876	★ 1308
	1101-124
MB8876A	★ 1308
	1091-21
	1101-27
MB8877	★ 1308
	1092-56
	1093-108
	1094-137
	1095-146
	1099-100
	1101-125
MB8877A	★ 1308
	1091-22
	1101-28
MBL6800	1091-139
	1061-24
MBL6802	1091-104
	1061-25
MBL6809	1091-116
	1061-26
MBL68A09	1091-117
	1061-27
MBL68B09	1091-118
	1061-28
MBL8031	★ 1307
	1061-29
MBL8035	1093-21
	1061-30
MBL8039	1093-22
	1061-31
MBL8041A	1094-2
	1095-100
	1096-60
MBL8048	1093-50
	1061-32
MBL8049	1093-51
	1061-33
MBL8051	★ 1307
	1063-1
MBL8086	★ 1305
	1097-141
	★ 1305
	1077-30
MBL8086-1	★ 1305
	1097-142
	★ 1305
	1077-31
MBL8086-2	★ 1305
	1097-143
	★ 1305
	1079-1
MBL8087	★ 1305
MBL8088	★ 1305
	1098-59
	★ 1305
	1063-2
MBL8089	★ 1305
	1098-9
MBL80C39	★ 1307
	1093-23
	★ 1307
	1063-3
MBL80C49	★ 1307
	1093-52
	★ 1307
	1063-4
MBL8243	1093-115
MBL8243E	1094-146
MBL8243N	1094-147
MBL8259A	★ 1305
	1098-31
MBL8282	★ 1305
	1098-50
MBL8283	★ 1305
	1098-45
MBL8284A	★ 1305
	1098-20
MBL8286	★ 1305
	1098-39
MBL8287	★ 1305
	1098-34
MBL8288	★ 1305
	1098-15
MBL8289	★ 1305
	1098-11
MBM100422	★ 3681
	3473-44
	3473-89
MBM100470	★ 3681
	470-55
	★ 3681
	3481-21
MBM100474	★ 3681
	470-51
MBM100474-15	★ 3681
	3477-29
MBM100474-20	★ 3681
	3477-31
MBM100480	★ 3680
	3483-62
MBM10415A	★ 3681
	3475-61
MBM10415AH	★ 3681
	3475-41
MBM10422E	★ 3681
	469-7
	★ 3681
	3473-51
MBM10422H	★ 3681
	469-8
	★ 3681
	3473-45
MBM10422N	★ 3681
	469-9
	★ 3681
	3473-53
MBM10470	★ 3681
	3481-41
MBM10470A-15	★ 3681
	469-23
	★ 3681
	3481-19
MBM10470A-20	★ 3681
	469-25
	★ 3681
	3481-22
MBM10474	★ 3681
	3477-32
MBM10480	★ 3680
	3483-63
MBM2147E	3481-92
MBM2147H	3481-60
MBM2147H-35	3481-32
MBM2147H-45	3481-45
MBM2148-45	3477-40
MBM2148-55	3477-50
MBM2148-55L	3477-51
MBM2149-45	3477-41
MBM2149-55L	3477-52
MBM2149-70	3477-71
MBM2149L-55	3477-53
MBM27128-25	★ 3674
	3467-19
MBM27128-30	★ 3674
	3467-23
MBM2716	3465-67
MBM2716H	3465-32
MBM2732A-20	3466-39
MBM2732A-25	3466-42
MBM2732A-30	3466-48
MBM2732A-30X	3466-49
MBM2732A-35	3466-53
MBM2764-20	★ 3674
	3466-84
MBM2764-25	★ 3674
	3466-91
MBM2764-30	★ 3674
	3466-99
MBM27C64-25	★ 3674
	3466-87
MBM27C64-30	★ 3674
	3466-96
MBM93419	3472-33

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

General Instrument

Device	Page-Line
ACF7092C	2962-20
ACF7301C	2962-21
ACF7302C	2962-22
AY-5-8136	2486-46
AY-5-8136T	2486-47
AY-5-8816	2486-48
AY-5-8816T	2486-49
AY3-1015D	2487-63
AY3-1270	2907-10
AY3-1350	2907-12
	¶ 273-4
AY3-4592	2468-15
AY3-8470	2902-6
AY3-8475	2902-7
AY3-8500	2906-26
	¶ 274-3
AY3-8500-1	2906-27
	¶ 274-3
AY3-8603	2906-28
AY3-8603-1	2906-29
AY3-8605	2906-30
AY3-8605-1	2906-31
AY3-8606	2906-32
AY3-8606-1	2906-33
AY3-8607-1	2906-34
AY3-8610	2906-35
AY3-8900	2906-36
AY3-8900-1	2906-37
AY3-8910	★ 1325
	2898-29
	2906-40
	★ 1325
	1101-87
AY3-8912	★ 1325
	2898-30
	2906-41
	★ 1325
	1101-88
AY3-8913	★ 1325
AY3-8915	2906-25
AY3-9400	2949-126
AY3-9410	2949-127
AY3-9900	2947-87
AY5-1016	2424-94
AY5-9151	2948-4
AY5-9153	2948-5
AY5-9154	2948-6
AY6-4016	2424-95
CK3300	2899-1
CP-1600	1079-2
CP1600	1089-1
ER0082	3455-17
ER1400	3455-18
	¶ 271-15
	¶ 284-15
	¶ 285-2
ER1451	3455-9
ER2051	3455-6
ER2055	3455-14
ER2810HR	3455-38
ER2810IR	3455-39
ER3400	3455-35
	¶ 284-14
ER5304	3475-23
ER5716	★ 3683
	3455-47
ER5816	3455-51
ER5816HR	3455-52
ER5901	★ 3687
	3455-21
ER5901HR	★ 3687
	3455-22
ER5916	3455-48
ER5916HR	3455-49
LA03	4141-132
LA05	4141-133
LA10	4141-134
LA15	4141-135
LA20	4141-136
PIC1650A	★ 1319
	1089-4
	¶ 246-16
	★ 1319
	1063-5
	¶ 246-16
PIC1654	★ 1319
	1089-5
	★ 1319
	1063-6
PIC1655A	★ 1319
	1089-6
	★ 1319
	1063-7
PIC1656	★ 1319
	1089-7
	★ 1319
	1063-8
PIC1670	★ 1309
	★ 1319
	1089-8
	★ 1309
	★ 1319
	1063-9
PIC1672	★ 1319
	1089-9
	★ 1319
	1063-10
PIC16C55	★ 1319
	1089-10
	★ 1319
	1063-11
RO3-2513	3453-7
RO3-5120	3484-27
RO3-9316A	3485-62
RO3-9316B	3485-39
RO3-9316C	3485-19
RO3-9332A	3486-24
RO3-9332B	3485-126
RO3-9332D	3485-70
RO3-9333B	3485-127
RO3-9333C	3485-101
RO3-9364B	3487-1
RO3-9364C	3486-78
RO3-9365B	3487-2
RO3-9365C	3486-68
RO3-9502	3485-65
	1089-2
RO3-9503	1089-3
RO3-9505	3486-28
SP-0250	2902-88
SP0200	2902-73
SP0230	2902-89
SP0232	★ 1324
SP0256	★ 1320
	★ 1324
	2902-80
SPB512	2902-75
SPB640	2902-76
SPR-128	3487-15
SPR-16	3484-107
SPR-32	3485-68
SPR000	★ 1324
	2902-79
TZ2001	2947-159
TZ2002	2947-160

Harris Semiconductor

Device	Page-Line
4905-5	★ 3284
76165	★ 3723
80C86	★ 669
	★ 1333
	1079-3
82C54	★ 669
	★ 1333
	★ 1335
82C55A	★ 669
	★ 1333
	★ 1336
82C59A	★ 669
	★ 1333
	★ 1337
82C82	★ 1333
	★ 1338
82C84A	★ 669
	★ 1333
	★ 1339
82C88	★ 669
	★ 1333
	★ 1340
8LC82	★ 669
HA-1600-2	2966-133
HA-1602-2	2966-134
HA-1605-5	2966-135
HA-1608	★ 3210
	★ 3287
	2967-2
HA-1610-2	2966-136
HA-1615-2	2966-137
HA-1615-5	2966-138
HA-1620	2966-68
HA-1625	2966-69
HA-2400	★ 3212
	★ 3287
	2888-32
	2928-48
	¶ 267-8
HA-2404	★ 3212
	★ 3287
	2888-33
	2928-49
HA-2405	★ 3212
	★ 3287
	2888-34
	2932-28
	¶ 267-8
HA-2420	★ 3214
	★ 3287
	2967-85
	¶ 265-6
HA-2425	★ 3214
	★ 3287
	2967-86
	¶ 265-6
HA-2500	★ 3216
	★ 3287
	2928-46
HA-2502	★ 3216
	★ 3287
	2932-22
HA-2505	★ 3216
	★ 3287
	2932-23
HA-2507	2933-17
HA-2510	★ 3218
	★ 3287
	2910-50
	2932-14
	¶ 264-14
HA-2512	★ 3218
	★ 3287
	2933-19
HA-2515	★ 3218
	★ 3287
	2933-26
HA-2517	2933-24
HA-2520	★ 3220
	★ 3287
	2910-30
	2932-16
	¶ 264-12
HA-2522	★ 3220
	★ 3287
	2933-21
HA-2525	★ 3220
	★ 3287
	2933-28
HA-2527	2933-32
HA-2530	2910-20
	2925-36
	¶ 267-9
HA-2535	2910-23
	2928-45
	¶ 267-9
HA-2539-2	★ 3222
	★ 3287
	2934-33
HA-2539-5	★ 3222
	★ 3287
	2934-32
HA-2540-2	★ 3224
	★ 3287
	2929-57
HA-2540-5	★ 3224
	★ 3287
	2934-31
HA-2600	★ 3226
	★ 3287
	2925-25
	¶ 264-14
	¶ 266-18
HA-2602	★ 3226
	★ 3287
	2927-56
HA-2605	★ 3226
	★ 3287
	2927-57
	¶ 266-18
HA-2607	2930-27
HA-2620	★ 3228
	★ 3287
	2910-4
	2925-53
	¶ 264-12
	¶ 264-13
	¶ 264-14
HA-2622	★ 3228
	★ 3287
	2928-4
HA-2625	★ 3228
	★ 3287
	2928-5
HA-2627	2930-29
HA-2630	★ 3230
	★ 3287
	2687-26
HA-2635	★ 3230
	★ 3287
	2887-27
HA-2640	★ 3232
	★ 3287
	2910-71
	2926-1
HA-2645	★ 3232
	★ 3287
	2910-72
	2930-33
HA-2650	★ 3234
	★ 3287
	2937-36
HA-2655	★ 3234
	★ 3287
	2938-35
HA-2700	2911-123
	2925-30
HA-2704	2911-124
	2925-31
HA-2705	2911-125
	2928-18
HA-2720	★ 3236
	2911-158
	2912-31
	2925-19
HA-2725	★ 3236
	2911-159
	2912-32
	2927-39
HA-2730	★ 3239
	★ 3287
	2912-58
	2937-24
HA-2735	★ 3239
	★ 3287
	2912-59
	2938-14
HA-2740	★ 3242
	★ 3287
	2941-42
HA-2740-2	★ 3242
	★ 3287
	2941-43
HA-2740-5	★ 3242
	★ 3287
	2942-26
HA-2900	2911-57
	2915-10
	¶ 267-10
HA-2904	2911-16
	2914-46
HA-2905	2915-40
HA-4156-2	★ 3244
	★ 3287
	2942-1
HA-4156-5	★ 3244
	★ 3287
	2942-37
HA-4600-2	★ 3246
	★ 3287
	2941-30
HA-4600-5	★ 3246
	★ 3287
	2941-31
HA-4602-2	★ 3246
	2941-33
HA-4605-5	★ 3246
	2942-9
HA-4620-2	★ 3248
	★ 3287
	2941-28
HA-4620-5	★ 3248
	★ 3287
	2941-29
HA-4622-2	★ 3248
	★ 3287
	2942-8
HA-4625-5	★ 3248
	★ 3287
	2942-13
HA-4741-2	★ 3250
	★ 3287
	2942-4
HA-4741-5	★ 3250
	★ 3287
	2942-42
HA-4900-2	★ 3284
	★ 3287
	2894-59
HA-4902-2	★ 3284
	★ 3287
	2895-9
HA-4905-5	★ 3284
	★ 3287
	2895-44
HA-4920	2894-58
HA-4925	2895-37
HA-4950	2891-17
HA-4955	2892-7
HA-5062-2	★ 3252
	★ 3287
	2930-16
HA-5062-5	★ 3252
	★ 3287
	2934-25
HA-5062A-5	★ 3252
	★ 3287
	2930-17
HA-5062B-5	★ 3252
	★ 3287
	2925-7
HA-5064-2	★ 3254
	★ 3287
	2943-8
HA-5064-5	★ 3254
	★ 3287
	2944-30
HA-5064A-5	★ 3254
	★ 3287
	2943-9
HA-5064B-5	★ 3254
	★ 3287
	2941-39
HA-5082-2	★ 3256
	★ 3287
	2930-21
HA-5082-5	★ 3256
	★ 3287
	2934-28
HA-5082A-5	★ 3256
	★ 3287
	2930-22
HA-5082B-5	★ 3256
	★ 3287
	2925-10
HA-5084-2	★ 3258
	★ 3287
	2942-22
HA-5084-5	★ 3258
	★ 3287
	2944-21
HA-5084A-5	★ 3258
	★ 3287
	2942-23
HA-5084B-5	★ 3258
	★ 3287
	2941-24
HA-5100-2	★ 3260
	★ 3287
	2918-25
HA-5100-5	★ 3260
	★ 3287
	2918-26
HA-5105-5	★ 3260
	★ 3287
	2921-1
HA-5110-2	★ 3262
	★ 3287
	2918-24
HA-5110-5	★ 3262
	★ 3287
	2918-27
HA-5115-5	★ 3262
	★ 3287
	2921-2
HA-5130-2	★ 3264
	★ 3287
	2914-20
HA-5130-5	★ 3264
	★ 3287
	2911-58
	2914-22
HA-5135-2	★ 3264
	★ 3287
	2914-21
HA-5135-5	★ 3264
	★ 3287
	2911-59
	2914-23
HA-5141	★ 3266
	2931-23
HA-5142	★ 3266
	2940-9
HA-5142A	★ 3266
	2939-27
HA-5144	★ 3266
	2943-53
HA-5144A	★ 3266
	2943-23
HA-514A	2930-35
HA-5150	2923-11
HA-5160-2	★ 3268
	★ 3287
	2924-49
HA-5160-5	★ 3268
	★ 3287
	2924-50
HA-5162-5	★ 3268
	★ 3287
	2934-17
HA-5170-2	★ 3270
	★ 3287
	2918-7
HA-5170-5	★ 3270
	★ 3287
	2918-30
HA-5180-2	★ 3272
	★ 3287
	2925-13
HA-5180-5	★ 3272
	★ 3287
	2925-14
HA-5180A-2	★ 3272
	★ 3287
	2918-40
HA-5180A-5	★ 3272
	★ 3287
	2918-41
HA-5190	★ 3275
	★ 3287
	★ 3289
	2910-26
	2929-45
	¶ 266-4
	¶ 269-2
HA-5195	★ 3275
	★ 3287
	★ 3290
	2910-27
	2929-53
	¶ 266-4
	¶ 269-2
HA-5310	2967-87
HA-5315	2967-88
HA-5320-2	★ 3277
	★ 3287
	2967-89
HA-5320-5	★ 3277
	★ 3287
	2967-90
HA-8023-2	★ 3282
	★ 3287
	2940-57
HA-8023-5	★ 3282
	★ 3287
	2941-6
HA-909	2928-52
	¶ 266-5
	¶ 266-6

Arranged alphanumerically from left to right.

© IC MASTER 1983

Harris Semiconductor (Cont'd)

Device	Page-Line
HA-911	2931-17
	¶ 266-5
	¶ 266-6
HA107	★ **3287**
HA5102	★ **3287**
HA5104	★ **3287**
HA5112	★ **3287**
HA5114	★ **3287**
HB61000-1	1767-3
	¶ 250-14
HC5116A	★ **2737**
	2947-86
HC5117A	★ **2737**
	2947-88
HC5156A	★ **2737**
	2947-43
HC5501	2949-31
HC5502	★ **2735**
	★ **3287**
HC5504	★ **2736**
HC5510	★ **3287**
HC5511	★ **3287**
HC5512	★ **2738**
	★ **3287**
	2948-71
HC5512A	★ **2738**
	★ **3287**
	2948-72
HC5541	★ **2740**
	2949-125
HC55516-2	★ **2739**
	★ **3287**
	2947-144
	¶ 270-3
HC55516-8	★ **2739**
	★ **3287**
	2947-145
	¶ 270-3
HC55516-9	★ **2739**
	★ **3287**
	2947-146
	¶ 270-3
HC55532-2	2947-147
	¶ 270-3
HC55532-8	2947-148
	¶ 270-3
HC55532-9	2947-149
	¶ 270-3
HC55536	2947-150
HD0165	★ **2733**
	★ **3287**
	2468-4
	¶ 269-13
HD115530	★ **1333**
HD15530-2	★ **669**
	★ **688**
	★ **1333**
	464-19
	★ **669**
	★ **688**
	★ **1333**
	2486-87
HD15530-9	★ **669**
	★ **688**
	★ **1333**
	464-20
	★ **669**
	★ **688**
	★ **1333**
	2486-88
HD15531-2	★ **669**
	★ **693**
	★ **1333**
	464-21
	★ **669**
	★ **693**
	★ **1333**
	2486-89
HD15531-9	★ **669**
	★ **693**
	★ **1333**
	464-22
	★ **669**
	★ **693**
	★ **1333**
	2486-90
HD15531A	★ **669**
	★ **693**
	★ **1333**
	2486-91
HD15531B	★ **695**
HD4702-2	★ **669**
	★ **1333**
	464-15
	★ **669**
	★ **1333**
	2486-30
	★ **669**
	★ **1333**
	1085-43
HD4702-9	★ **669**
	★ **1333**
	464-16
	★ **669**
	★ **1333**
	2486-31
	★ **669**
	★ **1333**
	1085-44
HD4702A-2	★ **669**
	★ **1333**
	1085-45
HD4702A-9	★ **669**
	★ **1333**
	1085-46
HD6101-2	1099-23
HD6101-9	1099-24
HD6101C-9	1099-25
HD6120	★ **669**
	★ **1333**
	★ **1341**
	1077-10
HD6121	★ **669**
	★ **1333**
	★ **1342**
HD6402-2	★ **669**
	★ **672**
	★ **1333**
	2487-42
	★ **669**
	★ **672**
	★ **1333**
	1099-31
HD6402-9	★ **669**
	★ **672**
	★ **1333**
	2487-43
	★ **669**
	★ **672**
	★ **1333**
	1099-32
HD6402A-2	★ **669**
	★ **672**
	★ **1333**
	2487-52
HD6402A-9	★ **669**
	★ **672**
	★ **1333**
	2487-53
HD6402C-9	★ **669**
	★ **672**
	★ **1333**
	2487-39
	★ **669**
	★ **672**
	★ **1333**
	1099-33
HD6403A-2	2487-56
HD6403A-9	2487-57
HD6408	★ **669**
	★ **675**
	★ **1333**
	2486-17
HD6408-9	★ **669**
	★ **675**
	★ **1333**
	464-12
HD6409	★ **669**
	★ **680**
	★ **1333**
	464-68
HD6409-2	★ **669**
	★ **680**
	★ **1333**
	2486-84
HD6409-9	★ **669**
	★ **680**
	★ **1333**
	2486-85
HD6431-2	★ **1343**
	454-171
	★ **1343**
	1099-10
HD6431-9	★ **1343**
	454-172
	★ **1343**
	1099-11
HD6431A-2	★ **1343**
	454-173
HD6431A-9	★ **1343**
	454-174
HD6432-2	★ **1343**
	454-169
	★ **1343**
	1099-8
HD6432-9	★ **1343**
	454-170
	★ **1343**
	1099-9
HD6433-2	★ **1343**
	454-175
	★ **1343**
	1099-16
HD6433-9	★ **1343**
	454-176
	★ **1343**
	1099-17
HD6434-2	★ **1344**
	1099-14
HD6434-9	★ **1344**
	1099-15
HD6435-2	1099-12
HD6435-9	1099-13
HD6436-2	★ **1344**
	1099-45
HD6436-9	★ **1344**
	1099-46
HD6440-2	★ **1344**
	455-79
	★ **1344**
	1099-47
HD6440-9	★ **1344**
	455-80
	★ **1344**
	1099-48
HD6495-2	★ **1344**
	455-77
	★ **1344**
	1099-43
HD6495-9	★ **1344**
	455-78
	★ **1344**
	1099-44
HD64XX	★ **669**
	★ **1333**
HD6600-2	★ **3745**
	507-116
HD6600-5	★ **3745**
	507-117
HD82C82	1098-51
HD82C86	1098-40
HELP	★ **3749**
HI1800A	★ **2640**
HI1800A-5	2420-31
HI1818A	★ **2646**
HI1818A-2	★ **3288**
	2424-15
HI1818A-5	★ **3288**
	2424-16
HI1828A	★ **2646**
HI1828A-2	2423-49
HI1828A-5	2423-50
HI1840-2	2425-27
HI1840-5	2425-20
HI200-2	★ **2624**
	★ **3287**
	2415-59
HI200-5	★ **2624**
	★ **3287**
	2415-76
HI201-2	★ **2626**
	★ **3287**
	2416-117
HI201-5	★ **2626**
	★ **3287**
	2417-14
HI201HS	★ **2628**
HI201HS-2	★ **2626**
	★ **3287**
	2416-102
HI201HS-5	★ **2626**
	★ **3287**
	2416-103
HI300	★ **2630**
	★ **3287**
	2415-30
HI301	★ **2630**
	★ **3287**
	2418-4
HI302	★ **2630**
	★ **3288**
	2420-35
HI303	★ **2630**
	★ **3288**
	2419-13
HI304	★ **2630**
	★ **3287**
	2415-31
HI305	★ **2630**
	★ **3287**
	2418-5
HI306	★ **2630**
	★ **3288**
	2420-36
HI307	★ **2630**
	★ **3288**
	2419-14
HI381	★ **2635**
	★ **3288**
	2415-32
HI384	★ **2635**
	★ **3288**
	2420-37
HI387	★ **2635**
	★ **3288**
	2418-6
HI390	★ **2635**
	★ **3288**
	2419-15
HI400	2415-33
HI401	2416-64
HI5040-2	★ **2643**
	★ **3288**
	2415-5
HI5040-5	★ **2643**
	★ **3288**
	2415-6
HI5041-2	★ **2643**
	2415-68
HI5041-5	★ **2643**
	2415-69
HI5042-2	★ **2643**
	2418-31
HI5042-5	★ **2643**
	2418-32
HI5043-2	★ **2643**
	★ **3288**
	2419-42
HI5043-5	★ **2643**
	★ **3288**
	2419-43
HI5044-2	★ **2643**
	2420-21
HI5044-5	★ **2643**
	2420-22
HI5045-2	★ **2643**
	★ **3288**
	2420-59
HI5045-5	★ **2643**
	★ **3288**
	2420-60
HI5046-2	★ **2643**
	2421-31
HI5046-5	★ **2643**
	2421-32
HI5046A-2	★ **2643**
	2421-28
HI5046A-5	★ **2643**
	2421-29
HI5047-2	★ **2643**
	2421-75
HI5047-5	★ **2643**
	2421-76
HI5047A-2	★ **2643**
	2421-72
HI5047A-5	★ **2643**
	2421-73
HI5048-2	★ **2643**
	2415-52
HI5048-5	★ **2643**
	2415-53
HI5049-2	★ **2643**
	2420-53
HI5049-5	★ **2643**
	2420-54
HI5050-2	★ **2643**
	2418-25
HI5050-5	★ **2643**
	2418-26
HI5051-2	★ **2643**
	★ **3288**
	2419-34
HI5051-5	★ **2643**
	★ **3288**
	2419-35
HI506-2	★ **2650**
	★ **3288**
	2425-7
HI506-5	★ **2650**
	★ **3288**
	2425-8
HI506A	★ **2652**
HI506A-2	★ **2650**
	★ **3288**
	2425-24
HI506A-5	★ **2650**
	★ **3288**
	2425-26
HI507-2	★ **2650**
	★ **3288**
	2424-67
HI507-5	★ **2650**
	★ **3288**
	2424-68
HI507A	★ **2652**
HI507A-2	★ **2650**
	★ **3288**
	2424-87
HI507A-5	★ **2650**
	★ **3288**
	2424-89
HI508-2	★ **2654**
	★ **3288**
	2424-3
HI508-5	★ **2654**
	★ **3288**
	2424-4
HI508A	★ **2656**
HI508A-2	★ **2654**
	★ **3288**
	2424-29
HI508A-5	★ **2654**
	★ **3288**
	2424-31
HI509-2	★ **2654**
	★ **3288**
	2423-41
HI509-5	★ **2654**
	★ **3288**
	2423-42
HI509A	★ **2656**
HI509A-2	★ **2654**
	★ **3288**
	2423-66
HI509A-5	★ **2654**
	★ **3288**
	2423-67
HI516-2	★ **2663**
	★ **3288**
	2425-14
HI516-5	★ **2663**
	★ **3288**
	2425-15
HI518-2	★ **2666**
	★ **3288**
	2424-79
HI518-5	★ **2666**
	★ **3288**
	2424-80
HI524-2	★ **2669**
	★ **3288**
	2423-75
HI524-5	★ **2669**
	★ **3288**
	2423-76
HI529	2423-11
HI539-2	★ **2674**
	★ **3288**
	2423-12
HI539-5	★ **2674**
	★ **3288**
	2423-13
HI5607-2	2439-43
HI5607-5	2439-44
HI5607-8	2439-45
HI5608-2	2439-46
	¶ 254-8
HI5608-5	2440-1
	¶ 254-8
HI5608-8	2440-2
	¶ 254-8
HI5609-2	2439-40
HI5609-5	2439-41
HI5609-8	2439-42
HI5610-2	★ **2683**
	★ **3288**
	2445-6
	¶ 254-8
HI5610-4	★ **2683**
	★ **3288**
	2445-7
	¶ 254-8
HI5610-5	★ **2683**
	★ **3288**
	2445-8
	¶ 254-8
HI5610-8	★ **2683**
	★ **3288**
	2445-9
	¶ 254-8
HI5612-2	2451-22
HI5612-4	2451-23
HI5612-5	2451-24
HI5612-8	2451-25
HI5618A	★ **2686**
HI5618A-2	★ **2686**
	★ **3288**
	2440-19
HI5618A-5	★ **2686**
	★ **3288**
	2440-20
HI5618B-2	★ **2686**
	★ **3288**
	2441-22
HI5618B-5	★ **2686**
	★ **3288**
	2441-23
HI562A	★ **2677**
HI562A-2	★ **3288**
	2450-31
	¶ 254-8
HI562A-4	★ **3288**
	2453-3
	¶ 254-8
HI562A-5	★ **3288**
	2453-4
	¶ 254-8
HI562A-8	★ **3288**
	2450-32
	¶ 254-8
HI565A	★ **2680**
HI565AJ	2453-15
HI565AK	2450-36
HI565AS	2453-16
HI565AT	2450-37
HI5660	★ **2730**
	2452-27
HI5680I-5	★ **2689**
	2451-47
HI5680V-5	★ **2689**
	2455-4
HI5685I-4	★ **2695**
	2452-1
HI5685V-4	★ **2696**
	2455-5
HI5687I-2	★ **2700**
	2452-2
HI5687V-2	★ **2700**
	2455-6
HI5712-2	★ **2704**
	★ **3288**
	★ **3291**
	2432-27
HI5712-5	★ **2704**
	★ **3288**
	★ **3291**
	2432-28
HI5712-7	★ **2704**
	★ **3288**
	★ **3291**
	2432-29

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Harris Semiconductor (Cont'd)

Device	Page-Line
HI5712-8	★ 2704
	★ 3288
	★ 3291
	2432-30
HI5712A	★ 2704
HI5712A-2	★ 2704
	★ 3288
	★ 3291
	2432-31
HI5712A-7	★ 2704
	★ 3288
	★ 3291
	2432-32
HI5712A-8	★ 2704
	★ 3288
	★ 3291
	2432-33
HI574A	★ 2712
	2433-48
HI5812	2434-5
HI5900-2	★ 2713
	★ 3288
	★ 3291
	2963-10
HI5900-5	★ 2713
	★ 3288
	★ 3291
	2963-11
HI5901	★ 2715
	★ 3288
	★ 3291
	2963-12
HI7541J	★ 2731
	★ 3288
	2453-47
HI7541K	★ 2731
	★ 3288
	2450-39
HI7541S	★ 2731
	★ 3288
	2453-48
HI7541T	★ 2731
	★ 3288
	2450-40
HIDAC16B	★ 2722
	2461-15
HIDAC16C	★ 2722
	2461-24
HIDAC801	2452-28
HIDAC80I	★ 2717
HM0104	★ 3742
	511-113
HM0168	★ 3742
	511-109
HM0186	★ 3742
	511-110
HM0198	★ 3742
	511-111
HM0410	★ 3742
	511-108
HM5-6564-2	★ 3779
	3483-58
	3483-104
HM5-6564-5	★ 3779
	3483-61
	3483-107
HM5-6564-8	★ 3779
	3483-59
	3483-105
HM5-6564-9	★ 3779
	3483-60
	3483-106
HM6100	1077-11
	¶ 242-14
	¶ 242-15
	¶ 247-12
HM6100-2	1099-1
	¶ 242-14
	¶ 242-15
	¶ 247-12
HM6100C-9	1099-2
	¶ 242-14
	¶ 242-15
	¶ 247-12
HM6116-2	★ 669
	★ 1333
	★ 3777
	3480-14
HM6322-2	3484-99
HM6322-9	3484-98
HM6322C-9	3484-100
HM6503-5	3479-113
HM6503-9	3479-111
HM6504-2	★ 669
	★ 1333
	★ 3762
	3482-54
HM6504-5	★ 669
	★ 1333
	★ 3762
	3482-85
HM6504-9	★ 669
	★ 1333
	★ 3762
	3482-55
HM6504B-2	★ 669
	★ 1333
	★ 3762
	3482-12
HM6504B-9	★ 669
	★ 1333
	★ 3762
	3482-13
HM6504C-9	★ 669
	★ 1333
	★ 3762
	3482-56
HM6505-2	3482-57
	¶ 287-1
HM6505-5	3482-86
	¶ 287-1
HM6505-9	3482-58
	¶ 287-1
HM6505B-2	3482-14
	¶ 287-1
HM6505B-9	3482-15
	¶ 287-1
HM6508	★ 669
	★ 1333
	★ 3754
	460-148
HM6508-2	★ 669
	★ 1333
	★ 3754
	3476-41
HM6508-5	★ 669
	★ 1333
	★ 3754
	3476-69
HM6508-9	★ 669
	★ 1333
	★ 3754
	3476-42
HM6508B-2	★ 669
	★ 1333
	★ 3754
	3476-23
HM6508B-9	★ 669
	★ 1333
	★ 3754
	3476-24
HM6508B9	★ 3755
HM6508BZ	★ 3755
HM6512-2	3472-40
	3472-40
HM6512-9	3472-41
	3472-41
HM6512C-9	3472-39
	3472-39
HM6513-5	3475-21
HM6513-9	3475-19
HM6514-2	★ 1333
	★ 3767
	3478-66
HM6514-5	★ 1333
	★ 3767
	3479-4
HM6514-9	★ 1333
	★ 3767
	3478-67
HM6514B-2	★ 1333
	★ 3767
	3478-1
HM6514B-9	★ 1333
	★ 3767
	3478-2
HM6514C-9	★ 1333
	★ 3767
	3478-68
HM6515-9	3479-103
HM65161-5	★ 669
	★ 1333
	★ 3774
	3479-116
HM65161B-5	★ 669
	★ 1333
	★ 3774
	3479-115
HM6516B-2	★ 669
	★ 1333
	★ 3772
	3480-28
HM6516B-9	★ 669
	★ 1333
	★ 3772
	3480-29
HM6518	★ 669
	★ 1333
	★ 3756
	460-149
HM6518-2	★ 669
	★ 1333
	★ 3756
	3476-48
HM6518-5	★ 669
	★ 1333
	★ 3756
	3476-72
HM6518-9	★ 669
	★ 1333
	★ 3756
	3476-49
HM6518B-2	★ 669
	★ 1333
	★ 3756
	3476-28
HM6518B-9	★ 669
	★ 1333
	★ 3756
	3476-29
HM6551	★ 669
	★ 1333
	★ 3758
	460-166
HM6551-2	★ 669
	★ 1333
	★ 3758
	3474-33
HM6551-5	★ 669
	★ 1333
	★ 3758
	3474-58
HM6551-9	★ 669
	★ 1333
	★ 3758
	3474-34
HM6551B-2	★ 669
	★ 1333
	★ 3758
	3474-1
HM6551B-9	★ 669
	★ 1333
	★ 3758
	3474-2
HM6561	★ 669
	★ 1333
	★ 3760
	460-167
HM6561-2	★ 669
	★ 1333
	★ 3760
	3474-28
HM6561-5	★ 669
	★ 1333
	★ 3760
	3474-56
HM6561-9	★ 669
	★ 1333
	★ 3760
	3474-29
HM6561B-2	★ 669
	★ 1333
	★ 3760
	3473-109
HM6561B-9	★ 669
	★ 1333
	★ 3760
	3473-110
HM6562	460-168
HM6562-2	3474-26
HM6562-5	3474-55
HM6562-9	3474-27
HM6562B-2	3473-107
HM6562B-9	3473-108
HM6564	★ 669
HM6611	460-137
HM6611-2	3460-12
HM6611-9	3460-13
HM6616-2	★ 669
	★ 1333
	★ 3786
	3464-121
HM6616-9	★ 669
	★ 1333
	★ 3786
	3464-122
HM6641	★ 669
	★ 1333
	★ 3783
	460-110
	¶ 286-2
HM6641-2	★ 669
	★ 1333
	★ 3783
	3461-91
	¶ 286-2
HM6641-9	★ 669
	★ 1333
	★ 3783
	3461-92
	¶ 286-2
HM6646	3466-11
HM6661	3460-14
HM6661-5	3460-15
HM6716-2	3465-33
HM6716-9	3465-34
HM6758-9	3463-69
HM7602-2	★ 3693
	3459-33
HM7602-5	★ 3693
	3459-22
HM7603-2	★ 3693
	3459-40
HM7603-5	★ 3693
	3459-26
HM7608-2	3463-49
HM7608-5	3463-5
HM7610-2	★ 3696
	3459-118
HM7610-5	★ 3696
	3459-100
HM7610A-2	★ 3696
	3459-101
HM7610A-5	★ 3696
	3459-73
HM7611-2	★ 3696
	3460-5
HM7611-5	★ 3696
	3459-108
HM7611A-2	★ 3696
	3459-109
HM7611A-5	★ 3696
	3459-75
HM7616-2	★ 3720
	3464-118
HM7616-5	★ 3720
	3464-109
HM76160-2	3464-117
HM76160-5	3464-107
HM76161-2	★ 3717
	3464-119
HM76161-5	★ 3717
	3464-110
HM76161A-5	★ 3717
	3464-75
HM76165-2	3466-10
HM76165-5	3466-6
HM7616A	★ 3720
	3464-76
HM7620-2	★ 3699
	3460-100
HM7620-5	★ 3699
	3460-86
HM7620A-2	★ 3699
	3460-72
HM7620A-5	★ 3699
	3460-47
HM7621-2	★ 3699
	3460-102
HM7621-5	★ 3699
	3460-88
HM7621A-2	★ 3699
	3460-78
HM7621A-5	★ 3699
	3460-49
HM76321-2	★ 3726
	3466-27
HM76321-5	★ 3726
	3466-23
HM7640-2	★ 3702
	3461-81
HM7640-5	★ 3702
	3461-58
HM7640A-2	★ 3702
	3461-59
HM7640A-5	★ 3702
	3461-17
HM7641-2	★ 3702
	3461-85
HM7641-5	★ 3702
	3461-66
HM7641A-2	★ 3702
	3461-67
HM7641A-5	★ 3702
	3461-18
HM7642-2	★ 3705
HM7642-5	★ 3705
	3462-16
	3462-16
HM7642A-2	★ 3705
HM7642A-5	★ 3705
	3462-3
	3462-3
HM7642P-2	★ 3705
HM7642P-5	★ 3705
	3462-4
	3462-4
HM7643-2	★ 3705
HM7643-5	★ 3705
HM7643A-2	★ 3705
HM7643A-5	★ 3705
	3462-5
	3462-5
HM7643P-2	★ 3705
HM7643P-5	★ 3705
	3462-6
	3462-6
HM7644-5	3462-15
	3462-15
HM7647R-2	3461-78
HM7647R-5	3461-43
HM7648-2	3461-73
HM7648-5	3461-30
HM7649-2	★ 3708
	3461-76
HM7649-5	★ 3708
	3461-34
HM7649A-2	★ 3708
	3461-26
HM7649A-5	★ 3708
	3461-11
HM76641-2	★ 3729
	3466-80
HM76641-5	★ 3729
	3466-79
HM7680-2	3463-41
HM7680-5	3462-113
HM7680A-5	3462-80
HM7680P-2	3463-42
HM7680P-5	3462-114
HM7680R-2	3463-43
HM7680R-5	3462-115
HM7680RP-2	3463-44
HM7680RP-5	3462-116
HM7681-2	★ 3711
	3463-50
HM7681-5	★ 3711
	3463-6
HM7681A-2	★ 3711
	3463-7
HM7681A-5	★ 3711
	3462-83
HM7681P-2	★ 3711
	3463-51
HM7681P-5	★ 3711
	3463-8
HM7681R-2	★ 3711
	3463-52
HM7681R-5	★ 3711
	3463-9
HM7681RP-2	★ 3711
	3463-53
HM7681RP-5	★ 3711
	3463-10
HM7684-2	3464-30
HM7684-5	3464-10
HM7684P-2	3464-31
HM7684P-5	3464-11
HM7685-2	★ 3714
	3464-32
HM7685-5	★ 3714
	3464-14
HM7685A-5	★ 3714
	3463-111
HM7685P-2	★ 3714
	3464-33
HM7685P-5	★ 3714
	3464-15
HM76LS03-5	3460-41
HM92560	★ 669
	★ 3782
HMI7602	★ 3740
HMI7603	★ 3740
HMI7610	★ 3740
HMI7611	★ 3740
HMI76161	★ 3740
HMI76165	★ 3740
HMI7620	★ 3740
HMI7621	★ 3740
HMI76321	★ 3740
HMI7640	★ 3740
HMI7641	★ 3740
HMI7642	★ 3740
HMI7643	★ 3740
HMI76641	★ 3740
HMI7681	★ 3740
HMI7685	★ 3740
HPL77153	★ 3747
	★ 3750
HPL77161	★ 3747
HPL77171	★ 3747
HPL77209/16L8	★ 3747
	★ 3750
HPL77210/16R4	★ 3747
HPL77211/16R6	★ 3747
HPL77215/16H8	★ 3747
	★ 3750
HPL77216/16P8	★ 3747
	★ 3750
HPL77317/16LD8	★ 3747
HPL77318/16HD8	★ 3747
HPL77800	★ 3747
HPL77801	★ 3747
HPL77903	★ 3747
HPROM0512	★ 3740
HS15530RH	2486-86
HS1840RH	2425-28
HS3182	2472-27
HS3273	2486-60
HS3282	2486-7
HS3511RH	2924-37
HS3530RH	2924-36
HS3546RH	2924-34
HS3604	2900-84
HS3819	2906-22
HS4602RH	2941-32
HS508ARH	2424-30
HS6504RH	3482-11
HS6508RH	3476-65
HS6514RH	3478-3
HS6551RH	3474-9
HS6564RH	3483-56
HV1000	★ 2741
	★ 3288
	2964-61
HV1005	★ 2741
	★ 3288
	2964-62
HV1010	★ 2741
	★ 3288
	2964-63
JAN-0512	3459-58
JAN0512	★ 3735
JAN38510/201	3459-59
JAN38510/207	3459-46
JAN38510/208	3461-86
JAN38510/301	3460-1
JAN38510/302	3460-6
JAN38510/401	3460-101
JAN38510/402	3460-103
LF155	★ 3286
	★ 3288

Arranged alphanumerically from left to right.

© IC MASTER 1983

Harris Semiconductor (Cont'd)

Device	Page-Line
LF156	★ 3286
	★ 3288
	2927-12
LF156A	★ 3286
	★ 3288
	2922-12
LF157	★ 3286
	★ 3288
	2926-55
LF157A	★ 3286
	★ 3288
	2921-47
LF347	★ 3286
	★ 3288
LF355	★ 3288
LF356	★ 3288
	2932-50
LF356A	★ 3288
	2922-13
LF357	★ 3288
	2932-38
LF357A	★ 3288
	2921-48
LH0002	2887-14
LH0002C	2887-15
LM101A	2909-19
	2923-58
LM107	2923-40
LM108	★ 3286
	★ 3288
	2911-143
	2922-56
LM108A	★ 3286
	★ 3288
	2918-48
LM118	★ 3286
	★ 3288
	2910-51
	2926-9
LM143	★ 3286
	★ 3288
	2910-73
LM1458	★ 3286
	★ 3288
LM146	★ 3286
	★ 3288
LM148	★ 3286
	★ 3288
	2942-29
LM1558	★ 3286
	★ 3288
LM2908	★ 3288
LM301A	2931-52
LM307	2931-42
LM308	★ 3286
	★ 3288
	2931-33
LM308A	★ 3286
	★ 3288
	2919-20
LM318	★ 3286
	★ 3288
	2910-52
	2933-39
LM343	★ 3286
	★ 3288
LM346	★ 3286
	★ 3288
LM348	★ 3286
	★ 3288
	2943-28
LM4250	★ 3286
	★ 3288
	2912-1
	2912-46
LM4250C	★ 3286
	★ 3288
	2911-160
	2912-33
	2927-41
OP-07	★ 3286
	★ 3288

Hilevel Technology

Device	Page-Line
DP9445	1623-3
DS1610	1623-4
DS1910	1623
DS270	★ 1719
	1623-1
DS570	★ 1719
	1623-2

Hitachi America, Ltd.

Device	Page-Line
10414	3472-71
	3472-71
10414-1	3472-68
	3472-68
H4701B	3491-112
HA1108	2903-14
HA11211	2900-116
HA11215	2905-122
HA11219	2901-90
HA11220	2905-123
HA11221	2905-124
HA11223	2901-102
HA11225	2901-26
HA11226	2896-46
HA11227	2901-103
HA11229	2904-159
HA11235	2904-67
HA11238	2905-125
HA1124	2904-160
HA11244	2904-68
HA11247	2903-94
HA1125	2904-161
HA11251	2900-117
HA1126	2903-15
HA1137	2901-27
HA11405	2905-126
HA11409	2899-77
	2904-45
HA11412	2903-95
HA11417	2903-96
HA1151	2900-59
HA1156	2901-104
HA11580	2903-97
HA11701	2902-151
HA11702	2903-4
HA11703	2902-148
HA11704	2902-139
HA11705	2902-140
HA11706	2902-141
HA11707	2903-5
HA1196	2901-105
HA1197	2900-60
HA1199	2900-61
HA12001	2902-115
HA12002	2906-110
HA12005	2902-117
HA12006	2902-104
HA1201	2901-3
HA12010	2463-29
HA12011	2463-30
HA12012	2897-186
HA12017	2897-144
HA1211	2901-4
HA12402	2900-118
HA12404	2900-113
HA12405	2900-114
HA12411	2901-28
HA1319	2896-15
HA1325	2896-78
HA1329	2896-79
HA1361	2896-16
HA1364	2904-162
HA1366	2897-8
HA1368	2897-9
HA1371	2897-10
HA1372	2897-11
HA1374	2897-91
HA1377	2897-109
HA1388	2896-141
HA1389	2897-12
HA1392	2896-142
HA1406	2897-145
HA1452W	2897-187
HA1457	2897-146
HA17741	2930-46
HA17805P	2952-101
HA17806P	2953-39
HA17808	2953-85
HA17812P	2954-85
HA17815P	2955-42
HA17818P	2955-86
HA17824P	2956-62
HA17902	2913-20
HA1902	2485-31
HC42022	2899-104
HC42030	2899-105
HC43032	2899-106
HC43802	2899-107
HC43803	2899-108
HC43850	2899-94
HD10101	468-53
HD10102	468-25
HD10104	467-129
HD10105	468-45
HD10106	468-19
HD10107	468-91
HD10109	468-37
HD10110	467-141
HD10111	468-5
HD10117	468-72
HD10118	468-60
HD10119	468-66
HD10121	468-79
HD10130	468-98
HD10131	467-100
HD10132	468-112
HD10133	468-124
HD10134	468-106
HD10136	467-47
HD10145	468-154
	3470-91
HD10147	468-163
HD10148	468-158
HD10161	467-71
HD10162	467-63
HD10175	468-137
HD10179	467-3
HD10180	467-11
HD10181	467-24
HD10209	468-38
HD10230	468-99
HD10231	467-101
HD103461	2485-60
HD14001B	458-153
HD14002B	458-89
HD14006B	463-138
HD14007B	450-147
HD14008B	449-33
HD14009B	450-1
HD14010B	450-37
HD14011B	457-90
HD14012B	457-15
HD14013B	455-90
HD14014B	463-115
HD14015B	462-116
	3489-92
HD14016B	2417-54
HD14017B	452-80
HD14018B	453-115
HD14020B	452-16
HD14021B	463-46
	3490-75
HD14022B	453-150
HD14023B	457-49
HD14024B	451-153
HD14025B	458-120
HD14027B	456-101
HD14028B	453-163
HD14032B	449-16
HD14034B	463-65
	3490-41
HD14035B	463-24
	3489-57
HD14038B	449-4
HD14040B	451-181
HD14042B	459-107
HD14043B	459-148
HD14044B	459-129
HD14046B	464-49
HD14049B	450-17
HD14050B	450-52
HD14051B	2423-92
HD14052B	2423-24
HD14053B	2419-99
HD14066B	2417-39
HD14068B	457-134
HD14069B	450-177
HD14070B	459-10
HD14071B	458-46
HD14072B	458-12
HD14073B	456-155
HD14075B	458-26
HD14076B	455-124
HD14077B	459-48
HD14078B	458-193
HD14081B	456-178
HD14082B	456-140
HD14093B	464-149
HD14094B	463-80
HD14099B	460-45
HD14160	452-134
HD14161B	451-50
HD14162B	452-106
HD14163B	451-26
HD14174B	455-165
HD14175B	455-148
HD14194B	462-149
HD14501	459-66
HD14502B	449-158
HD14503B	450-94
HD14506B	457-185
HD14508B	459-88
HD14510B	452-162
HD14511B	455-48
	2464-27
HD14512	461-144
HD14514B	454-118
HD14515B	454-119
HD14516B	451-82
HD14517B	462-136
HD14518B	453-22
HD14519	461-128
HD14519B	457-167
HD14520B	451-127
HD14522B	453-7
HD14526B	451-118
HD14527B	464-96
HD14528B	462-29
HD14531B	466-25
HD14532B	466-3
HD14533B	453-48
HD14534B	453-84
HD14536B	462-72
HD14537	460-116
HD14539B	461-81
HD14541B	462-69
HD14543B	455-11
HD14549B	464-74
HD14555B	454-29
HD14557B	463-177
HD14558B	454-21
HD14559B	464-69
HD14566B	453-105
HD14568B	453-110
HD14569B	453-151
HD14572	459-69
HD14580B	460-77
HD14581B	449-60
HD14582B	449-72
HD14583B	464-112
HD14584B	465-21
HD14585B	449-85
HD146818	★ 1345
HD26501	1092-16
HD268T26	508-12
	2477-12
HD2904	2469-24
HD2905	2473-20
HD2912	2483-39
HD2915	2473-19
HD2916	2483-40
HD2919	2481-42
HD2922	2483-17
HD38510	2898-79
HD38513	2898-80
HD38546	2898-81
HD38550	2898-82
HD38560	2898-83
HD38570	2898-84
HD38580	2898-85
HD38585	2898-86
HD38980	2898-136
HD38991C	2898-137
HD43115	2898-138
HD43890	2898-139
HD44007	2903-39
HD44010	2899-29
HD4470	1087-117
	1051-7
HD44790	1087-118
	1051-8
HD46508	★ 1345
HD46508-1	★ 1345
HD46508A	★ 1345
HD46508A-1	★ 1345
HD6301	1063-31
HD6301V0	★ 1345
HD6303	★ 1345
	1091-105
	★ 1345
	1063-32
HD6333	★ 1345
	1063-33
HD63A01V0	★ 1345
HD63A03	★ 1345
HD63A33	★ 1345
HD63B01V0	★ 1345
HD63B03	★ 1345
HD63B33	★ 1345
HD63L05	★ 1345
	1063-34
HD6800	★ 1345
	1091-140
	★ 1345
	1063-35
HD68000	1100-19
HD68000-10	★ 1345
	1100-20
HD68000-4	★ 1345
	1100-21
HD68000-6	★ 1345
	1100-22
HD68000-8	★ 1345
	1100-23
HD68000R-10	1079-4
HD68000R-4	1079-5
HD68000R-6	1079-6
HD68000R-8	1079-7
HD6801	1091-75
	1065-1
HD6801S0	★ 1345
HD6801S5	★ 1345
HD6801V0	★ 1345
HD6801V5	★ 1345
HD6802	★ 1345
	1091-106
	★ 1345
	1065-2
HD6802V	★ 1345
HD6803	★ 1345
	1091-62
	★ 1345
	1065-3
HD6803-1	★ 1345
HD6805	1091-76
	1065-4
HD6805S1	★ 1345
HD6805U1	★ 1345
HD6805V1	★ 1345
HD6805W0	★ 1345
HD6805X0	★ 1345
HD6808	1091-129
	1065-5
HD6809	★ 1345
	1091-119
	★ 1345
	1065-6
HD6809E	★ 1345
	1065-7
HD6821	★ 1345
	1092-87
HD6840	★ 1345
	1092-108
HD6843	★ 1345
	1092-57
HD6844	★ 1345
	1092-43
HD6845	★ 1345
	1092-26
HD68450	★ 1345
	1100-36
HD6846	★ 1345
HD6850	★ 1345
	1092-3
HD6852	★ 1345
	1092-140
HD68A00	★ 1345
	1091-141
HD68A09	★ 1345
	1091-120
HD68A09E	★ 1345
HD68A21	★ 1345
	1092-88
HD68A40	★ 1345
	1092-109
HD68A43	★ 1345
	1092-58
HD68A44	★ 1345
	1092-44
HD68A45	★ 1345
	1092-27
HD68A50	★ 1345
	1092-4
HD68A52	★ 1345
	1092-141
HD68B00	★ 1345
	1091-142
HD68B09	★ 1345
	1091-121
HD68B09E	★ 1345
HD68B21	★ 1345
	1092-89
HD68B40	★ 1345
	1092-110
HD68B44	★ 1345
	1092-45
HD68B45	★ 1345
	1092-28
HD68P01	1065-8
HD68P01S0	★ 1345
HD68P01V05	★ 1345
HD68P01V07	★ 1345
HD68P05	1065-9
HD68P05V05	★ 1345
HD68P05V07	★ 1345
HD7400	492-1
HD7401	491-127
HD7402	494-87
HD7403	491-128
HD7404	477-157
HD7405	477-59
HD7406	484-160
HD7407	484-136
HD7408	489-126
HD7409	489-90
HD7410	490-170
HD74107	487-170
HD7412	490-148
HD74121	500-98
HD74123	500-158
HD74125	476-132
HD74126	476-108
HD7413	507-72
HD74132	507-120
HD74136	494-166
HD7414	507-150
HD74141	2464-72
HD74145	482-141
HD74147	509-28
HD74148	508-128
HD74150	500-78
HD74151	499-146
HD74153	498-16
HD74154	484-25
HD74155	483-124
HD74156	483-92
HD74157	499-6
HD74159	484-46
HD7416	484-147
HD74160	480-129
HD74161	478-105
HD74162	480-180
HD74163	478-160
HD74164	502-17
	3490-108
HD74166	502-90
	3490-60
HD7417	484-125
HD74173	486-19
HD74174	486-47
HD74175	485-115
HD74176	480-83
HD74177	478-45
HD74180	508-157
HD74182	475-70
HD74190	481-165
HD74191	479-126
HD74192	481-128
HD74193	479-194
HD74194	501-143
	3488-74
HD74195	501-38
	3488-126
HD74196	480-84
HD74197	478-46
HD74198	502-49
	3490-6
HD74199	502-56
	3490-7

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Hitachi America, Ltd. (Cont'd)

Device	Page-Line
HD7420	490-86
HD7422	490-48
HD74221	500-137
HD7423	494-6
HD7425	493-176
HD74251	500-30
HD7426	484-80
HD7427	494-34
HD74279	495-163
HD74283	476-52
HD74290	480-42
HD74293	479-31
HD7430	492-64
HD7432	493-124
HD7437	491-86
HD7438	491-37
HD7440	489-190
HD7442A	483-5
HD7443A	482-102
HD7444A	482-94
HD7445	482-131
HD7446A	2464-9
HD7447A	2463-154
HD7450	492-147
HD7451	492-169
HD7453	493-79
HD7454	493-67
HD7460	493-21
HD7472	487-76
HD7473	487-171
HD7474	485-58
HD7475	495-121
HD7476	488-40
HD7483A	476-53
HD7485	474-43
HD7486	495-10
HD7489	3471-91
HD7490A	480-43
HD7491A	502-125
HD7492A	482-30
HD7493A	479-32
HD7496	501-182
	3489-105
HD74H183	474-152
HD74LS00	492-36
HD74LS01	491-165
HD74LS02	494-123
HD74LS03	491-166
HD74LS04	478-5
HD74LS05	477-84
HD74LS08	489-162
HD74LS09	489-105
HD74LS10	491-11
HD74LS107	488-14
HD74LS109	487-136
HD74LS11	489-38
HD74LS112	488-116
HD74LS113	488-77
HD74LS114	488-141
HD74LS12	490-157
HD74LS122	500-126
HD74LS123	500-167
HD74LS13	507-83
HD74LS132	507-130
HD74LS136	494-174
HD74LS138	483-171
HD74LS139	483-69
HD74LS14	507-161
HD74LS148	508-148
HD74LS15	489-19
HD74LS151A	499-170
HD74LS152	500-12
HD74LS153	498-42
HD74LS155	483-135
HD74LS156	483-103
HD74LS157	499-39
HD74LS158	498-133
HD74LS160A	480-161
HD74LS161A	478-139
HD74LS162A	481-20
HD74LS163A	478-184
HD74LS164	502-35
	3490-109
HD74LS168	481-105
HD74LS169	479-104
HD74LS174	486-67
HD74LS175	485-135
HD74LS18	475-41
HD74LS190	482-8
HD74LS191	479-154
HD74LS192	481-152
HD74LS193	480-17
HD74LS194A	501-160
	3488-75
HD74LS195A	501-58
	3488-127
HD74LS196	480-110
HD74LS197	478-73
HD74LS20	490-121
HD74LS21	488-183
HD74LS22	490-65
HD74LS221	500-142
HD74LS240	503-136
HD74LS241	504-46
	2470-20
HD74LS244	504-1
	2470-21
HD74LS247	2463-155
HD74LS248	2463-111
HD74LS249	2463-83
HD74LS251	500-50
HD74LS253	497-153
HD74LS257	498-170
HD74LS258	498-92
HD74LS27	494-51
HD74LS279	495-170
HD74LS280	509-10
HD74LS283A	476-68
HD74LS290	480-58
HD74LS293	479-50
HD74LS298	499-91
HD74LS299	502-166
HD74LS30	492-90
HD74LS32	493-148
HD74LS367	477-1
	485-26
HD74LS368	477-125
HD74LS37	491-103
HD74LS375	495-132
HD74LS38	491-55
HD74LS386	495-33
HD74LS40	490-25
HD74LS42	483-28
HD74LS47	2463-156
HD74LS48	2463-112
HD74LS49	2463-84
HD74LS51	492-189
HD74LS54	493-88
HD74LS55	493-33
HD74LS73	488-15
HD74LS74A	485-90
HD74LS76	488-54
HD74LS78	487-155
HD74LS83A	476-69
HD74LS85	474-44
HD74LS86	495-34
HD74LS91	502-134
HD74LS92	482-41
HD74LS93	479-51
HD74LS95B	501-93
HD74S00	492-50
HD74S02	494-144
HD74S03	491-186
HD74S04	478-19
HD74S05	477-98
HD74S10	491-25
HD74S11	489-79
HD74S112	488-128
HD74S113	488-91
HD74S114	488-154
HD74S12	490-165
HD74S133	492-128
HD74S134	492-110
HD74S135	494-159
HD74S140	484-54
	2471-51
HD74S15	489-31
HD74S151	499-188
HD74S157	499-55
HD74S158	498-149
HD74S174	486-82
HD74S175	485-151
HD74S181	475-58
HD74S182	475-85
HD74S189	3471-26
HD74S20	490-135
HD74S251	500-64
HD74S257	498-185
HD74S258	498-109
HD74S280	509-18
HD74S289	3471-17
HD74S40	490-39
HD74S64	493-106
HD74S65	493-114
HD74S74	485-104
HD74S86	495-54
HD75107A	2474-20
HD75108A	2474-27
HD75109	2472-12
HD75110	2472-18
HD75154	2473-22
HD75188	2469-55
HD75189	2473-31
HD75450A	2481-120
HD75451A	2481-121
HD75452	2482-24
HD75453	2482-95
HD75454	2482-60
HD84S22	490-77
HM100422	★ 3789
	3473-49
HM100470	★ 3789
	3481-25
HM100474	★ 3789
HM10414	★ 3789
HM10422	★ 3789
	3473-50
HM10470	★ 3789
	3481-26
HM10470-1	★ 3789
	3481-15
HM10474	★ 3789
HM2106	468-167
HM2110	★ 3789
	469-16
	★ 3789
	3475-62
HM2110-1	★ 3789
	3475-49
HM2110-2	★ 3789
	3475-42
HM2112	★ 3789
	469-17
	★ 3789
	3475-29
HM2112-1	★ 3789
	3475-25
HM2120	469-10
HM2140	469-26
	3481-13
HM2142	469-27
	3481-14
HM2148	3476-4
HM2148-3	3477-47
HM2510	★ 3789
	3476-6
HM2510-1	★ 3789
	3475-81
HM2510-2	★ 3789
	3475-66
HM2511	★ 3789
	3476-10
HM2511-1	★ 3789
	3475-85
HM4315	★ 3789
	461-28
	★ 3789
	3482-95
HM4334	★ 3789
	461-18
HM4334-4	★ 3789
	3479-11
HM435101	460-169
HM435101-1	3474-82
HM4434-3	3478-69
HM46810	3472-61
	3472-61
HM468A10	3472-56
	3472-56
HM4716A-1	★ 3789
	3468-81
HM4716A-2	★ 3789
	3468-93
HM4716A-3	★ 3789
	3469-5
HM4716A-4	★ 3789
	3469-23
HM472114-3	★ 3789
	3478-93
HM472114-4	★ 3789
	3479-31
HM472114A-1	★ 3789
	3477-100
HM472114A-2	★ 3789
	3478-20
HM4816A-7	★ 3789
	3468-86
HM4847	3481-93
HM4847-2	3481-49
HM4847-3	3481-61
HM4864-1	★ 3789
	3469-45
HM4864-2	★ 3789
	3469-86
HM4864-3	★ 3789
	3470-13
HM6116-2	★ 3789
	3480-15
HM6116-3	★ 3789
	3480-37
HM6116-4	★ 3789
	3480-74
HM6116L-2	★ 3789
	3480-16
HM6116L-3	★ 3789
	3480-38
HM6116L-4	★ 3789
	3480-75
HM6147	★ 3789
	461-29
	★ 3789
	3481-83
HM6147-3	★ 3789
	3481-53
HM6147-6	★ 3789
	3481-112
HM6147H-35	★ 3789
	3481-33
HM6147HL-35	★ 3789
	3481-34
HM6147HL-45	★ 3789
	3481-46
HM6147L	★ 3789
	3481-84
HM6147L-3	★ 3789
	3481-54
HM6148	★ 3789
	3477-67
HM6148-6	★ 3789
	3477-86
HM6148L	★ 3789
	3477-68
HM6148L-6	★ 3789
	3477-87
HM6167	★ 3789
	3483-78
HM6167-6	★ 3789
	3483-89
HM6167-8	★ 3789
	3483-96
HM6167L-6	★ 3789
	3483-90
HM6167L-8	★ 3789
	3483-97
HM6264-10	3483-43
HM6264-12	3483-48
HM6264-15	3483-49
HM8416A-3	3468-66
HM8416A-4	3468-74
HMCS42	1087-119
	1051-9
HMCS42C	1051-10
HMCS43	1087-120
	1051-11
HMCS43C	1087-121
	1051-12
HMCS44A	1087-122
	1051-13
HMCS44C	1087-123
	1051-14
HMCS45	1051-15
HMCS45A	1087-124
HMCS45C	1087-125
	1051-16
HMCS46C	1087-126
	1051-17
HMCS47C	1087-127
	1051-18
HMSC42C	1087-128
HN462532	★ 3789
	3466-60
HN462716	★ 3789
	3465-68
HN462716-2	★ 3789
	3465-45
HN462732	★ 3789
	3466-61
HN46830	3484-80
HN48016	★ 3789
	3455-50
HN482764	★ 3789
	3466-100
SAS560	2906-130
SAS570	2906-131
TBA800	2897-13
TBA810	2897-14
TDA2002	2897-15

Holt Inc.

Device	Page-Line
HI1000	4141-140
HI3700	4141-141
HI4000	4140-94
HI7000	2899-155
HI7020	2899-159
HI8000	1102-71

Hybrid Systems

Device	Page-Line
ADC541B-8	2426-51
ADC541C-8	2426-52
ADC542B-8	2426-53
ADC542C-8	2426-54
ADC581B-12	2433-44
ADC581C-12	2433-45
ADC582B-12	2433-16
ADC582C-12	2433-17
DAC3120B-0	2457-38
DAC3120C-0	2457-39
DAC331B-10	2446-28
DAC331B-12	2454-30
DAC331B-14	2460-28
DAC331B-8	2443-2
DAC331C-10	2446-29
DAC331C-12	2454-31
DAC331C-14	2460-29
DAC331C-8	2443-3
DAC335B-12	2454-4
DAC335C-12	2454-5
DAC336B-1	2443-16
DAC336B-12	2455-11
DAC336B-8	2443-14
DAC336C-12	2455-12
DAC336C-8	2443-15
DAC337B-0	2443-17
DAC337B-2	2443-18
DAC337B-3	2447-6
DAC337B-4	2446-39
DAC337B-5	2446-40
DAC337B-6	2443-32
DAC337B-7	2447-7
DAC337C-0	2443-19
DAC337C-1	2443-20
DAC337C-2	2443-21
DAC337C-3	2447-8
DAC337C-4	2446-41
DAC337C-5	2446-42
DAC337C-6	2443-33
DAC337C-7	2447-9
DAC338B	★ 2748
DAC338B-12-0	2458-2
DAC338B-12-1	2457-5
DAC338B-12-2	2454-29
DAC345I-10	2458-1
DAC345I-12	2454-28
DAC345V-10	2458-6
DAC345V-12	2455-16
DAC347LPB-10B	2446-35
DAC347LPB-10U	2446-36
DAC347LPB-12U	2455-34
DAC347LPC-10B	2446-37
DAC347LPC-10U	2446-38
DAC347LPC-12B	2455-35
DAC347LPC-12U	2455-36
DAC348B-10	2446-33
DAC348B-12	2455-29
DAC348C-10	2446-34
DAC348C-12	2455-30
DAC349B-12	2455-31
DAC349B-3D	2460-3
DAC349C-12	2455-32
DAC349C-3D	2460-4
DAC356B-12	2456-5
DAC356C-12	2456-6
DAC356LPB-12	2456-7
DAC356LPC-12	2456-8
DAC370B-16	2461-1
DAC370B-18	2462-28
DAC370C-16	2461-2
DAC370C-18	2462-29
DAC377-18	★ 2745
	2462-32
DAC377B-18	★ 2745
	2462-33
DAC377C-18	★ 2745
	2462-34
DAC391B-12	2451-16
DAC391C-12	2451-17
DAC392B-12	2453-24
DAC392C-12	2453-25
DAC397B-12	2451-18
DAC397C-12	2451-19
DAC9331-14	2460-25
DAC9331-16-4	★ 2745
	2461-31
DAC9331-16-5	★ 2745
	2461-16
DAC9331-16-6	★ 2745
	2461-3
DAC9349-12	2455-33
DAC9349-3D	2460-5
DAC9356	2455-40
DAC9377-16-4	★ 2745
	2458-7
DAC9377-16-5	★ 2745
	2457-9
DAC9377-16-6	★ 2745
	2461-8
DAC9377-4D	★ 2745
	★ 2745
	2460-15
HAC347LPB-12B	2455-37
HS2020	2888-37
HS3020B	2443-10
HS3020C	2443-11
HS3120B-2	★ 2747
	2454-24
HS3120C-2	★ 2747
	2454-25
HS3140B-3	★ 2746
	2460-36
HS3140B-4	★ 2746
	2460-26
HS3140C-3	★ 2746
	2460-37
HS3140C-4	★ 2746
	2460-27
HS3160B-3	★ 2746
	2462-15
HS3160B-4	★ 2746
	2461-29
HS3160C-3	★ 2746
	2462-16
HS3160C-4	★ 2746
	2461-30
HS3860B	★ 2748
	2455-14
HS3860C	★ 2748
	2455-15
HS5131B	2429-9
HS5131C	2429-10
HS5210B	★ 2744
	2436-6
HS5210C	★ 2744
	2436-7
HS5211B	★ 2744
	2436-8
HS5211C	★ 2744
	2436-9
HS5212B	★ 2744
	2436-10
HS5212C	★ 2744
	2436-11
HS5213B	★ 2744
	2436-12
HS5213C	★ 2744
	2436-13
HS5214B	★ 2744
	2436-14
HS5214C	★ 2744
	2436-15
HS5215B	★ 2744
	2436-16
HS5215C	★ 2744
	2436-17
HS5216B	★ 2744
	2436-18

Arranged alphanumerically from left to right.

© IC MASTER 1983

Hybrid Systems (Cont'd)

Device	Page-Line
HS5216C	★ 2744
	2436-19
HS574J	★ 2743
	2431-29
HS574K	★ 2743
	2433-42
HS574L	★ 2743
	2433-43
HS574S	★ 2743
	2431-30
HS574S/B	★ 2743
HS574T	★ 2743
	2435-30
HS574T/B	★ 2743
HS574U	★ 2743
	2435-31
HS574U/B	★ 2743
HS7541-4	2453-46
HS7541B-1	2456-34
HS7541B-2	2453-41
HS7541C-1	2456-35
HS7541C-2	2453-42
HS9338-0	★ 2748
	2458-3
HS9338-1	★ 2748
	2457-7
HS9338-2	★ 2748
	2455-13
HS9516-4	2436-35
HS9516-5	2436-41
HS9516-6	2436-49
HSADC82	2427-17
HSADC85B	★ 2744
	2432-18
HSADC85C	★ 2744
	2432-19
HSDAC80CBI-I	★ 2747
	2454-1
HSDAC80CBI-V	★ 2747
	2454-9
HSDAC87BI/V	2454-2
HSDAC87CI/V	2454-3
HSREF01	2966-139
R675B-1	2966-140
R675B-3	2967-3
R675B-4	2966-141
R675B-5	2966-142
R675C-1	2966-143
R675C-3	2967-4
R675C-5	2966-144

Inmos Corporation

Device	Page-Line
IMS1400	★ 3790
	3483-66
IMS1400L	★ 3790
	3483-82
IMS1420	★ 3790
	3483-4
IMS1420L	★ 3790
	3483-22
IMS1421	★ 3790
	3482-113
IMS2600	★ 3792
	3469-70
IMS2620	★ 3792

Integrated Device Technology

Device	Page-Line
IDT6116	★ 3793
IDT6116L120	★ 3793
	3480-17
	3480-18
IDT6116L150	★ 3793
	3480-39
	3480-40
IDT6116L90	★ 3793
	3480-2
	3480-3
IDT6116S120	★ 3793
	3480-19
	3480-20
IDT6116S150	★ 3793
	3480-41
	3480-42
IDT6116S70	★ 3793
	3479-117
IDT6116SS0	★ 3793
	3480-4
	3480-5
IDT6167	★ 3799
IDT6167L100	★ 3799
	3483-99
	3483-100
IDT6167L45	★ 3799
	3483-67
IDT6167L55	★ 3799
	3483-71
IDT6167L70	★ 3799
	3483-79
IDT6167L85	★ 3799
	3483-91
	3483-92
IDT6167S100	★ 3799
	3483-98
IDT6167S45	★ 3799
	3483-68
IDT6167S55	★ 3799
	3483-72
	3483-73
IDT6167S70	★ 3799
	3483-80
IDT6167S85	★ 3799
	3483-93
	3483-94
IDT6168	★ 3804
IDT6168L100	★ 3804
	3483-35
	3483-36
IDT6168L45	★ 3804
	3482-114
	3482-115
IDT6168L55	★ 3804
	3483-5
	3483-6
IDT6168L70	★ 3804
	3483-13
	3483-14
IDT6168L85	★ 3804
	3483-27
	3483-28
IDT6168S100	★ 3804
	3483-37
IDT6168S45	★ 3804
	3482-116
	3482-117
IDT6168S55	★ 3804
	3483-7
	3483-8
IDT6168S70	★ 3804
	3483-15
	3483-16
IDT6168S85	★ 3804
	3483-29
	3483-30
IDT71671L70	★ 3805
IDT7168	★ 3805
IDT71681L100	★ 3805
	3483-38
	3483-39
IDT71681L45	★ 3805
	3482-118
	3483-1
IDT71681L55	★ 3805
	3483-9
	3483-10
IDT71681L70	3483-17
	3483-18
IDT71681L85	★ 3805
	3483-31
	3483-32
IDT71681S100	★ 3805
	3483-40
	3483-41
IDT71681S45	★ 3805
	3483-2
	3483-3
IDT71681S55	★ 3805
	3483-11
	3483-12
IDT71681S70	★ 3805
	3483-19
	3483-20
IDT71681S85	★ 3805
	3483-33
	3483-34

Intel

Device	Page-Line
2114A-4	3478-21
2114A-5	3478-53
2114A-6	3478-94
2114AL-1	3477-91
2114AL-2	3477-94
2114AL-3	3477-101
2114AL-4	3478-22
2114L-2	3477-95
2115A	3475-71
2115A-2	3475-103
2115AL	3475-72
2115AL-2	3475-104
2115H-2	3475-51
2115H-3	3475-54
2115H-4	3475-64
2118-10	3468-67
2118-15	3468-87
2118-4	3468-75
2125A	3475-75
2125A-2	3475-107
2125AL	3475-76
2125AL-2	3476-1
2125H-1	3475-46
2125H-2	3475-52
2125H-3	3475-55
2125H-4	3475-65
2128-12	3480-30
2128-15	3480-52
2128-20	3480-90
2141-2	3482-4
2141-3	3482-8
2141-4	3482-23
2141-5	3482-40
2141L-3	3482-9
2141L-4	3482-24
2141L-5	3482-41
2142	3479-49
2142-2	3478-44
2142-3	3478-105
2142L	3479-50
2142L-2	3478-45
2142L-3	3478-106
2147-3	3481-62
2147A	3481-94
2147A-3	3481-63
2147AL	3481-95
2147AL-3	3481-64
2147H	3481-96
2147H-1	3481-43
2147H-2	3481-50
2147H-3	3481-65
2147HL	3481-97
2147HL-3	3481-66
2148H	3477-72
2148H-2	3477-42
2148H-3	3477-54
2148HL	3477-73
2148HL-3	3477-55
2149H	3477-74
2149H-2	3477-43
2149H-3	3477-56
2149HL	3477-75
2149HL-3	3477-57
2164-15	3469-87
2164-25	3470-27
2164A-15	3469-88
2164A-20	3470-14
2167-10	3483-101
2167-55	3483-75
2167-70	3483-83
2167L-70	3483-84
2186-25	★ 3810
	3483-55
2186-30	★ 3810
	3483-57
2186/7	★ 3810
	3483-54
27128	★ 3821
	3467-16
27128-2	★ 3821
	3467-17
27128-25	★ 3821
	3467-18
27128-3	★ 3821
	3467-21
27128-30	★ 3821
	3467-22
27128-4	★ 3821
	3467-24
27128-45	★ 3821
	3467-25
2716	★ 3810
	★ 3822
	3465-69
	¶ 238-11
2716-1	★ 3818
	★ 3822
	3465-35
	¶ 238-11
2716-2	★ 3818
	★ 3822
	3465-46
	¶ 238-11
2716-5	★ 3818
	★ 3822
	3465-88
	¶ 238-11
2716-6	★ 3818
	★ 3822
	3465-91
	¶ 238-11
2732A	★ 3819
	★ 3822
	3466-43
2732A-2	3466-40
2732A-20	3466-41
2732A-25	3466-44
2732A-3	3466-50
2732A-30	3466-51
2732A-4	3466-62
2764	★ 3820
	★ 3822
	3466-92
2764-2	★ 3820
	★ 3822
	3466-85
2764-25	★ 3820
	★ 3822
	3466-93
2764-3	★ 3820
	★ 3822
	3466-101
2764-30	★ 3820
	★ 3822
	3466-102
2764-4	★ 3820
	★ 3822
	3467-7
2764-45	★ 3820
	★ 3822
	3467-8
2815	3464-123
2815-3	3465-19
2815-4	3465-52
2816	★ 3824
	3465-1
	3465-29
2816-3	★ 3824
	3465-20
2816-4	★ 3824
	3465-60
2817	★ 3825
	3465-10
2817-3	★ 3825
	3465-28
2817-4	★ 3825
	3465-61
2910	2947-97
2910A	2947-98
2911A	2947-44
2912A	2948-81
	¶ 269-12
2913	2947-67
2914	2947-68
2920-10	2967-169
	¶ 236-4
	¶ 236-8
	¶ 236-10
	¶ 277-6
2920-16	2967-170
	¶ 236-4
	¶ 236-8
	¶ 236-10
	¶ 277-6
2920-18	2967-171
	¶ 236-4
	¶ 236-8
	¶ 236-10
	¶ 277-6
3000	1049-1
3002	476-36
3245	2483-84
	¶ 287-11
3404	496-21
3628A-1	3462-84
3628A-3	3463-11
3628A-4	3463-54
3632	3466-17
3632-1	3466-15
3636B-1	3464-54
3636B-2	3464-63
7110	3468-2
7220	1100-64
7220-1	2962-113
7230	2962-114
7242	2485-47
	2962-119
	2962-120
8008	1065-12
8020H	1093-87
8021	1093-88
	¶ 239-6
8021H	1093-89
	¶ 239-6
	1065-13
	¶ 239-6
8022	1093-92
	¶ 239-6
8022H	1093-93
	¶ 239-6
80286	1097-144
80287	★ 1350
8031	1065-14
	¶ 246-6
8031AH	1094-19
	¶ 246-6
8032	1065-15
8035H	1093-24
	¶ 239-6
	1065-16
	¶ 239-6
8035HL	1065-17
	¶ 239-6
8039HL	1093-25
	¶ 239-6
	1065-18
	¶ 239-6
8040AH	1093-26
8040H	1065-19
8041A	1096-61
	¶ 239-6
	¶ 243-7
8041AH	1094-3
	1095-101
	1101-100
	¶ 239-6
	¶ 243-7
8041AH-2	1094-4
	1095-102
	¶ 239-6
	¶ 243-7
8042	1094-5
	1101-102
8044	1101-82
8048H	1093-53
	¶ 239-6
	¶ 243-7
	1065-20
	¶ 239-6
	¶ 243-7
8048H-1	1093-54
	¶ 239-6
	¶ 243-7
8049	1093-55
	¶ 239-6
	¶ 239-17
8049H	1065-21
	¶ 239-6
	¶ 239-17
8050AH	1093-56
	1065-22
8051	1065-23
	¶ 246-6
8051AH	1094-25
	¶ 246-6
8052	1094-26
	1065-24
8080A	1094-39
	¶ 238-11
	¶ 238-18
	¶ 242-4
	¶ 243-11
	1065-25
	¶ 238-11
	¶ 238-18
	¶ 242-4
	¶ 243-11
8080A-1	1094-40
	¶ 238-11
	¶ 243-11
8080A-2	1094-41
	¶ 238-11
	¶ 243-11
8085A	1095-113
	¶ 238-18
	¶ 240-8
	¶ 242-4
	¶ 246-7
	1065-26
	¶ 238-18
	¶ 240-8
	¶ 242-4
	¶ 246-7
8085A-2	1095-114
	¶ 246-7
8085AH	1095-115
	¶ 246-7
	1065-27
	¶ 246-7
8085AH-2	1095-116
	¶ 246-7
8086	1097-145
	¶ 240-8
8086-2	1098-1
	¶ 240-8
8088	1098-60
8088-2	1098-61
8089	★ 1349
	1098-10
	★ 1349
	1065-28
80C31	1094-20
	1065-29
80C35	1093-27
80C39	1093-28
	1065-30
80C48	1093-57
80C49	1093-58
	1065-31
80C51	1094-27
	1065-32
8148	3483-42
8155	1093-151
	1096-40
8155-2	1093-152
	1096-41
8155H	1093-153
8155H-2	1093-154
8156	1093-155
	1096-42
8156-2	1093-156
	1096-43
8156H	1093-157
8156H-2	1093-158
8185	1096-50
8185-2	1096-51
8202A	1094-131
	1095-140
	1098-26
	¶ 240-8
8203	1094-132
	1095-141
	1098-27
8205	1093-107
	1094-125
	1095-139
8206	1094-135
	1102-39
8207	1100-61
8212	1094-157
	¶ 238-11
8214	1093-122
8216	1093-98
	1094-75
	1095-125
8218	1094-95
8219	1095-129
8224	1094-101
	¶ 238-11

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Device	Page-Line
Intel (Cont'd)	
8226	1093-99
	1094-76
	1095-126
8228	1095-88
	¶ 238-11
8231A	1090-77
	1094-62
8232	1094-136
	1102-41
8237	1101-74
8237A	1096-5
8237A-4	1096-6
8237A-5	1096-7
8238	1095-89
8243	1093-116
	1094-150
	1095-153
82501	1101-50
8251	2487-8
	¶ 238-11
	1093-7
	¶ 238-11
8251A	1093-125
	1095-23
	1096-2
	¶ 238-11
8253	1093-135
	1095-54
	1101-76
8253-5	1096-26
8254	1095-36
	1101-77
8255A	1093-140
	1095-62
	1101-79
8255A-5	1096-32
8256	1095-14
8257	1095-41
	1096-11
	1101-75
	¶ 238-11
	¶ 238-18
8257-5	1095-42
	1096-12
	¶ 238-11
	¶ 238-18
82586	★ **1350**
	1101-51
8259	1093-127
8259-5	1093-128
8259A	1093-129
	1095-47
	1096-16
	1098-32
8259A-2	1093-130
	1095-48
	1096-17
8259A-8	1093-131
	1095-49
	1096-18
8271	1093-109
	1094-138
	1095-147
	1101-37
8271-6	1093-110
82720	★ **1350**
	1101-45
8272A	1101-126
8273	1093-167
	1095-78
	1096-57
8274	1095-82
	1101-129
8275	1093-104
	1094-109
	1095-131
	1101-72
	¶ 238-11
8276	1094-110
	1101-85
8279	1095-4
	1101-48
	¶ 238-11
8279-5	1095-5
	¶ 238-11
8282	1098-52
8283	1098-46
8284A	1098-21
8284A-1	1098-22
8286	1098-41
8287	1098-35
8288	1098-16
8289	1098-12
8291	1093-114
8291A	1094-143
	1095-152
	1098-28
8292	1094-142
	1095-151
8293	1094-144
8294	1094-122
	1102-36
8295	1100-97
	¶ 240-9
82HS181	3462-85
82HS191	3464-77
82HS321	3466-16
82S181	3463-12
82S191	3464-99
82S321	3466-18
8355	1093-164
	1096-52
8355-2	1093-165
	1096-53
8641A	1094-6
	1095-103
8741A	1094-7
	1095-104
	1096-62
	1101-99
	¶ 239-6
	¶ 243-7
8742	1094-8
	1101-101
8748-8	1093-11
	¶ 239-6
	¶ 243-7
8748H	1093-12
	¶ 239-6
	¶ 243-7
	1065-33
	¶ 239-6
	¶ 243-7
8749H	1093-13
8749H-8	1093-14
8751	1094-16
	¶ 246-6
	1065-34
	¶ 246-6
8755A	1093-144
	1095-142
	1096-34
88/50	1065-35
BPK70	★ **3808**
	3468-3
BPK72	★ **3809**
IM65X61-1	3473-111
IM6658	3463-75
IM6658M	3463-76
Intellec245	1624-3
IntellecIII	1624-4
M2114A-4	3478-23
M2114A-5	3478-54
M2114AL-3	3477-102
M2114AL-4	3478-24
M2118-4	3468-76
M2118-7	3468-88
M2128	3480-53
M2147H	3481-98
M2147H-3	3481-67
M2148H	3477-76
M2164	3469-89
M2167-10	3483-102
M27128	3467-15
M27128-45	3467-26
M2716	3465-70
M2716M	3465-71
M2732/S8416	3466-72
M2732A	3466-63
M2764/S8460	3466-94
M2764/S8461	3467-9
M2764/S8462	3466-95
M2764/S8463	3467-10
M2816	3465-2
M2817	3465-62
M3001	506-157
M3636	3464-111
M8031	1094-21
M8048	1093-59
M8049	1093-60
M8051	1094-28
M8080A	1094-42
M8085A	1095-117
M8085AH	1095-118
M8086	1098-2
M8155	1096-44
M8155H	1093-159
M8212	1094-158
M8214	1102-66
M8216	1094-77
M8224	1094-102
M8226	1094-78
M8228	1095-90
M8231A	1094-63
M8243	1093-117
M8251A	1095-24
M8253	1096-23
M8255A	1095-63
M8257	1095-43
	1096-13
M8259A	1096-19
M8259H	1093-141
M8282	1098-53
M8283	1098-47
M8284	1098-23
M8286	1094-14
	1095-107
	1096-65
	1098-42
M8287	1094-15
	1095-108
	1096-66
	1098-36
M8288	1098-17
M8289	1098-13
M8741A	1094-9
M8748	1093-15
M8751	1094-17
M8755A	1095-143
NDS-2	★ **1723**
NDS-I	1625-1
NDS-II	1625-2
P80A48L	1093-61
PSCOPE	★ **1726**
SDK-86	1769-7
iAPX186	★ **1347**
	1097-134
	★ **1347**
	1079-8
iAPX186/50	★ **1347**
	★ **1349**
	1079-9
iAPX188	★ **1348**
	1067-1
iAPX268/10	1079-10
iAPX286/10	★ **1348**
	1097-137
	★ **1348**
	1079-11
iAPX286/20	1079-12
iAPX43201	1100-58
iAPX43202	1100-59
iAPX43203	1100-60
iAPX432GDP	1079-13
iAPX432IP	1079-14
iAPX86/10	★ **1347**
	1098-3
	★ **1347**
	1079-15
iAPX86/20	★ **1348**
	1097-135
	★ **1348**
	1079-16
iAPX86/30	★ **1349**
	1097-136
	★ **1349**
	1079-17
iAPX86/50	★ **1349**
	1079-18
iAPX88/10	★ **1347**
	1098-62
	★ **1347**
	1067-2
iAPX88/20	★ **1348**
	1098-56
	★ **1348**
	1067-3
iAPX88/30	★ **1349**
	1098-57
	★ **1349**
	1067-4
iAPX88/50	★ **1349**
iAPX 88/10	1094-43
iAPX 88/20	1094-44
iMDX225	★ **1724**
	1624-1
iMDX557	★ **1725**
iPDS	★ **1721**
	1624-2
iSBC-86/05	1769-11
iSBC-86/12A	1769-10
iSBC-86/14	1769-16
iSBC-86/30	1769-17
iSBC544	1765-6
iSBC569	1765-14
iSBC80/04	1763-33
iSBC80/05	1763-34
iSBC80/10B	1763-11
iSBC80/20-4	1763-24
iSBC80/24	1763-28
iSBC80/30	1763-25
iSBC88/25	1765-23
iSBC88/40	1765-24
iUP-200	★ **1722**
	4005-1
iUP-201	★ **1722**
	4005-1

Interdesign

MCA	★ **4433**
	4141-142
MCB	★ **4433**
	4141-143
MCC	★ **4433**
	4141-144
MCD	★ **4433**
	4141-145
MCE	★ **4433**
	4140-95
MCF	★ **4433**
	4140-96
MCG	★ **4433**
	4140-97
MDA	★ **4433**
	4140-98
MLA	★ **4433**
	4140-99
MOA	★ **4433**
	4140-100
MOA-268B	2470-1
MOB	★ **4433**
	4140-101
MOB-272	2473-60
MOC	★ **4433**
	4140-102
MOD	★ **4433**
	4140-103
MOE	★ **4433**
	4140-104
MOF	★ **4433**
	4140-105
MOF1305B	2470-2
MOF1623B	2475-39
MOG	★ **4433**
	4140-106
MOH	★ **4433**
	4140-107
MOJ	★ **4433**
	4140-108
MOL	★ **4433**
	4140-109
MOM	★ **4433**
	4140-110
MON	★ **4433**
	4140-111
MONOCHIP	4140-112
	¶ 232-15
	¶ 232-16
	¶ 237-12
	¶ 267-2
	¶ 269-6
	¶ 269-9
	¶ 273-11
	¶ 275-4
	¶ 275-8
	¶ 275-9
	¶ 275-15
	¶ 277-13
	¶ 277-14
	¶ 278-1
	¶ 279-15
	¶ 280-6
	¶ 280-15
	¶ 281-8
	¶ 282-1
MOP	★ **4433**
	4140-113
MOQ	★ **4433**
	4140-114
MPA	★ **4433**
	4140-115
MPB	★ **4433**
	4140-116
MPC	★ **4433**
	4140-117
MPD	★ **4433**
	4140-118
MPX	★ **4433**
	4140-119
MRA	★ **4433**
	4140-120
MRB	★ **4433**
	4140-121
MRC	★ **4433**
	4140-122
MRD	★ **4433**
	4140-123
MRE	★ **4433**
	4140-124
MRF	★ **4433**
MSA	★ **4433**
	4140-125
MSA450	4140-126
MSB	★ **4433**
	4140-127
MSB880	4140-128
MSC	★ **4433**
	4140-129
MUA	★ **4433**
	4140-130
MUA-225	4140-131
MUB	★ **4433**
	4140-132
MUC	★ **4433**
	4140-133

International Microelectronic Products

I	★ **4435**
IMPEL	★ **4435**
ISeries	4140-135

Kontron Electronics/FutureData

2300	1625-4
EPP-80	★ **4103**
	4006-2
KDS	1625-3
MPP-805	4006-1
MPP80	4005-4

LSI Computer Systems

C1200	2464-87
	2899-34
D3600	462-68
D6	462-62
D60	462-64
LS2740	★ **696**
LS7030	★ **696**
	510-58
LS7031	★ **696**
	510-55
LS7040	★ **696**
	510-45
LS7050	★ **696**
	510-49
LS7055/56	★ **696**
	510-50
LS7060	★ **696**
	510-61
	¶ 260-5
LS7061	★ **696**
	510-62
	¶ 260-5
LS7062	★ **696**
	510-46
LS7100	★ **696**
	2464-46
LS7110	★ **696**
	511-95
	★ **696**
	2424-96
LS7210	★ **696**
	464-64
	★ **696**
	2951-26
LS7220	★ **696**
	2906-50
	¶ 231-10
LS7225	★ **696**
	2906-51
LS7229	★ **696**
LS7231	2906-154
LS7232	2906-155
LS7233	2906-156
LS7234	2906-157
LS7235	2906-158
LS7236	2906-159
LS7240	510-25
LS7262	★ **696**
LS7263	★ **696**
LS7270	1102-70
RDD104	★ **696**
	453-72
	510-105
RED100/120	★ **696**
	462-65
	511-18
RED300/360	★ **696**
	462-66
	511-28
RED3000/3600	★ **696**
	462-67
	511-32
RED5/6	★ **696**
	462-61
	510-85
RED50/60	★ **696**
	462-63
	511-2

Micro Power Systems

AD562S/BIN	2450-42
DAC-01	2439-7
DAC-01B	2439-8
DAC-01C	2439-9
DAC-01D	2439-10
DAC-01F	2439-11
DAC-01H	2439-12
DAC-100C	2442-39
MP200DI	★ **2749**
MP200DIA	★ **401**
	2415-60
MP200DIB	★ **401**
	2415-77
MP200DIC	★ **401**
	2415-78
MP201DI	★ **2749**
MP201DIA	★ **401**
	2416-108
MP201DIB	★ **401**
	2416-109
MP2325-45	3487-54
MP2325-85	3487-55
MP2364C	3486-109
MP301	2889-71
MP302	2889-72
MP303	2889-73
MP310	2889-74
MP311	2889-75

Arranged alphanumerically from left to right.

© IC MASTER 1983

Micro Power Systems (Cont'd)

MP312 2889-76
MP3140B-3 ★ 2749 2460-39
MP3140B-4 ★ 2749 2460-34
MP3140C-3 ★ 2749 2460-40
MP3140C-4 ★ 2749 2460-35
MP318 2889-61
MP350 2889-87
MP351 2889-88
MP352 2889-69
MP358 2889-82
MP360 2889-77
MP370B-18 ★ 401 ★ 2749 2462-30
MP370C-18 ★ 401 ★ 2749 2462-31
MP377-18 ★ 2749
MP377B-18 ★ 401 2462-35
MP377C-18 ★ 401 2462-36
MP4136 ★ 3292 2942-49
MP4136C ★ 3292 2943-46
MP5010 ★ 401 ★ 3292 2966-5
MP5010A ★ 401 ★ 3292 2966-6
MP5071 2901-96
MP517J 2916-28
MP517K 2911-79 2914-49
MP517L 2911-24 2014-14
MP517S 2911-80 2914-50
MP5501A ★ 401 ★ 3292 2919-52
MP5501C ★ 401 ★ 3292 2928-21
MP5501E ★ 401 ★ 3292 2923-20
MP5501F ★ 401 ★ 3292 2923-21
MP5501G ★ 401 ★ 3292 2928-22
MP5501H ★ 401 ★ 3292 2919-53
MP5502 ★ 401 ★ 3292 2909-30 2923-26
MP5502A ★ 401 ★ 3292 2919-26
MP5502B ★ 401 ★ 3292 2928-29
MP5502D ★ 401 ★ 3292 2928-30
MP5502E ★ 401 ★ 3292 2919-27
MP5505A ★ 401 ★ 3292 2911-25 2911-81 2916-25
MP5505B ★ 401 ★ 3292 2919-9
MP5505C ★ 401 ★ 3292 2911-100 2921-24
MP5505E ★ 401 ★ 3292 2919-14
MP5507A ★ 401 ★ 3292 2911-46 2911-51 2914-17
MP5507B ★ 401 ★ 3292 2911-96 2915-28
MP5507C ★ 401 ★ 3292 2911-108 2916-35
MP5507D ★ 401 ★ 3292 2916-41
MP5507E ★ 401 ★ 3292 2911-52 2911-93 2915-34
MP5508 ★ 401 ★ 3292 2917-38
MP5509A ★ 401 ★ 3292 2941-15
MP5509E ★ 401 ★ 3292 2941-16
MP550Z 2439-5
MP5510A ★ 401 ★ 3292 2911-87
MP5510B ★ 401 ★ 3292 2911-88
MP5510C ★ 401 ★ 3292 2936-30
MP5510E ★ 401 ★ 3292 2911-89
MP5511A ★ 401 ★ 3292 2941-17
MP5511E ★ 401 ★ 3292 2941-18
MP5512 ★ 401 ★ 3292 2917-37
MP5520A ★ 401 ★ 2749 2439-13
MP5520B ★ 401 ★ 2749 2439-14
MP5520C ★ 401 ★ 2749 2439-15
MP5520D ★ 401 ★ 2749 2439-31
MP5520F ★ 401 ★ 2749 2439-16
MP5520H ★ 401 ★ 2749 2439-17
MP5524 ★ 401 ★ 3292 2916-47
MP5527 ★ 401 ★ 3292 2914-7
MP5531 ★ 401 ★ 3292 2966-70
MP5532 ★ 401 ★ 3292 2966-145
MP5534 ★ 401 ★ 3292 2916-45
MP5537 ★ 401 ★ 3292 2914-8
MP5540 2966-46
MP5541 2966-71
MP5542 2966-146
MP5543 2966-72
MP5544 2966-115
MP5545 2966-147
MP5560A ★ 2749 2445-40
MP5560B ★ 2749 2447-34
MP5560C ★ 2749 2448-24 2448-25
MP5560D ★ 2749 2449-17
MP561J 2445-32
MP561K 2445-14
MP561S 2445-33
MP561T 2445-15
MP562 ★ 401 ★ 2749 2451-1
MP571J 2431-19
MP571K 2431-4
MP571S 2431-20
MP6116-20 3480-76
MP6116-25 3480-108
MP6117-20 3480-77
MP6117-25 3480-109
MP6118-20 3480-78
MP6118-25 3480-110
MP7104A 511-43
MP7138 ★ 401 ★ 2749 2438-6
MP7138A ★ 401 ★ 2749 2438-7
MP7139 2898-126
MP7149 2898-127 2945-141
MP7150 2899-165
MP7156 2898-124 2945-84
MP7160 2899-149
MP7162 2906-116
MP7189 2898-128
MP7216 2899-156
MP7501DIJ ★ 401 ★ 2749 2424-6
MP7501DIK ★ 401 ★ 2749 2424-7
MP7501DIS ★ 401 ★ 2749 2423-85
MP7502DIJ ★ 401 ★ 2749 2423-44
MP7502DIK ★ 401 ★ 2749 2423-45
MP7502DIS ★ 401 ★ 2749 2423-14
MP7503DIJ ★ 401 ★ 2749 2424-8
MP7503DIK ★ 401 ★ 2749 2424-9
MP7503DIS ★ 401 ★ 2749 2423-86
MP7506DIJ ★ 401 ★ 2749 2425-3
MP7506DIK ★ 401 ★ 2749 2425-4
MP7506DIS ★ 401 ★ 2749 2424-99
MP7507DIJ ★ 401 ★ 2749 2424-63
MP7507DIK ★ 401 ★ 2749 2424-64
MP7507DIS ★ 401 ★ 2749 2424-54
MP7508DI ★ 2749
MP7508DIJ ★ 401 2424-10
MP7508DIK ★ 401 2424-11
MP7508DIS ★ 401 2423-87
MP7509DI ★ 2749
MP7509DIJ ★ 401 2423-46
MP7509DIK ★ 401 2423-47
MP7509DIS ★ 401 2423-15
MP7510DI ★ 2749
MP7510DIJ ★ 401 2417-15
MP7510DIK ★ 401 2417-16
MP7510DIS ★ 401 2417-17
MP7511DI ★ 2749
MP7511DIJ ★ 401 2417-18
MP7511DIK ★ 401 2417-19
MP7511DIS ★ 401 2417-20
MP7511DIT ★ 401 2417-21
MP7512DI ★ 2749
MP7512DIJ ★ 401 2419-49
MP7512DIK ★ 401 2419-50
MP7512DIS ★ 401 2419-51
MP7512DIT ★ 401 2419-52
MP7520G ★ 401 ★ 2749 2449-27
MP7520H ★ 401 ★ 2749 2449-20
MP7520J ★ 401 ★ 2749 2448-35
MP7520K ★ 401 ★ 2749 2447-44
MP7520L ★ 401 ★ 2749 2446-6
MP7520M ★ 401 ★ 2749 2448-36
MP7520N ★ 401 ★ 2749 2447-45
MP7520P ★ 401 ★ 2749 2446-7
MP7520S ★ 401 ★ 2749 2448-37
MP7520T ★ 401 ★ 2749 2447-46
MP7520U ★ 401 ★ 2749 2446-8
MP7521G ★ 401 ★ 2749 2458-41
MP7521H ★ 401 ★ 2749 2458-40
MP7521J ★ 401 ★ 2749 2458-32
MP7521K ★ 401 ★ 2749 2458-18
MP7521L ★ 401 ★ 2749 2457-28
MP7521M ★ 401 ★ 2749 2458-33
MP7521N ★ 401 ★ 2749 2458-19
MP7521P ★ 401 ★ 2749 2457-29
MP7521S ★ 401 ★ 2749 2458-34
MP7521T ★ 401 ★ 2749 2458-20
MP7521U ★ 401 ★ 2749 2457-30
MP7522J ★ 401 ★ 2749 2448-47
MP7522K ★ 401 ★ 2749 2448-5
MP7522L ★ 401 ★ 2749 2446-18
MP7522S ★ 401 ★ 2749 2448-48
MP7522T ★ 401 ★ 2749 2448-6
MP7522U ★ 401 ★ 2749 2446-19
MP7523J ★ 401 ★ 2749 2441-41
MP7523K ★ 401 ★ 2749 2440-39
MP7523L ★ 401 ★ 2749 2440-6
MP7524J ★ 401 ★ 2749 2442-4
MP7524K ★ 401 ★ 2749 2440-43
MP7524L ★ 401 ★ 2749 2440-10
MP7524S ★ 401 ★ 2749 2442-5
MP7524T ★ 401 ★ 2749 2440-44
MP7524U ★ 401 ★ 2749 2440-11
MP7525B 2962-83
MP7525K 2962-84
MP7525T 2962-85
MP7530 ★ 401 ★ 2749 2446-9
MP7530J ★ 401 ★ 2749 2448-38
MP7530K ★ 401 ★ 2749 2447-47
MP7531J ★ 401 ★ 2749 2458-35
MP7531K ★ 401 ★ 2749 2458-21
MP7531L ★ 401 ★ 2749 2457-31
MP7533K ★ 401 ★ 2749 2448-13
MP7533L ★ 401 ★ 2749 2446-26
MP7533S ★ 401 ★ 2749 2449-6
MP7533T ★ 401 ★ 2749 2449-7 2449-8
MP7533U ★ 401 ★ 2749 2446-27
MP7541 ★ 401 ★ 2749 2453-32
MP7550B ★ 401 ★ 2749 2436-25
MP7570J ★ 401 ★ 2749 2428-9
MP7570L ★ 401 ★ 2749 2431-6
MP7570P ★ 401 ★ 2749 2428-10
MP7570S ★ 401 ★ 2749 2431-7
MP7574A ★ 401 ★ 2749 2429-4
MP7574B ★ 401 ★ 2749 2427-48
MP7574J ★ 401 ★ 2749 2429-5
MP7574K ★ 401 ★ 2749 2427-49
MP7574S ★ 401 ★ 2749 2429-6
MP7574T ★ 401 ★ 2749 2427-50
MP7581 ★ 401 ★ 2749 2963-36
MP7614 ★ 401 ★ 2749 2460-38
MP7616K ★ 401 ★ 2749 2462-14
MP7616L ★ 401 ★ 2749 2462-13
MP7620J 2445-5
MP7620K 2445-17
MP7620L 2446-20
MP7620M 2448-7
MP7621A ★ 401 ★ 2749 2456-25
MP7621B ★ 401 ★ 2749 2453-33
MP7621C ★ 401 ★ 2749 2450-33
MP7621H ★ 401 ★ 2749 2457-20
MP7621J ★ 401 ★ 2749 2456-26
MP7621K ★ 401 ★ 2749 2453-34
MP7621L ★ 401 ★ 2749 2450-34
MP7621R ★ 401 ★ 2749 2457-21
MP7621S ★ 401 ★ 2749 2456-27

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Micro Power Systems (Cont'd)

Device	Page-Line
MP7621T	★ 401
	★ 2749
	2453-35
MP7621U	★ 401
	★ 2749
	2450-35
MP7621Z	★ 401
	★ 2749
	2457-22
MP7622A	★ 401
	★ 2749
	2456-39
MP7622H	★ 401
	★ 2749
	2457-35
MP7622J	★ 401
	★ 2749
	2456-40
MP7622R	★ 401
	★ 2749
	2457-36
MP7622S	★ 401
	★ 2749
	2456-41
MP7622Z	★ 401
	★ 2749
	2457-37
MP7623	★ 401
	★ 2749
	2453-21
MP8416-20	3480-79
MP8416-25	3480-111
MP8417-20	3480-80
MP8417-25	3480-112
MP8418-20	3480-81
MP8418-25	3480-113
MP9311	★ 2749
MP9331-4	2461-32
MP9331-5	2461-17
MP9331-6	2461-4
MP9377-16	★ 401
	★ 2749
	2461-9
MPDAC100	★ 401
MPS5003	2896-8
MPS5004	2896-9
MPS5053	2896-10
OP-01A	2919-54
OP-01C	2928-23
OP-01E	2923-22
OP-01F	2923-23
OP-01G	2928-24
OP-01H	2919-55
OP-02	2923-27
OP-02A	2919-28
OP-02B	2928-31
OP-02C	2923-28
OP-02D	2928-32
OP-02E	2919-29
OP-05	2919-10
OP-05A	2916-24
OP-05C	2921-25
OP-05E	2919-15
OP-07	2915-26
OP-07A	2914-18
OP-07C	2916-33
OP-07E	2915-35
OP-10	2935-58
OP-10A	2936-1
OP-10C	2936-31
OP-10E	2936-2
OP-15A	2918-16
OP-15B	2920-50
OP-15C	2924-56
OP-15E	2918-17
OP-15F	2920-51
OP-15G	2924-57
OP-16A	2918-20
OP-16B	2920-54
OP-16C	2924-60
OP-16E	2918-21
OP-16F	2920-55
OP-16G	2925-1
OP-17A	2918-12
OP-17B	2920-46
OP-17C	2925-4
OP-17E	2918-13
OP-17F	2920-47
OP-17G	2925-5
OP-27	2915-50
OP-37	2915-56
REF-02	2966-73
REF-02A	2966-74
REF-02C	2966-75
REF-02D	2966-76
REF-02E	2966-77
REF-02H	2966-78

Micro-Circuit Engineering, Inc.

Device	Page-Line
A20A	★ 137
A75X	4140-164
A75XS	4140-165
BIPOLAR UNIRAYS	★ 4438
Bipolar Unirays	★ 4438
CMOS UNIRAYS	★ 4439
CMOS Unirays	★ 4439
MCD574K	2434-11
MCE-A20A	★ 4437
	4140-166
MCE-A20AS	★ 4437
	4140-167
MCE-A20B	★ 4437
	4140-168
MCE-A20BS	★ 4437
	4140-169
MCE-A20C	★ 4437
	4140-170
MCE-A20CS	★ 4437
	4140-171
MCE-A20E	★ 4437
	4140-172
MCE-A20ES	★ 4437
	4140-173
MCE-A20F	★ 4437
	4140-174
MCE-A20FS	★ 4437
	4140-175
MCE-A20G	★ 4437
	4140-176
MCE-A20GS	★ 4437
	4140-177
MCE-A20H	★ 4437
	4140-178
MCE-A20HS	★ 4437
	4140-179
MCE-A20J	★ 4437
	4140-180
MCE-A20JS	★ 4437
	4140-181
MCE-A20L	★ 4437
	4140-182
MCE-A20LS	★ 4437
	4140-183
MCE-A20M	★ 4437
	4140-184
MCE-A20MS	★ 4437
	4140-185
MCE-A20W	4140-186
MCE-A20WS	★ 4437
	4140-187
MCE-A40A	4140-188
MCE-A40AS	★ 4437
	4140-189
MCE-A40B	4140-190
MCE-A40BS	★ 4437
	4140-191
MCE-A40D	★ 4437
	4140-192
MCE-A40DS	★ 4437
	4140-193
MCE-A75X	★ 4437
MCE-A75XS	★ 4437
MCE-AD15C	★ 4437
	4140-194
MCE-B20A	4140-195
MCE-B20B	4140-196
MCE-B40A	4140-197
MCE-B40B	4140-198
MCE-D15A	★ 4437
	4140-199
MCE-D15B	★ 4437
	4140-200
MCE-D15D	★ 4437
	4140-201
MCE-P20A	4140-202
MCE-P40A	4140-203
MCE4194	★ 4440
	4140-204
	★ 4440
	2960-79
MCE565A	★ 4440
	4140-205
MCE565AJ	2451-37
MCE565AS	2451-38
MCE565J	2452-35
MCE565K	2450-29
MCE565S	2452-36
MCE565T	2450-30
MCE566A	★ 4440
	4140-206
MCE566AJ	2452-37
MCE566AK	2450-23
MCE566AS	2452-38
MCE566AT	2450-24
MCE566J	2452-39
MCE566K	2450-25
MCE566S	2452-40
MCE566T	2450-26
MCE570	★ 4440
	4140-207
MCE570J	★ 4440
	2428-14
MCE570S	★ 4440
	2428-15
MCE571	★ 4440
	4140-208
MCE571J	★ 4440
	2431-21
MCE571S	★ 4440
	2431-22
MCE574	★ 4440
	4141-1
MCE574AS	★ 4440
	2435-32
MCE574J	★ 4440
	2435-36
MCE574L	★ 4440
	2434-12
MCE574S	★ 4440
	2434-13
MCE574T	★ 4440
	2434-14
MCE574U	★ 4440
	2434-15
MCE574Z	★ 4440
MCE574ZJ	★ 4440
	2435-39
MCE574ZK	★ 4440
	2435-40
MCE574ZL	★ 4440
	2434-20
MCE574ZS	★ 4440
	2434-21
MCE574ZT	★ 4440
	2434-22
MCE574ZU	★ 4440
	2434-23
MCE60	2930-13
MCE6012	★ 4440
	4141-2
MCE6012C	★ 4440
	2453-13
MCE6012M	★ 4440
	2453-14
MCE66	2930-11
MCE70	2934-22
MCE72	2940-25
MCE74	2943-6
MCE80	2930-18
MCE82	2940-48
MCE83	2940-49
MCE84	2943-13
MCEL165	★ 4440
	4141-3
	★ 4440
	2909-53
MCEL2165	2909-54
MCELM10	★ 4440
	4141-4
	★ 4440
	2923-13
MCELM117	2959-76
MCELM137	2960-39
MCELM217	2959-77
MCELM237	2960-40
MCELM317	2959-78
MCELM337	2960-41
MCETCA2365	2909-55
MCETCA365	★ 4440
	4141-5
	★ 4440
	2909-56
MCEVFC32	★ 4440
	4141-6
	★ 4440
	2968-99
MGB110A	★ 4437
	4141-7
MGB160B	★ 4437
	4141-8
MGB210C	★ 4437
	4141-9
MGB270E	★ 4437
	4141-10
MGB350D	★ 4437
	4141-11
MGB50	★ 4437
	4141-12
MGB500	★ 4437
	4141-13
MGB600	★ 4437
	4141-14
MGC110A	★ 4437
	4141-15
MGC160B	★ 4437
	4141-16
MGC210C	★ 4437
	4141-17
MGC270E	★ 4437
MGC350D	★ 4437
	4141-18
MGC50	★ 4437
	4141-19
MGC500	★ 4437
	4141-20
MGC600	★ 4437
	4141-21
MT003	464-36
MT006	464-40
MT32003	★ 4440
	4141-22
MT34006	★ 4440
	4141-23
MT34009	★ 4440
	4141-24
	★ 4440
	464-11
MT70003	★ 4440
	4141-25
	★ 4440
	464-9
MT70014	★ 4440
	4141-26
	★ 4440
	464-10
MT80001	★ 4440
	4141-27
	★ 4440
	464-84
Unides	4141-28

Mitel Semiconductor

Device	Page-Line
MA5000	4141-33
MA5050	4141-34
MA5100	4141-35
MA5150	4141-36
MD4330B	463-156
	2466-1
	3491-43
MD4332B	463-162
MD545C239	454-54
MD54SC137	★ 697
	454-102
MD54SC138	★ 697
	454-80
MD54SC139	★ 697
	454-55
MD54SC237	★ 697
	454-103
MD54SC238	★ 697
	454-81
MD54SC239	★ 697
	454-56
MD54SC240	★ 702
	465-65
MD54SC241	★ 702
	465-84
MD54SC244	★ 702
	465-46
MD54SC245	★ 706
	465-130
	★ 706
	2475-48
MD54SC373	★ 710
	459-170
MD54SC374	★ 710
	456-33
MD54SC533	★ 710
	460-8
MD54SC534	★ 710
MD54SC540	★ 702
	450-133
MD54SC541	★ 702
	450-134
MD54SC545	★ 706
	465-131
	★ 706
	2475-49
MD54SC563	★ 710
	460-9
MD54SC564	★ 710
MD54SC573	★ 710
	459-171
MD54SC574	★ 710
	456-34
MD65SC22	1091-38
MD65SC51	1091-12
MD68SC02	1091-87
	1067-5
MD68SC21	1092-99
MD68SC40	1092-150
MD68SC49	1092-9
MD74SC137	★ 697
	454-104
MD74SC138	★ 697
	454-82
MD74SC139	★ 697
	454-57
MD74SC237	★ 697
	454-105
MD74SC238	★ 697
	454-83
MD74SC239	★ 697
	454-58
MD74SC240	★ 702
	465-66
MD74SC241	★ 702
	465-85
MD74SC244	★ 702
	465-47
MD74SC245	★ 702
	★ 706
	465-132
	★ 702
	★ 706
	2475-50
MD74SC373	★ 710
	460-10
MD74SC374	★ 710
	456-35
MD74SC533	★ 710
	460-11
MD74SC534	★ 710
MD74SC540	★ 702
	450-135
MD74SC541	★ 702
	450-136
MD74SC545	★ 706
	465-133
	★ 706
	2475-51
MD74SC563	★ 710
	460-12
MD74SC564	★ 710
MD74SC573	★ 710
	459-172
MD74SC574	★ 710
	456-36
MH-88305	2949-95
MH88210	2949-96
MH88315	2949-2
MH88500	2949-32
ML8204	2949-108
ML8205	2949-109
MT4320	2948-8
MT4322	2948-9
MT4323	2948-10
MT4325	2948-11
MT4326	2948-12
MT4327	2948-13
MT5087	2949-145
MT5089	2949-146
MT5091	2949-147
MT5092	2949-148
MT8251	2949-110
MT8804A	2947-135
MT8804B	2947-136
MT8860	2949-74
MT8862	2949-75
MT8863	2949-76
MT8865	2947-30
MT8870	2949-97
MT8912	2948-73
	2948-82
MT8960	2947-79
MT8961	2947-60
MT8962	2947-80
MT8963	2947-61
MT8980	2948-58

Monolithic Memories, Inc.

Device	Page-Line
5055	3453-8
5086	497-73
5087	497-74
5155	3453-9
5255-1	3484-94
5256-1	3484-95
5260-1	3484-90
5261-1	3484-91
5275-1	3484-119
5276-1	3484-120
5280-1	3484-47
5280-2	3484-36
5281-1	3484-52
5281-2	3484-37
5282-1	3484-48
5283-1	3484-53
5290	3453-37
5291	3453-38
5292	3453-59
5293	3453-60
5300-1	3460-2
5301-1	3460-7
5305-1	3460-93
5306-1	3460-95
5308-1	3460-31
5309-1	3460-33
5330-1	3459-47
5331-1	3459-48
5340-1	3461-75
5340-2	3461-87
5341-1	3461-79
5341-2	3461-68
5348-1	3461-74
5349-1	3461-77
5360-1	3463-65
5380-2	3463-45
5381-1	3463-66
5381-2	3463-13
5388-1	3464-36
5389-1	3464-37
5389-2	3464-16
53LS140	3460-3
53LS141	3460-8
53LS240	3460-94
53LS241	3460-96
53RS881	3462-89
53S080	★ 3827
	3459-15
53S081	★ 3827
	3459-19
53S140	3459-90
53S141	3459-93
53S1641	★ 3836
	3466-9
53S1641A	★ 3836
	3466-3
53S1681	3464-96
53S1681A	3464-78
53S240	3460-61
53S241	3460-63
53S441	★ 3830
	3462-13
	3462-13
53S841	★ 3833
	3463-119
53S841A	★ 3833
	3463-112

Arranged alphanumerically from left to right.

© IC MASTER 1983

Monolithic Memories, Inc. (Cont'd)

Device	Page-Line
57402	3456-47
57558	475-150
57558-1	475-151
6055	3453-10
6056	3453-21
6061	3453-11
6062	3453-22
6071	3453-39
6072	3453-40
6086	497-75
6087	497-76
6155	3453-12
6156	3453-13
6161	3453-14
6162	3453-15
6255-1	3484-92
6256-1	3484-93
6260-1	3484-88
6261-1	3484-89
6275-1	3484-117
6276-1	3484-118
6280-1	3484-41
6280-2	3484-32
6281-1	3484-43
6281-2	3484-33
6282-1	3484-42
6283-1	3484-44
6290	3453-41
6291	3453-42
6292	3453-61
6293	3453-62
6300-1	★ **3826** 3459-91
6301-1	★ **3826** 3459-94
6305-1	★ **3826** 3460-73
6306-1	★ **3826** 3460-79
6308-1	★ **3826** 3460-24
6309-1	★ **3826** 3460-27
6330-1	★ **3826** 3459-34
6331-1	★ **3826** 3459-41
6335-1	★ **3826** 3460-26
6336-1	★ **3826** 3460-30
6340-1	★ **3826** 3461-60
6340-2	★ **3826**
6341-1	★ **3826** 3461-69
6341-2	★ **3826** 3461-27
6348-1	★ **3826** 3461-56
6348-2	★ **3826**
6349-1	★ **3826** 3461-61
6349-2	3461-23
6350-1	3462-17
6352-1	★ **3826** 3462-18
6353-1	★ **3826**
6353-2	3462-14 3462-14
6380-1	★ **3826** 3463-46
6380-2	★ **3826** 3462-117
6381-1	★ **3826** 3463-55
6381-2	★ **3826** 3462-90
6388-1	★ **3826** 3464-12
6389-1	★ **3826** 3464-17
6389-2	★ **3826** 3463-120
63LS140	★ **3826** 3459-92
63LS141	★ **3826** 3459-95
63LS240	★ **3826** 3460-74
63LS241	★ **3826** 3460-80
63RA441	★ **3826** 3462-7 3462-7
63RS881	3462-70
63S080	★ **3826** 3459-11
63S081	★ **3826** 3459-13
63S140	★ **3826** 3459-79
63S141	★ **3826** 3459-83
63S1641	★ **3826** ★ **3836** 3466-4
63S1641A	★ **3826** ★ **3836** 3465-96
63S1681	3464-79
63S1681A	3464-55
63S240	★ **3826** 3460-48
63S241	★ **3826** 3460-50
63S441	★ **3826** ★ **3830** 3461-119 3461-119
63S441A	★ **3826** ★ **3830** 3461-106 3461-106
63S841	★ **3826** ★ **3833** 3463-113
63S841A	★ **3826** ★ **3833** 3463-97
6701	1049-11
67401A	3456-53
67558	475-152
67558-1	475-153
C57401	★ **722** 3456-38
C57401A	★ **722** 3456-41
C57402	★ **722** 3456-48
C57402A	★ **722** 3456-49
C67401	★ **722** 3456-42
C67401A	★ **722** 3456-43
C67401B	★ **722** 3456-44
C67402	★ **722** 3456-50
C67402A	★ **722** 3456-51 3456-54
C67402B	★ **722** 3456-52
DP8408	★ **727** 2480-151
DP8409	★ **724**
HAL10H8C	506-112
HAL10H8M	506-113
HAL10L8C	506-114
HAL10L8M	506-115
HAL12H6C	506-116
HAL12H6M	506-117
HAL12L6C	506-118
HAL12L6M	506-119
HAL14H4C	506-120
HAL14H4M	506-121
HAL14L4C	506-122
HAL14L4M	506-123
HAL16A4C	506-124
HAL16A4M	506-125
HAL16C1C	506-126
HAL16C1M	506-127
HAL16H2C	506-128
HAL16H2M	506-129
HAL16L2C	506-130
HAL16L2M	506-131
HAL16L8C	506-132
HAL16L8M	506-133
HAL16R4C	506-134
HAL16R4M	506-135
HAL16R6C	506-136
HAL16R6M	506-137
HAL16R8C	506-138
HAL16R8M	506-139
HAL16X4C	506-140
HAL16X4M	506-141
PAL	★ **4442**
PAL10H8-2	★ **4470**
PAL10H8C	★ **4449** 506-33 ★ **4449** 3457-7
PAL10H8M	★ **4449** 506-34 ★ **4449** 3457-8
PAL10L8-2	★ **4470**
PAL10L8C	★ **4449** 506-35 ★ **4449** 3457-9
PAL10L8M	★ **4449** 506-36 ★ **4449** 3457-10
PAL12H6-2	★ **4470**
PAL12H6C	★ **4449** 506-37 ★ **4449** 3457-11
PAL12H6M	★ **4449** 506-38 ★ **4449** 3457-12
PAL12L10	★ **4458**
PAL12L6-2	★ **4470**
PAL12L6C	★ **4449** 506-39 ★ **4449** 3457-13
PAL12L6M	★ **4449** 506-40 ★ **4449** 3457-14
PAL14H4-2	★ **4470**
PAL14H4C	★ **4449** 506-41 ★ **4449** 3457-15
PAL14H4M	★ **4449** 506-42 ★ **4449** 3457-16
PAL14L4-2	★ **4470**
PAL14L4C	★ **4449** 506-43 ★ **4449** 3457-17
PAL14L4M	★ **4449** 506-44 ★ **4449** 3457-18
PAL14L8	★ **4458**
PAL16A4C	★ **4449** 506-45 ★ **4449** 3457-19
PAL16A4M	★ **4449** 506-46 ★ **4449** 3457-20
PAL16C1-2	★ **4470**
PAL16C1C	★ **4449** 3457-21
PAL16C1M	★ **4449** 3457-22
PAL16H2-2	★ **4470**
PAL16H2C	★ **4449** 506-47 ★ **4449** 3457-23
PAL16H2M	★ **4449** 506-48 ★ **4449** 3457-24
PAL16L2-2	★ **4470**
PAL16L2C	★ **4449** 506-49 ★ **4449** 3457-25
PAL16L2M	★ **4449** 506-50 ★ **4449** 3457-26
PAL16L6	★ **4458**
PAL16L8-2	★ **4470**
PAL16L8-4	★ **4470**
PAL16L8A	★ **4464**
PAL16L8C	★ **4449** 506-51 ★ **4449** 3457-27
PAL16L8M	★ **4449** 506-52 ★ **4449** 3457-28
PAL16R4-2	★ **4470**
PAL16R4-4	★ **4470**
PAL16R4A	★ **4464**
PAL16R4C	★ **4449** 506-53 ★ **4449** 3457-29
PAL16R4M	★ **4449** 506-54 ★ **4449** 3457-30
PAL16R6-2	★ **4470**
PAL16R6-4	★ **4470**
PAL16R6A	★ **4464**
PAL16R6C	★ **4449** 506-55 ★ **4449** 3457-31
PAL16R6M	★ **4449** 506-56 ★ **4449** 3457-32
PAL16R8-2	★ **4470**
PAL16R8-4	★ **4470**
PAL16R8A	★ **4464**
PAL16R8C	★ **4449** 506-57 ★ **4449** 3457-33
PAL16R8M	★ **4449** 506-58 ★ **4449** 3457-34
PAL16X4C	★ **4449** 506-59 ★ **4449** 3457-35
PAL16X4M	★ **4449** 506-60 ★ **4449** 3457-36
PAL18L4	★ **4458**
PAL20C1	★ **4458**
PAL20L10	★ **4458**
PAL20L2	★ **4458**
PAL20X10	★ **4458**
PAL20X4	★ **4458**
PAL20X8	★ **4458**
SN54LS210	★ **715** 503-137
SN54LS240	★ **715** 503-138 ★ **715** 2471-6
SN54LS241	★ **715** 504-48 ★ **715** 2470-23
SN54LS244	★ **715** 504-3 ★ **715** 2470-24
SN54LS245	★ **715** 505-1 ★ **715** 2470-25
SN54LS273	★ **715** 486-160
SN54LS310	★ **715** 504-49
SN54LS341	★ **715**
SN54LS340	★ **715** 503-139 ★ **715** 2471-7
SN54LS341	★ **715** 504-50 ★ **715** 2470-26
SN54LS344	★ **715** 504-4 ★ **715** 2470-27
SN54LS373	★ **715** 496-75
SN54LS374	★ **715** 487-14
SN54LS377	★ **715** 487-50
SN54LS380	502-140
SN54LS450	500-87
SN54LS451	498-64
SN54LS453	499-119
SN54LS461	482-83
SN54LS491	482-86
SN54LS498	502-138
SN54LS533	★ **715** 496-131
SN54LS534	★ **715** 486-136
SN54LS645	★ **715** 505-2 ★ **715** 2478-33
SN54LS645-1	★ **715** 505-3 ★ **715** 2478-34
SN54S182	475-86
SN54S210	★ **715** 478-39
SN54S240	★ **715** 503-157 ★ **715** 2471-8
SN54S241	★ **715** 504-71 ★ **715** 2470-28
SN54S244	★ **715** 504-15 ★ **715** 2470-29
SN54S373	★ **715** 496-94
SN54S374	★ **715** 487-29
SN54S381	475-59
SN54S508	474-1
SN54S516	★ **716** 475-95
SN54S531	496-95
SN54S533	★ **715** 496-135
SN54S534	★ **715** 486-140
SN54S557	★ **719** 475-97
SN54S558	★ **719** 475-98
SN54S700	★ **728** 2483-150
SN54S730	★ **728** 2483-151
SN54S731	★ **728** 2483-152
SN54S734	★ **728** 2483-153
SN74LS210	★ **715** 503-140
SN74LS240	★ **715** 503-141 ★ **715** 2471-9
SN74LS241	★ **715** 504-51 ★ **715** 2470-30
SN74LS244	★ **715** 504-5 ★ **715** 2470-31
SN74LS245	★ **715** 505-4 ★ **715** 2470-32
SN74LS273	★ **715** 486-161
SN74LS310	★ **715**
SN74LS310	★ **715** 504-52
SN74LS340	★ **715** 503-142
SN74LS341	★ **715** 504-53 ★ **715** 2470-33
SN74LS344	★ **715** 504-6 ★ **715** 2470-34
SN74LS373	★ **715** 496-76
SN74LS374	★ **715** 487-15
SN74LS377	★ **715** 487-51
SN74LS380	502-141
SN74LS450	500-88
SN74LS451	498-65
SN74LS453	499-120
SN74LS461	482-84
SN74LS491	482-87
SN74LS498	502-139
SN74LS533	★ **715** 496-132
SN74LS534	★ **715** 486-137
SN74LS645	★ **715** 505-5 ★ **715** 2478-60
SN74LS645-1	★ **715** 505-6 ★ **715** 2478-61
SN74S182	475-87
SN74S210	★ **715** 478-40
SN74S240	★ **715** 503-158 ★ **715** 2471-10
SN74S241	★ **715** 504-72 ★ **715** 2470-35
SN74S244	★ **715** 504-16 ★ **715** 2470-36
SN74S373	★ **715** 496-96
SN74S374	★ **715** 487-30
SN74S381	475-60
SN74S408	★ **727** 2480-152
SN74S408-3	★ **727** ★ **727** 2480-153
SN74S409	★ **724**
SN74S4093	★ **724**
SN74S508	474-2
SN74S516	★ **716** 475-96
SN74S531	★ **715** 496-97
SN74S532	★ **715** 487-31
SN74S533	★ **715** 496-136
SN74S534	★ **715** 486-141
SN74S535	★ **715** 496-137
SN74S536	★ **715** 486-142
SN74S557	★ **719** 475-99
SN74S558	★ **719** 475-100
SN74S700	★ **728** 2483-154

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Monolithic Memories, Inc. (Cont'd)

Device	Page-Line
SN74S730	★ 728
	2483-155
SN74S731	★ 728
	2483-156
SN74S734	★ 728
	2483-157

Motorola Semiconductor Products

Device	Page-Line
AD562	★ 2759
	2453-19
AD563	★ 2759
	2453-20
AM26LS31	★ 2753
	2472-43
AM26LS31C	★ 2753
	2472-44
AM26LS31M	★ 2753
	2472-45
AM26LS32	★ 2753
C68A29	1092-72
CA3054	2889-49
CA3059	2968-123
CA3079	2968-124
CA3139	2903-16
DAC-08	2441-31
DAC-08A	2440-25
DAC-08C	2443-40
DAC-08E	2441-47
DAC-08H	2440-26
DAC-20	2444-42
DAC-20A	2444-40
DAC-20C	2444-43
DAC-20E	2444-41
DAC08	★ 2759
DG10H161	467-72
DG10H162	467-64
DS8641	2476-46
EXORciserDS35	1626-4
EXORciserII	1626-3
EXORsetDS35	★ 1733
HA1199	2900-62
HDS-200	★ 1729
	★ 1731
	1627-1
HDS-400	★ 1732
	1627-2
LF155	2909-50
	2918-34
LF155A	2922-4
LF156	2927-14
LF156A	2922-16
LF157	2909-51
LF157A	2921-51
LF255	2927-4
LF256	2927-15
LF355	2932-45
LF355A	2922-5
LF355B	2927-5
LF356	2932-52
LF356A	2922-17
LF356B	2927-16
LF357	2932-40
LF357A	2921-52
LF357B	2926-57
LM101A	2909-20
	2923-59
LM104	2960-52
LM107	2923-42
LM108	2911-145
	2922-58
LM108A	2918-50
LM109H	★ 3294
	2952-19
LM109K	★ 3294
	2952-54
LM111	2891-43
LM117	★ 3295
	2959-79
LM117L	★ 3295
	2959-64
LM117M	★ 3295
	2959-109
LM123	★ 3294
	2952-111
LM124	2913-61
LM137	★ 3295
	2960-36
LM139	2895-1
LM139A	2894-32
LM140-12	★ 3294
	2954-56
LM140-15	★ 3294
	2955-18
LM140-18	★ 3294
	2955-88
LM140-24	★ 3294
	2956-41
LM140-5	★ 3294
	2952-77
LM140-6	★ 3294
	2953-21
LM140-8	★ 3294
	2953-87
LM148	2942-30
LM150	★ 3295
	2959-40
LM158	2913-29
	2938-25
LM201A	2923-60
LM204	2960-53
LM205	2959-125
LM207	2923-43
LM208	2922-59
LM208A	2918-51
LM209H	★ 3294
	2952-20
LM209K	★ 3294
	2952-55
LM211	2891-44
LM217	★ 3295
	2959-80
LM217L	★ 3295
	2959-65
LM217M	★ 3295
	2959-110
LM223	★ 3294
	2952-112
LM224	2913-62
LM237	★ 3295
	2960-37
LM239	2895-17
LM239A	2894-43
LM250	★ 3295
	2959-41
LM258	2913-30
	2939-29
LM2901	2895-38
LM2902	2913-21
LM2904	2913-22
LM301A	2931-53
LM304	2960-25
LM305	2959-30
LM307	2931-44
LM308	2931-35
LM308A	2919-22
LM309H	★ 3294
	2952-21
LM309K	★ 3294
	2952-56
LM310	2908-27
LM311	2892-38
LM317	★ 3295
	2959-81
LM317L	★ 3295
	2959-66
LM317M	★ 3295
	2959-111
LM323	★ 3294
	2952-113
LM324	2913-63
LM337	★ 3295
	2960-38
LM339	2895-18
LM339A	2894-44
LM340-12	★ 3294
	2954-57
LM340-15	★ 3294
	2955-19
LM340-18	★ 3294
	2955-89
LM340-24	★ 3294
	2956-42
LM340-5	★ 3294
	2952-78
LM340-6	★ 3294
	2953-22
LM340-8	★ 3294
	2953-88
LM350	★ 3295
	2959-42
LM358	2913-31
	2939-30
LM565	2946-1
M10900	★ 4479
	4141-38
M146805	★ 1352
M146805E2	★ 1737
M146805E2EM	★ 1737
M146805F2	★ 1737
M146805F2EM	★ 1737
M146805G2	★ 1737
M146805G2EM	★ 1737
M6800	★ 1351
M68000	★ 1354
	★ 1731
	1627-3
M6800EXOR	★ 1735
M6800UPDWNLD	★ 1736
M6801	★ 1351
M6801DS351M	★ 1735
M6805	★ 1351
M6805FIM	★ 1737
M6809	★ 1352
M6809ASMR	★ 1736
M6809EXOR	★ 1735
M6809FORTRN	★ 1736
M6809MPL	★ 1736
M6809PASCLC	★ 1736
M6809SA	★ 1737
M6809SETPAS	★ 1735
M6809UPDOWNLD	★ 1736
M68BASRO10M	★ 1736
M68BSA1	★ 1729
M68BSA2	★ 1729
M68BSA4	★ 1729
M68BSA5	★ 1729
M68BSA6	★ 1729
M68BSAC	★ 1729
M68BSAE	★ 1729
M68BSK2	★ 1738
M68BSK3	★ 1738
M68EDITM	★ 1736
M68FTNRO12M	★ 1736
M68KEXOR	★ 1733
M68KEXOR16	★ 1733
M68KEXOR32	★ 1733
M68KEXOR96	★ 1733
M68KFD1102	★ 1738
M68KHDS16-1	★ 1738
M68KHDS32-1	★ 1738
M68KHDS96-1	★ 1738
M68KOFORTRNH	★ 1734
M68KOPASCALH	★ 1734
M68KORMS68K	★ 1936
M68KOUDOSH	★ 1734
M68KOVDOS	★ 1936
M68KVM01A	★ 1937
M68KVM02	★ 1937
	1767-33
M68KVM10	★ 1938
M68KVM11	★ 1938
M68KVM20	★ 1938
M68KVM21	★ 1938
M68KVM30	★ 1938
M68KVM31	★ 1938
M68KVM40	★ 1938
M68KVM60	★ 1938
M68KVM80	★ 1938
M68MDOC	★ 1736
M68MM01	★ 1939
	1759-17
M68MM01A2	★ 1939
	1759-18
M68MM01B	★ 1939
	1761-5
M68MM01B1A	★ 1939
	1761-6
M68MM01D	★ 1939
	1759-19
M68MM03	★ 1940
M68MM04	★ 1940
M68MM04-A	★ 1940
M68MM05A	★ 1940
M68MM05B	★ 1940
M68MM05C	★ 1940
M68MM06	★ 1940
M68MM07	★ 1940
M68MM09	★ 1940
M68MM11	★ 1940
M68MM12	★ 1940
M68MM12-1	★ 1940
M68MM12A	★ 1940
M68MM13A	★ 1940
M68MM13B	★ 1940
M68MM13C	★ 1940
M68MM13D	★ 1940
M68MM15A	★ 1940
M68MM15A1	★ 1940
M68MM15B	★ 1940
M68MM15BEX	★ 1940
M68MM15CI	★ 1940
M68MM15CV	★ 1940
M68MM16-1	★ 1940
M68MM16-2	★ 1940
M68MM16-3	★ 1940
M68MM17	★ 1939
	1761-21
M68MM18	★ 1940
M68MM19	1761-22
M68MM19-1	★ 1939
M68MM19A	★ 1939
	1761-32
M68MM21	★ 1940
M68MM21-1	★ 1940
M68MM22	★ 1940
M68MMCC05	★ 1940
M68MMCC10	★ 1940
M68MMFLC1	★ 1940
M68MMLC1	★ 1940
M68MMO1D	★ 1939
M68MMS1-1	★ 1940
M68MMSC1	★ 1940
M68MPLRO20M	★ 1736
M68PP3	★ 1737
M68RAD1	★ 1941
M68RFDC1	★ 1941
M68RIO1	★ 1941
M68RMS68K	★ 1935
M68RSC1	★ 1938
M68RTFRO2M	★ 1736
M68RWIN1-1	★ 1941
M68RWIN1-2	★ 1941
M68SETDS351	★ 1735
M68SP702C10	★ 1738
M68SXD10155	★ 1738
M68UCANA1	★ 1737
M68XDOC	★ 1736
MC10H173	★ 730
MC10H174	★ 730
MC10100	468-32
MC10101	468-54
	¶ 234-10
MC10102	468-26
MC10103	467-148
MC10104	467-130
MC10105	468-46
MC10106	468-20
MC10107	468-92
MC10109	468-39
MC10110	467-142
MC10111	468-6
	¶ 257-11
MC10113	468-86
MC10114	469-96
MC10115	469-110
	¶ 234-12
MC10116	469-97
	¶ 234-10
	¶ 234-12
MC10117	468-73
MC10118	468-61
MC10119	468-67
MC10121	468-80
MC10123	467-90
	¶ 257-11
MC10124	469-77
	¶ 234-12
MC10125	469-72
	¶ 234-12
MC10128	467-87
	¶ 234-12
MC10129	469-106
	¶ 234-12
MC10130	468-100
MC10131	467-102
MC10132	468-113
MC10133	468-125
MC10134	468-107
MC10135	467-122
	¶ 235-5
MC10136	467-48
MC10137	467-56
MC10138	467-52
MC10141	469-60
	3489-50
MC10148	468-159
MC10153	468-126
MC10158	469-46
MC10159	469-41
MC10160	469-122
MC10161	467-73
MC10162	467-65
MC10163	469-84
	2467-13
MC10164	469-51
MC10165	469-115
MC10166	467-30
MC10168	468-118
MC10170	469-119
MC10171	467-84
MC10172	467-79
MC10173	468-132
MC10174	469-34
MC10175	468-138
MC10176	467-115
MC10177	469-67
MC10178	467-43
MC10179	467-4
	¶ 234-14
MC10180	467-12
	¶ 234-14
MC10181	467-25
	¶ 234-14
MC10182	467-16
MC10183	467-20
MC10186	467-111
MC10188	467-35
MC10189	467-39
MC10190	469-68
MC10191	469-80
MC10192	467-94
MC10193	469-85
	2467-14
MC10194	469-90
	¶ 260-3
MC10195	467-37
MC10197	467-134
MC10198	469-56
MC10210	467-143
MC10211	468-7
MC10212	468-14
MC10216	469-98
	¶ 234-12
MC10231	467-103
MC10287	467-18
MC10315L	★ 2760
	2426-17
MC10317L	★ 2760
	2426-18
MC10318	★ 2759
	2441-19
MC10318-9	★ 2759
	2440-18
MC10318C-6	★ 2759
	2444-2
MC10318C-7	★ 2759
	2443-35
MC10500	468-33
MC10501	468-55
MC10502	468-27
MC10503	467-149
MC10504	467-131
MC10505	468-47
MC10506	468-21
MC10507	468-93
MC10509	468-40
MC10513	468-87
MC10514	469-99
MC10515	469-111
MC10516	469-100
MC10517	468-74
MC10518	468-62
MC10519	468-68
MC10521	468-81
MC10524	469-78
MC10525	469-73
MC10530	468-101
MC10531	467-104
MC10532	468-114
MC10533	468-127
MC10534	468-108
MC10535	467-123
MC10536	467-49
MC10537	467-57
MC10538	467-53
MC10541	469-61
	3489-51
MC10553	468-128
MC10558	469-47
MC10559	469-42
MC10560	469-123
MC10561	467-74
MC10562	467-66
MC10563	469-86
	2467-15
MC10564	469-52
MC10565	469-116
MC10566	467-31
MC10568	468-119
MC10571	467-85
MC10572	467-80
MC10574	469-35
MC10575	468-139
MC10576	467-116
MC10578	467-44
MC10579	467-5
MC10580	467-13
MC10581	467-26
MC10582	467-17
MC10586	467-112
MC10590	469-69
MC10591	469-81
MC10593	469-87
	2467-16
MC10594	469-91
MC10595	467-38
MC10597	467-135
MC10610	467-144
MC10611	468-8
MC10612	468-15
MC10616	469-101
MC10631	467-105
MC10687	467-19
MC10800	467-21
	¶ 248-2
	1085-61
	¶ 248-2
	1049-12
	¶ 248-2
MC10801	1085-67
	¶ 244-10
MC10802	1085-69
MC10803	1085-66
	¶ 244-10
MC10804	1085-62
MC10805	1085-63
MC10806	1085-70
MC10807	1085-64
MC10808	1085-68
MC10900	467-33
MC10900Z	★ 4479
	4141-39
MC10901	467-32
MC10901Z	★ 4479
	4141-40
MC10902	467-34
MC10902Z	★ 4479
	4141-41
MC10904	469-89
MC10904Z	★ 4479
	4141-42
MC10905	469-88
MC10905Z	★ 4479
	4141-43
MC10H016	★ 730
MC10H100	★ 730
MC10H101	★ 730
	468-56
MC10H102	★ 730
	468-28
MC10H103	★ 730
MC10H104	★ 730
	467-132
MC10H105	★ 730
	468-48
MC10H106	★ 730
MC10H107	★ 730
	468-94
MC10H109	★ 730
	468-41

Arranged alphanumerically from left to right.

© IC MASTER 1983

Motorola Semiconductor Products (Cont'd)

Device	Page-Line
MC10H113	★ 730
MC10H115	★ 730
MC10H116	★ 730
	469-102
MC10H117	★ 730
	468-75
MC10H118	★ 730
MC10H119	★ 730
MC10H121	★ 730
	468-82
MC10H123	★ 730
MC10H124	★ 730
MC10H125	★ 730
MC10H130	★ 730
	468-102
MC10H131	★ 730
	467-106
MC10H135	★ 730
MC10H136	★ 730
	467-50
MC10H141	★ 730
	469-62
MC10H145	★ 730
MC10H155	★ 730
MC10H158	★ 730
MC10H159	★ 730
MC10H160	★ 730
	469-124
MC10H161	★ 730
	467-75
MC10H162	★ 730
	467-67
MC10H164	★ 730
	469-53
MC10H166	★ 730
MC10H173	468-133
MC10H174	469-36
MC10H175	★ 730
	468-140
MC10H176	★ 730
	467-117
MC10H179	★ 730
	467-6
MC10H180	★ 730
	467-14
MC10H181	★ 730
	467-27
MC10H186	★ 730
MC10H188	★ 730
MC10H189	★ 730
MC10H209	★ 730
MC10H210	★ 730
MC10H211	★ 730
MC10H330	★ 730
MC10H332	★ 730
MC10H334	★ 730
MC10H350	★ 730
MC10H423	★ 730
MC10H424	★ 730
MC12000	★ 733
	2945-10
MC12002	2945-17
	2962-90
MC12009	510-88
	2946-60
	2946-65
MC12011	510-95
	2946-70
MC12012	2946-67
MC12013	510-108
	2946-77
MC12014	2945-7
MC12020	2945-28
MC12021	2945-29
MC12040	2945-61
MC12060	2945-8
	¶ 278-10
MC12061	2945-11
	¶ 278-10
MC12071	511-10
	2945-78
	2946-87
MC12500	★ 733
	506-175
MC12502	2945-18
	2962-91
MC12509	510-89
	2946-61
	2946-66
MC12511	510-96
	2946-71
MC12513	510-109
	2946-78
MC12520	2945-30
MC12521	2945-31
MC12540	2945-62
MC12560	2945-9
MC12561	2945-12
MC13001	2905-127
MC13002	2905-128
MC1302	2900-14
MC1305	2905-90
MC1309	2901-106
MC1310	2901-107
MC1323	2903-98
	¶ 274-8
	¶ 274-9
MC1324	2903-99
MC1327	2903-100
MC1330A1	2905-129
MC1331	2905-130
MC13330A2	2905-131
MC1344	2904-143
MC1349	2905-132
MC1350	2901-5
	2905-133
	¶ 274.7
MC1351	2904-165
MC1352	2905-134
	¶ 274.7
MC1355	2901-6
MC1356	2901-29
MC1357	2904-166
MC1358	2904-167
MC1364	2903-17
MC1372	2905-135
	2906-46
	¶ 238-5
	¶ 238-7
	¶ 241-13
MC1373	2905-136
	2906-47
MC1374	2904-126
MC1376	2901-89
MC1384	2896-81
MC1391	2904-89
MC1393	2905-89
MC1394	2904-90
MC1398	2903-101
MC1399	2903-102
MC1400-10	★ 2761
	2966-148
MC1400-2	★ 2761
	2966-47
MC1400-5	★ 2761
	2966-79
MC1400-6	★ 2761
	2965-167
MC14000UBA	★ 729
	458-71
MC14000UBC	★ 729
	458-72
MC14001BA	458-154
MC14001BC	458-155
MC14001UBA	458-156
MC14001UBC	458-157
MC14002BA	458-90
MC14002BC	458-91
MC14002UBA	458-92
MC14002UBC	458-93
MC14006BA	463-139
	3489-128
MC14006BC	463-140
	3489-127
MC14007UBA	450-148
MC14007UBC	450-149
MC14008BA	449-34
MC14008BC	449-35
MC1400A-10	★ 2761
	2966-149
MC1400A-2	★ 2761
	2966-48
MC1400A-5	★ 2761
	2966-80
MC1400A-6	★ 2761
	2965-168
MC14011BA	457-91
MC14011BC	457-92
MC14011UBA	457-93
MC14011UBC	457-94
MC14012BA	457-16
MC14012BC	457-17
MC14012UBA	457-18
MC14012UBC	457-19
MC14013BA	455-91
	¶ 273-5
MC14013BC	455-92
	¶ 273-5
MC14014BA	463-116
	3490-87
MC14014BC	463-117
MC14015BA	462-117
	3489-100
MC14015BC	462-118
	3489-93
MC14016BA	2417-55
MC14016BC	2417-56
MC14017BA	452-81
MC14017BC	452-82
MC14018BA	453-116
MC14018BC	453-117
MC14020BA	452-17
MC14020BC	452-18
MC14021BA	463-47
	3490-88
MC14021BC	463-48
	3490-76
MC14022BA	453-90
MC14022BC	453-91
MC14023BA	457-50
MC14023BC	457-51
MC14023UBA	457-52
MC14023UBC	457-53
MC14024BA	451-154
MC14024BC	451-155
MC14025BA	458-121
MC14025BC	458-122
MC14025UBA	458-123
MC14025UBC	458-124
MC14027BA	456-102
MC14027BC	456-103
MC14028BA	453-164
MC14028BC	453-165
MC14029BA	453-133
MC14029BC	453-134
MC1403	★ 2761
	2966-49
MC14032BA	449-17
MC14032BC	449-18
MC14034BA	463-66
	3490-42
MC14034BC	463-67
	3490-34
MC14035BA	463-25
	3489-69
MC14035BC	463-26
	3489-58
MC14038BA	449-5
MC14038BC	449-6
MC1403A	★ 2761
	2966-50
MC1404-10	★ 2761
	2966-150
MC1404-5	★ 2761
	2966-81
MC1404-6	★ 2761
	2966-1
MC14040BA	451-182
	¶ 273-5
MC14040BC	451-183
	¶ 273-5
MC14042BA	459-108
MC14042BC	459-109
MC14043BA	459-149
MC14043BC	459-150
MC14044BA	459-130
MC14044BC	459-131
MC14046BA	464-50
	2945-45
MC14046BC	464-51
	2945-46
MC14049UBA	450-18
MC14049UBC	450-19
MC1404A-10	★ 2761
	2966-151
MC1405	2438-31
MC14050BA	450-53
MC14050BC	450-54
MC14051BA	2423-93
MC14051BC	2423-94
MC14052BA	2423-25
MC14052BC	2423-26
MC14053BA	2419-100
MC14053BC	2419-101
MC1406	★ 2759
	2439-28
MC14060B	452-36
MC14066BA	2417-40
MC14066BC	2417-41
MC14067BA	461-156
	2424-100
MC14067BC	461-157
	2424-101
MC14068BA	457-135
MC14068BC	457-136
MC14069UBA	450-178
MC14069UBC	450-179
MC14070BA	459-11
MC14070BC	459-12
MC14071BA	458-47
MC14071BC	458-48
MC14072BA	458-13
MC14072BC	458-14
MC14073BA	456-156
MC14073BC	456-157
MC14075BA	458-27
MC14075BC	458-28
MC14076BA	455-125
MC14076BC	455-126
MC14077BA	459-49
MC14077BC	459-50
MC14078BA	458-194
MC14078BC	458-195
MC1408-6	★ 2759
	2444-7
	¶ 253-6
	¶ 256-14
MC1408-7	★ 2759
	2443-52
	¶ 253-6
	¶ 256-14
MC1408-8	★ 2759
	2442-33
	¶ 253-6
	¶ 256-14
MC14081BA	456-179
MC14081BC	456-180
MC14082BA	456-141
MC14082BC	456-142
MC14093BA	464-150
MC14093BC	464-151
MC14094BA	463-81
	3491-17
MC14094BC	463-82
	3491-18
MC14097BA	462-4
	2424-55
MC14097BC	462-5
	2424-56
MC14099BA	460-46
MC14099BC	460-47
MC141000	1086-130
	1088-15
	1051-21
MC141099	1088-43
MC1411	★ 2753
	2480-71
	★ 2753
	2890-30
MC1412	★ 2753
	2480-89
	★ 2753
	2890-31
MC141200	1086-131
	1088-16
	1051-22
MC1413	★ 2753
	2480-48
	★ 2753
	2890-32
MC1414	2893-41
	¶ 270-14
MC1416	★ 2753
	2480-33
	★ 2753
	2890-33
MC14160BA	452-135
MC14160BC	452-136
MC14161BA	451-51
MC14161BC	451-52
MC14162BA	452-107
MC14162BC	452-108
MC14163BA	451-27
MC14163BC	451-28
MC14174BA	455-166
MC14174BC	455-167
MC14175BA	455-149
MC14175BC	455-150
MC14194BA	462-150
	3489-74
MC14194BC	462-151
MC142100	★ 3298
	2423-2
	★ 3298
	2947-128
MC1422	2951-1
MC1436	2910-83
	2933-10
MC1436C	2910-92
	2933-51
MC1437	2940-18
MC1438	2887-20
MC1439	2932-1
MC14400	★ 729
	★ 3298
	2948-64
MC14401	★ 3298
	2948-65
MC14402	★ 3298
	2948-66
MC14403	★ 3298
	2947-69
	2948-67
MC14404	★ 3298
	2947-89
MC14405	★ 3298
	2947-70
	2948-68
MC14406	★ 3298
	2947-101
MC14407	★ 3298
	2947-90
MC14408	★ 3298
	464-94
	★ 3298
	2948-18
MC14409	★ 3298
	464-95
	★ 3298
	2948-19
MC14410	★ 3298
	2949-157
MC14411	★ 3298
	464-17
	★ 3298
	2486-34
MC14412	★ 3298
	464-42
	★ 3298
	2948-135
MC14413-1	★ 3298
	2948-85
MC14413-2	★ 3298
	2948-86
MC14414-1	★ 3298
	2948-87
MC14414-2	★ 3298
	2948-88
MC14415	464-141
MC14415E	464-142
MC14416	★ 3298
	2949-56
MC14417	★ 3298
	2949-57
MC14418	★ 3298
	2949-58
MC14419	★ 3298
	465-165
	¶ 286-10
	★ 3298
	2468-5
	¶ 286-10
	★ 3298
	2948-61
	¶ 286-10
MC14433	2438-8
	¶ 253-5
	¶ 238-15
MC14435	464-30
	2438-32
MC14435E	464-31
	2438-33
MC1444	2485-75
MC14443	2429-39
MC14444	2429-37
MC14447	2429-40
MC1445	2888-41
MC14457	2902-13
MC14458	2902-14
MC14460	2898-45
MC14466	2906-117
MC14467	2906-118
MC14469	464-8
	¶ 258-12
	2486-15
	¶ 258-12
MC14490	465-15
MC14490E	465-16
MC14495	455-42
	2463-71
MC145000	2463-64
MC145001	2463-65
MC14500B	★ 729
	464-7
	★ 729
	1086-101
MC14501UBA	459-67
MC14501UBC	459-68
MC145026	2902-15
MC145027	2902-16
MC145028	2902-17
MC14502BA	449-159
MC14502BC	449-160
MC14503BA	450-95
MC14503BC	450-96
MC14504BA	464-3
MC14504BC	464-4
MC14506BA	457-186
MC14506BC	457-187
MC14508BA	459-89
MC14508BC	459-90
MC145100	★ 3298
	2423-3
	★ 3298
	2947-129
MC145104	2945-95
MC145106	2945-96
MC145107	2945-97
MC145109	2945-98
MC14510BA	452-164
MC14510BC	452-165
MC145112	2945-99
MC14511BA	455-49
	¶ 260-2
	2464-28
	¶ 260-2
MC14511BC	455-50
	¶ 260-2
	2464-29
	¶ 260-2
MC14512A	461-145
MC14512C	461-146
MC14513BA	455-51
	2464-30
MC14513BC	455-52
	2464-31
MC145143	2945-100
MC145144	2945-101
MC145145	2945-102
MC145146	2945-103
MC14514BA	454-120
MC14514BC	454-121
MC145151	2945-104
MC145152	2945-105
MC145155	2945-106
MC145156	2945-107
MC145157	2945-108
MC145158	2945-109
MC145159	2945-110
MC14515BA	454-122
MC14515BC	454-123
MC14516BA	451-83
MC14516BC	451-84
MC14517BA	462-137
	3491-60
MC14517BC	462-138
	3491-57
MC14518BA	453-23
MC14518BC	453-24
MC14519BA	461-129
MC14519BC	461-130
MC14520BA	451-128
MC14520BC	451-129

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Motorola Semiconductor Products (Cont'd)

Device	Page-Line
MC14521BA	462-108
MC14521BC	462-109
MC14522BA	453-8
MC14522BC	453-9
MC14526BA	451-119
MC14526BC	451-120
MC14527BA	464-97
MC14527BC	464-98
MC14528BA	462-30
MC14528BC	462-31
MC14529BA	2423-18
	2423-77
MC14529BC	2423-19
	2423-78
MC14530BA	459-64
MC14530BC	459-65
MC14531BA	466-26
MC14531BC	466-27
MC14532BA	466-4
MC14532BC	466-5
MC14534BA	453-85
	¶ 232-4
MC14534BC	453-86
	¶ 232-4
MC14536BA	462-73
MC14536BC	462-74
MC14538BA	462-47
MC14538BC	462-48
MC14539BA	461-82
MC14539BC	461-83
MC1454	2896-82
MC145414	2948-94
MC14541BA	462-70
	2951-27
MC14541BC	462-71
	2951-28
MC145431	★ **3298**
	2948-95
MC145433	★ **3298**
	2948-96
MC145434	★ **3298**
	2948-97
MC14543BA	455-12
	¶ 260-2
	2464-47
	¶ 260-2
MC14543BC	455-13
	¶ 260-2
	2464-48
	¶ 260-2
MC145440	★ **3298**
	2948-126
MC145441	★ **3298**
	2948-127
MC14544BA	2464-44
MC14544BC	2464-45
MC14547BA	454-19
	2463-77
MC14547BC	454-20
	2463-78
MC14549BA	464-75
MC14549BC	464-76
MC1455	2951-37
MC14551BA	2420-2
MC14551BC	2420-3
MC14553BA	453-49
MC14553BC	453-50
MC14554BA	449-122
MC14554BC	449-123
MC14555BA	454-30
MC14555BC	454-31
MC14556BA	454-41
MC14556BC	454-42
MC14557BA	463-178
	3491-55
MC14557BC	463-179
MC14558BA	454-22
MC14558BC	454-23
MC14559BA	464-70
	¶ 256-14
MC14559BC	464-71
	¶ 256-14
MC1455BC	3491-51
MC1456	2933-9
	¶ 252-12
MC14560BA	449-1
	¶ 228-10
MC14560BC	449-2
	¶ 228-10
MC14561BA	449-117
	¶ 228-10
MC14561BC	449-118
	¶ 228-10
MC14562BA	463-182
	3491-42
MC14562BC	463-183
	3491-41
MC14566BA	453-106
MC14566BC	453-107
MC14568BA	453-111
	2945-32
MC14568BC	453-112
	2945-33
MC14569BC	453-152
MC1456C	2933-53
	¶ 252-12
MC14572A	459-70
	¶ 273-5
MC14572C	459-71
	¶ 273-5
MC14573	464-24
	2944-36
MC14574	464-23
	2895-51
MC14575	464-25
	2894-25
	2894-26
MC1458	2909-3
	2939-42
MC14580BA	460-78
	3470-42
MC14580BC	460-79
	3470-43
MC14581BA	449-61
MC14581BC	449-62
MC14582BA	449-73
MC14582BC	449-74
MC14583BA	464-113
MC14583BC	464-114
MC14584BA	465-22
MC14584BC	465-23
MC14585BA	449-86
MC14585BC	449-87
MC1458C	2940-33
MC1458N	2940-6
MC1458S	2940-7
MC14597BA	460-70
	1086-102
MC14597BC	460-71
	1086-103
MC14598BA	460-39
	1086-104
MC14598BC	460-40
	1086-105
MC14599BA	460-37
	1086-106
MC14599BC	460-38
	1086-107
MC1463G	★ **3295**
	2960-32
MC1463R	★ **3295**
	2960-35
MC1466	★ **3296**
	2960-19
MC1468	★ **3296**
	2958-69
	2960-26
	2960-28
	2960-66
	2960-68
MC146805	★ **1352**
MC146805E2	1091-88
	1067-20
MC146805F2	1091-52
	1067-21
MC146805G2	1067-22
MC14680G2	1091-53
MC146818	★ **1352**
	1092-15
MC146823	★ **1352**
	1092-90
MC1468705	★ **1352**
	★ **1730**
MC1468705G2	1067-23
MC1469	★ **3295**
	2959-55
	2959-56
MC1472	2482-49
MC1472U/PI	★ **2753**
MC1488	★ **2753**
	2469-56
	¶ 260-3
MC1489	★ **2753**
	2473-23
	¶ 260-3
MC1489A	★ **2753**
	2473-32
	¶ 260-3
MC1494	2964-160
MC1495	2964-161
MC1496	2962-92
MC1500-10	★ **2761**
	2966-152
MC1500-2	★ **2761**
	2966-51
MC1500-5	★ **2761**
	2966-82
MC1500-6	★ **2761**
	2966-2
MC1500A-10	★ **2761**
	2966-153
MC1500A-2	★ **2761**
	2966-52
MC1500A-5	★ **2761**
	2966-83
MC1500A-6	★ **2761**
	2966-3
MC1503	★ **2761**
	2966-53
MC1503A	★ **2761**
	2966-54
MC1504-10	★ **2761**
	2966-154
MC1504-5	★ **2761**
	2966-84
MC1504-6	★ **2761**
	2966-4
MC1504A-10	★ **2761**
	2966-155
MC1505	2438-34
MC1506	★ **2759**
	2439-29
MC1508-8	★ **2759**
	2442-34
	¶ 253-6
MC1514	2893-4
	¶ 270-14
	¶ 285-10
MC1536	2910-74
	2927-49
MC1536R	2960-51
MC1537	2939-8
MC1538	2887-21
MC1539	2925-43
MC1544	2485-76
MC1545	2888-42
MC1550	2888-75
MC1552	2888-76
MC1553	2888-77
MC1554	2896-83
	¶ 268-6
MC1555	2951-38
MC1556	2925-52
MC1558	2938-50
MC1558N	2939-7
MC1558S	2938-40
MC1563G	★ **3295**
	2960-34
MC1566	★ **3296**
MC15666	2960-20
MC1568	★ **3296**
	2958-70
	2960-27
	2960-29
	2960-67
	2960-69
MC1569	★ **3295**
	2959-112
	2959-113
MC1590G	2887-36
	¶ 268-7
MC1594	2964-162
MC1595	2964-163
MC1596	2962-93
MC1648	471-48
	2945-158
MC1648M	471-49
	2945-159
MC1650	471-51
	¶ 234-12
MC1651	471-52
MC1654	471-18
MC1658	471-45
	2945-160
MC1660	471-33
	¶ 235-3
MC1662	471-31
	¶ 234-10
	¶ 235-3
MC1664	471-28
	¶ 235-3
MC1666	471-26
MC1668	471-42
MC1670	471-21
MC1672	471-38
MC1674	471-40
MC1678	470-97
MC1688	471-37
MC1690	471-25
MC1692	471-54
	¶ 234-12
MC1694	471-47
	3489-87
MC1697	470-98
MC1699	470-99
MC1709	2929-5
MC1709A	2924-10
MC1710	2891-25
MC1710C	2892-16
MC1711	2893-27
MC1711C	2893-48
MC1723	★ **3295**
	2959-93
MC1723C	★ **3295**
	2959-94
MC1733	2888-78
	¶ 257-7
MC1733C	2888-79
	¶ 257-7
MC1741	2909-31
	2929-11
MC1741C	2930-47
MC1741N	2929-19
MC1741NC	2931-10
MC1741NS	2929-35
MC1741S	2929-33
MC1741SC	2931-8
MC1747	2938-51
MC1747C	2939-43
MC1748	2929-25
MC1748C	2930-60
MC1776	2911-163
	2912-37
	2928-19
	¶ 273-5
MC1776C	2912-4
	2912-53
	¶ 273-5
MC2261A	2486-66
MC2261B	2486-69
MC2261C	2486-70
MC2652	★ **1359**
	2486-93
MC2652-2	★ **1359**
	2486-94
MC2653	★ **1360**
	2467-29
MC2661A	★ **1360**
	1100-101
MC2661B	★ **1360**
	1100-102
MC2661C	★ **1360**
	1100-103
MC26S10	508-44
	2478-4
MC26S11	508-45
	2478-5
MC2801	2904-62
MC2901A	1049-13
MC2902AC	1085-129
MC2902AM	1085-130
MC2903	1085-86
	1049-14
MC3000	★ **729**
	492-29
MC3001	489-156
MC3002	494-151
MC3003	493-144
MC3004	491-157
MC3005	491-3
MC3006	489-58
MC3007	490-155
MC3008	477-184
MC3009	477-76
MC3010	490-113
MC3011	488-175
MC3012	490-57
MC3015	492-80
MC3016	492-81
MC3020	492-159
MC3021	495-60
MC3022	495-84
MC3023	492-181
MC3024	490-15
MC3025	490-16
MC3026	488-163
MC3028	484-48
MC3029	484-50
MC3031	492-137
MC3032	493-57
MC3051	487-85
	¶ 235-7
MC3052	487-92
	¶ 235-7
MC3060	485-82
	¶ 235-7
MC3061	488-5
	¶ 235-7
MC3062	488-6
	¶ 235-7
MC3100	★ **729**
	492-30
MC3101	489-157
MC3102	494-152
MC3103	493-145
MC3104	491-158
MC3105	491-4
MC3106	489-59
MC3107	490-156
MC3108	477-185
MC3109	477-77
MC3110	490-114
MC3111	488-176
MC3112	490-58
MC3115	492-82
MC3116	492-83
MC3120	492-160
MC3121	495-61
MC3122	495-85
MC3123	492-182
MC3124	490-17
MC3125	490-18
MC3126	488-164
MC3128	484-49
MC3129	484-51
MC3131	492-138
MC3132	493-58
MC3151	487-86
	¶ 235-7
MC3152	487-93
	¶ 235-7
MC3160	485-83
	¶ 235-7
MC3161	488-7
MC3162	488-8
	¶ 235-7
MC3221	2896-65
MC3232A	2481-22
MC3242A	2481-25
	¶ 286-9
MC3301	2913-99
MC3302	2895-46
MC3303	2913-89
MC3310	2901-7
MC3320	2896-66
MC3321	2896-67
MC3324	2894-22
	2965-109
MC3324A	2894-17
	2965-110
MC3325	2898-53
MC3330	2887-32
MC3333	2898-42
MC3340	2900-8
MC3344	2963-79
MC3346	2889-7
MC3357	2901-97
MC3359	2901-77
MC3360	2896-84
MC3370	2968-125
MC3380	511-103
	2960-113
MC3386	2889-8
MC3393	2946-83
MC3396	2945-69
MC34001	★ **3293**
	2933-3
MC34001A	★ **3293**
	2922-33
MC34001B	★ **3293**
	2927-33
MC34002	★ **3293**
	2940-23
MC34002A	★ **3293**
	2936-44
MC34002B	★ **3293**
	2938-8
MC34003A	2935-51
MC34004A	★ **3293**
	2941-23
MC34004B	★ **3293**
	2942-24
MC3401	2913-95
MC34022	2936-46
MC34022A	2935-52
	2936-38
MC3403	2913-90
MC3405	2888-3
	2895-45
MC34060	★ **3297**
	2960-114
MC34061	2965-105
MC34061A	2965-106
MC34062	2965-103
MC3408	★ **2759**
	2444-1
MC3410	★ **2759**
	2445-25
MC3410C	★ **2759**
	2447-28
MC3412	★ **2757**
	2452-30
MC3416	2423-4
	¶ 262-1
MC3417	2947-151
MC3418	2947-152
MC3419	★ **2756**
	2949-34
MC3419A	★ **2756**
	2949-35
MC3419C	★ **2756**
	2949-36
MC3420	★ **3297**
	2960-115
MC3423	2965-59
MC3424	2894-23
	2965-111
MC3424A	2894-18
	2965-112
MC3425	2965-115
MC3425A	2965-116
MC3426	2906-56
MC3430	2485-62
	2894-53
MC3431	2485-63
	2894-54
MC3432	2485-64
	2894-55
MC3433	2485-65
	2894-56
MC3437	2473-57
MC3438	2476-2
MC3440A	★ **2753**
	2476-47
MC3441A	★ **2753**
	2476-48
MC3442A	★ **2753**
	1092-70
MC3443A	★ **2753**
	2476-49
MC3446A	★ **2753**
	2476-20
MC3447	★ **2753**
	★ **2755**
	2475-52
MC3448A	★ **2753**
	2476-43
MC3449	507-105
MC3450	2475-12
	¶ 288-3
MC3452	2475-15
	¶ 288-3
MC3453A	2472-38
MC3456	2951-74

Arranged alphanumerically from left to right.

© IC MASTER 1983

Device	Page-Line
Motorola Semiconductor Products (Cont'd)	
MC3458	2913-53
MC3459	2483-51
	¶ 288-3
MC3460	2483-52
	¶ 288-3
MC3461	2485-61
MC3466	2483-85
MC3467	2888-39
MC3468	2888-40
MC3469	★ **2751**
MC3470	★ **2750**
	2887-43
MC3471	★ **2751**
MC3476	2912-5
	2912-54
MC3480	2481-19
	¶ 286-9
	1092-71
	¶ 286-9
MC3481	★ **2753**
	2469-42
MC3482	★ **2752**
	477-30
MC3482A	★ **2752**
	477-31
	★ **2752**
	1092-155
MC3482B	★ **2752**
	477-32
	★ **2752**
	1092-156
MC3485	★ **2753**
	2469-43
MC3486	★ **2753**
	2475-18
	¶ 258-16
	¶ 260-3
MC3487	2472-34
	¶ 258-16
	¶ 260-3
MC3488A	★ **2753**
MC3490	2465-54
MC3491	2465-111
MC3492	2465-112
MC3494	2465-55
MC35001A	★ **3293**
	2922-32
MC35001B	★ **3293**
	2927-29
MC35002	★ **3293**
	2940-24
MC35002A	★ **3293**
	2936-37
MC35002B	★ **3293**
	2938-7
MC35003A	2935-49
MC35004A	★ **3293**
	2941-14
MC35004B	★ **3293**
	2942-19
MC35022	2936-15
	2936-47
MC35022A	2935-50
MC35022B	2936-24
MC3503	2913-91
MC3505	2888-4
	2895-36
MC35060	★ **3297**
	2960-116
MC35061	2965-107
MC35061A	2965-108
MC35062	2965-104
MC3510	★ **2759**
	2445-26
MC3512	★ **2757**
	2450-18
MC3517	2947-153
MC3518	2947-154
MC3519	2949-37
MC3520	★ **3297**
	2960-117
MC3523	2965-60
MC3524	2894-21
	2965-113
MC3524A	2894-19
	2965-114
MC3525	2965-117
MC3525A	2965-118
MC3556	2951-75
MC3558	2938-39
MC3571	2943-5
MC3575	2912-82
MC3870	1090-55
	1067-24
MC4000	★ **729**
	498-17
	★ **729**
	2485-1
MC4001	482-124
MC4004	496-161
	3470-82
MC4005	496-162
	3470-83
MC4006	482-110
	¶ 285-10
MC4007	483-46
	¶ 285-10
MC4008	508-99
MC4010	507-66
MC4012	501-81
	3489-31
MC4015	485-110
MC4016	482-56
	¶ 237-1
	¶ 278-12
MC4017	482-57
MC4018	482-52
	¶ 237-1
MC4019	482-53
MC4021	474-28
MC4022	474-29
MC4023	482-77
MC4024	501-13
	¶ 237-1
	¶ 278-12
	2946-32
	¶ 237-1
	¶ 278-12
MC4038	482-108
	¶ 285-10
MC4039	2463-141
MC4040	482-123
	¶ 285-10
MC4041	507-45
	2467-34
MC4042	484-65
	2483-80
MC4043	2481-92
	¶ 285-10
MC4044	507-3
	¶ 237-1
	¶ 278-12
	2945-63
	¶ 237-1
	¶ 278-12
MC4048	482-109
MC4050	482-73
MC4051	482-74
MC4052	481-38
MC4053	479-4
MC4054	482-18
MC4055	480-33
MC4056	474-3
MC4060	506-1
MC4062	495-86
MC4064	3471-92
MC4068	505-128
	2485-48
MC4202	2942-44
MC4300	★ **729**
	498-18
	★ **729**
	2485-2
MC4304	496-163
	3470-84
MC4305	496-164
	3470-85
MC4306	482-111
MC4307	483-47
MC4308	508-100
MC4310	507-67
MC4312	501-82
	3489-32
MC4316	482-58
	¶ 278-12
MC4317	482-59
MC4318	482-54
MC4319	482-55
MC4321	474-30
MC4322	474-31
MC4324	501-14
	¶ 237-1
	¶ 278-12
	2946-33
	¶ 237-1
	¶ 278-12
MC4344	507-4
	¶ 237-1
	¶ 278-12
	2945-64
	¶ 237-1
	¶ 278-12
MC4350	482-75
MC4352	481-39
MC4353	479-5
MC4354	482-19
MC4355	480-34
MC4356	474-4
MC4363	506-2
MC4368	505-129
	2485-49
MC4558	2938-43
MC4558A	2938-44
MC4558C	2939-57
MC4558N	2938-45
MC4558NC	2939-58
MC4741	2943-3
MC4741C	2943-43
MC5400	492-2
MC5401	491-129
MC5402	494-88
MC5403	491-130
MC5404	477-158
MC5405	477-60
MC5406	484-161
MC5407	484-137
MC5408	489-127
MC5409	489-91
MC5410	490-171
MC54100	495-107
MC54107	487-172
MC54120	507-46
MC54121	500-99
MC54122	500-122
MC54123	500-159
MC5413	507-73
MC54132	507-121
MC54136	494-167
MC5414	507-151
MC54141	2464-73
MC54145	482-142
MC54150	500-79
MC54151	499-147
MC54152	500-4
MC54153	498-19
MC54154	484-26
MC54155	483-125
MC54156	483-93
MC54157	499-7
MC5416	484-148
MC54160	480-130
MC54161	478-107
MC54162	480-181
MC54163A	478-161
MC54165	502-69
	3490-48
MC54167	507-20
MC5417	484-126
MC54174	486-48
MC54175	485-116
MC54176	480-85
MC54177	478-47
MC54180	508-158
MC54181	475-5
MC54182	475-71
MC54190	481-166
MC54191	479-127
MC54192	481-129
MC54193	479-175
MC54194	501-144
	3488-76
MC54195	501-39
	3488-128
MC54196	480-86
MC54197	478-48
MC5420	490-87
MC5423	494-7
MC5425	493-177
MC5426	484-81
MC5427	494-35
MC54290	480-44
MC54293	479-33
MC54298	499-70
MC5430	492-65
MC5437	491-87
MC5438	491-38
MC5440	489-191
MC54408	508-101
MC5442	483-6
MC5443	482-103
MC5444	482-95
MC5445	482-132
MC54452	481-66
MC54453	479-6
MC54454	482-20
MC54455	480-35
MC54456	474-5
MC5446	2464-10
MC54460	506-3
MC54468	505-130
	2485-50
MC5447	2463-157
MC5448	2463-113
MC5449	2463-85
MC5450	492-148
MC5451	492-170
MC5453	493-80
MC5454	493-68
MC5460	493-22
MC5470	487-63
MC5472	487-77
MC5473	487-173
MC5474	485-59
MC5475	495-122
MC5476	488-41
MC5477	495-150
MC5480	474-142
MC5483	476-54
MC5485	474-45
MC5486	495-11
MC5490	480-45
MC5491	502-126
MC5491A	3491-7
MC5492	482-31
MC5493	479-34
MC5494	501-134
	3489-81
MC5495A	501-83
	3489-27
MC5496	501-183
	3489-106
MC5497	508-77
MC54ALS174	486-56
MC54F00	★ **731**
	492-23
MC54F02	★ **731**
	494-116
MC54F04	★ **731**
	477-178
MC54F08	★ **731**
	489-151
MC54F10	★ **731**
	490-172
MC54F109	★ **731**
	487-131
MC54F11	★ **731**
	489-53
MC54F112	★ **731**
MC54F113	★ **731**
MC54F114	★ **731**
MC54F138	★ **731**
	483-158
MC54F139	★ **731**
	483-60
MC54F151	★ **731**
	499-163
MC54F153	★ **731**
	498-35
MC54F157	★ **731**
	499-30
MC54F158	★ **731**
	498-124
MC54F160	★ **731**
	480-155
MC54F161	★ **731**
	478-132
MC54F162	★ **731**
	481-14
MC54F163	★ **731**
	478-179
MC54F168	★ **731**
MC54F169	★ **731**
MC54F174	★ **731**
MC54F175	★ **731**
	485-128
MC54F181	★ **731**
	475-22
MC54F182	★ **731**
	475-81
MC54F190	★ **731**
	482-2
MC54F191	★ **731**
	479-148
MC54F192	★ **731**
	481-144
MC54F193	★ **731**
	480-9
MC54F194	★ **731**
	501-154
MC54F195	★ **731**
MC54F20	★ **731**
	490-107
MC54F240	★ **731**
	503-126
MC54F241	★ **731**
	504-35
MC54F242	★ **731**
	503-58
MC54F243	★ **731**
	503-59
MC54F244	★ **731**
	503-172
MC54F245	★ **731**
	504-182
MC54F251	★ **731**
	500-43
MC54F253	★ **731**
	497-146
MC54F257	★ **731**
	498-162
MC54F258	★ **731**
	498-84
MC54F280	★ **731**
	509-8
MC54F283	★ **731**
MC54F2960	★ **731**
MC54F2968	★ **731**
MC54F2969	★ **731**
MC54F2970	★ **731**
MC54F299	★ **731**
	502-152
MC54F32	★ **731**
	493-141
MC54F350	★ **731**
MC54F352	★ **731**
	497-123
MC54F353	★ **731**
	497-91
MC54F373	★ **731**
	496-64
MC54F374	★ **731**
	487-3
MC54F378	★ **731**
MC54F379	★ **731**
	485-178
MC54F381	★ **731**
	475-23
MC54F382	★ **731**
	475-24
MC54F521	★ **731**
	474-88
MC54F533	★ **731**
	496-124
MC54F534	★ **731**
	486-129
MC54F537	★ **731**
	483-42
MC54F538	★ **731**
	484-7
MC54F539	★ **731**
	483-117
MC54F620	★ **731**
MC54F623	★ **731**
MC54F64	★ **731**
	493-101
MC54F640	★ **731**
MC54F643	★ **731**
MC54F645	★ **731**
MC54F74	★ **731**
	485-77
MC54F86	★ **731**
	495-28
MC54H87	508-70
MC54HC00	★ **733**
	457-95
MC54HC02	458-158
MC54HC03	457-82
MC54HC04	450-180
MC54HC08	456-181
MC54HC10	457-54
MC54HC107	456-75
MC54HC109	456-104
MC54HC11	456-158
MC54HC112	456-72
MC54HC132	465-1
MC54HC138	454-84
MC54HC139	454-59
MC54HC14	465-24
MC54HC147	454-163
MC54HC153	461-84
MC54HC157	461-98
MC54HC158	461-108
MC54HC160	452-137
MC54HC161	451-53
MC54HC162	452-109
MC54HC163	451-29
MC54HC164	463-104
MC54HC165	463-93
	466-31
MC54HC173	455-127
MC54HC174	455-168
MC54HC175	455-151
MC54HC192	452-166
MC54HC193	451-85
MC54HC194	462-152
MC54HC195	463-12
MC54HC20	457-20
MC54HC240	465-67
MC54HC241	465-86
MC54HC242	464-123
MC54HC243	464-134
MC54HC244	465-48
MC54HC245	465-134
MC54HC251	461-172
MC54HC253	461-89
MC54HC257	461-114
MC54HC259	460-48
MC54HC266	459-51
MC54HC27	458-125
MC54HC280	449-108
MC54HC30	457-137
MC54HC32	458-49
MC54HC354	461-173
MC54HC356	461-174
MC54HC367	450-97
MC54HC373	459-173
MC54HC374	456-37
MC54HC4002	458-94
MC54HC4017	452-83
MC54HC4020	452-19
MC54HC4024	451-156
MC54HC4040	451-184
MC54HC4060	452-37
MC54HC4075	458-29
MC54HC407B	458-196
MC54HC42	453-166
MC54HC4511	455-53
MC54HC4514	454-124
MC54HC4538	462-49
MC54HC4543	455-14
MC54HC51	457-196
MC54HC533	460-13
MC54HC563	460-14
MC54HC573	459-174
MC54HC574	456-38
MC54HC58	457-181
MC54HC640	465-118
MC54HC643	465-119
MC54HC645	465-135
MC54HC646	465-108
MC54HC648	465-100
MC54HC73	456-76
MC54HC74	455-93
MC54HC75	459-110
MC54HC76	456-105
MC54HC77	459-91
MC54HC85	449-88
MC54HC86	459-13
MC54HCU04	450-167
MC55107	2474-21
MC55108	2474-28
MC55325	2480-161
MC6170	2948-128

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Motorola Semiconductor Products (Cont'd)

Device	Page-Line
MC6172	★ 3298
MC6173	★ 3298
	2948-148
MC6190	2905-90
MC6191	2905-91
MC6192	2905-92
MC6193	2905-93
MC6194	2905-94
MC6195	2903-18
	2945-111
MC6482	477-33
MC6482A	477-34
MC6482B	477-35
MC660	★ 729
	472-76
MC661	472-77
MC662	472-44
MC663	472-64
MC664	472-65
MC665	473-33
MC666	473-34
MC667	473-12
MC668	472-97
MC669	473-4
MC670	472-88
MC671	472-89
MC672	472-98
MC673	472-116
	¶ 276-9
MC674	472-117
MC675	473-41
MC676	472-35
	2465-116
MC677	472-8
MC678	472-4
	472-17
MC67B	472-18
MC680	472-12
MC6800	★ 1351
	1091-143
	¶ 286-13
	¶ 238-15
	¶ 239-5
	¶ 243-5
	¶ 244-15
	¶ 245-3
	¶ 248-2
	★ 1351
	1067-25
	¶ 286-13
	¶ 238-15
	¶ 239-5
	¶ 243-5
	¶ 244-15
	¶ 245-3
	¶ 248-2
MC68000-10	★ 1355
	★ 1730
	1100-28
	¶ 287-18
	¶ 239-4
	¶ 241-3
	¶ 241-4
	¶ 241-11
	¶ 241-12
MC68000-12	★ 1355
	★ 1730
	1100-29
	¶ 287-18
	¶ 239-4
	¶ 241-3
	¶ 241-4
	¶ 241-11
	¶ 241-12
MC68000-4	★ 1355
	★ 1730
	1100-30
	¶ 287-18
	¶ 239-4
	¶ 241-3
	¶ 241-4
	¶ 241-11
	¶ 241-12
MC68000-6	★ 1355
	★ 1730
	1100-31
	¶ 287-18
	¶ 239-4
	¶ 241-3
	¶ 241-4
	¶ 241-11
	¶ 241-12
MC68000-8	★ 1355
	★ 1730
	1100-32
	¶ 287-18
	¶ 239-4
	¶ 241-3
	¶ 241-4
	¶ 241-11
	¶ 241-12
MC68000L10	1079-23
MC68000L12	1079-24
MC68000L4	1079-25
MC68000L6	1079-26
MC68000L8	1079-27
MC68000NPU	★ 1935
MC68008	★ 1356
	1100-17
	★ 1356
	1067-26
MC6800M	★ 1351
	1091-144
	¶ 286-13
	¶ 238-15
	¶ 239-5
	¶ 243-5
	¶ 244-15
	¶ 245-3
	¶ 248-2
MC6800NS	★ 1351
	1091-145
	¶ 286-13
	¶ 238-15
	¶ 239-5
	¶ 243-5
	¶ 244-15
	¶ 245-3
	¶ 248-2
MC6801	★ 1351
	★ 1730
	1091-77
	¶ 238-5
	¶ 240-3
	¶ 241-2
	★ 1351
	★ 1730
	1067-27
	¶ 238-5
	¶ 240-3
	¶ 241-2
MC6801-1	★ 1351
	★ 1730
	1091-78
	¶ 238-5
	¶ 240-3
	¶ 241-2
	★ 1351
	★ 1730
	1067-28
	¶ 238-5
	¶ 240-3
	¶ 241-2
MC6801O	★ 1356
	1100-18
	★ 1356
	1079-28
MC6801C	★ 1351
	★ 1730
	1091-79
	¶ 238-5
	¶ 240-3
	¶ 241-2
MC6801U4	1091-80
	1067-29
MC6801U4-1	1067-30
MC6802	★ 1351
	1091-107
	¶ 243-6
	★ 1351
	1067-31
	¶ 243-6
MC6802O	★ 1356
	1083-7
MC6803	★ 1351
	1091-66
	¶ 241-2
	★ 1351
	1067-32
	¶ 241-2
MC6803-1	★ 1351
	1091-67
	¶ 241-2
	★ 1351
	1067-33
	¶ 241-2
MC6803C	★ 1351
	1091-68
	¶ 241-2
MC6803E	★ 1351
	1067-34
	¶ 241-2
MC6803E-1	★ 1351
	1067-35
	¶ 241-2
MC6803U4	1091-81
	1067-36
MC6803U4-1	1067-37
MC6804	★ 1351
MC6804P2	1067-38
MC6805	★ 1351
MC6805P2	1091-82
	1069-1
MC6805P4	1091-83
	1069-2
MC6805P6	1069-3
MC6805R2	1091-71
	1069-4
MC6805R3	1069-5
MC6805T2	1091-51
	1069-6
MC6805U2	1091-84
	1069-7
MC6805U3	1069-8
MC6808	★ 1351
	1091-130
	★ 1351
	1069-9
MC6809	★ 1352
	1091-122
	¶ 238-7
	¶ 241-7
	★ 1352
	1069-10
	¶ 238-7
	¶ 241-7
MC6809E	★ 1352
	1091-95
	¶ 238-7
	¶ 241-7
	★ 1352
	1069-11
	¶ 238-7
	¶ 241-7
MC681	472-5
MC68120	★ 1352
	★ 1357
	★ 1730
	1100-37
	★ 1352
	★ 1357
	★ 1730
	1069-12
MC68120-1	★ 1352
	★ 1357
	★ 1730
	1069-13
MC68121	★ 1357
	1100-38
	★ 1357
	1069-14
MC68121-1	★ 1357
	1069-15
MC68122	1092-19
	1100-34
MC68122-1	1092-20
	1100-35
MC682	473-9
MC68200	1081-1
MC6821	★ 1351
	1092-91
	1102-57
	¶ 239-5
	¶ 246-5
MC6822	★ 1351
	1092-69
MC68230	★ 1357
MC68230L10	1100-45
MC68230L8	1100-46
MC6828	★ 1351
	1092-100
	1102-67
MC6829	★ 1351
	1092-73
MC683	473-1
MC6835	★ 1351
	1092-29
MC6839	★ 1351
	1092-53
MC684	472-29
MC6840	★ 1351
	1092-111
MC6840M	★ 1351
	1092-112
MC6843	★ 1351
	1092-59
MC6844	★ 1351
	1092-46
	¶ 241-7
MC68440	★ 1358
	1101-128
MC6844M	★ 1351
	1092-47
	¶ 241-7
MC6845	★ 1351
	1092-30
MC68450	★ 1358
MC68451	★ 1358
	1100-41
MC68452	★ 1359
MC6845M	★ 1351
	1092-31
MC6846	★ 1351
	1092-119
	¶ 243-6
MC6846M	★ 1351
	1092-120
	¶ 243-6
MC6847	★ 1351
	2906-45
	¶ 238-5
	¶ 238-7
	¶ 241-13
	★ 1351
	1092-147
	1100-49
	1101-109
	¶ 238-5
	¶ 238-7
	¶ 241-13
MC68478	1092-148
MC6847Y	★ 1351
	1100-50
	¶ 238-5
	¶ 238-7
	¶ 241-13
MC68488	★ 1351
	1092-64
MC68488M	★ 1351
	1092-65
MC685	472-20
MC6850	★ 1351
	2486-5
	¶ 258-1
	¶ 241-3
	★ 1351
	1092-5
	1102-30
	¶ 258-1
	¶ 241-3
MC6850M	★ 1351
	1092-6
	¶ 258-1
	¶ 241-3
MC6852	★ 1351
	2487-23
	¶ 241-12
	★ 1351
	1092-142
	1102-79
	¶ 241-12
MC6852M	★ 1351
	1092-143
	¶ 241-12
MC6854	★ 1351
	1091-156
MC6855	1092-50
MC68562	★ 1359
MC68564	★ 1359
MC6859	★ 1351
	510-66
	★ 1351
	1092-40
MC686	473-17
	3489-88
MC6860	★ 1351
	★ 3298
	2486-63
	¶ 258-8
	¶ 258-9
	★ 1351
	★ 3298
	2948-134
	¶ 258-8
	¶ 258-9
	★ 1351
	★ 3298
	1092-75
	¶ 258-8
	¶ 258-9
MC6860L	★ 1351
	★ 3298
	1092-76
	¶ 258-8
	¶ 258-9
MC6862	★ 1351
	2948-133
	★ 1351
	1092-41
MC68652	★ 1359
	2486-95
MC68652-2	★ 1359
	2486-96
MC68653	★ 1360
	2467-30
MC68661A	★ 1360
	2486-71
	★ 1360
	1100-104
MC68661B	★ 1360
	2486-73
	★ 1360
	1100-105
MC68661C	★ 1360
	2486-72
	★ 1360
	1100-106
MC68681	★ 1360
	2487-79
MC6870	1092-17
MC68701	★ 1351
	★ 1730
	1091-55
	¶ 241-2
	¶ 243-4
	★ 1351
	★ 1730
	1069-16
	¶ 241-2
	¶ 243-4
MC68701-1	★ 1351
	★ 1730
	1091-56
	¶ 241-2
	¶ 243-4
	★ 1351
	★ 1730
	1069-17
	¶ 241-2
	¶ 243-4
MC68701C	★ 1351
	★ 1730
	1091-57
	¶ 241-2
	¶ 243-4
MC68701C-1	★ 1351
	★ 1730
	1091-58
	¶ 241-2
	¶ 243-4
MC68701U4	1069-18
MC68701U4-1	1069-19
MC68705	★ 1351
	★ 1730
MC68705P3	1091-59
	1069-20
MC68705R3	1091-54
	1069-21
MC68705U3	1091-60
	1069-22
MC6871	1092-18
MC6875	1092-13
	¶ 244-15
	¶ 246-4
MC6875A	1092-14
	¶ 244-15
	¶ 246-4
MC688	472-59
	¶ 276-9
MC6880	2477-13
MC6880A	1092-10
MC6881	507-106
	1092-149
MC6882A	★ 2752
	1092-157
MC6882B	★ 2752
	1092-158
MC6883	497-82
	1092-131
MC6885	1092-151
MC6886	1092-152
MC6887	1092-153
MC6888	1092-154
MC68881	★ 1357
MC6889	508-24
	2477-27
	1092-11
MC689	472-6
MC6890	★ 2758
	2442-12
	★ 2758
	1092-38
MC68901	★ 1360
MC6890A	★ 2758
	2441-38
	★ 2758
	1092-39
MC68A00	1091-146
MC68A01	★ 1351
	1091-85
	★ 1351
	1069-23
MC68A02	1091-108
MC68A03	★ 1351
	1091-69
	★ 1351
	1069-24
MC68A08	1091-131
MC68A09	1091-123
MC68A09E	1091-96
MC68A21	1092-92
	1102-58
MC68A35	1092-32
MC68A39	1092-54
MC68A40	1092-113
MC68A44	1092-48
MC68A45	1092-33
MC68A46	1092-121
MC68A488	1092-66
MC68A50	1092-7
	1102-31
MC68A52	1092-144
MC68A54	1091-157
MC68B00	1091-147
MC68B01	★ 1351
	1091-86
	★ 1351
	1069-25
MC68B02	1091-109
MC68B03	★ 1351
	1091-70
	★ 1351
	1069-26
MC68B08	1091-132
MC68B09	1091-124
	¶ 248-10
MC68B09E	1091-97
	¶ 248-10
	¶ 248-10
MC68B21	1092-93
	1102-59
MC68B29	1092-74
MC68B35	1092-34
MC68B39	1092-55
MC68B40	1092-114
MC68B44	1092-49
MC68B45	1092-35
MC68B46	1092-122
MC68B488	1092-67
MC68B50	1092-8
	1102-32

Arranged alphanumerically from left to right.

© IC MASTER 1983

Motorola Semiconductor Products (Cont'd)

Device	Page-Line
MC68B52	1092-145
MC68B54	1091-158
MC690	472-13
MC691	473-37
MC693	472-94
	2483-98
MC696	473-29
MC697	472-14
MC699	472-43
MC7241	495-12
MC7242	495-64
MC7250	482-112
MC7260	474-168
MC7261	474-137
MC7266	498-68
MC7267	499-62
MC7270	501-104
	3488-55
MC7271	501-112
	3488-56
MC7280	480-87
MC7281	478-49
MC7400	492-3
MC7401	491-131
MC7402	494-89
MC7403	491-132
MC7404	477-159
MC7405	477-61
MC7406	485-1
MC7407	484-138
MC7408	489-128
MC7409	489-92
MC7410	490-173
MC74100	495-108
MC74107	487-174
MC74120	507-47
MC74121	500-100
MC74122	500-123
MC74123	500-160
MC7413	507-74
MC74132	507-122
MC74136	494-168
MC7414	507-152
MC74141	2464-74
MC74145	482-143
MC74150	500-80
MC74151	499-148
MC74152	500-5
MC74153	498-20
MC74154	484-27
MC74155	483-126
MC74156	483-94
MC74157	499-8
MC7416	484-149
MC74160	480-131
MC74161	478-108
MC74162	480-182
MC74163A	478-162
MC74165	502-70
	3490-49
MC74167	507-21
MC7417	484-127
MC74174	486-49
MC74175	485-117
MC74176	480-88
MC74177	478-50
MC74180	508-159
MC74181	475-6
MC74182	475-72
MC74190	481-167
MC74191	479-128
MC74192	481-130
MC74193	479-176
MC74194	501-145
	3488-77
MC74195	501-40
	3488-129
MC74196	480-89
MC74197	478-51
MC7420	490-88
MC7423	494-8
MC7425	493-178
MC7426	484-82
MC7427	494-36
MC74290	480-46
MC74293	479-35
MC74298	499-71
MC7430	492-66
MC7437	491-88
MC7438	491-39
MC7440	490-1
MC74408	508-102
MC7442	483-7
MC7443	482-104
MC7444	482-96
MC7445	482-133
MC74452	481-67
MC74453	479-7
MC74454	482-21
MC74455	480-36
MC74456	474-6
MC7446	2464-11
MC74460	506-4
MC74468	505-131
	2485-51
MC7447	2463-158
MC7448	2463-114
MC7449	2463-86
MC7450	492-149
MC7451	492-171
MC7453	493-81
MC7454	493-69
MC7460	493-23
MC7470	487-64
MC7472	487-78
MC7473	487-175
MC7474	485-60
MC7475	495-123
MC7476	488-42
MC7477	495-151
MC7480	474-143
MC7482	474-161
MC7483	476-55
MC7485	474-46
MC7486	495-13
MC7490	480-47
MC7491	502-127
MC7491A	3491-8
MC7492	482-32
MC7493	479-36
MC7494	501-135
	3489-82
MC7495A	501-84
	3489-28
MC7496	501-184
	3489-107
MC7497	508-78
MC74ALS174	486-57
MC74F11	★ 731
MC74F00	★ 731
	492-24
MC74F02	★ 731
	494-117
MC74F04	★ 731
	477-179
MC74F08	★ 731
	489-152
MC74F10	★ 731
	490-192
MC74F109	★ 731
	487-132
MC74F11	★ 731
	489-54
MC74F112	★ 731
MC74F113	★ 731
MC74F114	★ 731
MC74F138	★ 731
	483-159
MC74F139	★ 731
	483-61
MC74F151	★ 731
	499-164
MC74F153	★ 731
	498-36
MC74F157	★ 731
	499-31
MC74F158	★ 731
	498-125
MC74F160	★ 731
	480-156
MC74F161	★ 731
	478-133
MC74F162	★ 731
	481-15
MC74F163	★ 731
	478-180
MC74F168	★ 731
MC74F169	★ 731
MC74F174	★ 731
MC74F175	★ 731
	485-129
MC74F181	★ 731
	475-25
MC74F182	★ 731
	475-82
MC74F190	★ 731
	482-3
MC74F191	★ 731
	479-149
MC74F192	★ 731
	481-145
MC74F193	★ 731
	480-10
MC74F194	★ 731
	501-155
MC74F195	★ 731
MC74F20	★ 731
	490-108
MC74F240	★ 731
	503-127
MC74F241	★ 731
	504-36
MC74F242	★ 731
	503-60
MC74F243	★ 731
	503-61
MC74F244	★ 731
	503-173
MC74F245	★ 731
	504-183
MC74F251	★ 731
	500-44
MC74F253	★ 731
	497-147
MC74F257	★ 731
	498-163
MC74F258	★ 731
	498-85
MC74F280	★ 731
	509-9
MC74F283	★ 731
MC74F2960	★ 731
MC74F2968	★ 731
MC74F2969	★ 731
MC74F2970	★ 731
MC74F299	★ 731
	502-153
MC74F32	★ 731
	493-142
MC74F350	★ 731
MC74F352	★ 731
	497-124
MC74F353	★ 731
	497-92
MC74F373	★ 731
	496-65
MC74F374	★ 731
	487-4
MC74F378	★ 731
MC74F379	★ 731
	485-179
MC74F381	★ 731
	475-26
MC74F382	★ 731
	475-27
MC74F521	★ 731
	474-89
MC74F533	★ 731
	496-125
MC74F534	★ 731
	486-130
MC74F537	★ 731
	483-43
MC74F538	★ 731
	484-8
MC74F539	★ 731
	483-118
MC74F620	★ 731
MC74F623	★ 731
MC74F64	★ 731
	493-102
MC74F640	★ 731
MC74F643	★ 731
MC74F645	★ 731
MC74F74	★ 731
	485-78
MC74F86	★ 731
	495-29
MC74H87	508-71
MC74HC00	★ 733
	457-96
MC74HC02	458-159
MC74HC03	457-83
MC74HC04	450-181
MC74HC08	456-182
MC74HC10	457-55
MC74HC107	456-77
MC74HC109	456-106
MC74HC11	456-159
MC74HC112	456-73
MC74HC132	465-2
MC74HC138	454-85
MC74HC139	454-60
MC74HC14	455-25
MC74HC147	454-164
MC74HC153	461-85
MC74HC157	461-99
MC74HC158	461-109
MC74HC160	452-138
MC74HC161	451-54
MC74HC162	452-110
MC74HC163	451-30
MC74HC164	463-105
MC74HC165	463-94
MC74HC173	455-128
MC74HC174	455-169
MC74HC175	455-152
MC74HC192	452-167
MC74HC193	451-86
MC74HC194	462-153
MC74HC195	463-13
MC74HC20	457-21
MC74HC240	465-68
MC74HC241	465-87
MC74HC242	464-124
MC74HC243	464-135
MC74HC244	465-49
MC74HC245	465-136
MC74HC251	461-175
MC74HC253	461-90
MC74HC257	461-115
MC74HC259	460-49
MC74HC266	459-52
MC74HC27	458-126
MC74HC280	449-109
MC74HC30	457-138
MC74HC32	458-50
MC74HC354	461-176
MC74HC356	461-177
MC74HC367	450-98
MC74HC373	459-175
MC74HC374	456-39
MC74HC4002	458-95
MC74HC4017	452-84
MC74HC4020	452-20
MC74HC4024	451-157
MC74HC4040	451-185
MC74HC4060	452-38
MC74HC4075	458-30
MC74HC4078	458-197
MC74HC42	453-167
MC74HC4511	455-54
MC74HC4514	454-125
MC74HC4538	462-50
MC74HC4543	455-15
MC74HC51	457-197
MC74HC533	460-15
MC74HC563	460-16
MC74HC573	459-176
MC74HC574	456-40
MC74HC58	457-182
MC74HC640	465-120
MC74HC643	465-121
MC74HC645	465-137
MC74HC646	465-109
MC74HC648	465-101
MC74HC73	456-78
MC74HC74	455-94
MC74HC75	459-111
MC74HC76	456-107
MC74HC77	459-92
MC74HC85	449-89
MC74HC86	459-14
MC74HCU04	450-168
MC75107	2474-22
	¶ 257-7
	¶ 260-3
MC75108	2474-29
MC75109	2472-13
MC75110	2472-19
	¶ 260-3
MC75125	★ 2753
	2473-61
MC75126	★ 2753
MC75127	★ 2753
	2473-62
MC75128	★ 2753
	2474-4
MC75129	★ 2753
	2474-5
MC75140	2472-60
MC75325	2480-162
MC75358	469-64
	2481-83
MC75365	2483-41
MC75368	469-65
	2481-84
MC75450	2481-122
MC75451	2481-123
MC75452	2482-25
MC75453	2482-96
MC75454	2482-61
MC75461	2481-124
MC75462	2482-26
MC75463	2482-97
MC75464	2482-62
MC75491	2464-139
MC75492	2465-37
MC75S110	2472-20
MC7705C	2952-37
MC7805	2952-79
MC7805A	2952-80
MC7805AC	2952-81
MC7805C	2952-82
MC7806	2953-23
MC7806A	2953-24
MC7806AC	2953-25
MC7806C	2953-26
MC7808	★ 3294
	2953-89
MC7808A	★ 3294
	2953-90
MC7808AC	★ 3294
	2953-91
MC7808C	★ 3294
	2953-92
MC7812	★ 3294
	2954-58
MC7812A	★ 3294
	2954-59
MC7812AC	★ 3294
	2954-60
MC7812C	★ 3294
	2954-61
MC7815	★ 3294
	2955-20
MC7815A	★ 3294
	2955-21
MC7815AC	★ 3294
	2955-22
MC7815C	★ 3294
	2955-23
MC7818	★ 3294
	2955-90
MC7818A	★ 3294
	2955-91
MC7818AC	★ 3294
	2955-92
MC7818C	★ 3294
	2955-93
MC7824	2956-43
MC7824A	2956-44
MC7824AC	2956-45
MC7824C	2956-46
MC78L00	★ 3294
MC78L02C	2952-2
MC78L05AC	2952-7
MC78L05C	2952-8
MC78L08AC	2953-61
MC78L08C	2953-62
MC78L12AC	2954-13
MC78L12C	2954-14
MC78L15AC	2954-111
MC78L15C	2954-112
MC78L18AC	2955-62
MC78L18C	2955-63
MC78L24AC	2956-10
MC78L24C	2956-11
MC78M00	★ 3294
MC78M05C	2952-38
MC78M06C	2953-6
MC78M08C	2953-73
MC78M12C	2954-28
MC78M15C	2954-126
MC78M18C	2955-67
MC78M20C	2955-119
MC78M24C	2956-18
MC78T00	★ 3294
MC78T05	2952-114
MC78T05A	2952-115
MC78T05AC	2952-116
MC78T05C	2952-117
MC78T06	2953-44
MC78T06C	2953-45
MC78T08	2953-106
MC78T08C	2953-107
MC78T12	2954-92
MC78T12A	2954-93
MC78T12AC	2954-94
MC78T12C	2954-95
MC78T15	2955-50
MC78T15A	2955-51
MC78T15AC	2955-52
MC78T15C	2955-53
MC78T18	2955-106
MC78T18C	2955-107
MC78T24	2956-63
MC78T24C	2956-64
MC7902C	2956-83
MC7905	2957-9
MC79052C	2956-129
MC7905C	★ 3294
	2956-115
MC7906C	★ 3294
	2957-25
MC7908C	★ 3294
	2957-39
MC7912AC	★ 3294
	2957-85
MC7912C	★ 3294
	2957-86
MC7915AC	★ 3294
	2957-130
MC7915C	★ 3294
	2957-131
MC7918C	★ 3294
	2958-20
MC7924C	★ 3294
	2958-54
MC79L00	★ 3294
MC79L03AC	2956-87
MC79L03C	2956-88
MC79L05AC	2956-89
MC79L05C	2956-90
MC79L12AC	2957-57
MC79L12C	2957-58
MC79L15A	2957-118
MC79L15AC	2957-100
MC79L15C	2957-101
MC79L18AC	2958-21
MC79L18C	2958-15
MC79L24AC	2958-48
MC79L24C	2958-49
MC8241	495-14
MC8242	495-65
MC8250	482-113
MC8260	474-169
MC8261	474-138
MC8266	498-69
MC8267	499-63
MC8270	501-105
	3488-57
MC8271	501-113
	3488-58
MC8281	478-52
MC82S100C	3458-21
MC82S100M	3458-25
MC82S101C	3458-17
MC82S101M	3458-23
MC830	★ 729
MC8300	501-41
	3488-50
MC8301	483-8
MC8304	474-148
MC8307	2463-115
MC8308	495-99
MC8309	497-107
MC8310	480-132
MC8311	484-28
MC8312	499-123
MC8314	495-158
MC8316	478-109

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Motorola Semiconductor Products (Cont'd)

Device	Page-Line
MC8318	508-129
MC8322	499-9
MC8324	474-47
MC8328	503-3
	3491-26
MC8500	2467-2
MC8501	2467-24
MC8502	2467-26
MC8503	2467-31
MC8504	508-74
	2467-33
MC8505	506-167
	2481-18
MC8506	507-5
	2467-28
MC8507	1092-101
	1102-68
MC8520	2467-10
MC854	2486-6
MC8601	500-109
MC8602	500-180
MC8T13	2469-7
MC8T14	2473-13
MC8T23	2469-1
MC8T24	2473-8
MC8T26A	508-13
	2477-14
	1090-27
MC8T28	508-25
	2477-28
	1090-28
MC8T95	477-24
	1090-31
MC8T96	477-148
	1090-32
MC8T97	477-25
	1090-33
MC8T98	477-149
	1090-34
MC930	★ 729
MC9300	501-42
	3488-51
MC9301	483-9
MC9304	474-149
MC9307	2463-116
MC9309	497-108
MC9310	480-133
MC9311	484-29
MC9312	499-124
MC9314	495-159
MC9316	478-110
MC9318	508-130
MC9322	499-10
MC9324	474-48
MC9328	503-4
	3491-27
MC9601	500-110
MC9602	500-181
MCA-series	2967-5
MCA1000ECL	★ 4479
	4141-44
MCA1200ECL	★ 4479
	4141-45
MCA1300ALS	★ 4479
	4141-46
MCA2500ECL	★ 4480
MCA2800ALS	★ 4479
	4141-47
MCA500ALS	★ 4479
	4141-48
MCA600ECL	★ 4479
	4141-49
MCC14457	464-65
MCC14458	464-66
MCH-01	3453-30
MCM10139	468-144
	3459-9
MCM10143	★ 3839
	468-151
	¶ 234-6
	★ 3839
	3470-77
	¶ 234-6
MCM10144	★ 3839
	468-168
	★ 3839
MCM10145	★ 3839
	468-155
	★ 3839
	3470-92
MCM10146	★ 3839
	469-18
	★ 3839
	3475-53
MCM10146A	★ 3839
	3475-33
MCM10147	★ 3839
	468-164
	★ 3839
	3472-45
	3472-45
MCM10148	★ 3839
	3472-10
MCM10149	468-148
	3459-69
MCM10152	★ 3839
	468-169
	★ 3839
	3472-73
MCM10415A	★ 3839
	469-19
MCM10422	★ 3839
	3473-26
MCM10470	★ 3839
MCM10474	★ 3839
MCM10544	468-170
MCM10545	3470-94
MCM10546	469-20
	3475-68
MCM10547	468-165
MCM10548	468-160
MCM14505A	460-108
	3472-14
MCM14505C	460-109
	3472-15
MCM14524A	★ 3840
	461-11
	★ 3840
	3484-2
MCM14524C	★ 3840
	461-12
	★ 3840
	3484-3
MCM14537A	460-117
	3472-64
	3472-64
MCM14537C	460-118
	3472-67
	3472-67
MCM14552A	460-130
	3472-6
MCM14552C	460-131
	3472-7
MCM2016-15	★ 3839
	★ 3846
	3480-55
MCM2016-20	★ 3839
	★ 3846
	3480-92
MCM2114-20	★ 3839
	3478-26
MCM2114-25	★ 3839
	3478-55
MCM2114-30	★ 3839
	3478-96
MCM2114-45	★ 3839
	3479-33
MCM2115A-45	3475-73
MCM2115A-55	3475-90
MCM2115A-70	3475-105
MCM2125A-45	3475-77
MCM2125A-55	3475-91
MCM2125A-70	3476-2
MCM2147-100	3482-2
MCM2147-55	3481-69
MCM2147-70	3481-101
MCM2147-85	3481-113
MCM2149-55	3477-58
MCM2149-85	3477-88
MCM21L14-20	★ 3839
	3478-27
MCM21L14-25	★ 3839
	3478-56
MCM21L14-30	★ 3839
	3478-97
MCM21L14-45	★ 3839
	3479-34
MCM21L15A-45	3475-74
MCM21L15A-70	3475-106
MCM21L25A-45	3475-78
MCM21L25A-70	3476-3
MCM2532	3466-65
MCM2532-25	3466-45
MCM2532-35	3466-54
MCM25L32	3466-66
MCM25L32-25	3466-46
MCM2708	3463-83
MCM2716	3465-76
MCM2716-25	3465-12
MCM2716-35	3465-38
MCM27A08	3463-70
MCM27L16	3465-77
MCM27L16-25	3465-13
MCM27L16-35	3465-39
MCM2801	★ 3839
	★ 3847
	3459-1
MCM2802	★ 3839
	3459-2
MCM2816	★ 3839
MCM2817	★ 3839
MCM2832	★ 3839
	★ 3848
MCM4027A-1	3468-16
	¶ 287-17
MCM4027A-2	3468-21
	¶ 287-17
MCM4027A-3	3468-29
	¶ 287-17
MCM4027A-4	3468-41
	¶ 287-17
MCM4116B-15	★ 3839
	3468-98
	¶ 286-9
	¶ 287-17
	¶ 287-18
MCM4116B-20	★ 3839
	3469-10
	¶ 286-9
	¶ 287-17
	¶ 287-18
MCM4116B-25	★ 3839
	3469-27
	¶ 286-9
	¶ 287-17
	¶ 287-18
MCM4116B-30	★ 3839
	3469-36
	¶ 286-9
	¶ 287-17
	¶ 287-18
MCM4117-20	3469-19
MCM4117-25	3469-33
MCM4132-15	3469-50
MCM4132-20	3469-55
MCM4132-25	3469-61
MCM4132-30	3469-65
MCM4517-10	★ 3839
	★ 3844
	3468-69
MCM4517-12	★ 3839
	★ 3844
	3468-78
MCM4517-15	★ 3839
	★ 3844
	3468-90
MCM4517-20	★ 3839
	★ 3844
	3469-1
MCM5101	460-172
MCM5101-65	3474-113
MCM5101-80	3475-4
MCM51L01-45	3474-84
MCM51L01-65	3474-114
MCM6256-10	★ 3841
	3470-40
MCM6256-20	★ 3841
	3470-41
MCM63256	★ 3840
	★ 3849
MCM6508	460-150
MCM6508-25	3476-45
MCM6508-30	3476-71
MCM6508-40	3476-96
MCM65116-12	★ 3839
	3480-56
MCM65116-15	★ 3839
	3480-46
MCM65147-55	★ 3839
	★ 3845
	3481-55
MCM65147-70	★ 3839
	★ 3845
	3481-85
MCM65147-85	★ 3839
	★ 3845
	3481-86
MCM6518	460-151
MCM6518-25	3476-52
MCM6518-30	3476-73
MCM6518-46	3477-4
MCM65256	★ 3840
	3487-50
MCM65516	★ 3840
	1092-124
MCM65516-43	★ 3840
	3485-27
MCM65516-55	★ 3840
	3485-54
MCM6632-15	3469-51
MCM6632-20	3469-56
MCM6632-25	3469-62
MCM6632A-12	3469-46
MCM6632A-15	3469-52
MCM6632A-20	3469-57
MCM6633-15	3469-53
MCM6633-20	3469-58
MCM6633-25	3469-63
MCM6641-20	3482-31
MCM6641-25	3482-45
MCM6641-30	3482-74
MCM6641-45	3482-101
MCM6664-15	★ 3839
	★ 3842
	3469-92
	¶ 287-17
	¶ 287-18
MCM6664-20	★ 3839
	★ 3842
	3470-17
	¶ 287-17
	¶ 287-18
MCM6664-25	★ 3839
	★ 3842
	3470-29
	¶ 287-17
	¶ 287-18
MCM6664A-12	★ 3839
	★ 3842
	3469-71
	¶ 287-17
	¶ 287-18
MCM6664A-15	★ 3839
	★ 3842
	3469-93
	¶ 287-17
	¶ 287-18
MCM6664A-20	★ 3839
	★ 3842
	3470-18
	¶ 287-17
	¶ 287-18
MCM6665-15	★ 3839
	★ 3843
	3470-1
MCM6665-20	★ 3839
	★ 3843
	3470-19
MCM6665A-12	★ 3839
	★ 3843
	3469-78
MCM6665A-15	★ 3839
	★ 3843
	3470-2
MCM6665A-20	★ 3839
	★ 3843
	3470-20
MCM6670	★ 3840
	3453-16
MCM66700	★ 3840
	3453-43
MCM66710	★ 3840
	3453-44
MCM66714	★ 3840
	3453-45
MCM66720	★ 3840
	3453-46
MCM66730	★ 3840
	3453-47
MCM66734	★ 3840
	3453-48
MCM6674	★ 3840
	3453-17
MCM66740	★ 3840
	3453-49
MCM66750	★ 3840
	3453-50
MCM66751	3453-51
MCM66760	★ 3840
	3453-52
MCM66770	★ 3840
	3453-53
MCM66780	★ 3840
	3453-54
MCM66790	★ 3840
	3453-55
MCM66L41-20	3482-32
MCM66L41-25	3482-46
MCM66L41-30	3482-75
MCM66L41-45	3482-102
MCM6810	★ 1351
	★ 3839
	3472-62
	3472-62
MCM68316	3454-4
MCM68364	★ 3840
	3486-30
MCM68364-25	★ 3840
	3486-52
MCM68364-30	★ 3840
	3486-83
MCM68365-25	★ 3840
	3486-53
MCM68365-35	★ 3840
	3486-101
MCM68366-25	★ 3840
	3486-54
MCM68366-35	★ 3840
	3486-102
MCM68708	3463-84
MCM6874-35	3466-103
MCM68764	★ 3839
	3467-3
MCM68766	★ 3839
	3467-4
MCM68766-35	★ 3839
	3466-104
MCM68A10	★ 3839
	3472-57
	3472-57
MCM68A308	★ 3840
	3484-73
MCM68A308P7	3484-74
MCM68A30A	3484-71
MCM68A316A	★ 3840
	3485-21
MCM68A316E	★ 3840
	3485-22
MCM68A316E-91	★ 3840
	3454-5
MCM68A316EP91	3485-23
MCM68A332	★ 3840
	3485-103
MCM68A332P2	★ 3840
	3485-104
MCM68A364	3486-103
MCM68A364P3	3486-104
MCM68A708	3463-71
MCM68B10	★ 3839
	3472-51
	3472-51
MCM68B308	★ 3840
	3484-55
MCM68B30A	3484-56
MCM68B364	3486-55
MCM68L764-35	3466-105
MCM76161	3464-100
MCM76161A	3464-80
MCM7621	3460-89
MCM7621A	3460-58
MCM7641	3461-70
MCM7641A	3460-60
MCM7643A	3462-8
	3462-8
MCM7649	3461-62
MCM7680C	3463-1
MCM7680M	3463-37
MCM7681A	3462-86
MCM7681C	3463-14
MCM7681M	3463-39
MCM7684C	3464-13
MCM7684M	3464-28
MCM7685A	3464-67
MCM7685C	3464-18
MCM7685M	3464-29
MCM7686	3464-19
MCM7687	3464-20
MCM7688	3463-92
MCM7689	3463-93
MCM82707C	3463-2
MCM82707M	3463-38
MCM82708C	3463-15
MCM82708M	3463-40
MCM93412C	3473-68
MCM93412M	3473-84
MCM93415C	★ 3839
	3475-82
MCM93415M	★ 3839
	3475-95
MCM93422C	★ 3839
	3473-73
MCM93422M	★ 3839
	3473-90
MCM93425C	★ 3839
	3475-86
MCM93425M	★ 3839
	3475-98
MCM93L422	★ 3839
MEX6801	★ 1737
MEX6805	★ 1737
MEX6805R2	★ 1737
MEX6809-22	★ 1940
MEX6816-1HR	★ 1940
MEX6816-22D	★ 1940
MEX6816-22S	★ 1940
MEX6820	★ 1940
MEX6821-2	★ 1940
MEX6832-1HR	★ 1940
MEX6832-22	★ 1940
MEX6848-1HR	★ 1940
MEX6848-22	★ 1940
MEX6850	★ 1940
MEX6850-2	★ 1940
MEX6864-1HR	★ 1940
MEX6864-22	★ 1940
MEX68KDM	1767-34
MEX68RR	★ 1940
MEX68SA2	★ 1737
MG8PPS	4006-3
MHQ3467	2889-156
MHQ4001A	2889-136
MHQ4002A	2889-137
MHQ4013	2889-138
MHQ4014	2889-139
MHW1121	2903-45
MHW1127	2903-46
MHW1171	2903-47
MHW1172	2903-48
MHW1182	2903-49
MHW1221	2903-50
MHW1222	2903-51
MHW1341	2903-52
MHW1342	2903-53
MHW1343	2903-54
MHW1391	2903-55
MHW1392	2903-56
MHW401	2888-44
MHW5181	2903-57
MHW5182	2903-58
MHW559	2903-59
MHW560	2903-60
MHW561	2903-61
MHW562	2903-62
MHW570	2903-63
MHW572	2903-64
MHW580	2903-65
MHW590	2888-45
MHW591	2888-46
MHW592	2888-47
MHW593	2888-48
MHW594	2903-66
MHW595	2903-67
MHW601	2888-49
MHW602	2888-50
MHW603	2888-51
MHW709	2888-52
MHW710	2888-53
MMBTS102	2968-23
MMBTS103	2968-24
MMBTS105	2968-25
MMH0026	2481-94

Arranged alphanumerically from left to right.

© IC MASTER 1983

Device	Page-Line
Motorola Semiconductor Products (Cont'd)	
MMH0026C	2481-95
MPQ3303	2889-140
MPQ3725	2889-141
MPQ3725A	2889-142
MPQ4003	2889-143
MPQ4004	2889-144
MPQ6842	1092-12
MPRINT703	★ 1738
MVMC682-114	★ 1942
MVMC682-114H	★ 1942
MVMC682-118	★ 1942
MVMC682-118H	★ 1942
MVME110	★ 1936 1769-1
MVME200	★ 1936
MVME201	★ 1936
MVME210	★ 1936
MVME300	★ 1936
MVME301	★ 1936
MVME400	★ 1941
MVME410	★ 1941
MVME420	★ 1941
MVME435	★ 1941
MVME600	★ 1941
MVME605	★ 1941
MVME610	★ 1941
MVME615	★ 1941
MVME620	★ 1941
MVME625	★ 1941
MVME930	★ 1936
MVME931	★ 1936
MVME932	★ 1941
MVME933	★ 1941
MVMEBUG	★ 1936
NE565	2946-2
NE592	2888-80
SE592	2888-81
SG1525	★ 3297
SG1526	★ 3297 2960-118
SG1527	★ 3297
SG2525	★ 3297
SG2526	★ 3297 2960-119
SG2527	★ 3297
SG3525	★ 3297
SG3526	★ 3297 2960-120
SG3527	★ 3297
SN54ALS00	★ 732 492-11
SN54ALS01	★ 732 491-145
SN54ALS02	★ 732 494-100
SN54ALS03	★ 732 491-146
SN54ALS04	★ 732 477-168
SN54ALS05	★ 732 477-68
SN54ALS08	★ 732 489-135
SN54ALS09	★ 732 489-97
SN54ALS10	★ 732 490-182
SN54ALS109	★ 732 487-121
SN54ALS11	★ 732 489-43
SN54ALS12	★ 732 490-151
SN54ALS13	★ 732
SN54ALS132	★ 732
SN54ALS138	★ 732 483-148
SN54ALS139	★ 732 483-54
SN54ALS14	★ 732
SN54ALS15	★ 732 489-11
SN54ALS151	★ 732 499-155
SN54ALS153	★ 732 498-27
SN54ALS157	★ 732 499-24
SN54ALS158	★ 732 498-118
SN54ALS160	★ 732 480-145
SN54ALS161	★ 732 478-122
SN54ALS162	★ 732 480-187
SN54ALS163	★ 732 478-169
SN54ALS164	★ 732 502-26
SN54ALS168	★ 732 481-94
SN54ALS169	★ 732 479-03
SN54ALS190	★ 732 481-174
SN54ALS191	★ 732 479-135
SN54ALS192	★ 732 481-138
SN54ALS193	★ 732 480-3
SN54ALS20	★ 732 490-97
SN54ALS22	★ 732 490-51
SN54ALS238	★ 732
SN54ALS239	★ 732
SN54ALS240	★ 732 503-116
SN54ALS241	★ 732 504-21
SN54ALS242	★ 732 503-31
SN54ALS243	★ 732 503-32
SN54ALS244	★ 732 503-110
SN54ALS245	★ 732 504-163
SN54ALS251	★ 732 500-35
SN54ALS253	★ 732 497-139
SN54ALS257	★ 732 498-156
SN54ALS258	★ 732 498-78
SN54ALS27	★ 732 494-43
SN54ALS273	★ 732 486-146
SN54ALS28	★ 732 494-101
SN54ALS32	★ 732 493-131
SN54ALS33	★ 732 494-67
SN54ALS352	★ 732 497-115
SN54ALS353	★ 732 497-84
SN54ALS37	★ 732 491-97
SN54ALS373	★ 732 496-48
SN54ALS374	★ 732 486-171
SN54ALS377	★ 732 487-38
SN54ALS38	★ 732 491-49
SN54ALS40	★ 732 490-9
SN54ALS533	★ 732 496-106
SN54ALS534	★ 732 486-115
SN54ALS537	★ 732
SN54ALS538	★ 732 483-149
SN54ALS539	★ 732 483-50
SN54ALS540	★ 732
SN54ALS541	★ 732
SN54ALS560	★ 732 481-68
SN54ALS561	★ 732 482-78
SN54ALS563	★ 732 496-107
SN54ALS564	★ 732 486-116
SN54ALS568	★ 732 481-90
SN54ALS569	★ 732 479-86
SN54ALS573	★ 732 496-49
SN54ALS574	★ 732 486-172
SN54ALS576	★ 732 489-136
SN54ALS580	★ 732 486-103
SN54ALS620	★ 732 505-93
SN54ALS621	★ 732 505-81
SN54ALS622	★ 732 505-79
SN54ALS623	★ 732 505-94
SN54ALS638	★ 732 504-79
SN54ALS639	★ 732 504-80
SN54ALS640	★ 732 504-110
SN54ALS641	★ 732 504-145
SN54ALS642	★ 732 504-93
SN54ALS643	★ 732 504-111
SN54ALS644	★ 732 505-26
SN54ALS646	★ 732 505-134
SN54ALS647	★ 732 505-45
SN54ALS648	★ 732 505-135
SN54ALS649	★ 732 505-46
SN54ALS671	★ 732 501-16
SN54ALS672	★ 732 501-17
SN54ALS690	★ 732 480-188
SN54ALS691	★ 732 478-85
SN54ALS692	★ 732 480-189
SN54ALS693	★ 732 478-86
SN54ALS694	★ 732
SN54ALS695	★ 732
SN54ALS696	★ 732 481-76
SN54ALS697	★ 732 479-136
SN54ALS698	★ 732 481-77
SN54ALS699	★ 732
SN54ALS74	★ 732 485-67
SN54ALS790	★ 732
SN54ALS873	★ 732 495-111
SN54ALS874	★ 732 485-33
SN54ALS876	★ 732 485-34
SN54ALS880	★ 732 496-5
SN54LS00	492-38
SN54LS01	491-168
SN54LS02	494-125
SN54LS03	491-169
SN54LS04	478-7
SN54LS05	477-86
SN54LS08	489-164
SN54LS09	489-107
SN54LS10	491-13
SN54LS107A	488-18
SN54LS109A	487-138
SN54LS11	489-67
SN54LS112A	488-118
SN54LS113A	488-79
SN54LS114A	488-143
SN54LS12	490-159
SN54LS122	500-127
SN54LS123	500-168
SN54LS125A	476-145
SN54LS126A	476-120
SN54LS13	507-85
SN54LS132	507-132
SN54LS133	492-122
SN54LS136	494-176
SN54LS138	483-173
SN54LS139	483-70
SN54LS14	507-163
SN54LS15	489-21
SN54LS151	499-172
SN54LS152	500-13
SN54LS153	498-44
SN54LS155	483-136
SN54LS156	483-104
SN54LS157	499-41
SN54LS158	498-135
SN54LS160A	480-162
SN54LS161A	478-140
SN54LS162A	481-21
SN54LS164	502-37 3490-110
SN54LS165	502-82 3490-61
SN54LS166	502-100
SN54LS168	481-106
SN54LS169	479-105
SN54LS170	3470-50
SN54LS173A	486-34
SN54LS175	485-137
SN54LS181	475-42
SN54LS189	3471-66
SN54LS190	482-9
SN54LS191	479-155
SN54LS192	481-153
SN54LS193	480-18
SN54LS194A	501-162 3488-130
SN54LS195A	501-60 3489-1
SN54LS196	480-111
SN54LS197	478-74
SN54LS20	490-123
SN54LS21	489-1
SN54LS22	490-67
SN54LS221	500-143
SN54LS240	503-143 2471-11
SN54LS241	504-54 2470-37
SN54LS242	503-78 2476-33
SN54LS243	503-79 2476-34
SN54LS244	504-7 2470-38
SN54LS245	505-7 2479-16
SN54LS247	2463-159
SN54LS248	2463-117
SN54LS249	2463-87
SN54LS251	500-52
SN54LS253	497-155
SN54LS256	495-92
SN54LS257A	498-172
SN54LS258A	498-94
SN54LS259	496-38
SN54LS26	491-71
SN54LS260	494-16
SN54LS266	495-73
SN54LS27	494-53
SN54LS273	486-162
SN54LS279	495-172
SN54LS28	494-126
SN54LS283	476-71
SN54LS289	3471-63
SN54LS290	480-59
SN54LS293	479-52
SN54LS295A	501-26 3489-2
SN54LS298	499-93
SN54LS299	502-169
SN54LS30	492-92
SN54LS32	493-150
SN54LS322	476-102
SN54LS323	502-170
SN54LS33	494-73
SN54LS352	497-129
SN54LS353	497-97
SN54LS365A	477-4
SN54LS366A	477-128
SN54LS367A	477-5
SN54LS368A	477-129
SN54LS37	491-105
SN54LS373	496-77
SN54LS374	487-16
SN54LS375	495-135
SN54LS377	487-52
SN54LS378	486-97
SN54LS379	486-5
SN54LS38	491-57
SN54LS384	475-166
SN54LS385	474-11
SN54LS386	495-37
SN54LS390	481-48
SN54LS393	479-13
SN54LS395	3489-3
SN54LS395A	501-123
SN54LS398	499-94
SN54LS399	499-95
SN54LS40	490-27
SN54LS42	483-29
SN54LS47	2463-160
SN54LS48	2463-118
SN54LS49	2463-88
SN54LS490	481-49
SN54LS502	508-120
SN54LS503	508-121
SN54LS504	509-43
SN54LS51	493-1
SN54LS54	493-89
SN54LS540	503-144 2471-12
SN54LS541	504-55 2470-39
SN54LS55	493-34
SN54LS568	481-122
SN54LS569	479-167
SN54LS573	496-78
SN54LS574	487-17
SN54LS640	504-131 2479-17
SN54LS641	504-155 2479-11
SN54LS642	504-103 2479-12
SN54LS645	505-8 2479-18
SN54LS670	497-17 3470-64
SN54LS682	474-118
SN54LS683	474-100
SN54LS684	474-119
SN54LS685	474-101
SN54LS686	474-120
SN54LS687	474-102
SN54LS688	474-121
SN54LS689	474-103
SN54LS73A	488-19
SN54LS74A	485-92
SN54LS75	495-136
SN54LS76A	488-56
SN54LS78A	487-156
SN54LS83A	476-72
SN54LS85	474-49
SN54LS86	495-38
SN54LS89	3471-64
SN54LS90	480-60
SN54LS92	482-42
SN54LS93	479-53
SN54LS95B	501-95 3489-4
SN54SL170	497-5
SN74ALS00	★ 732 492-12
SN74ALS01	★ 732 491-147
SN74ALS02	★ 732 494-102
SN74ALS03	★ 732 491-148
SN74ALS04	★ 732 477-169
SN74ALS05	★ 732 477-69
SN74ALS08	★ 732 489-137
SN74ALS09	★ 732 489-98
SN74ALS10	★ 732 490-183
SN74ALS109	★ 732 487-122
SN74ALS11	★ 732 489-44
SN74ALS12	★ 732 490-152
SN74ALS13	★ 732
SN74ALS132	★ 732
SN74ALS138	★ 732 483-150
SN74ALS139	★ 732 483-55
SN74ALS14	★ 732
SN74ALS15	★ 732 489-12
SN74ALS151	★ 732 499-156
SN74ALS153	★ 732 498-28
SN74ALS157	★ 732 499-25
SN74ALS158	★ 732 498-119
SN74ALS160	★ 732 480-146
SN74ALS161	★ 732 478-123
SN74ALS162	★ 732 480-190
SN74ALS163	★ 732 478-170
SN74ALS164	★ 732 502-27
SN74ALS168	★ 732 481-95
SN74ALS169	★ 732 479-94
SN74ALS190	★ 732 481-175
SN74ALS191	★ 732 479-137
SN74ALS192	★ 732 481-139
SN74ALS193	★ 732 480-4
SN74ALS20	★ 732 490-98
SN74ALS22	★ 732 490-52
SN74ALS238	★ 732
SN74ALS239	★ 732
SN74ALS240	★ 732 503-117
SN74ALS241	★ 732 504-22
SN74ALS242	★ 732 503-33
SN74ALS243	★ 732 503-34
SN74ALS244	★ 732 503-111
SN74ALS245	504-164
SN74ALS251	★ 732 500-36
SN74ALS253	★ 732
SN74ALS257	★ 732 498-157
SN74ALS258	★ 732 498-79
SN74ALS27	★ 732 494-44
SN74ALS273	★ 732 486-147
SN74ALS28	★ 732 494-103
SN74ALS32	★ 732 493-132
SN74ALS33	★ 732 494-68
SN74ALS352	★ 732 497-116
SN74ALS353	★ 732
SN74ALS37	★ 732 491-98
SN74ALS373	★ 732 496-50
SN74ALS374	★ 732 486-173
SN74ALS377	★ 732 487-39

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Motorola Semiconductor Products (Cont'd)

SN74ALS38 ★ 732 491-50
SN74ALS40 ★ 732 490-10
SN74ALS533 ★ 732 496-109
SN74ALS534 ★ 732 486-117
SN74ALS537 ★ 732
SN74ALS538 ★ 732 483-151
SN74ALS539 ★ 732 483-51
SN74ALS540 ★ 732
SN74ALS541 ★ 732
SN74ALS560 ★ 732 481-69
SN74ALS561 ★ 732 482-79
SN74ALS563 ★ 732 496-110
SN74ALS564 ★ 732 486-118
SN74ALS568 ★ 732 481-91
SN74ALS569 ★ 732
SN74ALS573 ★ 732 496-51
SN74ALS574 486-174
SN74ALS576 ★ 732 489-138
SN74ALS580 ★ 732 496-111
SN74ALS620 ★ 732 505-95
SN74ALS621 ★ 732 505-82
SN74ALS622 ★ 732 505-80
SN74ALS623 ★ 732 505-96
SN74ALS638 ★ 732 504-81
SN74ALS639 ★ 732 504-82
SN74ALS640 ★ 732 504-112
SN74ALS641 ★ 732 504-146
SN74ALS642 ★ 732 504-94
SN74ALS643 ★ 732 504-113
SN74ALS644 ★ 732 505-27
SN74ALS646 ★ 732 505-136
SN74ALS647 ★ 732 505-47
SN74ALS648 ★ 732 505-137
SN74ALS649 ★ 732 505-48
SN74ALS671 ★ 732 501-18
SN74ALS672 ★ 732 501-19
SN74ALS690 ★ 732 480-191
SN74ALS691 ★ 732 478-87
SN74ALS692 ★ 732 481-1
SN74ALS693 ★ 732 478-88
SN74ALS694 ★ 732
SN74ALS696 ★ 732 481-78
SN74ALS697 ★ 732 479-138
SN74ALS698 ★ 732 481-79
SN74ALS699 ★ 732 479-139
SN74ALS74 ★ 732 485-68
SN74ALS790 ★ 732 506-30
★ 732 2467-18
SN74ALS873 ★ 732 495-112
SN74ALS874 ★ 732 485-35
SN74ALS876 ★ 732 485-36
SN74ALS880 ★ 732 496-6
SN74LS00 492-39
SN74LS01 491-170
SN74LS02 494-127
SN74LS03 491-171
SN74LS04 478-8
SN74LS05 477-87
SN74LS08 489-165
SN74LS09 489-108
SN74LS10 491-14
SN74LS107A 488-20
SN74LS109A 487-139
SN74LS11 489-68
SN74LS112A 488-119
SN74LS113A 488-80
SN74LS114A 488-144
SN74LS12 490-160
SN74LS122 500-128
SN74LS123 500-169
SN74LS126A 476-121
SN74LS13 507-86
SN74LS132 507-133
SN74LS133 492-123
SN74LS136 494-177
SN74LS138 483-174
SN74LS139 483-71
SN74LS14 507-164
SN74LS15 489-22
SN74LS151 499-173
SN74LS152 500-14
SN74LS153 498-45
SN74LS155 483-137
SN74LS156 483-105
SN74LS157 499-42
SN74LS158 498-136
SN74LS160A 480-163
SN74LS161A 478-141
SN74LS162A 481-22
SN74LS163A 478-186
¶ 246-5
SN74LS164 502-38
3490-111
SN74LS165 502-83
¶ 246-5
3490-62
¶ 246-5
SN74LS166 502-101
SN74LS168 481-107
SN74LS169 479-106
SN74LS170 497-6
3470-51
SN74LS173A 486-35
SN74LS174 486-69
SN74LS175 485-138
¶ 246-5
SN74LS181 475-43
SN74LS189 3471-34
SN74LS190 482-10
SN74LS191 479-156
SN74LS192 481-154
SN74LS193 480-19
SN74LS194A 501-163
3489-5
SN74LS195A 501-61
3489-6
SN74LS196 480-112
SN74LS197 478-75
SN74LS20 490-124
SN74LS21 489-2
SN74LS22 490-68
SN74LS221 500-144
SN74LS240 503-145
2471-13
SN74LS241 504-56
2470-40
SN74LS242 503-80
2476-66
SN74LS243 503-81
2477-1
SN74LS244 504-8
2470-41
SN74LS245 505-9
2479-25
SN74LS247 2463-161
SN74LS248 2463-119
SN74LS249 2463-89
SN74LS251 500-53
SN74LS253 497-156
SN74LS256 495-93
SN74LS257A 498-173
SN74LS258A 498-95
SN74LS259 496-39
SN74LS26 491-72
SN74LS260 494-17
SN74LS266 495-74
SN74LS27 494-54
SN74LS273 486-163
SN74LS279 495-173
SN74LS28 494-128
SN74LS283 476-73
SN74LS289 3471-31
SN74LS290 480-61
SN74LS293 479-54
SN74LS295A 501-27
3489-7
SN74LS298 499-96
SN74LS299 502-171
SN74LS30 492-93
SN74LS32 493-151
SN74LS322 476-103
SN74LS323 502-172
SN74LS33 494-74
SN74LS352 497-130
SN74LS353 497-98
SN74LS365A 477-6
SN74LS366A 477-130
SN74LS367A 477-7
SN74LS368A 477-131
SN74LS37 491-106
SN74LS373 496-79
SN74LS374 487-18
¶ 246-5
SN74LS375 495-137
SN74LS377 487-53
¶ 246-5
SN74LS378 486-98
SN74LS379 486-6
SN74LS38 491-58
SN74LS384 475-167
SN74LS385 474-12
SN74LS386 495-39
SN74LS390 481-50
SN74LS393 479-14
SN74LS395 3489-8
SN74LS395A 501-124
SN74LS398 499-97
SN74LS399 499-98
SN74LS40 490-28
SN74LS42 483-30
SN74LS47 2463-162
SN74LS48 2463-120
SN74LS49 2463-90
SN74LS490 481-51
SN74LS502 508-122
SN74LS503 508-123
SN74LS504 509-44
SN74LS51 493-2
SN74LS54 493-90
SN74LS540 503-146
2471-14
SN74LS541 504-57
2470-42
SN74LS55 493-35
SN74LS568 481-123
SN74LS569 479-168
SN74LS573 496-80
SN74LS574 487-19
SN74LS640 504-132
2479-26
SN74LS641 504-156
2479-21
SN74LS642 504-104
2479-22
SN74LS645 505-10
2479-27
SN74LS670 497-18
3470-65
SN74LS682 474-122
SN74LS683 474-104
SN74LS684 474-123
SN74LS685 474-105
SN74LS686 474-124
SN74LS687 474-106
SN74LS688 474-125
SN74LS689 474-107
SN74LS73A 488-21
SN74LS74A 485-93
SN74LS75 495-138
SN74LS76A 488-57
SN74LS783 497-83
1092-132
SN74LS78A 487-157
SN74LS83A 476-74
SN74LS85 474-50
SN74LS86 495-40
SN74LS89 3471-32
SN74LS90 480-62
SN74LS92 482-43
SN74LS93 479-55
SN74LS95B 501-96
3489-9
SN75172 ★ 2753
SN75173 ★ 2753
SN75174 ★ 2753
SN75175 ★ 2753
SN75176 ★ 2753
SN75177 ★ 2753
SN75178 ★ 2753
SN75451B 2481-125
SN75452B 2482-27
SN75453B 2482-98
SN75454B 2482-63
SN75ALS245 ★ 732
SN75ALS574 ★ 732
SN75ALS695 ★ 732
SYSTEM3000 ★ 1943
SYSTEM4000 ★ 1945
TCA3002 2912-83
TCA3003 2912-84
TCA4500 2901-108
TDA1190 2904-168
TDA11902 2904-169
TDA1190P 2904-170
TDA2002 2897-16
TDA2002A 2897-17
TDA3190P 2904-171
TL494C ★ 3297 2960-121
TL494M ★ 3297 2960-122
TL495C ★ 3297 2960-123
TL495M ★ 3297 2961-1
TMS2716 3465-86
TMS27A16 3465-16
ULN2068 ★ 2753 2889-90
ULN2074 2889-91
ULN2074B ★ 2753
ULN2801 2480-131
ULN2801A ★ 2753
ULN2802 2480-138
ULN2802A ★ 2753
ULN2803 2480-112
ULN2803A ★ 2753
ULN2804 2480-101
ULN2804A ★ 2753
VERSAmodule 1769-2
XC160 4141-50
XC177 4141-51
XC400 4141-52
uA758A 2901-109
uA78540 2961-2
μA78S40 ★ 3297
μA9636A ★ 2753

National Semiconductor

1001 ★ 3320
5413 507-75
AD7520J 2449-13
AD7520K 2448-20
AD7520L 2447-10
AD7520S 2449-14
AD7520T 2448-21
AD7520U 2447-11
AD7521J 2458-36
AD7521K 2458-22
AD7521L 2458-10
AD7521S 2458-37
AD7521T 2458-23
AD7521U 2458-11
ADB1200C 2436-5
ADB4500 511-45
2438-45
ADC0800P ★ 3319 2429-34
ADC0800PC ★ 3319 2429-33
ADC0801C 2426-26
ADC0801M 2426-27
ADC0802 ★ 3319 2428-35
ADC0802C ★ 3319 2428-36
ADC0803 ★ 3319 2428-37
ADC0803C ★ 3319 2428-38
ADC0804C ★ 3319 2429-24
ADC0805C ★ 3319 2429-26
ADC0805M ★ 3319 2429-27
ADC0808 ★ 3319 2428-23
★ 3319 2963-28
ADC0809 ★ 3319 2963-29
ADC0816 ★ 3319 2428-24
ADC0816C ★ 3319 2963-45
★ 3319 1094-54
ADC0817 ★ 3319 2429-19
ADC0817C ★ 3319 2963-46
ADC0820 ★ 3321 2426-50
ADC0831B ★ 3319 ★ 3322 2428-18
ADC0831C ★ 3319 ★ 3322 2429-13
ADC0832B ★ 3319 ★ 3322 2428-19
ADC0832C ★ 3319 ★ 3322 2429-14
ADC0833B ★ 3319 ★ 3323 2428-20
ADC0833C ★ 3319 ★ 3323 2429-15
ADC0834B ★ 3319 ★ 3322 2428-21
ADC0834C ★ 3319 ★ 3322 2429-16
ADC0838B ★ 3319 ★ 3322 2428-22
ADC0838C ★ 3319 ★ 3322 2429-17
ADC0844 ★ 3324 2428-11
ADC1001B ★ 3319 2431-8
ADC1001C ★ 3319 2431-23
ADC1021B ★ 3319 2431-9
ADC1021C ★ 3319 2431-24
ADC1080 ★ 3319 ★ 3344 2430-44
ADC1210 ★ 3344 2435-14
ADC1210C ★ 3344 2435-15
ADC1211 ★ 3344 2436-2
ADC1211C ★ 3344 2436-3
ADC1280 ★ 3344 2430-10
ADC3511 2438-9
¶ 253-8
ADC3711 2438-38
¶ 253-8
¶ 277-3
ADC809 2429-20
ADD3501 2438-10
¶ 276-13
ADD3701 2438-39
ADM2901AC 476-37
AF100 ★ 3345 2962-23
AF101 2947-31
AF102 2947-32
AF103 2947-33
AF104 2949-87
AF105 2949-88
AF110 2949-89
AF120 ★ 3345 2948-98
AF121 2947-34
AF122 2947-35
AF132 2948-74
AF133 2948-75
¶ 269-10
AF134 2948-76
¶ 269-10
AF150 ★ 3345 2962-24
AF151 ★ 3345 2962-25
AF160 ★ 3345 2962-26
AF161 2962-27
AH0014 ★ 3344 2421-66
AH0014C ★ 3344 2421-67
AH0015 ★ 3344 2416-100
AH0015C ★ 3344 2416-101
AH0019 ★ 3344 2420-29
AH0019C ★ 3344 2420-30
AH0126 ★ 3344 2421-5
AH0126C ★ 3344 2421-6
AH0129 ★ 3343 2420-92
AH0129C ★ 3343 2420-93
AH0133 ★ 3344 2416-7
AH0133C ★ 3344 2416-8
AH0134 ★ 3344 2416-45
AH0134C ★ 3344 2416-46
AH0139 ★ 3344 2421-48
AH0139C ★ 3344 2421-49
AH0140 ★ 3344 2420-71
AH0140C ★ 3344 2420-72
AH0141 ★ 3344 2415-93
AH0141C ★ 3344 2415-94
AH0142 ★ 3344 2421-59
AH0142C ★ 3344 2421-60
AH0143 ★ 3344 2418-96
AH0143C ★ 3344 2418-97
AH0144 ★ 3344 2418-66
AH0144C ★ 3344 2418-67
AH0145 ★ 3344 2421-35
AH0145C ★ 3344 2421-36

Arranged alphanumerically from left to right.

© IC MASTER 1983

National Semiconductor (Cont'd)

Device	Page-Line
AH0146	★ 3344
	2418-45
AH0146C	★ 3344
	2418-46
AH0151	★ 3344
	2415-101
AH0151C	★ 3344
	2415-102
AH0152	★ 3344
	2416-21
AH0152C	★ 3344
	2416-22
AH0153	★ 3344
	2420-75
AH0153C	★ 3344
	2420-76
AH0154	2420-105
AH0154C	2420-106
AH0161	★ 3344
	2418-49
AH0161C	★ 3344
	2418-50
AH0162	★ 3344
	2418-79
AH0162C	★ 3344
	2418-80
AH0163	★ 3344
	2421-39
AH0163C	★ 3344
	2421-40
AH0164	★ 3344
	2421-53
AH0164C	★ 3344
	2421-54
AH2114	★ 3344
	2418-110
AH2114C	★ 3344
	2418-113
AH5009C	★ 3318
	2422-25
AH5010C	★ 3318
	2422-32
AH5011C	★ 3318
	2422-51
AH5012C	★ 3318
	2422-58
AM1000	2421-78
	¶ 262-9
AM1001	2421-79
	¶ 262-9
AM1002	2421-86
	¶ 262-9
AM181	2415-113
	2416-2
AM182	2416-30
	2416-34
AM184	2420-85
	2420-89
AM185	2420-110
	2420-114
AM187	2418-59
	2418-63
AM188	2418-85
	2418-89
AM190	2419-64
	2419-69
AM191	2419-75
	2419-79
AM193	2417-87
AM194	2417-99
AM2009	2422-74
AM2009C	2422-75
AM281	2416-15
	2416-19
	2416-37
AM282	2416-50
	2416-54
AM284	2420-99
	2420-103
AM285	2421-10
	2421-14
AM287	2418-73
	2418-77
AM288	2418-101
	2418-105
AM290	2419-72
	2419-74
AM291	2419-85
	2419-89
AM3705	★ 3318
	2424-51
AM3705C	★ 3318
	2424-52
AM9709C	2422-26
AM9710C	2422-33
AM9711C	2422-52
AM9712C	2422-59
AM97C09	2422-27
AM97C10C	2422-34
AM97C11C	2422-53
AM97C12C	2422-60
BLC-80/05	1765-1
BLC-80/07	1763-12
BLC-80/10	1763-13
BLC-80/11	1763-14
BLC-80/116	1763-5
BLC-80/11A	1763-15
BLC-80/12	1763-16
BLC-80/12A	1763-17
BLC-80/14	1763-18
BLC-80/14A	1763-19
BLC-80/204	1763-27
BLC-80/24	1765-19
BLC-80/28	1765-20
BLC-80/316	1757-1
BLC-86/05	1769-18
BLC-86/1213	1769-8
BLMX-80C	★ 1949
CD4000C	458-73
CD4000M	458-74
CD4001A	458-160
CD4001BC	458-161
CD4001BM	458-162
CD4002A	458-96
CD4002BC	458-97
CD4002BM	458-98
CD4006A	463-141
	3489-124
CD4006BC	463-142
CD4006BM	463-143
CD4007C	450-150
CD4007M	450-151
CD4008BC	449-36
CD4008BM	449-37
CD4009AC	450-2
CD4009AM	450-3
CD40106BC	465-26
CD40106BM	465-27
CD4010A	450-38
CD4011AC	457-97
CD4011AM	457-98
CD4011BC	457-99
CD4011BM	457-100
CD4012A	457-22
CD4012BC	457-23
CD4012BM	457-24
CD4013BC	455-95
CD4013BM	455-96
CD4014A	463-118
	3490-77
CD4014BC	463-119
CD4014BM	463-120
CD4015A	3489-94
CD4015AC	462-119
CD4015BC	462-120
CD4015BM	462-121
CD40160BC	452-139
CD40160BM	452-140
CD40161BC	451-55
CD40161BM	451-56
CD40162BC	452-111
CD40162BM	452-112
CD40163BC	451-31
CD40163BM	451-32
CD4016BC	★ 3318
	2417-66
CD4016BM	★ 3318
	2417-67
CD40174BC	455-170
CD40174BM	455-171
CD40175B	455-153
CD4017BC	452-85
CD4017BM	452-86
CD4018BC	453-118
CD4018BM	453-119
CD40192BC	452-168
CD40192BM	452-169
CD40193BC	451-87
CD40193BM	451-88
CD40195BC	463-14
CD40195BM	463-15
CD4019BC	457-168
CD4019BM	457-169
CD4020BC	452-21
CD4020BM	452-22
CD4021A	463-49
	3490-78
CD4021BC	463-50
CD4021BM	463-51
CD4022BC	453-92
CD4022BM	453-93
CD4023BC	457-56
CD4023BM	457-57
CD4024BC	451-158
CD4024BM	451-159
CD4025A	458-127
CD4025BC	458-128
CD4025BM	458-129
CD4027BC	456-108
CD4027BM	456-109
CD4028BC	453-168
CD4028BM	453-169
CD4029BC	453-135
CD4029BM	453-136
CD4030A	459-15
CD4031BC	463-166
	3491-52
CD4031BM	463-167
	3491-53
CD4034BC	463-68
	3490-36
CD4034BM	463-69
	3490-37
CD4035BC	463-27
	3489-59
CD4035BM	463-28
	3489-70
CD4040BC	451-186
CD4040BM	451-187
CD4041C	449-138
CD4041M	449-139
CD4042BC	459-112
CD4042BM	459-113
CD4043A	459-151
CD4043BC	459-152
CD4043BM	459-153
CD4044A	459-132
CD4044BC	459-133
CD4044BM	459-134
CD4046BC	464-52
	2945-47
CD4046BM	464-53
	2945-48
CD4047BC	462-14
CD4047BM	462-15
CD4048BC	459-72
CD4048BM	459-73
CD4049UB	450-20
CD4050BC	450-55
CD4050BM	450-56
CD4052BC	★ 3318
	2423-27
CD4052BM	★ 3318
	2423-28
CD4053BC	★ 3318
	2419-102
CD4053BM	★ 3318
	2419-103
CD4060BC	452-39
CD4060BM	452-40
CD4066BC	★ 3318
	2417-42
CD4066BM	★ 3318
	2417-43
CD4069C	450-182
CD4069M	450-183
CD4070BC	459-16
CD4070BM	459-17
CD4071BC	458-51
CD4071BM	458-52
CD4072BC	458-15
CD4072BM	458-16
CD4073BC	456-160
CD4073BM	456-161
CD4075BC	458-31
CD4075BM	458-32
CD4076BC	455-129
CD4076BM	455-130
CD4081BC	456-183
CD4081BM	456-184
CD4082BC	456-143
CD4082BM	456-144
CD4089BC	464-88
CD4089BM	464-89
CD4093BC	465-3
CD4093BM	465-4
CD4099BC	460-50
CD4099BM	460-51
CD4501BC	★ 3318
	2423-95
CD4501BM	★ 3318
	2423-96
CD4503BC	450-99
CD4503BM	450-100
CD4507BC	459-18
CD4507BM	459-19
CD4510BC	452-170
CD4510BM	452-171
CD4511BC	455-55
	2464-32
CD4511BM	455-56
	2464-33
CD4512BC	461-147
CD4512BM	461-148
CD4514BC	454-126
CD4514BM	454-127
CD4515BC	454-128
CD4515BM	454-129
CD4516BC	451-89
CD4516BM	451-90
CD4518BC	453-25
CD4518BM	453-26
CD4519BC	461-131
CD4519BM	461-132
CD4520BC	451-130
CD4520BM	451-131
CD4522BC	453-10
CD4522BM	453-11
CD4526BC	451-121
CD4526BM	451-122
CD4527BC	464-99
CD4527BM	464-100
CD4528BC	462-32
CD4528BM	462-33
CD4529BC	★ 3318
	2423-20
	2423-79
CD4529BM	2423-21
	2423-80
CD4538BC	462-51
CD4538BM	462-52
CD4543BC	455-16
CD4543BM	455-17
CD4584BC	465-28
CD4584BM	465-29
CD4723BC	459-86
CD4723BM	459-87
CD4724BC	460-52
CD4724BM	460-53
CLM-100	★ 1950
CLM-104	★ 1950
CLM-109	★ 1950
CLM-201	★ 1950
CLM-230	★ 1951
CLM-311	★ 1951
CLM-411	★ 1952
CLM-421	★ 1952
CLM-602	★ 1953
CLM-604	★ 1953
CLM-610	★ 1953
CLM-611	★ 1954
CLM-630	★ 1954
CLM-640	★ 1955
CLM-660	★ 1955
CLM-802	★ 1946
	1755-7
CLB-80/11B	1763-20
COP210C	1087-60
COP211C	1087-61
COP2340	1087-89
COP2341	1087-90
COP2342	1087-91
COP2404	1087-56
	1087-47
	1051-23
COP2440	1087-92
	1051-24
COP2440R	1087-48
	1087-100
	1051-25
COP2441	1087-93
	1051-26
COP2441R	1087-49
	1087-101
	1051-27
COP2442	1087-94
	1051-28
COP310C	★ 1361
	★ 1364
	1087-62
COP310L	★ 1361
	★ 1364
	1087-63
COP311C	★ 1361
	★ 1364
	1087-64
COP311L	★ 1361
	★ 1364
	1087-65
COP320	1087-66
COP320C	1087-67
COP320L	1087-68
COP321	1087-69
COP321C	1087-70
COP321L	1087-71
COP340	1087-72
COP341	1087-73
COP352	1087-95
COP353	1087-96
COP370	1087-108
COP398	1087-106
COP399	1087-110
COP402	1087-57
	1051-29
COP402L	1087-58
COP402M	1087-50
	1051-30
COP404	1087-59
COP404L	1087-51
COP404LP	1051-31
COP404LS	1051-32
COP410C	★ 1361
	1087-74
	★ 1361
	1051-33
COP410L	★ 1361
	1087-75
	★ 1361
	1051-34
COP411C	★ 1361
	1087-76
	★ 1361
	1051-35
COP411L	★ 1361
	1087-77
	★ 1361
	1053-1
COP420	1087-78
	1053-2
COP420C	1087-79
	1053-3
COP420L	1087-80
	1053-4
COP420R	1087-52
	1087-102
	1053-5
COP421	1087-81
COP421C	1087-82
COP421L	1087-83
COP430	1087-112
COP431	★ 3322
	1087-113
COP432	★ 3322
	1087-114
COP434	★ 3322
	1087-115
COP438	★ 3322
	1087-116
COP440	1087-84
	1053-6
COP440R	1087-53
	1087-103
	1053-7
COP441	1087-85
	1053-8
COP441R	1087-54
	1087-104
	1053-9
COP442	1087-86
	1053-10
COP444L	1087-87
	1053-11
COP444LR	1087-55
	1087-105
	1053-12
COP445L	1087-88
	1053-13
COP452	1087-97
COP453	1087-98
COP470	454-177
	2464-135
	1087-109
COP472	1087-99
COP498	460-132
	1087-107
COP499	1087-111
D77S180	★ 3851
D87S180	★ 3851
DAC0332	★ 3320
DAC0800	★ 3320
	2441-32
DAC0800A	★ 3320
	2440-27
DAC0800C	★ 3320
	2441-48
DAC0801C	★ 3320
	2443-41
DAC0802	★ 3320
	2440-28
DAC0802C	★ 3320
	2440-29
DAC0806C	★ 3320
	2444-8
DAC0807C	★ 3320
	2443-53
DAC0808	★ 3320
	2442-6
DAC0808C	★ 3320
	2442-7
DAC0830	★ 3320
	2440-14
DAC0831	★ 3320
	2441-10
DAC0832	2442-43
DAC1000	★ 3320
	2446-10
DAC1000C	★ 3320
	2446-11
DAC1001	2447-48
DAC1001C	2447-49
DAC1002	★ 3320
	2448-39
DAC1002C	★ 3320
	2448-40
DAC1003	2446-12
DAC1003C	2446-13
DAC1004	2447-50
DAC1004C	2447-51
DAC1005	2448-41
DAC1005C	2448-42
DAC1006	★ 3320
	2446-14
DAC1006C	★ 3320
	2446-15
DAC1007	★ 3320
	2448-1
DAC1007C	★ 3320
	2448-2
DAC1008	★ 3320
	2448-43
DAC1008C	★ 3320
	2448-44
DAC1020	★ 3320
	2447-12
DAC1020C	★ 3320
	2447-13
DAC1021	★ 3320
	2448-22
DAC1021C	★ 3320
	2448-23
DAC1022	★ 3320
	2449-15
DAC1022C	★ 3320
	2449-16
DAC1200	★ 3320
	★ 3345
	2454-10
DAC1200C	★ 3320
	★ 3345
	2454-11
DAC1201	★ 3320
	★ 3345
	2458-4

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Device	Page-Line
National Semiconductor (Cont'd)	
DAC1201C	★ 3320
	★ 3345
	2458-5
DAC1208	★ 3320
	2453-43
DAC1209	★ 3320
	2456-36
DAC1210	2457-33
DAC1218	2453-44
DAC1219	2456-37
DAC1220	2453-7
DAC1220C	2453-8
DAC1221	2458-24
DAC1221C	2458-25
DAC1222	2458-38
DAC1222C	2458-39
DAC1230	2453-45
DAC1231	2456-38
DAC1232	2457-34
DAC1242	★ 3345
DAC1243	★ 3345
DAC1280AC	★ 3345
	2452-8
DAC1280C	★ 3345
	2457-6
DAC1285	★ 3345
	2452-9
DAC1285A	★ 3345
	2452-10
DAC1285AC	★ 3345
	2452-11
DAC1285C	★ 3345
	2452-12
DAC80-CBI-V	2452-13
DAC80Z-CBI-V	2452-14
DAC85-CBI-V	2452-15
DAC85L-CBI-V	2452-16
DAC87-CBI-V	2452-17
DADC0801	★ 3319
DB16000	★ 1365
	1767-18
DH0006	★ 3344
	2484-11
DH0006C	★ 3344
	2484-12
DH0008	★ 3344
	2484-13
DH0008C	★ 3344
	2484-14
DH0011	★ 3344
	2484-15
DH0011C	★ 3344
	2484-16
DH0016	★ 3344
DH0017C	★ 3344
	2484-17
DH0018C	★ 3344
	2484-18
DH0028C	★ 3344
	2480-155
DH0034	★ 3344
	505-144
DH0034C	★ 3344
	505-145
DH0035	★ 3344
	511-104
	¶ 262-12
	★ 3344
	2965-78
	¶ 262-12
DH0035C	★ 3344
	511-105
	¶ 262-12
	★ 3344
	2965-79
	¶ 262-12
DH0069	★ 3344
	2483-158
DH3467C	2889-157
DH3725C	2889-145
DH6376C	2889-146
DM100422	3473-54
DM10105	468-49
DM10116	469-103
DM10414	469-1
DM10415	469-21
	3475-45
DM10415A	3475-63
DM10422	★ 3854
	469-11
	★ 3854
	3473-55
DM10470	★ 3855
	469-28
	★ 3855
	3481-27
DM10470A	★ 3855
	469-29
	★ 3855
	3481-16
DM10470L	★ 3855
	469-30
	★ 3855
	3481-28
DM2502C	508-113
DM2502M	508-114
DM2503C	508-115
DM2503M	508-116
DM2504C	509-41
DM2504M	509-42
DM5400	492-4
DM5401	491-133
DM5402	494-90
DM5403	491-134
DM5404	477-160
DM5405	477-62
DM5406	485-2
DM5407	484-139
DM5408	489-129
DM5409	489-93
DM5410	490-174
DM54107	487-176
DM54109	487-115
DM5411	489-39
DM54121	500-101
DM54123	500-161
DM54125	476-133
DM54132	507-123
DM5414	507-153
DM54141	2464-75
DM54145	482-144
DM54147	509-29
DM54148	508-131
DM54150	500-81
DM54151A	499-149
DM54153	498-21
DM54154	484-30
DM54155	483-127
DM54156	483-95
DM54157	499-11
DM5416	484-150
DM54160A	480-134
DM54161A	478-111
DM54162A	480-183
DM54163	478-163
DM54164	502-18
	3490-112
DM54165	502-71
	3490-50
DM54166	502-91
	3490-63
DM5417	484-128
DM54170	3470-52
DM54173	486-20
DM54174	486-50
DM54175	485-118
DM54176	480-90
DM54177	478-53
DM54180	508-160
DM54181	475-7
DM54182	475-73
DM54184	507-41
DM54185A	507-33
DM54190	481-168
DM54191	479-129
DM54192	481-131
DM54193	479-177
DM54194	501-146
	3488-78
DM54195	501-43
	3489-10
DM54196	480-91
DM54197	478-54
DM54198	502-50
	3490-8
DM54199	502-57
	3490-9
DM5420	490-89
DM5423	494-9
DM5425	493-179
DM54251	500-31
DM54259	496-25
DM5426	484-83
DM5427	494-37
DM54284	475-111
DM5430	492-67
DM5432	493-125
DM54365	476-157
DM54366	105
	485-15
DM54367	158
	485-16
DM54368	706
	485-15
DM5437	491-89
DM5438	491-40
DM5440	490-2
DM5441A	2464-66
DM5442	483-10
DM5445	482-134
DM5446A	2464-12
	¶ 259-15
DM5447A	2463-163
	¶ 259-15
DM5448	2463-121
DM5450	492-150
DM5451	492-172
DM5453	493-82
DM5454	493-70
DM5460	493-24
DM5470	487-65
DM5472	487-79
DM5473	487-177
DM5474	485-61
DM5475	495-124
DM5476	488-43
DM5483	476-56
	¶ 228-7
DM5485	474-51
DM5486	495-15
DM5490	480-48
DM5491A	502-128
DM5492A	482-33
DM5493A	479-37
DM5495	501-85
	3488-79
DM5496	501-185
	3489-108
DM54ALS00	492-13
DM54ALS02	494-104
DM54ALS04	477-170
DM54ALS08	489-139
DM54ALS109	487-123
DM54ALS113	488-70
DM54ALS160	480-147
DM54ALS161	478-124
DM54ALS162	481-2
DM54ALS163	478-171
DM54ALS240	503-118
DM54ALS241	504-23
DM54ALS242	503-35
DM54ALS243	503-36
DM54ALS244	503-112
DM54ALS245	504-165
DM54ALS273	486-148
DM54ALS32	493-133
DM54ALS373	496-52
DM54ALS374	486-175
DM54ALS377	487-40
DM54ALS573	496-53
DM54ALS574	486-176
DM54ALS576	489-140
DM54ALS580	496-112
DM54ALS620	505-97
DM54ALS622	505-98
DM54ALS623	505-99
DM54ALS641	504-147
DM54ALS642	504-95
DM54ALS643	504-114
DM54ALS644	505-28
DM54ALS646	505-138
DM54ALS647	505-49
DM54ALS648	505-139
DM54ALS649	505-50
DM54ALS690	481-3
DM54ALS691	478-89
DM54ALS692	481-4
DM54ALS693	478-90
DM54ALS696	481-80
DM54ALS697	479-140
DM54ALS698	481-81
DM54ALS699	479-141
DM54ALS74	485-69
DM54ALS873	495-113
DM54ALS876	485-37
DM54ALS880	496-7
DM54H00	492-31
DM54H01	491-159
DM54H04	477-186
DM54H05	477-78
DM54H08	489-158
DM54H10	491-5
DM54H103	488-100
DM54H106	488-110
DM54H108	488-66
DM54H11	489-60
DM54H20	490-115
DM54H21	488-177
DM54H22	490-59
DM54H30	492-84
DM54H40	490-19
DM54H50	492-161
DM54H51	492-183
DM54H52	492-139
DM54H53	493-59
DM54H54	493-50
DM54H55	493-44
DM54H60	507-101
DM54H61	507-109
DM54H62	508-4
DM54H71	487-100
DM54H72	487-87
DM54H73	488-9
DM54H74	485-84
DM54H76	488-50
DM54H78	487-151
DM54L164A	3490-97
DM54L91	3491-1
DM54L95	3488-46
DM54LS00	492-40
DM54LS01	491-172
DM54LS02	494-129
DM54LS03	491-173
DM54LS04	478-9
DM54LS05	477-88
DM54LS08	489-166
DM54LS09	489-109
DM54LS10	491-15
DM54LS107A	488-22
DM54LS109	487-140
DM54LS11	489-69
DM54LS112	488-120
DM54LS113A	488-81
DM54LS114A	488-145
DM54LS12	490-161
DM54LS122	500-129
DM54LS123	500-170
DM54LS125A	476-147
DM54LS126	476-122
DM54LS13	507-87
DM54LS132	507-134
DM54LS136	494-178
DM54LS138	483-175
DM54LS139	483-72
DM54LS14	507-165
DM54LS15	489-23
DM54LS151	499-174
DM54LS153	498-46
DM54LS154	484-40
DM54LS155	483-138
DM54LS156	483-106
DM54LS157	499-43
DM54LS158	498-137
DM54LS160A	480-164
DM54LS161A	478-142
DM54LS162	481-23
DM54LS163A	479-1
DM54LS164	502-39
	3490-113
DM54LS166	502-102
DM54LS168A	481-108
DM54LS169A	479-107
DM54LS170	497-7
	3470-53
DM54LS173	486-36
DM54LS174	486-70
DM54LS175	485-139
DM54LS190	482-11
DM54LS191	479-157
DM54LS192	481-155
DM54LS193	480-20
DM54LS194A	501-164
DM54LS195A	501-62
DM54LS196	480-113
DM54LS197	478-76
DM54LS20	490-125
DM54LS21	489-3
DM54LS22	490-69
DM54LS221	500-145
DM54LS244	504-59
DM54LS245	505-11
DM54LS247	2463-164
DM54LS248	2463-122
DM54LS249	2463-91
DM54LS251	500-54
DM54LS253	497-157
DM54LS257B	498-174
DM54LS258B	498-96
DM54LS259	496-40
DM54LS26	491-73
DM54LS266	495-75
DM54LS27	494-55
DM54LS279	495-174
DM54LS283	476-75
DM54LS290	480-63
DM54LS293	479-56
DM54LS298	499-99
DM54LS30	492-94
DM54LS32	493-152
DM54LS352	497-131
DM54LS353	497-99
DM54LS365A	477-8
DM54LS366A	477-132
DM54LS367A	477-9
DM54LS368A	477-133
DM54LS37	491-107
DM54LS373	496-81
DM54LS374	487-20
DM54LS377	495-153
DM54LS38	491-59
DM54LS386	495-41
DM54LS390	481-52
DM54LS393	479-15
DM54LS40	490-29
DM54LS42	483-31
DM54LS47	2463-165
DM54LS471	★ 3850
	3460-28
DM54LS48	2463-123
DM54LS49	2463-92
DM54LS51	493-3
DM54LS54	493-91
DM54LS55	493-36
DM54LS670	497-19
	3470-66
DM54LS73A	488-23
DM54LS74	485-94
DM54LS75	495-139
DM54LS76	488-58
DM54LS78	487-158
DM54LS83A	476-76
DM54LS85	474-52
DM54LS86	495-42
DM54LS90	480-64
DM54LS92	482-44
DM54LS93	479-57
DM54S00	492-51
DM54S02	494-145
DM54S03	491-187
DM54S04	478-20
DM54S05	477-99
DM54S08	489-176
DM54S09	489-119
DM54S10	491-26
DM54S11	489-80
DM54S112	488-129
DM54S113	488-92
DM54S114	488-155
DM54S133	492-129
DM54S134	492-111
DM54S135	494-160
DM54S136	495-3
DM54S138	483-187
DM54S139	483-84
DM54S140	484-55
DM54S15	489-32
DM54S151	499-189
DM54S153	498-58
DM54S157	499-56
DM54S158	498-150
DM54S162	481-34
DM54S174	486-83
DM54S175	485-152
DM54S188	3459-28
DM54S189	3471-52
DM54S194	501-174
DM54S195	501-71
DM54S196	480-119
DM54S20	490-136
DM54S22	490-78
DM54S240	2471-15
DM54S241	2470-43
DM54S242	503-96
DM54S243	503-97
DM54S251	500-65
DM54S253	498-8
DM54S257	498-186
DM54S258	498-110
DM54S280	509-19
DM54S287	3459-110
DM54S288	3459-29
DM54S289	3471-44
DM54S299	502-177
DM54S30	492-104
DM54S32	493-162
DM54S373	496-98
DM54S374	487-32
DM54S387	3459-102
DM54S40	490-40
DM54S472	3461-35
DM54S472A	3461-36
DM54S472B	3461-37
DM54S473	3461-48
DM54S473A	3461-31
DM54S474	3461-71
DM54S474A	3461-38
DM54S474B	3461-39
DM54S475	3461-50
DM54S475A	3461-33
DM54S51	493-13
DM54S570	3460-82
DM54S571	3460-83
DM54S571A	3460-84
DM54S571B	3460-85
DM54S572A	3461-99
	3461-99
DM54S573A	3461-100
	3461-100
DM54S64	493-107
DM54S65	493-115
DM7090	495-87
DM7091	491-90
DM7092	490-142
DM7093	476-134
	¶ 236-15
DM7094	476-109
DM7095	159
	485-16
DM7096	107
	485-15
DM7097	160
	485-16
DM7098	108
	485-15
DM7099	491-80
DM7121	500-1
DM7123	499-66
DM7130	474-135
DM7131	474-76
DM7136	474-78
DM7160	474-70
DM71LS95	477-42
DM71LS97	477-43
DM71S96	478-31
DM71S98	478-32
DM7200	474-32
DM7210	500-6
	¶ 235-12
DM7211	500-7
DM7214	497-137
	¶ 236-15
DM7219	500-89
DM7220	509-26
DM7223	483-146
DM7230	482-91
	¶ 236-15
DM7280	480-92
DM7281	478-55
DM7288	482-24
DM7290	480-93

Arranged alphanumerically from left to right.

© IC MASTER 1983

National Semiconductor (Cont'd)

DM7291 478-56
DM7400 492-5
¶ 259-4
DM7401 491-135
DM7402 494-91
DM7403 491-136
DM7404 477-161
DM7405 477-63
DM7406 485-3
DM7407 484-140
DM7408 489-130
DM7409 489-91
DM7410 490-175
DM74107 487-178
DM74109 487-116
DM7411 489-40
DM74121 500-102
DM74123 500-162
DM74125 475-135
DM7413 507-76
DM74132 507-124
DM7414 507-154
DM74141 2464-76
DM74145 482-145
DM74147 509-30
DM74148 508-132
DM74150 500-82
DM74151A 499-150
DM74153 498-22
DM74154 484-31
DM74155 483-128
DM74156 483-96
DM74157 499-12
DM7416 484-151
DM74160A 480-135
DM74161A 478-112
DM74162A 480-184
DM74163 478-164
DM74164 502-19
3490-114
DM74165 502-72
3490-51
DM74166 502-92
3490-64
DM7417 484-129
DM74170 496-171
3470-54
DM74173 486-21
DM74174 486-51
DM74175 485-119
DM74176 480-94
DM74177 478-57
DM74180 508-161
DM74182 475-74
DM74184 507-42
DM74185A 507-34
DM74190 481-169
DM74191 479-130
DM74192 481-132
DM74193 479.178
DM74194 501-147
3488-80
DM74195 501-44
3489-11
DM74196 480-95
DM74197 478-58
DM74198 502-51
3490-10
DM74199 502-58
3490-11
DM7420 490-90
DM7423 494-10
DM7425 493-180
DM74251 500-32
DM74259 496-26
DM7426 484-84
DM7427 494-38
DM7430 492-68
DM7432 493-126
DM74365 109
485-15
DM74366 161
485-17
DM74367 162
485-18
DM74368 110
485-15

DM7437 491-91
DM7438 491-41
DM7440 490-3
DM7441A 2464-67
DM7442 483-11
DM7445 482-135
DM7446A 2464-13
¶ 259-15
DM7447A 2463-166
¶ 259-15
DM7448 2463-124
DM7450 492-151
DM7451 492-173
DM7453 493-83
DM7454 493-71
DM7460 493-25
DM7470 487-66
DM7472 487-80
DM7473 487-179
DM7474 485-62
DM7475 495-125
DM7476 488-44
DM7483 476-57
¶ 228-7
DM7485 474-53
DM7486 495-16
DM7489B 497-38
DM7490 480-49
¶ 236-15
DM7491A 502-129
DM7492A 482-34
DM7493A 479-38
DM7495 501-86
3488-81
DM7496 501-186
3489-109
DM74ALS00 492-14
DM74ALS02 494-105
DM74ALS04 477-171
DM74ALS08 489-141
DM74ALS109 487-124
DM74ALS160 480-148
DM74ALS161 478-125
DM74ALS162 481-5
DM74ALS163 478-172
DM74ALS240 503-119
DM74ALS241 504-24
DM74ALS242 503-37
DM74ALS243 503-38
DM74ALS244 503-113
DM74ALS245 504-166
DM74ALS273 486-149
DM74ALS32 493-134
DM74ALS373 496-54
DM74ALS374 486-177
DM74ALS377 487-41
DM74ALS573 496-55
DM74ALS574 486-178
DM74ALS576 489-142
DM74ALS580 496-113
DM74ALS620 505-100
DM74ALS622 505-101
DM74ALS623 505-102
DM74ALS640 504-115
DM74ALS641 504-148
DM74ALS642 504-96
DM74ALS643 504-116
DM74ALS644 505-29
DM74ALS646 505-140
DM74ALS647 505-51
DM74ALS648 505-141
DM74ALS649 505-52
DM74ALS690 481-6
DM74ALS691 478-91
DM74ALS692 481-7
DM74ALS693 478-92
DM74ALS696 481-82
DM74ALS697 479-142
DM74ALS698 481-83
DM74ALS699 479-143
DM74ALS74 485-70
DM74ALS873 495-114
DM74ALS874 485-38
DM74ALS876 485-39
DM74ALS880 496-8
DM74H00 492-32
DM74H01 491-160
DM74H04 477-187
DM74H05 477-79
DM74H08 489-159
DM74H10 491-6
DM74H103 488-101

DM74H106 488-111
DM74H108 488-67
DM74H11 489-61
DM74H20 490-116
DM74H21 488-178
DM74H22 490-60
DM74H30 492-85
DM74H40 490-20
DM74H50 492-162
DM74H51 492-184
DM74H52 492-140
DM74H53 493-60
DM74H54 493-51
DM74H55 493-45
DM74H60 507-102
DM74H61 507-110
DM74H62 508-5
DM74H71 487-101
DM74H72 487-88
DM74H73 488-10
DM74H74 485-85
DM74H76 488-51
DM74H78 487-152
DM74L164A 3490-98
DM74L91 3491-2
DM74L95 3488-47
DM74LS00 492-41
DM74LS01 491-174
DM74LS02 494-130
DM74LS03 491-175
DM74LS04 478-10
DM74LS05 477-89
DM74LS08 489-167
DM74LS09 489-110
DM74LS10 491-16
DM74LS107A 488-24
DM74LS109 487-141
DM74LS11 489-70
DM74LS112 488-121
DM74LS113A 488-82
DM74LS114A 488-146
DM74LS12 490-162
DM74LS122 500-130
DM74LS123 500-171
DM74LS125A 476-148
DM74LS126 476-123
DM74LS13 507-88
DM74LS132 507-135
DM74LS136 494-179
DM74LS138 483-176
1094-126
DM74LS139 483-73
DM74LS14 507-166
DM74LS15 489-24
DM74LS151 499-175
DM74LS153 498-47
DM74LS154 484-41
DM74LS155 483-139
DM74LS156 483-107
DM74LS157 499-44
DM74LS158 498-138
DM74LS160A 480-165
DM74LS161A 478-143
DM74LS162 481-24
DM74LS163A 478-187
DM74LS164 502-40
3490-115
DM74LS166 502-103
DM74LS168A 481-109
DM74LS169A 479-108
DM74LS170 497-8
3470-55
DM74LS173 486-37
DM74LS174 486-71
DM74LS175 485-140
1097-3
DM74LS190 482-12
DM74LS191 479-158
DM74LS192 481-156
DM74LS193 480-21
DM74LS194A 501-165
DM74LS195A 501-63
DM74LS196 480-114
DM74LS197 478-77
DM74LS20 490-126
DM74LS21 489-4
DM74LS22 490-70
DM74LS221 500-146
DM74LS240 503-148
DM74LS241 504-60
DM74LS242 503-84
DM74LS243 503-85

DM74LS244 504-61
DM74LS245 505-12
DM74LS247 2463-167
DM74LS248 2463-125
DM74LS249 2463-93
DM74LS251 500-55
DM74LS253 497-158
DM74LS257B 498-175
DM74LS258B 498-97
DM74LS259 496-41
DM74LS26 491-74
DM74LS266 495-76
DM74LS27 494-56
DM74LS279 495-175
DM74LS283 476-77
DM74LS290 480-65
DM74LS293 479-58
DM74LS298 499-100
DM74LS30 492-95
DM74LS32 493-153
DM74LS352 497-132
DM74LS353 497-100
DM74LS365A 477-10
DM74LS366A 477-134
DM74LS367A 477-11
DM74LS368A 477-135
DM74LS37 491-108
DM74LS373 496-82
DM74LS374 487-21
DM74LS38 491-60
DM74LS386 495-17
DM74LS390 481-53
DM74LS393 479-16
DM74LS40 490-30
DM74LS42 483-32
DM74LS47 2463-168
DM74LS471 ★ 3850
3460-23
DM74LS48 2463-126
DM74LS49 2463-94
DM74LS51 493-4
DM74LS54 493-92
DM74LS55 493-37
DM74LS62 496-147
DM74LS670 497-20
3470-67
DM74LS73A 488-25
DM74LS74 485-95
DM74LS75 495-140
DM74LS76 488-59
DM74LS77 495-154
DM74LS78 487-159
DM74LS83A 476-78
DM74LS85 474-54
DM74LS86 495-43
DM74LS90 480-66
DM74LS92 482-45
DM74LS93 479-59
DM74S00 492-52
DM74S02 494-146
DM74S03 491-188
DM74S04 478-21
DM74S05 477-100
DM74S08 489-177
DM74S09 489-111
DM74S10 491-27
DM74S11 489-81
DM74S112 488-130
DM74S113 488-93
DM74S114 488-156
DM74S133 492-130
DM74S134 492-112
DM74S135 494-161
DM74S136 495-4
DM74S138 483-188
DM74S139 483-85
DM74S140 484-56
2471-52
DM74S15 489-33
DM74S151 499-190
DM74S153 498-59
DM74S157 499-57
DM74S158 498-151
DM74S162 481-35
DM74S174 486-84
DM74S175 485-153
DM74S182 475-88
¶ 245-10
DM74S188 3459-16
DM74S189 497-49
3471-27

DM74S194 501-175
DM74S195 501-72
DM74S196 480-120
DM74S20 490-137
DM74S200 497-62
DM74S206 497-61
3473-7
DM74S22 490-79
DM74S240 2471-16
DM74S241 2470-44
DM74S242 503-98
DM74S243 503-99
DM74S251 500-66
DM74S253 498-9
DM74S257 498-187
DM74S258 488-111
DM74S260 494-25
DM74S280 509-20
DM74S281 476-18
DM74S287 3459-88
¶ 286-4
DM74S288 3459-17
DM74S289 497-42
3471-18
DM74S299 502-178
DM74S30 492-105
DM74S32 493-163
DM74S373 496-99
DM74S374 487-33
DM74S387 3459-86
DM74S40 490-41
DM74S472 3461-40
DM74S472A 3461-12
DM74S473 3461-32
DM74S473A 3461-6
DM74S474 3461-55
DM74S474A 3461-16
DM74S474B 3461-13
DM74S475 3461-51
DM74S475A 3461-8
DM74S51 493-14
DM74S570 3460-62
DM74S571 3460-64
DM74S571A 3460-65
DM74S571B 3460-66
DM74S572A 3461-116
3461-116
DM74S573A 3462-1
3462-1
DM74S64 493-108
DM74S65 493-116
DM74S74 485-105
DM74S86 495-55
DM7511 485-50
DM7512 487-111
DM7542 485-158
DM7544 506-5
DM7546 502-142
3489-129
DM7551 486-22
¶ 236-15
DM7552 482-71
DM7553 496-140
DM7554 482-60
DM7555 480-123
DM7556 478-97
DM7560 481-133
DM7563 479-179
DM7570 502-20
3490-116
DM7575 507-7
3458-31
DM7576 507-8
3458-32
DM7589 497-39
3471-99
DM7590 3490-44
DM7599 497-47
3471-97
DM75S28 3484-40
DM75S29 3484-39
DM75S50 482-82
DM7613 485-51
DM76LS52 496-148
DM76S128 3453-1
3453-31
DM76S64 3453-2
3453-32
DM7773101 ★ 3851
DM77S180 3463-47
DM77S181 3463-56
DM77S184 3464-22

DM77S185 3464-23
DM77S188 3459-5
DM77S190 3464-108
DM77S191 3464-112
DM77S280 ★ 3851
3463-23
DM77S281 ★ 3851
3463-24
DM77S288 3459-6
DM77S291 3464-113
DM77S401 ★ 3853
3456-45
DM77S402 ★ 3853
3456-55
DM77SR181 ★ 3852
3462-68
DM7853 500-135
DM7875 475-160
DM8090 495-88
DM8091 491-92
DM8092 490-143
DM8093 476-136
¶ 237-7
DM8094 476-110
¶ 237-7
DM8095 163
485-18
DM8096 111
485-15
DM8097 164
485-18
DM8098 112
485-15
DM8099 491-81
DM8121 500-2
DM8123 499-67
DM8130 474-136
DM8131 474-77
DM8136 474-79
DM8160 474-71
DM81LS95 477-44
DM81LS96 478-33
DM81LS97 477-45
DM81LS98 478-34
DM8200 474-33
DM8210 500-8
¶ 235-12
DM8211 500-9
DM8214 497-138
¶ 237-7
DM8219 500-90
DM8220 509-27
DM8223 483-147
DM8230 482-92
¶ 237-7
DM8280 480-96
DM8281 478-59
DM8288 482-25
DM8290 480-97
DM8291 478-60
DM8300 501-45
3489-12
DM8301 483-12
DM8309 497-109
DM8310 480-136
DM8311 484-32
DM8312 499-125
DM8316 478-113
DM8318 508-133
DM8322 499-13
DM8334 496-27
DM8511 485-52
DM8512 487-112
DM8542 485-159
DM8544 506-6
DM8546 502-143
3489-130
DM8551 486-23
¶ 237-6
¶ 237-7
DM8552 482-72
¶ 237-7
DM8553 496-141
DM8554 482-61
DM8555 480-124
DM8556 478-98
¶ 237-5
DM8560 481-134
DM8563 479-180
DM8570 502-21
3490-117

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

National Semiconductor (Cont'd)

Device	Page-Line
DM8575	507-9
	¶ 235-14
	3458-33
	¶ 235-14
	3457-40
DM8576	507-10
	¶ 235-14
	3458-34
	¶ 235-14
DM8576AAA	3454-3
	¶ 235-14
DM8589	497-40
	3471-76
DM8590	3490-45
DM8599	497-48
	3471-53
DM85S68	497-54
	¶ 245-14
	3471-29
	¶ 245-14
DM8601	500-111
DM8602	501-1
DM8613	485-53
DM8678	3453-3
	3453-33
	¶ 284-9
	¶ 284-11
	¶ 284-12
DM86LS52	496-149
DM86LS62	496-150
DM86S128	3453-4
	3453-34
DM86S64	3453-5
	3453-35
DM1873181	★ **3851**
DM87S180	3463-3
DM87S181	3463-16
DM87S184	3463-122
DM87S185	3464-3
DM87S188	3459-3
DM87S190	3464-98
DM87S191	3464-101
DM187S280	★ **3851**
	3462-91
DM187S281	★ **3851**
	3462-92
DM87S288	3459-4
DM87S291	3464-97
DM187S401	★ **3853**
	3456-46
DM187S402	★ **3853**
	3456-56
DM187SR181	★ **3852**
	3462-69
DM8853	500-136
DM8875	475-161
DM8898	507-38
DM8899	507-35
DM9002C	492-6
DM9003C	490-176
DM9004C	490-91
DM9005C	492-152
DM9006C	493-29
DM9008C	493-54
DM9009C	490-4
DM9012C	491-137
DM9016C	477-162
DM9300	501-46
	3489-13
DM9301	483-13
DM9309	497-110
DM9310	480-137
DM9311	484-33
DM9312	499-126
DM9316	478-114
DM9318	508-134
DM9322	499-14
DM9334	496-28
DM9601	500-112
DM9602	501-2
DMC2716	★ **3860**
DMPAL10H8C	★ **737**
	506-61
	★ **737**
	3457-37
DMPAL10H8M	★ **737**
	506-62
	★ **737**
	3457-38
DMPAL10L8C	★ **737**
	506-63
	★ **737**
	3457-39
DMPAL10L8M	★ **737**
	506-64
	★ **737**
	3457-40
DMPAL12H6C	★ **737**
	506-65
	★ **737**
	3457-41
DMPAL12H6M	★ **737**
	506-66
	★ **737**
	3457-42
DMPAL12L6C	★ **737**
	506-67
	★ **737**
	3457-43
DMPAL12L6M	★ **737**
	506-68
	★ **737**
	3457-44
DMPAL14H4C	★ **737**
	506-69
	★ **737**
	3457-45
DMPAL14H4M	★ **737**
	506-70
	★ **737**
	3457-46
DMPAL14L4C	★ **737**
	506-71
	★ **737**
	3457-47
DMPAL14L4M	★ **737**
	506-72
	★ **737**
	3457-48
DMPAL16A4C	506-73
	3457-49
DMPAL16A4M	506-74
	3457-50
DMPAL16C1C	★ **737**
	506-75
	★ **737**
	3457-51
DMPAL16C1M	★ **737**
	506-76
	★ **737**
	3457-52
DMPAL16H2C	★ **737**
	506-77
	★ **737**
	3457-53
DMPAL16H2M	★ **737**
	506-78
	★ **737**
	3457-54
DMPAL16L2C	★ **737**
	506-79
	★ **737**
	3457-55
DMPAL16L2M	★ **737**
	506-80
	★ **737**
	3457-56
DMPAL16L8C	★ **737**
	506-81
	★ **737**
	3457-57
DMPAL16L8M	★ **737**
	506-82
	★ **737**
	3457-58
DMPAL16R4C	★ **737**
	506-83
	★ **737**
	3457-59
DMPAL16R4M	★ **737**
	506-84
	★ **737**
	3457-60
DMPAL16R6C	★ **737**
	506-85
	★ **737**
	3457-61
DMPAL16R6M	★ **737**
	506-86
	★ **737**
	3457-62
DMPAL16R8C	★ **737**
	506-87
	★ **737**
	3457-63
DMPAL16R8M	★ **737**
	506-88
	★ **737**
	3457-64
DMPAL16X4C	506-89
	3457-65
DMPAL16X4M	506-90
	3457-66
DP3216	1094-80
DP3226	1094-81
DP7303	2478-35
DP7304	1094-82
DP7304B	2478-36
DP7307	2478-37
DP7308	2478-38
DP7310	2483-159
DP7311	2483-160
DP8212	1094-160
	1097-4
	¶ 246-13
DP8212M	1094-161
	¶ 246-13
DP8216	1094-83
	¶ 246-13
DP8216M	1094-84
	¶ 246-13
DP8224	1094-103
	¶ 246-13
DP8226	1094-85
	¶ 246-13
DP8226M	1094-86
	¶ 246-13
DP8228	1095-92
	¶ 246-13
DP8228M	1095-93
	¶ 246-13
DP8238	1095-94
	¶ 246-13
DP8238M	1095-95
	¶ 246-13
DP8250	1094-64
DP8303	2478-39
DP8304	2478-15
	1094-87
DP8304B	2478-40
DP8307	2478-41
DP8308	2478-42
DP8310	2483-161
DP8311	2483-162
DP8340	★ **2762**
	2487-30
DP8341	★ **2762**
	2487-15
DP8342	★ **2762**
	2487-31
DP8343	★ **2762**
	2487-14
DP8350	★ **2763**
	1094-111
	1100-74
	¶ 238-3
	¶ 239-3
	¶ 240-1
DP8352	1094-112
DP8353	1094-113
DP8356	1095-71
DP8400	★ **2764**
	2467-25
DP8402	506-170
DP8408	2481-28
DP8409	★ **2765**
	2481-29
DP84240	★ **2767**
	2484-1
DP84244	★ **2767**
	2484-2
DP8460	★ **2766**
	2481-13
DS0025	2481-96
	¶ 285-7
DS0025C	2481-97
	¶ 285-7
DS0026	2481-98
	¶ 285-7
DS0026C	2481-99
	¶ 285-7
DS0056	2481-100
DS0056C	2481-101
DS1488	2469-57
	¶ 257-13
DS1489	2473-24
	¶ 257-13
DS1489A	2473-33
	¶ 257-13
DS1603	2474-34
	2485-58
DS1611	2482-13
DS1612	2482-53
DS1613	2482-124
DS1614	2482-88
DS16147	2483-27
DS16149	485-7
	2483-129
DS16177	2483-28
DS16179	485-8
	2483-130
DS1628	2484-3
DS1630	449-154
DS1631	2482-9
DS1632	2482-47
DS1633	2482-120
DS1634	2482-84
DS1640	2483-60
DS1642	2481-108
DS1644	2483-53
DS1645	2483-141
DS1646	2484-19
DS1647	2483-29
DS1648	2483-35
DS1649	2483-137
DS1650	2475-13
DS1651	2485-66
DS1652	2475-16
DS1653	2485-67
DS1670	2483-61
DS1671	2481-109
DS1672	2481-110
DS1674	2483-54
DS1675	2483-142
DS1676	2484-20
DS1677	2483-30
DS1678	2483-36
DS1679	2483-138
DS1686	2481-49
	2949-7
DS1687	2481-50
	2949-8
DS1688	2472-37
DS1689	2475-29
DS1690	2475-30
DS1691	2469-49
DS1692	2472-39
DS26LS31C	2472-46
DS26LS31M	2472-47
DS26LS32C	2475-23
DS26LS32M	2475-24
DS26LS33C	2475-35
DS26LS33M	2475-36
DS26S10C	508-46
	2478-6
DS26S10M	508-47
	2477-62
DS26S11C	508-48
	2478-7
DS26S11M	508-49
	2477-63
DS3245	2483-25
DS3486	2475-19
DS3487	2472-35
DS3603	2474-35
	2485-59
DS3604	2474-15
	2485-57
DS3605	2485-70
DS3606	2485-71
DS3607	2485-72
DS3608	2485-73
DS3611	2482-14
DS3612	2482-54
DS3613	2482-125
DS3614	2482-89
DS36143	2483-26
DS36144	2483-55
DS36147	2483-31
DS36149	485-9
	2483-131
DS3615	2962-115
DS3616	2962-112
DS3617	2962-118
DS36177	2483-32
DS36179	485-10
	2483-132
DS3618	2962-116
DS3628	2484-4
DS3629	2480-160
DS3630	449-155
DS3631	2482-10
DS3632	2482-48
DS3633	2482-121
DS3634	2482-85
DS3644	2483-56
DS3645	2483-143
DS3647	2483-33
DS3648	2483-37
DS3649	2483-139
DS3650	2475-14
DS3651	2485-68
DS3652	2475-17
DS3653	2485-69
DS3654	2481-43
DS3658	★ **2769**
	2483-18
DS3662	2476-50
DS3666	★ **2768**
	2475-40
DS3667	2479-28
DS3671	2463-33
DS3674	2483-57
DS3675	2483-144
DS3677	2483-34
DS3678	2483-38
DS3679	2483-140
DS3680	2483-49
DS3686	2481-51
	2949-9
DS3687	2481-52
	2949-10
DS3689	2475-31
DS3690	2475-32
DS3691	2469-48
DS3692	2472-40
DS3695	★ **2770**
	2479-37
DS3696	★ **2770**
	2479-38
DS3697	★ **2770**
	2479-39
DS3698	★ **2770**
	2479-40
DS55107	2474-23
	2474-37
DS55108	2474-30
	2474-42
DS55113	2472-3
DS55114	2471-42
DS55115	2474-58
DS55121	2469-8
DS55122	2473-14
DS55325	2480-163
DS55450	2481-126
DS55451	2481-127
DS55452	2482-28
DS55453	2482-99
DS55454	2482-64
DS55461	2481-128
DS55462	2482-29
DS55463	2482-100
DS55464	2482-65
DS55493	2464-140
DS75107	2474-24
	2474-38
DS75108	2474-31
	2474-43
DS75113	2472-4
DS75114	2471-43
DS75115	2474-59
DS75121	2469-9
DS75122	2473-15
DS75123	2469-2
DS75124	2473-9
DS75125	2473-63
DS75127	2474-1
DS75128	2474-6
DS75129	2474-7
DS75150	2469-21
DS75154	2473-51
DS75160A	★ **2768**
	2475-41
DS75161A	★ **2768**
	2475-42
DS75162A	★ **2768**
	2475-43
DS75207	2474-11
	2485-53
DS75208	2474-12
	2485-54
DS75325	2480-164
DS75361	2482-132
DS75362	2482-133
DS75365	2483-42
DS75450	2481-129
DS75451	2481-130
DS75452	2482-30
	¶ 259-4
DS75453	2482-101
DS75454	2482-66
DS75461	2481-131
DS75462	2482-31
DS75463	2482-102
DS75464	2482-67
DS75491	2464-141
	¶ 259-15
DS75492	2465-38
	¶ 259-15
DS75493	2464-142
DS75494	2465-39
DS7640	2473-39
DS7641	2476-51
DS7664	2465-139
DS7800	505-146
DS7803	2484-5
DS7807	2484-6
DS7810	484-85
DS7811	484-86
DS7812	484-152
DS7819	484-66
DS7820	2475-7
	¶ 257-13
	¶ 258-6
	¶ 259-4
DS7820A	2475-1
	¶ 257-13
	¶ 258-6
	¶ 259-4
DS7822	2473-6
DS7830	2471-53
	¶ 257-13
	¶ 258-6
	¶ 259-4
DS7831	2469-39
	2471-62
	¶ 236-15
	¶ 237-7
	¶ 257-13
DS7832	2469-30
	2472-1
	¶ 257-13
DS7833	2477-45
	¶ 257-13
DS7834	2477-40
	¶ 257-13
DS7835	2477-38
	¶ 257-13
DS7836	2473-37
	¶ 257-13
DS7837	2473-56
	¶ 257-13
DS7838	2477-37
	¶ 257-13
DS7839	2477-43
	¶ 257-13
DS7880	2465-64
DS7889	2465-113
DS78C120	2474-48
DS78C20	2475-8
DS78L12	505-151
DS78L20	2474-55
DS78LS120	2474-46
DS8614	★ **2771**
	510-127
DS8615	★ **2771**
	510-132
DS8616	★ **2771**
	511-1
DS8617	★ **2771**
	511-14
DS8621	511-11
	2945-79
	2946-88
DS8622	511-19
	2945-82
DS8626	510-133
	2945-72

Arranged alphanumerically from left to right.

© IC MASTER 1983

National Semiconductor (Cont'd)

Device	Page-Line
DS8627	510-128
DS8628	510-121
DS8629	511-15
	2945-73
DS8640	2473-40
DS8641	2476-52
DS8646	2465-33
DS8647	2465-127
DS8648	2465-128
DS8654	2481-44
DS8656	2481-45
DS8664	2465-140
	1087-13
DS8665	2465-137
DS8666	2465-138
DS8669	2464-23
DS8692	2481-46
DS8693	2481-47
DS8694	2481-48
DS8800	505-147
DS8803	2484-7
DS8807	2484-8
DS8810	484-87
DS8811	484-88
DS8812	484-153
DS8819	484-67
DS8820	2475-9
	¶ 257-13
	¶ 258-6
	¶ 259-4
DS8820A	2475-2
	¶ 257-13
	¶ 258-6
	¶ 259-4
DS8822	2473-7
DS8830	2471-54
	¶ 257-13
	¶ 258-6
	¶ 259-4
DS8831	2469-40
	2471-63
	¶ 236-15
	¶ 237-7
	¶ 257-13
DS8832	2469-31
	2472-9
	¶ 257-13
DS8833	2477-46
	¶ 257-13
	1094-88
	¶ 257-13
DS8834	2477-41
	¶ 257-13
DS8835	2477-39
	¶ 257-13
	1094-89
	¶ 257-13
DS8836	2473-38
	¶ 257-13
DS8837	2473-58
	¶ 257-13
DS8838	2476-3
	¶ 257-13
DS8839	2477-44
	¶ 257-13
DS8856	2463-127
	¶ 259-15
DS8857	2464-55
	¶ 259-15
DS8858	2464-58
	¶ 259-15
DS8859	2464-82
DS8861	2465-18
	¶ 259-15
DS8863	2465-83
	¶ 259-15
DS8864	2465-123
	¶ 259-15
DS8867	2465-117
DS8869	2464-83
DS8870	2465-40
DS8871	2465-84
DS8872	2465-118
DS8873	2465-124
DS8874	2465-125
DS8877	2465-41
DS8880	2465-65
	¶ 259-14
DS8881	2465-142
DS8884A	2465-66
	¶ 259-14
DS8885	2465-60
	¶ 259-14
DS8887	2465-80
	¶ 259-14
DS8889	2465-114
	¶ 259-14
DS8891	2465-26
DS8897	2465-81
DS88C120	2474-49
DS88C20	2475-10
DS88L12	505-152
DS88LS120	2474-47
DS8906	2945-112
DS8907	2945-113
DS8908	2945-114
DS8920	2465-119
DS8963	2465-85
DS8973	2465-120
DS8975	2465-121
DS8980	2465-67
	¶ 259-14
DS8T26A	508-14
	2477-15
	1090-29
DS8T26AM	508-15
	2477-16
DS8T28	508-26
	2477-29
	1090-30
DS8T28M	508-27
	2477-30
DT1000	★ 3338
	2902-81
DT1050	2902-91
DT1051	2902-74
DT1052	2902-90
DT1056	★ 3340
	2902-92
DT1057	★ 3340
	2902-93
Digitalker	1102-77
F29705M	3471-59
FOE3803-1	★ 3345
	2963-67
FOE3803-2	★ 3345
	2963-68
FOR1003	★ 3345
	2963-70
FOR261F-1	★ 3345
	2963-71
FOR261F-2	★ 3345
	2963-72
FOR36	★ 3345
FOR361	★ 3345
FOT1603	★ 3345
	2963-74
IDA2003	★ 3327
IDM2901A-2	★ 3856
	1085-87
IDM2901A/A-1	★ 3856
	1049-15
IDM2901AC	★ 3856
	1085-88
IDM2901AM	★ 3856
	476-38
	★ 3856
	1085-89
IDM2902C	1085-131
IDM2902M	1085-132
IDM2909AC	506-158
	1086-7
IDM2909AM	506-159
	1086-8
IDM2910A	★ 3857
	1101-55
IDM2911AC	506-160
	1086-9
IDM2911AM	506-161
	1086-10
IDM29704C	497-43
IDM29704M	497-44
	3471-69
IDM29705	3471-60
IDM29705AC	497-50
	1086-34
IDM29705AM	497-51
	1086-35
IDM29705C	497-52
	3471-48
IDM29705M	497-53
IDM2970C	3471-56
IDM29803C	1086-79
IDM29803M	1086-80
IDM29811C	1086-13
IDM29811M	1086-14
IDM29901C	1086-54
IDM29901M	1086-55
IDM29902C	1086-15
IDM29902M	1086-16
IDM29903C	1086-81
IDM29908C	1086-48
IDM29908M	1086-49
INS1771	1097-112
	1101-29
	¶ 238-17
INS2651	1095-25
INS8035	1093-30
	1069-27
INS8035L	1093-31
	1069-28
INS8039	1093-32
	1069-29
INS8039L	1093-33
	1069-30
INS8040	1093-34
	1069-31
INS8040L	1093-35
	1069-32
INS8048	1093-65
	¶ 241-6
	1069-33
	¶ 241-6
INS8048L	1093-66
	¶ 241-6
	1069-34
	¶ 241-6
INS8049	1093-67
	1069-35
INS8049L	1093-68
	1069-36
INS8050	1093-69
	1069-37
INS8050L	1093-70
	1069-38
INS8060	1096-130
	¶ 238-10
	¶ 239-11
	1069-39
	¶ 238-10
	¶ 239-11
INS8070	1093-85
	1069-40
INS8072	1093-83
	1069-41
INS8073	1093-84
	1069-42
INS8080A	1094-45
	¶ 253-8
	¶ 286-11
	¶ 287-12
	¶ 238-3
	¶ 246-13
	1069-43
	¶ 253-8
	¶ 286-11
	¶ 287-12
	¶ 238-3
	¶ 246-13
INS8080A-1	1094-46
INS8080A-2	1094-47
INS8154	1095-72
	1097-2
INS8202	1094-96
INS8203	1094-97
INS8208	1094-90
INS8212	1094-162
	1097-5
INS8216	1094-91
INS8224	1094-104
INS8226	1094-92
INS8228	1095-96
INS8238	1095-97
INS8243	1093-118
INS8244	1095-9
INS8245	1095-10
INS8246	1095-11
INS8247	1094-129
INS8248	1094-130
INS8250	2487-73
	¶ 238-3
	1094-65
	1096-135
	¶ 238-3
INS8251	1095-26
	1096-136
	¶ 246-13
INS8253	1095-55
INS8253-5	1095-56
	1096-27
INS8254	1095-64
	1096-134
INS8255	1095-65
	1097-1
	¶ 246-13
INS8259	1095-50
INS82891	1101-41
INS82893	1101-42
INS8294	1094-57
INS82C06	1094-152
INS82LS05	1094-127
INS8708	3463-85
LF111	★ 3310
	★ 3317
	2892-3
LF11201	★ 3318
	2416-90
LF11202	★ 3318
	2416-91
LF11331	★ 3318
	2416-92
LF11332	★ 3318
	2416-93
LF11333	★ 3318
	2416-94
LF11508	★ 3318
	2424-35
LF11509	★ 3318
	2423-70
LF13201	★ 3318
	2416-95
LF13202	★ 3318
	2416-96
LF13300	2438-46
LF13331	★ 3318
	2416-97
LF13332	★ 3318
	2416-98
LF13333	★ 3318
	2416-99
LF13508	2424-36
LF13509	2423-71
LF13741	★ 3309
	2909-42
	2934-18
LF151	2927-35
LF151A	2922-44
LF153	2938-11
LF155	★ 3309
	2927-6
LF155A	★ 3309
	2922-6
LF156	★ 3309
	2927-17
LF156A	★ 3309
	2922-18
LF157	★ 3309
	2926-58
LF157A	★ 3309
	2921-53
LF164	★ 3316
LF198	2967-109
LF198A	2967-110
LF211	★ 3310
	★ 3317
	2892-4
LF2111	2891-10
LF255	★ 3309
	2927-7
LF256	★ 3309
	2927-18
LF257	★ 3309
	2926-59
LF298	2967-111
LF298A	2967-112
LF311	★ 3310
	★ 3317
	2892-53
LF347	★ 3309
	★ 3326
	2944-8
	¶ 265-10
LF347B	★ 3309
	★ 3326
	2942-25
	¶ 265-10
LF351	★ 3309
	2909-44
	2933-2
LF351A	★ 3309
	2922-34
LF351B	★ 3309
	2927-34
LF353	★ 3309
	★ 3326
	2940-30
	¶ 265-10
LF353A	★ 3309
	★ 3326
	2936-43
	¶ 265-10
LF353B	★ 3309
	★ 3326
	2938-12
	¶ 265-10
LF355	★ 3309
	2932-46
LF355A	★ 3309
	2922-7
LF355B	★ 3309
	2927-8
LF356	★ 3309
	2932-53
LF356A	★ 3309
	2922-19
LF356B	★ 3309
	2927-19
LF357	★ 3309
	2932-41
LF357A	★ 3309
	2921-54
LF357B	★ 3309
	2926-60
LF398	2967-113
LF398A	2967-114
LF400	2933-5
LF411	★ 3309
	★ 3311
	2922-43
LF411A	★ 3309
	★ 3311
	2918-29
LF412	★ 3309
	★ 3312
	2937-23
LF412A	★ 3309
	★ 3312
	2936-26
LF422A	2936-21
LF441	★ 3309
	★ 3313
	2927-22
LF441A	★ 3309
	★ 3313
	2918-28
LF442	★ 3309
	★ 3314
	2911-137
	2938-6
LF442A	★ 3309
	★ 3314
	2911-133
	2936-22
LF444	★ 3309
	★ 3315
	2944-7
LF444A	★ 3309
	★ 3315
	2942-18
LH0002	★ 3342
	2887-16
	¶ 264-2
LH0002C	★ 3342
	2887-17
	¶ 264-2
LH0003	2909-82
	2913-113
	2925-46
LH0003C	2913-114
	2925-47
LH0004	2910-75
	2921-13
LH0004C	2909-115
	2910-76
	2921-36
LH0005	2909-91
	2913-115
	2933-14
LH0005A	2909-92
	2913-116
	2925-32
LH0005C	2909-95
	2913-117
	2933-15
LH0020	★ 3342
	2909-93
	2924-35
LH0020C	★ 3342
	2909-94
	2931-12
LH0021	★ 3342
	2909-61
	2925-42
LH0021C	★ 3342
	2909-71
	2931-16
LH0022	★ 3342
	2925-50
	¶ 266-15
LH0022C	★ 3342
	2930-1
	¶ 266-15
	¶ 266-15
LH0023	★ 3343
	2967-115
LH0023C	★ 3343
	2967-116
LH0024	★ 3342
	2910-14
	2913-153
	2926-32
LH0024C	★ 3342
	2910-24
	2913-154
	2932-26
LH003	★ 3342
LH0032	★ 3342
	2910-15
	2913-151
	2927-25
LH0032C	★ 3342
	2910-16
	2913-152
	2934-20
LH0033	★ 3342
	2908-3
LH0033C	★ 3342
	2908-6
LH0036	★ 3343
	2887-86
LH0036C	★ 3343
	2887-87
LH0037	★ 3343
	2887-88
LH0037C	★ 3343
	2887-89
LH0038	★ 3343
	2887-90
LH0038C	★ 3343
	2887-91
LH004	★ 3342
LH0041	★ 3342
	2909-77
	2925-40
LH0041C	★ 3342
	2909-78
	2931-7
LH0042	★ 3342
	2934-48
LH0042C	★ 3342
	2934-52
	¶ 266-15
LH0043	★ 3343
	2967-117
LH0043C	★ 3343
	2967-118
LH0044	★ 3342
	2911-82
	2915-8
LH0044A	★ 3342
	2911-26
	2914-25

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

National Semiconductor (Cont'd)

Device	Page-Line
LH0044AC	★ 3342
	2911-27
	2914-26
LH0044B	★ 3342
	2911-49
	2915-7
LH0044C	★ 3342
	2911-83
	2915-49
LH0045	2888-136
LH0045C	2888-137
LH005	★ 3342
LH0052	★ 3342
	2911-32
	2917-46
	¶ 266-15
LH0052C	★ 3342
	2911-43
	2920-17
	¶ 266-15
	¶ 266-15
LH0053	★ 3343
	2967-119
LH0053C	★ 3343
	2967-120
LH0061	★ 3342
	2909-73
	2926-17
LH0061C	★ 3342
	2909-74
	2933-44
LH0062	★ 3342
	2910-54
	2926-39
LH0062C	★ 3342
	2910-55
	2934-16
LH0063	★ 3342
	2908-7
LH0063C	★ 3342
	2908-8
LH0070	★ 3304
	★ 3343
	2966-156
LH0071	★ 3304
	★ 3343
	2966-175
LH0071-0	★ 3304
	★ 3343
	2966-172
LH0071-1	★ 3304
	★ 3343
	2966-173
LH0071-2	★ 3304
	★ 3343
	2966-174
LH0075	★ 3303
	★ 3343
	2954-1
	2958-99
	2959-15
LH0075C	★ 3303
	★ 3343
	2959-16
LH0076	★ 3303
	★ 3343
	2960-23
LH0076C	★ 3303
	★ 3343
	2960-24
LH0082	2887-40
LH0082C	2887-41
LH0084	★ 3343
	2887-100
LH0084C	★ 3343
	2887-101
LH0086	★ 3343
	2887-102
LH0086C	★ 3343
	2887-103
LH0091	★ 3343
	2967-48
	¶ 277-11
LH0091C	★ 3343
	2967-49
	¶ 277-11
LH0094	★ 3343
	2964-146
LH0094C	★ 3343
	2964-147
LH0101	★ 3342
	2909-62
	2933-6
LH0101A	★ 3342
	2909-63
	2925-11
LH0101AC	★ 3342
	2909-64
	2925-12
LH0101C	★ 3342
	2909-65
	2933-7
LH1605	★ 3343
	2961-3
LH1605C	★ 3343
	2961-4
LH2011	★ 3342
	2935-40
LH2011B	★ 3342
	2936-8
LH2011C	★ 3342
	2936-25
LH2101A	★ 3342
	2937-6
LH2108	★ 3342
	2936-48
LH2108A	★ 3342
	2935-54
LH2110	★ 3342
	2908-20
LH2111	★ 3317
	2893-19
LH2201A	★ 3342
	2937-7
LH2208	★ 3342
	2936-49
LH2208A	★ 3342
	2935-55
LH2210	2908-15
LH2211	★ 3317
	2893-20
LH2250	★ 3342
	2937-26
LH2250C	★ 3342
	2937-27
LH2301A	★ 3342
	2940-17
LH2308	★ 3342
	2940-13
LH2308A	★ 3342
	2936-4
LH2310	2908-25
LH2311	2894-11
LH24250	★ 3342
	2912-62
	2937-28
LH24250C	★ 3342
	2912-63
	2939-25
LH0082	★ 3345
LM10	2923-14
LM101	2929-22
LM1011	2906-52
LM1014	2906-70
	2964-130
LM1017	2463-75
	2903-74
LM1019	2904-50
LM101A	2909-21
	2923-61
LM102	2908-31
LM103	2966-17
LM1035	★ 3326
	2896-34
LM1037	★ 3326
	2906-148
LM1038	★ 3326
	2906-149
LM104	2960-54
LM105	2959-126
LM106	★ 3317
	2891-22
LM107	2923-44
LM108	2911-146
	2922-60
LM108A	2918-52
LM109H	★ 3299
	2952-22
	¶ 281-13
LM109K	★ 3299
	2952-57
	¶ 281-13
LM10B	2923-15
LM10BL	2923-12
LM10C	2926-3
LM10CL	2926-2
LM11	2911-84
	2917-28
	¶ 265-11
LM110	2908-21
LM111	★ 3317
	2891-45
LM1111	★ 3326
	★ 3328
	2896-47
LM112	2911-138
	2922-48
LM1121A	★ 3326
	2896-48
LM1121B	★ 3326
	2896-49
LM1121C	★ 3326
	2896-50
LM113	★ 3304
	2966-7
LM113-1	★ 3304
	2966-8
LM113-2	★ 3304
	2966-9
LM1131A	★ 3326
	2896-51
LM1131B	★ 3326
	2896-52
LM1131C	★ 3326
	2896-53
LM117	★ 3299
	2959-82
	¶ 281-13
LM11700A	2936-27
LM118	2910-56
	2926-10
LM119	★ 3317
	2893-31
	2893-34
LM11C	2911-85
	2919-50
	¶ 265-11
LM11CL	2927-32
	¶ 265-11
LM120	★ 3301
LM120H12	2957-63
LM120H15	2957-106
LM120H5	2956-98
LM120K12	2957-74
LM120K15	2957-119
LM121	2888-24
LM121A	2888-25
LM122	2951-13
LM123	★ 3299
	2952-118
	¶ 281-13
LM124	2913-64
LM124A	2941-25
LM125	2958-77
	¶ 281-13
LM126	2958-67
LM129	★ 3304
	2966-105
	¶ 281-13
LM1301	2897-188
LM1303	★ 3325
	2897-189
LM13080	2931-25
LM131	2963-90
LM1310	★ 3325
	★ 3328
	2901-110
LM131A	2963-91
LM134	2968-26
	2962-130
LM135	2968-27
LM136-2	★ 3304
	2966-55
	¶ 281-13
LM136-5	★ 3304
	¶ 281-13
LM13600	★ 3326
	2939-9
LM136A-2	★ 3304
	2966-56
	¶ 281-13
LM136A-5	★ 3304
	¶ 281-13
LM137	★ 3301
	2960-42
	2960-63
	¶ 281-13
LM13700	★ 3326
	★ 3328
	2937-46
LM13700A	★ 3326
	★ 3328
	2936-28
LM138	★ 3299
	2959-52
LM139	★ 3317
	2895-2
LM1391	2904-91
LM139A	★ 3317
	2894-33
LM140-12	★ 3299
	2954-62
LM140-15	★ 3299
	2955-24
LM140-5	★ 3299
	2952-83
LM1408-6	2444-9
LM1408-7	2443-54
LM1408-8	2442-35
LM140A-12	★ 3299
	2954-63
LM140A-15	★ 3299
	2955-25
LM140A-5	★ 3299
	2952-84
LM140LA-12	★ 3299
	2954-15
LM140LA-15	★ 3299
	2954-113
LM140LA-5	★ 3299
	2952-9
LM1414	★ 3317
	2893-40
LM143	2910-77
LM1436	2910-93
	2933-54
LM144	2910-78
	2927-48
LM1145	★ 3301
LM1458	2909-4
	2939-44
LM145K5	2956-130
	2957-20
LM146	2912-85
LM149	2942-33
LM1496	2962-94
LM150	★ 3299
	2959-43
	¶ 281-13
LM1508-8	2442-36
LM1514	★ 3317
	2893-3
LM1524	2961-5
LM1536	2910-79
	2927-50
LM1558	2938-52
LM158	2913-32
	2938-26
LM158A	2913-47
LM159	2935-28
LM1596	2962-95
LM160	★ 3317
	2892-11
LM161	★ 3317
	2891-34
LM163	2915-46
LM163A	2887-65
	2914-51
LM1800	★ 3325
	★ 3328
	2901-111
LM1801	2906-119
LM1812	2901-168
LM1818	★ 3325
	★ 3328
	2902-105
LM1821	2900-101
LM1822	★ 3329
	2905-137
LM1828	2903-103
LM1830	2963-77
LM1837	★ 3325
	★ 3327
	2897-147
LM1848	2903-104
LM185	★ 3304
	2966-14
LM185-1	★ 3304
LM185-2	★ 3304
	2966-57
LM1851	2906-57
LM1865	★ 3325
	★ 3327
	2901-30
LM1866	★ 3325
	2900-119
LM1868	★ 3325
	2900-102
LM1870	★ 3325
	★ 3328
	2901-112
LM1871	2902-18
LM1872	2902-19
LM1875	★ 3330
	2896-143
LM1877	★ 3326
	★ 3328
	2897-92
LM1879	2896-85
LM1880	2904-69
LM1886	2905-138
LM1889	2905-139
	2906-48
LM1893	★ 3331
	2968-146
LM1894	★ 3326
	2896-54
LM1895	★ 3326
	2897-93
LM1896	★ 3326
	★ 3328
	2897-94
LM1897	★ 3325
	★ 3327
	2897-190
LM192	2887-148
	2937-42
LM193	★ 3317
	2893-44
LM193A	★ 3317
	2893-6
LM194	2889-78
LM195	2962-109
LM196	★ 3299
	2959-6
LM1981	2900-83
LM199	★ 3304
	2966-106
	¶ 281-13
	¶ 282-13
LM199A	★ 3304
	2966-107
	¶ 281-13
	¶ 282-13
	¶ 282-13
LM2001	2896-86
LM2002	★ 3326
	2897-18
LM201	2932-7
LM201A	2923-62
LM202	2908-33
LM204	2960-55
LM205	2960-1
LM206	★ 3317
	2891-23
LM207	2923-45
LM208	2922-61
LM208A	2918-53
LM209H	★ 3299
	2952-23
LM209K	★ 3299
	2952-58
LM210	2908-16
LM211	★ 3317
	2891-46
LM212	2911-139
	2922-49
LM217	★ 3299
	2959-83
LM218	2926-11
LM219	★ 3317
	2893-35
LM221	2888-26
LM221A	2888-27
LM223	★ 3299
	2952-119
LM224	2913-65
LM224A	2941-44
LM231	2963-92
LM2311	★ 3317
LM231A	2963-93
LM234	2968-28
	2962-131
LM236-2	★ 3304
	2966-58
LM236-5	★ 3304
	2966-87
LM236A-2	★ 3304
	2966-59
LM236A-5	★ 3304
	2966-88
LM237	★ 3301
	2960-43
	2960-64
LM238	★ 3299
	2959-53
LM239	★ 3317
	2895-19
LM239A	★ 3317
	2894-45
LM240	★ 3299
LM245	★ 3301
LM246	2912-86
LM248	2943-29
LM249	2943-35
LM250	★ 3299
	2959-44
LM2524	2961-6
LM258	2913-33
	2938-27
LM258A	2913-34
	2937-30
LM260	★ 3317
	2892-12
LM261	★ 3317
	2891-35
LM285	★ 3304
	2966-15
LM285-1	★ 3304
LM285-2	★ 3304
	2966-60
LM2877	★ 3326
	★ 3328
	2897-95
LM2878	★ 3326
	2897-110
LM2879	2897-111
LM2887	2903-105
LM2895	★ 3326
	2896-87
LM2896	★ 3326
	★ 3328
	2897-96
LM2900	2913-102
LM2901	2895-39
LM2902	2913-23
LM2903	★ 3317
	2894-2
LM2904	2913-24
LM2905	2951-14
LM2907	2907-5
	2963-113
	¶ 277-9
LM2917	2907-6
	2963-114
	¶ 277-9
LM292	2887-149
	2938-37
LM2924	2888-1
LM293	★ 3317
	2893-55
LM2930-5	★ 3299
LM2930-8	★ 3299
LM2931	★ 3299
	2959-12
LM2931-5	★ 3299
LM293A	★ 3317
	2893-10
LM295	2962-110
LM299	★ 3304
	2966-108
	¶ 282-13

Arranged alphanumerically from left to right.

© IC MASTER 1983

National Semiconductor (Cont'd)

Device	Page-Line
LM299A	★ 3304
	2966-109
	¶ 282-13
	¶ 282-13
LM3011	★ 3325
	★ 3328
	2901-31
LM301A	2931-54
LM302	2908-37
LM304	2960-26
LM3045	2889-9
LM3046	2889-10
LM305	2959-31
LM305A	2960-7
LM306	★ 3317
	2892-14
LM3064	2903-19
LM307	2931-45
LM3075	★ 3325
	★ 3327
	2901-32
LM308	2931-36
LM3080	2897-148
LM3080A	2897-149
LM3086	2889-11
LM3089	★ 3325
	★ 3327
	2901-33
LM308A	2919-23
LM309H	★ 3299
	2952-25
LM309K	★ 3299
	2952-59
LM310	2908-28
LM311	★ 3317
	2892-39
LM312	2931-30
LM3126	2903-106
LM313	★ 3304
	2966-10
LM3146	2889-12
LM316	2932-35
LM316A	2911-140
	2924-52
LM317	★ 3299
	2959-84
LM317L	★ 3299
	2959-67
LM318	2910-57
	2933-40
LM3189	★ 3325
	★ 3327
	2901-34
LM319	★ 3317
	2894-14
LM320	★ 3301
LM320H12	2957-64
LM320H15	2957-107
LM320H5	2956-99
LM320K12	2957-75
LM320K15	2957-120
LM320L05	2956-91
LM320L12	2957-59
LM320L15	2957-102
LM320ML05	2956-95
LM320ML15	2957-111
LM320MP12	2957-70
LM320MP15	2957-114
LM320MP5	2956-100
LM320T12	2957-76
LM320T15	2957-121
LM321	2888-28
LM321A	2888-29
LM322	2951-15
LM323	★ 3299
	2952-120
LM324	2913-66
LM324A	2941-45
LM325	2958-78
LM326	2958-68
LM329	★ 3304
	2966-110
LM330-5	★ 3299
LM3301	2913-100
LM3302	2895-50
LM331	2963-94
LM331A	2963-95
LM334	2968-29
	2962-132
LM335	2968-30
LM336-2	★ 3304
	2966-61
LM336-5	★ 3304
	2966-89
LM336B-5	★ 3304
	2966-90
LM337	★ 3301
	2960-44
	2960-65
LM337L	★ 3301
	2960-62
LM338	★ 3299
	2959-54
LM339	★ 3317
	2895-20
LM339A	★ 3317
	2894-46
LM340-12	★ 3299
	2954-64
	¶ 281-13
LM340-15	★ 3299
	2955-26
	¶ 281-13
LM340-5	★ 3299
	2952-86
	¶ 281-13
LM3401	2913-96
LM340A-12	★ 3299
	2954-65
	¶ 281-13
LM340A-15	★ 3299
	2955-27
	¶ 281-13
LM340A-5	★ 3299
	2952-87
	¶ 281-13
LM340LA-12	★ 3299
	2954-16
	¶ 281-13
LM340LA-15	★ 3299
	2954-114
	¶ 281-13
LM341-12	★ 3300
	2954-29
	¶ 281-13
LM341-15	★ 3300
	2954-127
	¶ 281-13
LM341-5	★ 3300
	2952-39
	¶ 281-13
LM342-12	★ 3299
	2954-24
LM342-15	★ 3299
	2954-122
LM342-5	★ 3299
	2952-33
LM343	2910-94
LM344	2910-84
	2932-13
LM345	★ 3301
LM345K5	2956-131
	2957-21
LM346	2912-87
LM348	2943-30
LM349	2943-36
LM350	★ 3299
	2959-45
LM3524	2961-7
LM358	2913-48
LM358A	2913-35
	2937-37
LM359	2935-29
LM360	★ 3317
	2892-13
LM361	★ 3317
	2892-8
LM363	2887-66
	2916-50
LM363A	2887-67
	2914-52
LM376	2959-115
LM377	2897-97
LM378	★ 3326
	2897-98
LM379	★ 3326
	2897-112
LM380	★ 3326
	2896-88
LM381	★ 3325
	★ 3328
	2897-191
LM382	★ 3325
	★ 3327
	2897-192
LM3820	★ 3325
	★ 3327
	2900-78
LM383	★ 3326
	2897-19
LM383A	★ 3326
	2897-20
LM384	★ 3326
	★ 3328
	2897-21
LM385	2966-16
LM385-2	2966-62
LM386	★ 3326
	★ 3328
	2896-89
LM387	★ 3325
	★ 3327
	2897-193
LM388	★ 3326
	★ 3328
	2896-90
LM389	★ 3326
	★ 3328
	2887-13
	2896-91
	¶ 272-8
LM390	★ 3326
	★ 3328
	2896-92
LM3900	2913-103
LM3905	2951-16
LM3909	2963-75
LM391	★ 3326
	★ 3328
	2896-68
LM3911	2968-31
LM3914	2463-4
	¶ 260-7
LM3915	2463-5
LM3916	2463-31
LM392	2887-150
	2938-38
LM3924	2888-2
LM393	★ 3317
	2893-56
LM393A	★ 3317
	2893-11
LM394	2889-79
LM395	2962-111
LM396	★ 3299
	2959-7
LM399	★ 3304
	2966-111
	¶ 282-13
LM3999	★ 3304
	2966-112
LM399A	★ 3304
	2966-113
	¶ 282-13
	¶ 282-13
LM4250	2911-164
	2912-38
	2925-21
LM4250C	2911-165
	2912-39
	2927-43
LM4500A	★ 3325
	★ 3328
	2901-113
LM555C	2951-39
LM556	2951-76
LM556C	2951-77
LM565	2946-3
LM565C	2946-4
LM566	2946-12
LM566C	2946-13
LM567	2945-151
LM567C	2945-152
	2949-67
LM709	2929-6
LM709A	2924-11
LM709C	2932-10
LM710	★ 3317
	2891-26
LM710C	★ 3317
	2892-17
LM711	★ 3317
	2893-29
LM711C	★ 3317
	2893-49
LM723	2959-95
LM723C	2959-96
LM725	2921-18
LM725A	2911-64
	2921-34
LM725C	2924-28
LM733	2888-82
LM741	2909-32
	2929-12
LM741A	2925-34
LM741C	2930-48
LM741E	2925-35
LM747	2938-53
LM747A	2937-34
LM747C	2939-45
LM747E	2937-35
LM748	2929-26
LM748C	2929-27
LM7805	2952-88
LM7812	2954-66
LM7815	2955-28
LM78L05A	2952-10
LM78L05C	2952-11
LM78L12A	2954-17
LM78L12C	2954-18
LM78L15A	2954-115
LM78L15C	2954-116
LM78LXX	★ 3299
LM78M05	2952-40
LM78M12	2954-30
LM78M15	2954-128
LM78XX	★ 3299
LM7905	2956-119
LM7912	2957-87
LM7915	2957-132
LM79L05	2956-92
LM79L05A	2956-93
LM79L12	2957-60
LM79L12A	2957-61
LM79L15	2957-103
LM79L15A	2957-104
LM79LXX	★ 3301
LM79M05	2956-101
LM79M12	2957-71
LM79M15	2957-115
LM79MXX	★ 3301
LM79XX	★ 3301
LM832	2896-45
LP165	★ 3316
	2965-141
LP365	★ 3316
	2965-142
LX04XXA	2965-119
LX05XXA	2965-120
LX05XXA0	2965-121
LX06002D	2965-136
LX06002G	2965-137
LX0603GB	2965-129
LX06XXGB	2965-130
LX06XXXA	2965-122
LX06XXXD	2965-138
LX14XXA	2965-123
LX14XXAF	2965-124
LX14XXAS	2965-125
LX1600A	2965-126
	¶ 282-14
	¶ 282-15
LX16XXA	2965-127
LX16XXD	2965-133
LX16XXG	2965-139
LX16XXGB	2965-131
LX18XXA	2965-128
LX18XXD	2965-134
LX18XXG	2965-140
LX18XXGB	2965-132
LX96XXD	2965-135
M1812	2967-173
MA2016	★ 3871
MF10	★ 3308
	2962-28
MF4	★ 3305
	2962-29
MF5	★ 3306
	2962-30
MF6	★ 3307
	2962-31
MH0007	2481-14
	¶ 260-4
MH0007C	2481-15
	¶ 260-4
MH0009	2481-102
	¶ 260-4
MH0009C	2481-103
	¶ 260-4
MH0012	2481-16
	¶ 260-4
MH0012C	2481-17
	¶ 260-4
MH0013	2481-104
	¶ 260-4
MH0013C	2481-105
	¶ 260-4
MH8805	2482-134
MM2102A	3476-87
MM2102A-2	3476-60
MM2102A-2L	3476-61
MM2102A-4	3476-104
MM2102A-4L	3476-105
MM2102A-6	3477-22
MM2102A-6L	3477-23
MM2102A-L	3476-88
MM2114	3479-35
MM2114-15	3477-103
MM2114-2	3478-28
MM2114-2L	3478-29
MM2114-3	3478-98
MM2114-3L	3478-99
MM2114L	3479-36
MM2147	3481-102
MM2147-3	3481-70
MM2147L	3481-103
MM2147M	3481-114
MM2148H	3481-104
MM2148H-2	3481-51
MM2148H-3	3481-71
MM2148H-3L	3481-72
MM2148H-L	3481-105
MM2716	3465-78
MM2716-1	3465-40
MM2716-2	3465-49
MM2758	3463-77
MM4280	3468-47
MM52116	3485-42
MM52116FDW	3453-6
MM52116FDX	3453-36
MM52132	3486-2
MM52164	3486-114
MM5257	3482-103
	¶ 287-19
MM5257-25	3482-47
	¶ 287-19
MM5257-25L	3482-48
	¶ 287-19
MM5257-3	3482-76
	¶ 287-19
MM5257-3L	3482-77
	¶ 287-19
MM5257L	3482-104
	¶ 287-19
MM5280	3468-33
MM5280-5	3468-48
MM5290-1	★ 3866
	3468-82
	¶ 286-11
MM5290-2	★ 3866
	3468-99
	¶ 286-11
MM5290-3	★ 3866
	3469-11
	¶ 286-11
MM5290-4	★ 3866
	3469-28
	¶ 286-11
MM5298-2	3468-54
MM5298-3	3468-55
MM5298-4	3468-56
MM5303	2487-64
	¶ 241-8
MM5307	510-13
	2486-35
MM5309	2899-35
	¶ 282-10
MM53100	2905-71
	¶ 274-4
MM53104	2906-23
MM53105	2905-72
MM53107	462-89
	¶ 274-4
MM53108	2898-147
MM5311	2899-36
	¶ 282-10
MM53110	2899-37
MM53113	2899-5
MM5312	2899-38
	¶ 282-10
MM53124	2899-6
MM53125	2949-158
MM5313	2899-39
MM53130	2949-159
MM5314	2899-40
MM53143	2948-20
MM53144	2948-21
MM5315	2899-41
	¶ 282-10
MM5316	★ 3327
	2898-148
MM5318	2899-42
MM53190	2948-22
MM5321	2903-40
MM5322	2899-76
MM53226	2901-169
MM5368	462-111
MM5369	462-112
MM5378	2899-43
MM5387	★ 3327
	2898-149
MM5393	2948-23
MM5394	2948-24
MM5395	2949-160
MM5402	★ 3327
	2898-150
MM5405	2898-151
MM54240	2486-14
MM5425	2902-20
MM5430	2900-111
MM5431	2900-112
MM5437	2896-42
MM5445	★ 735
	2464-94
MM5446	★ 735
	2464-95
MM5447	★ 735
	2464-96
MM5448	★ 735
	2464-97
MM5450	★ 735
	2464-92
MM5451	★ 735
	2464-93
MM5452	★ 735
	2466-2
MM5453	★ 735
	2466-3
MM5455	2899-7
MM5456	★ 3327
	2899-8
MM5457	★ 3327
	2899-9
MM5458	★ 735
MM5459	★ 735
MM5462	2899-10
MM5463	2899-11
MM5464	★ 3327
	2899-12
MM5465	2899-13
MM5466	★ 735
	2899-14
MM5474	2464-88
MM5476	2464-89
MM5477	2464-90
MM5478	2464-91
MM5483	2466-14
MM5484	2465-144
MM5485	2465-134
MM5486	2463-54
MM54C00	457-101
MM54C02	458-163
MM54C04	450-184
MM54C08	456-185
MM54C10	457-58
MM54C107	456-79
MM54C14	465-30
	¶ 237-10
MM54C150	462-1
MM54C151	461-135
MM54C154	454-156
MM54C157	461-100
MM54C160	452-141
MM54C161	451-57

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

National Semiconductor (Cont'd)

Device	Page-Line
MM54C162	452-113
MM54C163	451-33
MM54C164	463-106
	3490-130
MM54C165	463-95
	3490-95
MM54C173	455-131
MM54C174	455-172
MM54C175	455-154
MM54C192	452-172
MM54C193	451-91
MM54C195	463-16
	3489-60
MM54C20	457-25
MM54C200	460-119
	3473-31
MM54C221	462-53
	¶ 237-13
MM54C240	465-69
MM54C244	465-50
MM54C30	457-139
MM54C32	458-53
MM54C374	456-41
MM54C42	453-170
MM54C48	454-24
MM54C73	456-80
MM54C74	455-97
MM54C76	456-110
MM54C83	449-38
MM54C85	449-90
MM54C86	459-20
MM54C89	460-102
	3471-108
MM54C90	452-128
MM54C901	450-80
	¶ 261-4
MM54C902	450-82
	¶ 261-4
MM54C903	450-74
	¶ 261-4
MM54C904	450-76
	¶ 261-4
MM54C905	464-72
MM54C906	450-70
MM54C907	450-72
MM54C909	464-26
	2895-10
MM54C910	460-133
	3472-16
MM54C914	465-31
MM54C915	455-84
	2465-70
MM54C920	460-173
	¶ 286-8
	3474-25
	¶ 286-8
MM54C921	461-1
	¶ 286-8
	3474-24
	¶ 286-8
MM54C922	2468-1
	¶ 232-5
MM54C923	2468-6
MM54C929	460-152
	¶ 286-8
	3476-66
	¶ 286-8
MM54C93	451-19
MM54C930	460-153
	¶ 286-8
	3476-67
	¶ 286-8
MM54C941	450-131
	2470-45
MM54C95	462-154
	3489-75
MM54C989	3471-106
MM54HC00	457-102
MM54HC02	458-164
MM54HC04	450-185
MM54HC08	456-186
MM54HC10	457-59
MM54HC107	456-81
MM54HC109	456-111
MM54HC112	456-112
MM54HC123	462-34
MM54HC132	465-5
MM54HC133	457-157
MM54HC138	454-86
MM54HC139	454-61
MM54HC14	465-17
MM54HC147	466-19
MM54HC151	461-136
MM54HC153	461-94
MM54HC154	454-157
MM54HC157	461-101
MM54HC158	461-102
MM54HC160	452-142
MM54HC161	451-58
MM54HC162	452-114
MM54HC163	451-34
MM54HC164	463-107
MM54HC165	463-96
MM54HC175	455-155
MM54HC192	452-173
MM54HC193	451-92
MM54HC194	463-1
MM54HC195	463-17
MM54HC20	457-60
MM54HC240	465-70
MM54HC241	465-88
MM54HC242	464-125
MM54HC244	465-51
MM54HC251	466-15
MM54HC253	461-91
MM54HC257	461-116
MM54HC259	460-54
MM54HC266	458-33
MM54HC27	458-130
MM54HC280	449-110
MM54HC299	463-134
MM54HC30	457-140
MM54HC32	458-54
MM54HC354	461-164
MM54HC356	461-165
MM54HC365	450-101
MM54HC366	450-84
MM54HC367	450-102
MM54HC368	450-85
MM54HC373	459-177
MM54HC374	456-42
MM54HC390	453-36
MM54HC393	451-143
MM54HC4002	458-99
MM54HC4017	452-52
MM54HC4018	458-198
MM54HC4020	452-7
MM54HC4040	451-175
MM54HC4049	450-21
MM54HC4050	450-123
MM54HC4060	452-8
MM54HC42	454-1
MM54HC4301	460-35
MM54HC4302	460-33
MM54HC4303	456-8
MM54HC4304	456-6
MM54HC4305	450-125
MM54HC4511	455-57
MM54HC4514	454-130
MM54HC4543	455-58
MM54HC533	460-17
MM54HC534	456-14
MM54HC563	460-18
MM54HC564	456-15
MM54HC573	459-178
MM54HC574	456-43
MM54HC646	465-110
MM54HC648	465-102
MM54HC688	464-34
MM54HC74	455-98
MM54HC75	459-114
MM54HC76	456-113
MM54HC77	460-55
MM54HC86	459-21
MM54HCXXX	★ **734**
MM55108	2945-115
MM55110	2945-116
MM55121	2945-117
MM55123	2945-118
MM55124	2945-119
MM55126	2945-120
MM554	2423-74
MM57109	1087-8
	¶ 246-14
MM57126	1087-7
MM57140	1087-9
	1053-14
MM57190	2945-85
MM57499	511-88
MM5781	1087-10
	1053-15
MM5782	1087-11
	1053-16
MM5799	1087-12
	1053-17
MM58106	2899-78
MM58142	2899-79
MM58143	★ **3327**
	2898-152
MM58144	2898-153
MM58147	★ **735**
MM58167	★ **735**
MM58201	2463-66
MM58250	2902-21
MM5837	2900-25
	2965-37
MM58438	2466-7
MM5865	2951-62
	¶ 282-5
	¶ 282-6
MM70C95	450-103
MM70C96	450-171
MM70C97	450-104
MM70C98	450-172
MM72C19	462-6
MM7317	★ **3327**
MM74920-3	3474-52
MM74921-3	3474-51
MM74C00	457-103
	¶ 229-11
MM74C02	458-165
	¶ 229-11
MM74C04	450-186
	¶ 229-11
MM74C08	456-187
MM74C10	457-61
MM74C107	456-82
MM74C14	465-32
	¶ 237-10
MM74C150	462-2
MM74C151	461-137
MM74C154	454-158
MM74C157	461-103
MM74C160	452-143
MM74C161	451-59
MM74C162	452-115
MM74C163	451-35
MM74C164	463-108
	3490-131
MM74C165	463-97
	3490-96
MM74C173	455-132
MM74C174	455-173
MM74C175	455-156
MM74C192	452-174
MM74C193	451-93
MM74C195	463-18
	3489-71
MM74C20	457-26
MM74C200	460-120
	3473-32
MM74C221	462-54
	¶ 237-13
MM74C240	465-71
MM74C244	465-52
MM74C30	457-141
MM74C32	458-55
MM74C374	456-44
MM74C42	454-2
MM74C48	454-25
MM74C73	456-83
MM74C74	455-99
MM74C76	456-114
MM74C83	449-39
MM74C85	449-91
MM74C86	459-22
MM74C89	460-103
	3471-109
MM74C90	452-129
MM74C901	450-81
	¶ 261-4
MM74C902	450-83
	¶ 261-4
MM74C903	450-75
	¶ 261-4
MM74C904	450-77
	¶ 261-4
MM74C905	464-73
MM74C906	450-71
MM74C907	450-73
MM74C908	455-75
	¶ 230-3
MM74C909	464-27
	2895-11
MM74C910	460-134
	¶ 287-13
	3472-17
	¶ 287-13
MM74C911	★ **735**
	455-81
	★ **735**
	2464-128
MM74C912	★ **735**
	455-82
	★ **735**
	2465-51
MM74C914	465-33
MM74C915	455-85
	2465-71
MM74C917	★ **735**
	455-83
	★ **735**
	2465-52
MM74C918	455-76
	¶ 230-3
MM74C920	461-2
	¶ 286-8
	3474-12
	¶ 286-8
MM74C920-3	3474-53
	¶ 286-8
MM74C921	461-3
	¶ 286-8
	3474-10
	¶ 286-8
MM74C921-3	3474-54
	¶ 286-8
MM74C922	2468-2
	¶ 232-5
MM74C923	2468-7
MM74C925	453-75
MM74C926	453-76
MM74C927	453-60
MM74C928	453-59
MM74C929	460-154
	¶ 286-8
	3476-39
	¶ 286-8
MM74C929-3	3476-78
	¶ 286-8
MM74C93	451-20
MM74C930	460-155
	¶ 286-8
	3476-40
	¶ 286-8
MM74C930-3	3476-79
	¶ 286-8
MM74C932	464-28
MM74C941	450-132
	2470-46
MM74C945	★ **735**
	453-61
MM74C946	★ **735**
	453-56
MM74C947	★ **735**
	453-62
MM74C95	463-2
	3489-76
MM74C956	455-41
	2464-129
	1100-95
MM74C989	3471-107
MM74HC00	457-104
MM74HC02	458-166
MM74HC04	450-187
MM74HC08	456-188
MM74HC10	457-62
MM74HC107	456-84
MM74HC109	456-115
MM74HC112	456-116
MM74HC123	462-35
MM74HC132	465-6
MM74HC133	457-158
MM74HC138	454-87
MM74HC139	454-62
MM74HC14	465-18
MM74HC147	466-20
MM74HC151	461-138
MM74HC153	461-95
MM74HC154	454-159
MM74HC157	461-104
MM74HC158	461-105
MM74HC160	452-144
MM74HC161	451-60
MM74HC162	452-116
MM74HC163	451-36
MM74HC164	463-109
MM74HC165	463-98
MM74HC175	455-157
MM74HC192	452-175
MM74HC193	451-94
MM74HC194	463-3
MM74HC195	463-19
MM74HC20	457-63
MM74HC240	465-72
MM74HC241	465-89
MM74HC242	464-126
MM74HC244	465-53
MM74HC251	466-16
MM74HC253	461-92
MM74HC257	461-117
MM74HC259	460-56
MM74HC266	458-34
MM74HC27	458-131
MM74HC280	449-111
MM74HC299	463-135
MM74HC30	457-142
MM74HC32	458-56
MM74HC354	461-166
MM74HC356	461-167
MM74HC365	450-105
MM74HC366	450-86
MM74HC367	450-106
MM74HC368	450-87
MM74HC373	459-179
MM74HC374	456-45
MM74HC390	453-37
MM74HC393	451-144
MM74HC4002	458-100
MM74HC4017	452-53
MM74HC4018	458-199
MM74HC4020	452-9
MM74HC4040	451-176
MM74HC4049	450-22
MM74HC4050	450-124
MM74HC4060	452-10
MM74HC42	454-3
MM74HC4301	460-36
MM74HC4302	460-34
MM74HC4303	456-9
MM74HC4304	456-7
MM74HC4305	450-126
MM74HC4511	455-59
MM74HC4514	454-131
MM74HC4543	455-60
MM74HC533	460-19
MM74HC534	456-16
MM74HC563	460-20
MM74HC564	456-17
MM74HC573	459-180
MM74HC574	456-46
MM74HC646	465-111
MM74HC648	465-103
MM74HC688	464-35
MM74HC74	455-100
MM74HC75	459-115
MM74HC76	456-117
MM74HC77	460-57
MM74HC86	459-23
MM74HC942	★ **736**
MM74HCXXX	★ **734**
MM74PC00	457-105
MM74PC02	458-167
MM74PC04	450-188
MM74PC08	456-189
MM74PC138	454-88
MM74PC74	455-101
MM78C29	464-143
	2472-28
MM78C30	464-108
	2471-37
MM80C95	450-107
MM80C96	450-173
MM80C97	450-108
MM80C98	450-174
MM8100	2947-113
MM82C08	505-116
MM82C19	462-7
MM82PC08	505-117
	1097-7
MM82PC12	1094-163
MM8702A-4	3460-22
MM88C29	464-144
	2472-29
MM88C30	464-109
	2471-38
MSC810	1097-9
NA21	★ **3327**
NA22	★ **3327**
NA31	★ **3327**
NA32	★ **3327**
NA41	★ **3327**
NA42	★ **3327**
NB01	★ **3327**
NB02	★ **3327**
NB11	★ **3327**
NB12	★ **3327**
NF5301	2906-120
NMC2114A	★ **3858**
	3477-99
NMC2114A-1L	★ **3858**
	3477-92
NMC2114A-2	★ **3858**
	3477-96
NMC2114A-2L	★ **3858**
	3477-97
NMC2114A-3	★ **3858**
	3477-104
NMC2114A-3L	★ **3858**
	3477-105
NMC2114A-4	★ **3858**
	3478-30
NMC2114A-4L	★ **3858**
	3478-31
NMC2116-15	★ **3859**
	3480-57
NMC2116-15L	★ **3859**
	3480-58
NMC2116-20L	★ **3859**
	3480-93
NMC2116-25	★ **3859**
	3481-8
NMC2116-25L	★ **3859**
	3480-94
NMC2141-2	3482-5
NMC2141-3	3482-10
NMC2147H-3	3481-73
NMC2147H-4	3481-74
NMC2148	3477-77
NMC2148-3	3477-59
NMC2148H	3477-78
NMC2148L	3477-79
NMC214A-5	3478-57
NMC2532	3466-67
NMC2716E	3465-79
NMC27C16-45	★ **3864**
	3465-60
NMC27C16-55	★ **3864**
	3465-90
NMC27C16-65	★ **3864**
	3465-93
NMC27C32-35	★ **3865**
	3466-55
NMC27C32-45	★ **3865**
	3466-68
NMC27C32-55	★ **3865**
	3466-73
NMC27C32-65	★ **3865**
	3466-74
NMC2816-25	★ **3861**
	★ **3863**
	3465-3
NMC2816-35	★ **3861**
	★ **3863**
	3465-21
NMC2816-45	★ **3861**
	★ **3863**
	3465-53
NMC2816E	★ **3862**
NMC2816E-25	★ **3861**
	★ **3863**
	3465-4
NMC2816E-35	★ **3861**
	★ **3863**
	3465-22
NMC2816E-45	★ **3861**
	★ **3863**
	3465-54
NMC2816M-25	★ **3861**
	★ **3863**
	3465-5
NMC2816M-35	★ **3861**
	★ **3863**
	3465-23

Arranged alphanumerically from left to right.

© IC MASTER 1983

National Semiconductor (Cont'd)

Device	Page-Line
NMC2816M-45	★ 3861
	★ 3863
	3465-55
NMC4132-1	3469-47
NMC4132-2	3469-54
NMC4164-12	3469-79
	¶ 287-6
NMC4164-15	3470-3
	¶ 287-6
NMC4164-20	3470-21
	¶ 287-6
NMC4864	3483-53
NMC5295-10	3468-70
	¶ 287-6
NMC5295-12	3468-83
	¶ 287-6
NMC5295-15	3468-100
	¶ 287-6
NMC5295-2	3468-63
	¶ 287-6
NMC5295-20	3469-12
	¶ 287-6
NMC5295-4	3468-79
	¶ 287-6
NMC6404-9	3482-59
NMC6414	461-19
NMC6503-5	3479-114
NMC6503-9	3479-112
NMC6504	461-30
NMC6504-2	3482-60
NMC6504-5	3482-87
NMC6504-9	3482-61
NMC6508	460-156
NMC6508-2	3476-37
NMC6508-5	3476-46
NMC6508-9	3476-27
NMC6508B-2	3476-21
NMC6513-5	3475-22
NMC6513-9	3475-20
NMC6514-2	3478-70
NMC6514-5	3479-5
NMC6514-9	3478-71
NMC6516	460-157
NMC6518	460-158
NMC6518-2	3476-38
NMC6518-5	3476-53
NMC6518-9	3476-32
NMC6518B-2	3476-22
NMC6518B-9	3476-20
NMC6551	461-4
NMC6551-2	3474-13
NMC6551-5	3474-37
NMC6551-9	3473-103
NMC6551B-2	3473-101
NMC6551B-9	3473-96
NMC6552	461-5
NMC6552-2	3474-11
NMC6552-5	3474-32
NMC6552-9	3473-102
NMC6552B-2	3473-100
NMC6552B-9	3473-95
NMC6716	3465-81
NMC6716-1	3465-41
NMC6716-2	3465-50
NMC85008B-9	3476-19
NMC9306	★ 3867
	3455-1
NMC9716	★ 3868
	3465-56
NMC9716-25	★ 3868
	3465-6
NMC9716-35	★ 3868
	3465-24
NMC9716-45	★ 3868
	3465-57
NMC9716E-25	★ 3868
	3465-7
NMC9716E-35	★ 3868
	3465-25
NMC9716E-45	★ 3868
	3465-58
NMC9716H-25	★ 3868
	3465-8
NMC9716H-35	★ 3868
	3465-26
NMC9716M-45	★ 3868
	3465-59
NMC0P494	★ 3867
NR041	★ 3328
NR042	★ 3328
NR11	★ 3327
NR12	★ 3327
NR421	★ 3327
NR431	★ 3327
NR461	★ 3327
NS16016	1081-2
NS16032-10	★ 1383
	★ 1397
	1081-3
NS16032-6	★ 1381
	★ 1383
	★ 1397
	1100-8
	★ 1381
	★ 1383
	★ 1397
	1081-4
NS16081	★ 1426
	1100-10
NS16082	★ 1428
	1100-13
NS16201-6	★ 1397
	★ 1409
	★ 1444
	★ 1446
	1100-12
NS32032	1083-8
NS80C48	1093-71
	1071-1
NS80CX35	★ 1448
	1093-36
	★ 1448
	1071-2
NS80CX48	★ 1448
	1093-8
	★ 1448
	1071-3
NS877C48	1071-4
NS87P50	1071-5
NS87PC48	★ 1451
	1093-17
	★ 1451
	1071-6
NSC800	★ 1367
	1097-6
	¶ 240-16
	¶ 241-1
	★ 1367
	1071-7
	¶ 240-16
	¶ 241-1
NSC800-1	★ 1367
	1071-8
	¶ 240-16
	¶ 241-1
NSC800-2	★ 1367
	1071-9
	¶ 240-16
	¶ 241-1
NSC800-4	★ 1367
	1071-10
	¶ 240-16
	¶ 241-1
NSC810	★ 1371
NSC830	★ 1374
	1097-10
NSC831	1097-8
NSC880	★ 1377
NSL4944	2964-68
NSM13914	★ 3328
NSM13915	★ 3328
NSM13916	★ 3328
NSM4307	2464-130
NSM4507	2464-131
NSX18	★ 1455
PS55494	2465-42
SC16008	1071-11
SCX6324	4141-176
SHM6401	2967-121
SLX6320	4141-53
SLX6324	4141-177
SLX6360	4141-54
SN5491A	3491-9
SN7491A	3491-10
Starplex	1627-4
	¶ 244-1
	¶ 248-11
Starplexll	1628-1
TAA550	2956-76
	2956-78
	2956-80
	2958-61
	2958-63
	2958-64
TBA120	★ 3325
	★ 3327
	2901-35
TBA120S	★ 3325
	★ 3327
	2904-172
TBA440	2905-140
TBA510	2903-107
TBA530	2903-108
TBA540	2903-109
TBA560	2903-110
TBA920	2904-92
TBA950-2	2904-93
TBA970	2905-141
TBA990	2903-111
TDA2002	2897-22
TDA2002A	2897-23
TDA2522	2903-112
TDA2523	2903-113
TDA2530	2903-114
TDA2540	2905-142
TDA2541	2905-143
TDA2560	2903-115
TDA2590	2904-94
TDA2591	2904-95
TDA3500	2903-116
TDA3501	2903-117
TDA440	2905-144
TP3020	★ 3332
	2947-102
TP3021	★ 3332
	2947-46
TP3040	2948-89
TP3040A	2948-90
TP3050	★ 3333
TP3051	★ 3334
	2947-65
TP3052	★ 3335
	2947-73
TP3053	★ 3335
	2947-74
TP3054	★ 3335
	2947-75
TP3056	★ 3334
	2947-66
TP3057	★ 3335
	2947-76
TP3110	★ 3336
	2948-56
TP3120	★ 3336
	2948-57
TP5116	★ 3337
	2947-103
TP5116A	★ 3337
	2947-104
TP5117A	★ 3337
	2947-91
TP5156	★ 3337
	2947-47
TP5156A	★ 3337
	2947-48
VMC68K/15	1767-31

OKI Semiconductor

Device	Page-Line
58321	★ 3873
EASE-40-I/C	★ 3873
EASE-49-I/C	★ 3873
MSA750	2899-47
MSL912R	★ 3873
	2465-99
MSL915R	★ 3873
	2465-100
MSL916R	2465-101
MSL917R	★ 3873
	2465-102
MSL9362	★ 3873
	2902-22
MSL9363	★ 3873
	2902-23
MSL9510R	★ 3873
	2465-103
MSL9511R	★ 3873
	2465-104
MSL9650	★ 3873
	3453-24
MSL9651	3453-25
MSL9653	3453-26
MSL9662	★ 3873
	3453-65
MSL9662RS	★ 3873
	3453-27
MSL9663	★ 3873
	3453-66
MSL9663RS	★ 3873
	3453-28
MSL9664	★ 3873
	3453-64
MSL9664RS	★ 3873
	3453-29
MSL9665	★ 3873
MSL9665RS	★ 3873
MSM2114	★ 3873
	3479-39
MSM2114-2	★ 3873
	3478-32
MSM2114-3	★ 3873
	3478-100
MSM2114L	★ 3873
	3479-40
MSM2114L-2	★ 3873
	3478-33
MSM2114L-3	★ 3873
	3478-101
MSM2128	★ 3873
	3480-95
MSM2128-1	★ 3873
	3480-96
MSM2312	★ 3873
MSM2708	★ 3873
	3463-86
MSM2716	★ 3873
	3465-83
MSM2732	3466-70
MSM2758	3463-78
MSM2764A	★ 3873
	3467-12
MSM28101	★ 3873
MSM2816	3465-11
MSM2916	★ 3873
	3485-45
MSM2932	★ 3873
MSM2954	★ 3873
MSM37255	★ 3873
MSM3764-12	★ 3873
	3469-80
MSM3764-15	★ 3873
	3470-5
MSM3764-2	★ 3873
	3470-6
MSM3764-20	★ 3873
	3470-23
MSM3764-3	★ 3873
	3470-24
MSM38128	★ 3873
MSM3914A	★ 3873
	2468-17
MSM4032	449-19
MSM5016	2899-157
MSM5080	2899-129
MSM5081	2899-158
MSM5104	★ 3873
	461-31
MSM5104-2	★ 3873
	3482-18
MSM5104-3	★ 3873
	3482-62
MSM5114	★ 3873
	461-21
MSM5114-2	★ 3873
	3478-6
MSM5115	★ 3873
	461-22
MSM5115-2	★ 3873
	3478-7
MSM5123	★ 3873
	461-57
	★ 3873
	3480-85
MSM5188	★ 3873
MSM5201	1088-1
MSM5204	★ 3873
MSM5205	★ 3873
MSM5218	★ 3873
MSM5219	★ 3873
	2465-53
MSM53256	★ 3873
MSM5509	★ 3873
	2899-48
MSM5514-3	3478-73
MSM5515	2899-150
MSM5515-3	3478-74
MSM5517	2899-130
MSM5518	2899-166
MSM5519	2899-167
MSM5523	2899-15
MSM5524	★ 3873
	2899-16
MSM5525	★ 3873
	2900-98
MSM5527	2900-93
MSM5528	★ 3873
	2899-49
MSM5529	2899-50
MSM5549	2899-17
MSM5550	★ 3873
	2898-157
	2899-18
MSM5557	★ 3873
	2899-23
MSM5558	★ 3873
	2899-51
MSM5559	2899-52
MSM5531	★ 3873
MSM573A	3474-116
MSM5803	★ 3873
	2899-131
MSM5810	2906-89
MSM5811	2906-90
MSM5814	2906-91
MSM5815	2906-92
MSM5816	★ 3873
	2906-93
MSM5819	★ 3873
	2906-71
MSM58282	★ 3873
	1088-5
MSM58283	★ 3873
	1088-6
MSM58291G	2465-9
MSM58292	★ 3873
	1088-7
MSM58293	★ 3873
	1088-8
MSM5829G	2465-12
MSM5832	★ 3873
	1087-135
	1102-73
MSM58321	1087-136
MSM58321R	1102-74
MSM5837	1088-4
MSM58371	★ 3873
MSM5838	★ 3873
	1088-3
MSM5839	★ 3873
	1088-2
MSM5840	★ 3873
	1087-131
MSM5840R	★ 3873
	1087-132
MSM5840RS	★ 3873
	1053-20
MSM58421	★ 3873
	1087-129
MSM58421GSK	★ 3873
	1053-21
MSM58422	★ 3873
	1087-130
MSM58422RS	★ 3873
	1053-22
MSM5842R	★ 3873
	1087-133
MSM5842RS	★ 3873
	1053-23
MSM5845R	★ 3873
	1087-134
MSM5845RS	★ 3873
	1053-24
MSM5846	★ 3873
MSM5870	1088-9
MSM5970	2899-151
MSM5972	2899-168
MSM5976	2899-152
MSM5977	2899-132
MSM6202	★ 3873
MSM6910	★ 3873
MSM6912	★ 3873
MSM6917	★ 3873
MSM8035	1071-26
MSM8039	1071-27
MSM8048	1093-74
	1071-28
MSM8049	1093-75
	1071-29
MSM8085A	★ 3873
	1095-122
	★ 3873
	1071-30
MSM80C35	★ 3873
	1093-39
	★ 3873
	1071-31
MSM80C39	★ 3873
	1093-40
	★ 3873
	1071-32
MSM80C48	★ 3873
	1093-76
	★ 3873
	1071-33
MSM80C49	★ 3873
	1093-77
	★ 3873
	1071-34
MSM80C85A	★ 3873
	1071-35
MSM8155	1096-49
MSM81C55	★ 3873
MSM8255A	1095-68
MSM82C12	★ 3873
MSM82C53	★ 3873
MSM82C55	★ 3873
MSM83C55	★ 3873
MSM8755	1095-145

Oliver Advanced Engineering

Device	Page-Line
SpeedScreener	4007-3
UPP-2700	4006-4
UPP-20000	★ 4104
	4007-1
UPP-20000-Z	★ 4104
	4007-2

Optical Electronics Inc.

Device	Page-Line
2531A	★ 3347
	2887-127
2540	2887-128
2910	★ 3347
	2887-130
	2887-134
3420	★ 3347
	2965-76
3421	★ 3347
	2965-77
3540	★ 3347
3930	★ 3347
	2968-69
5021	★ 3347
	2967-123
5025	★ 3347
	2967-124
5030A	★ 3347
	2965-71
5032A	★ 3347
	2965-72
5090A	★ 3347
	2962-133
5902	★ 3347
	2965-73
5905	★ 3347
	2965-74
6125A	2963-143
9014	★ 3347
	2962-1
9050	★ 3347
	2692-56
9405	★ 3346
9412	★ 3346
9491A	★ 3346
9597	★ 3346
9725	★ 3346
9740	★ 3346
9304	★ 3346
9208	★ 3346

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Device	Page-Line
Optical Electronics Inc. (Cont'd)	
9818	2935-5
9826	★ **3346**
9906	★ **3346**
	2910-22
	2913-159
	2933-8
9908	★ **3346**
	2910-28
	2913-162
9909	★ **3346**
	2910-6
	2913-163
9910	★ **3346**
	2887-24
	2908-34
9911	★ **3346**
	2887-25
	2908-22
9912	★ **3346**
	2909-111
	2910-10
	2913-143
	2913-158
	2935-6
9913	2888-22
9914	★ **3346**
	2909-88
	2910-9
	2913-166
	2935-10
9915	★ **3347**
	2892-57
9916	★ **3346**
	2910-19
	2913-164
	2935-9
9917	2910-29
	2913-126
9918	★ **3346**
	2909-89
	2913-165
9923	2888-23
9932	★ **3346**
	2910-11
	2913-128
9934	★ **3347**
	2962-2
9963	★ **3346**
	2887-19
	2908-4
AH0013CA	★ **3346**
	2888-19
AH0013CB	★ **3346**
	2888-20
AH0013MA	★ **3346**
	2888-21
AH0605	★ **3346**
Plessey Semiconductors	
BAA1000	★ **4514**
	4141-69
BAA2000	★ **4514**
	4141-70
CLA1000	★ **4505**
CLA10XX	4141-71
CLA12XX	4141-72
CLA15XX	4141-73
CLA18XX	4141-74
CLA2000	★ **4505**
CLA3000	★ **4505**
ISOCMOS	★ **4504**
MICROCELL	★ **4508**
MICROLIN	★ **4512**
MJ1446	2949-55
MJ1480	2947-50
MJ2812	3456-15
MJ2813	3456-21
MJ2814	3456-16
MJ2841	3456-36
ML920	2902-26
ML922	2902-27
ML926	2902-28
ML928	2902-29
ML929	2902-30
MN9102	511-89
	¶ 233-4
MN9105	510-47
	¶ 233-4
MN9106	510-52
	¶ 233-4
MN9107	510-53
	¶ 233-4
MN9108	510-54
	¶ 233-4
MV4311	455-43
MV4330	463-157
MV4332	463-163
MV74SC137	454-106
MV74SC237	454-107
MV74SC239	454-63
MV74SC374	456-47
MV74SC533	460-21
MV74SC563	460-22
MV74SC573	459-181
MV74SC574	456-48
MV8820	2949-77
MV8860	2949-78
MV8862	2949-79
MV8863	2949-80
MV8865	2947-39
NJ8811	2945-90
NJ8812	2945-91
SCAMP	★ **4515**
SCD-1000	4141-75
SCD-2000H	4141-76
SCD-2000L	4141-77
SCD-2000M	4141-78
SCD-4000	4141-79
SCD-4000H	4141-80
SCD-4000L	4141-81
SCD-4000M	4141-82
SCD-5000	4141-83
SCD1000	★ **4510**
SCD2000H	★ **4510**
SCD2000L	★ **4510**
SCD2000M	★ **4510**
SCD4000H	★ **4510**
SCD4000L	★ **4510**
SCD4000M	★ **4510**
SCD5000	★ **4510**
SL1025	2962-88
SL1430	2905-154
SL1431	2905-155
SL1432	2905-156
SL1440	2905-157
SL1480	2947-51
SL1521	2888-123
	¶ 268-15
	¶ 272-5
SL1522	2888-124
SL1523	2888-125
SL1524	2888-126
SL1525	2888-127
SL1531	2888-119
SL1532	2888-120
SL1550	2888-86
SL1680	2963-1
SL2363C	2889-59
SL2364C	2889-60
SL3045	2889-13
SL3046	2889-14
SL3081	2890-96
SL3082	2890-90
SL3083	2889-158
SL3086	2889-15
SL3127	2889-168
SL3145	2889-16
SL3146	2889-17
SL3183	2889-159
SL354	2889-58
SL355	2967-35
SL360	2889-80
SL362	2889-81
	¶ 269-7
SL440	2906-72
	2964-131
	¶ 279-12
SL441	2968-126
SL442	2961-8
SL443	2968-127
SL445A	2965-88
SL446	2968-128
SL470	2902-31
SL490	2902-32
SL491	2902-33
SL521	2888-128
	¶ 268-14
SL523	2888-129
SL531C	2888-121
SL532C	2888-122
SL541	2888-87
SL550	2888-88
SL560	2888-89
	¶ 270-9
SL561	2897-159
SL561B	2897-160
SL561C	2897-161
SL565	2913-122
SL610C	2888-90
SL611C	2888-91
SL612C	2888-92
SL620C	2887-5
SL621C	2887-4
SL623C	2900-82
SL624C	2900-126
SL6270	2887-6
SL6310	2887-142
SL640C	2962-98
SL641C	2962-99
SL650	2946-19
	¶ 279-1
SL651	2946-18
	¶ 279-1
SL652	2945-36
SL6640	2901-79
	¶ 271-12
SL6650	2901-80
	¶ 271-12
SL6690	2901-81
	¶ 271-12
SL680	2963-2
SL748	2930-61
SL748A	2929-28
SL792	2947-2
SL793	2947-3
SL952	2905-79
SP1450B	2948-155
SP1455B	2948-156
SP1648	471-50
	¶ 272-5
	2945-161
	¶ 272-5
SP1650B	471-53
SP1658	471-46
	2945-162
SP1660B	471-34
SP1662B	471-32
SP1664B	471-29
SP1665B	471-30
SP1666	471-27
SP1668	471-43
SP1670B	471-22
SP1672B	471-39
SP1674B	471-41
SP1692B	471-55
SP16F60	471-35
SP8600A	510-83
SP8600B	510-84
SP8602A	510-68
SP8602B	510-69
SP8605B	510-70
SP8605M	510-71
SP8606B	511-34
SP8606M	511-35
SP8607A	510-72
SP8607B	510-73
SP8610	471-5
SP8611B	471-6
SP8611M	471-7
SP8613	510-78
SP8616	510-79
SP8617B	471-8
SP8627	511-36
	2945-74
SP8628	511-16
	2945-75
SP8629	511-17
	2945-76
SP8630A	510-103
SP8630B	510-104
SP8643	2946-79
SP8643B	510-110
SP8647	2946-80
SP8647A	510-111
SP8647B	510-112
SP8655A	510-130
SP8655B	510-131
SP8656	510-129
SP8657A	510-124
SP8657B	510-125
SP8658	510-126
SP8659A	510-119
SP8659B	510-120
SP8665B	510-101
SP8668B	510-102
SP8680	471-14
SP8680A	510-113
SP8680B	510-114
SP8685	2946-81
SP8685A	510-115
SP8685B	510-116
SP8690	2946-82
	¶ 272-5
SP8690A	510-117
	¶ 272-5
SP8690B	510-118
	¶ 272-5
SP8720	510-76
	2946-54
SP8725	2946-55
SP8735B	510-94
SP8740	2946-62
SP8740A	510-90
SP8740B	510-91
SP8741	2946-68
SP8741A	510-92
SP8741B	510-93
SP8743	2946-72
SP8743B	510-97
SP8743M	510-98
SP8745	2946-63
SP8746	2946-69
SP8755A	511-3
SP8755B	511-4
SP8757	511-5
SP8770B	511-22
SP8772B	511-23
SP8790	2945-6
	¶ 272-5
SP8790A	511-38
	¶ 272-5
	2945-2
	¶ 272-5
SP8790B	511-39
	¶ 272-5
	2945-3
	¶ 272-5
SP8791A	510-99
SP8791B	510-100
SP8792	2946-91
SP8792A	2946-92
SP8793	2946-85
SP8793A	2946-86
SP8794A	511-40
	2945-4
SP8794B	511-41
	2945-5
SP8901	511-29
	2945-92
	2946-96
SP8906	511-20
	2945-93
	2946-97
SP8921	2898-130
SP8922	2898-134
SP8923	2898-129
	2898-131
SP9131	4141-84
SP9685	2893-38
	¶ 271-1
SP9687	2893-39
	¶ 271-1
SP9768	2441-17
SPD-4000	4141-85
SW203	2905-59
SW205	2905-60
SW206	2905-61
SW303	2905-62
SW450	2905-63
TAA570	2905-11
TAA661	2901-38
	2905-12
TAB1042	2943-1
TAB1043	2943-2
TBA120	2901-39
	2905-13
TBA673	2967-36
TBA750	2901-40
	2905-14
TBA920	2904-99
TBA940	2904-100
TBA950	2904-101
TBA990	2903-132
TCA270	2905-158
TDA1085A	2906-73
	¶ 279-10
TDA2085A	2906-74
TDA2522	2903-133
TDA2523	2903-134
TDA2530	2903-135
TDA2532	2903-136
TDA2540	2905-159
TDA2541	2905-160
TDA2560	2903-137
TDA2591	2904-102
TDA440	2905-161
RCA Solid State Division	
1800	★ **1457**
CA080	★ **3348**
	2934-9
CA080A	★ **3348**
	2930-2
CA080AT	★ **3348**
	2924-47
CA080B	★ **3348**
	2924-45
CA080C	★ **3348**
	2934-10
CA080T	★ **3348**
	2930-3
CA081	★ **3348**
	2934-7
CA081A	★ **3348**
	2930-4
CA081AT	★ **3348**
	2924-46
CA081B	★ **3348**
	2924-44
CA081C	★ **3348**
	2934-8
CA081T	★ **3348**
	2930-5
CA082	★ **3348**
	2940-37
CA082A	★ **3348**
	2939-10
CA082AT	★ **3348**
	2937-17
CA082B	★ **3348**
	2937-15
CA082C	★ **3348**
	2940-39
CA082T	★ **3348**
	2939-11
CA083	★ **3348**
	2940-38
CA083A	★ **3348**
	2939-12
CA083B	★ **3348**
	2937-16
CA083C	★ **3348**
	2940-40
CA084	★ **3348**
	2944-19
CA084A	★ **3348**
	2943-4
CA084B	★ **3348**
	2941-38
CA101A	2909-23
	2924-2
CA111	2891-48
CA1190	2905-15
CA1191	2905-16
CA124	2913-72
CA1310A	2901-123
CA1352	2905-162
CA139	2895-5
CA1391	2904-103
CA1394	2904-104
CA1395	2901-124
CA1398	2903-138
CA139A	2894-35
CA1458	2909-9
CA1524	★ **3368**
	2961-15
CA1558	2938-58
CA158	2913-36
	2938-28
CA158A	2936-52
CA1724G	2889-147
CA1725G	2889-148
CA2002	2897-36
CA2004	2896-144
CA201A	2924-3
CA211	2891-49
CA2111A	2901-41
CA224	2913-73
CA239	2895-28
CA239A	2894-49
CA2524	★ **3368**
	2961-16
CA258	2913-37
	2938-29
CA258A	2937-31
CA270	2905-163
CA2904	2913-26
CA3000	2887-37
	¶ 264-4
CA3001	2888-93
	¶ 269-1
CA3002	2901-10
	¶ 268-9
CA3004	2888-94
	¶ 268-10
CA3005	2901-11
	2901-165
	¶ 268-10
	¶ 271-13
CA3006	2901-12
	2901-166
	¶ 268-10
CA3007	2887-38
	¶ 272-9
CA3008	2929-49
	¶ 265-3
CA3008A	2924-19
	¶ 265-3
CA3010	2929-50
	¶ 265-3
CA3010A	2924-20
	¶ 265-3
CA3011	2888-95
	¶ 271-13
CA3012	2901-13
	¶ 271-13
CA3013	2901-42
	¶ 271-13
CA3014	2901-43
	¶ 271-13
CA3015	2913-129
	2929-58
	¶ 265-4
CA3015A	2913-130
	2924-23
	¶ 265-4
CA3016	2913-131
	2929-59
	¶ 265-4
CA3016A	2913-132
	2924-24
	¶ 265-4
CA3018	2889-1
	¶ 269-3
CA3018A	2889-2
	¶ 269-3
CA3019	2890-148
	¶ 269-4
CA301A	2931-57
CA3020	2896-104
CA3020A	2888-96
CA3021	2888-97
	¶ 268-11
CA3022	2888-98
	¶ 268-11
CA3023	2888-99
	¶ 268-11
CA3026	2889-50
CA3028	2901-14
CA3028A	2887-33
	¶ 268-12
CA3028B	2887-34
	¶ 268-12
CA3029	2929-51
CA3029A	2924-21
CA3030	2913-133
	2929-60
CA3030A	2913-134
	2924-25
CA3035	2888-130
CA3036	2889-39

Arranged alphanumerically from left to right.

© IC MASTER 1983

RCA Solid State Division (Cont'd)

Device	Page-Line
CA3037	2929-52
CA3037A	2924-22
CA3038	2913-135
	2929-61
CA3038A	2913-136
	2924-26
CA3040	2888-100
CA3041	2901-44
	2905-17
	¶ 274-2
CA3042	2901-45
	2905-18
	¶ 274-2
CA3045	2889-18
CA3046	2889-19
CA3048	2887-1
	2962-3
	¶ 265-9
CA3049	2889-54
	2901-167
CA3050	2889-56
CA3051	2889-57
CA3052	2887-2
CA3053	2887-35
CA3054	2889-51
CA3058	2968-129
	¶ 262-8
CA3059	2968-130
	¶ 262-8
CA3060	2912-64
	2941-5
CA3060A	2912-69
CA3060B	2912-70
CA3064	2903-26
CA3065	2901-46
	2905-19
CA3067	2903-139
	¶ 273-6
CA3068	2905-164
	¶ 273-9
CA307	2931-46
CA3070	2903-140
CA3071	2903-141
CA3072	2903-142
CA3075	2901-47
	2905-20
CA3076	2901-15
CA3078	★ 3354
	2911-169
	2912-43
	2926-34
CA3078A	★ 3354
	2912-6
	2912-55
CA3079	2968-131
	¶ 262-8
CA3080	2897-135
	2900-5
	2911-37
	2912-44
	2926-37
CA3080A	2897-136
	2900-6
	2911-38
	2912-45
	2926-38
	¶ 265-7
CA3081	2890-97
CA3082	2890-91
CA3083	2889-160
CA3084	2889-129
CA3085	2959-14
	¶ 281-3
CA3085A	2959-60
	¶ 281-3
CA3085B	2960-10
	¶ 281-3
CA3086	2889-20
CA3088	2900-65
CA3089	2901-48
	¶ 271-8
CA3090A	2901-125
	¶ 265-7
CA3091	2964-164
CA3093	2890-154
CA3094	2896-75
	2909-84
	2911-154
	2912-26
	2913-1
	¶ 265-1
	¶ 279-13
CA3094A	2911-155
	2912-27
	2913-5
	2929-36
	¶ 265-1
	¶ 279-13
CA3094B	2911-156
	2912-28
	2913-6
	2929-37
	¶ 265-1
	¶ 279-13
CA3096	2889-131
CA3096A	2889-132
CA3096C	2889-133
CA3097	2890-153
CA3098	511-118
	2962-128
CA3099	511-119
	2962-129
CA3100	2913-127
	2929-44
CA3102	2889-55
CA3105	★ 3355
CA311	2892-43
CA3118	2889-3
CA3118A	2889-4
CA3120	2904-150
CA3121	2903-143
CA3123	2900-66
CA3125	2903-144
CA3126	2903-145
CA3127	2889-169
	2901-98
CA3128	2903-146
CA3130	★ 3349
	2913-9
	2934-6
CA3130A	★ 3349
	2913-10
	2926-41
CA3131	2897-37
CA3132	2897-38
CA3134	2905-21
	¶ 273-15
CA3135	2903-147
CA3136	2905-165
CA3137	2903-148
CA3138	2889-149
CA3138A	2889-150
CA3139	2903-27
CA3140	★ 3350
	2909-45
	2913-4
	2934-5
CA3140A	★ 3350
	2926-43
CA3141	2890-149
CA3142	2904-151
CA3143	2903-149
	¶ 273-13
CA3144	2903-150
	¶ 273-13
CA3145	2903-151
CA3146	2889-21
CA3146A	2889-22
CA3151	2903-152
CA3154	2904-152
	¶ 273-7
CA3156	2903-153
CA3157	2904-77
	¶ 273-7
CA3158	2903-154
CA3159	2904-105
CA3160	★ 3349
	2909-46
	2934-4
CA3160A	★ 3349
	2926-40
CA3161	★ 3361
	2438-19
CA3162	★ 3356
	2438-20
CA3163	511-12
	2946-89
CA3164	2906-121
CA3164E	2962-34
CA3165	2963-58
CA3166	2887-146
CA3168	2464-54
CA3169	★ 3362
	2964-115
CA3169A	★ 3362
	2964-116
CA3170	2903-155
CA3172	2903-156
CA3177	2887-147
CA3179	★ 3363
	511-13
	★ 3363
	2945-80
	2946-90
CA3183	2889-161
CA3189	2901-49
CA3190	2904-78
CA3191	2905-166
CA3192	2905-167
CA3193	★ 3351
	2919-33
CA3193A	★ 3351
	2916-52
CA3193B	★ 3351
	2911-113
	2915-38
CA3194	2903-157
CA3195	2901-126
CA3196	2965-156
CA3197	2965-157
CA3198	2965-158
CA3199	★ 3364
	471-9
	★ 3364
	2945-81
CA3201	2903-158
CA3207	★ 3365
CA3208	★ 3365
CA3209	2901-50
CA3210	2904-106
CA3211	★ 3365
CA3215	2901-51
CA3216	2905-168
CA3217	2903-159
CA3219	★ 3367
CA3221	2903-160
CA3223	2904-79
CA3227	★ 3369
	2889-170
CA324	2913-74
CA3240	★ 3350
	2913-54
CA3240A	★ 3350
	2938-1
CA3246	★ 3369
	2889-171
CA3260	★ 3349
	2909-47
CA3260AE	★ 3349
	2937-56
CA3260AT	★ 3349
	2937-57
CA3260B	★ 3349
	2936-32
CA3260E	★ 3349
	2940-35
CA3260T	★ 3349
	2940-36
CA3280	2937-40
CA3290	2894-24
CA3290A	2894-20
CA3290B	2893-63
CA3300	★ 3357
	2426-12
CA3303	★ 3359
	2426-30
CA339	2895-29
CA339A	2894-50
CA3401	2913-98
CA3420	★ 3352
	2932-29
CA3420A	★ 3352
	2926-36
CA3420B	★ 3352
	2921-37
CA3440	★ 3353
	2932-31
CA3440A	★ 3353
	2926-42
CA3440B	★ 3353
	2921-43
CA3493	★ 3351
	2919-34
CA3493B	★ 3351
	2915-37
CA3524	★ 3368
	2961-17
CA358	2913-49
CA358A	2937-38
CA3600	464-18
	2890-147
CA3999	★ 3361
CA555	2951-43
CA555C	2951-44
CA6078A	★ 3354
	2912-7
CA6741	2929-20
CA723	2959-99
CA723C	2959-100
CA741	2909-37
CA741C	2930-53
CA747	2938-59
CA747C	2939-53
CA748	2929-29
CA748C	2931-1
CA758	2901-127
CA810	2897-39
CA810A	2897-40
CA810AM	2897-41
CA810M	2897-42
CA920A	2904-107
CD1800	★ 403
CD1878	1089-130
CD22012	2899-64
CD22014	2899-65
CD22100	★ 749
	★ 753
	2423-7
	★ 749
	★ 753
	2947-131
CD22101	★ 749
	★ 754
	2423-8
	★ 749
	★ 754
	2947-133
CD22102	★ 749
	★ 754
	2423-9
	★ 749
	★ 754
	2947-134
CD22103	★ 749
	★ 756
	2949-119
CD22104	★ 749
	455-28
CD22104A	★ 749
	455-29
CD22105	★ 749
	455-23
CD22105A	★ 749
	455-24
CD22301	★ 749
	★ 757
CD22302	★ 760
CD22404	★ 749
	2947-52
CD22406	★ 749
	2947-106
CD22407	★ 749
	2947-107
CD22413	★ 749
	2948-91
CD22414	★ 749
	2948-92
CD22416	★ 749
	2949-59
CD22417	★ 749
	2949-60
CD22418	★ 749
	2949-61
CD22419	★ 749
	2949-38
CD22859	★ 749
	★ 758
	2949-163
CD3226	2906-19
CD4000A	★ 407
	★ 748
	458-75
	¶ 230-15
CD4000AE	★ 407
	★ 748
	458-76
CD4000B	★ 407
	★ 748
	458-77
CD4000BE	★ 407
	★ 748
	458-78
CD4000UB	★ 407
	★ 748
	458-79
CD4000UBE	★ 407
	★ 748
	458-80
CD4001A	★ 748
	458-168
	¶ 228-4
	¶ 230-15
CD4001AE	★ 748
	458-169
	¶ 228-4
CD4001B	★ 748
	458-170
	¶ 228-4
CD4001BE	★ 748
	458-171
	¶ 228-4
CD4001UB	★ 748
	458-172
	¶ 228-4
CD4001UBE	★ 748
	458-173
	¶ 228-4
CD4002A	★ 748
	458-101
CD4002AE	★ 748
	458-102
CD4002B	★ 748
	458-103
CD4002BE	★ 748
	458-104
CD4002UB	★ 748
	458-105
CD4002UBE	★ 748
	458-106
CD4006I	★ 3874
	460-121
CD4006IA	★ 3874
	460-122
	★ 3874
	3473-30
CD4005A	★ 748
	463-144
CD4005AE	★ 748
	463-145
CD4005B	★ 748
	463-146
CD4005BE	★ 748
	463-147
	★ 748
	3489-120
CD4007A	★ 748
	450-152
	¶ 254-11
CD4007AE	★ 748
	450-153
CD4007UB	★ 748
	450-154
CD4007UBE	★ 748
	450-155
CD4008A	★ 748
	449-40
	¶ 228-4
CD4008AE	★ 748
	449-41
	¶ 228-4
CD4008B	★ 748
	449-42
	¶ 228-4
CD4008BE	★ 748
	449-43
	¶ 228-4
CD4009A	★ 748
	450-4
	¶ 229-7
CD4009AE	★ 748
	450-5
	¶ 229-7
CD4009UB	★ 748
	450-6
	¶ 229-7
CD4009UBE	★ 748
	450-7
	¶ 229-7
CD4010B	★ 749
	463-158
CD4010BE	★ 749
	463-159
CD4010B	★ 749
	464-43
CD4010BE	★ 749
	464-44
CD4010B	★ 749
	453-1
CD4010BE	★ 749
	453-2
CD4010B	★ 749
	451-112
CD4010BE	★ 749
	451-113
CD4010B	★ 749
	463-29
CD4010B	★ 749
	460-73
	★ 749
	3456-1
CD4010BE	★ 749
	460-74
	★ 749
	3456-2
CD4010B	★ 749
	465-34
CD4010BE	★ 749
	465-35
CD4010B	★ 749
	457-5
CD4010BE	★ 749
	457-6
	¶ 229-4
CD4010B	★ 749
	460-80
CD4010BE	★ 749
	460-81
CD4010B	★ 749
	463-185
CD4010BE	★ 749
	463-186
CD4010A	★ 740
	★ 748
	450-39
	¶ 229-7
CD4010AE	★ 740
	★ 748
	450-40
	¶ 229-7
CD4010B	★ 740
	★ 748
	450-41
	¶ 229-7
CD4010BE	★ 740
	★ 748
	450-42
	¶ 229-7
CD4011B	★ 749
	453-14
CD4011BE	★ 749
	453-15
CD4011B	★ 3874
	460-104
	★ 3874
	3471-110
CD4011BE	★ 3874
	460-105
CD4011B	★ 749
	464-6
CD4011B	★ 749
	★ 752
	464-116
CD4011A	★ 748
	457-106
	¶ 228-4
CD4011AE	★ 748
	457-107
	¶ 228-4
CD4011B	★ 748
	457-108
	¶ 228-4

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

RCA Solid State Division (Cont'd)

Device	Page-Line
CD4011BE	★ 748 457-109 ¶ 228-4 ★ 748 3471-111 ¶ 228-4
CD4011UB	★ 748 457-110 ¶ 228-4
CD4011UBE	★ 748 457-111 ¶ 228-4
CD4012A	★ 748 457-27
CD4012AE	★ 748 457-28
CD4012B	★ 748 457-29
CD4012BE	★ 748 457-30
CD4012UB	★ 748 457-31
CD4012UBE	★ 748 457-32
CD4013A	★ 748 455-102 ¶ 228-4
CD4013AE	★ 748 455-103 ¶ 228-4
CD4013B	★ 748 455-104 ¶ 228-4
CD4013BE	★ 748 455-105 ¶ 228-4
CD40147B	★ 749 466-21
CD40147BE	★ 749 466-22
CD4014A	★ 748 463-121
CD4014AE	★ 748 463-122
CD4014B	★ 748 463-123 ★ 748 3490-89
CD4014BE	★ 748 463-124 ★ 748 3490-79
CD4015A	★ 748 462-122
CD4015AE	★ 748 462-123
CD4015B	★ 748 462-124 ★ 748 3489-97
CD4015BE	★ 748 462-125 ★ 748 3489-95
CD40160B	★ 749 452-145
CD40160BE	★ 749 452-146
CD40161B	★ 749 451-61
CD40161BE	★ 749 451-62
CD40162B	★ 749 452-117
CD40162BE	★ 749 452-118
CD40163B	★ 749 451-37
CD40163BE	★ 749 451-38
CD4016A	★ 748 2417-68 ¶ 259-6
CD4016AE	★ 748 2417-69
CD4016B	★ 748 2417-70
CD4016BE	★ 748 2417-71
CD40174B	★ 749 455-174
CD40174BE	★ 749 455-175
CD40175	★ 749
CD4017A	★ 748 452-87 ¶ 231-15
CD4017AE	★ 748 452-88 ¶ 231-15
CD4017B	★ 748 452-89 ¶ 231-15
CD4017BE	★ 748 452-90 ¶ 231-15
CD40181B	★ 749 449-63
CD40181BE	★ 749 449-64
CD40182B	★ 749 449-75
CD40182BE	★ 749 449-76
CD4018A	★ 748 453-120 ¶ 232-3
CD4018AE	★ 748 453-121 ¶ 232-3
CD4018B	★ 748 453-122 ¶ 232-3
CD4018BE	★ 748 453-123 ¶ 232-3
CD40192B	★ 749 452-176
CD40192BE	★ 749 452-177
CD40193B	★ 749 451-95
CD40193BE	★ 749 451-96
CD40194B	★ 749 463-30
CD4019A	★ 748 457-170 ¶ 228-4
CD4019AE	★ 748 457-171 ¶ 228-4
CD4019B	★ 748 457-172 ¶ 228-4
CD4019BE	★ 748 457-173 ¶ 228-4
CD40208B	★ 749 460-82
CD40208BE	★ 749 460-83
CD4020A	★ 748 452-23
CD4020AE	★ 748 452-24
CD4020B	★ 748 452-25
CD4020BE	★ 748 452-26
CD4021A	★ 748 463-52
CD4021AE	★ 748 463-53
CD4021B	★ 748 463-54 ★ 748 3490-90
CD4021BE	★ 748 463-55 ★ 748 3490-80
CD4022A	★ 748 453-94
CD4022AE	★ 748 453-95
CD4022B	★ 748 453-96
CD4022BE	★ 748 453-97
CD4023A	★ 748 457-64
CD4023AE	★ 748 457-65
CD4023B	★ 748 457-66
CD4023BE	★ 748 457-67
CD4023UB	★ 748 457-68
CD4023UBE	★ 748 457-69
CD4024A	★ 748 451-160 ¶ 231-15
CD4024AE	★ 748 451-161 ¶ 231-15
CD4024B	★ 748 451-162 ¶ 231-15
CD4024BE	★ 748 451-163 ¶ 231-15
CD40257B	★ 749 461-118
CD40257BE	★ 749 461-119
CD4025A	★ 748 458-132
CD4025AE	★ 748 458-133
CD4025B	★ 748 458-134
CD4025BE	★ 748 458-135
CD4025UB	★ 748 458-136
CD4025UBE	★ 748 458-137
CD4026A	★ 748 452-54 ¶ 229-7
CD4026AE	★ 748 452-55 ¶ 229-7
CD4026B	★ 748 452.56 ¶ 229-7
CD4026BE	★ 748 452-57 ¶ 229-7
CD4027A	★ 748 456-118
CD4027AE	★ 748 456-119
CD4027B	★ 748 456-120
CD4027BE	★ 748 456-121
CD4028A	★ 748 454-4
CD4028AE	★ 748 454-5
CD4028B	★ 748 454-6
CD4028BE	★ 748 454-7
CD4029A	★ 748 453-137
CD4029B	★ 748 453-138
CD4029BE	★ 748 453-139
CD4030A	★ 748 459-24
CD4030AE	★ 748 459-25
CD4030B	★ 748 459-26
CD4030BE	★ 748 459-27
CD4031A	★ 748 463-168
CD4031AE	★ 748 463-169
CD4031B	★ 748 463-170 ★ 748 3491-49
CD4031BE	★ 748 463-171 ★ 748 3491-47
CD4032A	★ 748 449-20
CD4032AE	★ 748 449-21
CD4032B	★ 748 449-22
CD4032BE	★ 748 449-23
CD4033A	★ 748 452-66 ¶ 229-7
CD4033AE	★ 748 452-67 ¶ 229-7
CD4033B	★ 748 452-68 ¶ 229-7
CD4033BE	★ 748 452-69 ¶ 229-7
CD4034A	★ 748 463-70
CD4034AE	★ 748 463-71
CD4034B	★ 748 463-72 ★ 748 3490-38
CD4034BE	★ 748 463-73
CD4035A	★ 748 463-31
CD4035AE	★ 748 463-32
CD4035B	★ 748 463-33 ★ 748 3489-72
CD4035BE	★ 748 463-34 ★ 748 3489-61
CD4036A	★ 3875 460-86 ★ 3875 3470-75
CD4036AE	★ 3875 460-87
CD4037A	★ 748 457-161
CD4037AE	★ 748 457-162
CD4038A	★ 748 449-7
CD4038AE	★ 748 449-8
CD4038B	★ 748 449-9
CD4038BE	★ 748 449-10
CD4039A	★ 3875 460-91 ★ 3875 3470-72
CD4039AE	★ 3875 460-92
CD4040A	★ 748 451-188
CD4040AE	★ 748 451-189
CD4040B	★ 748 451-190
CD4040BE	★ 748 451-191
CD4041A	★ 748 449-140
CD4041AE	★ 748 449-141
CD4041UB	★ 748 449-142
CD4041UBE	★ 748 449-143
CD4042A	★ 748 459-116
CD4042AE	★ 748 459-117
CD4042B	★ 748 459-118
CD4042BE	★ 748 459-119
CD4043A	★ 748 459-154
CD4043AE	★ 748 459-155
CD4043B	★ 748 459-156
CD4043BE	★ 748 459-157
CD4044A	★ 748 459-135
CD4044A/B	★ 748 459-136
CD4044A/BE	★ 748 459-137
CD4044AE	★ 748 459-138
CD4044B	★ 748 459-139
CD4045A	★ 748 462-93
CD4045AE	★ 748 462-94
CD4045B	★ 748 462-95
CD4045BE	★ 748 462-96
CD4046A	★ 748 464-54 ¶ 279-3 ★ 748 2945-49 ¶ 279-3
CD4046AE	★ 748 464-55 ★ 748 2945-50
CD4046B	★ 748 464-56 ★ 748 2945-51
CD4046BE	★ 748 464-57 ★ 748 2945-52
CD4047A	★ 748 462-16 ¶ 231-5
CD4047AE	★ 748 462-17 ¶ 231-5
CD4047B	★ 748 462-18 ¶ 231-5
CD4047BE	★ 748 462-19 ¶ 231-5
CD4048A	★ 748 459-74
CD4048AE	★ 748 459-75
CD4048B	★ 748 459-76
CD4048BE	★ 748 459-77
CD4049A	★ 748 450-23
CD4049AE	★ 748 450-24
CD4049UB	★ 748 450-25
CD4049UBE	★ 748 450-26
CD4050A	★ 748 450-57
CD4050AE	★ 748 450-58
CD4050B	★ 748 450-59
CD4050BE	★ 748 450-60
CD4051B	★ 748 2423-97
CD4051BE	★ 748 2423-98
CD4052B	★ 748 2423-29
CD4052BE	★ 748 2423-30
CD4053B	★ 748 2419-104
CD4053BE	★ 748 2419-105
CD4054B	★ 748 455-32 ★ 748 2464-136
CD4054BE	★ 748 455-33
CD4055B	★ 748 455-1 ★ 748 2464-20
CD4055BE	★ 748 455-2 ★ 748 2464-21
CD4056B	★ 748 455-6 ★ 748 2464-49
CD4056BE	★ 748 455-7 ★ 748 2464-50
CD4057A	449-65
CD4059A	★ 748 453-73 ¶ 278-9
CD4059AE	★ 748 453-74 ¶ 278-9
CD4060A	★ 748 452-41
CD4060AE	★ 748 452-42
CD40603	★ 748 452-43 ¶ 275-16
CD4060BE	★ 748 452-44
CD4061A	★ 3874 460-123 ¶ 287-15
CD4063B	★ 748 449-92
CD4063BE	★ 748 449-93
CD4066A	★ 748 2417-44
CD4066AE	★ 748 2417-45
CD4066B	★ 748 2417-46
CD4066BE	★ 748 2417-47
CD4067B	★ 748 2424-105
CD4067BE	★ 748 2424-106
CD4068B	★ 748 457-143
CD4068BE	★ 748 457-144
CD4069UB	★ 748 451-1
CD4069UBE	★ 748 451-2
CD4070B	★ 748 459-28
CD4070BE	★ 748 459-29
CD4071B	★ 748 458-57
CD4071BE	★ 748 458-58
CD4072B	★ 748 458-17
CD4072BE	★ 748 458-18
CD4073B	★ 748 456-162
CD4073BE	★ 748 456-163
CD4075B	★ 748 458-35
CD4075BE	★ 748 458-36
CD4076B	★ 748 455-133
CD4076BE	★ 748 455-134

Arranged alphanumerically from left to right.

© IC MASTER 1983

RCA Solid State Division (Cont'd)

CD4077B ★ 748 459-53
CD4077BE ★ 748 459-54
CD4078B ★ 748 458-200
CD4078BE ★ 748 458-201
CD4081B ★ 748 456-190
CD4081BE ★ 748 456-191
CD4082B ★ 748 456-145
CD4082BE ★ 748 456-146
CD4085B ★ 748 457-188
CD4085BE ★ 748 457-189
CD4086B ★ 748 458-3
CD4086BE ★ 748 458-4
CD4089B ★ 748 464-90 ¶ 228-5
CD4089BE ★ 748 464-91 ¶ 228-5
CD4093B ★ 748 465-7 ¶ 229-3
CD4093BE ★ 748 465-8
CD4094B ★ 748 463-83 ★ 748 3491-19
CD4094BE ★ 748 463-84 ★ 748 3491-20
CD4095B ★ 748 456-63
CD4095BE ★ 748 456-64
CD4096B ★ 748 456-65
CD4096BE ★ 748 456-66
CD4097B ★ 748 2424-59
CD4097BE ★ 748 2424-60
CD4098B ★ 749 462-36
CD4098BE ★ 749 462-37
CD4099B ★ 749 460-58
CD4099BE ★ 749 460-59
CD4502B ★ 749 449-161
CD4502BE ★ 749 449-162
CD4503BD ★ 749 450-109
CD4503BE ★ 749 450-110
CD4508B ★ 749 459-94
CD4508BE ★ 749 459-95
CD4510B ★ 749 452-178
CD4510BE ★ 749 452-179
CD4511B ★ 749 455-61 ★ 749 2464-34
CD4511BE ★ 749 455-62 ★ 749 2464-35
CD4512B ★ 749 461-149
CD4512BE ★ 749 461-150
CD4514B ★ 749 454-132
CD4514BE ★ 749 454-133
CD4515B ★ 749 454-134
CD4515BE ★ 749 454-135
CD4516B ★ 749 451-97
CD4516BE ★ 749 451-98
CD4517B ★ 749 462-139
CD4517BE ★ 749 462-140 ★ 749 3491-58 3491-61
CD4518B ★ 749 453-27 ¶ 231-15
CD4518BE ★ 749 453-28 ¶ 231-15
CD4520B ★ 749 451-132 ¶ 231-6
CD4520BE ★ 749 451-133
CD4527B ★ 749 464-101 ¶ 228-5
CD4527BE ★ 749 464-102 ¶ 228-5
CD4532B ★ 749 466-6
CD4532BE ★ 749 466-7
CD4536B ★ 749 462-75
CD4536BE ★ 749 462-76
CD4538B ★ 749 462-55
CD4538BE ★ 749 462-56
CD4541 ★ 749
CD4543BD ★ 749 2464-41
CD4543BE ★ 749 2464-42
CD4555B ★ 749 454-32
CD4555BE ★ 749 454-33
CD4556B ★ 749 454-43
CD4556BE ★ 749 454-44
CD4585B ★ 749 449-94
CD4585BE ★ 749 449-95
CD4724B ★ 749 460-60
CD4724BE ★ 749 460-61
CD54HC00 ★ 740 457-112
CD54HC02 ★ 740 458-174
CD54HC04 ★ 740 451-3
CD54HC08 ★ 740 456-192
CD54HC10 ★ 740 457-70
CD54HC107 ★ 739 456-85
CD54HC109 ★ 739 456-122
CD54HC11 ★ 740 456-164
CD54HC112 ★ 739 456-123
CD54HC123 ★ 740
CD54HC132 ★ 740
CD54HC133 ★ 740 457-159
CD54HC138 ★ 739 454-89
CD54HC139 ★ 739 454-64
CD54HC14 ★ 740 465-36
CD54HC147 ★ 739 454-166
CD54HC151 ★ 740 461-139
CD54HC153 ★ 740 461-96
CD54HC154 ★ 739 454-100
CD54HC157 ★ 740
CD54HC158 ★ 740
CD54HC160 ★ 739 452-147
CD54HC161 ★ 739 451-63
CD54HC162 ★ 739 452-119
CD54HC163 ★ 739 451-39
CD54HC164 ★ 740 463-110
CD54HC165 ★ 740 463-99
CD54HC166 ★ 740
CD54HC173 ★ 739 455-135
CD54HC174 ★ 739 455-176
CD54HC175 ★ 739 455-158
CD54HC191 ★ 739 451-99
CD54HC192 ★ 739 452-180
CD54HC193 ★ 739 451-100
CD54HC194 ★ 740 463-4
CD54HC195 ★ 740 463-20
CD54HC20 ★ 740 457-33
CD54HC221 ★ 740 462-57
CD54HC238 ★ 739
CD54HC240 ★ 740 465-73
CD54HC241 ★ 740 465-90
CD54HC242 ★ 739 464-127
CD54HC243 ★ 739 464-136
CD54HC244 ★ 740 465-54
CD54HC245 ★ 739 465-138
CD54HC251 ★ 740 461-178
CD54HC253 ★ 740
CD54HC257 ★ 740 461-120
CD54HC259 ★ 739 460-62
CD54HC266 ★ 740 459-55
CD54HC27 ★ 740 458-138
CD54HC273 ★ 739
CD54HC280 ★ 739 449-112
CD54HC297 ★ 740
CD54HC299 ★ 740
CD54HC30 ★ 740 457-145
CD54HC32 ★ 740 458-59
CD54HC354 ★ 740 461-168
CD54HC356 ★ 740 461-169
CD54HC365 ★ 740 450-111
CD54HC366 ★ 740 450-112
CD54HC367 ★ 740 450-113
CD54HC368 ★ 740 450-114
CD54HC373 ★ 739 459-182
CD54HC374 ★ 739 456-49
CD54HC377 ★ 739
CD54HC384 ★ 739 449-115
CD54HC390 ★ 739 453-40
CD54HC393 ★ 739 451-145
CD54HC4002 ★ 740 458-107
CD54HC40104 ★ 740
CD54HC40105 ★ 740
CD54HC4017 ★ 739 452-91
CD54HC4020 ★ 739 452-27
CD54HC4024 ★ 739 451-164
CD54HC4040 ★ 739 451-192
CD54HC4049 450-27
CD54HC4050 ★ 740 450-61
CD54HC4051 ★ 740
CD54HC4052 ★ 740
CD54HC4053 ★ 740
CD54HC4060 ★ 739 452-45
CD54HC4099 450-28
CD54HC42 ★ 739 454-8
CD54HC4511 ★ 739 455-63
CD54HC4514 ★ 739 454-136
CD54HC4520 ★ 739 451-147
CD54HC4533 ★ 740 462-58
CD54HC533 ★ 739 460-23
CD54HC534 ★ 739 456-18
CD54HC540 ★ 740 450-127
CD54HC541 ★ 740 450-128
CD54HC563 ★ 739 460-24
CD54HC564 ★ 739 456-19
CD54HC573 ★ 739 459-183
CD54HC574 ★ 739 456-50
CD54HC640 ★ 739 465-122
CD54HC643 ★ 739 465-123
CD54HC645 ★ 739 465-139
CD54HC646 ★ 739 465-112
CD54HC648 ★ 739 465-104
CD54HC670 ★ 739
CD54HC688 ★ 739 449-55
CD54HC73 ★ 739 456-86
CD54HC74 ★ 739 455-106
CD54HC75 ★ 739
CD54HC76 ★ 739 456-124
CD54HC85 ★ 739 449-96
CD54HC86 ★ 740 459-30
CD54HCT00 ★ 740
CD54HCT02 ★ 740
CD54HCT04 ★ 740
CD54HCT08 ★ 740
CD54HCT10 ★ 740
CD54HCT107 ★ 739
CD54HCT109 ★ 739
CD54HCT11 ★ 740
CD54HCT112 ★ 739
CD54HCT123 ★ 740
CD54HCT132 ★ 740
CD54HCT133 ★ 740
CD54HCT138 ★ 739
CD54HCT139 ★ 739
CD54HCT14 ★ 740
CD54HCT147 ★ 739
CD54HCT151 ★ 740
CD54HCT153 ★ 740
CD54HCT154 ★ 739
CD54HCT157 ★ 740
CD54HCT158 ★ 740
CD54HCT160 ★ 739
CD54HCT161 ★ 739
CD54HCT162 ★ 739
CD54HCT163 ★ 739
CD54HCT164 ★ 740
CD54HCT165 ★ 740
CD54HCT166 ★ 740
CD54HCT173 ★ 739
CD54HCT174 ★ 739
CD54HCT175 ★ 739
CD54HCT191 ★ 739
CD54HCT192 ★ 739
CD54HCT193 ★ 739
CD54HCT194 ★ 740
CD54HCT195 ★ 740
CD54HCT20 ★ 740
CD54HCT221 ★ 740
CD54HCT238 ★ 739
CD54HCT240 ★ 740
CD54HCT241 ★ 740
CD54HCT242 ★ 739
CD54HCT243 ★ 739
CD54HCT244 ★ 740
CD54HCT245 ★ 739
CD54HCT251 ★ 740
CD54HCT253 ★ 740
CD54HCT257 ★ 740
CD54HCT259 ★ 739
CD54HCT266 ★ 740
CD54HCT27 ★ 740
CD54HCT273 ★ 739
CD54HCT280 ★ 739
CD54HCT297 ★ 740
CD54HCT299 ★ 740
CD54HCT30 ★ 740
CD54HCT32 ★ 740
CD54HCT354 ★ 740
CD54HCT356 ★ 740
CD54HCT365 ★ 740
CD54HCT366 ★ 740
CD54HCT367 ★ 740
CD54HCT368 ★ 740
CD54HCT373 ★ 739
CD54HCT374 ★ 739
CD54HCT377 ★ 739
CD54HCT384 ★ 739
CD54HCT390 ★ 739
CD54HCT393 ★ 739
CD54HCT4002 ★ 740
CD54HCT40104 ★ 740
CD54HCT40105 ★ 740
CD54HCT4017 ★ 739
CD54HCT4020 ★ 739
CD54HCT4024 ★ 739
CD54HCT4040 ★ 739
CD54HCT4051 ★ 740
CD54HCT4052 ★ 740
CD54HCT4053 ★ 740
CD54HCT4060 ★ 739
CD54HCT42 ★ 739
CD54HCT4511 ★ 739
CD54HCT4514 ★ 739
CD54HCT4520 ★ 739
CD54HCT4538 ★ 740
CD54HCT533 ★ 739
CD54HCT534 ★ 739
CD54HCT540 ★ 740
CD54HCT541 ★ 740
CD54HCT563 ★ 739
CD54HCT564 ★ 739
CD54HCT573 ★ 739
CD54HCT574 ★ 739
CD54HCT640 ★ 739
CD54HCT643 ★ 739
CD54HCT645 ★ 739
CD54HCT646 ★ 739
CD54HCT648 ★ 739
CD54HCT670 ★ 739
CD54HCT688 ★ 739
CD54HCT73 ★ 739
CD54HCT74 ★ 739
CD54HCT75 ★ 739
CD54HCT76 ★ 739
CD54HCT85 ★ 739
CD54HCT86 ★ 740
CD54HCU4049 ★ 740
CD74HC00 ★ 740 457-113
CD74HC02 ★ 740 458-175
CD74HC04 ★ 740 451-4
CD74HC08 ★ 740 456-193
CD74HC10 ★ 740 457-71
CD74HC107 ★ 739 456-87
CD74HC109 ★ 739 456-125
CD74HC11 ★ 740 456-165
CD74HC112 ★ 739 456-126
CD74HC123 ★ 740
CD74HC132 ★ 740
CD74HC133 ★ 740 457-160
CD74HC138 ★ 739 454-90
CD74HC139 ★ 739 454-65
CD74HC14 ★ 740 465-37
CD74HC147 ★ 739 454-167
CD74HC151 ★ 740 461-140
CD74HC153 ★ 740 461-97
CD74HC154 ★ 739 454-161
CD74HC157 ★ 740
CD74HC158 ★ 740
CD74HC160 ★ 739 452-148
CD74HC161 ★ 739 451-64
CD74HC162 ★ 739 452-120
CD74HC163 ★ 739 451-40
CD74HC164 ★ 740 463-111
CD74HC165 ★ 740 463-100
CD74HC166 ★ 740
CD74HC173 ★ 739 455-136
CD74HC174 ★ 739 455-177
CD74HC175 ★ 739 455-159
CD74HC191 ★ 739 451-101
CD74HC192 ★ 739 452-181
CD74HC193 ★ 739 451-102
CD74HC194 ★ 740 463-5
CD74HC195 ★ 740 463-21
CD74HC20 ★ 740 457-34
CD74HC221 ★ 740 462-59
CD74HC238 ★ 739
CD74HC240 ★ 740 465-74
CD74HC241 ★ 740 465-91
CD74HC242 ★ 739 464-128
CD74HC243 ★ 739 464-137
CD74HC244 ★ 740 465-55

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

RCA Solid State Division (Cont'd)

Device	Page-Line
CD74HC245	★ 739 465-140
CD74HC251	★ 740 461-179
CD74HC253	★ 740
CD74HC257	★ 740 461-121
CD74HC259	★ 739 460-63
CD74HC266	★ 740 459-56
CD74HC27	★ 740 458-139
CD74HC273	★ 739
CD74HC280	★ 739 449-113
CD74HC297	★ 740
CD74HC299	★ 740
CD74HC30	★ 740 457-146
CD74HC32	★ 740 458-60
CD74HC354	★ 740 461-170
CD74HC356	★ 740 461-171
CD74HC365	★ 740 450-115
CD74HC366	★ 740 450-116
CD74HC367	★ 740 450-117
CD74HC368	★ 740 450-118
CD74HC373	★ 739 459-184
CD74HC374	★ 739 456-51
CD74HC377	★ 739
CD74HC384	★ 739 449-116
CD74HC390	★ 739 453-41
CD74HC393	★ 739 451-146
CD74HC4002	★ 740 458-108
CD74HC40104	★ 740
CD74HC40105	★ 740
CD74HC4017	★ 739 452-92
CD74HC4020	★ 739 452-28
CD74HC4024	★ 739 451-165
CD74HC4040	★ 739 451-193
CD74HC4049	450-29
CD74HC4050	★ 740 450-62
CD74HC4051	★ 740
CD74HC4052	★ 740
CD74HC4053	★ 740
CD74HC4060	★ 739 452-46
CD74HC42	★ 739 454-9
CD74HC4511	★ 739 455-64
CD74HC4514	★ 739 454-137
CD74HC4520	★ 739 451-148
CD74HC4538	★ 740 462-60
CD74HC533	★ 739 460-25
CD74HC534	★ 739 456-20
CD74HC540	★ 740 450-129
CD74HC541	★ 740 450-130
CD74HC563	★ 739 460-26
CD74HC564	★ 739 456-21
CD74HC573	★ 739 459-185
CD74HC574	★ 739 456-52
CD74HC640	★ 739 465-124
CD74HC643	★ 739 465-125
CD74HC645	★ 739 465-141
CD74HC646	★ 739 465-113
CD74HC648	★ 739 465-105
CD74HC670	★ 739
CD74HC688	★ 739 449-56
CD74HC73	★ 739 456-88
CD74HC74	★ 739 455-107
CD74HC75	★ 739
CD74HC76	★ 739 456-127
CD74HC85	★ 739 449-97
CD74HC86	★ 740 459-31
CD74HCT00	★ 740
CD74HCT02	★ 740
CD74HCT04	★ 740
CD74HCT08	★ 740
CD74HCT10	★ 740
CD74HCT107	★ 739
CD74HCT109	★ 739
CD74HCT11	★ 740
CD74HCT112	★ 739
CD74HCT123	★ 740
CD74HCT132	★ 740
CD74HCT133	★ 740
CD74HCT138	★ 739
CD74HCT139	★ 739
CD74HCT14	★ 740
CD74HCT147	★ 739
CD74HCT151	★ 740
CD74HCT153	★ 740
CD74HCT154	★ 739
CD74HCT157	★ 740
CD74HCT158	★ 740
CD74HCT160	★ 739
CD74HCT161	★ 739
CD74HCT162	★ 739
CD74HCT163	★ 739
CD74HCT164	★ 740
CD74HCT165	★ 740
CD74HCT166	★ 740
CD74HCT173	★ 739
CD74HCT174	★ 739
CD74HCT175	★ 739
CD74HCT191	★ 739
CD74HCT192	★ 739
CD74HCT193	★ 739
CD74HCT194	★ 740
CD74HCT195	★ 740
CD74HCT20	★ 740
CD74HCT221	★ 740
CD74HCT238	★ 739
CD74HCT240	★ 740
CD74HCT241	★ 740
CD74HCT242	★ 739
CD74HCT243	★ 739
CD74HCT244	★ 740
CD74HCT245	★ 739
CD74HCT251	★ 740
CD74HCT253	★ 740
CD74HCT257	★ 740
CD74HCT259	★ 739
CD74HCT266	★ 740
CD74HCT27	★ 740
CD74HCT273	★ 739
CD74HCT280	★ 739
CD74HCT297	★ 740
CD74HCT299	★ 740
CD74HCT30	★ 740
CD74HCT32	★ 740
CD74HCT354	★ 740
CD74HCT356	★ 740
CD74HCT365	★ 740
CD74HCT366	★ 740
CD74HCT367	★ 740
CD74HCT368	★ 740
CD74HCT373	★ 739
CD74HCT374	★ 739
CD74HCT377	★ 739
CD74HCT384	★ 739
CD74HCT390	★ 739
CD74HCT393	★ 739
CD74HCT4002	★ 740
CD74HCT40104	★ 740
CD74HCT40105	★ 740
CD74HCT4017	★ 739
CD74HCT4020	★ 739
CD74HCT4024	★ 739
CD74HCT4040	★ 739
CD74HCT4051	★ 740
CD74HCT4052	★ 740
CD74HCT4053	★ 740
CD74HCT4060	★ 739
CD74HCT42	★ 739
CD74HCT4511	★ 739
CD74HCT4514	★ 739
CD74HCT4520	★ 739
CD74HCT533	★ 739
CD74HCT534	★ 739
CD74HCT538	★ 740
CD74HCT540	★ 740
CD74HCT541	★ 740
CD74HCT563	★ 739
CD74HCT564	★ 739
CD74HCT573	★ 739
CD74HCT574	★ 739
CD74HCT640	★ 739
CD74HCT643	★ 739
CD74HCT645	★ 739
CD74HCT646	★ 739
CD74HCT648	★ 739
CD74HCT670	★ 739
CD74HCT688	★ 739
CD74HCT73	★ 739
CD74HCT74	★ 739
CD74HCT75	★ 739
CD74HCT76	★ 739
CD74HCT85	★ 739
CD74HCT86	★ 740
CD74HCU4049	★ 740
CDM5332	★ 3878
CDM5333	★ 3878
CDM6116	★ 3874 ★ 3880
CDP1800	★ 1465
CDP1802	★ 1459 1071-36 ¶ 242-11 ¶ 243-19 ¶ 245-5 ¶ 245-9 ¶ 246-15 ¶ 247-5 ¶ 248-7 ¶ 248-8
CDP1802A	★ 1459 1089-19 ¶ 242-11 ¶ 243-19 ¶ 245-5 ¶ 245-9 ¶ 246-15 ¶ 247-5 ¶ 248-7 ¶ 248-8 ★ 1459 1071-37 ¶ 242-11 ¶ 243-19 ¶ 245-5 ¶ 245-9 ¶ 246-15 ¶ 247-5 ¶ 248-7 ¶ 248-8
CDP1802AC	★ 1459 1089-20 ¶ 242-11 ¶ 243-19 ¶ 245-5 ¶ 245-9 ¶ 246-15 ¶ 247-5 ¶ 248-7 ¶ 248-8
CDP1802BC	★ 1459 1073-1 ¶ 242-11 ¶ 243-19 ¶ 245-5 ¶ 245-9 ¶ 246-15 ¶ 247-5 ¶ 248-7 ¶ 248-8
CDP1802C	★ 1459 1073-2 ¶ 242-11 ¶ 243-19 ¶ 245-5 ¶ 245-9 ¶ 246-15 ¶ 247-5 ¶ 248-7 ¶ 248-8
CDP1802M	★ 1459 1073-3 ¶ 242-11 ¶ 243-19 ¶ 245-5 ¶ 245-9 ¶ 246-15 ¶ 247-5 ¶ 248-7 ¶ 248-8
CDP18042CD	3460-16
CDP1804AC	★ 1461 1089-12 ★ 1461 1073-4
CDP1805AC	★ 1461 1089-14 ★ 1461 1073-5
CDP1805C	★ 1461 1073-6
CDP1806AC	★ 1461 1089-13 ★ 1461 1073-7
CDP1806C	★ 1461 1073-8
CDP1821	★ 3874 460-159 ★ 3874 3476-16 ★ 3874 1089-69
CDP1821C	★ 3874 3476-47 ★ 3874 1089-70
CDP1822	★ 3874 461-7 ¶ 288-6 ¶ 248-6 ★ 3874 3474-15 ¶ 288-6 ¶ 248-6 ★ 3874 1089-67 ¶ 288-6 ¶ 248-6
CDP1822C	★ 3874 461-8 ¶ 288-6 ¶ 248-6 ★ 3874 3474-67 ¶ 288-6 ¶ 248-6 ★ 3874 1089-68 ¶ 288-6 ¶ 248-6
CDP1823	★ 3874 460-162 ★ 3874 3472-52 3472-52 ★ 3874 1089-63
CDP1823C	★ 3874 3472-58 3472-58 ★ 3874 1089-64
CDP1824	★ 3874 460-128 ¶ 288-5 ¶ 248-4 ★ 3874 3472-2 ¶ 288-5 ¶ 248-4 ★ 3874 1089-60 ¶ 288-5 ¶ 248-4
CDP1824C	★ 3874 460-129 ¶ 288-5 ¶ 248-4 ★ 3874 3472-5 ¶ 288-5 ¶ 248-4 ★ 3874 1089-61 ¶ 288-5 ¶ 248-4
CDP1825	461-23 3479-58 1089-71
CDP1825C	461-24 3479-59 1089-72
CDP1826C	3472-28
CDP1831	★ 3876 461-41 ¶ 289-3 ¶ 248-5 ★ 3876 3484-15 ¶ 289-3 ¶ 248-5 ★ 3876 1089-83 ¶ 289-3 ¶ 248-5
CDP1831C	★ 3876 461-42 ¶ 289-3 ¶ 248-5 ★ 3876 3484-25 ¶ 289-3 ¶ 248-5 ★ 3876 1089-84 ¶ 289-3 ¶ 248-5
CDP1832	461-43 ¶ 289-3 ¶ 248-5 3484-16 ¶ 289-3 ¶ 248-5 1089-85 ¶ 289-3 ¶ 248-5
CDP1832C	461-44 ¶ 289-3 ¶ 248-5 3484-26 ¶ 289-3 ¶ 248-5 1089-86 ¶ 289-3 ¶ 248-5
CDP1833	★ 3876 461-53 ¶ 289-4 ★ 3876 3484-69 ¶ 289-4 ★ 3876 1089-95 ¶ 289-4
CDP1833C	★ 3876 461-54 ¶ 289-4 ★ 3876 3484-86 ¶ 289-4 ★ 3876 1089-96 ¶ 289-4
CDP1834	★ 3877 461-55 ¶ 289-4 ★ 3877 3484-70 ¶ 289-4 ★ 3877 1089-97 ¶ 289-4
CDP1834C	★ 3877 461-56 ¶ 289-4 ★ 3877 3484-87 ¶ 289-4 ★ 3877 1089-98 ¶ 289-4
CDP1835	★ 3876 461-73 ★ 3876 3485-1 ★ 3876 1089-107
CDP1835C	★ 3876 461-74 ★ 3876 3485-5 ★ 3876 1089-108
CDP1837	★ 3876
CDP1851	★ 1475 1089-47
CDP1851C	★ 1475 1089-48
CDP1852	★ 1471 465-171 ¶ 241-14 ¶ 247-5 ★ 1471 1090-5 ¶ 241-14 ¶ 247-5
CDP1853	★ 1466 453-157 ★ 1466 1089-41
CDP1853C	★ 1466 453-158 ★ 1466 1089-42
CDP1854	★ 1476 2487-55 ¶ 241-15 ★ 1476 1089-115 ¶ 241-15
CDP1854A	★ 1476 464-85 ¶ 241-15 ★ 1476 1089-116 ¶ 241-15

Arranged alphanumerically from left to right.

© IC MASTER 1983

Device	Page-Line
RCA Solid State Division (Cont'd)	
CDP1854AC	★ 1476
	2487-38
	¶ 241-15
	★ 1476
	1089-117
	¶ 241-15
CDP1855	★ 1478
	1089-35
	¶ 248-3
CDP1855C	★ 1478
	1089-36
	¶ 248-3
CDP1856	★ 1472
	1089-137
	¶ 248-7
CDP1856C	★ 1472
	1089-138
	¶ 248-7
CDP1857	★ 1472
	1089-143
	¶ 248-7
CDP1857C	★ 1472
	1089-144
	¶ 248-7
CDP1858	★ 1468
	1089-149
CDP1858C	★ 1468
	1089-150
CDP1859	★ 1468
	1089-155
CDP1859C	★ 1468
	1089-156
CDP1860	1089-62
CDP1861	★ 1486
	1089-122
CDP1861C	★ 1486
	1089-123
CDP1862	★ 1485
	1089-21
CDP1862C	★ 1486
	1089-22
CDP1863	★ 1485
	1089-53
CDP1863C	★ 1485
	1089-54
CDP1864	★ 1486
	1089-109
CDP1864C	★ 1486
	1089-110
CDP1866	★ 1469
	1089-25
CDP1866C	★ 1469
	1089-26
CDP1867	★ 1469
	1089-27
CDP1867C	★ 1469
	1089-28
CDP1868	★ 1469
	1089-29
CDP1868C	★ 1469
	1089-30
CDP1869	★ 1482
	1089-124
	¶ 257-8
	¶ 285-11
CDP1869C	★ 1482
	1089-125
	¶ 257-8
	¶ 285-11
CDP1870	★ 1482
	1089-126
	¶ 257-8
	¶ 285-11
CDP1870C	★ 1482
	1089-127
	¶ 257-8
	¶ 285-11
CDP1871	★ 1484
	2468-8
	★ 1484
	1089-23
CDP1871C	★ 1484
	2468-10
	★ 1484
	1089-24
CDP1871CD	★ 1484
	2468-11
CDP1871D	★ 1484
	2468-9
CDP1872C	★ 1473
	465-172
	★ 1473
	1090-6
CDP1873C	★ 1467
	454-91
	★ 1467
	1089-132
CDP1874C	★ 1473
	465-173
	★ 1473
	1090-7
CDP1875C	★ 1473
	465-174
	★ 1473
	1090-8
CDP1876	★ 1482
	1089-128
CDP1876C	★ 1482
	1089-129
CDP1877	★ 1479
	1089-49
CDP1877C	★ 1479
	1089-50
CDP1877CD	★ 1479
	1089-51
CDP1877D	★ 1479
	1089-52
CDP1878C	★ 1480
	1089-131
CDP1879	★ 1481
	1089-73
CDP1879C	★ 1481
	1089-74
CDP1881	★ 3879
CDP1882	★ 3879
CDP18S601	1757-20
CDP18S601A	★ 1956
CDP18S602	★ 1956
	1757-19
CDP18S603	1757-21
CDP18S603A	★ 1956
CDP18S604	1757-22
CDP18S604B	★ 1956
CDP18S605	★ 1956
	1757-23
	★ 1956
	1629-3
CDP18S606	★ 1956
	1757-25
CDP18S607	★ 1956
	1757-24
CDP18S608	★ 1956
	1757-26
CDP18S609	★ 1956
	1757-27
CDP18S610	★ 1956
	1757-28
CDP18S620	★ 1957
CDP18S621	★ 1957
CDP18S622	★ 1957
CDP18S623A	★ 1957
CDP18S625	★ 1957
CDP18S626	★ 1957
CDP18S627	★ 1957
CDP18S628	★ 1957
CDP18S629	★ 1957
CDP18S630	★ 1957
CDP18S631	★ 1957
CDP18S632	★ 1957
CDP18S640A	★ 1957
CDP18S640A1	★ 1957
CDP18S641A	★ 1957
CDP18S642	★ 1958
CDP18S643A	★ 1958
CDP18S644	★ 1958
CDP18S646	★ 1957
CDP18S647	★ 1958
CDP18S648	★ 1958
CDP18S650	★ 1957
CDP18S651	★ 1957
CDP18S652	★ 1957
CDP18S653V1	★ 1957
CDP18S653V2	★ 1957
CDP18S653V3	★ 1957
CDP18S653V4	★ 1957
CDP18S654	★ 1958
CDP18S657	★ 1958
CDP18S658	★ 1958
CDP18S660	★ 1957
CDP18S661B	★ 1958
CDP18S661V3	★ 1958
CDP18S662	★ 1957
CDP18S663	★ 1957
CDP18S693	★ 1960
	1629-1
CDP18S694	★ 1960
	1629-2
CDP18S695	★ 1960
CDP18U42CD	1089-55
	¶ 286-6
CDP6402D	★ 1476
	464-86
	★ 1476
	2487-48
CDP6402E	★ 1476
	464-87
	★ 1476
	2487-49
CDP65516	★ 3878
CDP6805	★ 1487
CDP6805E2	1073-9
CDP6805F2	1073-10
CDP6805G2	1073-11
CDP6818	★ 1491
CDSIV	1628-4
CO40061	3473-33
CPP6823	★ 1491
DEP1832	★ 3877
GP001	★ 409
	1086-93
GP201	★ 409
	1086-97
GP301	★ 409
	1086-99
GP302	★ 409
	1086-100
GP501	★ 409
	1086-95
GP504	★ 409
	1086-94
GP505	★ 409
	1086-98
GP507	★ 409
	1086-96
HCF4095B	456-67
MA10150	★ 4518
	4141-88
MA10250	★ 4518
	4141-89
MA10350	★ 4518
	4141-90
MA10500	★ 4518
	4141-91
MA30150	★ 4518
	4141-92
MA30250	★ 4518
	4141-93
MA60150	★ 4518
	4141-94
MA60250	★ 4518
	4141-95
MA60400	★ 4518
	4141-96
MA60550	★ 4518
	4141-97
MA60800	★ 4518
	4141-98
MS2000	★ 1960
	1629-4
MSE3001	★ 1961
MSI800	★ 1959
MSI8000	★ 1959
MSIC004	★ 1959
MSIC003	★ 1959
MSI8012	★ 1959
MSI8016	★ 1959
MSI8020	★ 1959
MSIC024	★ 1959
MSIC025	★ 1959
MSI804	★ 1959
MSI808	★ 1959
MSI812	★ 1959
MSI816	★ 1959
MSI820	★ 1959
MSI824	★ 1959
MSI825	★ 1959
MSI8000	★ 1959
MSI8004	★ 1959
MSI8808	★ 1959
MSI8812	★ 1959
MSI8816	★ 1959
MSI8820	★ 1959
MSI8824	★ 1959
MSI8825	★ 1959
MSIA0100	★ 1959
MSIA0200	★ 1959
MSIA0300	★ 1959
MSIA0400	★ 1959
MSIA06	★ 1959
MSIA07	★ 1959
MSIA08	★ 1959
MSIA10	★ 1959
MSIA11	★ 1959
MSIM20	★ 1959
MSIM40	★ 1959
MSIM40E	★ 1959
MSIM41	★ 1959
MSIM41E	★ 1959
MSIM50	★ 1959
MWS5101	★ 3874
MWS5101DL3	3474-60
MWS5101EL2	3474-14
MWS5101EL3	3474-61
MWS5114-1	★ 3874
	3478-75
MWS5114-2	★ 3874
	3478-52
MWS5114-3	★ 3874
	3478-8
MWS5114A	★ 3874
	3479-14
MWS5114A-5	★ 3874
	3479-15
PA20250	★ 4518
	4141-99
PA20450	★ 4518
	4141-100
PA20650	★ 4518
	4141-101
PA20850	★ 4518
	4141-102
PA21000	★ 4518
	4141-103
PA40650	★ 4518
	4141-104
PA40850	★ 4518
	4141-105
PA41000	★ 4518
	4141-106
PA41200	★ 4518
	4141-107
PA60650	★ 4518
	4141-108
PA61200	★ 4518
	4141-109
TCC-244	3474-16
SEEQ Technology, Inc.	
5133-350	★ 3891
	3467-1
5143	★ 3896
	3467-20
5213-250	★ 3882
	3455-44
5213-350	★ 3882
	3455-53
5213H	★ 3882
	3455-45
5223	★ 3890
	3455-56
8001	★ 1492
	1100-108
E5213	★ 3889
	3455-46
M5213	★ 3889
	3455-54
Semi Processes Inc.	
SP54SC240	465-75
SP54SC241	465-92
SP54SC244	465-56
SP54SC245	465-142
SP54SC373	459-186
SP54SC374	456-53
SP54SC573	459-187
SP54SC574	456-54
SP74HC00	★ 766
	457-115
SP74HC02	★ 766
	458-177
SP74HC04	★ 766
	451-6
SP74HC10	★ 766
	457-72
SP74HC107	★ 768
	456-89
SP74HC109	★ 768
	456-128
SP74HC11	★ 766
	456-166
SP74HC112	★ 768
	456-74
SP74HC113	★ 768
	456-71
SP74HC125	★ 768
	449-133
SP74HC126	★ 768
	449-132
SP74HC138	★ 769
SP74HC139	★ 769
	454-66
SP74HC14	★ 766
	465-38
SP74HC147	★ 769
	454-165
SP74HC148	★ 769
	454-162
SP74HC153	★ 769
	461-86
SP74HC157	★ 769
	461-106
SP74HC158	★ 769
	461-110
SP74HC160	★ 769
	452-149
SP74HC161	★ 770
	451-65
SP74HC162	★ 770
	452-121
SP74HC163	★ 770
	451-41
SP74HC174	★ 770
	455-178
SP74HC175	★ 770
	455-160
SP74HC192	★ 770
	452-182
SP74HC193	★ 770
	451-103
SP74HC20	★ 766
	457-35
SP74HC240	★ 770
	465-76
SP74HC253	★ 771
	461-93
SP74HC257	★ 771
	461-122
SP74HC258	★ 771
	461-125
SP74HC266	★ 771
	459-57
SP74HC27	★ 766
	458-140
SP74HC280	★ 771
	449-114
SP74HC30	★ 767
	457-147
SP74HC32	★ 767
	458-62
SP74HC365	★ 771
	465-14
SP74HC42	★ 767
	454-10
SP74HC73	★ 767
	456-90
SP74HC74	★ 767
	455-109
SP74HC76	★ 767
	456-129
SP74HC80	★ 767
	449-57
SP74HC86	★ 767
	459-32
SP74HC90	★ 768
	452-101
SP74HC93	★ 768
	451-149
SP74HCXXX	★ 764
SP74SC137	★ 761
SP74SC138	★ 761
SP74SC139	★ 761
SP74SC238	★ 761
SP74SC239	★ 761
SP74SC240	★ 761
	465-77
SP74SC241	★ 761
	465-93
SP74SC244	★ 761
	465-57
SP74SC245	★ 761
	465-143
SP74SC373	★ 761
	459-188
SP74SC374	★ 761
	456-55
SP74SC540	★ 761
SP74SC541	★ 761
SP74SC573	★ 761
	459-189
SP74SC574	★ 761
	456-56
SP75HC138	454-92
Signetics	
100101	470-35
100102	470-37
100107	470-39
100112	470-23
100114	470-93
100117	470-31
100118	470-33
100122	470-16
100123	470-25
100131	470-27
100149	3459-65
	3459-66
100150	470-42
100151	470-29
100155	470-63
100158	470-68
100160	470-91
100163	470-59
100164	470-65
100166	470-13
100170	470-19
100171	470-61
100415	3475-43
100415A	3475-36
10041BB	3475-30
100422	3473-58
100422A	3473-56
100422B	3473-46
100470	3481-37
100470A	3481-29
10100	468-34
10101	468-57
10102	468-29
10103	467-150
10104	467-133
10105	468-50
10106	468-22
10107	468-95
10108	467-125
10109	468-42
10110	467-145
10111	468-9
10112	468-16
10113	468-88
10114	469-104
10115	469-112
10116	469-105
10117	468-76
10118	468-63
10119	468-69
10121	468-83
10123	467-91
10124	469-79
10125	469-74
10129	469-107
10130	468-103
10131	467-107
10132	468-115
10133	468-129
10134	468-109
10135	467-124
10136	467-51
10137	467-58
10139	468-145
	3459-8
10141	469-63
	3489-52

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Device	Page-Line
Signetics (Cont'd)	
10145	468-156
	3470-93
10149	468-150
	3459-67
10155	468-142
	3470-76
10158	469-48
10159	469-43
10160	469-125
10161	467-76
10162	467-68
10164	469-54
10165	469-117
10171	467-86
10172	467-81
10173	468-134
10174	469-37
10175	468-141
10176	467-118
10179	467-7
10180	467-15
10181	467-28
10188	467-36
10189	467-40
10192	467-95
10210	468-10
10211	468-11
10231	467-108
10415	469-22
10415A	3475-44
10415B	3475-31
10422	3473-59
10422A	3473-57
10422B	3473-47
10470	3481-38
10470A	3481-30
2064-20	3485-71
23128-25	★ **3901**
	3487-25
23128-30	★ **3901**
	3487-28
23256A	★ **3903**
	3487-43
2332-20	★ **3897**
	3485-75
2332-25	★ **3897**
	3485-78
2332-30	★ **3897**
	3485-94
2332-45	★ **3897**
	3486-20
2364-20	★ **3899**
	3486-44
2364-25	★ **3899**
	3486-67
2364-30	★ **3899**
	3486-70
2364-35	3486-107
2364-45	★ **3899**
	3487-5
2616-30	3485-8
2616-35	3485-26
2616-45	3485-49
2616A-25	3485-3
2632A-20	★ **3905**
	3485-72
2632A-25	★ **3905**
	3485-76
2632A-30	★ **3905**
	3485-88
2632A-35	★ **3905**
	3485-110
2632A-45	★ **3905**
	3486-8
2632AE-30	★ **3905**
	3485-89
2632AM-35	★ **3905**
	3485-111
2632AM-45	★ **3905**
	3486-9
2650A	1073-24
2650A-1	1073-25
2653	2467-32
	¶ 257-10
	¶ 257-15
	¶ 257-16
	¶ 258-2
	¶ 259-9
2664-25	★ **3907**
	3486-58
2664A-20	★ **3907**
	3486-34
2664A-25	★ **3907**
	3486-59
2664A-30	★ **3907**
	3486-85
2664A-45	★ **3907**
	3486-115
2664AE-30	★ **3907**
	3486-86
2664AM-35	★ **3907**
	3486-108
2664AM-45	★ **3907**
	3486-116
2670	3453-63
2671	1103-1
2672	1093-106
26810	2486-64
26814	2486-65
26818	2486-66
3001	★ **1512**
3002	★ **1512**
3207A	2483-43
3207A-1	2483-44
32128-45	3487-36
5373545373	★ **783**
5374545374	★ **783**
5400	492-7
5402	494-92
5403	491-138
5404	477-163
5408	489-131
5410	490-177
54107	487-180
54109	487-117
5411	489-41
54116	495-101
54121	500-103
54123	500-163
54125	476-137
54126	476-111
54128	2472-32
5413	507-77
54132	507-125
5414	507-155
54145	482-146
54147	509-31
54148	508-135
54150	500-83
54151	499-151
54153	498-23
54154	484-34
54155	483-129
54156	483-97
54157	499-17
54158	498-116
5416	484-154
54160	480-138
54161	478-115
54163	478-165
54164	502-22
	3490-118
54165	502-73
	3490-52
54166	502-93
	3490-65
5417	484-130
54170	496-172
54173	486-26
54174	486-52
54175	485-120
54180	508-164
54181	475-8
54190	481-170
54191	479-131
54193	479-181
54194	501-148
	3488-82
54195	501-47
54199	502-59
5420	490-92
5421	488-167
54221	500-138
5425	493-181
5426	484-89
5427	494-39
54279	495-164
5428	494-93
54298	499-72
5430	492-69
5432	493-127
5433	494-63
54365A	165
	485-18
54366A	113
	485-19
54367A	166
	485-20
54368A	114
	485-19
5437	491-93
5439	491-42
5440	490-5
5442	483-18
5450	492-153
5451	492-174
5460	493-26
5473	487-181
5474	485-63
5475	495-126
5476	488-45
5483	476-58
5485	474-57
5486	495-20
5490	480-50
5491	502-130
	3491-11
5492	482-36
5493	479-39
5494	3489-83
5495A	501-87
	3488-83
5496	501-187
	3489-110
54F-TTL	★ **775**
54F00	492-25
54F04	477-180
54F139	483-62
54F157	499-32
54F158	498-126
54F181	475-28
54F20	490-109
54F241	504-37
54F242	503-62
54F243	503-63
54F244	503-174
54F257	498-164
54F258	498-86
54F373	496-66
54F374	487-5
54F521	474-90
54F533	496-126
54F534	486-131
54F64	493-103
54F86	495-30
54LS00	492-44
54LS01	491-178
54LS02	494-135
54LS03	491-179
54LS04	478-13
54LS05	477-92
54LS08	489-170
54LS09	489-114
54LS10	491-19
54LS107	488-26
54LS109	487-144
54LS11	489-73
54LS112	488-122
54LS113	488-85
54LS125A	476-151
54LS126A	476-126
54LS13	507-93
54LS132	507-136
54LS136	494-182
54LS138	483-179
54LS139	483-76
54LS14	507-169
54LS151	499-178
54LS153	498-50
54LS154	484-42
54LS155	483-142
54LS156	483-110
54LS157	499-47
54LS158	498-141
54LS160A	480-168
54LS161A	478-146
54LS162A	481-27
54LS164	502-43
	3490-119
54LS168A	481-112
54LS169A	479-111
54LS170	3470-56
54LS173	486-38
54LS174	486-74
54LS175	485-143
54LS181	475-46
54LS190	482-15
54LS191	479-161
54LS192	481-159
54LS193	480-24
54LS194A	501-166
54LS195A	3489-16
54LS20	490-129
54LS21	489-7
54LS221	500-147
54LS240	503-159
54LS244	504-9
54LS245	★ **779**
	505-13
54LS251	500-67
54LS251A	500-58
54LS253	497-161
54LS256	498-100
54LS257	498-178
54LS258	498-101
54LS259	496-44
54LS26	491-76
54LS260A	494-20
54LS261	475-105
54LS27	494-59
54LS273	486-165
54LS279	495-178
54LS28	494-136
54LS283	476-83
54LS290	480-71
54LS293	479-64
54LS295B	501-30
54LS298	499-103
54LS30	492-98
54LS32	493-156
54LS33	494-77
54LS363	496-84
54LS365A	477-16
54LS366A	477-140
54LS367A	477-17
54LS368A	477-141
54LS37	491-111
54LS373	★ **783**
	496-85
54LS374	★ **783**
	487-23
54LS375	495-141
54LS377	487-55
54LS378	486-101
54LS38	491-61
54LS390	481-58
54LS393	479-19
54LS395A	501-127
54LS40	490-33
54LS42	483-35
54LS445	482-125
54LS490	481-59
54LS51	493-7
54LS54	493-95
54LS540	★ **2775**
	2471-17
54LS541	★ **2775**
	504-62
54LS623	505-111
54LS641	★ **2772**
	504-157
	★ **2772**
	2478-16
54LS642	★ **2772**
	2478-17
54LS645	505-14
54LS670	497-23
	3470-68
54LS73	488-27
54LS74A	485-98
54LS75	495-142
54LS76	488-60
54LS83A	476-84
54LS85	474-58
54LS86	495-46
54LS90	480-72
54LS92	482-48
54LS93	479-65
54LS95B	501-99
54LS96	502-5
	3489-111
54S00	492-53
54S02	494-147
54S04	478-22
54S05	477-101
54S08	489-178
54S10	491-28
54S11	489-82
54S112	488-131
54S113	488-94
54S13	507-99
54S133	492-131
54S134	492-113
54S135	494-162
54S139	483-86
54S140	484-57
	2471-55
54S151	499-191
54S153	498-60
54S157	499-58
54S158	498-152
54S172	497-28
54S174	486-85
54S175	485-154
54S181	475-61
54S182	475-89
54S189	3471-54
54S195	501-73
54S20	490-138
54S240	503-160
54S241	504-73
54S244	504-17
54S251	500-68
54S253	498-10
54S257	498-188
54S258	498-112
54S260	494-26
54S273	486-169
54S280	509-21
54S301	3473-16
54S32	493-164
54S350	508-61
54S37	491-115
54S373	496-100
54S374	487-34
54S38	491-65
54S40	490-42
54S51	493-15
54S534	★ **789**
	486-143
54S64	493-109
54S65	493-117
54S74	485-106
54S85	474-66
54S86	495-56
68652	★ **1520**
68653	★ **1520**
68661	★ **1521**
68681	2486-67
7400	492-8
7402	494-94
7403	491-139
7404	477-164
7405	477-64
7406	485-4
7407	484-141
7408	489-132
7410	490-178
74107	487-182
74109	487-118
7411	489-42
74116	495-102
74121	500-104
74123	500-164
74125	476-138
74126	476-112
74128	484-112
	2472-30
7413	507-78
74132	507-126
7414	507-156
74145	482-147
74147	509-32
74148	508-136
74150	500-84
74151	499-152
74153	498-24
74154	484-35
74155	483-130
74156	483-98
74157	499-18
74158	498-117
7416	484-155
74160	480-139
74161	478-116
74163	478-166
74164	502-23
	3490-120
74165	502-74
	3490-53
74166	502-94
	3490-66
7417	484-131
74170	496-173
74173	486-27
74174	486-53
74175	485-121
74180	508-165
74181	475-9
74190	481-171
74191	479-132
74192	481-135
74193	479-182
74194	501-149
	3488-84
74195	501-48
	3489-17
74199	502-60
	3490-12
7420	490-93
7421	488-168
74221	500-139
7425	494-1
7426	484-90
7427	494-40
74279	495-165
7428	494-95
74298	499-73
7430	492-70
7432	493-128
7433	494-64
74365A	166
	485-20
74366A	115
	485-21
74367A	168
	485-22
74368A	117
	485-21
7437	491-94
7438	491-43
7439	491-44
7440	490-6
7442	483-19
7445	482-136
7450	492-154
7451	492-175
7473	487-183
7474	485-64
7475	495-127
7476	488-46
7483	476-59
7485	474-59
7486	495-21
7490	480-51
7491	502-131
	3491-12
7492	482-37
7493	479-40
7494	501-136
	3489-84
7495A	501-88
	3488-85
7496	502-1
	3489-112
74F-TTL	★ **775**
74F00	492-26
74F02	494-118
74F04	477-181
74F08	489-153
74F10	490-193
74F109	487-133
74F11	489-55
74F138	483-160
74F139	483-63
74F153	497-80
74F157	499-33
74F158	498-127
74F181	475-29
74F190	481-75
74F191	479-80
74F195	501-52
74F20	490-110
74F240	503-128
74F241	504-38
74F242	503-64
74F243	503-65

Arranged alphanumerically from left to right.

© IC MASTER 1983

Device	Page-Line
Signetics (Cont'd)	
74F244	503-175
74F245	503-29
74F253	497-81
74F257	498-165
74F258	498-87
74F280	505-158
74F32	493-143
74F350	508-58
74F352	497-125
74F353	497-93
74F373	496-67
74F374	487-6
74F521	474-91
74F533	496-127
74F534	486-132
74F545	503-30
74F581	477-36
74F582	477-37
74F585	507-175
74F588	504-78
74F646	505-77
74F647	505-53
74F648	505-78
74F649	505-54
74F74	485-79
74F86	495-31
74LS00	492-45
74LS01	491-180
74LS02	494-137
74LS04	478-14
74LS05	477-93
74LS08	489-171
74LS09	489-115
74LS10	491-20
74LS107	488-28
74LS109	487-145
74LS11	489-74
74LS112	488-123
74LS113	488-86
74LS125A	476-152
74LS126A	476-127
74LS13	507-94
74LS132	507-137
74LS136	494-183
74LS138	483-180
74LS139	483-77
74LS14	507-170
74LS151	499-179
74LS153	498-51
74LS154	484-43
74LS155	483-143
74LS156	483-111
74LS157	499-48
74LS158	498-142
74LS160A	480-169
74LS161A	478-147
74LS162A	481-28
74LS163A	478-189
74LS164	502-44
	3490-121
74LS168A	481-113
74LS169A	479-112
74LS170	497-11
	3470-57
74LS173	486-39
74LS174	486-75
74LS175	485-144
74LS181	475-47
74LS191	479-162
74LS192	481-160
74LS193	480-25
74LS194A	501-167
74LS195A	501-64
	3489-18
74LS197	478-80
74LS20	490-130
74LS21	489-8
74LS240	503-149
	2471-18
74LS241	504-63
	2470-47
74LS242	503-86
	2477-2
74LS243	503-87
	2477-3
74LS244	504-10
	2470-48
74LS245	★ 779
	505-15
	★ 779
	2479-29
74LS251A	500-59
74LS253	498-1
74LS256	495-96
74LS257A	498-179
74LS258A	498-102
74LS259	496-45
74LS26	491-77
74LS260	494-21
74LS27	494-60
74LS273	486-166
74LS283	476-85
74LS290	480-73
74LS293	479-66
74LS295B	501-31
74LS298	499-104
74LS30	492-99
74LS32	493-157
74LS33	494-78
74LS363	496-86
74LS365A	477-18
74LS366A	477-142
74LS367A	477-19
74LS368A	477-143
74LS37	491-112
74LS373	★ 783
	496-87
74LS374	487-24
74LS375	495-143
74LS377	487-56
74LS378	486-102
74LS38	491-62
74LS390	481-60
74LS393	479-20
74LS395A	501-128
74LS40	490-34
74LS42	483-36
74LS445	482-126
74LS490	481-61
74LS51	493-8
74LS54	493-96
74LS540	★ 2775
	2471-19
74LS541	★ 2775
	504-64
	★ 2775
	2470-49
74LS569	479-169
74LS620	505-112
74LS623	505-113
74LS640	504-133
	2478-62
74LS640-1	504-134
	2478-63
74LS641	504-158
	2478-18
74LS641-1	504-159
	2478-19
74LS642	★ 2772
	504-105
	★ 2772
	2478-20
74LS642-1	★ 2772
	504-106
	★ 2772
	2478-21
74LS645	505-16
	2479-1
74LS670	497-24
	3470-69
74LS73	488-29
74LS74A	485-99
74LS75	495-144
74LS76	488-61
74LS83A	476-86
74LS85	474-60
74LS86	495-47
74LS90	480-74
74LS92	482-49
74LS93	479-67
74LS95B	501-100
	3488-86
74LS96	502-6
	3489-113
74S00	492-54
74S02	494-148
74S03	491-191
74S04	478-23
74S05	477-102
74S08	489-179
74S10	491-29
74S11	489-83
74S112	488-132
74S113	488-95
74S133	492-132
74S134	492-114
74S135	494-163
74S138	483-189
74S139	483-87
74S140	484-58
	2471-56
74S151	499-192
74S153	498-61
74S157	499-59
74S158	498-153
74S168	481-114
74S169	479-119
74S172	497-29
	3470-78
74S174	486-86
74S175	485-155
74S181	475-62
74S182	475-90
74S194	3489-41
74S195	501-74
	3489-42
74S20	490-139
74S240	503-161
74S241	504-74
74S244	504-18
74S251	500-69
74S253	498-11
74S257	498-189
74S258	498-113
74S260	494-27
74S273	486-170
74S280	509-22
74S32	493-165
74S350	508-62
74S37	491-116
74S373	496-101
74S374	487-35
74S38	491-66
74S40	490-43
74S51	493-16
74S534	★ 789
	486-144
74S64	493-110
74S74	485-107
74S85	474-67
74S86	495-57
76LS641	★ 2772
8000	★ 1975
8021	1073-26
8035	1073-27
8039	1073-28
8040	1073-29
8048	1073-30
8049	1073-31
8050	1073-32
82L16	★ 3938
82LS17	★ 3938
82PS181	3463-59
82S100	★ 3911
82S101	★ 3911
82S102	★ 3913
82S103	★ 3913
82S104	★ 3915
82S137	★ 3926
82S147	★ 3928
82S150	★ 3917
	3457-69
82S151	★ 3917
	3457-70
82S152	★ 3919
	3457-67
82S153	★ 3919
	3457-68
82S154	★ 3921
82S155	★ 3921
82S156	★ 3921
82S157	★ 3921
82S158	★ 3921
82S159	★ 3921
82S181	★ 3930
82S185	★ 3932
82S191	★ 3934
82S195	★ 3936
82S212	★ 3924
8881	2465-143
8885	2465-61
8891	2465-27
8A1200	4141-110
	¶ 232-13
8A1260	4141-111
	¶ 232-13
8A1542	4141-112
	¶ 232-13
8S2105	★ 3915
8T3404	496-22
8TS805	★ 793
	496-88
8TS806	★ 793
	486-113
8TS807	★ 799
	486-80
8TS808	★ 799
	486-114
8X01A	2467-8
8X08	2945-142
8X300	1073-33
	¶ 247-1
8X300KT100SK	1763-3
8X305	1073-34
	¶ 248-9
9386	495-68
9601	500-113
ACE/CCL/8AXXX	★ 4522
AM26LS29	2469-51
AM26LS30	2469-64
	2472-25
AM26LS31	2472-48
AM6012	★ 3303
	2457-32
B68430	★ 1525
C700	★ 4524
CA3081	2890-98
CA3082	2890-92
CA3089	2901-60
CA3089D2	2901-61
CA3183	2889-162
DAC-08	2441-35
DAC-08A	2440-34
DAC-08C	2443-44
DAC-08E	2441-52
DAC-08H	2440-35
DS8880	2465-68
E/CCL/8AXXX	★ 4522
ECL-100X	★ 774
ECL-10X	★ 773
HE40003	★ 804
HEF4738	1092-68
	1102-47
HEF4750	2945-133
HEF4751	511-114
LF298	2967-136
LF355	2932-48
LF356	2932-55
LF398	2967-137
LM111	2891-50
LM119	2893-36
LM124	2913-75
LM139A	2895-6
LM158	2913-38
	2938-30
LM1870	2901-139
LM1880	2904-80
LM193	2893-45
LM193A	2893-7
LM211	2891-51
LM219	2893-37
LM224	2913-76
LM239A	2895-30
LM258	2913-39
	2938-31
LM2901	2895-42
LM2903	2894-3
LM293	2893-57
LM301A	2931-58
LM311	2892-44
LM319	2894-16
LM324	2913-77
LM339	2895-31
LM358	2913-50
LM381A	2898-8
LM387	2898-9
LM393A	2893-58
LS641	★ 2772
MAN3500	★ 1975
MAN5500	★ 1975
MB101	2899-98
MB105	2899-99
MB125	2899-100
MB126	2899-101
MB140	2899-102
MB512	2899-66
MB513	2899-67
MB561	2898-168
MB562	2898-169
MC1408-7	2443-36
MC1408-8	2442-37
MC1456	2933-11
MC1488	2469-58
MC1489	2473-25
MC1489A	2473-34
MC1496	2962-102
MC1503-8	2442-33
MC1556	2925-51
MC1558	2938-60
MC1596	2962-103
MC3302	2895-48
MC3303	2943-58
MC3403	2944-16
MC3410	2445-27
MC3410C	2447-29
MC3503	2942-46
MC3510	2447-19
MJ11-2	2899-138
MJ121	2899-139
MJ123	2899-140
MJ150	2899-169
MLA24	4141-113
MLA36	4141-114
N25S10	508-67
N3000	1049-2
N3001	506-162
	¶ 244-7
	¶ 244-11
	1085-59
	¶ 244-7
	¶ 244-11
N3002	476-39
	¶ 243-18
	¶ 244-7
	¶ 244-11
	1085-57
	¶ 243-18
	¶ 244-7
	¶ 244-11
	1049-3
	¶ 243-18
	¶ 244-7
	¶ 244-11
N3101A	3471-20
N4066A	2417-50
N5039	★ 1523
N58451	★ 1525
N74LS301	497-59
N8040	★ 1523
N8059	★ 1523
N8202	503-12
N8230	499-131
N8233	499-19
N8234	498-76
N8235	498-67
N8242	495-69
	495-79
N8250	482-117
N8252	483-20
N8262	508-166
N8266	498-72
N8271	501-116
	3488-52
N8273	503-23
	3491-38
N8274	503-20
N8277	503-7
	3491-30
N8280	480-102
N8281	478-65
N82HS137	3462-2
	3462-2
N82HS180	3462-100
N82HS195	3465-97
N82LS181	3463-64
N82S09A	3472-29
N82S100	507-12
	3458-22
N82S101	507-13
	3458-18
N82S102	3457-71
N82S103	3457-72
N82S104	3457-109
N82S104A	3457-103
	3457-110
N82S105	3457-113
N82S105A	3457-106
	3457-114
N82S106	3458-1
N82S107	3458-2
N82S115	3461-44
N82S123	3459-42
N82S126	3459-87
N82S129	3459-89
N82S130	3460-54
N82S131	3460-59
N82S137B	3461-107
	3461-107
N82S141	3461-45
N82S147A	3461-14
N82S151	3457-78
N82S152	3457-81
N82S152A	3457-79
N82S153	3457-82
N82S153A	3457-80
N82S154	3457-97
N82S155	3457-100
N82S156	3457-98
N82S157	3457-101
N82S158	3457-99
N82S159	3457-102
N82S180	3463-4
N82S181	3463-19
N82S181A	3462-93
N82S181B	3462-77
N82S183	3462-111
N82S185	3464-38
N82S185A	3463-114
N82S185B	3463-108
N82S19	3472-31
N82S191	3464-115
N82S191A	3464-6
N82S21	497-57
	3471-122
N82S210	3475-15
N82S212A	3475-13
N82S23	3459-35
N82S25	3471-45
N82S321	3466-32
N82S41	495-5
N82S42	495-83
N82S50	482-120
N82S52	483-39
N82S62	509-23
N82S71	501-120
N82S82	476-93
N82S83	474-15
N8S150	3457-77
N8T05	2463-128
N8T06	2463-95
N8T09	484-63
	2469-35
N8T10	486-28
N8T125	504-135
	2479-30
N8T126	2477-17
N8T127	508-16
	2477-18
N8T128	508-28
	2477-31
N8T129	508-29
	2477-32
N8T13	2469-10
N8T14	2473-16
N8T15	2469-19
N8T16	2473-5
N8T20	500-93
N8T22	500-114
N8T23	2469-3
N8T24	2473-10
N8T245	505-17
N8T26A	508-17
	2477-19
N8T28	508-30
	2477-33
N3T31	★ 1502
	★ 1504
	508-81
	★ 1502
	★ 1504
	1096-81

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Device	Page-Line
Signetics (Cont'd)	
N8T32	★ 1502
	★ 1504
	508-83
	★ 1502
	★ 1504
	1096-85
N8T33	★ 1502
	★ 1504
	508-84
	★ 1502
	★ 1504
	1096-86
N8T34	2477-42
N8T35	★ 1502
	★ 1504
	508-85
	★ 1502
	★ 1504
	1096-74
N8T36	★ 1502
	★ 1504
	508-86
	★ 1502
	★ 1504
	1096-75
N8T37	2473-59
N8T38	2476-4
N8T39	★ 1502
	★ 1504
	★ 1511
	508-87
	★ 1502
	★ 1504
	★ 1511
	1096-72
N8T58	★ 1502
	★ 1504
	★ 1511
	1096-101
N8T80	484-93
N8T93	478-24
N8T95	477-26
	1090-35
N8T96	477-150
	1090-36
N8T97	477-27
	1090-37
N8T98	477-151
	1090-38
N8V41	★ 1516
N8X01A	★ 1514
	506-15
N8X02	1085-112
	1102-35
N8X02A	★ 1513
	506-163
N8X300	★ 1501
	★ 1511
	1096-67
N8X305	★ 1501
	1096-68
N8X31	★ 1502
	★ 1504
	508-82
	★ 1502
	★ 1504
	1096-82
N8X310	★ 1501
	★ 1505
	1096-98
N8X32	★ 1502
	★ 1504
	508-88
	★ 1502
	★ 1504
	1096-87
N8X320	★ 1501
	★ 1505
	506-142
	★ 1501
	★ 1506
	1096-97
N8X330	★ 1501
	★ 1507
	1096-73
N8X338	★ 1501
	★ 1508
N8X350	★ 1501
	★ 1509
	3475-11
	★ 1501
	★ 1509
	1096-100
N8X36	★ 1502
	★ 1504
	508-89
	★ 1502
	★ 1504
	1096-76
N8X360	★ 1501
	★ 1510
	1096-99
N8X371	★ 1501
	1096-83
N8X372	★ 1501
	1096-88
N8X374	★ 1501
	★ 1510
	1096-95
N8X376	★ 1501
	1096-77
N8X382	★ 1501
	1096-89
N8X41	505-159
	1102-24
N9X42	★ 1502
	★ 1504
	★ 1511
	1096-90
N8X60	★ 1517
	506-107
N9300	501-49
N9301	482-118
N9309	497-111
N9310	480-140
N9312	499-132
N9316	478-117
N9322	499-20
N9324	474-61
N9334	496-29
N9401	★ 1514
	506-16
	★ 1514
	2467-9
	★ 1514
	1085-15
N9403	★ 1515
	1085-6
N9602	501-3
NE455B	2939-59
NE5018	2443-6
	1102-16
NE5019	2441-12
NE5020	2446-30
NE5034	★ 3396
	2428-1
NE5036	2426-13
NE5037	2426-14
NE5044	2948-160
NE5045	2949-1
NE5046	2948-159
NE5090	2480-113
NE510	2889-45
NE511	2889-46
NE5118	2441-26
NE5119	2441-1
NE521	2894-5
NE522	2894-7
NE527	2892-27
NE529	2892-28
NE530	2928-38
NE531	2931-22
NE532	2913-40
	2939-31
NE535	2913-41
	2930-38
NE536	2935-25
NE538	2928-43
NE540	2896-70
NE5410	★ 3413
	2447-20
NE542	★ 3393
	2898-10
NE544	2906-113
NE545B	2896-55
NE550	2959-123
NE5512	2909-10
	2938-15
NE5514	2909-11
NE5517	2938-16
NE5517A	2938-17
NE5520	★ 3372
	2964-113
	2964-135
NE5530	2938-24
NE5532	2937-52
NE5532A	2937-53
NE5533	2937-54
NE5533A	2937-55
NE5534	2926-26
NE5534A	2926-27
NE5535	2939-28
NE5537	2967-138
NE5538	2938-34
NE5539	2913-160
	2929-54
NE555	2951-45
NE556	2951-80
NE556-1	2951-81
NE5560	★ 3402
	2961-20
NE5561	2961-21
NE558	2951-91
NE564	2945-39
NE565	2946-5
NE566	2946-16
NE567	2945-155
	2949-70
NE570	★ 3391
	2947-119
NE571	★ 3391
	2947-120
NE572	2947-121
NE582-1	2465-43
	2483-145
NE587	2464-56
NE589	2464-40
NE590	2480-1
	1102-6
NE591	2480-2
	1102-7
NE592	2888-101
NE594	2465-91
NE644	2906-114
NE645	2896-56
NE646	2896-57
NE648	2896-58
NE649	2896-59
NE650	2896-60
OM200	2896-13
PCA1122	2899-141
PCA1126	2899-142
PCA1515	2898-170
PCA1517	2898-171
PCA1564	2898-172
PCA1566	2898-173
PCD3320	2948-34
PCD3321	2948-35
PCD3322	2948-36
PCD3323	2948-37
PCD3340	2947-158
PCD8571	3472-48
	3472-48
PCE2100	2466-15
PCE2110	2466-16
PCE2111	2466-17
PCE2112	2466-4
PCF1171	2898-38
	2899-21
PCF1172	2898-39
	2899-22
S1534	510-82
S3001	506-164
	1085-60
S3002	476-40
	1085-58
S3101A	3471-46
S54LS301	497-60
	3473-17
S68000	★ 1975
S8202	503-13
S8233	499-21
S8234	498-77
S8241	494-169
S8242	495-80
S8250	482-119
S8262	509-1
S8266	498-73
S8270	487-67
	3488-53
S8271	501-117
	3488-54
S8273	503-24
S8274	3491-35
S8280	480-103
S8281	478-66
S8284	480-32
S82HS180	3463-32
S82HS181	3463-35
S82HS185	3464-25
S82HS195	3466-5
S82LS16	3473-10
S82LS17	3473-8
S82LS181	3463-68
S82S09	3472-36
	3472-36
S82S100	507-14
	3458-26
S82S101	507-15
	3458-24
S82S102	3457-73
S82S103	3457-74
S82S104	3457-104
	3457-111
S82S104A	3457-105
	3457-112
S82S105	3457-107
	3457-115
S82S105A	3457-108
S82S115	3461-89
S82S123	3459-53
S82S126	3459-115
S82S129	3459-117
S82S130	3460-87
S82S131	3460-92
S82S141	3461-90
S82S150	3457-75
S82S151	3457-76
S82S152	3457-85
S82S152A	3457-83
S82S153	3457-86
S82S153A	3457-84
S82S154	3457-91
S82S155	3457-94
S82S156	3457-92
S82S157	3457-95
S82S158	3457-93
S82S159	3457-96
S82S16	3473-19
S82S17	3473-18
S82S180	3463-48
S82S181	3463-60
S82S181A	3463-36
S82S183	3463-61
S82S185	3464-39
S82S185A	3464-26
S82S19	3472-34
	3472-34
S82S191	3464-120
S82S191A	3464-27
S82S210	3475-17
S82S212	3475-16
S82S23	3459-51
S82S25	3471-78
S82S2708	3463-62
S82S30	499-135
S82S31	499-136
S82S32	499-137
S8T04	2463-142
S8T05	2463-129
S8T09	484-64
	2469-36
S8T10	486-29
S8T125	504-136
	2479-31
S8T126	508-18
	2477-20
S8T127	508-19
	2477-21
S8T128	508-31
	2477-34
S8T129	508-32
	2477-35
S8T13	2469-11
S8T245	505-18
S8T32	★ 1502
	★ 1504
	508-90
	★ 1502
	★ 1504
	1096-91
S8T33	★ 1502
	★ 1504
	508-91
	★ 1502
	★ 1504
	1096-92
S8T35	★ 1502
	★ 1504
	508-92
	★ 1502
	★ 1504
	1096-78
S8T36	★ 1502
	★ 1504
	508-93
	★ 1502
	★ 1504
	1096-79
S8T39	★ 1502
	★ 1504
	★ 1511
	508-94
S8T80	484-94
S8T90	477-65
S8T95	477-28
	1090-39
S8T97	477-29
	1090-40
S8T98	477-152
	1090-41
S8X300-1	★ 1501
	★ 1511
	1096-69
S8X300-2	★ 1501
	★ 1511
	1096-70
S8X305	★ 1501
	1096-71
S8X310	★ 1501
	★ 1505
S8X350	3475-12
S8X371	★ 1501
	1096-84
S8X372	★ 1501
	1096-93
S8X374	1096-96
S8X376	★ 1501
	1096-80
S8X382	★ 1501
	1096-94
S9309	497-112
S9314	495-160
S9334	496-30
S9602	501-4
SA1034	510-80
SA1534	510-81
SA571	★ 3391
	2947-122
SA594	2465-92
SAA1027	2906-97
	2964-142
SAA1056	2945-134
SAA1057	2900-153
	2945-135
SAA1058	2888-118
SAA1060	2463-55
SAA1061	2463-56
SAA1062	2463-37
SAA1063	2464-98
SAA1082	2901-161
SAA1300	2906-129
SAA3004	2901-162
SAA3027	2901-163
SAA3028	2901-164
SAA5000	2902-43
SAA5012	2902-44
SAA5020	2949-53
SAA5025A	2949-50
SAA5025B	2949-51
SAA5025C	2949-52
SAA5030	2949-54
SAA5040	2949-44
SAA5050	2949-47
SAA5051	2949-48
SAA5052	2949-49
SAA5055	2949-46
SAA5070	2949-124
SAA5120	2947-9
SAA5125	2947-8
SAA5150	2947-6
SAA5151	2947-5
SAA5155	2947-7
SAA7000	2896-39
SAA7010	2896-40
SAA7020	2896-41
SAB1009B	2887-121
SAB1018	511-25
SAB1018A	511-26
SAB1046	511-27
SAB1047	511-9
SAB1077	511-21
	2946-95
SAB3013	2904-46
SAB3021	2902-45
SAB3023	2902-46
SAB3035	2904-52
	2904-63
SAB3036	2904-53
SAB3037	2904-54
SAB3042	2902-47
SAF1032	2902-48
SAF1039	2902-49
SC2670AC3	1090-10
SC2670BC3	1090-11
SCB2675	1100-71
SCB68430	★ 1525
SCC700	★ 4524
	4141-115
SCN2621A	2905-87
	1101-92
SCN2622A	2905-86
	1101-91
SCN2636A	2906-38
	1101-80
SCN2637A	2905-88
	2906-39
	1101-103
SCN2650A	1090-9
SCN2651C	★ 1520
	2487-3
	★ 1520
	1090-14
	1095-29
SCN2652A	★ 1520
	2486-92
	2487-1
	★ 1520
	1090-12
	1095-12
	1095-13
	1101-60
SCN2653A	★ 1520
	2948-158
	★ 1520
	1090-13
	1095-20
	1101-65
SCN2661A	★ 1521
	2486-74
	★ 1521
	1090-15
	1095-30
	1101-69
SCN2661B	★ 1521
	2486-75
	★ 1521
	1090-16
	1095-31
	1101-67
SCN2661C	★ 1521
	2486-76
	★ 1521
	1090-17
	1095-32
	1101-68
SCN2670A	★ 1521
	1100-91
SCN2670B	★ 1521
	1100-92
SCN2671A	★ 1522
	2468-16
	★ 1522
	1090-21
	1101-78
SCN2672A	★ 1522
	1090-22
	1101-81
SCN2673A	★ 1522
	1090-23
	1101-104
SCN2673B	★ 1522
	1090-24
	1101-105

Arranged alphanumerically from left to right.

© IC MASTER 1983

Device	Page-Line
Signetics (Cont'd)	
SCN2674	★ 1523
	1100-62
SCN2681	★ 1521
	1090-25
SCN5039	★ 1523
SCN68000	★ 1524
	1081-9
SCN68120C	★ 1524
	1100-39
SCN68230C	★ 1524
	1100-47
SCN68451	★ 1525
SCN68681C	★ 1525
	1100-52
SCN8021	1093-91
SCN8035A	★ 1523
	1093-41
SCN8039A	1093-42
SCN8040	★ 1523
SCN8048A	★ 1523
	1093-78
SCN8049A	★ 1523
	1093-79
SCN8059	★ 1523
SE4558	2938-42
SE5018	2443-7
SE5019	2441-13
SE5090	2480-114
SE510	2889-47
SE511	2889-48
SE5118	2441-27
SE5119	2441-2
SE521	2894-6
SE522	2894-8
SE527	2892-1
SE529	2892-2
SE530	2923-38
SE531	2929-3
SE532	2913-42
	2938-32
SE535	2913-43
	2926-4
SE538	2923-37
SE540	2896-71
SE5410	★ 3413
	2447-21
SE550	2959-116
SE5512	2909-12
	2937-25
SE5514	2909-13
SE5520	★ 3372
	2964-114
SE5530	2936-55
SE5532	2937-11
SE5532A	2937-12
SE5533	2937-13
SE5533A	2937-14
SE5534	2924-16
SE5534A	2924-17
SE5535	2937-41
SE5537	2967-139
SE5538	2936-54
SE5539	2913-161
	2929-55
SE555	2951-46
SE555C	2951-47
SE556	2951-82
SE556-1	2951-83
SE556-1C	2951-84
SE5560	★ 3402
	2961-22
SE5561	2961-23
SE558	2951-92
SE564	2945-40
SE565	2946-6
SE566	2946-17
SE567	2945-156
	2949-71
SE570	2947-123
SE571	2940-31
SE590	2480-3
SE592	2888-102
SFT2000	★ 1974
SFT20000	★ 1975
SFT20010	★ 1975
SFT20300	★ 1975
SFT20310	★ 1975
SFT20390	★ 1975
SFT20890	★ 1975
SFT51970	★ 1972
SG1524	2961-24
SG3524	2961-25
SMDEV10000	★ 1739
SMMAM3500	★ 1975
SMMAM5500	★ 1975
SMSFT10000	★ 1745
SMSFT16000	★ 1742
SMSFT2000	★ 1974
SMSFT20000	★ 1975
SMSFT20010	★ 1975
SMSFT20300	★ 1975
SMSFT20310	★ 1975
SMSFT20390	★ 1975
SMSFT20890	★ 1975
SMSFT51970	★ 1972
SMVME0500	★ 1962
SMVME1500	★ 1954
SMVME2000	★ 1966
	1769-3
SMVME3100	★ 1968
SMVME4300	★ 1970
SN3001	★ 1512
SN3002	★ 1512
SN74LS684	474-126
ST101	2947-109
ST120	2950-7
SU536	2934-49
TAA263	2897-170
TAA310A	2897-171
TAA320	2887-144
TAA320A	2887-145
TAA960	2887-12
TAA970	2887-139
TBA120S	2901-62
	2905-32
TBA120U	2901-63
	2901-99
	2905-33
TBA1440G	2905-182
TBA1441G	2905-183
TBA1576	2901-19
TBA540	2903-171
TBA570A	2900-129
TBA673	2967-37
TBA750C	2901-64
	2905-34
TBA890	2904-155
TBA915	2896-14
TBA920S	2904-109
TCA1516	2898-174
TCA210	2896-1
TCA220	2941-11
TCA240	2962-104
TCA280A	2968-133
TCA420A	2901-65
TCA440	2900-69
TCA520B	2930-37
TCA640	2903-172
TCA650	2903-173
TCA660B	2903-174
TCA730A	2896-35
TCA740A	2896-36
TCA770	2901-66
	2901-100
TCA980	2887-140
TCD3311	2948-38
TCD3312	2948-39
TDA 1580	2900-145
TDA0820	2905-68
	2962-105
TDA1001A	2901-84
TDA1001B	2901-85
TDA1003A	2906-80
	2964-136
TDA1005A	2901-140
TDA1006A	2906-94
	2964-137
TDA1008	2900-13
TDA1010	2907-2
TDA1010A	2897-68
TDA1011	2897-69
TDA1011A	2897-70
TDA1012	2896-122
TDA1013	2896-123
TDA1020	2897-71
TDA1022	2900-3
	2962-63
TDA1023	2968-134
TDA1024	2968-135
TDA1028	2421-68
	2888-67
TDA1029	2421-70
	2888-68
	2906-150
TDA1059B	2906-81
TDA1060	2961-26
TDA1072	2900-70
TDA1074	2896-37
	2965-82
TDA1077	2948-40
TDA1096	2898-24
	2962-45
TDA1506	2906-82
	2964-138
TDA1510	2897-124
TDA1512	2897-3
TDA1515	2897-125
TDA1520	2897-4
TDA1522	2898-11
TDA1524	2896-38
	2905-73
TDA1527	2421-27
	2906-151
TDA1533	2906-87
TDA1559	2906-83
TDA1571	2900-157
TDA1574	2900-158
TDA1578	2901-141
TDA1594	2463-16
TDA2015	2962-60
TDA2054	2896-17
TDA2104	2898-25
	2962-64
TDA2105	2898-26
TDA2107	2898-27
	2962-51
TDA2108	2898-28
	2962-55
TDA2110	2962-46
TDA2522	2903-175
TDA2530	2903-176
TDA2532	2903-177
TDA2540	2905-184
TDA2541	2905-185
TDA2560	2903-178
TDA2571A	2904-110
TDA2577	2904-81
TDA2578	2904-82
TDA2581	2904-111
	2960-110
	2961-27
TDA2582	2904-137
TDA2591	2904-112
TDA2593	2904-113
TDA2594	2904-114
TDA2611A	2897-72
TDA2640	2961-28
TDA2653	2905-110
TDA2653A	2905-111
TDA2654	2905-112
TDA2730	2902-150
TDA2791	2905-35
TDA3047	2888-16
TDA3500	2903-179
TDA3501	2903-180
TDA3505	2903-181
TDA3510	2903-182
TDA3520	2903-183
TDA3540	2905-186
TDA3541	2888-103
	2905-187
TDA3560	2903-184
TDA3561	2903-185
TDA3562	2903-186
TDA3563	2903-187
TDA3570	2903-188
TDA3590	2903-189
TDA3600	2903-190
TDA3650	2905-113
TDA3651	2905-114
TDA3651A	2905-115
TDA3700	2903-3
TDA3810	2905-36
TDA4550	2903-191
TDA4560	2903-192
TDA5700	2900-130
TDA5701	2900-131
TDB2033	2888-17
TEA1021	2948-41
TEA1042	2949-120
TEA1043	2948-42
TEA1044	2948-43
TEA1046	2949-121
TEA1055	2949-122
TEA5550	2900-71
TEA5560	2901-20
ULN2001	2480-74
	2890-44
ULN2003	2480-51
	2890-45
ULN2004	2480-35
	2890-46
V41	★ 1516
VME0500	★ 1962
VME1500	★ 1964
VME3100	★ 1968
VME4300	★ 1970
X01A	★ 1514
X02A	★ 1513
X310	★ 1501
	★ 1505
X330	★ 1501
	★ 1508
uA723	2959-101
uA723C	2959-102
uA733	2888-104
uA733C	2888-105
uA740C	2934-55
uA741	2909-38
	2929-15
uA741C	2930-54
uA747	2938-61
uA747C	2939-54
uA748	2929-30
uA748C	2931-2
uA758	2901-142
uPD8741A	1094-13
Silicon Systems Inc.	
SSI101A	2481-66
SSI102	2481-64
SSI103	2481-62
SSI104	2481-65
SSI105	2481-70
SSI106	2480-154
SSI108	2481-71
SSI114	2481-63
	2481-72
SSI115	2481-73
SSI116	2481-67
SSI117	2481-74
SSI201	2949-98
	¶ 270-5
SSI8500	2467-3
SSI8502	2467-27
SSI8520	2467-11
Siliconix	
300A	★ 2779
D123A	505-153
	2422-106
D123B	505-154
	2422-107
D125A	505-155
	2422-108
D125B	505-156
	2422-109
D129A	2422-100
D129B	2422-101
D139A	505-132
	2422-96
D139B	505-133
	2422-97
D139C	2422-98
D169	2423-10
DF320	2948-44
DF320A	2948-45
DF322	2948-46
DF328	2948-47
DF331A	2947-116
DF332A	2947-117
DF341A	2947-56
DF342A	2947-57
DF412	455-30
	2464-124
DG123A	2417-101
DG123B	2417-105
DG125A	2417-103
DG125B	2417-107
DG126A	2421-7
DG126B	2421-19
DG129A	2420-94
DG129B	2420-108
DG133A	2416-9
	¶ 262-14
DG133B	2416-25
	¶ 262-14
DG134A	2416-47
DG134B	2416-59
DG139A	2421-50
DG139B	2421-56
DG140A	2420-73
DG140B	2420-79
DG141A	2415-95
DG141B	2415-106
DG142A	2421-61
DG142B	2421-65
DG143A	2418-98
DG143B	2418-109
DG144A	2418-68
DG144B	2418-84
DG145A	2421-37
DG145B	2421-43
DG146A	2418-47
DG146B	2418-54
DG151A	2415-103
DG151B	2415-109
DG152A	2416-23
DG152B	2416-57
DG153A	2420-77
DG153B	2420-82
DG154A	2420-107
DG154B	2421-18
DG161A	2418-51
DG161B	2418-56
DG162A	2418-81
DG162B	2418-107
DG163A	2421-41
DG163B	2421-46
DG164A	2421-55
DG164B	2421-64
DG172A	2416-73
DG172B	2416-74
DG172C	2416-75
DG180A	★ 2779
	2415-89
	2415-98
DG180B	★ 2779
	2415-90
	2415-99
DG181A	★ 2779
	2415-114
	2416-3
	¶ 262-11
	¶ 262-14
DG181B	★ 2779
	2416-14
	2416-18
	¶ 262-11
	¶ 262-14
DG182A	★ 2779
	2416-33
	2416-38
DG182B	★ 2779
	2416-51
	2416-55
DG183A	★ 2780
	2420-64
	2420-68
DG183B	★ 2780
	2420-65
	2420-69
DG184A	★ 2780
	2420-86
	2420-90
DG184B	★ 2780
	2420-98
	2420-102
DG185A	★ 2780
	2420-113
	2421-2
DG185B	★ 2780
	2421-11
	2421-15
DG186A	★ 2779
	2418-38
	2418-42
DG186B	★ 2779
	2418-39
	2418-43
DG187A	★ 2779
	2418-60
	2418-64
DG187B	★ 2779
	2418-72
	2418-76
DG188A	★ 2779
	2418-88
	2418-92
DG188B	★ 2779
	2418-102
	2418-106
DG189A	★ 2780
	2419-55
	2419-59
DG189B	★ 2780
	2419-56
	2419-60
DG190A	★ 2780
	2419-65
	2419-70
DG190B	★ 2780
	2419-71
	2419-73
DG191A	★ 2780
	2419-78
	2419-82
DG191B	★ 2780
	2419-86
	2419-90
DG200A	★ 2779
	★ 2784
	2415-61
	¶ 262-14
DG200AA	★ 2779
	★ 2784
	2415-62
	¶ 262-14
DG200AB	★ 2779
	★ 2784
	2415-79
	¶ 262-14
DG200AC	★ 2779
	★ 2784
	2415-80
	¶ 262-14
DG200B	★ 2779
	★ 2784
	2415-81
	¶ 262-14
DG200C	★ 2779
	★ 2784
	2415-82
	¶ 262-14
DG201A	★ 2779
	★ 2786
	2417-26
DG201AA	★ 2779
	★ 2779
	★ 2786
	2417-27
DG201AB	★ 2779
	★ 2786
	2417-32
DG201AC	★ 2779
	★ 2786
	2417-33
DG201B	★ 2779
	★ 2785
	2417-34
DG201C	★ 2779
	★ 2786
	2417-35
DG202A	★ 2779
	★ 2788
	2417-28
DG202B	★ 2779
	★ 2788
	2417-29
DG202C	★ 2779
	★ 2788
	2417-36
DG211C	★ 2779
	★ 2790
	2417-30
DG212C	★ 2779
	★ 2792
	2417-31
DG221A	★ 2794
	2417-1
DG221C	★ 2794
	2417-2
DG243A	★ 2780
	★ 2796
	2419-36

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Device	Page-Line
Siliconix (Cont'd)	
DG243C	★ 2780
	★ 2796
	2419-37
DG281A	★ 2779
	2416-62
DG281B	★ 2779
	2416-63
DG284A	★ 2780
	2421-23
DG284B	★ 2780
	2421-24
DG287A	★ 2779
	2418-114
DG287B	★ 2779
	2418-115
DG290A	★ 2780
	2419-94
DG290B	★ 2780
	2419-95
DG300A	★ 2779
	2415-34
DG300AA	★ 2779
	2415-35
DG300AB	★ 2779
	2415-36
DG300AC	★ 2779
	2415-37
DG300B	★ 2779
	2415-38
DG300C	★ 2779
	2415-39
DG301A	★ 2779
	2418-7
DG301AA	★ 2779
	2418-8
DG301AB	★ 2779
	2418-9
DG301AC	★ 2779
	2418-10
DG301B	★ 2779
	2418-11
DG301C	★ 2779
	2418-12
DG302A	★ 2780
	2420-38
DG302AA	★ 2780
	2420-39
DG302AB	★ 2780
	2420-40
DG302AC	★ 2780
	2420-41
DG302B	★ 2780
	2420-42
DG302C	★ 2780
	2420-43
DG303A	★ 2780
	2419-16
DG303AA	★ 2780
	2419-17
DG303AB	★ 2780
	2419-18
DG303AC	★ 2780
	2419-19
DG303B	★ 2780
	2419-20
DG303C	★ 2780
	2419-21
DG304A	★ 2779
	2415-40
DG304AA	★ 2779
	2415-41
DG304AB	★ 2779
	2415-42
DG304AC	★ 2779
	2415-43
DG304B	★ 2779
	2415-44
DG304C	★ 2779
	2415-45
DG305A	★ 2779
	2418-13
DG305AA	★ 2779
	2418-14
DG305AB	★ 2779
	2418-15
DG305AC	★ 2779
	2418-16
DG305B	★ 2779
	2418-17
DG305C	★ 2779
	2418-18
DG306A	★ 2780
	2420-44
DG306AA	★ 2780
	2420-45
DG306AB	★ 2780
	2420-46
DG306AC	★ 2780
	2420-47
DG306B	★ 2780
	2420-48
DG306C	★ 2780
	2420-49
DG307A	★ 2780
	2419-22
DG307AA	★ 2780
	2419-23
DG307AB	★ 2780
	2419-24
DG307AC	★ 2780
	2419-25
DG307B	★ 2780
	2419-26
DG307C	★ 2780
	2419-27
DG308A	★ 2779
	★ 2798
	2417-22
DG308C	★ 2779
	★ 2798
	2417-23
DG309A	★ 2779
	★ 2800
	2417-24
DG309C	★ 2779
	★ 2800
	2417-25
DG381A	★ 2779
	2415-46
DG381AA	★ 2779
	2415-47
DG381AB	★ 2779
	2415-48
DG381AC	★ 2779
	2415-49
DG381B	★ 2779
	2415-50
DG381C	★ 2779
	2415-51
DG384A	★ 2780
	2420-50
DG384AA	★ 2780
	2420-13
DG384AB	★ 2780
	2420-14
DG384AC	★ 2780
	2420-15
DG384B	★ 2780
	2420-51
DG384C	★ 2780
	2420-52
DG387A	★ 2779
	2418-19
DG387AA	★ 2779
	2418-20
DG387AB	★ 2779
	2418-21
DG387AC	★ 2779
	2418-22
DG387B	★ 2779
	2418-23
DG387C	★ 2779
	2418-24
DG390A	★ 2780
	2419-28
DG390AA	★ 2780
	2419-29
DG390AB	★ 2780
	2419-30
DG390AC	★ 2780
	2419-31
DG390B	★ 2780
	2419-32
DG390C	★ 2780
	2419-33
DG501A	2424-42
	2424-48
DG501B	2424-43
	2424-49
DG501C	2424-44
	2424-50
DG503A	2424-46
DG503B	2424-47
DG5040A	★ 2779
	★ 2813
	2415-2
DG5040C	★ 2779
	★ 2813
	2415-3
DG5041A	★ 2779
	★ 2813
	2415-54
DG5041C	★ 2779
	★ 2813
	2415-55
DG5042A	★ 2779
	★ 2813
	2418-27
DG5042C	★ 2779
	★ 2813
	2418-28
DG5043A	★ 2780
	★ 2813
	2419-38
DG5043C	★ 2780
	★ 2813
	2419-39
DG5044A	★ 2780
	★ 2813
	2420-19
DG5044C	★ 2780
	★ 2813
	2420-20
DG5045A	★ 2780
	★ 2813
	2420-55
DG5045C	★ 2780
	★ 2813
	2420-56
DG506A	★ 2802
	2425-9
	¶ 262-11
DG506AA	★ 2802
	2423-51
	¶ 262-11
DG506AB	★ 2802
	2423-54
	¶ 262-11
DG506AC	★ 2802
	2423-55
	¶ 262-11
DG506B	★ 2802
	2425-12
	¶ 262-11
DG506C	★ 2802
	2425-13
	¶ 262-11
DG507A	★ 2802
	2424-69
DG507AA	★ 2802
	2424-70
DG507AB	★ 2802
	2424-74
DG507AC	★ 2802
	2424-75
DG507B	★ 2802
	2424-76
DG507C	★ 2802
	2424-77
DG508A	★ 2804
	2424-13
DG508AA	★ 2804
	2424-14
DG508AB	★ 2804
	2424-17
DG508AC	★ 2804
	2424-18
DG508B	★ 2804
	2424-19
DG508C	★ 2804
	2424-20
DG509A	★ 2804
	2423-52
DG509AA	★ 2804
	2423-53
DG509AB	★ 2804
	2423-56
DG509AC	★ 2804
	2423-57
DG509B	★ 2804
	2423-58
DG509C	★ 2804
	2423-59
DG515A	2420-5
DG515B	2420-6
DG515C	2420-7
DG516A	2420-10
DG516B	2420-11
DG516C	2420-12
DG528A	★ 2806
	2424-71
DG528C	★ 2806
	2424-78
DG529A	★ 2806
	2423-81
DG529C	★ 2806
	2423-82
DGM111A	2416-65
	2416-66
DGM111B	2416-67
	2416-68
DGM122A	2420-27
DGM122B	2420-28
G115A	2422-76
G115B	2422-77
G116A	2422-68
G116B	2422-69
G117A	2422-65
G118A	2422-78
G119A	2422-84
G119B	2422-85
G122A	2422-81
G123A	2422-39
G123B	2422-40
L144A	2912-74
	¶ 266-9
L144B	2912-75
	¶ 266-9
L144C	2912-76
	¶ 266-9
L161	2894-57
	¶ 270-16
LD110	2438-28
	¶ 255-1
	¶ 255-8
LD111A	2438-29
	¶ 255-1
	¶ 255-8
LD120	2438-47
	¶ 255-8
	¶ 277-8
LD121A	★ 2817
	2438-48
	¶ 255-8
	¶ 277-8
LD122	★ 2817
	2438-49
	¶ 255-2
	¶ 255-8
PWM25	★ 2820
	2961-42
PWM27	★ 2820
	2961-43
SD5000	★ 2824
	2417-80
SD5001	★ 2824
	2417-78
SD5002	★ 2824
	2417-79
SD5200	★ 2824
	2417-81
SI1525B	2961-44
SI1527B	2961-45
SI2525B	2961-46
SI2527B	2961-47
SI3002A	2418-121
SI3002B	2419-1
SI3525B	2961-48
SI3527B	2961-49
SI3705	2424-45
SI7250	★ 2830
	2962-117
VN10KE	2481-35
VN10KM	2481-36
	¶ 279-7
VN2410	2483-63
VN3500	2483-64
VN3501	2483-65
VN4000	2483-66
VN46AF	2481-37
VN64GA	2481-38
	¶ 280-3
VN66AF	2481-39
VN88AF	2481-40
VQ1000	★ 2835
	2483-67
VQ1001	2483-68
VQ1004	★ 2837
	2483-69
VQ1006	★ 2837
	2483-70
VQ2001	2483-71
VQ2004	2483-72
VQ2006	★ 2839
	2483-73
VQ3001	★ 2841
	2483-74
VQ7254	2483-75

Sprague Electric Company

N-3611M	★ 2843
N-3614M	★ 2843
N-5711M	★ 2843
N-5713	★ 2843
N-5714M	★ 2843
NO5712M	★ 2843
TDA1083	2900-132
TDA1090	2900-133
TDA1170	2905-116
TDA1190Z	2905-37
TDA2002	2697-73
TDA2002A	2697-74
TPQ3724	2889-151
TPQ3725	2889-152
TPQ3725A	2889-153
UCN-4202A	★ 2843
	2964-145
UCN-4401A	★ 2843
	2483-23
UCN-4801A	★ 2843
	2484-9
UCN-4805A	2463-72
UCN-4806A	2463-73
UCN-4810A	★ 2843
	2465-130
UCN-4815A	★ 2843
	2465-72
UCN-4821A	★ 2843
	2484-21
UCN-4822A	★ 2843
	2484-22
UCN-4823A	★ 2843
	2484-23
UCS-4401H	2480-4
	2483-24
UCS-4801H	2480-5
UCS-4815H	2465-73
UCS-4821H	2484-24
UCS-4822H	2484-25
UCS-4823H	2484-26
UCS4801H	2484-10
UDN-2540B	★ 2843
	2483-62
UDN-2580A	★ 2843
	2949-11
UDN-2585A	★ 2843
	2949-12
UDN-2588A	★ 2843
	2949-13
UDN-2595A	★ 2843
	2480-145
UDN-2841B	★ 2843
	2889-106
UDN-2842B	★ 2843
	2889-107
UDN-2843B	★ 2843
	2889-108
UDN-2844B	★ 2843
	2889-109
UDN-2845B	★ 2843
	2889-110
UDN-2846B	★ 2843
	2889-111
UDN-2949Z	★ 2843
	2906-98
	2964-143
UDN-2952	★ 2843
	2964-117
UDN-2956A	★ 2843
	2480-22
	★ 2843
	2889-174
	2949-14
UDN-2957A	★ 2843
	2480-23
	★ 2843
	2889-175
	2949-15
UDN-2981A	★ 2843
	2480-127
	★ 2843
	2890-104
UDN-2982A	★ 2843
	2480-108
	★ 2843
	2890-105
UDN-2983A	★ 2843
	2480-128
	★ 2843
	2890-106
UDN-2984A	★ 2843
	2480-109
	★ 2843
	2890-107
UDN-3611M	★ 2843
	2482-15
UDN-3612M	★ 2843
	2482-55
UDN-3613M	★ 2843
	2482-126
UDN-3614M	★ 2843
	2482-90
UDN-5703A	★ 2843
	2483-118
UDN-5706A	★ 2843
	484-76
	★ 2843
	2483-86
UDN-5707A	★ 2843
	2483-96
UDN-5711M	★ 2843
	2482-16
UDN-5712M	★ 2843
	2482-56
UDN-5713M	★ 2843
	2482-127
UDN-5714M	★ 2843
	2482-91
UDN-5722M	2482-50
UDN-5733A	★ 2843
	2483-107
UDN-5733M	★ 2843
	2483-108
UDN-6116	★ 2843
	2465-49
UDN-6118	★ 2843
	2465-94
UDN-6126	★ 2843
	2465-50
UDN-6128	★ 2843
	2465-95
UDN-6138	★ 2843
	2465-96
UDN-6148	★ 2843
	2465-97
UDN-6164	★ 2843
	2465-28
UDN-6184	★ 2843
	2465-82
UDN-6510A	★ 2843
	2480-158
UDN-6514A	★ 2843
	2480-159
UDN-7180	★ 2843
	2465-115
UDN-7183	★ 2843
	2464-118
UDN-7184	★ 2843
	2464-119
UDN-7186	★ 2843
	2464-120
UDS-2981H	2480-129
	2890-108
UDS-2982H	2480-110
	2890-109
UDS-2983H	2480-130
	2890-110
UDS-2984H	2480-111
	2890-111
UDS-3611H	2482-17
UDS-3612H	2482-57
UDS-3613H	2482-128
UDS-3614H	2482-92

Arranged alphanumerically from left to right.

© IC MASTER 1983

Sprague Electric Company (Cont'd)

Device	Page-Line
UDS-5703H	2483-119
UDS-5706H	484-77
	2483-87
UDS-5707H	2483-97
UDS-5711H	2482-18
UDS-5712H	2482-58
UDS-5713H	2482-129
UDS-5714H	2482-93
UDS-5733H	2483-109
UDS-5790H	★ **2843**
	511-106
	★ **2843**
	2483-59
	★ **2843**
	2965-80
UDS-5791H	★ **2843**
	511-107
	★ **2843**
	2483-59
	★ **2843**
	2965-81
UGN-3013	511-71
	2963-124
UGN-3019	511-72
UGN-3020	511-73
UGN-3030	511-74
	2963-125
UGN-3040	511-75
	2963-126
UGN-3201	511-76
UGN-3203	511-77
UGN-3220	511-78
	2963-127
UGN-3501	511-79
	2963-128
UGN-3600	2963-129
UGN-3601	2963-130
UGS-3019	511-80
UGS-3020	511-81
UGS-3030	511-82
	2963-131
UHC/D-400	484-68
	2483-88
UHC/D-402	484-115
	2483-120
UHC/D-403	484-116
	2483-121
UHC/D-406	484-69
	2483-89
UHC/D-407	484-96
	2483-99
UHC/D-408	484-97
	2483-100
UHC/D-432	484-104
	2483-110
UHC/D-433	484-105
	2483-111
UHC/D-500	484-70
	2483-90
UHC/D-502	484-117
	2483-122
UHC/D-503	484-118
	2483-123
UHC/D-506	484-71
	2483-91
UHC/D-507	484-98
	2483-101
UHC/D-508	484-99
	2483-102
UHC/D-532	484-106
	2483-112
UHC/D-533	484-107
	2483-113
UHD-490	2465-10
UHD-491	2465-29
UHP-400	★ **2843**
	484-72
	★ **2843**
	2483-92
UHP-402	★ **2843**
	484-119
	★ **2843**
	2483-124
UHP-403	★ **2843**
	484-120
	★ **2843**
	2483-125
UHP-406	★ **2843**
	484-73
	★ **2843**
	2483-93
UHP-407	★ **2843**
	484-100
	★ **2843**
	2483-103
UHP-408	★ **2843**
	484-101
	★ **2843**
	2483-104
UHP-432	★ **2843**
	484-108
	★ **2843**
	2483-114
UHP-433	★ **2843**
	484-109
	★ **2843**
	2483-115
UHP-460	★ **2843**
	2465-17
UHP-481	★ **2843**
	2465-62
UHP-482	★ **2843**
	2464-121
UHP-490	★ **2843**
	2465-11
UHP-491	★ **2843**
	2465-30
UHP-495	★ **2843**
	2465-31
UHP-500	★ **2843**
	484-74
	★ **2843**
	2483-94
UHP-502	★ **2843**
	484-121
	★ **2843**
	2483-126
UHP-503	★ **2843**
	484-122
	★ **2843**
	2483-127
UHP-505	★ **2843**
	484-75
	★ **2843**
	2483-95
UHP-507	★ **2843**
	484-102
	★ **2843**
	2483-105
UHP-508	★ **2843**
	484-103
	★ **2843**
	2483-106
UHP-532	★ **2843**
	484-110
	★ **2843**
	2483-116
UHP-533	★ **2843**
	484-111
	★ **2843**
	2483-117
ULN-2001A	★ **2843**
	2480-77
	¶ 260-6
	★ **2843**
	2890-53
	¶ 260-6
ULN-2002A	★ **2843**
	2480-94
	¶ 260-6
	★ **2843**
	2890-54
	¶ 260-6
ULN-2003A	★ **2843**
	2480-54
	¶ 260-6
	★ **2843**
	2890-55
	¶ 260-6
ULN-2004A	★ **2843**
	2480-36
	¶ 260-6
	★ **2843**
	2890-56
	¶ 260-6
ULN-2005A	★ **2843**
	2480-55
	★ **2843**
	2890-57
ULN-2011A	★ **2843**
	2480-78
	★ **2843**
	2890-70
ULN-2012A	★ **2843**
	2480-95
	★ **2843**
	2890-71
ULN-2013A	★ **2843**
	2480-56
	★ **2843**
	2890-72
ULN-2014A	★ **2843**
	2480-37
	★ **2843**
	2890-73
ULN-2015A	★ **2843**
	2480-57
	★ **2843**
	2890-74
ULN-2021A	★ **2843**
	2480-79
	★ **2843**
	2890-80
ULN-2022A	★ **2843**
	2480-96
	★ **2843**
	2890-81
ULN-2023A	★ **2843**
	2480-58
	★ **2843**
	2890-82
ULN-2024A	★ **2843**
	2480-38
	★ **2843**
	2890-83
ULN-2025A	★ **2843**
	2480-59
	★ **2843**
	2890-84
ULN-2031A	2890-1
ULN-2032A	2890-2
ULN-2033A	2890-3
ULN-2046A	2889-34
ULN-2047A	2889-130
ULN-2054A	2889-53
ULN-2061M	★ **2843**
	2481-88
	★ **2843**
	2889-43
ULN-2062M	★ **2843**
	2481-89
	★ **2843**
	2889-44
ULN-2064B	★ **2843**
	2482-160
	★ **2843**
	2889-112
ULN-2065B	★ **2843**
	2482-161
	★ **2843**
	2889-113
ULN-2066B	★ **2843**
	2482-162
	★ **2843**
	2889-114
ULN-2067B	★ **2843**
	2482-163
	★ **2843**
	2889-115
ULN-2068B	★ **2843**
	2482-164
	★ **2843**
	2889-116
ULN-2069B	★ **2843**
	2482-165
	★ **2843**
	2889-117
ULN-2070B	★ **2843**
	2482-166
	★ **2843**
	2889-118
ULN-2071B	★ **2843**
	2482-167
	★ **2843**
	2889-119
ULN-2074B	★ **2843**
	2482-168
	★ **2843**
	2889-120
ULN-2075B	★ **2843**
	2482-169
	★ **2843**
	2889-121
ULN-2076B	★ **2843,**
	2482-170
	★ **2843**
	2889-122
ULN-2077B	★ **2843**
	2482-171
	★ **2843**
	2889-123
ULN-2081A	2890-100
ULN-2082A	2890-94
ULN-2083A	2889-166
ULN-2086A	2889-35
ULN-2111A	2901-67
	2905-38
ULN-2136A	2901-68
ULN-2140A	2419-113
ULN-2204A	2900-134
	¶ 272-4
ULN-2211B	2905-39
ULN-2224A	2904-1
ULN-2231A	2898-12
ULN-2240A	2900-135
	¶ 271-4
ULN-2241A	2900-136
	¶ 271-4
ULN-2242A	2900-137
	¶ 271-4
ULN-2243A	2900-58
	2901-21
ULN-2245A	2901-143
ULN-2249A	2900-72
ULN-2260A	2904-2
ULN-2261A	2904-3
ULN-2270	2905-117
ULN-2280B	2896-124
ULN-2283B	2896-125
ULN-2290	2905-40
ULN-2300M	2962-38
ULN-2350C	4141-116
ULN-2351C	4141-117
ULN-2401A	2968-145
	2898-43
ULN-2429A	2898-44
	2963-78
ULN-2801A	★ **2843**
	2480-132
	★ **2843**
	2890-112
ULN-2802A	★ **2843**
	2480-139
	★ **2843**
	2890-113
ULN-2803A	★ **2843**
	2480-115
	★ **2843**
	2890-114
ULN-2804A	★ **2843**
	2480-102
	★ **2843**
	2890-115
ULN-2805A	★ **2843**
	2480-116
	★ **2843**
	2890-116
ULN-2811A	★ **2843**
	2480-133
	★ **2843**
	2890-122
ULN-2812A	★ **2843**
	2480-140
	★ **2843**
	2890-123
ULN-2813A	★ **2843**
	2480-117
	★ **2843**
	2890-124
ULN-2814A	★ **2843**
	2480-103
	★ **2843**
	2890-125
ULN-2815A	★ **2843**
	2480-118
	★ **2843**
	2890-126
ULN-2821A	★ **2843**
	2480-134
	★ **2843**
	2890-137
ULN-2822A	★ **2843**
	2480-141
	★ **2843**
	2890-138
ULN-2823A	★ **2843**
	2480-119
	★ **2843**
	2890-139
ULN-2824A	★ **2843**
	2480-104
	★ **2843**
	2890-140
ULN-2825A	★ **2843**
	2480-120
	★ **2843**
	2890-141
ULN-3304M	511-122
	2951-50
ULN-3305M	511-124
ULN-3306M	511-126
ULN-3330Y	2964-93
ULN-3701Z	2897-75
ULN-3702Z	2897-76
ULN-3703Z	2897-77
ULN-3705M	2896-126
ULN-3784B	2897-78
ULN-3809A	2901-144
ULN-3810A	2901-145
ULN-3838A	2900-73
ULN-3859A	2901-78
ULN-3889A	2901-69
ULN-3914A	2904-4
ULN-4810H	2465-131
ULN-8126	2961-50
ULN-8160	2961-51
ULN-8161	2961-52
ULS-2001H	2480-80
	2890-58
ULS-2002H	2480-97
	2890-59
ULS-2003H	2480-60
	2890-60
ULS-2004H	2480-39
	2890-61
ULS-2005H	2480-61
	2890-62
ULS-2011H	2480-81
	2890-75
ULS-2012H	2480-82
	2890-76
ULS-2013H	2480-62
	2890-77
ULS-2014H	2480-40
	2890-78
ULS-2015H	2480-63
	2890-79
ULS-2021H	2890-85
ULS-2022H	2480-98
	2890-86
ULS-2023H	2480-64
	2890-87
ULS-2024H	2480-41
	2890-88
ULS-2025H	2480-65
	2890-89
ULS-2045H	2889-36
ULS-2064H	2482-172
ULS-2065H	2482-173
ULS-2066H	2482-174
ULS-2067H	2482-175
ULS-2068H	2482-176
ULS-2069H	2482-177
ULS-2070H	2482-178
ULS-2071H	2482-179
ULS-2074H	2483-1
ULS-2075H	2483-2
ULS-2076H	2483-3
ULS-2077H	2483-4
ULS-2083H	2889-167
ULS-2140H	2419-114
ULS-2801H	2480-135
	2890-117
ULS-2802H	2480-142
	2890-118
ULS-2803H	2480-121
	2890-119
ULS-2804H	2480-105
	2890-120
ULS-2805H	2480-122
	2890-121
ULS-2811A	2890-127
ULS-2811H	2480-136
	2890-128
ULS-2812H	2480-143
	2890-129
ULS-2813H	2480-123
	2890-130
ULS-2814H	2480-106
	2890-131
ULS-2815H	2480-124
	2890-132
ULS-2821H	2480-137
	2890-142
ULS-2822H	2480-144
	2890-143
ULS-2823H	2480-125
	2890-144
ULS-2824H	2480-107
	2890-145
ULS-2825H	2480-126
	2890-146
ULS-8126	2961-53
ULS-8160	2961-54
ULX-3704B	2897-79
ULX-3777W	2897-126
ULX-3783M	2897-105
ULX-3804A	2900-146
ULX-3840A	2900-138
UTH-2886B	★ **2843**
	2890-151
UTH-2888A	★ **2843**
	2890-152

Stag Microsystems

PBX	4008-4
PM2000	★ **4105**
PM2100	★ **4105**
PM2700	★ **4105**
PMG8	★ **4105**

Structured Design Inc.

SD-1000	4009-2
SD1000	★ **4106**
SD20/24	★ **4106**
	4009-1

Sunrise Electronics

Z-1000	4009-4
Z-1200	4010-1
Z-1248	4010-2
Z-2000	4009-4
Z-2400	4010-1
ZAP-48	★ **4107**
ZAP-68	★ **4107**
ZAP-80	★ **4107**
ZAP48	4009-3
ZAP68	4009-3
ZAP80	4009-3

Synertek

7100	★ **4536**
7110	★ **4537**
7111	★ **4537**
C016D	★ **1983**
C020-65	★ **1981**
C020-68	★ **1981**
C032D	★ **1983**
C048D	★ **1983**
C064D	★ **1983**
CP110	1759-5
KTM-3	★ **1980**
M-3	★ **1980**
MBC01-A2-1	1759-23
MBC010-65	1759-12
MBC010-68	1759-28
MBC016D	★ **1983**
MBC01A2	★ **1982**
	1759-24
MBC01A2-1	★ **1982**
MBC020-65	★ **1981**
	1759-13
MBC020-68	★ **1981**
	1759-29
MBC032D	★ **1983**
MBC048D	★ **1983**

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Device	Page-Line
Synertek (Cont'd)	
MBC064D	★ 1983
MDT-1000	1631-2
MDT-2000	★ 1747
	1631-3
SY16000	1100-9
	1081-11
SY16008	1073-35
SY16016	1081-12
SY16032	1081-13
SY1791-01	★ 1538
	1091-23
SY1791-02	★ 1538
	1101-12
SY1793-01	★ 1538
	1091-24
SY1793-02	★ 1538
	1101-13
SY2101-1	3474-108
SY2101A	3474-65
SY2101A-2	3474-23
SY2101A-4	3474-90
SY2111-1	3474-107
SY2111A	3474-64
SY2111A-2	3474-22
SY2111A-4	3474-89
SY2112-1	3474-96
SY2112A	3474-63
SY2112A-2	3474-20
SY2112A-4	3474-88
SY2114	★ 3941
	3479-42
SY2114-2	★ 3941
	3478-34
SY2114-3	★ 3941
	3478-102
SY2114A-4	★ 3941
	3478-35
SY2114A-5	★ 3941
	3478-58
SY2114AL-1	★ 3941
	3477-93
SY2114AL-2	★ 3941
	3477-98
SY2114AL-3	★ 3941
	3477-106
SY2114AL-4	★ 3941
	3478-36
SY2114L	★ 3941
	3479-43
SY2114L-2	★ 3941
	3478-37
SY2114L-3	★ 3941
	3478-103
SY2114LV-2	★ 3941
	3478-38
SY2128-1	★ 3944
	3480-6
SY2128-2	★ 3944
	3480-32
SY2128-3	★ 3944
	3480-59
SY2128-4	★ 3944
	3480-97
SY2128L-1	★ 3944
	3480-7
SY2128L-2	★ 3944
	3480-33
SY2128L-3	★ 3944
	3480-60
SY2128L-4	★ 3944
	3480-98
SY2129-1	★ 3944
	3480-8
SY2129-2	★ 3944
	3480-34
SY2129-3	★ 3944
	3480-61
SY2129-4	★ 3944
	3480-99
SY2129L-1	★ 3944
	3480-9
SY2129L-2	★ 3944
	3480-35
SY2129L-3	★ 3944
	3480-62
SY2129L-4	★ 3944
	3480-100
SY2142	3479-51
SY2142-2	3478-46
SY2142-3	3478-107
SY2142L	3479-52
SY2142L-2	3478-47
SY2142L-3	3478-108
SY2147	★ 3941
	3481-107
SY2147-3	★ 3941
	3481-76
SY2147-6	★ 3941
	3481-115
SY2147L	★ 3941
	3481-108
SY2148H	★ 3942
	3477-80
SY2148H-2	★ 3942
	3477-44
SY2148H-3	★ 3942
	3477-61
SY2148HL	★ 3942
	3477-81
SY2148HL-3	★ 3942
	3477-62
SY2149H	★ 3942
	3477-82
SY2149H-2	★ 3942
	3477-45
SY2149H-3	★ 3942
	3477-63
SY2149HL	★ 3942
	3477-83
SY2149HL-3	★ 3942
	3477-64
SY2158A-1	★ 3943
	3479-69
SY2158A-2	★ 3943
	3479-78
SY2158A-3	★ 3943
	3479-87
SY2158A-4	★ 3943
	3479-98
SY2158B-1	★ 3943
	3479-70
SY2158B-2	★ 3943
	3479-79
SY2158B-3	★ 3943
	3479-88
SY2158B-4	★ 3943
	3479-89
SY2158L-1	★ 3943
	3479-71
SY2158L-2	★ 3943
	3479-80
SY2158L-3	★ 3943
	3479-90
SY2158L-4	★ 3943
	3479-99
SY2159A-1	★ 3943
	3479-72
SY2159A-2	★ 3943
	3479-81
SY2159A-3	★ 3943
	3479-91
SY2159A-4	★ 3943
	3479-100
SY2159B-1	★ 3943
	3479-73
SY2159B-2	★ 3943
	3479-82
SY2159B-3	★ 3943
	3479-92
SY2159B-4	★ 3943
	3479-101
SY2159L-1	★ 3943
	3479-74
SY2159L-2	★ 3943
	3479-83
SY2159L-3	★ 3943
	3479-93
SY2159L-4	★ 3943
	3479-102
SY2167	★ 3945
	3483-87
SY2168	★ 3946
	3483-24
SY2169	★ 3946
	3483-23
SY21D1	★ 3947
	3479-75
SY21H01	3473-99
SY21H01-2	3473-106
SY21H11	3473-98
SY21H11-2	3473-105
SY21H12	3473-97
SY21H12-2	3473-104
SY23128	★ 3952
	3486-29
SY2316A	★ 3949
	3484-112
SY2316B	★ 3949
	3485-50
SY2316B-2	★ 3949
	3485-2
SY2316B-3	★ 3949
	3485-9
SY23256	★ 3953
	3487-44
SY2332	★ 3950
	3486-11
SY2332-2	★ 3950
	3485-73
SY2332-3	★ 3950
	3485-90
SY2333	★ 3950
	3486-12
SY2333-2	★ 3950
	3485-74
SY2333-3	★ 3950
	3485-91
SY2364	3486-117
SY2364-2	3486-35
SY2364-3	3486-87
SY2364A	3486-61
SY2364A-2	3486-36
SY2364A-3	3486-88
SY2365	★ 3951
	3487-6
SY2365-2	★ 3951
	3486-37
SY2365-3	★ 3951
	3486-89
SY2365A	★ 3951
	3487-7
SY2365A-2	★ 3951
	3486-38
SY2365A-3	★ 3951
	3486-90
SY2661	★ 1539
	1090-20
SY2716	3465-85
SY2716-1	3465-42
SY2716-2	3465-51
SY2801	★ 3956
	3459-55
SY2801A	★ 3956
	3459-56
SY2802	★ 3957
	3460-35
SY2816	3465-9
SY3308	★ 3954
	3484-35
SY3316	★ 3954
	3484-113
SY5621	★ 1528
SY6500	★ 1526
	1073-36
SY6502	1090-143
	1073-37
SY6502A	1090-144
SY6502B	1090-145
SY6502C	1090-146
SY6503	1090-147
	1073-38
SY6503A	1090-148
SY6504	1090-149
	1073-39
SY6504A	1090-150
SY6505	1090-151
	1073-40
SY6505A	1090-152
SY6506	1090-153
	1073-41
SY6506A	1090-154
SY6507	1090-155
	1073-42
SY6507A	1090-156
SY6512	1090-157
	1073-43
SY6512A	1090-158
SY6513	1091-1
	1073-44
SY6513A	1091-2
SY6514	1091-3
	1075-1
SY6514A	1091-4
SY6515	1091-5
	1075-2
SY6515A	1091-6
SY6520	★ 1527
	1092-94
	1102-60
SY6520A	★ 1527
	1091-33
SY6521	1091-34
SY6521A	1091-35
SY6522	★ 1529
	1091-36
	1102-61
SY6522A	★ 1529
	1091-37
	1102-62
SY6530	★ 1530
	1091-41
SY6532	★ 1531
	1091-43
SY6532A	★ 1531
	1091-44
SY6545-1	★ 1533
	1091-15
SY6545E	★ 1533
	1091-16
SY6545R	★ 1532
	1091-17
SY6545RA	★ 1533
	1091-18
SY6551	★ 1536
	1091-10
	¶ 260-11
SY6551A	★ 1536
	1091-11
	¶ 260-11
SY6591	★ 1537
	1091-25
SY6591A	★ 1537
	1091-26
SY6593	1091-27
SY66016	★ 1549
	475-119
SY68045	★ 1535
	1092-36
SY6820	★ 1527
	1092-95
SY6821	★ 1528
	1092-96
SY6845R	★ 1532
	1092-37
SY68B20	★ 1527
	1092-97
SY68B21	★ 1528
	1092-98
SY7100	★ 4536
	4141-118
SY7110	★ 4537
	4141-119
SY7111	★ 4537
	4141-120
SYM-1	1759-6
	¶ 251-7
SYM-1/68	1761-10
	¶ 251-7
SYM-1/69	1761-23
	¶ 251-7
SYM2114	★ 424
	3479-44
SYM2114-3	★ 424
	3478-104
SYM2114A-3	★ 424
	3477-107
SYM2114A-4	★ 424
	3478-39
SYM2114A-5	★ 424
	3478-59
SYM2128-3	★ 427
	3480-63
SYM2128-4	★ 427
	3480-101
SYM2129-3	★ 427
	3480-64
SYM2129-4	★ 427
	3480-102
SYM2147	★ 425
	3481-109
SYM2147-3	★ 425
	3481-77
SYM2147-6	★ 425
	3481-78
SYM2148H	★ 426
	3477-84
SYM2148H-3	★ 426
	3477-65
SYM2148H-6	★ 426
	3477-89
SYM2149H	★ 426
	3477-85
SYM2149H-3	★ 426
	3477-66
SYM2149H-6	★ 426
	3477-90
SYM2167	★ 428
	3483-88
SYM2168	★ 429
	3483-25
SYM2169	★ 429
	3483-26
SYM23128	3487-37
SYM23128-3	3487-29
SYM23128A	3487-38
SYM23128A-3	3487-30
SYM2316	★ 430
SYM2332	★ 430
	3486-13
SYM2333	3486-14
SYM2364	★ 431
	3486-118
SYM2364A	★ 431
	3486-119
SYM2365	★ 431
	3487-8
SYM2365A	★ 431
	3487-9
SYM3316	★ 432
	3484-115
SYM3316A	★ 432
	3484-116
Z-UPC	1101-96
Z8	1075-3
Z8601	★ 1540
	1097-11
	★ 1540
	1075-4
Z8601A	★ 1540
	1097-12
	★ 1540
	1075-5
Z8602	★ 1541
	1097-13
	★ 1541
	1075-6
Z8602A	★ 1541
	1097-14
	★ 1541
	1075-7
Z8603	★ 1542
	1097-15
	★ 1542
	1075-8
Z8603A	★ 1542
	1097-16
	★ 1542
	1075-9
Z8611	★ 1543
	1097-17
	★ 1543
	1075-10
Z8611A	★ 1543
	1097-18
	★ 1543
	1075-11
Z8612	★ 1544
	1097-19
	★ 1544
	1075-12
Z8612A	★ 1544
	1097-20
	★ 1544
	1075-13
Z8613	★ 1545
	1097-21
	★ 1545
	1075-14
Z8613A	★ 1545
	1075-15
Z8681	★ 1546
	1097-22
	★ 1546
	1075-16
Z86C01	★ 1548
	1097-23
	★ 1548
	1075-17
Z8S	1075-18
Z8SMCU	★ 1547
	1097-24

Teledyne Semiconductor

Device	Page-Line
14433	2438-11
14433A	2438-12
301A/C	472-45
301B/M	472-46
302A/C	472-40
	¶ 233-12
302B/M	472-41
	¶ 233-12
303A/C	472-103
303B/M	472-104
304A/C	472-113
304B/M	472-114
306A/C	472-129
307A/C	472-124
311A/C	472-53
	¶ 233-12
311B/M	472-54
	¶ 233-12
312A/C	472-60
	¶ 233-12
312B/M	472-61
	¶ 233-12
313A/C	472-62
313B/M	472-63
321A/C	472-105
321B/M	472-106
322A/C	472-86
322B/M	472-87
323A/C	472-92
323B/M	472-93
324A/C	472-107
324B/M	472-108
325A/C	472-109
325B/M	472-110
326A/C	472-111
326B/M	472-112
331A/C	473-5
331B/M	473-6
332A/C	472-15
332B/M	472-16
333A/C	473-7
333B/M	473-8
334A/C	472-7
335A/C	472-11
341A/C	472-118
341B/M	472-119
342A/C	473-13
342B/M	473-14
343A/C	472-1
343B/M	472-2
344A/C	472-115
347A/C	473-15
347B/M	473-16
349A/C	473-42
350A/C	473-11
	¶ 234-3
351A/C	473-10
355A/C	473-38
	2951-51
355B/M	2951-52
361A/C	473-27
361B/M	473-28
362A/C	473-31
362B/M	473-32
363A/C	473-35
363B/M	473-36
367A	2473-43
	¶ 234-3
367A/C	473-45
	¶ 234-3
367B	2473-47
	¶ 234-3
367B/M	473-46
	¶ 234-3
367C	2473-48
	¶ 234-3
367M	2473-44
	¶ 234-3
368A	2473-45
368A/C	473-47

Arranged alphanumerically from left to right.

© IC MASTER 1983

Device	Page-Line
Teledyne Semiconductor (Cont'd)	
368C	2473-46
370A/C	472-49
370B/M	472-50
371A/C	472-30
	¶ 233-12
371B/M	472-31
	¶ 233-12
372A/C	472-23
	¶ 233-12
372B/M	472-24
	¶ 233-12
373A/C	472-27
373B/M	472-28
374A/C	472-19
375A/C	473-18
	3488-44
375B/M	473-19
	3488-45
380A/C	472-42
	¶ 233-12
	2464-61
	¶ 233-12
380B/M	472-34
	¶ 233-12
	2464-62
	¶ 233-12
381A/C	472-32
	2464-63
381B/M	472-33
	2464-64
382A/C	472-36
	2464-68
382B/M	472-37
	2464-69
383A/C	472-38
	2463-169
383B/M	472-39
	2463-170
390	472-67
390A/C	2482-141
391	472-66
391A/C	2481-75
392	472-72
392A/C	2481-111
393	472-120
393A/C	2481-113
394	472-123
394A/C	2481-112
395	472-73
395A/C	2482-142
396AC	473-30
7541S	2456-28
7541T	2453-36
9400	2963-107
	¶ 252-3
	¶ 252-15
9401	2963-108
9402	2963-109
9491AM	2966-11
9491B	2966-12
9491BM	2966-13
9495A	2966-99
9495C	2966-100
TSC450C	★ **2845**
	2482-130
TSC450M	★ **2845**
	2482-131
TSC7C0A	★ **2846**
	2464-133
TSC7106	2438-13
TSC7107	2438-14
TSC710CC	★ **2847**
	2435-26
TSC710CM	★ **2847**
	2435-27
TSC7116	2438-15
TSC7117	2438-16
TSC7126	★ **2848**
	2438-17
TSC7135	★ **2850**
	2438-41
TSC7211A	★ **2852**
	2464-132
TSC7212	★ **2852**
TSC7441S	2456-29
TSC7541A	2456-30
TSC7541B	2453-37
TSC7541J	2456-31
TSC7541K	2453-38
TSC800AC	★ **2853**
	2436-31
TSC800AM	★ **2853**
	2436-32
TSC800BC	★ **2853**
	2436-33
TSC800BM	★ **2853**
	2436-34
TSC8212A	2464-134
TSC8640B	2456-32
TSC8640C	2456-33
TSC8641B	2453-39
TSC8641C	2453-40
TSC8700	2428-47
TSC8701	2431-12
TSC8702	2435-23
TSC8703	2428-48
TSC8704	2431-13
TSC8705	2435-24
TSC8750	2438-35
TSC8751	2438-30
TSC9403	★ **2854**
	2480-14
	★ **2854**
	3488-1
	3491-39
TSC9404	★ **2854**
	2480-15
	★ **2854**
	3488-2
	3491-40
TSC9495	2966-101
TSC9496	2966-171
Texas Instruments	
4810A	★ **2859**
7512A	★ **2860**
75176	★ **2858**
75177	★ **2858**
75178	★ **2858**
75437A	★ **2855**
75513A	★ **2861**
75584A	★ **2864**
9614C	2471-44
9615C	2474-60
AC5945	2900-147
AC5947	2465-145
ADC0804	2429-25
ADC0808	2428-25
ADC809	2429-21
AM26LS31C	2472-49
AM26LS31M	2472-50
AM26LS32C	2475-25
AM26LS32M	2475-26
AM26LS33C	2475-37
AM26LS33M	2475-38
AM26S10C	508-51
	2478-8
AM26S10M	508-52
	2477-64
AM26S11C	508-53
	2478-9
AM26S11M	2477-65
AM2S10C	2478-10
DMDD5000	★ **438**
DS3680	2483-50
DS8820	2475-3
DS8830	2471-57
DS8831	2469-41
	2471-64
DS8832	2469-32
	2472-2
FP54ALS16L8	506-91
FP54ALS16R4	506-93
	3457-1
FP54ALS16R6	506-94
	3457-2
FP54ALS16R8	506-95
	3457-3
FP54AS839	506-99
	3458-5
FP54AS840	506-100
	3458-3
FP54LS333	506-103
	3457-89
FP54LS335	506-104
	3457-87
FP73LS333	3457-90
FP74ALS16L8	506-92
FP74ALS16R4	506-96
	3457-4
FP74ALS16R6	506-97
	3457-5
FP74ALS16R8	506-98
	3457-6
FP74AS839	506-101
	3458-6
FP74AS840	506-102
	3458-4
FP74LS333	506-105
FP74LS335	506-106
	3457-88
FS990/10	1632-3
LM101A	2909-25
	2924-6
LM106	2891-30
LM107	2923-49
LM111	2891-38
LM118	2910-59
	2926-13
LM124	2913-81
LM137	2960-48
LM139	2895-8
LM139A	2894-37
LM148	2942-32
LM158	2913-44
	2938-33
LM1900	2913-108
LM193	2893-46
LM201A	2924-7
LM206	2891-31
LM207	2923-50
LM211	2892-48
LM217	2959-88
LM218	2926-14
LM224	2913-82
LM237	2960-49
LM239	2895-34
LM248	2943-33
LM258	2913-83
LM2900	2913-106
LM2901	2895-43
LM2902	2913-27
LM2903	2894-4
LM2904	2913-28
LM293	2893-59
LM301A	2931-60
LM306	2892-20
LM307	2931-48
LM311	2892-49
LM317	2959-89
LM318	2910-60
	2933-42
LM324	2913-84
LM324A	2941-46
LM3302	2892-55
LM337	2960-50
LM339	2895-35
LM340-10	2954-6
LM340-12	2954-82
LM340-15	2955-39
LM340-18	2955-104
LM340-24	2956-60
LM340-5	2952-99
LM340-6	2953-37
LM340-8	2953-103
LM348	2943-34
LM358	2913-51
LM388	2896-130
LM3900	2913-107
LM393	2893-60
MC1445	2888-43
MC1458	2909-16
MC1488	2469-60
MC1558	2939-3
MC3303	2943-59
MC3403	2944-18
MC3423	2965-68
MC3443	2476-53
MC3446	2476-21
MC3470	2887-44
MC3484V2	2481-56
	2967-174
MC3484V4	2481-57
	2967-175
MC3486	2475-20
MC3487	2472-36
MC79L05AC	2956-94
MC79L12AC	2957-62
MC79L15AC	2957-105
N8T13	2469-12
N8T23	2469-4
N8T26	508-20
N8T26A	508-21
NE5532	2937-48
NE5532A	2937-49
NE5534	2926-28
NE5534A	2926-29
NE555	2951-53
NE556	2951-87
NE592	2888-112
OP-07C	2916-29
OP-07D	2916-17
OP-07E	2915-30
RC4136	2943-51
RC4558	2940-3
S8T23	2469-5
SBP8316C	3485-12
SBP8316M	3485-13
SBP96600	★ **438**
SBP9708C	476-5
	1098-89
SBP9708M	476-6
	1098-90
SBP97600	★ **438**
SBP9818C	3484-121
SBP9818M	3484-122
SBP9900A	1081-14
SBP9900AC	1098-74
SBP9900AE	1098-75
SBP9900AM	1098-76
SBP9960C	1098-117
SBP9960M	1098-118
SBP9961C	1098-106
SBP9961M	1098-107
SBP9964C	1098-124
SBP9964M	1098-125
SBP9965C	1098-111
SBP9965M	1098-112
SBP9939	★ **1553**
	1081-15
SE100	★ **1560**
SE1000C	1088-35
	1088-46
	1055-26
SE1000P	1088-36
	1088-47
	1055-27
SE1004C	★ **1560**
	1088-37
	1088-48
	★ **1560**
	1055-28
SE100C	★ **1560**
SE1100C	★ **1560**
	1088-38
	1088-49
	★ **1560**
	1055-29
SE1400P	★ **1560**
	1088-39
	1088-50
	★ **1560**
	1055-30
SE2100P	★ **1560**
	1087-4
	1088-65
	★ **1560**
	1055-31
SE2130P	★ **1560**
	1087-5
	1088-66
	★ **1560**
	1057-1
SE2200P	★ **1560**
	1088-40
	1088-51
	★ **1560**
	1057-2
SE2400P	★ **1560**
	1087-6
	1088-67
	★ **1560**
	1057-3
SE5534	2924-18
SE555	2951-54
SE556	2951-88
SEB100	★ **1560**
SEB1000	★ **1560**
SEB1000C	★ **1560**
SEB1004	★ **1560**
SEB1100	★ **1560**
SEB1400	★ **1560**
SEB2100	★ **1560**
SEB2130	★ **1560**
SEB2400	★ **1560**
SG1524	2961-55
SG2524	2961-56
SG3524	2961-57
SG3525A	2961-58
SG3527A	2961-59
SH74ALS1034	173
	485-25
SN10139	3459-7
SN10140	468-162
	3472-12
SN10142	468-157
	3472-0
SN10144	469-4
SN10147	468-166
	3472-47
	3472-47
SN10148	468-161
	3472-13
SN10164	469-55
SN10174	469-38
SN16923	2896-131
SN29301	483-21
SN29308	495-103
SN29309	497-113
SN29310	480-141
SN29311	484-36
SN29312	499-133
SN29316	478-118
SN29318	508-137
SN29601	500-115
SN39301	483-22
SN39308	495-104
SN39309	497-114
SN39310	480-142
SN39311	484-37
SN39312	499-134
SN39316	478-119
SN39318	508-138
SN5400	★ **833**
	492-9
SN5401	★ **833**
	491-140
SN5402	★ **833**
	494-96
SN5403	★ **834**
	491-141
SN5404	★ **834**
	477-165
SN5405	★ **834**
	477-66
SN5406	★ **835**
	485-5
SN5407	★ **835**
	484-142
SN5408	★ **835**
	489-133
SN5409	★ **836**
	489-95
SN5410	★ **836**
	490-179
SN54100	★ **867**
	495-109
SN54107	★ **869**
	487-184
SN54109	★ **870**
	487-119
SN54110	★ **870**
	487-70
SN54111	★ **871**
	488-34
SN54116	★ **872**
	495-105
SN5412	★ **837**
	490-149
SN54120	★ **873**
	507-48
SN54121	★ **873**
	500-105
SN54122	★ **873**
	500-124
SN54123	★ **874**
	500-165
SN54125	★ **875**
	476-139
SN54126	★ **875**
	476-113
SN54128	★ **876**
	484-113
	★ **876**
	2472-33
SN5413	★ **837**
	507-79
SN54132	★ **877**
	507-127
SN54136	★ **878**
	494-170
SN5414	★ **837**
	507-157
SN54143	★ **882**
	482-67
SN54144	★ **882**
	482-69
SN54145	★ **882**
	482-148
SN54147	★ **882**
	509-33
SN54148	★ **883**
	508-139
SN54150	★ **883**
	500-85
SN54151A	★ **884**
	499-153
SN54152A	★ **884**
	500-10
SN54153	★ **884**
	498-25
SN54154	★ **885**
	484-38
	★ **885**
	2473-54
SN54155	★ **886**
	483-131
SN54156	★ **886**
	483-99
SN54157	★ **887**
	499-22
SN54159	★ **888**
	484-44
SN5416	★ **838**
	484-156
SN54160	★ **889**
	480-143
SN54161	★ **889**
	478-120
SN54162	★ **890**
	480-185
SN54163	★ **890**
	478-167
SN54164	★ **891**
	502-24
	★ **891**
	3490-122
SN54165	★ **891**
	502-75
	★ **891**
	3490-54
SN54166	★ **891**
	502-95
	★ **891**
	3490-67
SN54167	★ **892**
SN5417	★ **838**
	484-132
SN54170	★ **893**
	497-1
	★ **893**
	3470-58
SN54173	★ **894**
	486-30
SN54174	★ **895**
	486-54
SN54175	★ **895**
	485-122
SN54176	★ **896**
	480-104
SN54177	★ **896**
	478-67
SN54178	★ **896**
	501-108
	★ **896**
	3488-87
SN54179	★ **897**
	501-118
	★ **897**
	3488-88
SN54180	★ **897**
	509-2

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Texas Instruments (Cont'd)

Device	Page-Line
SN54181	★ 897
	475-10
SN54182	★ 898
	475-75
SN54184	★ 440
	★ 899
	507-43
	★ 440
	★ 899
	3454-6
SN54184A	★ 440
SN54185A	★ 900
	507-36
	★ 900
	3454-1
SN54187	★ 900
SN54188A	3459-44
SN54190	★ 901
	481-172
SN54191	★ 901
	479-133
SN54192	★ 902
	481-136
SN54193	★ 902
	480-1
SN54194	★ 902
	501-150
	★ 902
	3488-89
SN54195	★ 903
	501-50
	★ 903
	3489-19
SN54196	★ 903
	480-105
SN54197	★ 904
	478-68
SN54198	★ 904
	502-52
	★ 904
	3490-13
SN54199	★ 905
	502-61
	★ 905
	3490-14
SN5420	★ 839
	490-94
SN5422	★ 840
	490-49
SN54221	★ 906
	500-140
SN5423	★ 840
	494-11
SN54246	★ 913
	2464-14
SN54247	★ 913
	2463-171
SN54248	★ 914
	2463-130
SN54249	★ 914
	2463-96
SN5425	494-2
SN54251	★ 915
	500-33
SN54259	★ 917
	496-31
SN5426	★ 841
	484-91
SN54265	★ 918
	507-114
SN5427	★ 842
	494-41
SN54273	★ 919
SN54276	★ 920
	488-161
SN54278	★ 921
	508-56
SN54279	★ 921
	495-166
SN5428	★ 842
	494-97
SN54283	★ 922
	476-60
SN54284	★ 923
	475-112
SN54285	★ 923
	475-109
SN54290	★ 924
	480-52
SN54293	★ 925
	479-41
SN54298	★ 926
	499-74
SN5430	★ 842
	492-71
SN5432	★ 843
	493-129
SN5433	★ 843
	494-65
SN54365A	★ 935
	169
	485-22
SN54366A	★ 935
	117
	485-23
SN54367A	★ 936
	170
	485-24
SN54368A	★ 936
	118
	485-23
SN5437	★ 844
	491-95
SN54376	★ 939
	488-159
SN5438	★ 844
	491-45
SN5439	★ 844
	491-46
SN54390	★ 943
	481-40
SN54393	★ 943
	479-8
SN5440	★ 845
	490-7
SN544167	507-22
SN54425	★ 946
	476-140
SN54426	★ 946
	476-114
SN5442A	★ 845
	483-23
SN5443A	★ 846
	482-105
SN5444A	★ 846
	482-97
SN5445	★ 846
	482-137
SN5446A	★ 847
	2464-15
SN5447A	★ 847
	2463-172
SN5448	★ 847
	2463-131
SN5449	★ 847
	2463-97
SN54490	★ 955
	481-41
SN5450	★ 848
	492-155
SN5451	★ 848
	492-176
SN5453	★ 849
	493-84
SN5454	★ 850
	493-72
SN545740	503-108
SN5460	★ 852
	493-27
SN5470	★ 855
	487-68
SN5472	★ 856
	487-81
SN5473	★ 856
	487-185
SN5474	★ 857
	485-65
SN5475	★ 858
	495-128
SN5476	★ 858
	488-47
SN5477	★ 859
	495-152
SN5480	★ 860
	474-144
SN5481	★ 860
SN5482	★ 860
	474-162
SN5483A	★ 861
	476-61
SN5484	★ 861
SN5485	★ 862
	474-62
SN5486	★ 862
	495-22
SN5488	★ 863
SN5490A	★ 864
	480-53
SN5491A	★ 864
	502-132
	★ 864
	3491-13
SN5492A	★ 864
	482-38
SN5493A	★ 865
	479-42
SN5494	★ 865
	501-137
	★ 865
	3489-85
SN5495A	★ 866
	501-89
	★ 866
	3488-90
SN5496	★ 866
	502-2
	★ 866
	3489-114
SN5497	★ 866
	508-79
SN54ALS00	★ 833
	492-15
SN54ALS01	★ 833
	491-149
SN54ALS02	★ 833
	494-106
SN54ALS03	★ 834
	491-150
SN54ALS04	★ 834
	477-172
SN54ALS05	★ 834
	477-70
SN54ALS08	★ 835
	489-143
SN54ALS09	★ 836
	489-99
SN54ALS10	★ 836
	490-184
SN54ALS1000	★ 1013
	492-16
SN54ALS1002	★ 1013
	494-107
SN54ALS1003	★ 1014
	491-151
SN54ALS1004	★ 1014
	477-173
SN54ALS1005	★ 1014
	477-71
SN54ALS1009	★ 1015
	489-144
SN54ALS1010	★ 1015
	490-185
SN54ALS1011	★ 1015
	489-45
SN54ALS1020	★ 1016
	490-99
SN54ALS1032	★ 1016
	493-135
SN54ALS1034	★ 1017
	174
	485-25
SN54ALS1035	★ 1017
	476-155
SN54ALS109	★ 870
	487-125
SN54ALS11	★ 836
	489-46
SN54ALS112	★ 871
	488-104
SN54ALS113	★ 871
	488-71
SN54ALS114	★ 872
	488-135
SN54ALS12	★ 837
	490-153
SN54ALS1240	★ 1018
	503-120
SN54ALS1241	★ 1018
	504-25
SN54ALS1242	★ 1018
	503-39
SN54ALS1243	★ 1019
	503-40
SN54ALS1244	★ 1019
	504-26
SN54ALS1245	★ 1019
	504-167
SN54ALS131	★ 876
	484-18
SN54ALS133	★ 877
	492-117
SN54ALS137	★ 879
	484-11
SN54ALS138	★ 880
	483-152
SN54ALS139	★ 880
	483-56
SN54ALS15	★ 838
	489-13
SN54ALS151	★ 884
	499-157
SN54ALS153	★ 884
	498-29
SN54ALS157	★ 887
	499-26
SN54ALS158	★ 887
	498-120
SN54ALS160	★ 889
	480-149
SN54ALS161	★ 889
	478-126
SN54ALS1616	★ 1020
SN54ALS162	★ 890
	481-8
SN54ALS1620	★ 1021
	505-103
SN54ALS1621	★ 1021
	505-83
SN54ALS1622	★ 1021
	505-84
SN54ALS1623	★ 1021
	505-104
SN54ALS163	★ 890
	478-173
SN54ALS1638	★ 1022
	504-83
SN54ALS1639	★ 1022
	504-84
SN54ALS164	★ 891
	502-28
SN54ALS1640	★ 1023
	504-117
SN54ALS1641	504-149
SN54ALS1642	★ 1023
	504-97
SN54ALS1643	★ 1023
	504-118
SN54ALS1644	★ 1023
	505-30
SN54ALS1645	★ 1023
	504-168
	★ 1023
	2478-43
SN54ALS165	★ 891
	502-77
SN54ALS166	★ 891
	502-97
SN54ALS168	★ 892
	481-96
SN54ALS169	★ 892
	479-95
SN54ALS16R4	★ 1025
SN54ALS174	★ 895
	486-58
SN54ALS175	★ 895
	485-124
SN54ALS190	★ 901
	481-176
SN54ALS191	★ 901
	479-144
SN54ALS192	★ 902
	481-140
SN54ALS193	★ 902
	480-5
SN54ALS20	★ 839
	490-100
SN54ALS21	★ 839
	488-169
SN54ALS217	★ 440
	★ 905
	497-69
SN54ALS218	★ 440
	★ 906
	497-65
SN54ALS22	★ 840
	490-53
SN54ALS240	★ 910
	503-121
	★ 910
	2471-20
SN54ALS241	★ 911
	504-27
	★ 911
	2470-50
SN54ALS242	★ 911
	503-41
	★ 911
	2476-35
SN54ALS243	★ 912
	503-42
	★ 912
	2476-36
SN54ALS244	★ 912
	503-165
	★ 912
	2470-51
SN54ALS245	★ 913
	504-169
	★ 913
	2478-44
SN54ALS251	★ 915
	500-37
SN54ALS253	★ 915
	497-140
SN54ALS257	★ 916
	498-158
SN54ALS258	★ 917
	498-80
SN54ALS259	★ 917
	496-33
SN54ALS260	494-13
SN54ALS27	★ 842
	494-45
SN54ALS273	★ 919
	486-150
SN54ALS28	★ 842
	494-108
SN54ALS299	★ 927
	502-144
SN54ALS30	★ 842
	492-74
SN54ALS317	★ 440
	★ 928
	497-67
SN54ALS318	★ 440
	★ 928
	497-63
SN54ALS32	★ 843
	493-136
SN54ALS323	★ 930
	502-145
SN54ALS33	★ 843
	494-69
SN54ALS352	★ 932
	497-117
SN54ALS353	★ 933
	497-85
SN54ALS366	477-52
SN54ALS367	175
	485-25
SN54ALS37	★ 844
	491-99
SN54ALS373	496-56
SN54ALS374	486-179
SN54ALS38	★ 844
	491-51
SN54ALS40	★ 845
	490-11
SN54ALS465	★ 952
SN54ALS466	★ 952
SN54ALS467	★ 952
SN54ALS468	★ 952
SN54ALS474	1094-106
SN54ALS518	★ 956
	474-94
SN54ALS519	★ 956
	474-95
SN54ALS520	★ 956
	474-80
SN54ALS521	★ 956
	474-81
SN54ALS522	★ 956
	474-82
SN54ALS533	★ 957
	496-114
SN54ALS534	★ 957
	486-119
SN54ALS538	★ 958
	483-153
SN54ALS539	★ 959
	483-52
SN54ALS540	★ 960
SN54ALS541	★ 960
SN54ALS560	★ 961
	481-70
SN54ALS561	482-80
SN54ALS563	★ 962
	496-115
SN54ALS564	★ 962
	486-120
SN54ALS568	★ 963
	481-92
SN54ALS569	★ 963
	479-87
SN54ALS573	★ 964
	496-57
SN54ALS574	★ 964
	486-180
SN54ALS575	★ 964
	486-181
SN54ALS576	★ 965
	486-121
SN54ALS577	★ 965
	486-182
SN54ALS580	★ 966
	496-116
SN54ALS620	★ 976
	505-105
SN54ALS621	★ 976
	505-85
SN54ALS622	★ 976
	505-86
SN54ALS623	★ 976
SN54ALS632	509-49
SN54ALS633	509-50
SN54ALS634	509-51
SN54ALS635	509-52
SN54ALS636	508-95
SN54ALS637	508-96
SN54ALS638	★ 983
	504-85
SN54ALS639	★ 983
	504-86
SN54ALS640	★ 984
	504-119
SN54ALS641	★ 984
	504-150
SN54ALS642	★ 984
	504-98
SN54ALS643	★ 984
	504-120
SN54ALS644	★ 984
	505-31
SN54ALS645	★ 984
	504-170
	★ 984
	2478-45
SN54ALS646	★ 986
	505-61
SN54ALS647	★ 986
	505-55
SN54ALS648	★ 986
	505-62
SN54ALS649	505-56
SN54ALS651	★ 988
	504-171
	505-63
SN54ALS652	★ 988
	504-172
	505-64
SN54ALS653	★ 989
	505-39
SN54ALS654	★ 989
	505-42
SN54ALS677	★ 993
	474-18
SN54ALS678	★ 993
	474-19
SN54ALS679	★ 994
	474-20
SN54ALS680	★ 994
	474-21
SN54ALS688	★ 998
	474-114

Arranged alphanumerically from left to right.

© IC MASTER 1983

Texas Instruments (Cont'd)

Device	Page-Line
SN54ALS669	★ 998 474-96
SN54ALS74	★ 857 485-71
SN54ALS804	★ 1002
SN54ALS805	★ 1003 494-153
SN54ALS808	★ 1003 489-182
SN54ALS832	★ 1004 493-168
SN54ALS857	★ 1004
SN54ALS869	★ 862 495-24
SN54ALS873	★ 1008 495-115
SN54ALS874	★ 1008 485-40
SN54ALS876	★ 1009 485-41
SN54ALS878	★ 1010 485-42
SN54ALS879	★ 1010 485-43
SN54ALS890	★ 1011 496-9
SN54ALSK1641	★ 1023
SN54AS00	★ 833 492-19
SN54AS02	★ 833 494-112
SN54AS03	★ 835 489-147
SN54AS10	★ 836 490-188
SN54AS1002	★ 1013
SN54AS1032	★ 1016
SN54AS1034	★ 1017 177 485-25
SN54AS109	★ 870 487-127
SN54AS11	★ 836 489-49
SN54AS112	★ 871 488-106
SN54AS113	★ 871 488-73
SN54AS114	★ 872 488-137
SN54AS1242	503-47
SN54AS1243	503-48
SN54AS151	★ 884 499-159
SN54AS153	★ 884 498-31
SN54AS160	★ 889 480-151
SN54AS161	★ 889 478-128
SN54AS162	★ 890 481-10
SN54AS163	★ 890 478-175
SN54AS168	481-98
SN54AS169	★ 892 479-97
SN54AS174	★ 895 486-60
SN54AS175	★ 895
SN54AS181	★ 897 475-12
SN54AS20	★ 839 490-103
SN54AS21	★ 840 488-171
SN54AS230	★ 910 503-167
SN54AS231	★ 910
SN54AS240	★ 910
SN54AS241	★ 911 504-30
SN54AS242	★ 911 503-49
SN54AS243	★ 912 503-50
SN54AS244	★ 912 504-31
SN54AS251	★ 915 500-39
SN54AS253	★ 915 497-142
SN54AS27	★ 842 494-47
SN54AS280	★ 921 509-4
SN54AS30	★ 842 492-76
SN54AS352	★ 932 497-119
SN54AS353	★ 933 497-86
SN54AS373	496-60
SN54AS374	486-187
SN54AS533	★ 957 496-120
SN54AS534	★ 957 486-122
SN54AS573	★ 964
SN54AS574	★ 964
SN54AS575	★ 964 486-188
SN54AS576	★ 965
SN54AS577	★ 965 486-189
SN54AS580	★ 966
SN54AS74	★ 857 485-73
SN54AS800	★ 1001
SN54AS802	★ 1002
SN54AS804	★ 1002 492-58
SN54AS805	494-155
SN54AS808	489-184
SN54AS832	493-170
SN54AS857	★ 1004
SN54AS866	★ 1005
SN54AS867	★ 1005 479-88
SN54AS869	★ 1005 479-89
SN54AS870	★ 1006 496-151
SN54AS871	★ 1007 496-152
SN54AS873	★ 1008
SN54AS874	★ 1008
SN54AS876	★ 1009
SN54AS877	★ 1009 508-124
SN54AS878	★ 1010
SN54AS879	★ 1010 485-48
SN54AS880	★ 1011
SN54AS881	★ 1011 475-13
SN54AS882	★ 1012 475-77
SN54AS885	★ 1012 474-116
SN54AS894	476-21
SN54H00	★ 833
SN54H01	★ 833 491-161
SN54H04	★ 834 478-1
SN54H05	★ 834 477-80
SN54H10	★ 836 491-7
SN54H101	★ 868 487-109
SN54H102	★ 868 487-105
SN54H103	★ 868 488-102
SN54H106	★ 869 488-112
SN54H108	★ 870 488-68
SN54H11	★ 836 489-62
SN54H15	★ 838 489-15
SN54H183	★ 893 474-153
SN54H20	★ 839 490-117
SN54H21	★ 840 488-179
SN54H22	★ 840 490-61
SN54H30	★ 842 492-86
SN54H40	★ 845 490-21
SN54H453	★ 849
SN54H50	★ 848 492-163
SN54H51	★ 848 ★ 849 492-185
SN54H52	492-141
SN54H53	★ 849 493-61
SN54H54	★ 850 493-52
SN54H55	★ 851 493-46
SN54H60	★ 852 507-103
SN54H61	★ 852 507-111
SN54H62	★ 853 508-6
SN54H71	★ 855 487-102
SN54H72	★ 856 487-89
SN54H73	★ 856 488-11
SN54H74	★ 857 485-86
SN54H76	★ 858 488-52
SN54H78	★ 859 487-153
SN54H87	★ 863 508-72
SN54L00	★ 833
SN54L02	★ 833
SN54L03	★ 834 491-142
SN54L04	★ 834 477-166
SN54L10	★ 836 490-180
SN54L121	★ 873
SN54L122	★ 873
SN54L123	★ 874
SN54L153	★ 884
SN54L154	★ 885
SN54L157	★ 887
SN54L164	★ 891 3490-99
SN54L192	★ 902 481-146
SN54L193	★ 902 480-11
SN54L196	480-121
SN54L20	★ 839 490-95
SN54L30	★ 842 492-72
SN54L42	★ 845 483-24
SN54L43	★ 846 482-106
SN54L44	★ 846 482-98
SN54L46	★ 847 467-136
SN54L47	★ 847 467-119
SN54L51	★ 848 492-177
SN54L54	★ 850 493-73
SN54L55	★ 851 493-30
SN54L71	★ 855
SN54L72	★ 856 487-90
SN54L73	★ 856 487-186
SN54L74	★ 857
SN54L75	★ 858
SN54L77	★ 859
SN54L78	★ 859
SN54L85	★ 862
SN54L86	★ 862
SN54L90	★ 864
SN54L91	★ 864 3490-132
SN54L93	★ 865
SN54L95	★ 866 3488-91
SN54L96	★ 866
SN54L98	★ 867
SN54L99	★ 867 3488-92
SN54LS00	★ 833 492-46
SN54LS01	★ 833 491-181
SN54LS02	★ 833 494-139
SN54LS03	★ 834 491-182
SN54LS04	★ 834 478-15
SN54LS05	★ 834 477-94
SN54LS08	★ 835 489-172
SN54LS09	★ 836 489-116
SN54LS10	★ 836 491-21
SN54LS104	506-7
SN54LS105	506-8
SN54LS107A	★ 859 488-30
SN54LS109A	★ 870 487-146
SN54LS11	★ 836 489-75
SN54LS112A	★ 871 488-124
SN54LS113A	★ 871 488-87
SN54LS114A	488-151
SN54LS12	★ 837 490-163
SN54LS122	★ 873 500-131
SN54LS123	★ 874 500-172
	¶ 237-11
SN54LS125A	★ 875 476-153
SN54LS126A	476-128
SN54LS13	★ 837 507-95
SN54LS132	★ 877 507-138
SN54LS136	★ 878 495-1
SN54LS137	★ 879 484-13
SN54LS138	★ 880 483-181
SN54LS139	★ 880 483-78
SN54LS14	★ 837 507-171
SN54LS145	★ 882 482-151
SN54LS147	★ 882 509-35
SN54LS148	★ 883 508-149
SN54LS15	★ 833 489-27
SN54LS151	★ 884 499-180
SN54LS152	★ 884 500-16
SN54LS152A	★ 884 500-17
SN54LS153	★ 884 498-52
SN54LS155	★ 886 483-144
SN54LS156	★ 886 483-112
SN54LS157	★ 887 499-49
SN54LS158	★ 887 498-143
SN54LS160A	★ 889 480-170
SN54LS161A	★ 889 478-148
SN54LS162A	★ 890 481-29
SN54LS163	★ 890
SN54LS164	★ 891 502-45
	★ 891 3490-123
SN54LS165	★ 891 502-84
	★ 891 3490-68
SN54LS166	★ 891 502-104
	★ 891 3490-69
SN54LS168	481-115
SN54LS169	479-113
SN54LS169A	479-114
SN54LS170	★ 893 497-12
	★ 893 3470-59
SN54LS171	★ 893 485-174
SN54LS173A	★ 894 486-40
SN54LS174	★ 895 486-76
SN54LS175	★ 895 485-145
SN54LS18	★ 839 507-96
SN54LS181	★ 897 475-48
SN54LS183	★ 893 474-155
SN54LS189A	★ 440
	★ 900 3471-87
SN54LS19	★ 839 507-172
SN54LS190	★ 901 482-16
SN54LS191	★ 901 479-163
SN54LS192	★ 902 481-161
SN54LS193	★ 902 480-26
SN54LS194A	★ 902 501-168
	★ 902 3488-93
SN54LS195A	★ 903 501-65
	★ 903 3489-20
SN54LS196	★ 903 480-117
SN54LS197	★ 904 478-81
SN54LS20	★ 839 490-131
SN54LS21	★ 840 489-9
SN54LS211	3471-116
SN54LS212	3471-117
SN54LS213	3471-120
SN54LS216	3472-23
SN54LS217	3472-24
SN54LS218	3471-125
SN54LS219A	★ 440
	★ 903 3471-88
SN54LS22	★ 840 490-73
SN54LS221	★ 903 500-148
SN54LS222	★ 907 3456-3
SN54LS224	★ 907 3456-4
SN54LS227	★ 909 3456-7
SN54LS228	★ 909 3456-8
SN54LS24	★ 841 507-139
SN54LS240	★ 910 503-150
	★ 910 2471-21
SN54LS241	★ 911 504-65
	★ 911 2470-52
SN54LS242	★ 911 503-88
	★ 911 2476-37
SN54LS243	★ 912 503-89
	★ 912 2476-38
SN54LS244	★ 912 504-11
	★ 912 2470-53
SN54LS245	★ 913 505-19
SN54LS247	★ 913 2463-173
SN54LS247A	★ 913 2463-174
SN54LS248	★ 914 2463-132
SN54LS249	★ 914 2463-98
SN54LS251	★ 915 500-60
	★ 915 1098-97
SN54LS253	498-2
SN54LS257A	★ 916 498-180
SN54LS258A	★ 917 498-103
SN54LS259	★ 917 496-46
	★ 917 1098-82
SN54LS26	★ 841 491-78
SN54LS260A	494-22
SN54LS261	★ 918 475-106
SN54LS266	★ 918 495-81
SN54LS27	★ 842 494-61
SN54LS273	★ 919 486-167
SN54LS275	★ 920 476-94
SN54LS279	★ 921 495-179
SN54LS28	★ 842 494-139
SN54LS280	★ 921 509-11
SN54LS283	★ 922 476-87
SN54LS289A	★ 440
	★ 924 3471-79
SN54LS290	★ 924 480-75
SN54LS292	★ 924 482-89
SN54LS293	★ 925 479-68
SN54LS294	★ 925 482-76
SN54LS295B	★ 925 501-32
	★ 925 3489-21
SN54LS297	★ 926 506-176
	★ 926 2945-41
SN54LS298	★ 926 499-105
SN54LS299	★ 927 502-173
	★ 927 3490-27
SN54LS30	★ 842 492-100

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

© IC MASTER 1983

IC MASTER

Texas Instruments (Cont'd)

Device	Page-Line
SN54LS31	★ 843
	506-19
SN54LS311	3471-112
SN54LS312	3471-113
SN54LS313	3470-86
SN54LS316	3472-19
SN54LS317	3472-20
SN54LS318	3471-123
SN54LS319A	★ 440
	★ 929
	3471-80
SN54LS32	★ 843
	493-158
SN54LS320	★ 929
	506-171
SN54LS321	★ 929
	506-172
SN54LS322A	★ 930
	476-104
SN54LS323	★ 930
	502-174
	★ 930
	3490-28
SN54LS324	2945-163
SN54LS325	507-50
	2946-34
SN54LS326	507-51
	2946-35
SN54LS327	507-52
	2946-36
SN54LS33	★ 843
	494-79
SN54LS333	3458-11
SN54LS334	3458-12
SN54LS335	3458-7
SN54LS336	3458-8
SN54LS347	★ 931
	2463-143
SN54LS348	★ 931
	508-150
SN54LS352	★ 932
	497-135
SN54LS353	★ 933
	497-103
SN54LS354	★ 933
	500-26
SN54LS355	★ 934
	500-22
SN54LS356	★ 934
	500-27
SN54LS357	★ 935
	500-23
SN54LS360	505-161
SN54LS361	505-160
SN54LS362	1098-91
SN54LS365A	★ 935
	477-20
	★ 935
	2471-28
SN54LS366A	★ 935
	477-144
	★ 935
	2471-32
SN54LS367A	★ 936
	477-21
	★ 936
	2471-29
SN54LS368A	★ 936
	477-145
	★ 936
	2471-33
SN54LS37	★ 844
	491-113
SN54LS373	★ 937
	496-90
SN54LS374	★ 938
	487-25
SN54LS375	★ 938
	495-145
SN54LS377	★ 939
	487-57
SN54LS378	★ 939
	486-103
SN54LS379	486-9
SN54LS38	★ 844
	491-63
SN54LS381	★ 940
	475-49
SN54LS382	★ 941
	475-50
SN54LS384	★ 941
	476-1
SN54LS385	★ 942
	474-13
SN54LS386	★ 942
	495-48
SN54LS390	★ 943
	481-62
SN54LS393	★ 943
	479-21
SN54LS395A	★ 943
	501-129
	★ 943
	3489-22
SN54LS396	★ 944
	496-155
SN54LS398	★ 944
	499-106
SN54LS399	★ 944
	499-107
SN54LS40	★ 845
	490-35
SN54LS42	★ 845
	483-37
SN54LS422	★ 945
	500-116
SN54LS423	★ 945
	500-150
SN54LS424	1094-107
SN54LS440	★ 947
	2476-8
SN54LS441	★ 947
	2476-9
SN54LS442	★ 947
	503-100
	★ 947
	2476-11
SN54LS443	★ 947
	503-101
	★ 947
	2476-12
SN54LS444	★ 947
	503-102
	★ 947
	2476-13
SN54LS445	★ 947
	482-127
SN54LS446	★ 950
	2476-39
SN54LS447	★ 950
	2463-144
SN54LS448	★ 951
	503-103
	★ 951
	2476-10
SN54LS449	★ 951
	2476-40
SN54LS465	★ 952
	477-46
SN54LS466	★ 952
	478-35
SN54LS467	★ 952
	477-47
SN54LS468	★ 952
	478-36
SN54LS47	★ 847
	2463-175
SN54LS48	★ 847
	2463-133
SN54LS49	★ 847
	2463-99
SN54LS490	★ 955
	481-63
SN54LS51	★ 848
	493-9
SN54LS54	★ 850
	493-97
SN54LS540	★ 950
	503-151
	★ 950
	2471-22
SN54LS541	★ 950
	504-66
	★ 950
	2470-54
SN54LS55	★ 851
	493-40
SN54LS56	★ 851
	509-57
SN54LS57	★ 852
	509-59
SN54LS590	★ 965
	479-76
SN54LS591	★ 966
	479-77
SN54LS592	★ 967
	479-72
SN54LS593	★ 967
	479-73
SN54LS594	★ 968
	502-113
SN54LS595	★ 968
	502-114
SN54LS596	★ 968
	502-115
SN54LS597	★ 969
	502-106
SN54LS598	★ 969
	502-107
SN54LS599	★ 970
	502-116
SN54LS600	★ 440
	★ 971
	506-21
SN54LS601	★ 440
	★ 971
	506-22
SN54LS602	★ 440
	★ 972
	506-23
SN54LS603	★ 440
	★ 972
	506-24
SN54LS604	★ 973
	496-11
SN54LS605	★ 973
	496-12
SN54LS606	★ 973
	496-13
SN54LS607	★ 973
	496-14
SN54LS608	★ 974
	496-15
SN54LS610	★ 975
	506-143
SN54LS611	★ 975
	506-144
SN54LS612	★ 975
	506-145
SN54LS613	★ 975
	506-146
SN54LS620	★ 976
	2478-46
SN54LS621	★ 976
	2478-22
SN54LS622	★ 976
	2478-23
SN54LS623	★ 976
	2478-47
SN54LS624	★ 977
	507-28
	★ 977
	2945-164
SN54LS625	★ 977
	507-57
	★ 977
	2946-37
SN54LS626	★ 977
	507-58
	★ 977
	2946-38
SN54LS627	★ 978
	507-59
	★ 978
	2946-39
SN54LS628	★ 978
	507-29
	★ 978
	2945-165
SN54LS629	★ 978
	507-60
	★ 978
	2946-40
SN54LS63	★ 853
	507-146
SN54LS630	★ 440
	★ 979
	2467-19
	¶ 285-8
SN54LS631	★ 440
	★ 979
	2467-20
	¶ 285-8
SN54LS632	★ 980
SN54LS633	★ 980
SN54LS634	★ 981
SN54LS635	★ 981
SN54LS636	★ 982
SN54LS637	★ 982
SN54LS638	★ 983
SN54LS639	★ 983
SN54LS640	★ 984
	504-137
	★ 984
	2478-48
SN54LS641	★ 984
	504-160
	★ 984
	2478-24
SN54LS642	★ 984
	504-107
	★ 984
	2478-25
SN54LS643	★ 984
	504-138
	★ 984
	2478-49
SN54LS644	★ 984
	505-36
	★ 984
	2478-26
SN54LS645	★ 984
	505-20
	★ 984
	2478-50
SN54LS646	★ 986
	2479-19
SN54LS647	★ 986
	2479-13
SN54LS648	★ 986
	2479-20
SN54LS649	★ 986
	2479-14
SN54LS651	★ 988
	505-21
	505-65
SN54LS652	★ 988
	505-22
	505-66
SN54LS653	★ 989
SN54LS654	★ 989
SN54LS668	★ 990
	481-116
SN54LS669	★ 990
	479-115
SN54LS670	★ 990
	497-25
	★ 990
	3470-70
SN54LS671	★ 991
	501-20
SN54LS672	★ 991
	501-21
SN54LS673	★ 992
	503-27
SN54LS674	★ 992
	503-25
SN54LS68	★ 854
	482-64
SN54LS681	★ 995
	476-16
SN54LS682	★ 996
	474-127
SN54LS683	★ 996
	474-108
SN54LS684	★ 996
	474-128
SN54LS685	★ 996
	474-109
SN54LS686	★ 997
	474-129
SN54LS687	★ 997
SN54LS688	★ 998
	474-130
SN54LS689	★ 998
	474-110
SN54LS69	★ 854
	482-62
SN54LS690	★ 999
	481-30
SN54LS691	★ 999
	478-93
SN54LS692	★ 999
	481-31
SN54LS693	★ 999
	478-94
SN54LS696	★ 1000
	481-84
SN54LS697	★ 1000
	479-81
SN54LS698	★ 1000
	481-85
SN54LS699	★ 1000
	479-82
SN54LS73A	★ 856
	488-31
SN54LS74A	★ 857
	485-100
SN54LS75	★ 858
	495-146
SN54LS76A	★ 858
	488-62
SN54LS77	★ 859
	495-155
SN54LS78A	★ 859
	487-160
SN54LS83A	★ 861
	476-88
SN54LS85	474-63
SN54LS86	★ 862
	495-49
SN54LS90	★ 864
	480-76
SN54LS91	★ 864
	502-136
	★ 864
	3491-14
SN54LS92	★ 864
	482-50
SN54LS93	★ 865
	479-69
SN54LS95B	★ 866
	501-101
	★ 866
	3488-94
SN54LS96	★ 866
	502-7
	★ 866
	3489-116
SN54PL16L8	★ 1025
SN54PL16R6	★ 1026
SN54PL16R8	★ 1026
SN54PL20L8	★ 1027
SN54PL20R4	★ 1027
SN54PL20R6	★ 1028
SN54PL20R8	★ 1028
SN54PL333	★ 1029
SN54PL335	★ 1029
SN54PL839	★ 1030
SN54PL840	★ 1030
SN54PLR19L8	★ 1031
SN54PLR19R4	★ 1031
SN54PLR19R6	★ 1032
SN54PLR19R8	★ 1032
SN54PLT19L8	★ 1033
SN54PLT19R4	★ 1033
SN54PLT19R6	★ 1034
SN54PLT19R8	★ 1034
SN54S00	★ 833
	492-55
SN54S02	★ 833
	494-149
SN54S03	★ 834
	491-192
SN54S04	★ 834
	478-25
SN54S05	★ 834
	477-103
SN54S08	★ 835
	489-180
SN54S09	★ 836
	489-120
SN54S10	★ 836
	491-30
SN54S11	★ 836
	489-84
SN54S112	★ 871
	488-133
SN54S113	★ 871
	488-96
SN54S114	★ 872
	488-157
SN54S124	★ 874
	2546-41
SN54S132	★ 877
	507-144
SN54S133	★ 877
	492-133
SN54S134	★ 877
	492-115
SN54S135	★ 878
	494-164
SN54S138	★ 880
	484-1
SN54S139	★ 880
	483-88
SN54S140	★ 881
	484-59
	★ 881
	2471-58
SN54S15	★ 838
	489-34
SN54S151	★ 884
	499-193
SN54S153	★ 884
	498-62
SN54S157	★ 887
	499-60
SN54S158	★ 887
	498-154
SN54S162	★ 890
	481-36
SN54S163	★ 890
	479-2
SN54S168	★ 892
	481-118
SN54S169	★ 892
	479-120
SN54S174	★ 895
	486-87
SN54S175	★ 895
	485-156
SN54S181	★ 897
	475-63
SN54S182	★ 898
	475-91
SN54S189A	★ 900
	3471-55
SN54S194	★ 902
	501-176
	★ 902
	3489-43
SN54S195	★ 903
	501-75
	★ 903
	3489-44
SN54S196	★ 903
SN54S197	★ 904
	478-83
SN54S20	★ 839
	490-140
SN54S22	★ 840
	490-80
SN54S226	★ 908
	508-54
SN54S240	★ 910
	503-162
	★ 910
	2471-23
SN54S241	★ 911
	504-75
	★ 911
	2470-55
SN54S244	★ 912
	504-19
SN54S251	★ 915
	500-70
SN54S253	★ 915
SN54S257	★ 916
	498-190
SN54S258	★ 917
	498-114
SN54S260	★ 918
	494-28
SN54S270	★ 919
SN54S271	★ 919
SN54S274	★ 920
SN54S275	476-96
SN54S280	★ 921
	509-24
SN54S281	★ 922
	476-19
SN54S283	★ 922
	476-91

Arranged alphanumerically from left to right.

© IC MASTER 1983

Texas Instruments (Cont'd)

Device	Page-Line
SN54S288A	★ 924
	3471-47
SN54S299	★ 927
	502-179
	★ 927
	3490-31
SN54S30	★ 842
	492-106
SN54S32	★ 843
	493-166
SN54S37	★ 844
	491-117
SN54S370	★ 936
SN54S371	★ 937
SN54S373	★ 937
	496-102
SN54S374	★ 933
	487-36
SN54S38	★ 844
	491-67
SN54S381	★ 940
	475-64
SN54S40	★ 845
	490-44
SN54S412	★ 945
	496-103
	★ 945
	1094-165
SN54S435	★ 947
	485-11
	★ 947
	2483-133
SN54S437	★ 947
	485-12
	★ 947
	2483-134
SN54S455	3463-98
SN54S402	★ 954
	506-165
	★ 954
	1036-84
SN54S404	★ 955
SN54S405	★ 955
SN54S51	★ 848
	493-17
SN54S64	★ 853
	493-111
SN54S65	★ 853
	493-118
SN54S74	★ 857
	485-108
SN54S744	503-114
SN54S85	★ 832
	474-68
SN54S86	★ 832
	495-58
SN54SL245	2478-51
SN55107A	2474-25
SN55107B	2474-39
SN55108A	2474-32
SN55108B	2474-44
SN55109A	2472-14
SN55110A	2472-21
SN55113	2472-5
SN55114	2471-45
SN55115	2474-61
SN55116	2479-41
SN55117	2479-47
SN55118	2479-43
SN55119	2479-45
SN55121	2469-13
SN55122	2473-17
SN55128	2471-47
SN55138	2477-52
SN55140	2473-1
SN55141	2473-2
SN55142A	2472-56
SN55143A	2472-57
SN55150	2469-22
SN55152	2475-4
SN55157	2474-52
SN55180	505-148
SN55182	2475-5
SN55183	2471-59
SN55188	2469-61
SN55189	2473-27
SN55189A	2473-36
SN5520	2485-10
SN5522	2485-46
SN55232	2485-24
SN55234	2485-17
SN55236	2485-13
SN55237	2485-14
SN5524	2485-36
SN5528	2485-41
SN55325	2481-2
SN55326	2481-8
SN55327	2481-9
SN55329	2485-74
SN55355	2483-45
SN55363	2481-77
SN55365	2483-46
SN55369	2481-106
SN55426B	2464-78
SN55427B	2464-79
SN55450B	2481-145
SN55451B	2481-146
SN55452B	2482-36
SN55453B	2482-107
SN55454B	2482-72
SN55460	2481-147
SN55461	2481-148
SN55462	2482-37
SN55463	2482-103
SN55464	2482-73
SN55470	2481-149
SN55471	2481-150
SN55472	2482-38
SN55473	2482-109
SN55474	2482-74
SN5N453	★ 849
SN64LS299	3490-29
SN73ALS519	474-97
SN74-ALS569	479-90
SN7400	★ 833
	492-10
	¶ 261-5
SN7401	★ 833
	491-143
SN7402	★ 833
	494-98
SN7403	★ 834
	491-144
SN7404	★ 834
	477-167
SN7405	★ 834
	477-67
SN7406	★ 835
	485-6
SN7407	★ 835
	484-143
SN7408	★ 835
	489-134
SN7409	★ 835
	489-96
SN7410	★ 835
	490-181
SN74100	★ 837
	495-110
SN74107	★ 869
	488-1
SN74109	★ 870
	487-120
SN74109A	★ 870
	2472-15
SN74110	★ 870
	487-71
SN74111	★ 871
	488-35
SN74116	★ 872
	495-103
SN7412	490-150
SN74120	★ 873
	507-49
SN74121	★ 873
	500-106
SN74122	★ 873
	500-125
SN74123	★ 874
	500-166
SN74125	★ 875
	476-141
SN74126	★ 875
	476-115
SN74128	★ 876
	484-114
	★ 876
	2472-31
SN7413	★ 837
	507-80
SN74132	★ 877
	507-128
SN74136	★ 878
	494-171
SN7414	★ 837
	507-158
SN74141	★ 881
	2464-77
SN74142	★ 881
	482-66
SN74143	★ 882
	482-68
SN74144	★ 882
	482-70
SN74145	★ 882
	482-149
SN74147	★ 882
	509-34
SN74148	★ 883
	508-140
SN74150	★ 883
	500-66
SN74151A	★ 884
	499-154
SN74153	★ 884
	498-26
SN74154	★ 885
	484-39
SN74155	★ 886
	483-132
SN74156	★ 886
	483-100
SN74157	★ 887
	499-23
SN74159	★ 888
	484-45
SN7416	★ 838
	484-157
SN74160	★ 889
	480-144
	¶ 232-0
SN74161	★ 889
	478-121
	¶ 232-0
SN74162	★ 890
	480-186
	¶ 232-0
SN74163	★ 890
	478-168
	¶ 232-0
SN74164	★ 891
	502-25
	★ 891
	3490-124
SN74165	★ 891
	502-76
	★ 891
	3490-55
SN74166	★ 891
	502-96
	★ 891
	3490-70
SN74167	★ 892
	507-23
SN7417	★ 838
	484-133
SN74170	★ 893
	497-2
	★ 893
	3470-60
SN74172	★ 894
	497-27
	★ 894
	3470-79
SN74173	★ 894
	486-31
SN74174	★ 895
	486-55
SN74175	★ 895
	485-123
SN74176	★ 896
	480-106
SN74177	★ 896
	478-69
SN74178	★ 896
	501-109
	★ 896
	3488-95
SN74179	★ 897
	501-119
	★ 897
	3488-96
SN74180	★ 897
	509-3
SN74181	★ 897
	475-11
SN74182	★ 893
	475-76
	¶ 288-12
SN74184	★ 899
	507-44
	★ 899
	3454-7
SN74185A	★ 900
	507-37
	★ 900
	3454-2
SN74186	3459-57
SN74187	★ 900
	3484-4
SN74188A	3459-45
SN74190	★ 901
	481-173
SN74191	★ 901
	479-134
SN74192	★ 902
	481-137
SN74193	★ 902
	480-2
SN74194	★ 902
	501-151
	★ 902
	3488-97
SN74195	★ 903
	501-51
	★ 903
	3489-23
SN74196	★ 903
	480-107
SN74197	★ 904
	478-70
SN74198	★ 904
	502-53
	★ 904
	3490-15
SN74199	★ 905
	502-62
	★ 905
	3490-16
SN7420	★ 839
	490-96
SN74201	★ 840
SN7422	★ 840
	490-50
SN74221	★ 906
	500-141
SN7423	★ 840
	494-12
SN74246	★ 913
	2464-16
SN74247	★ 913
	2463-176
SN74248	★ 914
	2463-134
SN74249	★ 914
	2463-100
SN7425	★ 841
	494-3
SN74251	★ 915
	500-34
SN74259	★ 917
	496-32
SN7426	★ 841
	484-92
SN74265	★ 910
	507-115
SN7427	★ 842
	494-42
SN74273	★ 919
	486-145
SN74276	★ 920
	488-162
SN74278	★ 921
	508-57
SN74279	★ 921
	495-167
SN7428	★ 842
	494-99
SN74283	★ 922
	476-62
	¶ 288-12
SN74284	★ 923
	475-113
	¶ 288-12
SN74285	★ 923
	475-110
	¶ 288-12
SN74290	★ 924
	480-54
SN74293	★ 925
	479-43
SN74294	★ 926
	499-75
SN7430	★ 842
	492-73
SN7432	★ 843
	493-130
SN7433	★ 843
	494-66
SN74351	★ 932
	498-66
SN74365A	★ 935
	171
	485-24
SN74366A	★ 935
	119
	485-23
SN74367A	★ 936
	172
	485-25
SN74368A	★ 936
	120
	485-23
SN7437	★ 844
	491-96
SN74376	★ 939
	488-160
SN7438	★ 844
	491-47
SN7439	★ 844
	491-48
SN74390	★ 943
	481-42
SN74393	★ 943
	479-9
SN7440	★ 845
	490-8
SN74425	★ 946
	476-142
SN74426	★ 946
	476-116
SN7442A	★ 845
	483-25
SN7443A	★ 846
	482-107
SN7444A	★ 846
	482-99
SN7445	★ 846
	482-138
SN7446A	★ 847
	2464-17
SN7447A	★ 847
	2464-1
SN7448	★ 847
	2463-135
SN7449	★ 847
	2463-101
SN74490	★ 955
	481-43
SN7450	★ 848
	492-156
SN7451	★ 848
	492-178
SN7453	★ 849
	493-85
SN7454	★ 850
	493-74
SN745740	503-109
SN7460	★ 852
	493-28
SN7470	★ 855
	487-69
SN7472	★ 856
	487-82
SN7473	★ 856
	488-2
SN7474	★ 857
	485-66
SN7475	★ 858
	495-129
SN7476	★ 858
	488-48
SN74C0	★ 860
	474-145
SN7401A	★ 000
	496-165
	★ 860
	3470-80
SN7402	★ 860
	474-163
SN7403A	★ 861
	476-63
SN74S431	★ 953
SN74C4A	★ 861
	496-166
	★ 861
	3470-81
SN74C5	★ 862
	474-64
SN74C6	★ 862
	485-23
SN74C8A	★ 863
	3484-1
SN7409	★ 440
	★ 863
	497-41
	★ 440
	★ 863
	3471-93
SN74C0A	★ 864
	480-55
SN7491A	★ 864
	502-133
	★ 864
	3491-15
SN7402A	★ 864
	482-39
SN7403A	★ 865
	479-44
SN7404	★ 865
	501-138
	★ 865
	3489-86
SN74C5A	★ 866
	501-90
	★ 866
	3488-98
SN74C6	★ 866
	502-3
	★ 866
	3489-115
SN7497	★ 866
	508-80
SN74AL867	479-91
SN74AL869	479-92
SN74ALS00	★ 833
	492-17
SN74ALS01	★ 833
	491-152
SN74ALS02	★ 833
	494-109
SN74ALS03	★ 834
	491-153
SN74ALS04	★ 834
	477-174
SN74ALS05	★ 834
	477-72
SN74ALS08	★ 835
	489-145
SN74ALS09	★ 836
	489-100
SN74ALS10	★ 836
	490-186
SN74ALS1000	★ 1013
	492-18
SN74ALS1002	★ 1013
	494-110
SN74ALS1003	★ 1014
	491-154
SN74ALS1004	★ 1014
	477-175
SN74ALS1005	★ 1014
	477-73
SN74ALS1008	★ 1015
	489-146
SN74ALS1010	★ 1015
	490-187
SN74ALS1011	★ 1015
	489-47
SN74ALS1020	★ 1016
	490-101
SN74ALS1032	★ 1016
	493-137
SN74ALS1034	★ 1017
SN74ALS1035	★ 1017
	476-156

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

Texas Instruments (Cont'd)

Device	Page-Line
SN74ALS109	★ 870 487-126
SN74ALS11	★ 836 489-48
SN74ALS112	★ 871 488-105
SN74ALS113	★ 871 488-72
SN74ALS114	★ 872 488-136
SN74ALS12	★ 837 490-154
SN74ALS1240	★ 1018 503-122
SN74ALS1241	★ 1018 504-28
SN74ALS1242	★ 1018 503-43
SN74ALS1243	★ 1019 503-44
SN74ALS1244	★ 1019 503-166
SN74ALS1245	★ 1019 504-173
SN74ALS131	★ 876 484-19
SN74ALS133	★ 877 492-118
SN74ALS137	★ 879 484-12
SN74ALS138	★ 880 483-154
SN74ALS139	★ 880 483-57
SN74ALS15	★ 838 489-14
SN74ALS151	★ 884 499-158
SN74ALS153	★ 884 498-30
SN74ALS157	★ 887 499-27
SN74ALS158	★ 887 498-121
SN74ALS160	★ 889 480-150
SN74ALS161	★ 889 478-127
SN74ALS1616	★ 1020
SN74ALS162	★ 890 481-9
SN74ALS1620	★ 1021 505-106
SN74ALS1620-1	★ 1021 505-107
SN74ALS1621	★ 1021 505-87
SN74ALS1621-1	★ 1021 505-88
SN74ALS1622	★ 1021 505-89
SN74ALS1622-1	★ 1021 505-90
SN74ALS1623	★ 1021 505-108
SN74ALS1623-1	★ 1021 505-109
SN74ALS163	★ 890 478-174
SN74ALS1638	★ 1022 504-87
SN74ALS1638-1	★ 1022 504-88
SN74ALS1639	★ 1022 504-89
SN74ALS1639-1	★ 1022 504-90
SN74ALS164	★ 891 502-29
SN74ALS1640	★ 1023 504-121
SN74ALS1640-1	★ 1023 504-122
SN74ALS1641	★ 1023 504-151
SN74ALS1641-1	★ 1023 504-152
SN74ALS1642	★ 1023 504-99
SN74ALS1642-1	★ 1023 504-100
SN74ALS1643	★ 1023 504-123
SN74ALS1643-1	★ 1023 504-124
SN74ALS1644	★ 1023 505-32
SN74ALS1644-1	★ 1023 505-33
SN74ALS1645	★ 1023 504-174
	★ 1023 2479-32
SN74ALS1645-1	★ 1023 504-175
SN74ALS165	★ 891 502-78
SN74ALS166	★ 891 502-98
SN74ALS168	★ 892 481-97
SN74ALS169	★ 892 479-96
SN74ALS16R4	★ 1025
SN74ALS174	★ 895 486-59
SN74ALS175	★ 895 485-125
SN74ALS190	★ 901 481-177
SN74ALS191	★ 901 479-145
SN74ALS192	★ 902 481-141
SN74ALS193	★ 902 480-6
SN74ALS20	★ 839 490-102
SN74ALS21	★ 840 488-170
SN74ALS217	★ 905 497-70
SN74ALS218	★ 906 497-66
SN74ALS22	★ 840 490-54
SN74ALS240	★ 910 503-123
	★ 910 2471-24
SN74ALS241	★ 911 504-29
	★ 911 2470-56
SN74ALS242	★ 911 503-45
	★ 911 2477-4
SN74ALS243	★ 912 503-46
	★ 912 2477-5
SN74ALS244	★ 912 2470-57
SN74ALS245	★ 913 504-176
	★ 913 2479-33
SN74ALS251	★ 915 500-38
SN74ALS253	★ 915 497-141
SN74ALS257	★ 916 498-159
SN74ALS258	★ 917 498-81
SN74ALS259	★ 917 496-34
SN74ALS27	★ 842 494-46
SN74ALS273	★ 919 486-151
SN74ALS28	★ 842 494-111
SN74ALS299	★ 927 502-146
SN74ALS30	★ 842 492-75
SN74ALS317	★ 928 497-68
SN74ALS318	★ 928 497-64
SN74ALS32	★ 843 493-138
SN74ALS323	★ 930 502-147
SN74ALS33	★ 843 494-70
SN74ALS352	★ 932 497-118
SN74ALS353	★ 933 497-87
SN74ALS366	477-53
SN74ALS366-1	477-54
SN74ALS367	176 485-25
SN74ALS37	★ 844 491-100
SN74ALS373	496-58
SN74ALS374	486-183
SN74ALS38	★ 844 491-52
SN74ALS40	★ 845 490-12
SN74ALS465	★ 952
SN74ALS466	★ 952
SN74ALS467	★ 952
SN74ALS468	★ 952
SN74ALS518	★ 956 474-98
SN74ALS519	★ 956
SN74ALS520	★ 956 474-83
SN74ALS521	★ 956 474-84
SN74ALS522	★ 956 474-85
SN74ALS533	★ 957 496-117
SN74ALS534	★ 957 486-123
SN74ALS538	★ 958 483-155
SN74ALS539	★ 959 483-53
SN74ALS540	★ 960
SN74ALS541	★ 960
SN74ALS560	★ 961 481-71
SN74ALS561	★ 961 482-81
SN74ALS563	★ 962 496-118
SN74ALS564	★ 962 486-124
SN74ALS568	★ 963 481-93
SN74ALS569	★ 963
SN74ALS573	★ 964 496-59
SN74ALS574	★ 964 486-184
SN74ALS575	★ 964 486-185
SN74ALS576	★ 965 486-125
SN74ALS577	★ 965 486-186
SN74ALS580	★ 966 496-119
SN74ALS620	★ 976 505-110
SN74ALS621	★ 976 505-91
SN74ALS622	★ 976 505-92
SN74ALS623	★ 976 509-53
SN74ALS632	509-54
SN74ALS633	509-55
SN74ALS634	509-56
SN74ALS635	508-97
SN74ALS636	508-98
SN74ALS637	★ 983 504-91
SN74ALS638	★ 983 504-92
SN74ALS639	★ 984 504-125
SN74ALS640	★ 984 504-153
SN74ALS641	★ 984 504-101
SN74ALS642	★ 984 504-126
SN74ALS643	★ 984 505-34
SN74ALS644	★ 984 504-177
SN74ALS644-1	★ 984 2479-34
SN74ALS645	★ 986 505-67
SN74ALS646	★ 986 505-68
SN74ALS646-1	★ 986 505-57
SN74ALS647	★ 986 505-58
SN74ALS647-1	★ 986 505-69
SN74ALS648	★ 986 505-70
SN74ALS648-1	★ 986 505-59
SN74ALS649	505-60
SN74ALS649-1	★ 988 504-127
SN74ALS651	★ 988 505-71
SN74ALS651-1	★ 988 505-72
SN74ALS652	★ 988 504-128
	505-73
SN74ALS652-1	★ 988 505-74
SN74ALS653	★ 989 505-40
SN74ALS653-1	★ 989 505-41
SN74ALS654	★ 989 505-43
SN74ALS654-1	★ 989 505-44
SN74ALS677	★ 993 474-22
SN74ALS678	★ 993 474-23
SN74ALS679	★ 994 474-24
SN74ALS680	★ 994 474-25
SN74ALS688	★ 998 474-115
SN74ALS689	★ 998 474-99
SN74ALS74	★ 857 485-72
SN74ALS804	★ 1002 492-57
SN74ALS805	★ 1003 494-154
SN74ALS808	★ 1003 489-183
SN74ALS832	★ 1004 493-169
SN74ALS857	★ 1004
SN74ALS86	★ 852 495-25
SN74ALS873	★ 1008 495-116
SN74ALS874	★ 1008 485-44
SN74ALS876	★ 1009 485-45
SN74ALS878	★ 1010 485-46
SN74ALS879	★ 1010 485-47
SN74ALS880	★ 1011 496-10
SN74AS00	★ 833 492-20
SN74AS02	★ 833 494-113
SN74AS08	★ 835 489-148
SN74AS10	★ 836 490-189
SN74AS1002	★ 1013
SN74AS1032	★ 1016
SN74AS1034	★ 1017
SN74AS109	★ 870 487-128
SN74AS11	★ 836 489-50
SN74AS112	★ 871 488-107
SN74AS113	★ 871 488-74
SN74AS114	★ 872 488-138
SN74AS1242	503-51
SN74AS1243	507-113
SN74AS151	★ 884 499-160
SN74AS153	★ 884 498-32
SN74AS160	★ 889 480-152
SN74AS161	★ 889 478-129
SN74AS162	★ 890 481-11
SN74AS163	★ 890 478-176
SN74AS168	481-99
SN74AS169	★ 892 479-98
SN74AS174	★ 895 486-61
SN74AS175	★ 895
SN74AS181	★ 897 475-14
SN74AS20	★ 839 490-104
SN74AS21	★ 840 488-172
SN74AS230	★ 910 503-168
SN74AS231	★ 910
SN74AS240	★ 910
SN74AS241	★ 911 504-32
SN74AS242	★ 911 503-52
SN74AS243	★ 912 503-53
SN74AS244	★ 912 503-169
SN74AS251	★ 915 500-40
SN74AS253	★ 915 497-143
SN74AS27	★ 842 494-48
SN74AS280	★ 921 509-5
SN74AS30	★ 842 492-77
SN74AS352	★ 932 497-120
SN74AS353	★ 933 497-88
SN74AS373	496-61
SN74AS374	486-190
SN74AS533	★ 957 496-121
SN74AS534	★ 957 486-126
SN74AS573	★ 964
SN74AS574	★ 964
SN74AS575	★ 964 486-191
SN74AS576	★ 965
SN74AS577	★ 965 486-192
SN74AS580	★ 966
SN74AS74	★ 857 485-74
SN74AS800	★ 1001
SN74AS802	★ 1002
SN74AS804	★ 1002 492-59
SN74AS805	494-156
SN74AS808	489-185
SN74AS832	493-171
SN74AS857	★ 1004
SN74AS866	★ 1005
SN74AS867	★ 1005
SN74AS869	★ 1005
SN74AS870	★ 1006 496-153
SN74AS871	★ 1007 496-154
SN74AS873	★ 1008
SN74AS874	★ 1008
SN74AS876	★ 1009
SN74AS877	★ 1009 508-125
SN74AS878	★ 1010
SN74AS879	★ 1010 485-49
SN74AS880	★ 1011
SN74AS881	★ 1011 475-15
SN74AS882	★ 1012 475-78
SN74AS885	★ 1012 474-117
SN74AS894	476-22
SN74H00	★ 833 492-33
SN74H01	★ 833 491-162
SN74H04	★ 834 478-2
SN74H05	★ 834 477-81
SN74H10	★ 836 491-8
SN74H101	★ 868 487-110
SN74H102	★ 868 487-106
SN74H103	★ 868 488-103
SN74H106	★ 869 488-113
SN74H108	★ 870 488-69
SN74H11	★ 836 489-63
SN74H15	★ 838 489-16
SN74H183	★ 893 474-154
	¶ 288-12
SN74H20	★ 839 490-118
SN74H21	★ 840 488-180
SN74H22	★ 840 490-62
SN74H30	★ 842 492-87
SN74H40	★ 845 490-22
SN74H50	★ 848 492-164
SN74H51	★ 848
	★ 849 492-186
SN74H52	492-142
SN74H53	★ 849 493-62
SN74H54	★ 850 493-53
SN74H55	★ 851 493-47
SN74H60	★ 852 507-104
SN74H61	★ 852 507-112
SN74H62	★ 853 508-7
SN74H71	★ 855 487-103
SN74H72	★ 856 487-91
SN74H73	★ 856 488-12
SN74H74	★ 857 485-87
SN74H76	★ 858 488-53
SN74H78	★ 859 487-154
SN74H87	★ 863 508-73
SN74L00	★ 833
SN74L157	★ 887
SN74L164	3490-100
SN74L47	2464-2

Arranged alphanumerically from left to right.

© IC MASTER 1983

Texas Instruments (Cont'd)

SN74L91 3490-133
SN74L95 3488-42
SN74L99 3488-43
SN74LS00 ★ 833 492-47
SN74LS01 ★ 833 491-183
SN74LS02 ★ 833 494-140
SN74LS03 ★ 834 491-184
SN74LS04 ★ 834 478-16
SN74LS05 ★ 834 477-95
SN74LS08 ★ 835 489-173
SN74LS09 ★ 836 489-117
SN74LS10 ★ 836 491-22
SN74LS104 506-9
SN74LS105 506-10
SN74LS107A ★ 869 488-32
SN74LS109A ★ 870 487-147
SN74LS11 ★ 836 489-76
SN74LS112A ★ 871 488-125
SN74LS113A ★ 871 488-88
SN74LS114A 488-152
SN74LS12 ★ 837 490-164
SN74LS122 ★ 873 500-132
SN74LS123 ★ 874 500-173
¶ 237-11
SN74LS124 507-53 2946-42
SN74LS125A ★ 875 476-154
SN74LS126A ★ 875 476-129
SN74LS13 ★ 837 507-97
SN74LS132 507-140
SN74LS136 ★ 878 495-2
SN74LS137 ★ 879 484-14
SN74LS138 ★ 880 483-182
★ 880 1094-128
SN74LS139 ★ 880 483-79
SN74LS14 ★ 837 507-173
SN74LS145 ★ 882 482-152
SN74LS147 ★ 882 509-36
SN74LS148 ★ 883 508-151
★ 883 1098-113
SN74LS15 ★ 838 489-28
SN74LS151 ★ 884 499-181
SN74LS153 ★ 884 498-53
SN74LS155 ★ 886 483-145
SN74LS156 ★ 886 483-113
SN74LS157 ★ 887 499-50
SN74LS158 ★ 887 498-144
SN74LS160A ★ 889 480-171
SN74LS161A ★ 889 478-149
SN74LS162 ★ 890
SN74LS163A ★ 890 478-190
SN74LS164 ★ 891 502-46
★ 891 3490-125
SN74LS165 ★ 891 502-85
★ 891 3490-71
SN74LS166 ★ 891 502-105
★ 891 3490-72
SN74LS169A 479-116
SN74LS169B 479-117
SN74LS170 ★ 893 497-13
★ 893 3470-61
SN74LS171 ★ 893 485-175
SN74LS173A ★ 894 486-41
SN74LS174 ★ 895 486-77
SN74LS175 ★ 895 485-146
SN74LS18 ★ 839 507-98
SN74LS181 ★ 897 475-51
SN74LS183 ★ 898 474-156
SN74LS189A ★ 900 3471-89
SN74LS19 ★ 839 507-174
SN74LS190 ★ 901 482-17
SN74LS191 ★ 901 479-164
SN74LS192 ★ 902 481-162
SN74LS193 ★ 902 480-27
SN74LS194A ★ 902 501-169
★ 902 3488-99
SN74LS195A ★ 903 501-66
★ 903 3489-24
SN74LS196 ★ 903 480-118
SN74LS197 ★ 904 478-82
SN74LS20 ★ 839 490-132
SN74LS21 ★ 840 489-10
SN74LS211 3471-118
SN74LS212 3471-119
SN74LS213 3471-121
SN74LS214 3476-13
SN74LS215 3475-102
SN74LS216 3472-25
SN74LS217 3472-26
SN74LS218 3471-126
SN74LS219A ★ 905 3471-90
SN74LS22 ★ 840 490-74
SN74LS221 ★ 905 500-149
SN74LS222 ★ 907 3456-5
SN74LS224 ★ 907 3456-6
SN74LS227 ★ 909 3456-9
SN74LS228 ★ 909 3456-10
SN74LS24 ★ 840
★ 841 507-141
SN74LS240 ★ 910 503-152
★ 910 2471-25
SN74LS241 ★ 911 504-67
★ 911 2470-58
SN74LS242 ★ 911 503-90
★ 911 2477-6
SN74LS243 ★ 912 503-91
★ 912 2477-7
SN74LS244 ★ 912 504-12
★ 912 2470-59
SN74LS245 ★ 913 505-23
★ 913 2479-2
SN74LS247 ★ 913 2464-3
SN74LS248 ★ 914 2463-136
SN74LS249 ★ 914 2463-102
SN74LS251 ★ 915 500-61
★ 915 1098-98
SN74LS253 498-3
SN74LS257A ★ 916 498-181
SN74LS258A ★ 917 498-104
SN74LS259 ★ 917 496-47
★ 917 1098-83
SN74LS26 ★ 841 491-79
SN74LS261 ★ 918 475-107
SN74LS266 ★ 918 495-82
SN74LS27 ★ 842 494-62
SN74LS273 ★ 919 486-168
SN74LS275 ★ 920 476-95
SN74LS279 ★ 921 495-180
SN74LS28 ★ 842 494-141
SN74LS280 ★ 921 509-12
SN74LS283 ★ 922 476-89
SN74LS289A ★ 924 3471-81
SN74LS290 ★ 924 480-77
SN74LS292 ★ 924 482-90
SN74LS293 ★ 925 479-70
SN74LS294 ★ 925 482-88
SN74LS295B ★ 925 501-33
★ 925 3489-25
SN74LS297 ★ 926 506-177
★ 926 2945-42
SN74LS298 ★ 926 499-108
SN74LS299 ★ 927 502-175
SN74LS30 ★ 842 492-101
SN74LS31 ★ 843 506-20
SN74LS311 3471-114
SN74LS312 3471-115
SN74LS314 3476-12
SN74LS315 3475-101
SN74LS316 3472-21
SN74LS317 3472-22
SN74LS318 3471-124
SN74LS319A ★ 929 3471-82
SN74LS32 ★ 843 493-159
SN74LS320 ★ 929 506-173
SN74LS321 ★ 929 506-174
SN74LS322A ★ 930 476-105
SN74LS323 ★ 930 502-176
★ 930 3490-30
SN74LS324 507-30
SN74LS325 507-54 2946-43
SN74LS326 507-55 2946-44
SN74LS327 507-56 2946-45
SN74LS328 507-61 2946-46
SN74LS33 ★ 843 494-80
SN74LS333 3458-13
SN74LS334 3458-14
SN74LS335 3458-9
SN74LS336 3458-10
SN74LS347 ★ 931 2463-145
SN74LS348 ★ 931 508-152
★ 931 1098-115
SN74LS352 ★ 932 497-136
SN74LS353 ★ 933 497-104
SN74LS354 ★ 933 500-28
SN74LS355 ★ 934 500-24
SN74LS356 ★ 934 500-29
SN74LS357 ★ 935 500-25
SN74LS365A ★ 935 477-22
★ 935 2471-30
SN74LS366A ★ 935 477-146
★ 935 2471-34
SN74LS367A ★ 936 477-23
★ 936 2471-31
SN74LS368A ★ 936 477-147
★ 936 2471-35
SN74LS37 ★ 844 491-114
SN74LS373 ★ 937 496-91
SN74LS374 ★ 938 487-26
SN74LS375 ★ 938 495-147
SN74LS377 ★ 939 487-58
SN74LS378 ★ 939 486-104
SN74LS379 ★ 940 486-10
SN74LS38 ★ 844 491-64
SN74LS381 ★ 940 475-52
SN74LS382 ★ 941 475-53
SN74LS384 ★ 941 476-2
SN74LS385 ★ 942 474-14
SN74LS386 ★ 942 495-50
SN74LS390 ★ 943 481-64
SN74LS393 ★ 943 479-22
SN74LS395A ★ 943 501-130
★ 943 3489-26
SN74LS396 ★ 944 496-156
SN74LS398 ★ 944 499-109
SN74LS399 ★ 944 499-110
SN74LS40 ★ 845 490-36
SN74LS42 ★ 845 483-38
SN74LS422 ★ 945 500-117
SN74LS423 ★ 945 500-151
SN74LS424 1094-108
SN74LS440 ★ 947 2476-14
SN74LS441 ★ 947 2476-15
SN74LS442 ★ 947 503-104
★ 947 2476-17
SN74LS443 ★ 947 503-105
★ 947 2476-18
SN74LS444 ★ 947 503-106
★ 947 2476-19
SN74LS445 ★ 947 482-128
SN74LS446 ★ 950 2476-44
SN74LS447 ★ 950 2463-146
SN74LS448 ★ 951 503-107
★ 951 2476-16
SN74LS449 ★ 951 2476-45
SN74LS462 506-31 1098-128
SN74LS463 506-32 1098-122
SN74LS465 ★ 952 477-48
SN74LS466 ★ 952 478-37
SN74LS467 ★ 952 477-49
SN74LS468 ★ 952 478-38
SN74LS47 ★ 847 2464-4
SN74LS48 ★ 847 2463-137
SN74LS481 ★ 953 1086-82
★ 953 1049-17
SN74LS49 ★ 847 2463-103
SN74LS490 ★ 955 481-65
SN74LS51 ★ 848 493-10
SN74LS54 ★ 850 493-98
SN74LS540 ★ 950 503-153
★ 950 2471-26
SN74LS541 ★ 950 504-68
★ 950 2470-60
SN74LS55 ★ 851 493-41
SN74LS56 ★ 851 509-58
SN74LS57 ★ 852 509-60
SN74LS590 ★ 966 479-78
SN74LS591 ★ 966 479-79
SN74LS592 ★ 967 479-74
SN74LS593 ★ 967 482-85
SN74LS594 ★ 968 502-117
SN74LS595 ★ 968 502-118
SN74LS596 ★ 968 502-119
SN74LS597 ★ 969 502-108
SN74LS598 ★ 969 502-109
SN74LS599 ★ 970 502-120
SN74LS600 ★ 971 506-25
SN74LS601 ★ 971 506-26
SN74LS602 ★ 972 506-27
SN74LS603 ★ 972 506-28
SN74LS604 ★ 973 496-16
SN74LS605 ★ 973 496-17
SN74LS606 ★ 973 496-18
SN74LS607 ★ 973 496-19
SN74LS608 ★ 974 496-20
SN74LS610 ★ 975 506-147
SN74LS611 ★ 975 506-148
SN74LS612 ★ 975 506-149
SN74LS613 ★ 975 506-150
SN74LS620 ★ 976 2479-3
SN74LS621 ★ 976 2478-52
SN74LS622 ★ 976 2478-53
SN74LS623 ★ 976 2479-4
SN74LS624 ★ 977 507-31
★ 977 2945-166
SN74LS625 ★ 977 507-62
★ 977 2946-47
SN74LS626 ★ 977 507-63
★ 977 2946-48
SN74LS627 ★ 978 507-64
★ 978 2946-49
SN74LS628 ★ 978 507-32
★ 978 2945-167
SN74LS629 ★ 978 507-65
★ 978 2946-50
SN74LS63 ★ 853 507-147
SN74LS630 ★ 979 2467-21
¶ 285-8
SN74LS631 ★ 979 2467-22
¶ 285-8
SN74LS632 ★ 980
SN74LS633 ★ 980
SN74LS634 ★ 981
SN74LS635 ★ 981
SN74LS636 ★ 982
SN74LS637 ★ 982

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

Texas Instruments (Cont'd)

Device	Page-Line
SN74LS638	★ 983
SN74LS639	★ 983
SN74LS640	★ 984 504-139
	★ 984 2479-5
SN74LS640-1	★ 984 504-140
	★ 984 2479-6
SN74LS641	★ 984 504-161
	★ 984 2478-54
SN74LS641-1	★ 984 504-162
	★ 984 2478-55
SN74LS642	★ 984 504-108
	★ 984 2478-56
SN74LS642-1	★ 984 504-109
	★ 984 2478-57
SN74LS643	★ 984 504-141
	★ 984 2479-7
SN74LS643-1	★ 984 504-142
	★ 984 2479-8
SN74LS644	★ 984 505-37
	★ 984 2478-58
SN74LS644-1	★ 984 505-38
	★ 984 2478-59
SN74LS645	★ 984 505-24
	★ 984 2479-9
SN74LS645-1	★ 984 505-25
	★ 984 2479-10
SN74LS646	★ 986 2479-35
SN74LS647	★ 986 2475-44
SN74LS648	★ 986 2479-36
SN74LS649	★ 986 2475-45
SN74LS651	★ 988 504-143
	505-75
SN74LS652	★ 988 504-144
	505-76
SN74LS653	★ 989
SN74LS654	★ 989
SN74LS668	★ 990 481-117
SN74LS669	★ 990 479-118
SN74LS670	★ 990 497-26
	★ 990 3470-71
SN74LS671	★ 991 501-22
SN74LS672	★ 991 501-23
SN74LS673	★ 992 503-28
SN74LS674	★ 992 503-26
SN74LS68	★ 854 482-65
SN74LS681	★ 995 476-17
SN74LS682	★ 995 474-131
SN74LS683	★ 995 474-111
SN74LS684	★ 995 474-132
SN74LS685	★ 995 474-112
SN74LS686	★ 997 474-133
SN74LS687	★ 997
SN74LS688	★ 998 474-134
SN74LS689	★ 998 474-113
SN74LS69	★ 854 482-63
SN74LS690	★ 999 481-32
SN74LS691	★ 999 478-95
SN74LS692	★ 999 481-33
SN74LS693	★ 999 478-96
SN74LS696	★ 1000 481-86
SN74LS697	★ 1000 479-83
SN74LS698	★ 1000 481-87
SN74LS699	★ 1000 479-84
SN74LS73A	★ 856 488-33
SN74LS74A	★ 857 485-101
SN74LS75	★ 858 495-148
SN74LS76A	★ 858 488-63
SN74LS78A	★ 859 487-161
SN74LS83A	★ 861 476-90
SN74LS85	★ 862 474-65
SN74LS86	★ 862 495-51
SN74LS90	★ 864 480-78
SN74LS91	★ 864 502-137
	★ 864 3491-16
SN74LS92	★ 864 482-51
SN74LS93	★ 865 479-71
SN74LS95B	★ 865 501-102
	★ 866 3488-100
SN74LS95	★ 866 502-8
	★ 866 3489-117
SN74PL16L8	★ 1025
SN74PL16R6	★ 1026
SN74PL16R8	★ 1026
SN74PL20L8	★ 1027
SN74PL20R6	★ 1028
SN74PL20R8	★ 1028
SN74PL333	★ 1029
SN74PL335	★ 1029
SN74PL839	★ 1030
SN74PL840	★ 1030
SN74PLR19L8	★ 1031
SN74PLR19R4	★ 1031
SN74PLR19R6	★ 1032
SN74PLR19R8	★ 1032
SN74PLT19L8	★ 1033
SN74PLT19R4	★ 1033
SN74PLT19R6	★ 1034
SN74PLT19R8	★ 1034
SN74S00	★ 833 492-56
SN74S02	★ 833 494-150
SN74S03	★ 834 491-193
SN74S04	★ 834 478-26
SN74S05	★ 834 477-104
SN74S08	★ 835 489-181
SN74S09	★ 836 489-121
SN74S10	★ 836 491-31
SN74S11	★ 836 489-85
SN74S112	★ 871 488-134
SN74S113	★ 871 488-97
SN74S114	★ 872 488-158
SN74S124	★ 874 2946-51
SN74S132	★ 877 507-145
SN74S133	★ 877 492-134
SN74S134	★ 877 492-116
SN74S135	★ 878 494-165
SN74S138	★ 880 484-2
SN74S139	★ 880 483-89
SN74S140	★ 881 484-60
	★ 881 2471-60
SN74S15	★ 838 489-35
SN74S151	★ 884 499-194
SN74S153	★ 884 498-63
SN74S157	★ 887 499-61
SN74S158	★ 887 498-155
SN74S162	★ 890 481-37
SN74S163	★ 890 479-3
SN74S168	★ 892 481-119
SN74S169	★ 892 479-121
SN74S174	★ 895 486-88
SN74S175	★ 895 485-157
SN74S181	475-65
SN74S182	★ 899 475-92
SN74S187	★ 897
SN74S189A	★ 900 3471-28
SN74S194	★ 902 501-177
	★ 902 3489-45
SN74S195	★ 903 501-76
	★ 903 3489-46
SN74S196	★ 903 480-122
SN74S197	★ 904 478-84
SN74S20	★ 839 490-141
SN74S201	★ 440
	★ 905 3473-14
SN74S207	3473-69
SN74S208	3473-70
SN74S214	3476-11
SN74S214A	3475-89
SN74S22	★ 840 490-81
SN74S225	★ 908 497-58
	★ 908 1086-90
SN74S226	★ 908 508-55
	★ 908 2476-57
SN74S240	★ 910 503-163
	★ 910 2471-27
SN74S241	★ 911 504-76
	★ 911 2470-61
SN74S244	★ 912
SN74S251	★ 915 500-71
SN74S253	★ 915
SN74S257	★ 916 498-191
SN74S258	★ 917 498-115
SN74S260	★ 918 494-29
SN74S270	★ 919 3484-7
SN74S2708	3462-101
SN74S271	★ 919 3484-5
SN74S274	★ 920 475-114
SN74S275	476-97
SN74S280	★ 921 509-25
SN74S281	★ 922 476-20
SN74S283	★ 922 476-92
SN74S289A	★ 924 3471-21
SN74S299	★ 927 502-180
	★ 927 3490-32
SN74S30	★ 842 492-107
SN74S301	★ 927 3473-12
SN74S314	3476-7
SN74S314A	3475-88
SN74S32	★ 843 493-167
SN74S330	507-16
	3458-29
	1086-88
SN74S331	507-17
	3458-28
	1086-89
SN74S340	503-164
SN74S341	504-77
SN74S344	504-20
SN74S37	★ 844 491-118
SN74S370	★ 936 3484-8
SN74S371	★ 937 3484-6
SN74S373	★ 937 496-104
SN74S374	★ 938 487-37
SN74S38	★ 844 491-68
SN74S381	★ 940 475-66
SN74S40	★ 845 490-45
SN74S412	★ 945 496-105
	★ 945 1094-166
SN74S428	★ 946 1095-16
SN74S436	★ 947 485-13
	★ 947 2483-135
SN74S437	★ 947 485-14
	★ 947 2483-136
SN74S438	★ 946 1095-17
SN74S455	3463-99
SN74S481	476-41
	1086-83
	1049-18
SN74S482	★ 954 506-166
	★ 954 1086-85
SN74S484	★ 955
SN74S485	★ 955
SN74S51	★ 848 493-18
SN74S593	479-75
SN74S64	★ 853 493-112
SN74S65	★ 853 493-119
SN74S74	★ 857 485-109
SN74S744	503-115
SN74S85	★ 862 474-69
SN74S86	★ 862 495-59
SN75064	2482-143
SN75065	2483-5
SN75066	2482-144
SN75067	2483-6
SN75068	2482-145
SN75069	2483-7
SN75107A	2474-26
SN75107B	2474-40
SN75108A	2474-33
SN75108B	2474-45
SN75110A	2472-22
SN75112	2472-23
SN75113	2472-6
SN75114	2471-46
SN75115	2474-62
SN75116	2479-42
SN75117	2479-48
SN75118	2479-44
SN75119	2479-46
SN75121	2469-14
SN75122	2473-18
SN75123	2469-6
SN75124	2473-11
SN75125	2474-2
SN75126	2469-44
SN75127	2474-3
SN75128	2474-8
SN75129	2474-9
SN7512A	★ 2860
SN75130	2469-45
SN75136	508-22
	2477-22
SN75138	2478-12
SN75140	2473-3
SN75141	2473-4
SN75142A	2472-58
SN75143A	2472-59
SN75150	2469-23
SN75151	2472-51
SN75152	2475-11
SN75153	2472-52
SN75154	2473-55
SN75157	2474-53
SN75158	2471-48
SN75159	2472-10
SN75160	2475-53
SN75160A	2475-54
SN75161	2475-55
SN75161A	2475-56
SN75162	2475-57
SN75162A	2475-58
SN75163	2475-59
SN75172	2469-47
SN75173	2475-27
SN75174	2469-46
SN75175	2475-28
SN75176	★ 2858
SN75177	★ 2858
SN75178	★ 2858
SN75182	2475-6
SN75183	2471-61
SN75188	2469-62
SN75189	2473-28
SN75189A	2473-42
SN75207	2474-13
	2485-55
	¶ 261-5
SN75207B	2474-16
	¶ 261-5
SN75208	2474-14
	2485-56
SN75208B	2474-17
SN75234	2485-18
SN75251C	★ 3437
	2887-45
SN75270	505-157
	¶ 261-5
	2481-58
	¶ 261-5
SN75322	2481-78
SN75325	2481-3
SN75326	2481-10
SN75327	2481-11
SN75328	2481-12
SN75350	2482-135
SN75361A	2482-136
SN75363	2481-79
SN75365	2483-47
	¶ 287-9
SN75367	505-149
	2483-81
SN75369	2481-107
SN75370	2481-85
	¶ 261-5
SN75375	2483-48
SN75401	2481-151
SN75402	2482-39
SN75403	2482-110
SN75404	2482-75
SN75407	★ 2855
	2482-40
	2482-76
SN75408	★ 2855
	2482-111
SN75411	2481-152
SN75412	2482-41
SN75413	2482-112
SN75414	2482-77
SN75416	2482-12
SN75417	2482-52
SN75418	2482-123
SN75419	2482-87
SN75426	2464-80
SN75427	2464-81
SN75430	2481-81
SN75431	2481-82
SN75432	2482-42
SN75433	2482-113
SN75434	2482-78
SN75436	★ 2856
	2483-19
SN75437A	★ 2856
	2483-20
SN75438	★ 2856
	2483-21
SN75441	2481-90
	2482-119
SN75446	2482-11
SN75447	2482-43
SN75448	2482-114
SN75449	2482-79
SN75450B	2482-1
	¶ 261-5
SN75451B	2482-2
	¶ 261-5
SN75452B	2482-44
SN75453B	2482-115
SN75454B	2482-80
SN75460	2482-3
SN75461	2482-4
SN75462	2482-45
SN75463	2482-116
SN75464	2482-81
SN75465	2890-4
SN75466	2480-83
	2482-5
	2890-63
SN75467	2480-99
	2890-64
SN75468	2480-66
	2890-5
SN75469	2480-42
	2890-6
SN75470	2482-6
SN75471	2482-7
SN75472	2482-46
SN75473	2482-117
SN75474	2482-82
SN75476	2482-8

Arranged alphanumerically from left to right.

© IC MASTER 1983

Texas Instruments (Cont'd)

Device	Page-Line
SN75477	2482-51
SN75478	2482-118
	2482-122
SN75479	2482-83
	2482-86
SN75480	2465-69
SN75481	2465-32
SN75490	2481-59
SN75491	2464-143
SN75491A	2465-1
SN75492	2465-44
SN75492A	2465-45
SN75493	2465-2
SN75494	2465-46
SN75497	2465-57
SN75498	2465-122
SN75500	2466-8
SN75501	2466-9
SN75502	2466-10
SN75503	2466-11
SN75512A	2465-135
SN75513A	★ **2861**
	2465-136
SN75518	★ **2862**
	2466-12
SN75581	★ **2863**
	2465-59
SN75584	2465-63
SN75584A	★ **2864**
SN75590	2481-60
SN75603	★ **2857**
	2964-121
SN75604	★ **2857**
	2964-122
SN75S225	3456-11
SN76000	2896-132
SN76002	2896-133
SN76005	2897-86
SN76011	2896-134
SN76021	2896-135
SN76024	2896-136
SN76104	2901-146
SN76105	2901-147
SN76110	2901-148
SN76111	2901-149
SN76113	2901-150
SN76115	2901-151
SN76116	2901-152
SN76130	2898-13
SN76131	2898-14
SN76149	2898-15
SN76242	2904-15
SN76243	2904-16
SN76246	2904-17
SN76267	2904-18
SN76298	2904-19
SN76333	2963-63
SN76334	2963-64
SN76477	2906-42
	1101-89
SN76487	2898-36
SN76488	2898-37
	1101-90
SN76489	2898-31
SN76489A	2898-32
SN76493	2898-33
SN76494	2898-34
SN76495	2898-35
SN76524	2904-156
SN76525	2904-117
SN76544	2904-157
SN76545	2904-158
SN76565	2903-30
SN76566	2962-144
SN76600	2906-7
SN76605	2902-54
SN76606	2902-55
SN76635	2900-75
SN76642	2901-72
SN76643	2901-73
	2905-42
SN76644	2906-8
SN76645	2904-20
SN76650	2906-9
SN76651	2905-43
SN76660	2905-44
SN76665	2905-45
SN76666	2905-46
SN76669	2901-74
SN76675	2901-75
SN76676	2901-22
SN76678	2901-23
SN76688	2905-47
SN76689	2901-76
SN76701	2903-83
SN76702	2903-84
SN76710	2903-85
SN76711	2903-86
SN76720	2904-140
SN76721	2903-87
SN76727	2903-88
SN76730	2902-56
SN76810	2907-8
SN76811	511-125
SN76812	2951-7
SN76831	2902-57
SN76832A	2902-58
SN76881	2901-170
SN76882	2901-171
SN76889	2904-21
SN76891	2901-172
SN76940	2949-45
SNLS132	★ **877**
STL700	★ **438**
TAC010	★ **438**
TAC020	★ **438**
TAT004	★ **438**
TAT008	★ **438**
TAT010	★ **438**
TAT020	★ **438**
TBP14S10M	★ **3964**
	3460-9
TBP18S030	★ **440**
	★ **3965**
	3459-27
TBP18S030M	★ **440**
	★ **3965**
	3459-43
TBP18S22	★ **3964**
TBP18S42	★ **3966**
TBP18S46	★ **3966**
TBP18SA030M	★ **440**
	★ **3965**
	3459-36
TBP18SA22	★ **3965**
TBP18SA30	3459-23
TBP18SA42	★ **3966**
TBP18SA46	★ **3967**
TBP247A10M	3460-4
TBP24S10	★ **440**
	★ **3967**
	3459-96
TBP24S10M	★ **440**
	★ **3967**
	3459-113
TBP24S41	★ **440**
	★ **3968**
	3461-110
	3461-110
TBP24S41M	★ **440**
	★ **3968**
	3461-111
	3461-111
TBP24S81	★ **440**
	★ **3968**
	3463-102
TBP24S81M	★ **440**
	★ **3968**
	3463-103
TBP24S86M	3463-26
TBP24SA10	★ **440**
	★ **3967**
	3459-111
TBP24SA10M	★ **440**
	★ **3967**
	3459-112
TBP24SA41	★ **440**
	★ **3968**
	3461-108
	3461-108
TBP24SA41M	★ **440**
	★ **3968**
	3461-109
	3461-109
TBP24SA81	★ **440**
	★ **3969**
	3463-100
TBP24SA81M	★ **440**
	★ **3969**
	3463-101
TBP28L166	★ **440**
	3464-106
TBP28L166A	★ **3972**
TBP28L22	★ **440**
	★ **3969**
	3460-29
TBP28L22M	★ **440**
	★ **3969**
	3460-34
TBP28L42	★ **440**
	★ **3970**
	3461-28
TBP28L45	★ **3971**
	3461-29
TBP28L46	★ **440**
	★ **3971**
TBP28L85	3462-112
TBP28L85A	★ **3971**
TBP28L86	★ **440**
	★ **3972**
	3463-28
TBP28L86M	★ **440**
	★ **3972**
	3463-29
TBP28LA22	★ **440**
	★ **3969**
	3460-25
TBP28LA22M	★ **440**
	★ **3969**
	3460-32
TBP28LA42	★ **3970**
TBP28LA45	★ **3971**
TBP28LA46	★ **3971**
TBP28P166	★ **3973**
	3464-48
TBP28P42	3460-113
TBP28P45	★ **3973**
	3460-114
TBP28P85	★ **3973**
	3462-58
TBP28R165	★ **3975**
	3463-94
TBP28R166	★ **440**
	★ **3975**
	3464-46
TBP28R45	★ **3974**
	3460-112
TBP28R46	★ **440**
	★ **3974**
TBP28R85	★ **3974**
	3462-57
TBP28R86	★ **440**
	★ **3974**
TBP28S165	★ **3979**
TBP28S166	★ **440**
	★ **3979**
	3464-49
TBP28S2708	★ **3980**
	3463-27
TBP28S42	★ **440**
	★ **3975**
	3461-41
TBP28S42M	★ **440**
	★ **3975**
	3461-64
	3461-65
	3461-83
	3461-84
TBP28S45	★ **3976**
	3460-115
TBP28S46	★ **440**
	★ **3976**
	3461-46
TBP28S46M	★ **440**
	★ **3976**
	3461-72
TBP28S85	★ **3977**
	3462-59
TBP28S86-60	★ **440**
	★ **3977**
	3462-102
TBP28S86-85	★ **440**
TBP28SA166	★ **440**
	★ **3979**
	3464-47
TBP28SA42	★ **440**
	★ **3976**
	3461-49
TBP28SA42M	★ **440**
	★ **3976**
	3461-80
TBP28SA45	★ **3976**
TBP28SA46	★ **440**
	3461-52
TBP28SA46M	★ **440**
	3461-82
TBP28SA86-60	★ **3978**
	3462-103
TBP28SA86M	★ **3978**
	3463-21
TC101	2964-53
TC102	2964-46
TC103	2964-56
TC104	2964-60
TCM1101	2948-48
TCM1501	2949-113
TCM1504	2949-114
TCM1505	2949-115
TCM1506	2949-116
TCM1512	2949-117
TCM1512A	2949-118
TCM1520	2949-16
TCM1703	2948-157
TCM1705A	2902-71
	2949-23
TCM1706	2902-72
	2949-24
TCM2101	2948-154
TCM2201	2948-99
TCM2401	2948-60
TCM2910A	2947-110
TCM2911A	2947-58
TCM2912A	2948-79
TCM2913	2947-71
TCM2914	2947-72
TCM3101	2948-103
TCM4110	2947-111
TCM4204	2949-40
TCM4205	2949-41
TCM4910	2947-112
TCM5087	2950-3
TCM5089	2950-4
TCM5092	2950-5
TIB0203S	3491-111
TIED461	2963-65
TIED463	2963-66
TIM8228	★ **3980**
	1095-18
TIM8238	★ **3980**
	1095-19
TIM9904	1098-92
TIM9905	★ **3980**
	★ **1554**
	1098-99
TIM9906	★ **1554**
	★ **3980**
	1098-84
TIM9907	★ **1554**
	★ **3980**
	1098-114
TIM9908	★ **3980**
	1098-116
TL010	2963-3
TL022C	2938-36
TL022M	2938-23
TL044C	2942-36
TL044M	2942-35
TL060AC	★ **3425**
	2930-14
TL060C	★ **3425**
	2934-24
TL060M	★ **3425**
	2930-15
TL061 Series	★ **3425**
	2911-126
TL061AC	★ **3425**
	2930-9
TL061BC	★ **3425**
	2925-6
TL061C	★ **3425**
	2934-23
TL061M	★ **3425**
	2930-10
TL062AC	★ **3425**
	2939-14
TL062BC	★ **3425**
	2937-19
TL062C	★ **3425**
	2940-44
TL062M	★ **3425**
	2939-15
TL064AC	★ **3425**
	2943-10
TL064BC	★ **3425**
	2941-40
TL064C	★ **3425**
	2944-22
TL064M	★ **3425**
	2944-1
TL066M	★ **3423**
	2930-12
TL068	★ **3422**
TL070AC	★ **3427**
	2932-56
TL070C	★ **3427**
	2932-57
TL070M	★ **3427**
	2930-7
TL071AC	★ **3427**
	2932-58
TL071BC	★ **3427**
	2932-59
TL071C	★ **3427**
	2932-60
TL071M	★ **3427**
	2930-8
TL072AC	★ **3427**
	2940-27
TL072BC	★ **3427**
	2940-28
TL072C	★ **3427**
	2940-26
TL072M	★ **3427**
	2939-13
TL074AC	★ **3427**
	2944-9
TL074BC	★ **3427**
	2944-10
TL074C	★ **3427**
	2944-11
TL074M	★ **3427**
	2943-7
TL075C	★ **3427**
	2933-4
	2944-12
TL075M	★ **3427**
	2930-6
TL080AC	2930-19
	2930-20
TL080C	2934-27
TL082AC	2939-20
TL082BC	2937-20
TL082C	2940-50
TL082M	2939-21
TL083AC	2939-22
TL083C	2940-51
TL083M	2939-23
TL084AC	2943-14
TL084BC	2941-41
TL084C	2944-25
TL084M	2943-15
TL085AC	2943-16
TL085C	2944-26
TL087C	★ **3424**
	2918-39
TL087M	★ **3424**
	2918-38
TL088C	★ **3424**
	2925-8
TL088M	★ **3424**
	2925-9
TL091C	2934-29
TL091M	2932-27
TL092C	2940-52
TL092M	2940-21
TL094C	2944-14
	2944-31
TL094M	2944-2
	2944-15
TL111	2891-5
TL117L	2959-71
TL136C	2943-52
TL170	511-83
TL172	511-84
TL172C	2963-132
TL173C	2963-133
TL175	511-85
TL176	511-86
TL182C	2416-60
TL182I	2416-61
TL182M	2416-39
TL185C	2421-21
TL185I	2421-22
TL185M	2421-20
TL188C	2418-111
TL188I	2418-112
TL188M	2418-93
TL191C	2419-92
TL191I	2419-93
TL191M	2419-91
TL195C	★ **3436**
	2967-145
TL287C	★ **3424**
	2936-6
TL287M	★ **3424**
	2936-7
TL288C	★ **3424**
	2937-21
TL288M	★ **3424**
	2937-22
TL311	★ **3426**
	2892-52
TL311A	★ **3426**
	2892-51
TL311M	★ **3426**
	2892-46
TL317	2959-39
TL3211	2928-40
TL321C	2913-45
	2940-10
TL321I	2928-41
TL321M	2913-46
	2928-42
TL322C	2940-32
TL322M	2940-20
TL326M	2944-37
TL331C	2892-24
TL331M	2892-23
TL336C	2895-52
TL336M	2895-53
TL376C	2488-1
	2964-144
TL430C	2959-23
TL431C	2959-62
TL431M	2959-63
TL440C	2968-140
TL441C	2887-135
TL441M	2887-136
TL442C	2962-86
TL442M	2962-87
TL4810A	★ **2859**
TL487C	2964-67
TL489C	2964-64
TL490C	2964-65
TL491C	2964-66
TL493C	2961-60
TL494C	2961-61
TL494M	2961-62
TL495C	2961-63
TL496C	2965-99
TL497AC	2961-64
TL497AM	2961-65
TL505C	2438-18
TL506C	2893-64
TL506M	2893-14
TL507C	2426-16
TL514C	2893-25
TL514M	2893-1
TL520	2429-8
TL521	2429-18
TL530	★ **2855**
	2428-41
TL531	★ **2856**
	2429-29
TL532	★ **2858**
	2428-42
TL533	★ **2857**
	2429-30
TL560C	2964-73
TL592	★ **3435**
	2888-113
TL593C	★ **3428**
	2961-66
TL594C	★ **3429**
	2961-67
TL594M	★ **3429**
	2961-68
TL595C	★ **3430**
	2961-69
TL601C	2419-8
TL601I	2419-2
TL601M	2419-3
TL604C	2418-119
TL604I	2418-117
TL604M	2418-118
TL607C	2419-9
TL607I	2419-4

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

© IC MASTER 1983

Texas Instruments (Cont'd)

Device	Page-Line
TL607M	2419-5
TL610C	2415-24
TL610I	2415-22
TL610M	2415-23
TL702C	2913-119
	2933-50
TL702M	2913-120
	2929-48
TL710C	2892-34
TL710M	2892-21
TL712	2965-154
TL721	2965-155
TL780-05C	★ 3433
	2952-100
TL780-12C	★ 3433
	2954-83
TL780-15C	★ 3433
	2955-40
TL783C	★ 3431
	2960-18
TL810C	2891-59
TL810M	2891-21
TL811C	2893-42
TL811M	2893-24
TL820C	2893-26
TL820M	2893-2
TM54016-15	3480-65
TM990/1481	★ 1564
	1769-5
	¶ 250-1
	¶ 250-17
	¶ 251-3
	¶ 251-4
	¶ 251-5
	¶ 251-6
TM9900/100MA	1767-20
TM9900/101MA	1767-21
TM9900/102	1767-22
TM9995	1098-63
TMAM6071	★ 1560
TMAM6073	★ 1560
TMAM6075	★ 1560
TMAM6031	★ 1560
TMAM9000	★ 1560
	★ 1748
	1632-4
TMAM9010	★ 1560
	★ 1749
	1633-1
TMAM9021	★ 1560
	★ 1749
	1633-2
TMAM9041	★ 1560
	★ 1749
	1633-3
TMS0117NLP	★ 1559
	1088-30
TMS1000	★ 1557
	1088-24
	¶ 247-10
	★ 1557
	1057-4
	¶ 247-10
TMS1000C	★ 1557
	1088-17
	¶ 247-10
	★ 1557
	1057-5
	¶ 247-10
TMS1004C	★ 1558
	1088-18
	★ 1558
	1057-6
TMS1018	★ 1559
	2898-78
	★ 1559
	1088-31
	1102-23
TMS1020NLL	★ 1559
	1088-45
TMS1022	2898-135
TMS1024	1088-33
TMS1025	1088-34
TMS1070	★ 1557
	1088-25
	★ 1557
	1057-7
TMS1070C	★ 1557
	1088-19
	★ 1557
	1057-8
TMS1098	1088-41
TMS1099	1088-42
TMS1099C	1088-44
TMS1100	★ 1557
	1088-26
	★ 1557
	1057-9
TMS1100C	★ 1557
	1088-20
	★ 1557
	1057-10
TMS1117	2951-9
TMS1117NLP	★ 1559
	2951-10
TMS1121	1088-52
TMS1121NLL	★ 1559
TMS1170	★ 1557
	1057-11
TMS1200	★ 1557
	1088-27
	★ 1557
	1057-12
TMS1200C	★ 1557
	1088-21
	★ 1557
	1057-13
TMS1270	★ 1557
	1088-28
	★ 1557
	1057-14
TMS1270C	★ 1557
	1088-22
	★ 1557
	1057-15
TMS1300	★ 1557
	1088-29
	★ 1557
	1057-16
TMS1300C	★ 1557
	1088-23
	★ 1557
	1057-17
TMS1370	★ 1557
	1057-18
TMS1400	★ 1557
	1057-19
TMS1470	★ 1557
	1057-20
TMS1600	★ 1557
	1057-21
TMS1670	★ 1557
	1057-22
TMS1700	★ 1557
	1057-23
TMS1976	2906-147
	1088-32
TMS2100	★ 1558
	1088-55
	★ 1558
	1057-24
TMS2114-15	3477-108
TMS2114-20	3478-40
TMS2114-25	3478-60
TMS2114-45	3479-45
TMS2114L-15	3477-109
TMS2114L-20	3478-41
TMS2114L-25	3478-61
TMS2114L-45	3479-46
TMS2132	★ 1558
	1087-3
	★ 1558
	1057-25
TMS2150-4	★ 3961
	2962-121
TMS2150-5	★ 3961
	2962-122
TMS2150-7	★ 3961
	2962-123
TMS2150-9	★ 3961
	2962-124
TMS2170	★ 1558
	1088-56
	★ 1558
	1057-26
TMS2220	★ 1558
	1088-54
	★ 1558
	1057-27
TMS2240	1087-2
	1088-57
	1057-28
TMS2300	★ 1558
	1088-58
	★ 1558
	1057-29
TMS2370	★ 1558
	1088-59
	★ 1558
	1057-30
TMS2372NLL	★ 1559
TMS2400	★ 1558
	1088-60
	★ 1558
	1057-31
TMS2470	★ 1558
	1088-61
	★ 1558
	1057-32
TMS2516	★ 442
TMS2528	★ 442
TMS2532	★ 442
TMS2564-35	★ 442
	3467-2
TMS2564-45	★ 442
	3467-13
TMS2564-50	★ 442
	3467-14
TMS25L32	★ 442
TMS2600	★ 1558
	1088-62
	★ 1558
	1057-33
TMS2670	★ 1558
	1088-63
	★ 1558
	1059-1
TMS2708-35	★ 442
	3463-74
TMS2708-45	★ 442
	3463-88
TMS2716-30	3465-17
TMS2716-45	3465-87
TMS2732NLL	1088-53
TMS27L08-45	★ 442
	3463-89
TMS3132	1088-64
	1059-2
TMS4016-12	★ 3958
	3480-25
TMS4016-20	★ 3958
	3480-103
TMS4016-25	★ 3958
	3481-9
TMS4044-12	3483-110
TMS4044-20	3482-34
TMS4044-25	3482-50
TMS4044-45	3482-105
TMS40L44-12	3483-111
TMS40L44-20	3482-35
TMS40L44-25	3482-51
TMS40L44-45	3482-106
TMS4116-15	3468-105
TMS4116-20	3469-17
TMS4116-25	3469-31
TMS4164-12	★ 3958
	3469-81
TMS4164-15	★ 3958
	3470-7
TMS4164-20	★ 3958
	3470-25
TMS4164-25	★ 3958
	3470-31
TMS4416-15	★ 442
	★ 3959
	3469-42
TMS4416-20	★ 442
	★ 3959
	3469-43
TMS4416-25	★ 442
	★ 3959
	3469-44
TMS4500A	★ 3960
	2480-149
TMS4732	3486-15
TMS4764	3486-120
TMS5100	★ 1562
	2902-82
TMS5110	★ 1562
	2902-83
TMS5200	2902-84
TMS5220	★ 1562
	2902-85
TMS5501	1095-35
	¶ 247-10
	¶ 247-14
TMS6100	★ 1563
	2902-96
TMS6125	★ 1563
	2902-97
TMS7000	★ 1556
	1093-2
	★ 1556
	1075-19
TMS7020	★ 1556
	1093-3
	★ 1556
	1075-20
TMS7040	★ 1556
	1092-123
	1093-4
	★ 1556
	1075-21
TMS7041	★ 1556
	1093-6
	★ 1556
	1075-22
TMS70C20	★ 1556
TMS70E40	★ 1556
	1093-1
	★ 1556
	1075-23
TMS70L22	1093-5
	1075-24
TMS9900	★ 1552
	1098-77
	¶ 239-8
	¶ 239-9
	¶ 240-4
	¶ 246-11
	¶ 247-10
	¶ 247-15
	★ 1552
	1081-16
	¶ 239-8
	¶ 239-9
	¶ 240-4
	¶ 246-11
	¶ 247-10
	¶ 247-15
TMS9900-40	★ 1552
	1098-78
	¶ 239-8
	¶ 239-9
	¶ 240-4
	¶ 246-11
	¶ 247-10
	¶ 247-15
	★ 1552
	1081-17
	¶ 239-8
	¶ 239-9
	¶ 240-4
	¶ 246-11
	¶ 247-10
	¶ 247-15
TMS99000	★ 1552
TMS9901	★ 1554
	1098-120
TMS9902A	★ 1554
	1098-86
TMS9903	★ 1554
	1098-123
TMS9909	★ 1554
	1098-101
TMS99105	★ 1555
	1081-18
TMS99105A	★ 1553
	★ 1555
	1098-68
TMS9910SA	1081-19
TMS9911	1098-100
TMS99110	★ 1555
	1081-20
TMS99110A	★ 1553
	★ 1555
	1098-69
	★ 1553
	★ 1555
	1081-21
TMS9914A	★ 1554
	1098-105
TMS9916	1098-87
TMS9918A	★ 1554
	1098-93
TMS9922	1098-88
TMS9923	1100-65
TMS9927	★ 1554
	1098-94
	1100-88
	¶ 239-8
	¶ 240-12
TMS9928A	★ 1554
	1098-126
TMS9929A	★ 1554
	1098-127
TMS9932	★ 1554
TMS9937	★ 1554
	1098-95
TMS9940E	★ 1552
	1098-65
	¶ 240-11
	★ 1552
	1081-22
	¶ 240-11
TMS9940M	★ 1552
	1098-67
	¶ 240-11
	★ 1552
	1081-23
	¶ 240-11
TMS99531	★ 1554
	1098-121
TMS99532	1098-102
TMS99541	★ 1554
	1098-96
TMS99610	★ 1555
TMS99650	★ 1554
	1098-110
TMS9980A	★ 1552
	1098-79
	★ 1552
	1081-24
TMS9981	★ 1553
	1098-80
	★ 1553
	1081-25
TMS9985	1098-81
TMS9989	★ 443
TMS998S	1081-26
TMS9995	★ 1552
TMS999S	1081-27
TP4320A	462-3
TZ2003	2947-161
UCN4810A	2465-132
UDN2841	2889-124
UDN2845	2889-125
ULN2001A	2480-84
	2890-65
ULN2002A	2480-100
	2890-66
ULN2003A	2480-67
	2890-67
ULN2004A	2480-43
	2890-68
ULN2005A	2890-69
ULN2064	2483-8
	2889-126
ULN2065	2483-9
	2889-127
ULN2066	2483-10
ULN2067	2483-11
ULN2068	2483-12
ULN2069	2483-13
ULN2074	2483-14
ULN2075	2483-15
VM61001	2902-63
VM61002	★ 1563
	2902-64
VM61003	★ 1563
	2902-65
VM61004	★ 1563
	2902-66
VM61005	★ 1563
	2902-67
VM61006	★ 1563
VM71001	2902-68
VM71002	2902-69
VM71003	★ 1563
	2902-70
VM71004	★ 1563
VM71005	★ 1553
uA2240C	2951-29
uA2240M	2951-30
uA702M	2923-8
uA709AM	2924-13
uA709C	2932-5
uA709M	2929-38
uA710M	2891-28
uA711C	2893-51
uA723C	2959-105
uA723M	2959-106
uA733C	2888-114
uA733M	2888-115
uA741C	2930-56
uA741M	2929-17
uA747C	2939-56
uA747M	2939-4
uA748C	2931-4
uA748M	2929-32
uA777C	2928-27
uA777M	2923-18
uA7806C	2953-38
uA7808C	2953-104
uA7810C	2954-7
uA7812C	2954-84
uA7815C	2955-41
uA7818C	2955-105
uA7822C	2956-7
uA7824C	2956-61
uA7885C	2953-121
uA78L02AC	2952-3
uA78L02C	2952-4
uA78L05AC	2952-13
uA78L05C	2952-14
uA78L06AC	2953-49
uA78L06C	2953-50
uA78L08AC	2953-64
uA78L08C	2953-65
uA78L09AC	2953-123
uA78L09C	2953-124
uA78L10AC	2953-131
uA78L10C	2953-132
uA78L12AC	2954-20
uA78L12C	2954-21
uA78L15AC	2954-118
uA78L15C	2954-119
uA78M05C	2952-48
uA78M05M	2952-49
uA78M06C	2953-13
uA78M06M	2953-14
uA78M08C	2953-81
uA78M08M	2953-82
uA78M10C	2954-4
uA78M12C	2954-39
uA78M12M	2954-40
uA78M15C	2955-2
uA78M15M	2955-3
uA78M20C	2955-126
uA78M20M	2955-127
uA78M22C	2956-6
uA78M24C	2956-26
uA78M24M	2956-27
uA7905C	2956-128
uA7906C	2957-26
uA7908C	2957-50
uA7912C	2957-97
uA7915	2958-8
uA7915C	2958-9
uA7918C	2958-31
uA7924C	2958-55
uA7952C	2957-19
uA79M05C	2956-105
uA79M05M	2956-106
uA79M06C	2957-22
uA79M06M	2957-23
uA79M08C	2957-35
uA79M08M	2957-36
uA79M10C	2957-53
uA79M10M	2957-54
uA79M12C	2957-72
uA79M12M	2957-73
uA79M15C	2957-116
uA79M15M	2957-117
uA79M20C	2958-34
uA79M20M	2958-35
uA79M24C	2958-50
uA79M24M	2958-51
uA9636A	2469-18
uA9637AC	2474-54
uA9638C	2472-11
uA9639C	2469-15

Arranged alphanumerically from left to right.

© IC MASTER 1983

Device	Page-Line
TRW (Cont'd)	
CA2100	2903-68
CA2300	2903-69
CA2301	2903-70
CA2418	2903-71
CA2600	2903-72
CA2601	2903-73
CA2800	2888-54
CA2810	2888-55
CA2820	2888-56
CA2830	2888-57
CA2840	2888-58
CA2842	2888-59
CA2850	2888-60
CA2851	2888-61
CA2870	2888-62
CA2871	2888-63
CA2875	2888-64
CA2876	2888-65
CA2880	2888-66
MPY008A	★ 812
	475-146
	475-147
MPY008H	★ 812
	475-148
	475-149
MPY012A	★ 812
	475-128
	475-129
MPY012H	★ 812
	475-115
	475-116
MPY012K	★ 812
	475-117
	475-118
MPY016A	★ 812
	475-132
	475-133
MPY016H	★ 812
	475-120
	475-121
MPY016K	★ 812
	★ 815
	475-122
	475-123
MPY08HU	★ 812
	475-103
	475-104
MPY1024	475-126
	475-127
MPY112K	★ 812
	★ 814
	476-7
	476-8
MPY16HD	★ 812
	475-124
	475-125
TDC1001	★ 3438
	2426-31
TDC1002	★ 3438
	2426-40
TDC1003	★ 812
	476-11
TDC1004	★ 813
	510-26
	510-27
TDC1005	★ 813
	3491-63
	3491-64
TDC1006	★ 813
	3491-100
	3491-101
TDC1007	★ 3438
	2426-28
	2426-29
TDC1008	★ 812
	476-9
	476-10
TDC1008J	★ 812
	475-158
TDC1008JM	★ 812
	475-159
TDC1009	★ 812
	476-12
	476-13
TDC1009J	★ 812
	475-130
TDC1009JM	★ 812
	475-131
TDC1010	★ 812
	476-14
	476-15
TDC1010J	★ 812
	475-136
TDC1010JM	★ 812
	475-137
TDC1014	★ 3438
	2426-10
	2426-11
TDC1016-10	★ 3438
	2445-18
TDC1016-8	★ 3438
	2441-18
TDC1016-9	★ 3438
	2444-47
TDC1019J	★ 3438
	2430-8
TDC1021	★ 3438
	2426-2
	2426-3
TDC1022	★ 813
	★ 817
	474-16
	474-17
TDC1023	★ 813
	★ 819
	510-28
	510-29
TDC1025	★ 3438
	2428-16
TDC1027	★ 3438
	2426-19
TDC1028	★ 813
	★ 818
	511-50
	511-51
TDC1029	★ 3438
	2426-15
TDC1030	★ 813
	★ 816
	3456-57
Y008A	★ 812
Y008H	★ 812
Y012A	★ 812
Y012H	★ 812
Y012K	★ 812
Y016A	★ 812
Y016H	★ 812
Y016K	★ 812
	★ 815
Y08HU	★ 812
Y112K	★ 812
	★ 814
Y16HD	★ 812

Unitrode

PF100	2964-94
PF200	2964-95
PF30	2964-96
PF300	2964-97
PF400	2964-98
PF60	2964-99
PIC600	★ 3446
	2961-70
PIC601	★ 3446
	2961-71
PIC602	★ 3446
	2961-72
PIC610	★ 3446
	2961-73
PIC611	★ 3446
	2961-74
PIC612	★ 3446
	2961-75
PIC625	★ 3446
	2961-76
PIC626	★ 3446
	2961-77
PIC627	★ 3446
	2961-78
PIC635	★ 3446
	2961-79
PIC636	★ 3446
	2961-80
PIC637	★ 3447
	2961-81
PIC645	★ 3446
	2961-82
PIC646	★ 3446
	2961-83
PIC647	★ 3446
	2961-84
PIC655	★ 3446
	2961-85
PIC656	★ 3446
	2961-86
PIC657	★ 3446
	2961-87
PIC660	★ 3446
	2961-88
PIC661	★ 3446
	2961-89
PIC662	★ 3446
	2961-90
PIC670	★ 3446
	2961-91
PIC671	★ 3446
	2961-92
PIC672	★ 3446
	2961-93
PIC730	★ 3446
	2961-94
PIC740	★ 3446
	2961-95
PIC800	★ 3446
	2961-96
PIC801	★ 3446
	2961-97
PIC810	★ 3446
	2961-98
PIC811	★ 3446
	2961-99
PIC900	★ 3446
	2964-118
PR100	2964-100
PR200	2964-101
PR30	2964-102
PR300	2964-103
PR400	2964-104
PR60	2964-105
UC1524A	★ 3444
	2961-100
UC1527A	★ 3445
	2961-101
UC1535	★ 3445
	2961-102
UC1840	★ 3445
	2961-103
UC2524A	★ 3444
	2961-104
UC2525A	★ 3445
	2961-105
UC2527A	★ 3445
	2961-106
UC2840	★ 3445
	2961-107
UC3524	★ 3444
	2961-108
UC3524A	★ 3444
	2961-109
UC3527A	★ 3445
	2961-110
UC3840	★ 3445
	2961-111
UC493	★ 3444
	2961-112
UC494	★ 3444
	2961-113
UC495	★ 3444
	2961-114

VLSI Technology

VT23128	3487-26
VT23128A	3487-18
VT23128B	3487-33
VT23129	3487-21
VT23129A	3487-19
VT23129B	3487-34
VT23256	3487-46
VT23257	3487-47
VT2332	3486-18
VT2332A	3485-92
VT2333	3486-19
VT2333A	3485-93
VT2365	3487-10
VT2365A	3486-93
VT2365B	3486-42
VT2366	3487-11
VT2366A	3486-94
VT2366B	3486-43

Weitek Corporation

WTL1010	★ 1041
	449-121
	511-96
WTL1016	★ 1036
	449-120
	511-99
WTL1024	★ 1040
	511-102
WTL1032	511-53
WTL1033	511-52
WTL1516	★ 1038
	511-100
WTL1517	★ 1038
	511-101
WTL2516	★ 1039
	511-97
WTL2517	★ 1039
	511-98

Western Digital

1820	★ 4563
1840	★ 4564
193X	★ 2880
1945	★ 2874
8250	★ 2873
8275	★ 2879
8276	★ 2878
AMS-D11	1765-9
AMS-DB	1769-15
BR1941	510-11
BR1941-00	2486-39
BR1941-02	2486-40
BR1941-04	2486-44
BR1941-05	2486-41
BR1941-06	2486-45
CP1600	1075-33
CP1631	1097-119
CP1651	1097-102
CP1661	1097-103
CP1851	1097-118
CP9008	1096-102
	1081-28
CR1872	1088-68
CR2872	1088-69
DM1881	1097-109
DM1883	1097-110
	1102-38
FD1761	1101-15
FD1761-02	1101-56
FD1763-02	1101-57
FD1765-02	1101-58
FD1767-02	1101-59
FD1771-01	1097-113
	1101-16
FD1781	1097-114
FD1781-01	1097-115
	1101-17
FD1791-02	★ 1574
	1097-116
	1101-18
FD1792-02	★ 1574
	1101-19
FD1793-02	★ 1574
	1092-60
	1093-112
	1094-140
	1095-149
	1099-101
	1101-20
FD1794-02	★ 1574
	1101-21
FD1795-02	★ 1574
	1097-117
	1101-22
FD1797-02	★ 1574
	1092-61
	1093-113
	1094-141
	1095-150
	1099-102
	1101-23
FR1502-10	3456-27
FR1502-11	3456-24
MP1600	1081-29
MP1651	1097-104
MP1661	1097-105
PT1472B	2487-5
PT1472B-01	2487-6
PT1482B	2487-10
PT1482B-01	2487-13
SKC-85	1765-10
SMP-E6	1765-13
SMP-E8	1765-26
TR1402	2487-61
TR1602	2487-62
	¶ 257-9
TR1863-00	★ 2872
	2487-35
TR1863-02	★ 2872
	2487-40
TR1863-04	★ 2872
	2487-50
TR1865-00	★ 2872
	2487-36
	¶ 257-9
TR1865-02	★ 2872
	2487-41
	¶ 257-9
TR1865-04	★ 2872
	2487-51
	¶ 257-9
TR1983	2486-59
	1094-66
UC1671	★ 2871
	2486-13
	★ 2871
	1097-107
UC1971	1097-108
WD/900	1767-25
WD0900	1767-24
WD1000	1101-116
WD1001	1101-114
WD1002	★ 1577
	1101-118
WD1010	★ 1573
	1101-113
WD1011	★ 1575
	1101-115
WD1012	★ 1576
	1101-119
WD1014	★ 1566
	1100-107
WD1050	★ 1571
	1101-86
WD1100	★ 1567
	1101-117
WD1510-00	★ 3994
	3456-58
WD1510-01	★ 3994
	3456-59
WD1510-02	★ 3994
	3456-63
WD1691	★ 1569
	1101-43
WD1770	★ 1579
	1101-24
WD1771	★ 1578
WD1820	★ 4563
	4141-128
WD1840	★ 4564
	4141-129
WD1931	2486-11
WD1933	1095-80
WD193X	★ 2880
WD193X-00/10	2487-16
WD193X-01/11	2487-17
WD193X-02/12	2487-18
WD193X-03/13	2487-19
WD1943	★ 2874
	510-12
WD1943-00	★ 2874
	2486-36
WD1943-02	★ 2874
	2486-37
WD1943-04	★ 2874
	2486-42
WD1943-05	★ 2874
	2486-38
WD1943-06	★ 2874
	2486-43
WD1945	★ 2874
	2486-54
WD1993-01	★ 2877
	2486-8
WD1993-02	★ 2877
	2486-9
WD1993-03	★ 2877
	2486-10
WD2001	★ 2876
	510-64
WD2002	★ 2876
	510-65
WD2123	★ 2875
	2487-34
WD2143-03	★ 1568
	1101-130
WD2412	2899-75
	2899-91
WD2501-01	★ 2869
	2486-78
WD2501-03	★ 2869
	2486-80
WD2501-11	★ 2869
	2486-82
WD2511-01	★ 2869
	2486-79
WD2511-05	★ 2869
	2486-81
WD2511-11	★ 2869
	2486-83
WD2520	★ 2870
	1100-69
WD2791	★ 1572
	1101-120
WD2791-02	★ 1572
	1101-25
WD2793-02	★ 1572
	1101-121
WD2795-02	★ 1572
	1101-122
WD2797-02	★ 1572
	1101-123
WD2840	1101-54
WD40	1059-6
WD74HC200	★ 3997
	460-111
WD8206	★ 3995
	2467-12
WD8207	★ 3996
	2480-150
WD8250	★ 2873
	2486-16
WD8275	★ 2879
	1101-73
WD8276	★ 2878
	1100-73
WD9000	1096-103
WD9216-00	★ 1570
	1101-38
WD9216-01	★ 1570
	1101-39

Xicor

X2201A	★ 3993
	3455-33
X2201AD1	★ 3993
	3455-34
X2210	★ 3993
	3455-12
X2210D1	★ 3993
	3455-13
X2212	★ 3993
	3455-25
X2212D1	★ 3993
	3455-26
X2444	3455-2
X2604	★ 3999
	3461-94
X2804A	★ 3999
	3455-29
X2816	★ 3999
	3465-18

Zilog

05-6101-01	1767-30
05-6168-01	1767-26
500	★ 1581
531	★ 1594
565	★ 1592
EMS8000	★ 1600
OCPU	★ 1583
PDS8000	★ 1601
	1633-4
S-1/40	★ 1602
S8000	★ 1600

¶ Indicates page number in Application Note Directory.
★ Indicates additional data is provided on the page noted.

IC MASTER

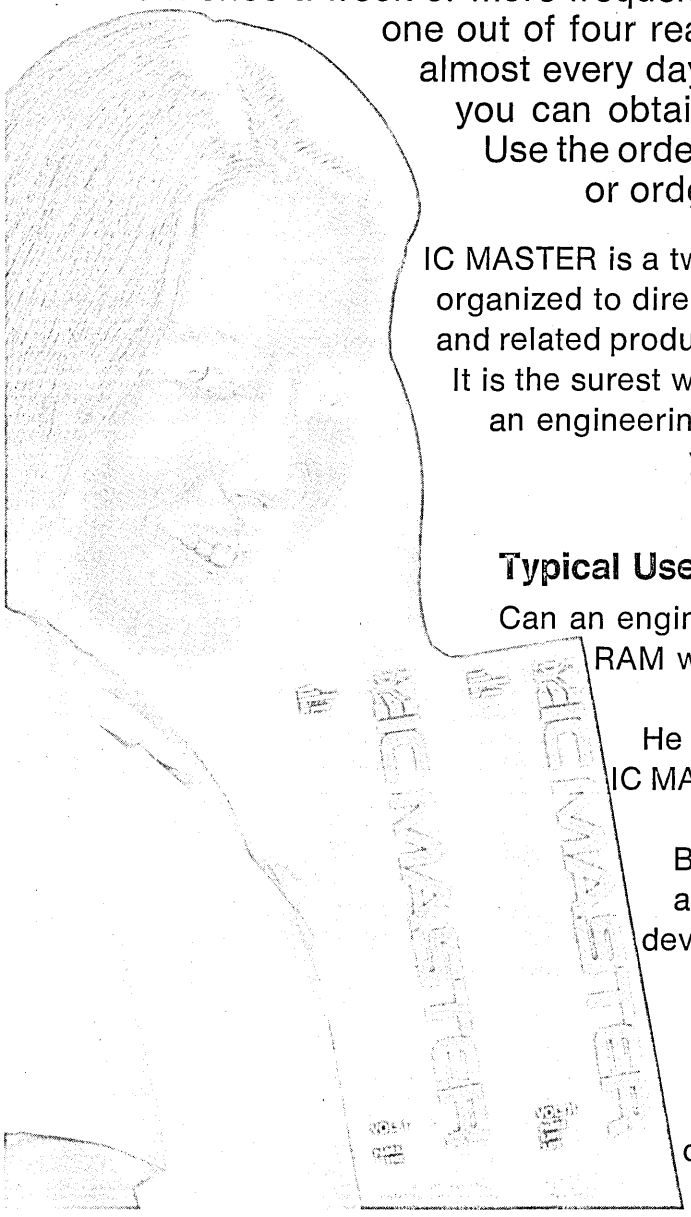
Device	Page-Line
Zilog (Cont'd)	
SCAN8	★ 1602
SCAN8000	★ 1600
STEM8000	★ 1599
SYSTEM8000	★ 1599
Z-SCAN8	★ 1602
Z-SCAN8000	★ 1600
Z2001B	1081-30
Z2002B	1081-31
Z8-SCB	★ 1582
	★ 1603
	1755-13
Z80	★ 1581
	1097-41
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
	★ 1581
	1075-34
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80-CTC	★ 1581
	1097-53
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80-DART	★ 1581
	1097-97
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80-DMA	★ 1581
	1097-67
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80-MCB/16	★ 1581
	1755-18
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80-MCB/4	★ 1581
	1755-19
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80-PIO	★ 1581
	1097-73
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80-SIO	★ 1581
	1097-83
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80-SIO/2	★ 1581
	1097-84
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80-SIO/9	★ 1581
	1097-85
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z8000	★ 1581
	★ 1601
	1099-70
	¶ 240-14
	¶ 243-8
	¶ 243-15
Z8000MPU	★ 1581
	★ 1601
	1767-29
	¶ 240-14
	¶ 243-8
	¶ 243-15
Z8001	★ 1587
	1099-71
	★ 1587
	1081-32
Z8001A	★ 1587
	1099-72
	★ 1587
	1081-33
Z8001B	★ 1587
	1099-73
Z8002	★ 1587
	1099-65
	★ 1587
	1083-1
Z8002A	★ 1587
	1099-66
	★ 1587
	1083-2
Z8002B	★ 1587
	1099-67
Z8003	★ 1588
	1099-74
	★ 1588
	1083-3
Z8003A	★ 1588
	1099-75
Z8003B	★ 1588
	1099-76
Z8004	★ 1588
	1099-77
	★ 1588
	1083-4
Z8004A	★ 1588
	1099-78
Z8004B	★ 1588
	1099-79
Z8010-Z-MMU	★ 1589
	1099-108
Z8010A-Z-MMU	★ 1589
	1099-109
Z8010B-Z-MMU	★ 1589
	1099-110
Z8015-PMMU	★ 1589
	1099-111
Z8016-Z-DTC	★ 1590
	1099-91
Z8030-Z-SCC	★ 1590
	1099-116
Z8030A-Z-SCC	★ 1590
	1099-117
Z8031-Z-ASCC	★ 1591
	1100-63
Z8036-Z-CIO	★ 1591
	1099-85
Z8036A-Z-CIO	★ 1591
	1099-86
Z8038-Z-FIO	★ 1592
	1099-99
	¶ 242-9
Z8060-Z-FIFO	★ 1592
	1099-96
Z8065-Z-BEP	1099-81
Z8068-Z-DCP	★ 1593
	1099-89
Z8090-Z-UPC	★ 1593
	1099-103
Z80A	★ 1581
	1097-42
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
	★ 1581
	1075-35
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80A-CTC	★ 1581
	1097-54
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80A-DART	★ 1581
	1097-98
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80A-DMA	★ 1581
	1097-68
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80A-PIO	★ 1581
	1097-74
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80A-SIO/1	★ 1581
	1097-86
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80A-SIO/2	★ 1581
	1097-87
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80A-SIO/9	★ 1581
	1097-88
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80B	★ 1581
	1097-43
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
	★ 1581
	1075-36
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80B-CTC	★ 1581
	1097-55
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80B-PIO	★ 1581
	1097-75
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80B-SIO/9	★ 1581
	1097-89
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80CPU	★ 1583
Z80H	★ 1581
	1075-37
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80L	★ 1581
	1097-44
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
	★ 1581
	1075-38
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z80MCB	★ 1581
	1755-20
	¶ 242-7
	¶ 242-10
	¶ 243-2
	¶ 243-16
	¶ 243-17
	¶ 244-2
	¶ 244-3
	¶ 244-4
Z8108	★ 1584
	1097-101
	★ 1584
	1075-39
Z8400H	★ 1583
	1097-45
Z8400L	★ 1583
	1097-46
Z8410	★ 1585
	1097-69
Z8420	★ 1585
	1097-76
Z8430	★ 1585
	1097-56
Z8440	★ 1586
	1097-90
Z8441	1097-91
Z8442	1097-92
Z8449	1097-93
Z8470	★ 1586
	1097-99
	¶ 243-17
Z8500	★ 1581
Z8530SCC	★ 1594
	1101-62
Z8531	★ 1594
Z8536CIO	★ 1594
	1100-72
	¶ 243-16
Z8565	★ 1592
Z8581-CGC	★ 1595
	1100-70
Z8590	★ 1595
	1101-97
Z8590UPC	★ 1595
	1101-98
Z8601	★ 1596
	1097-25
Z8601-MCU	★ 1596
	1077-1
Z8602	1097-26
Z8603	★ 1596
	1097-27
Z8603-MCU	★ 1596
	1077-2
Z8611	★ 1597
	1097-28
Z8611-MCU	★ 1597
	1077-3
Z8612	★ 1597
	1097-29
Z8612-MCU	★ 1597
	1077-4
Z8613	★ 1597
	1097-30
Z8613-MCU	★ 1597
	1077-5
Z8671	★ 1597
	1097-31
Z8671-MCU	★ 1597
	1077-6
Z8675	1097-32
Z8675-MCU	1077-7
Z8681	★ 1597
	1097-33
Z8681-MCU	★ 1597
	1077-8
ZDS-1/40	★ 1602

Arranged alphanumerically from left to right.

© IC MASTER 1983

IC MASTER BELONGS ON YOUR BOOKSHELF; ORDER YOUR COPY NOW

A recent survey revealed that one out of two IC MASTER users refer to it once a week or more frequently. The survey also discovered that one out of four readers use IC MASTER every day or almost every day. If you use IC MASTER frequently, you can obtain your own copy by ordering now. Use the order cards contained in this publication, or order by telephone as described below.



IC MASTER is a two-volume set of technical data carefully organized to direct the engineer to the integrated circuits and related products that are closest to his specific needs. It is the surest way to find the optimum device to answer an engineering design requirement. By ordering now, you won't have to borrow or search for IC MASTER the next time you need it.

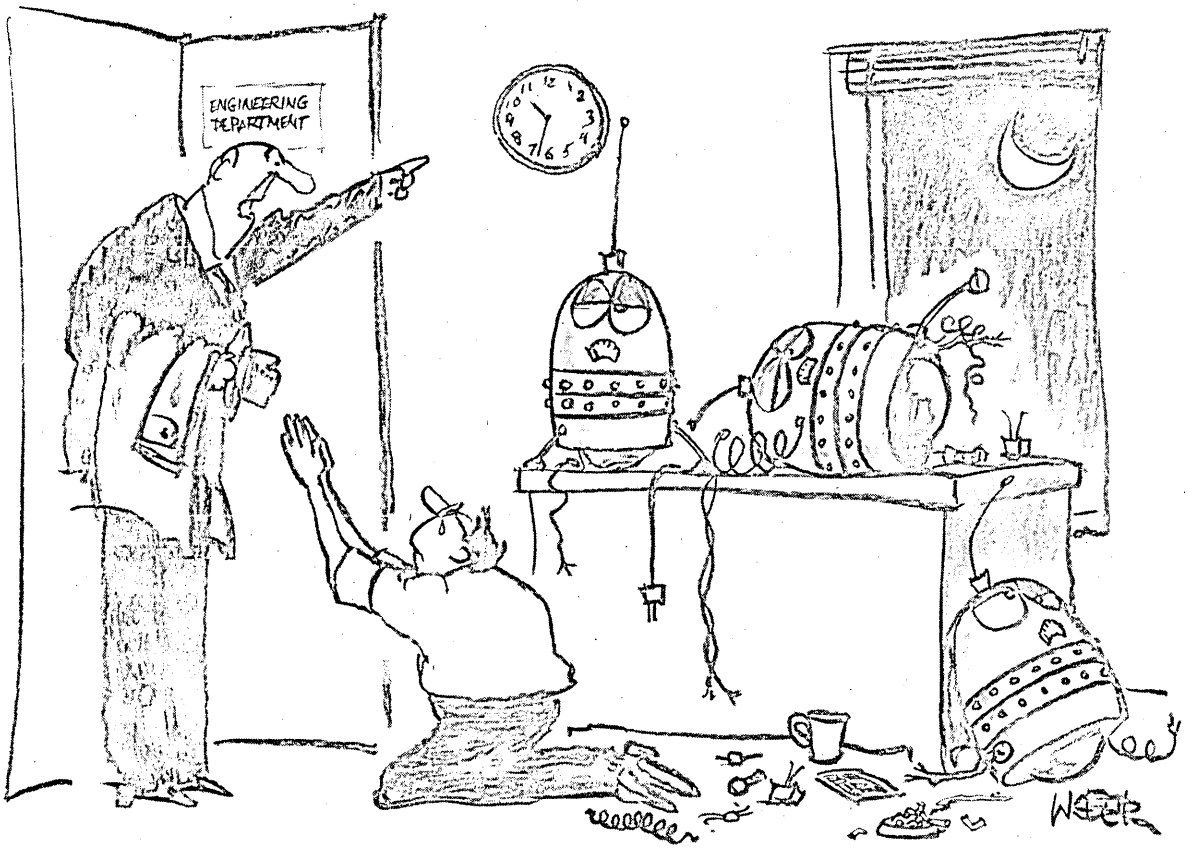
Typical Use of IC MASTER

Can an engineer find out who makes a 64K dynamic RAM with an access time of 120 nanoseconds or faster in less than 30 seconds? He can if he turns to the Memory section of IC MASTER and looks for the 64K organization (words and bits per word) that he needs. Because each device is listed in order of access time, he can easily determine the devices that satisfy his speed requirements.

In the United States only:

You can order IC MASTER simply by charging it to your VISA or Master Card credit card. To place your order, call now: (516) 222-2500. Ask for Extension 314.

GET HIGH TECHNOLOGY WITHOUT HIGH ANXIETY.



"DON'T GIVE ME EXCUSES ABOUT 'UNDELIVERED PARTS' McGINNIS! I WANT THESE ROBOTS COMPLETED AND READY FOR SHIPPING BY NINE O'CLOCK TOMORROW MORNING!"

CALL SCHWEBER FOR IMMEDIATE DELIVERY ON:

AMD	Corning	Hazeltine	Mepco/Electra	RCA
Allen-Bradley	Crydom	Hewlett Packard	3M	Seeq
American Microsystems	Data General	IBM	Mostek	Signetics
Amphenol	Fairchild	IR	Motorola	Sprague
Anadex	General Electric	Intersil	National	Timeplex
Beehive International	General Instrument/Opto.	Intersil Systems	Olivetti	Westinghouse
Bourns	Harris	Kemet	Qume	Zilog
Computer Memories, Inc.				

Schweber is the high technology leader in distribution. Our technology centers are located nationwide. Staffed with specialists, they feature the latest in computer products. For your FREE copy of the 32-page "Microcomputer Acronyms and Buzz-Words" write to Schweber Electronics, Att: Technology Center, Jericho Turnpike, CB 1032, Westbury, New York 11590. Or call:

Westbury, NY: 516/334-7474 ◘ Rochester, NY: 716/424-2222 ◘ Fairfield, NJ: 201/227-7880 ◘ Danbury, CT: 203/792-3500
Bedford, MA: 617/275-5100 ◘ Manchester, NH: 603/625-2250 ◘ Horsham, PA: 215/441-0600 ◘ Pittsburgh, PA: 412/782-1600
Gaithersburg, MD: 301/840-5900 ◘ Raleigh, NC: 919/876-0000 ◘ Atlanta, GA: 404/449-9170 ◘ Huntsville, AL: 205/882-2200
Orlando, FL: 305/331-7555 ◘ Hollywood, FL: 305/927-0511 ◘ Dayton, OH: 513/439-1800 ◘ Beachwood, OH: 216/464-2970
Livonia, MI: 313/525-8100 ◘ Elk Grove, IL: 312/364-3750 ◘ Brookfield, WI: 414/784-9020 ◘ Eden Prairie, MN: 612/941-5280
Cedar Rapids, IA: 319/373-1417 ◘ Kansas City, KA: 913/492-2922 ◘ St. Louis, MO: 314/739-0526 ◘ Tulsa, OK: 918/622-8000
Dallas, TX: 214/661-5010 ◘ Austin, TX: 512/458-8253 ◘ Houston, TX: 713/784-3600 ◘ Sacramento, CA: 916/929-9732
Santa Clara, CA: 408/748-4700 ◘ Canoga Park, CA: 213/999-4702 ◘ Irvine, CA: 714/556-3880, 213/537-4321

SCHWEBER ELECTRONICS

©1982 SCHWEBER ELECTRONICS CORPORATION

© IC MASTER 1983

ALTERNATE SOURCE DIRECTORY

The Alternate Source Directory is an industry-wide cross reference of those devices which manufacturers claim are pin-for-pin and functional equivalents to IC's made by other firms. It is a compilation of many individual references and shows literally thousands of alternates that are not implied by their model numbers, especially in the linear and memory areas. Unlike the usual alternate source guides, this directory leads you to many alternate sources for any particular device, not just one. Containing over 50,000 cross references, it is the most comprehensive alternate source directory ever published.

HOW TO USE THE ALTERNATE SOURCE DIRECTORY

The second column of this Alternate Source Directory shows devices which are replacements for those in the first column. Devices listed in **BOLD FACE** type have technical data in the Master Selection Guide. This information begins on the page listed to the right of the **BOLD FACE** part numbers. Products preceded by a ◇ have been discontinued by the manufacturer. This section does include devices not listed in the Master Section Guide; e.g., discontinued items, DTL and 54L devices.

In order to maintain this list within some reasonable bounds, the A and B suffixes indicating improved versions generally have been dropped. If this were not done, for example, every higher speed selection conjured up by a memory manufacturer would result in a device that could replace many equal or slower competitors and this directory would become highly involved in slight performance variations. Moreover, improved performance is only important if your circuits take advantage of it.

One of the difficulties with any cross reference is that devices meant to be alternates do not necessarily perform the same in all circuits. Thus, it will be necessary for you to check specifications, or even check circuit performance before deciding which alternates are right for you. A major benefit of this list is that it gives you more alternatives to study. But if you do not find what you need here, it may be possible to find additional alternates by locating the device in the Master Selection Guide. Particularly for digital circuits, the other products grouped with it will normally offer similar or identical performance.

© IC MASTER 1983

VERZEICHNIS VON AUSTAUSCH-BAREN BAUELE-MENTEN

Das Verzeichnis von austauschbaren Bauelementen ist eine umfassende vergleichende Äquivalenzliste für die gesamte Halbleiterindustrie. Darin sind solche Bauelemente enthalten die, nach Herstellerangaben, nach Funktionen und Pinbelegung mit Typen anderer Hersteller voll austauschbar sind. Es ist eine Zusammenfassung von vielen Einzelangaben und enthält Tausende von Äquivalenztypen, die nicht aus den Typennummern hervorgehen, besonders im Linear- und Speicherbereich. Im Gegensatz zu üblichen Äquivalenzlisten bietet dieses Verzeichnis nicht nur eine sondern veile Alternativlösungen für jedes einzelne Bauelment. Mit über 50,000 Querverweisen ist es die umfassendste Referenzliste, die je veröffentlicht wurde.

GEBRAUCHSANLEITUNG FÜR DIE ÄQUIVALENZLISTE

Die zweite Spalte dieses Verzeichnisses enthält Bauteile, welche für die in der ersten Spalte austauchbar sind. Für Bauteile in Fettdruck finden Sie technische Daten im Master Selection Guide. Diese Information beginnt auf der Seite, die rechts neben den fettgedruckten Typennummern erscheint. Produkte mit einem vorgestellten ◊ Zeichen werden nicht mehr hergestellt. Dieser Abschnitt enthält auch Bauelemente, die nicht im Master Selection Guide aufgelistet sind, z.B. nicht mehr produzierte Teile, DTL und 54L Bauelemente.

Diese Auflistung wurde aus Hersteller-Empfehlungen erstellt. Nachdem jede Firma dazu neigt, nur sich selbst als Alternative zu den bekannten Herstellern zu nennen und größere Firmen kleinere gerne ignorieren, hat nicht jedes Bauelement seine jeweilige Entsprechung Daher sollten Sie, wenn Sie nach Alternativen für ein Bauteil einer weniger bekannten Firma suchen, zunächst die entsprechenden Aquivalenztypen nachschlagen, insbesondere wenn sie von größberen Firmen sind, und damit evtl. weitere Alternativen ausfindig machen.

Um diese Liste nicht zu umfangreich werden zu lassen, wurden die A- und B-suffixe, die verbesserte Versionen bezeichnen, in der Regel Weggelassen. Wäre dies nicht geschehen, dann würde z.B. jede Selektion nach höherer Geschwindigkeit, die von einem Speicher-Hersteller durchgeführt wurde, ein Bauelement ergeben, das viele gleichschnelle oder langsamere Versionen von anderen Herstellern ersetzen könnte, und diese Vergleichsliste hätte eine Vielzahl von Bauelementen, die sich nur ganz geringfügig voneinander unterscheiden. Darüber hinaus sind bessere Parameter nur dann wichtig, wenn Sie diese in Ihrer Schaltung zu Ihrem Vorteil nutzen können.

Eine der Schwierigkeiten, die bei jeder Aquivalenzliste auftreten, ist die, daß austauschbare Bauelemente nicht unbedingt in allen Schaltungen dieselbe Funktion erfüllen. Daher sollten Sei, bevor Sei sich für einen Aquivalenztyp entscheiden, alle Datenblätter genau prüfen oder sogar feststellen, ob das betreffende Bauelement in Ihrer Schaltung richtig arbeitet.
Ein großer Vorteil dieser Liste ist, daß sie noch mehr Alternativlösungen zur Prüfung anbeitet. Aber wenn sie hier nicht das finden, was Sie suchen, können Sie möglicherweise weitere Aquivalenztypen feststellen, wenn Sie das Bauelement im Master Selection Guide nachschlagen. Insbesondere bei Digital-ICs bieten die anderen dort mitaufgeführten Produkte normalerweise ähnliche oder identische Funktionen.

© IC MASTER 1983

LE REPERTOIRE DES SOURCES ALTERNATIVES

Ce répertoire est un outil de référence utilisé largement dans toute l'industrie. Il permet de trouver quels sont les appareils qui, d'après leurs fabricants, sont les équivalents des circuits intégrés vendus par d'autres firmes. Cet ouvrage compile un nombre considérable de références individuelles, et offre littéralement des milliers de possibilités alternatives qui ne sont pas évidentes de par les numéros de modéle des appareils, particulièrement dans le cas des mémoires et des systèmes linéaires. A la difference des autres guides du même domaine, ce répertoire n'offre pas qu'une seule et unique source alternative pour un appareil, mais au contraire plusieurs. Il contient plus de 50,000 références et représente le Répertoire des Sources Alternatives le plus complet jamais publié a ce jour.

COMMENT SE SERVIR DU REPERTOIRE DES SOURCES ALTERNATIVES

La deuxieme colonne de ce répertoire fournit une liste de produits capables de remplacer ceux énumérés dans la première colonne. Les produits écrits en gros caractères sont étudiés en detail dans le Guide Général de Sélection — se reporter à la page indiquée à la droite des numéros de pièces marqués en gras. Les produits précédés du signe (◊) ne sont plus en fabrication. Cette Section comprend des appareils qui n'apparaissent pas dans le Guide Général de Sèlection, tels que les appareils qui ont été discontinués, les DTL et les 54L.

Cette liste a été conçue en fonction des renseignements fournis par les fabricants. Il est cepedant relativement bien connu que chaque fabricant estime être le seul sur le marché à pouvoir produire des appareils équivalents à ceix des grands fournisseurs, et que, d'autre part, les gros fournisseurs ont tendance a ignorer les petits. Cet état d'esprit explique pourquoi il est impossible de fournir des équivalents de remplacement pour chacun des appareils énumérés.

Si vous recherchez des sources alternatives pour un appareil provenant d'une société qui n'ait pas une renommée mondiale, nous vous conseillons de prendre les produits de remplacement que vous pourrez trouver, notamment s'ils proviennent de fabricants bien connus, et d'ensuite consulter ce Répertoire pour trouver des sources alternatives possibles.

Afin de maintenir cette liste dans certaines limites, les suffixes A et B indiquant des versions plus puissantes ont généralement été ignorés. Cela pour éviter qu'un fabricant ayant conçu un système mémoire avec possibilitié de sélection à plus grande vitesse, se trouve en concurrence directe avec des sociétés équivalentes ou plus petites. Ce Répertoire deviendrait alors trop spécialisé dans des différences de performance minimes. D'autre part, une meilleure performance n'est importante que si vos circuits en profitent.

L'un des problèmes que l'on rencontre dans tout système de renvoi est que des appareils dits alternants ne vont pas obligatoirement avoir les mêmes performances sur tous les circuits. Il vous sera donc nécessaire avant de decider quels vont être les alternants que vous allez utiliser, de vérifier les spécifications ou même les performances du circuit. L'un des avantages de cette liste est qu'elle vous procure énormément d'appareils alternants. Au cas ou vous ne pourriez trouver dans cette Section ce dont vous avez besoin, nous vous conseillons de consulter le Guide Général de Sélection. Dans le cas des circuits digitaux, en particulier, les produits énumérés dans chaque groupe offrent généralement des performances similaires ou identiques.

© IC MASTER 1983

DIRECTORIO DE FUENTES ALTERNAS

El Directorio de Fuentes Alternas es una referencia entre componentes usado ampliamente en la industria en la cual los fabricantes mantienen que provee estilo constructivo de terminales en los circuitos Integrados (IC) fabricados por otras compañías. Es una compilación de muchas referencias individuales y muestra literalmente miles de equivalentes alternas que no son obvias por su número de modelo, especialmente en las areas de lineal y memoria. En vez de las guías de fuentes, el alterno usual, este directorio los refiere a muchas fuentes alternas para cualquier componente, no solamente una. Con un contenido de 50,000 referencias de componente-a-componente es el directorio publicado más completo.

MODO DE EMPLEO DEL DIRECTORIO DE FUENTES ALTERNAS

La segunda columna de este Directorio de Fuentes Alternas muestra componentes que pueden reemplazar a los de la primera columna. Componentes que aparecen con letras oscuras tienen especificaciones técnicas en la Guía Maestra de Selección. Esta información empieza en las página que aparece a la derecha sel número de la parte en letras oscuras. Los productos acompañados por un (◊) han sido descontinuados por el fabricante. Esta sección si incluye componentes que no aparecen en la Guía Maestra de la sección; en otras palabras, artículos descontinuados, DTL y 54L.

Esta lista ha sido compilada por medio de recomendaciones de los fabricantes. Debido a que hay una tendencia a que cada compañía se muestre así misma como alterna a los fabricantes más prominentes, y que los fabricantes mayores ignoren a los mas pequeños, no cada componente hace referencia de uno a otro; de tal manera que, si usted busca alternos para una compañía menos conocida, obtenga los substitutos que encuentre, más que nada si son producto de compañías prominentes, y luego refiérase a ellos para encontrar otras fuentes.

Con objeto de mantener esta lista bajo un control razonable, los sufijos A y B que denotan mejoras, no aparecen. Si esto no se hubiese hecho, por ejemplo, cada selección de memorias de alta velocidad resultaría en una componente que podría substituir otras de igual velocidad o más lentas y este directorio terminaría dando mucha importncia a cambios insignificantes en el funcionamiento de ellos. Además, una mejora en las características solo es importante si sus circuitos lo requieren.

Una de las dificultades con cualquier referencia es que componentes que tienen como propósito ser equavalentes no necesariamente tienen el mismo rendimiento en todos los circuitos. Debido a esto, será necesario que usted determine las especificaciones, o inclusive determine las características del circuito antes de decidir que equivalente es mejor para usted. Un beneficio de esta lista es que le provee alternativas que investigar. Pero si no encuentra lo que necesita aquí, es aún posible encontrar equivalentes encontrando la componente en las Guía Maestra de Selección. En particular para circuitos digitales, los otros productos agrupados con aquel, le ofrecerá un funcionamiento igual o parecido.

© IC MASTER 1983

代替ソース
ダイレクトリー

このダイレクトリーはメーカーが他とピンコンパチブルか機能的に互換性があるという製品の全業界のクロスリファレンスです。これは個々のリファレンスを多数を編集したものであり，文字通り数千の型名からは全く分らない特にリニアとかメモリといった分野で数千の代替品を記載しています。

通常の代替品がガイドと異り，このダイレクトリーは特定品種について一社丈でなく数社の代替品を記載しています。50,000のクロスリファレンスがありこれ程広くカバーしたクロスリファレンスは本書が初めてです。

使用法

第二欄は第一欄の代替品を示しています。太字で印刷されている製品はマスターセレクションガイドにデータがのっている事を示します。そのページは太字印刷の型名の右側に書いてあります。◇印が前についている製品はメーカーが生産中止した事を示します。このセクションにはマスターセレクションガイドにのっていない，生産中止した製品例えばＤＴＬとか５４製品とかも記載しています。このリストはメーカーの推せんに従って作られたものです。各メーカーにある傾向ですが自社丈が本当の代替ソースと主張したり大手は中小メーカーを無視したりするので全ての製品が互い互いに全製品にクロスリファレンスされてはいない。ですからもし利用者皆様が小さなメーカーの代替品を探す時は皆様が先ず代替品を見つけ，大手メーカーがそれを作っていればそこを調べて代替メーカを探し当てる方法をとった方が良いでしょう。

このリストをある納得されうる限界にしておく為に改良品につけられるＡとかＢとか云ったサフィックスは通常つけてありません。もしつけてあるとメモリーメーカーが主張する高速セレクションが同等かスピードの遅い製品メーカーの製品を数多く取換えてしまう結果にもなるでしょうし，このダイレクトリーが少々の性能の違いに相当の比重をかけなくてはならないようになってしまいます。更に云えば改良性能はそれを充分に利用する回路丈にしか必要ないのです。

クロスリファレンスを作る難しさの一つは代替とされる製品が応々にして全ての回路で同性能でないと云うことです。この為利用者皆様は性能表を調査するか決定する前にどの代替が回路に合うかを回路で調査されることをおすすめします。このリストの良いところは皆様に多くの代替ソースがあることを知って頂く事です。もし皆様がこのセクションで見つけられなかった場合は，マスターセレクションガイドからも見つけることが出来ます。特にディジタル回路はグループ毎の他社製品は通常似かよったあるいは同一の性能を持っています。

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Adaptive Science Corp			
1010	AMI	1010	
1020	AMI	1020	
1120	AMI	1120	
560	AMI	560	
590	AMI	590	
Advanced Micro Devices			
1002	Mostek	MK1002	
1408	AMD	1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		µA0801	
		µA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	µPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
1458	AMD	1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	µA1458	
		µA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	µPC1458	
		µPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
1458	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
1508	AMD	1408	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		µA0801	
		µA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	µPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
1558	AMD	1458	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	µA1458	
		µA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	µPC1458	
		µPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
1702A	National	MM1702	
2101A	AMD	91L01	
	Intel	8101A	
	NEC-Micro	µPD2101	
	Synertek	SY2101	
2111A	AMD	91L11	
2111A	Intel	8111	
	NEC-Micro	µPD2111	
	Synertek	SY2111	
2112	Synertek	SY2112	
	TI	TMS4043	
2114	AMD	9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	µPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
25LS2521	**TI**	**SN74LS688**	**998**
2708	Fairchild	F2708	
	Hitachi	HN462708	
	Motorola	MC27A08	
		MCM2708	
	National	MM2708	
	NEC-EA	EA2708	
	Panasonic	MN2708	
	Rockwell	2708	
	SGS	M2708	
	TI	TMS2708	
2716	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HN462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	µPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
2732	Fairchild	F2732	
	Hitachi	**HN462732**	**3789**
	Intel	2732	
		2732A	**3819,3822**
		M2732	
	Mitsubishi	M5L2732	
	National	MM2732	
		NMC2732	
	NEC-Micro	µPD2732	
	Toshiba	TMM2732	
		TMM324C	
	Universal	UM2732	
27S41	Signetics	N82HS195	
2841	Fairchild	3341A	
2847	Fairchild	F2847	
29516	**Weitek**	**WTL1516**	**1038**
29517	**Weitek**	**WTL1517**	**1038**
29704	Fairchild	F29704	
29705	Fairchild	F29705	
3101	AMD	3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
3101	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	µPB2089	
		µPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
3101A	AMD	3101	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	µPB2089	
		µPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Advanced Micro Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
31L0101	AMD	3101	
		3101A	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440.863**
		SN74S289	
3212	AMD	8212	
	Intel	8212	
	National	DP8212	
		INS8212	
	NEC-Micro	μPB8212	
	TI	**SN54S412**	**945**
		SN74S412	**945**
3216	Intel	3216	
3226	Intel	3226	
3341	Fairchild	3341	
	MMI	67401	
	Raytheon	67401	
4044	AMD	9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
4702	Intel	4702	
5056	National	MM5066	
715	Fairchild	μA715	
◇723	Fairchild	μA723	
	Hitachi	HA17723	
	Intersil	LM723	
◇723	**Motorola**	**MC1723**	**3295**
	National	LM723	
	Raytheon	RC723	
		RM723	
	RCA	CA723	
		LM723	
	SGS	L123	
	Signetics	μA723	
	SiliconG	SG723	
	TI	μA723	
	Thomson-CSF	SFC2723	
◇733	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		μA733	
	SiliconG	SG733	
	TI	μA733	
741	AMD	SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401.3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
74164	Fairchild	74164	
	Hitachi	HD74164	
	National	DM74164	
		DM8570	
		DM8579	
	Signetics	74164	
	TI	**SN74164**	**891**
747	Fairchild	μA747	
	Hitachi	HA17747	
	Motorola	MC1747	
	National	LM747	
	NEC-Electron	μPC251	
	PMI	OP-04	
		PM747	
	Raytheon	RC747	
		RM747	
	RCA	CA747	
	Signetics	μA747	
	SiliconG	SG747	
	TeledyneS	747	
	TI	μA747	
748	AMD	LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
8214	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
7525	Fairchild	7525	
	Motorola	MC7525	
	National	LM7525	
	SiliconG	SG7525	
8035	AMD	D8035	
		ID8035	
		P8035	
	Fujitsu	MBL8035	
	Intel	8035	
		D8035	
		ID8035	
		P8035	
	National	INS8035	
	NEC-Micro	μPD8035	
		μPD80C35	
	Signetics	SCN8035	
8041	AMD	D8041	
		P8041	
	Intel	8041A	
		D8041	
		P8041	
	NEC-Micro	μPD8041A	
8048	Fujitsu	MBL8048	
	Intel	8048	
	National	INS8048	
	NEC-Micro	μPD8048	
		μPD80C48	
	Signetics	SCN8048	
	Toshiba	TMP8048	
8085	AMD	8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	Intel	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	NEC-Micro	μPD8085	
	Toshiba	TMP8085A	
8085A	AMD	8085	
		D8085	
		ID8085	
		MD8085	
		P8085	
	NEC-Micro	μPD8085	
	Toshiba	TMP8085A	
8155	AMD	D8155	
		ID8155	
		MD8155	
		P8155	
	Intel	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	NEC-Micro	μPD8155	
	Toshiba	TMP8155	
8156	AMD	D8156	
		ID8156	
		P8156	
	Intel	8156	
		D8156	
		ID8156	
		P8156	
	NEC-Micro	μPD8156	
8212	AMD	3212	
	Intel	8212	
	National	DP8212	
		INS8212	
	NEC-Micro	μPB8212	
	TI	**SN54S412**	**945**
		SN74S412	**945**
8214	Intel	8214	
	National	INS8214	
	NEC-Micro	μPB8214	
8216	Intel	8216	
	National	DP8216	
		INS8216	
	NEC-Micro	μPB8216	
8224	Intel	8224	
	National	DP8224	
		INS8224	
	NEC-Micro	μPB8224	
8226	Intel	8226	
	National	DP8226	
		INS8226	
	NEC-Micro	μPB8226	
8228	Intel	8228	
	National	DP8228	
		INS8228	
	NEC-Micro	μPB8228	
	TI	**SN74S428**	**946**
		TMS8228	**3930**
8238	Intel	8238	
	National	DP8238	
		INS8238	
	NEC-Micro	μPB8238	
	TI	**SN74S438**	**946**
		TMS8238	**3930**
8243	Fujitsu	MB8243	
	Intel	8243	
	NEC-Micro	μPD8243	
	Signetics	8243	
8251	AMD	9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	
8253	AMD	D8253	
		ID8253	
		P8253	
	Intel	8253	
		D8253	
		ID8253	
		P82	
	National	INS8253	
	NEC-Micro	μPD8253	
8253-5	AMD	D8253-5	
		P8253-5	
	Intel	8253-5	
		D8253-5	
		P8253-5	
	National	INS8253-5	
	NEC-Micro	μPD8253-5	
8255A-5	AMD	9555	
		D8255	
		ID8255	
		P8255	
	Intel	8255A-5	
		D8255	
		ID8255	
		P8255	
	National	INS8255	
	NEC-Micro	8255A	
		μPB8255	
		μPD8225	
		μPD8255	
8257	Intel	8257	
	NEC-Micro	μPD8257	
8279-5	AMD	D8279-5	
		P8279-5	
	Intel	8279	
		8279-5	
		D8279-5	
		P8279-5	
	NEC-Micro	μPD8279-5	
8304	AMD	DP8304	
	Intel	8286	
		8304	
	National	DP8304	
	NEC-Micro	μPB8286	
8308	AMD	9208	
	Motorola	**MCM68A308**	**3840**

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Advanced Micro Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
8308	NEC-EA	EA8308	
	NEC-Micro	μPD2308	
8355	Intel	8355	
	NEC-Micro	μPD8355	
	Toshiba	TMP8355	
8702	Intel	8702	
9016	AMD	AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
9080	AMD	9080A	
		AM9080	
	Intel	8080A	
		D8080	
		MD8080	
		P8080	
	National	DP8080A	
		INS8080A	
	NEC-Micro	μPD8080	
	TI	TMS8080	
		TMS8080A	
9080A	AMD	9080	
		AM9080	
	Intel	8080A	
		D8080	
		MD8080	
		P8080	
	National	DP8080A	
		INS8080A	
	NEC-Micro	μPD8080	
	TI	TMS8080	
		TMS8080A	
9114	AMD	2114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
9147	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
9147	**Synertek**	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
9148	AMD	AM9148	
	Fairchild	**93475**	**3615,3646**
	Fujitsu	MBM2148	
		MBM2149	
	Hitachi	**HM6148**	**3789**
	Intel	2148H	
		2149H	
	National	NMC2148	
	Synertek	SY2148	
		SY2149	
91L01	AMD	2101A	
	Intel	8101A	
	NEC-Micro	μPD2101	
	Synertek	SY2101	
91L11	AMD	2111A	
	Intel	8111	
	NEC-Micro	μPD2111	
	Synertek	SY2111	
9208	AMD	8308	
	Motorola	**MCM68A308**	**3840**
	NEC-EA	EA8308	
	NEC-Micro	μPD2308	
9232	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
9244	AMD	4044	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
9264	AMD	9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
9265	AMD	9264	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
93415	AMD	93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
93425	AMD	93415	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S62S110	
	TI	SN54S314	
		SN74S314	
9551	AMD	8251	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	
9555	AMD	8255A-5	
		D8255	
		ID8255	
		P8255	
	Intel	8255A-5	
		D8255	
		ID8255	
		P8255	
	National	INS8255	
	NEC-Micro	8255A	
		μPB8255	
		μPD8225	
		μPD8255	
9708	Fairchild	F68708	
	Motorola	MCM68708	
AM100415	Fairchild	100415	
	Signetics	100415	
AM100470	**Fairchild**	**F100470**	**3615,3628**
	Fujitsu	**MBM100470**	**3681**
AM100474	**Fairchild**	**F100474**	**3615,3629**
	Hitachi	HM100474	
AM10415	**Fairchild**	**F10415**	**3615,3618**
	Hitachi	**HM2110**	**3789**
		HM2112	**3789**
	Motorola	**MCM10146**	**3839**
	National	DM10415	
	Siemens	GXB10415	
	Signetics	10146	
AM10470	**Fairchild**	**F10470**	**3615,3621**
	Fujitsu	**MBM10470**	**3681**
	Hitachi	**HM10470**	**3789**
	Motorola	MCM10470	
	National	**DM10470**	**3855**
	Signetics	10470	
AM10474	Fairchild	F10474	
	Fujitsu	**MBM10474**	**3681**
	Hitachi	**HM10470**	**3789**
AM1458	AMD	1458	
		1558	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
AM1508	AMD	1408	
		1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Advanced Micro Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
AM1508	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
AM25LS2518	MMI	53LS080	
		63LS080	
	Signetics	N82S23	
		S82S23	
	TI	TBP18SA030	
AM26LS31	**Motorola**	**AM26LS31**	**2753**
	National	DS26LS31	
	TI	AM26LS31	
AM26S10	Fairchild	9640	
	Motorola	DC26S10	
	National	DS26S10	
	TI	AM26	
AM26S11	National	DS26S11	
	TI	AM26S11	
AM2701	AMD	AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
AM27LS00	AMD	AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
AM27LS01	AMD	AM2701	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
AM27LS01	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
AM27LS02	AMD	3101	
		3101A	
		31L0101	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
AM27LS03	AMD	AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
AM27LS19	AMD	AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	**3826**
		63LS081	
AM27LS19	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	**TBP18S030**	**440,3965**
		TBP18S030N	**440,3965**
AM27PS181	AMD	AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
AM27PS185	Raytheon	29653	
AM27PS191	AMD	AM27PS291	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	
	National	DM77S190	
		DM87S190	
	Raytheon	29680	
		29683	
	Signetics	82S190	
		N82S190	
		S82S190	
	Supertex	MM82S190	
AM27PS291	AMD	AM27PS191	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	
	National	DM77S190	
		DM87S190	
	Raytheon	29680	
		29683	
	Signetics	82S190	
		N82S190	
		S82S190	
	Supertex	MM82S190	
AM27PS41	Raytheon	29643	
AM27S02	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
AM27S03	AMD	AM27LS03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
AM27S11	AMD	AM27S21	
	Harris	HM7611	
		HM7611-2	**3696**
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	**3826**
	National	DM54S287	
		DM74S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
	TI	**TBP24S10**	**440,3967**
AM27S12	Fairchild	93436	
	Harris	HM7620	
	Intel	M3602	
	MMI	5305	
		6305	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Advanced Micro Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
AM27S12	National	DM54S570	
		DM74S570	
	Raytheon	29610	
	Signetics	N82S130	
		S82S130	
AM27S13	Fairchild	93446	
	Harris	HM7621	
	Intel	M3622	
	MMI	5306	
		6306	
	National	DM54S571	
		DM74S571	
	Raytheon	29611	
	Signetics	N82S131	
		S82S131	
AM27S15	Harris	HM7647R	
	Signetics	N82S115	
		S82S115	
AM27S18	Harris	HM7602	
	MMI	5330-1	
		6330-1	**3826**
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
AM27S180	AMD	AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
AM27S181	AMD	AM27PS181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
AM27S181M	AMD	AM27PS181	
		AM27S181	
		AM27S281	
AM27S181M	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
AM27S184	Fujitsu	MB7127	
	Harris	HM7684	
	MMI	53100	
		63100	
	Motorola	MCM7684	
	National	DM77S184	
		DM87S184	
	Raytheon	29650	
	Signetics	N82S184	
	TI	**TBP24SA81**	
			440,3969
AM27S185	**Fujitsu**	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	
			440,3968
		TBP24S81M	
			440,3968
AM27S19	AMD	AM27LS19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	**3826**
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	**TBP18S030**	
			440,3965
		TBP18S030M	
			440,3965
AM27S190	AMD	AM27PS191	
		AM27PS291	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	
AM27S190	National	DM77S190	
		DM87S190	
	Raytheon	29680	
		29683	
	Signetics	82S190	
		N82S190	
		S82S190	
	Supertex	MM82S190	
AM27S191	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	
			440,3979
AM27S20	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	**3696**
	Intel	M3601	
	MMI	5300-1	
		6300-1	**3826**
	National	DM54S387	
		DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
	TI	**TBP24SA10**	
			440,3967
		TBP24SA10M	
			440,3967
AM27S21	AMD	AM27S11	
	Harris	HM7611	
		HM7611-2	**3696**
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	**3826**
	National	DM54S287	
		DM74S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
	TI	**TBP24S10**	
			440,3967
AM27S28	Fujitsu	MB7123	
		MB7124	
		MC7124	
	Harris	HM7648	
	MMI	5348	
		6348	
	National	DM54S473	
		DM74S473	
	Raytheon	29620	
	Signetics	N82S146	
		S82S146	
	TI	**TBP28SA42**	
			440,3976
AM27S280	AMD	AM27S180	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
AM27S281	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
AM27S29	Fujitsu	MB7124	
		MBM7124	
	Harris	HM7649	
	MMI	5349-1	
		6349-1	**3826**
	Motorola	MCM7649	
	National	DM54S472	
		DM74S472	
	Raytheon	29621	
	Signetics	N82S147	
		S82S147	
	TI	DM54S472	
		TBP28S42	
			440,3975
		TBP28S42M	
			440,3975
AM27S30	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	**TBP28SA46**	**440**
AM27S31	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	**3826**
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	**TBP28S46**	
			440,3976
		TBP28S46M	
			440,3976
AM27S32	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642	
		HM7642-2	**3705**
	Intel	M3605	
	MMI	5352-1	
		6352	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Advanced Micro Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
AM27S32	National	DM54S572	
		DM74S572	
	Raytheon	29640	
	Signetics	N82S136	
		S82S136	
	TI	**TBP24SA41**	**440,3968**
		TBP24SA41M	**440,3968**
AM27S33	AMD	AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
AM27S33M	AMD	AM27S33	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
AM27S37	National	DM87SR81	
AM27S40	Harris	HM76164	
AM27S41	AMD	AM27S33	
		AM27S33M	
AM27S41	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
AM27S43	Fujitsu	MB7142	
	Intel	3632	
	Signetics	82S321	
		N82S321	
		S82S321	
AM2812	Plessey	MP3812	
AM2901A	Fairchild	29F01	
		F2901A	
	National	IDM2901A	
AM2902	Raytheon	AM2902	
AM2903	Fairchild	F2903	
	Motorola	MC2903	
AM2910	Fairchild	29F10	
		F2910	
	Motorola	MC2910	
AM29702	National	IDM29702	
AM29703	National	IDM29703	
AM29704	Fairchild	29704	
AM29705	Fairchild	29705	
		29F705	
AM29720	AMD	AM2701	
		AM27LS01	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
AM29721	AMD	AM27LS00	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
AM29721	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
AM3101	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
AM3101A	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
AM3101A	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
AM3705	Siliconix	SI3705	
AM4516	Fujitsu	MB8118	
	Hitachi	HM4816	
		HM4816A	
	Intel	2118	
	Intersil	IM7118	
	Mostek	4516	
		MK4516	
	National	NMC5295	
	NEC-Micro	2118	
	TI	TMS4516	
AM5489-1	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Advanced Micro Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
AM54S189	AMD	AM27LS03	
		AM27S03	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
AM54S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	µPB2089	
		µPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
AM592	AMD	NE592	
		SE592	
	Fairchild	µA733	
	Hitachi	HA17733	
	Intersil	µA733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		µA733	
	SiliconG	SG733	
	TI	µA733	
AM6012	AD	AD562	
	Burr-Brown	DAC862	
AM6012	Datel	DAC-562	
		DAC-681	
		DAC-681C	
	Harris	HI562	
		HI562-5	
	MicroPwr	**MP562**	**401,2749**
	MicroEng	MCE-6012	
	Motorola	**AD562**	**2759**
	PMI	DAC12	
	Signetics	**AM6012**	**3383**
		DAC-312	
	TeledyneP	4068	
AM6080	Signetics	SE5019	
		SE5118	
		SE5119	
AM6081	Datel	DAC-UP8B	
	Signetics	NE5018	
		NE5019	
		NE5118	
		NE5119	
AM7489-1	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	µPB2089	
		µPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
AM74LS568	Signetics	74LS568	
AM74LS569	Signetics	74LS569	
AM74S189	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
AM74S189	TI	SN54S189	
		SN74S189	
AM74S244	Signetics	74S244	
AM74S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	µPB2089	
		µPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
AM74S534	**Signetics**	**74S534**	**789**
AM9016	AMD	9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	µPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
AM9044E	National	NMC5257A	
AM9080	AMD	9080	
		9080A	
	Intel	8080A	
		D8080	
		MD8080	
		P8080	
	National	DP8080A	
		INS8080A	
	NEC-Micro	µPD8080	
	TI	TMS8080	
		TMS8080A	
AM9102	Fairchild	2102H	
	National	MM2102A	
AM9102	Panasonic	MN2102	
	SGS	M2102A	
AM9148	AMD	9148	
	Fairchild	**93475**	**3615,3646**
	Fujitsu	MBM2148	
		MBM2149	
	Hitachi	**HM6148**	**3789**
	Intel	2148H	
		2149H	
	National	NMC2148	
	Synertek	SY2148	
		SY2149	
AM9218	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	RO3-8316	
		RO3-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	µPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
AM9233	**AMI**	**S2333**	**3608**
	CSG	MPS2333	
	Fairchild	F3533	
	GI	RO3-9333	
	Intel	2332	
	NEC-EA	8332	
		EA8333	
	RCA	CDM5332	
	Signetics	2332	
	Synertek	**SY2333**	**3950**
	Toshiba	TM2332	
	Universal	UM2333-45	
AM9244E	AMD	4044	
		9244	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	µPD4104	
		µPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
AM9264	AMI	S4264	
	GTEMicro	2364-3	
	Mostek	MK36000-5	
	NEC-EA	UPD2/8364-30	
	Signetics	**2564A-30**	**3907**
	Synertek	SY2364-3	
	Toshiba	TMM2364	
	Weitek	SC8164	
AM92640	AMI	S68B364	
	Fairchild	F-3564-25	
	Mostek	MK36000-4	
	Motorola	MCM67365-25	
	NEC-EA	µPD2/8364-20	
	Signetics	2064-20	
	Synertek	SY2364-2	
AM93412	Fairchild	93412	
	Motorola	MCM93412	
AM93415	AMD	93415	
		93425	
	AMI	4015	
		4025	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Advanced Micro Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
AM93415	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
AM93422	Fairchild	93422	
	Motorola	MCM93422	
AM93L412	Fairchild	97L412	
AM93L422	Fairchild	93L422	
	Motorola	MCM93L422	
AM9511	Intel	C8231	
		MC8231	
AM9512	Intel	C8232	
AM9517	Intel	D8237	
		P8237	
AM9685	Plessey	SP9685	
AM9687	Plessey	SP9687	
AMD264	NEC-EA	μPD2/8364-35	
AMLM112	AMD	AMLM212	
		AMLM312	
		LM312	
	Motorola	LM312	
	National	LM312	
	SiliconG	SG3118	
AMLM212	AMD	AMLM112	
		AMLM312	
		LM312	
	Motorola	LM312	
	National	LM312	
	SiliconG	SG3118	
AMLM312	AMD	AMLM112	
		AMLM212	
		LM312	
	Motorola	LM312	
	National	LM312	
	SiliconG	SG3118	
AMZ8001	SGS	Z8001	
	Zilog	**Z8001**	**1587**
AMZ8002	SGS	Z8002	
	Zilog	**Z8002**	**1587**
AMZ8010	SGS	Z8010	
	Zilog	Z8010	
D8035	AMD	8035	
		ID8035	
		P8035	
	Fujitsu	MBL8035	
	Intel	8035	
		D8035	
		ID8035	
		P8035	
	National	INS8035	
	NEC-Micro	μPD8035	
		μPD80C35	
	Signetics	SCN8035	
D8039	AMD	ID8039	
	Fujitsu	MBL8039	
	Intel	8039	
		D8039	
		ID8039	
	National	INS8039	
	NEC-Micro	μPD8039	
	Signetics	SCN8039	
D8041	AMD	8041	
		P8041	
	Intel	8041A	
		D8041	
		P8041	
	NEC-Micro	μPD8041A	
D8085	AMD	8085	
		8085A	
		ID8085	
		MD8085	
		P8085	
D8085	Intel	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	NEC-Micro	μPD8085	
	Toshiba	TMP8085A	
D8086	AMD	ID8086	
		MD8086	
	Intel	8086	
		D8086	
		ID8086	
		MD8086	
	NEC-Micro	μPD8086	
D8088	Intel	D8088	
D8155	AMD	8155	
		ID8155	
		MD8155	
		P8155	
	Intel	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	NEC-Micro	μPD8155	
	Toshiba	TMP8155	
D8156	AMD	8156	
		ID8156	
		P8156	
	Intel	8156	
		D8156	
		ID8156	
		P8156	
	NEC-Micro	μPD8156	
D8212	Intel	D8212	
	NEC-Micro	PD8212	
D8216	Intel	D8216	
	NEC-Micro	PD8216	
D8224	Intel	D8224	
	NEC-Micro	PD8224	
D8226	Intel	D8226	
	NEC-Micro	PD8226	
D8228	Intel	D8228	
	NEC-Micro	PD8228	
D8238	Intel	D8238	
D8251	AMD	8251	
		9551	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	
D8253	AMD	8253	
		ID8253	
		P8253	
	Intel	8253	
		D8253	
		ID8253	
		P82	
	National	INS8253	
	NEC-Micro	μPD8253	
D8253-5	AMD	8253-5	
		P8253-5	
	Intel	8253-5	
		D8253-5	
		P8253-5	
	National	INS8253-5	
	NEC-Micro	μPD8253-5	
D8255	AMD	8255A-5	
		9555	
		ID8255	
		P8255	
	Intel	8255A-5	
		D8255	
		ID8255	
		P8255	
	National	INS8255	
	NEC-Micro	8255A	
		μPB8255	
		μPD8225	
		μPD8255	
D8259	AMD	ID8259	
		MD8259	
		P8259	
	Intel	8259	
		D8259	
		ID8259	
		M8259	
		P8259	
	National	INS8259	
	NEC-Micro	μPD8259	
D8279	Intel	D8279	
D8279-5	AMD	8279-5	
		P8279-5	
	Intel	8279	
		8279-5	
		D8279-5	
		P8279-5	
	NEC-Micro	μPD8279-5	
D8286	Intel	D8286	
	NEC-Micro	PD8286	
D8287	Intel	D8287	
	NEC-Micro	PD8287	
DM71LS95	National	DM71LS95	
DM71LS96	National	DM71LS96	
DM71LS97	National	DM71LS97	
DM71LS98	National	DM71LS98	
DP8303	National	DP8303	
DP8304	AMD	8304	
	Intel	8286	
		8304	
	National	DP8304	
	NEC-Micro	μPB8286	
DP8307	National	DP8307	
DS7838	National	DS7838	
DS8838	Motorola	MC3438	
	National	DS8838	
	Signetics	N8T38	
ID8035	AMD	8035	
		D8035	
		P8035	
	Fujitsu	MBL8035	
	Intel	8035	
		D8035	
		ID8035	
		P8035	
	National	INS8035	
	NEC-Micro	μPD8035	
		μPD80C35	
	Signetics	SCN8035	
ID8039	AMD	D8039	
	Fujitsu	MBL8039	
	Intel	8039	
		D8039	
		ID8039	
	National	INS8039	
	NEC-Micro	μPD8039	
	Signetics	SCN8039	
ID8085	AMD	8085	
		8085A	
		D8085	
		MD8085	
		P8085	
	Intel	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	NEC-Micro	μPD8085	
	Toshiba	TMP8085A	
ID8086	AMD	D8086	
		MD8086	
	Intel	8086	
		D8086	
		ID8086	
		MD8086	
	NEC-Micro	μPD8086	
ID8155	AMD	8155	
		D8155	
		MD8155	
		P8155	
	Intel	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	NEC-Micro	μPD8155	
	Toshiba	TMP8155	
ID8156	AMD	8156	
		D8156	
		P8156	
ID8156	Intel	8156	
		D8156	
		ID8156	
		P8156	
	NEC-Micro	μPD8156	
ID8212	Intel	ID8212	
ID8216	Intel	ID8216	
ID8226	Intel	ID8226	
ID8251	AMD	8251	
		9551	
		D8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	
ID8253	AMD	8253	
		D8253	
		P8253	
	Intel	8253	
		D8253	
		ID8253	
		P82	
	National	INS8253	
	NEC-Micro	μPD8253	
ID8255	AMD	8255A-5	
		9555	
		D8255	
		P8255	
	Intel	8255A-5	
		D8255	
		ID8255	
		P8255	
	National	INS8255	
	NEC-Micro	8255A	
		μPB8255	
		μPD8225	
		μPD8255	
ID8259	AMD	D8259	
		MD8259	
		P8259	
	Intel	8259	
		D8259	
		ID8259	
		M8259	
		P8259	
	National	INS8259	
	NEC-Micro	μPD8259	
ID8279	Intel	ID8279	
ID8286	Intel	ID8286	
ID8287	Intel	ID8287	
LF155	Intersil	LF155	
	Motorola	LF155	
	National	**LF155**	**3309**
	PMI	PM155	
	Signetics	LF155	
LF156	Intersil	LF156	
	MicroPwr	OP-16	
	Motorola	LF156	
	National	**LF156**	**3309**
	PMI	OP-16	
		PM156	
	Signetics	LF156	
LF157	Intersil	LF157	
	MicroPwr	OP-17	
	Motorola	LF157	
	National	**LF157**	**3309**
	PMI	OP-17	
		PM157	
LF255	Motorola	LF255	
	National	**LF255**	**3309**
	PMI	PM255	
LF256	Motorola	LF256	
	National	**LF256**	**3309**
	PMI	PM256	
LF257	Motorola	LF257	
	National	**LF257**	**3309**
	PMI	PM257	
LF355	Intersil	LF355	
	Motorola	LF355	
	National	**LF355**	**3309**
	PMI	PM355	
	Signetics	LF355	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Advanced Micro Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LF356	Intersil	LF356	
	Motorola	LF356	
	National	**LF356**	**3309**
	PMI	PM356	
	Signetics	LF356	
LF357	Intersil	LF357	
	Motorola	LF357	
	National	**LF357**	**3309**
	PMI	PM357	
LH2101	Intersil	LH2101	
	National	LH2101	
	Raytheon	LH2101	
	Signetics	LH2101	
LH2111	Intersil	LH2111	
	National	**LH2111**	**3317**
	Raytheon	LH2111	
LH2201	National	LH2201	
	Raytheon	LH2201	
LH2211	**National**	**LH2211**	**3317**
LH2301	Intersil	LH2301	
	National	LH2301	
LH2311	Intersil	LH2311	
	National	LH2311	
LM101	AD	AD101	
	Fairchild	μA101	
	Intersil	AD101	
	Motorola	LM101	
	Raytheon	LM101	
	Signetics	LM101	
	SiliconG	SG101	
	TI	LM101	
	Thomson-CSF	SFC2101	
LM105	Fairchild	μA105	
	Intersil	LM105	
	National	LM105	
	SiliconG	SG105	
	Thomson-CSF	SFC2105	
LM107	**AD**	**AD741S**	**3153**
	Intersil	LM107	
	National	LM107	
	Raytheon	LM107	
	SiliconG	SG107	
	TI	LM107	
		SN55107	
	Thomson-CSF	SFC2107	
LM108	**AD**	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
LM110	AMD	LM210	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM210	
		LM310	
	PMI	BUF-01	
		BUF-02	
		BUF-03	
	SiliconG	SG110	
		SG210	
		SG310	
LM111	AD	AD111	
	Fairchild	μA111	
LM111	Intersil	LM111	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM111	
	National	**LM111**	**3317**
	PMI	PM111	
	Raytheon	LM111	
	Signetics	LM111	
	SiliconG	SG111	
	TI	LM111	
	Thomson-CSF	SFC2111	
LM112	Motorola	LM112	
	National	LM112	
LM118	National	LM118	
	TI	LM118	
LM119	**National**	**LM119**	**3317**
	Signetics	LM119	
LM124A	Motorola	LM124A	
	National	LM124A	
	Raytheon	LM124A	
	RCA	CA124A	
	Signetics	LM124A	
	SiliconG	SG124	
	TI	LM124A	
LM139	Fairchild	μA139	
	Motorola	LM139	
	National	**LM139**	**3317**
	PMI	CMP-04	
		PM139	
	Raytheon	LM139	
	RCA	CA139	
	Signetics	LM139	
	SiliconG	SG139	
	TI	LM139	
LM139A	Motorola	LM139A	
	National	**LM139A**	**3317**
	PMI	CMP-04	
		PM139A	
	RCA	CA139A	
	SiliconG	SG139A	
LM148	AMD	LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
LM149	National	LM149	
LM201	AMD	748	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
LM202	National	LM202	
	SiliconG	SG202	
LM205	National	LM205	
	SiliconG	SG205	
	Thomson-CSF	SFC2205	
LM207	National	LM207	
	RCA	CA207	
	SiliconG	SG207	
LM207	TI	SN55207	
	Thomson-CSF	SFC2207	
LM208	**AD**	**AD208**	**3153**
	Fairchild	μA208	
	MicroPwr	MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM208	
	National	LM208	
	PMI	OP-08	
		OP05	
		PM208	
	SiliconG	SG208	
	TI	μA714	
LM209	Motorola	LM209	
	National	LM209	
LM210	AMD	LM110	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM210	
		LM310	
	PMI	BUF-01	
		BUF-02	
		BUF-03	
	SiliconG	SG110	
		SG210	
		SG310	
LM211	AD	AD211	
	Motorola	LM211	
	National	**LM211**	**3317**
	PMI	PM211	
	RCA	LM211	
	Signetics	LM211	
	SiliconG	SG211	
	TI	LM211	
	Thomson-CSF	SFC2211	
LM212	Motorola	LM212	
	SiliconG	SG212	
LM218	AMD	LM318	
	AD	**AD518**	**3155**
	Fairchild	μA318	
	National	LM218	
		LM318	
	NEC-Electron	μPC159	
	TI	LM218	
		LM318	
LM219	**National**	**LM219**	**3317**
	Signetics	LM219	
LM224	Fairchild	μA224	
	Motorola	LM224	
	National	LM224	
	Raytheon	LM224	
	RCA	CA224	
	Signetics	LM224	
	SiliconG	SG224	
	TI	LM224	
LM239	Fairchild	μA239	
	Motorola	LM239	
	National	**LM239**	**3317**
	PMI	CMP-04	
		PM239	
	Raytheon	LM239	
	RCA	CA239	
	Signetics	LM239	
	SiliconG	SG239	
	TI	LM239	
LM239A	Motorola	LM239A	
	National	**LM239A**	**3317**
	PMI	CMP-04	
		PM239A	
	RCA	CA239A	
	SiliconG	SG239A	
LM248	AMD	LM148	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
LM248	TI	LM148	
		LM248	
		XR4156	
LM249	National	LM249	
LM302	Intersil	LM302	
	National	LM302	
	SiliconG	SG302	
LM305	Fairchild	μA305	
	Intersil	LM305	
	National	LM305	
	NEC-Electron	μPC141	
	SiliconG	SG305	
	Thomson-CSF	SFC2305	
LM306	Fairchild	MA306	
	National	**LM306**	**3317**
	TI	LM306	
LM307	**AD**	**AD741J**	**3153**
	Intersil	LM307	
	Motorola	LM307	
	National	LM307	
	Raytheon	LM307	
	RCA	CA307	
	SiliconG	SG307	
	TI	LM307	
	Thomson-CSF	SFC2307	
LM308	**AD**	**AD308**	**3153**
	Burr-Brown	3500	
		3501	
	Fairchild	μA308	
	Intersil	AD308	
		LM308	
	MicroPwr	MP5505	
	Motorola	LM308	
	National	LM308	
	Raytheon	LM308	
	SiliconG	SG308	
LM309	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
LM310	AMD	LM110	
		LM210	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM210	
		LM310	
	PMI	BUF-01	
		BUF-02	
		BUF-03	
	SiliconG	SG110	
		SG210	
		SG310	
LM311	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
LM312	AMD	AMLM112	
		AMLM212	
		AMLM312	

◇ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

ALTERNATE SOURCE DIRECTORY

© IC MASTER 1983

Advanced Micro Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LM312	Motorola	LM312	
	National	LM312	
	SiliconG	SG3118	
LM318	AMD	LM218	
	AD	**AD518**	**3155**
	Fairchild	μA318	
	National	LM218	
		LM318	
	NEC-Electron	μPC159	
	TI	LM218	
		LM318	
LM319	**National**	**LM319**	**3317**
	NEC-Electron	μPC319	
	Signetics	LM319	
LM324	**Exar**	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
LM339	AMD	LM339A	
	Fairchild	μA339	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
		LM339	
	SiliconG	SG339	
	TI	LM339	
LM339A	AMD	LM339	
	Fairchild	μA339	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
		LM339	
	SiliconG	SG339	
	TI	LM339	
LM348	AMD	LM148	
		LM248	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
LM349	National	LM349	
LM555	AMD	LM556	
	Exar	XR556	
		XR556M	
LM555	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
LM556	AMD	LM555	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
MC1488	**Exar**	**XR1488**	**3188**
	Fairchild	μA1488	
	Harris	HA1488	
	Hitachi	HD75188	
	Motorola	**MC1488**	**2753**
	National	DS1488	
	Raytheon	RM1488	
	Signetics	MC1488	
	SiliconG	SG1488	
	TI	MC1488	
		SN75188	
MC1489	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
MD8085	AMD	8085	
		8085A	
		D8085	
		ID8085	
		P8085	
	Intel	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	NEC-Micro	μPD8085	
	Toshiba	TMP8085A	
MD8086	AMD	D8086	
		ID8086	
	Intel	8086	
		D8086	
		ID8086	
		MD8086	
	NEC-Micro	μPD8086	
MD8155	AMD	8155	
		D8155	
		ID8155	
		P8155	
	Intel	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	NEC-Micro	μPD8155	
	Toshiba	TMP8155	
MD8212	Intel	MD8212	
MD8216	Intel	MD8216	
MD8224	Intel	MD8224	
MD8226	Intel	MD8226	
MD8228	Intel	MD8228	
MD8251	AMD	8251	
		9551	
		D8251	
		ID8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	
MD8259	AMD	D8259	
		ID8259	
		P8259	
	Intel	8259	
		D8259	
		ID8259	
		M8259	
		P8259	
	National	INS8259	
	NEC-Micro	μPD8259	
MD8286	Intel	MD8286	
MMH0026	Motorola	MMH0026	
	National	DS0026	
		MH0026	
N8T26	AMD	N8T26A	
	Fairchild	μA8T26A	
	Hitachi	HD268T26	
	Motorola	MC6880A	
		MC8T26	
		MC8T26A	
	National	DS8T26A	
	Signetics	N8T26	
		N8T26A	
	TI	N8T26A	
N8T26A	AMD	N8T26	
	Fairchild	μA8T26A	
	Hitachi	HD268T26	
	Motorola	MC6880A	
		MC8T26	
		MC8T26A	
	National	DS8T26A	
	Signetics	N8T26	
		N8T26A	
	TI	N8T26A	
N8T28	Motorola	MC8T28	
	Signetics	N8T28	
NE592	AMD	AM592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		μA733	
	SiliconG	SG733	
	TI	μA733	
P8035	AMD	8035	
		D8035	
		ID8035	
	Fujitsu	MBL8035	
	Intel	8035	
		D8035	
		ID8035	
		P8035	
	National	INS8035	
	NEC-Micro	μPD8035	
		μPD80C35	
	Signetics	SCN8035	
P8041	AMD	8041	
		D8041	
	Intel	8041A	
		D8041	
		P8041	
	NEC-Micro	μPD8041A	
P8085	AMD	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
P8085	Intel	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	NEC-Micro	μPD8085	
	Toshiba	TMP8085A	
P8088	Intel	P8088	
P8155	AMD	8155	
		D8155	
		ID8155	
		MD8155	
	Intel	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	NEC-Micro	μPD8155	
	Toshiba	TMP8155	
P8156	AMD	8156	
		D8156	
		ID8156	
	Intel	8156	
		D8156	
		ID8156	
		P8156	
	NEC-Micro	μPD8156	
P8216	Intel	P8216	
P8224	Intel	P8224	
P8226	Intel	P8226	
P8228	Intel	P8228	
P8238	Intel	P8238	
P8251	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	
P8253	AMD	8253	
		D8253	
		ID8253	
	Intel	8253	
		D8253	
		ID8253	
		P82	
	National	INS8253	
	NEC-Micro	μPD8253	
P8253-5	AMD	8253-5	
		D8253-5	
	Intel	8253-5	
		D8253-5	
		P8253-5	
	National	INS8253-5	
	NEC-Micro	μPD8253-5	
P8255	AMD	8255A-5	
		9555	
		D8255	
		ID8255	
	Intel	8255A-5	
		D8255	
		ID8255	
		P8255	
	National	INS8255	
	NEC-Micro	8255A	
		μPB8255	
		μPD8225	
		μPD8255	
P8259	AMD	D8259	
		ID8259	
		MD8259	
	Intel	8259	
		D8259	
		ID8259	
		M8259	
		P8259	
	National	INS8259	
	NEC-Micro	μPD8259	
P8279	Intel	P8279	
P8279-5	AMD	8279-5	
		D8279-5	

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Advanced Micro Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
P8279-5	Intel	8279	
		8279-5	
		D8279-5	
		P8279-5	
	NEC-Micro	μPD8279-5	
P8286	Intel	P8286	
P8287	Intel	P8287	
S8T26	Signetics	S8T26	
S8T28	Signetics	S8T28	
SE592	AMD	AM592	
		NE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		μA733	
	SiliconG	SG733	
	TI	μA733	
SN54LS138	Fairchild	54LS138	
	Motorola	SN54LS138	
	National	DM54LS138	
	Raytheon	54LS138	
	Signetics	54LS138	
	TI	**SN54LS138**	**880**
SN54LS139	Fairchild	54LS139	
	Motorola	SN54LS139	
	National	DM54LS139	
	Raytheon	54LS139	
	Signetics	54LS139	
	TI	**SN54LS139**	**880**
SN54LS148	Motorola	SN54LS148	
	TI	**SN54LS148**	**883**
SN54LS151	Fairchild	54LS151	
	Motorola	SN54LS151	
	National	DM54LS151	
	Raytheon	54LS151	
	Signetics	54LS151	
	TI	**SN54LS151**	**884**
SN54LS153	Fairchild	54LS153	
	Motorola	SN54LS153	
	National	DM54LS153	
	Raytheon	54LS153	
	Signetics	54LS153	
	TI	**SN54LS153**	**884**
SN54LS157	Fairchild	54LS157	
	Motorola	SN54LS157	
	National	DM54LS157	
	Raytheon	54LS157	
	Signetics	54LS157	
	TI	**SN54LS157**	**887**
SN54LS158	Fairchild	54LS158	
	Motorola	SN54LS158	
	National	DM54LS158	
	Raytheon	54LS158	
	Signetics	54LS158	
	TI	**SN54LS158**	**887**
SN54LS160A	**AMD**	**SN74S160**	**1227**
	Fairchild	93S10	
	Motorola	SN54LS160A	
	National	DM54LS160	
	Raytheon	54LS160	
	Signetics	54LS160	
		54LS160A	
	TI	**SN54LS160A**	**889**
SN54LS161A	Fairchild	54LS161A	
	Motorola	SN54LS161A	
	National	DM54LS161A	
	Raytheon	54LS161	
	Signetics	54LS161A	
	TI	SN54LS161	
		SN54LS161A	**889**
SN54LS162A	Motorola	SN54LS162A	
	National	DM54LS162A	
	Raytheon	54LS162	
	Signetics	54LS162A	
	TI	SN54LS162	
		SN54LS162A	**890**
SN54LS163A	Motorola	SN54LS163A	
	National	DM54LS163	
		DM54LS163A	
	Raytheon	54LS163	
	Signetics	54LS163A	
SN54LS163A	TI	54LS163A	
		SN54LS163	
		SN54LS163A	
SN54LS164	Fairchild	54LS164	
	Motorola	SN54LS164	
		SN54LS164A	
	National	DM54LS164	
		DM54LS164A	
	Raytheon	54LS164	
	Signetics	54LS164	
	TI	**SN54LS164**	**891**
		SN54LS164A	
SN54LS168A	Fairchild	54LS168	
	Motorola	SN54LS168	
	National	DM54LS168	
	TI	SN54LS168	
SN54LS169A	Fairchild	54LS169	
	Motorola	SN54LS169	
	National	DM54LS169	
	TI	SN54LS169	
SN54LS174	Fairchild	54LS174	
	Motorola	SN54LS174	
	National	DM54LS174	
	Raytheon	54LS174	
	Signetics	54LS174	
	TI	**SN54LS174**	**895**
SN54LS175	Fairchild	54LS175	
	Motorola	SN54LS175	
	National	DM54LS175	
	Raytheon	54LS175	
	Signetics	54LS175	
	TI	**SN54LS175**	**895**
SN54LS181	Fairchild	54LS181	
	Motorola	SN54LS181	
	Raytheon	54LS181	
	Signetics	54LS181	
	TI	**SN54LS181**	**897**
SN54LS190	Motorola	SN54LS190	
	National	DM54LS190	
	Raytheon	54LS190	
	Signetics	54LS190	
	TI	**SN54LS190**	**901**
SN54LS191	Motorola	SN54LS191	
	National	DM54LS191	
	Raytheon	54LS191	
	Signetics	54LS191	
	TI	**SN54LS191**	**901**
SN54LS192	Fairchild	54LS192	
	Motorola	SN54LS192	
	National	DM54LS192	
	Raytheon	54LS192	
	Signetics	54LS192	
	TI	**SN54LS192**	**902**
SN54LS193	Fairchild	54LS193	
	Motorola	SN54LS193	
	National	DM54LS193	
	Raytheon	54LS193	
	Signetics	54LS193	
	TI	**SN54LS193**	**902**
SN54LS194A	Fairchild	54LS194A	
	Motorola	SN54LS194A	
	TI	**SN54LS194A**	**902**
SN54LS195A	Fairchild	54LS195A	
	Motorola	SN54LS195A	
	Raytheon	54LS195A	
	Signetics	54LS195A	
	TI	**SN54LS195A**	**903**
SN54LS240	Fairchild	54LS240	
	MMI	54LS240	
	Motorola	SN54LS240	
	Raytheon	54LS240	
	TI	**SN54LS240**	**910**
SN54LS241	Fairchild	54LS241	
	MMI	54LS241	
	Motorola	SN54LS241	
	Raytheon	54LS241	
	TI	**SN54LS241**	**911**
SN54LS242	Motorola	SN54LS242	
	Raytheon	54LS242	
	TI	**SN54LS242**	**911**
SN54LS243	Motorola	SN54LS243	
	Raytheon	54LS243	
	TI	**SN54LS243**	**912**
SN54LS244	Fairchild	54LS244	
	MMI	54LS244	
	Motorola	SN54LS244	
	Raytheon	54LS244	
	TI	**SN54LS244**	**912**
SN54LS251	Fairchild	54LS251	
	Motorola	SN54LS251	
	Raytheon	54LS251	
	Signetics	54LS251	
SN54LS251	**TI**	**SN54LS251**	**915**
SN54LS253	Fairchild	54LS253	
	Motorola	SN54LS253	
	National	DM54LS253	
		DM7214	
	Raytheon	54LS253	
	Signetics	54LS253	
	TI	SN54LS253	
SN54LS257	Motorola	SN54LS257A	
	National	DM54LS257	
	Raytheon	54LS257	
	Signetics	54LS257	
	TI	SN54LS257	
		SN54LS257A	**916**
SN54LS258	Fairchild	54LS258A	
	Motorola	SN54LS258A	
	National	DM54LS258	
	Raytheon	54LS258	
	Signetics	54LS258	
	TI	SN54LS258	
		SN54LS258A	**917**
SN54LS273	Fairchild	54LS273	
	Motorola	SN54LS273	
	Raytheon	54LS273	
	TI	**SN54LS273**	**919**
SN54LS281	TI	SN54LS281	
SN54LS298	Fairchild	54LS298	
	Motorola	SN54LS298	
	Raytheon	54LS298	
	TI	**SN54LS298**	**926**
SN54LS299	Fairchild	54LS299	
	MMI	54LS299	
	Motorola	SN54LS299	
	Raytheon	54LS299	
	TI	**SN54LS299**	**927**
SN54LS322	Motorola	SN54LS322	
	Raytheon	54LS322	
		54LS322A	
	TI	SN54LS322	
		SN54LS322A	**930**
SN54LS323	AMD	SN74LS323	
	Fairchild	54LS323	
		74LS323	
	Motorola	SN54LS323	
		SN74LS323	
	Raytheon	54LS323	
		74LS323	
	TI	**SN54LS323**	**930**
		SN54LS323A	
		SN74LS323	**930**
SN54LS373	MMI	54LS373	
	Motorola	SN54LS373	
	Raytheon	54LS373	
	Signetics	**54LS373**	**783**
	TI	**SN54LS373**	**937**
SN54LS374	MMI	54LS374	
	Motorola	SN54LS374	
	National	DM54LS374	
	Raytheon	54LS374	
	TI	**SN54LS374**	**938**
SN54LS377	Fairchild	54LS377	
	Motorola	SN54LS377	
	Raytheon	54LS377	
	TI	**SN54LS377**	**939**
SN54LS378	Fairchild	54LS378	
	Motorola	SN54LS378	
	TI	**SN54LS378**	**939**
SN54LS379	Fairchild	54LS379	
	Motorola	SN54LS379	
	TI	SN54LS379	
SN54LS381	**TI**	**SN54LS381**	**940**
SN54LS384	Motorola	SN54LS384	
	Raytheon	54LS384	
	TI	**SN54LS384**	**941**
SN54LS385	Motorola	SN54LS385	
	Raytheon	54LS385	
	TI	**SN54LS385**	**942**
SN54LS399	Fairchild	54LS399	
	Motorola	SN54LS399	
	TI	**SN54LS399**	**944**
SN54LS424	TI	SN54LS424	
SN54LS568	Motorola	SN54LS568	
SN54LS569	Motorola	SN54LS569	
SN54S138	Fairchild	54S138	
	TI	**SN54S138**	**880**
SN54S139	Fairchild	54S139	
	Signetics	54S139	
	TI	**SN54S139**	**880**
SN54S151	Fairchild	54S151	
	Signetics	54S151	
	TI	**SN54S151**	**884**
SN54S153	Fairchild	54S153	
SN54S153	Signetics	54S153	
	TI	**SN54S153**	**884**
SN54S157	Fairchild	54S157	
	Signetics	54S157	
	TI	**SN54S157**	**887**
SN54S158	Fairchild	54S158	
	Signetics	54S158	
	TI	**SN54S158**	**887**
SN54S174	Fairchild	54S174	
	TI	**SN54S174**	**895**
SN54S175	Fairchild	54S175	
		93S411	
	TI	**SN54S175**	**895**
SN54S181	Fairchild	93S41M	
	Signetics	54S181	
	TI	**SN54S181**	**897**
SN54S189	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
SN54S194	Fairchild	54S194	
	TI	**SN54S194**	**902**
SN54S195	Fairchild	54S195	
		93S00M	
SN54S240	MMI	54S240	
		SN54S240	**715**
	Raytheon	54S240	
	TI	**SN54S240**	**910**
SN54S241	MMI	54S241	
		SN54S241	**715**
	Raytheon	54S241	
	TI	**SN54S241**	**911**
SN54S244	MMI	54S244	
		SN54S244	**715**
	Raytheon	54S244	
	TI	**SN54S244**	**912**
SN54S251	Signetics	54S251	
	TI	**SN54S251**	**915**
SN54S253	Fairchild	54S253	
	Signetics	54S253	
SN54S257	AMD	SN74S257	
	Fairchild	74S257	
	Hitachi	HD74S257	
	National	DM7123	
		DM74S257	
		DM8123	
	Signetics	54S257	
		74S257	
	TI	**SN54S257**	**916**
		SN74S257	**916**
SN54S258	Fairchild	54S258	
	Signetics	54S258	
	TI	**SN54S258**	**917**
SN54S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Advanced Micro Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN54S289	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
SN74LS161	Fairchild	74LS161A	
	Hitachi	HD74LS161A	
	Motorola	SN74LS161A	
	National	DM74LS161	
	NEC-Electron	μPB74LS161	
	Raytheon	74LS161	
	Signetics	74LS161A	
	TI	**SN74LS161A**	**889**
SN74LS240	Fairchild	74LS240	
	Hitachi	HD74LS240	
	MMI	74LS240	
	Motorola	SN74LS240	
	Raytheon	74LS240	
	Signetics	74LS240	
	TI	**SN74LS240**	**910**
SN74LS241	Fairchild	74LS241	
	Hitachi	HD74LS241	
	MMI	74LS241	
	Motorola	SN74LS241	
	Raytheon	74LS241	
	Signetics	74LS241	
	TI	**SN74LS241**	**911**
SN74LS242	Fairchild	74LS242A	
	Motorola	SN74LS242	
	Raytheon	74LS242	
	Signetics	74LS242	
	TI	**SN74LS242**	**911**
SN74LS243	Fairchild	74LS243A	
	Motorola	SN74LS243	
	Raytheon	74LS243	
	Signetics	74LS243	
	TI	**SN74LS243**	**912**
SN74LS244	Fairchild	74LS244	
	Hitachi	HD74LS244	
	MMI	74LS244	
	Motorola	SN74LS244	
	Raytheon	74LS244	
	Signetics	74LS244	
	TI	**SN74LS244**	**912**
SN74LS273	Fairchild	74LS273	
	Motorola	SN74LS273	
	Raytheon	74LS273	
	SGS	T74LS273	
	Signetics	74LS273	
	TI	**SN74LS273**	**919**
SN74LS299	Fairchild	74LS299	
	Hitachi	HD74LS299	
	Motorola	SN74LS299	
	Raytheon	74LS299	
	SGS	T74LS299	
	TI	**SN74LS299**	**927**
SN74LS322	Fairchild	74LS322	
	Motorola	SN74LS322	
	Raytheon	74LS322	
		74LS322A	
	TI	**SN74LS322A**	**930**
SN74LS323	AMD	SN54LS323	
	Fairchild	54LS323	
		74LS323	
SN74LS323	Motorola	SN54LS323	
		SN74LS323	
	Raytheon	54LS323	
		74LS323	
	TI	**SN54LS323**	**930**
		SN54LS323A	
		SN74LS323	**930**
SN74LS373	Fairchild	74LS373	
	MMI	74LS373	
	Motorola	SN74LS373	
	Raytheon	74LS373	
	SGS	T74LS373	
	Signetics	**74LS373**	**783**
	TI	**SN74LS373**	**937**
SN74LS374	Fairchild	74LS374	
	MMI	74LS374	
	Motorola	SN74LS374	
	National	DM74LS374	
	Raytheon	74LS374	
	SGS	T74LS374	
	Signetics	74LS374	
	TI	**SN74LS374**	**938**
SN74LS377	Fairchild	74LS377	
	Motorola	SN74LS377	
	Raytheon	74LS377	
	SGS	T74LS377	
	Signetics	74LS377	
	TI	**SN74LS377**	**939**
SN74LS378	Fairchild	74LS378	
	Motorola	SN74LS378	
	SGS	T74LS378	
	Signetics	74LS378	
		SN74LS378	
	TI	**SN74LS378**	**939**
SN74LS379	Fairchild	74LS379	
	Motorola	SN74LS379	
	SGS	T74LS379	
	TI	**SN74LS379**	**940**
SN74LS381	**TI**	**SN74LS381**	**940**
SN74LS384	Motorola	SN74LS384	
	Raytheon	74LS384	
	TI	**SN74LS384**	**941**
SN74LS385	Motorola	SN74LS385	
	Raytheon	74LS385	
	TI	**SN74LS385**	**942**
SN74LS399	Motorola	SN74LS399	
	TI	**SN74LS399**	**944**
SN74LS424	TI	SN74LS424	
SN74LS533	Fairchild	74LS533	
SN74LS534	Fairchild	74LS534	
SN74LS568	Motorola	SN74LS568	
SN74LS569	Motorola	SN74LS569	
SN74S138	Fairchild	74S138	
	National	DM74S138	
	Signetics	74S138	
	TI	**SN74S138**	**880**
SN74S139	Fairchild	74S139	
	National	DM74S139	
	Signetics	74S139	
	TI	**SN74S139**	**880**
SN74S151	Fairchild	74S151	
	Hitachi	HD74S151	
	National	DM74S151	
	Signetics	74S151	
	TI	**SN74S151**	**884**
SN74S153	Fairchild	74S153	
	Hitachi	HD74S153	
	National	DM74S153	
	Signetics	74S153	
	TI	**SN74S153**	**884**
SN74S157	Fairchild	74S157	
	Hitachi	HD74S157	
	National	DM74S157	
	Signetics	74S157	
	TI	**SN74S157**	**887**
SN74S158	Fairchild	74S158	
	Hitachi	HD74S158	
	National	DM74S158	
	Signetics	74S158	
	TI	**SN74S158**	**887**
SN74S160	AMD	SN54LS160A	
	Fairchild	93S10	
	Motorola	SN54LS160A	
	National	DM54LS160	
	Raytheon	54LS160	
	Signetics	54LS160	
		54LS160A	
	TI	**SN54LS160A**	**889**
SN74S174	Fairchild	74S174	
	Hitachi	HD74S174	
	National	DM74S174	
SN74S174	Signetics	74S174	
	TI	**SN74S174**	**895**
SN74S175	Fairchild	74S175	
	Hitachi	HD74S175	
	National	DM74S175	
	Signetics	74S175	
	TI	**SN74S175**	**895**
SN74S181	Fairchild	93S41C	
	Hitachi	HD74S181	
	Signetics	74S181	
	TI	SN74S181	
SN74S189	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
SN74S194	Fairchild	74S194	
	Signetics	74S194	
	TI	**SN74S194**	**902**
SN74S195	Fairchild	74S195	
		93S00C	
	National	DM74S195	
	Signetics	74S195	
	TI	**SN74S195**	**903**
SN74S240	MMI	74S240	
		SN74S240	**715**
	Signetics	74S240	
	TI	**SN74S240**	**910**
SN74S241	MMI	74S241	
		SN74S241	**715**
	Signetics	74S241	
	TI	**SN74S241**	**911**
SN74S251	Hitachi	HD74S251	
	National	DM74S251	
	Signetics	74S251	
	TI	**SN74S251**	**915**
SN74S253	Fairchild	74S253	
	National	DM74S253	
	Signetics	74S253	
SN74S257	AMD	SN54S257	
	Fairchild	74S257	
	Hitachi	HD74S257	
	National	DM7123	
		DM74S257	
		DM8123	
	Signetics	54S257	
		74S257	
	TI	**SN54S257**	**916**
		SN74S257	**916**
SN74S258	Fairchild	74S258	
	Hitachi	HD74S258	
	Signetics	74S258	
	TI	**SN74S258**	**917**
SN74S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
SN74S289	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
SSS1408	AMD	1408	
		1508	
		AM1508	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
SSS741	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	PMI	OP-02	
		SSS741	
TMS2812	Plessey	MP2812	
Z8530	Zilog	Z8530	
Z8536	Zilog	Z8536	
Z8538	Zilog	Z8538	
Z8590	**Zilog**	**Z8590**	**1595**
Z8591	Zilog	Z8591	
Z8592	Zilog	Z8592	
Z8593	Zilog	Z8593	
Z8594	Zilog	Z8594	

American Microsystems, Inc.

1010	AdaptSci	1010
1020	AdaptSci	1020
1120	AdaptSci	1120
4015	AMD	93415
		93425
		AM93415
	AMI	4025
	Fairchild	93415
		93425A

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

© IC MASTER 1983

American Microsystems, Inc. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
4015	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
4017	AMD	9147	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
4025	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
560	AdaptSci	560	
590	AdaptSci	590	
S1103A	Fairchild	1103	
S1602	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
◆S1863	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
◆S2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	FMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
S2182	AMI	S2183	
		S2185	
	Fairchild	3347	
	SMC	SR5015	
S2183	AMI	S2182	
		S2185	
	Fairchild	3347	
	SMC	SR5015	
S2185	AMI	S2182	
		S2183	
	Fairchild	3347	
	SMC	SR5015	
S23128	National	S2128	
	NEC-EA	μPD2/83128	
	Signetics	**23128-30**	**3901**
S2333	AMD	AM9233	
	CSG	MPS2333	
	Fairchild	F3533	
	GI	R03-9333	
	Intel	2332	
	NEC-EA	8332	
		EA8333	
	RCA	CDM5332	
	Signetics	2332	
	Synertek	**SY2333**	**3950**
	Toshiba	TM2332	
	Universal	UM2333-45	
S2364	GI	R03-9367	
	Mostek	MK37000	
	Signetics	**2364-20**	**3899**
	Synertek	**SY2365**	**3951**
		SY2365-2	**3951**
S25089	Mitel	MT5089	
	Mostek	MK5089	
	National	TP5089	
	Plessey	MV5089	
S2688	National	MM5837	
S2859	GI	AY-5-9559	
	Mitel	MT5087	
	Mostek	MK5087	
	National	TP5087	
	Plessey	MV5087	
S4264	AMD	AM9264	
	GTEMicro	2364-3	
	Mostek	MK36000-5	
	NEC-EA	UPD2/8364-30	
	Signetics	**2664A-30**	**3907**
	Synertek	SY2364-3	
	Toshiba	TMM2364	
	Weitek	SC8164	
S4521	Hughes	HLCD0438	
	RCA	CD0438	
S4534	Sprague	UCN-4810	
	TI	UCN4810	
S50240	Mostek	MK50240	
S50241	Mostek	MK50241	
S50242	Mostek	MK50242	
S6508	Fairchild	4736B	
	Harris	**HM6508**	**669,1333,3754**
	Intel	2125A	
S6508	Motorola	MCM2125	
	National	MM74C929	
		NMC6508	
	NEC-Micro	μPD443	
	SSS	SCM21C02	
	Toshiba	TC5508	
S6551	CSG	MP6551	
		MPS6551	
	Rockwell	R6551	
	Synertek	**SY6551**	**1536**
S6801	Hitachi	HD6801	
	Motorola	**MC6801**	**1351,1730**
S6802	**Fairchild**	**F6802**	**1278**
	Hitachi	**HD6802**	**1345**
	Motorola	**MC6802**	**1351**
S68045	**Synertek**	**SY68045**	**1535**
S6805	Hitachi	HD6805	
	Motorola	MC6805	
S6808	**Fairchild**	**F6808**	**1278**
	Hitachi	HD6808	
	Motorola	**MC6808**	**1351**
S6809	**Hitachi**	**HD6809**	**1345**
		HD68A09	**1345**
		HD68B09	**1345**
	Motorola	**MC6809**	**1352**
S6810	**Fairchild**	**F6810**	**1278**
	Hitachi	HD6810	
		HD68A10	
	Motorola	MC6810	
		MCM6810	**1351,3839**
S6821	**Fairchild**	**F6821**	**1279**
	Hitachi	**HD6821**	**1345**
		HD68A21	**1345**
		HD68B21	**1345**
	Motorola	**MC6821**	**1351**
S6831B	AMD	AM9218	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
S68322	AMD	9232	
	AMI	S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
S68364	AMD	9264	
		9265	
	AMI	**S68A364**	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
S68364	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
S6840	**Fairchild**	**F6840**	**1279**
	Hitachi	HD46840	
		HD6840	**1345**
		HD68A40	**1345**
		HD68B40	**1345**
	Motorola	**MC6840**	**1351**
S6846	**Fairchild**	**F6846**	**1280**
	Hitachi	HD46846	
		HD6846P	
	Motorola	**MC6846**	**1351**
S68488	**Fairchild**	**F68488**	**1280**
	Motorola	**MC68488**	**1351**
S6852	**Fairchild**	**F6852**	**1281**
	Hitachi	**HD6852**	**1345**
		HD68A52	**1345**
	Motorola	**MC2652**	**1359**
		MC6852	**1351**
		MC68652	**1359**
	Signetics	SCN2652	
	SSS	SND5025	
	SMC	COM5025	
S6854	**Fairchild**	**F6854**	**1281**
	Motorola	**MC6854**	**1351**
S68A00	Motorola	MC68A00	
S68A10	Motorola	MC68A10	
S68A21	Motorola	MC68A21	
S68A332	AMD	9232	
	AMI	S68322	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
S68A364	AMD	9264	
		9265	
	AMI	S68364	
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
S68A50	Motorola	MC68A50	
S68A54	Motorola	MC68A54	
S68B00	Motorola	MC68B00	
S68B10	Motorola	MC68B10	
S68B21	Motorola	MC68B21	
S68B364	AMD	AM92640	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
American Microsystems, Inc. (Cont'd)			
S68B364	Fairchild	F-3564-25	
	Mostek	MK36000-4	
	Motorola	MCM67365-25	
	NEC-EA	μPD2/8364-20	
	Signetics	2064-20	
	Synertek	SY2364-2	
S68B50	Motorola	MC68B50	
S68B54	Motorola	MC68B54	
S9900	**TI**	**TMS9900**	**1552**
S99000	TI	TMS99000	
S9901	**TI**	**TMS9901**	**1554**
S9902	TI	TMS9902	
S9903	**TI**	**TMS9903**	**1554**
S9904	TI	TMS9904	
S9940	TI	TMS9940	
S9980	TI	TMS9980	
S9981	**TI**	**TMS9981**	**1553**
S9995	TI	TMS9995	
UA-1	CalDevices	HC3100	
	LSILogic	LC3100	
UA-2	CalDevices	HC4100	
	LSILogic	LC4100	
UA-3	CalDevices	HC5400	
	LSILogic	LC5400	
UA-4	CalDevices	HC7700	
	LSILogic	LC7700	
UA-5	CalDevices	HC10000	
	LSILogic	LC10000	
UA-6	CalDevices	HC12600	
	LSILogic	LC12600	
Amperex Electronic Corp.			
MD8287	Intel	MD8287	
Analog Devices			
AD0042	AD	AD503	
	Intersil	AD503	
		LH0042	
	National	**LH0042**	**3342**
AD101	AMD	LM101	
	Fairchild	μA101	
	Intersil	AD101	
	Motorola	LM101	
	Raytheon	LM101	
	Signetics	LM101	
	SiliconG	SG101	
	TI	LM101	
	Thomson-CSF	SFC2101	
AD108	AMD	LM108	
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
AD111	AMD	LM111	
	Fairchild	μA111	
	Intersil	LM111	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM111	
	National	**LM111**	**3317**
	PMI	PM111	
	Raytheon	LM111	
AD111	Signetics	LM111	
	SiliconG	SG111	
	TI	LM111	
	Thomson-CSF	SFC2111	
AD1403	**Motorola**	**MC1403**	**2761**
	SiliconG	SG1403	
AD1408	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	**ADDAC-08**	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
AD201	AMD	748	
		LM201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
AD2020	**RCA**	**CA3162**	**3356**
AD208	AMD	LM208	
	Fairchild	μA208	
	MicroPwr	MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM208	
	National	LM208	
	PMI	OP-08	
		OP05	
		PM208	
	SiliconG	SG208	
	TI	μA714	
AD211	AMD	LM211	
	Motorola	LM211	
	National	**LM211**	**3317**
	PMI	PM211	
	RCA	LM211	
	Signetics	LM211	
	SiliconG	SG211	
	TI	LM211	
	Thomson-CSF	SFC2211	
AD2700	HybridSys	R675-4	
AD2701	HybridSys	R675-5	
AD2702	HybridSys	R675-3	
AD301	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
AD308	AMD	LM308	
	Burr-Brown	3500	
		3501	
	Fairchild	μA308	
	Intersil	AD308	
		LM308	
	MicroPwr	MP5505	
	Motorola	LM308	
	National	LM308	
	Raytheon	LM308	
	SiliconG	SG308	
AD311	AMD	LM311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
AD3542	Burr-Brown	3542	
AD370	AD	AD371	
	HybridSys	DAC346	
		DAC347	
	MicroNet	MN3210	
		MN3211	
		MN370	
		MN371	
AD371	AD	AD370	
	HybridSys	DAC346	
		DAC347	
	MicroNet	MN3210	
		MN3211	
		MN370	
		MN371	
AD503	AD	AD0042	
	Intersil	AD503	
		LH0042	
	National	**LH0042**	**3342**
AD506	**National**	**LH0022**	**3342**
		LM0052	
AD507	Burr-Brown	3508	
	Datel	AM-462-1	
		AM-462-2	**2622**
	Harris	**HA-2620**	**3228,3287**
		HA-2622	**3228,3287**
		HA-2625	**3228,3287**
	Intersil	HA-2622	
		HA-2625	
		HA2620	
		HA2625	
AD510	AD	AD517	
		ADOP-07	**3153**
	Burr-Brown	3510	
	Datel	AM-430	
		AM-490-2	
	Fairchild	μA714	
	Harris	HA-2900	
		HA-2905	
		HA-5130	
		HA-5135	
AD510	MicroPwr	MP517	
		MP5505	
		MP5507	
		OP-05	
		OP-07	
	National	**LH0044**	**3342**
	NEC-Electron	μPC725	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TeledyneP	1340	
	TI	OP-07	
AD515	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
AD517	AD	AD510	
		ADOP-07	**3153**
	Burr-Brown	3510	
	Datel	AM-430	
		AM-490-2	
	Fairchild	μA714	
	Harris	HA-2900	
		HA-2905	
		HA-5130	
		HA-5135	
AD518	AMD	LM218	
		LM318	
	Fairchild	μA318	
	National	LM218	
		LM318	
	NEC-Electron	μPC159	
	TI	LM218	
		LM318	
AD5201	MicroNet	MN5201	
AD5202	MicroNet	MN5202	
AD5203	MicroNet	MN5203	
AD5204	MicroNet	MN5204	
AD5205	MicroNet	MN5205	
AD5206	MicroNet	MN5206	
AD5207	MicroNet	MN5207	
AD5210	**Datel**	**ADC-5210**	**2621**
	HybridSys	HS5210	
	DDC	DDC5210	
	MicroNet	MN5210	
	TeledyneP	TP5210	
AD528	**National**	**LH0062**	**3342**
AD530	AD	AD533	
	Burr-Brown	4203	
	Intersil	ICL8013	
AD532	Burr-Brown	4205	
		4213	
		4214	
AD533	AD	AD530	
	Burr-Brown	4203	
	Intersil	ICL8013	
AD540	Burr-Brown	3503	
	Datel	**AM-450-2**	**2622**
	Harris	**HA-2505**	**3216,3287**
	Intersil	HA2505	
		HA2525	
	MicroPwr	MP5501	
	PMI	OP01	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Analog Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
AD545	Burr-Brown	OPA103	
◆AD559	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
AD561	MicroPwr	MP561	
AD562	AMD	AM6012	
	Burr-Brown	DAC862	
	Datel	DAC-562	
		DAC-681	
		DAC-681C	
	Harris	HI562	
		HI562-5	
	MicroPwr	**MP562**	**401,2749**
	MicroEng	MCE-6012	
	Motorola	**AD562**	**2759**
	PMI	DAC12	
	Signetics	**AM6012**	**3383**
		DAC-312	
	TeledyneP	4068	
AD562A/BCD	Analogic	MN562-AD-BCD	
AD563	Burr-Brown	DAC863	
	Motorola	**AD563**	**2759**
AD563J/BCD	Analogic	MN563-JD-BCD	
AD565	Fairchild	μA565	
	MicroEng	MCE-565	
AD565J	**Motorola**	**MC3412**	**2757**
AD565S	**Motorola**	**MC3512**	**2757**
AD566	MicroEng	MCE-566	
AD570	MicroEng	MCE-570	
AD571	Fairchild	μA571	
	MicroPwr	MP571	
	MicroEng	MCE-571	
AD574	MicroEng	MCE-574	
AD583	**Datel**	**SHM-IC-1**	**2622**
	Harris	**HA-2425**	**3214,3287**
	PMI	SMP-10	
		SMP-11	
	TeledyneP	4856	
AD589	Datel	VR-8069	
	Ferranti	ZN423	
	Intersil	ICL8069	
	MicroPwr	**MP5010**	**401,3292**
	National	**LH1113**	**3304**
		LH1313	**3304**
	TeledyneS	9491	
		9941	
AD590	Intersil	AD590	
AD741	AMD	741	
		SSS741	
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
AD741	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
AD741J	AMD	LM307	
	Intersil	LM307	
	Motorola	LM307	
	National	LM307	
	Raytheon	LM307	
	RCA	CA307	
	SiliconG	SG307	
	TI	LM307	
	Thomson-CSF	SFC2307	
AD741S	AMD	LM107	
	Intersil	LM107	
	National	LM107	
	Raytheon	LM107	
	SiliconG	SG107	
	TI	LM107	
		SN55107	
	Thomson-CSF	SFC2107	
AD7501	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
AD7502	Fairchild	F4052	
	Harris	HI1828	
	MicroPwr	MP7502	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
AD7503	**Datel**	**MV-808**	**2622**
	Harris	HI1818A	
	MicroPwr	MP7503	
AD7506	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
		MX-1606	**2622**
	Fairchild	F4067	
	Harris	HI1840	
		HI506	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	
	Motorola	MC14067	
	PMI	MUX-16	
	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
AD7507	Burr-Brown	MPC8D	
	Datel	**MVD-807**	**2622**
		MXD-807	**2622**
	Harris	HI507	
		HI507A	
AD7507	Intersil	IH6216	
	MicroPwr	MP7507	
	PMI	MUX-28	
	Siliconix	DG507	
		DG507A	**2802**
	TeledyneP	4551	
AD7510	MicroPwr	MP7510	
	PMI	SW7510	
AD7511	MicroPwr	MP7511	
	PMI	SW7511	
AD7512	MicroPwr	MP7512	
AD7520	Datel	DAC-HA10B	
	Intersil	AD7520	
	MicroPwr	MP7520	
	National	AD7520	
		DAC1020	**3320**
		DAC1021	**3320**
		DAC1022	**3320**
AD7521	Datel	DAC-HA12B	
	HybridSys	DAC331-12	
	Intersil	AD7521	
	MicroPwr	MP7521	
	National	AD7521	
		DAC1220	
		DAC1221	
		DAC1222	
AD7522	MicroPwr	MP7522	
AD7523	Intersil	AD7523	
	MicroPwr	MP7523	
AD7524	MicroPwr	MP7524	
AD7530	**MicroPwr**	**MP7530**	**401,2749**
AD7531	MicroPwr	MP7531	
AD7533	Intersil	AD7533	
	MicroPwr	MP7533	
	National	AD7533	
AD7541	Datel	DAC-7541	
	HybridSys	HS7541	
	Intersil	AD7541	
		ICL7541	
	MicroPwr	**MP7541**	**401,2749**
		MP7621	
	TeledyneS	7541	
AD7546	MicroPwr	MP7616	
		MP7623	**401,2749**
AD7550	MicroPwr	MP7550	
AD7570	MicroPwr	MP7570	
AD7574	MicroPwr	MP7574	
AD7581	**MicroPwr**	**MP7581**	**401,2749**
AD7622	HybridSys	HS3120	
	MicroPwr	MP7622	
AD8007	Intersil	ICL8007	
ADADC80	Burr-Brown	ADC80	
ADADC84	AD	ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADADC85	AD	ADADC84	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADADC85S	AD	ADADC84	
		ADADC85	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADDAC-08	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
ADDAC80	AD	ADDAC85	
	Burr-Brown	DAC80	
		DAC85	
	Datel	DAC-85	
		DAC-HZ12B	
	HybridSys	DAC335	
		DAC9356	
		HSDAC80	
	MicroNet	DAC80	
		DAC85	
	National	DAC1280	
		DAC1285	**3345**
ADDAC85	AD	ADDAC80	
	Burr-Brown	DAC80	
		DAC85	
	Datel	DAC-85	
		DAC-HZ12B	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

ALTERNATE SOURCE DIRECTORY

© IC MASTER 1983

Analog Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
ADDAC85	HybridSys	DAC335	
		DAC9356	
		HSDAC80	
	MicroNet	DAC80	
		DAC85	
	National	DAC1280	
		DAC1285	**3345**
ADDAC87	Burr-Brown	DAC851	
		DAC87	
	Datel	DAC-687	
		DAC-87	
	HybridSys	DAC335	
		HSDAC87	
	MicroNet	MNDAC87	
ADG200	Harris	HI200	
	Intersil	IH200	
	MicroPwr	MP200	
		MP7513	
	PMI	SW-05	
	Siliconix	DG200	
ADG201	Harris	HI201	
	MicroPwr	MP201	
	National	**LF11201**	**3318**
		LF13201	**3318**
	PMI	SW-01	
		SW-201	
	Siliconix	DG201	
ADOP-07	MicroPwr	MP5505	
		MP5507	
		OP-05	
		OP-07	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TI	OP-07	
ADSHC85	Burr-Brown	SHC85	
ADVFC32	Burr-Brown	VFC32	
	MicroEng	MCE-VFC32	
ADX3554	Burr-Brown	3554	
	TeledyneP	3554	
DAC1136	Burr-Brown	DAC736	
DAC71	Burr-Brown	DAC71	
		DAC72	
	Datel	DAC-71	
		DAC-72	
		DAC-HP16	
	MicroNet	MNDAC71	

Analogic

MN562-AD-BCD	**AD**	**AD562A/BCD**	**3166,3168**
MN563-JD-BCD	**AD**	**AD563J/BCD**	**3165**

Aptek Microsystems

3201	Aptek	ITT3201	
	SiliconSys	SSI201	
ITT3044	Cermetek	CH1295	
ITT3045	Cermetek	CH1296	
ITT3201	Aptek	3201	
	SiliconSys	SSI201	
ITT88205-5NC	Mitel	MT88205	

Burr-Brown Research

3500	AMD	LM308	
	AD	**AD308**	**3153**
	Burr-Brown	3501	
	Fairchild	μA308	
	Intersil	AD308	
		LM308	
	MicroPwr	MP5505	
	Motorola	LM308	
	National	LM308	
	Raytheon	LM308	
	SiliconG	SG308	
3501	AMD	LM308	
	AD	**AD308**	**3153**
	Burr-Brown	3500	
	Fairchild	μA308	
	Intersil	AD308	
		LM308	
	MicroPwr	MP5505	
	Motorola	LM308	
	National	LM308	
	Raytheon	LM308	
	SiliconG	SG308	
3503	AD	AD540	
3503	**Datel**	**AM-450-2**	**2622**
	Harris	**HA-2505**	**3216,3287**
	Intersil	HA2505	
		HA2525	
	MicroPwr	MP5501	
	PMI	OP01	
3508	AD	AD507	
	Datel	AM-462-1	
		AM-462-2	**2622**
	Harris	**HA-2620**	**3228,3287**
		HA-2622	**3228,3287**
		HA-2625	**3228,3287**
	Intersil	HA-2622	
		HA-2625	
		HA2620	
		HA2625	
3510	AD	AD510	
		AD517	
		ADOP-07	**3153**
	Datel	AM-430	
		AM-490-2	
	Fairchild	μA714	
	Harris	HA-2900	
		HA-2905	
		HA-5130	
		HA-5135	
	MicroPwr	MP517	
		MP5505	
		MP5507	
		OP-05	
		OP-07	
	National	**LH0044**	**3342**
	NEC-Electron	μPC725	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TeledyneP	1340	
	TI	OP-07	
3528	AD	AD515	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
3542	AD	AD3542	
3554	TeledyneP	3554	
4203	AD	AD530	
		AD533	
	Intersil	ICL8013	
4205	AD	AD532	
	Burr-Brown	4213	
		4214	
4213	AD	AD532	
	Burr-Brown	4205	
		4214	
4214	AD	AD532	
	Burr-Brown	4205	
		4213	
ADC80	AD	ADADC80	
ADC82	HybridSys	ADC542	
		HSADC82	
ADC84	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
ADC84	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADC85	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
DAC71	AD	DAC71	
	Burr-Brown	DAC72	
	Datel	DAC-71	
		DAC-72	
		DAC-HP16	
	MicroNet	MNDAC71	
DAC72	AD	DAC71	
	Burr-Brown	DAC71	
	Datel	DAC-71	
		DAC-72	
		DAC-HP16	
	MicroNet	MNDAC71	
DAC736	AD	DAC1136	
DAC80	AD	ADDAC80	
		ADDAC85	
	Burr-Brown	DAC85	
	Datel	DAC-85	
		DAC-HZ12B	
	HybridSys	DAC335	
		DAC9356	
		HSDAC80	
	MicroNet	DAC80	
		DAC85	
	National	DAC1280	
		DAC1285	**3345**
DAC85	AD	ADDAC80	
		ADDAC85	
	Burr-Brown	DAC80	
	Datel	DAC-85	
		DAC-HZ12B	
	HybridSys	DAC335	
		DAC9356	
		HSDAC80	
	MicroNet	DAC80	
		DAC85	
	National	DAC1280	
		DAC1285	**3345**
DAC85/CCD	National	DAC1287	
DAC851	AD	ADDAC87	
	Burr-Brown	DAC87	
	Datel	DAC-687	
		DAC-87	
	HybridSys	DAC335	
		HSDAC87	
	MicroNet	MNDAC87	
DAC862	AMD	AM6012	
	AD	AD562	
	Datel	DAC-562	
		DAC-681	
		DAC-681C	
	Harris	HI562	
		HI562-5	
	MicroPwr	**MP562**	**401,2749**
	MicroEng	MCE-6012	
DAC862	**Motorola**	**AD562**	**2759**
	PMI	DAC12	
	Signetics	**AM6012**	**3303**
		DAC-312	
	TeledyneP	4068	
DAC863	AD	AD563	
	Motorola	**AD553**	**2759**
DAC87	AD	ADDAC87	
	Burr-Brown	DAC851	
	Datel	DAC-687	
		DAC-87	
	HybridSys	DAC335	
		HSDAC87	
	MicroNet	MNDAC87	
MPC16S	AD	AD7506	
	Datel	**MX-1605**	**2622**
		MX-1606	**2622**
	Fairchild	F4067	
	Harris	HI1840	
		HI506	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	
	Motorola	MC14067	
	PMI	MUX-16	
	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
MPC4D	**Datel**	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2604**
	TeledyneP	4553	
MPC800	Datel	MX-1616	
	Harris	HA-516	
MPC801	Datel	MX-818	
	Harris	HA-518	
MPC8D	AD	AD7507	
	Datel	**MXD-607**	**2622**
		MXD-607	**2622**
	Harris	HI507	
		HI507A	
	Intersil	IH6216	
	MicroPwr	MP7507	
	PMI	MUX-28	
	Siliconix	DG507	
		DG507A	**2602**
	TeledyneP	4551	
MPC8S	AD	AD7501	
	Datel	**MX-803**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2604**
	TeledyneP	4554	
OPA103	AD	AD545	
OPA605	OEI	AH0605	
SHC85	AD	ADSHC85	
VFC32	AD	ADVFC32	
	MicroEng	MCE-VFC32	

California Devices

HC10000	AMI	UA-5	
	LSILogic	LC10000	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Manufacturer Device	Replacement Source	Device	IC Master Page
California Devices (Cont'd)			
HC12600	AMI	UA-6	
	LSILogic	LC12600	
HC3100	AMI	UA-1	
	LSILogic	LC3100	
HC4100	AMI	UA-2	
	LSILogic	LC4100	
HC5400	AMI	UA-3	
	LSILogic	LC5400	
HC7700	AMI	UA-4	
	LSILogic	LC7700	
Cermetek			
CH1295	Aptek	ITT3044	
CH1296	Aptek	ITT3045	
Cherry Semiconductor			
CS102	Sprague	ULN-3304	
CS1200	Exar	XR1200	
CS122	Sprague	ULN-3306	
CS1300	Exar	XR1300	
CS1400	Exar	XR1400	
CS166	Sprague	ULN-2429	
CS2000	Exar	XRE100	
	Interdesign	**MOE**	**4433**
	MicroEng	**MCE-A20E**	**4437**
CS250	Dionics	DI250	
CS2500	Exar	XRG100	
	Interdesign	**MOG**	**4433**
	MicroEng	**MCE-A20G**	**4437**
CS260	Dionics	DI260	
CS263	Philips	TAA263	
CS2907-D14	National	LM2907	
CS2917	National	LM2917	
CS3000	Exar	XRF100	
	Interdesign	**MCF**	**4433**
		MOF	**4433**
	MicroEng	**MCE-A20F**	**4437**
CS3200	**Interdesign**	**MOL**	**4433**
	MicroEng	**MCE-A20L**	**4437**
CS4000	Interdesign	ADVFC32	
CS555	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
CS560	Philips	TAA560	
CS8204	Mitel	ML8204	
CS8205	Mitel	ML8205	
Commodore Semiconductor Group			
MCS2114	AMD	2114	
		9114	
	CSG	MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
MP6551	**AMI**	**S6551**	**1249**
	CSG	MPS6551	
	Rockwell	R6551	
	Synertek	**SY6551**	**1536**
MPS2114	AMD	2114	
		9114	
	CSG	MCS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
MPS2316	AMD	AM9218	
	AMI	S6831B	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
MPS2332	AMD	9232	
	AMI	S68322	
		S68A332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
MPS2333	AMD	AM9233	
	AMI	**S2333**	**3608**
MPS2333	Fairchild	F3533	
	GI	R03-9333	
	Intel	2332	
	NEC-EA	8332	
		EA8333	
	RCA	CDM5332	
	Signetics	2332	
	Synertek	**SY2333**	**3950**
	Toshiba	TM2332	
	Universal	UM2333-45	
MPS4118	Mostek	MK4118A	
		MK4801A	
	Rockwell	R8118	
MPS6500/1	Rockwell	R6500/1	
	Synertek	SY6500/1	
MPS6502	Rockwell	R6502	
	Synertek	SY6502	
MPS6503	Rockwell	R6503	
	Synertek	SY6503	
MPS6504	Rockwell	R6504	
	Synertek	SY6504	
MPS6505	Rockwell	R6505	
	Synertek	SY6505	
MPS6506	Rockwell	R6506	
	Synertek	SY6506	
MPS6507	Rockwell	R6507	
	Synertek	SY6507	
MPS6512	Rockwell	R6512	
	Synertek	SY6512	
MPS6514	Rockwell	R6514	
	Synertek	SY6514	
MPS6515	Rockwell	R6515	
	Synertek	SY6515	
MPS6520	Rockwell	R6520	
	Synertek	**SY6520**	**1527**
MPS6522	Rockwell	R6522	
	Synertek	**SY6522**	**1529**
MPS6532	Rockwell	R6532	
	Synertek	**SY6532**	**1531**
MPS6545	**Hitachi**	**HD6845**	**1345**
		HD68A45	**1345**
		HD68B45	**1345**
	Motorola	**MC6845**	**1351**
	Rockwell	R6545	
	Synertek	SY6545	
MPS6551	**AMI**	**S6551**	**1249**
	CSG	MP6551	
	Rockwell	R6551	
	Synertek	**SY6551**	**1536**
Datel-Intersil			
ADC-5101	DDC	DDC5101	
	MicroNet	MN5101	
ADC-5210	**AD**	**AD5210**	**3174**
	HybridSys	HS5210	
	DDC	DDC5210	
	MicroNet	MN5210	
	TeledyneP	TP5210	
ADC-5211	HybridSys	HS5211	
	DDC	DDC5211	
	MicroNet	MN5211	
	TeledyneP	TP5211	
ADC-5212	HybridSys	HS5212	
	DDC	DDC5212	
	MicroNet	MN5212	
	TeledyneP	TP5212	
ADC-5213	HybridSys	HS5213	
		MN5214	
	MicroNet	MN5213	
		MN5214	
	TeledyneP	TP5213	
		TP5214	
ADC-5214	HybridSys	HS5215	
	MicroNet	MN5215	
	TeledyneP	TP5215	
ADC-5216	HybridSys	ADC582	
		HS5216	
	DDC	DDC5216	
	MicroNet	MN5216	
ADC-830	Intersil	ADC0803	
	National	**ADC0803**	**3319**
	TI	ADC0803	
ADC-84	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
ADC-84	Datel	ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADC-85	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADC-856	Ferranti	ZN433	
ADC-87	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADC-883	**RCA**	**CA3300**	**3357**
ADC-EH12B	DDC	ADC4454	
	TeledyneP	TP4134	
ADC-EK10B	TeledyneP	4141	
	TeledyneS	8701	
ADC-EK12B	TeledyneP	4142	
	TeledyneS	8702	
ADC-EK12D	TeledyneP	4146	
	TeledyneS	8750	
ADC-EK8B	TeledyneP	4140	
	TeledyneS	8700	
ADC-ET10B	TeledyneP	4144	
	TeledyneS	8704	
ADC-ET12B	TeledyneP	4145	
	TeledyneS	8705	
ADC-ET8B	TeledyneP	4143	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Datel-Intersil (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
ADC-ET8B	TeledyneS	8703	
ADC-HX12B	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADC-HZ12B	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADC-HZ12BGZ	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADC-MC8	Ferranti	ZN425	
AM-410-2	Harris	HA-5105	
AM-410-2M	Harris	HA-5100	
AM-411-2	Harris	HA-5115	
AM-411-2M	Harris	HA-5110	
AM-427	PMI	OP-27	
	Raytheon	OP-27	
AM-430	AD	AD510	
		AD517	
		ADOP-07	**3153**
AM-430	Burr-Brown	3510	
	Datel	AM-490-2	
	Fairchild	μA714	
	Harris	HA-2900	
		HA-2905	
		HA-5130	
		HA-5135	
	MicroPwr	MP517	
		MP5505	
		MP5507	
		OP-05	
		OP-07	
	National	**LH0044**	**3342**
	NEC-Electron	μPC725	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TeledyneP	1340	
	TI	OP-07	
AM-450-2	AD	AD540	
	Burr-Brown	3503	
	Harris	**HA-2505**	**3216,3287**
	Intersil	HA2505	
		HA2525	
	MicroPwr	MP5501	
	PMI	OP01	
AM-450-2M	**Harris**	**HA-2502**	**3216,3287**
	Intersil	HA2502	
AM-452-2M	**Harris**	**HA-2522**	**3220,3287**
	Intersil	HA2522	
AM-453-2C	Datel	AM-453-2M	
	Exar	**XR5534**	**3209**
	Raytheon	RC5534	
		RM5534	
	Signetics	NE5534	
		NE5534A	
		SE5534	
		SE5534A	
	TI	NE5534	
		NE5534A	
AM-453-2M	Datel	AM-453-2C	
	Exar	**XR5534**	**3209**
	Raytheon	RC5534	
		RM5534	
	Signetics	NE5534	
		NE5534A	
		SE5534	
		SE5534A	
	TI	NE5534	
		NE5534A	
AM-460-2	**Harris**	**HA-2605**	**3226,3287**
	Intersil	HA-2602	
		HA-2605	
		HA2605	
	Motorola	MC1456	
	Signetics	MC1456	
	SiliconG	SG1456	
	TI	MC1456	
AM-460-2M	**Harris**	**HA-2602**	**3226,3287**
	Intersil	HA2602	
AM-462-1	AD	AD507	
	Burr-Brown	3508	
	Datel	**AM-462-2**	**2622**
	Harris	**HA-2620**	**3228,3287**
		HA-2622	**3228,3287**
		HA-2625	**3228,3287**
	Intersil	HA-2622	
		HA-2625	
		HA2620	
		HA2625	
AM-462-2	AD	AD507	
	Burr-Brown	3508	
	Datel	AM-462-1	
	Harris	**HA-2620**	**3228,3287**
		HA-2622	**3228,3287**
		HA-2625	**3228,3287**
	Intersil	HA-2622	
		HA-2625	
		HA2620	
		HA2625	
AM-464-2	**Harris**	**HA-2645**	**3232,3287**
	Motorola	MC1436	
		MC1439	
	National	LM1436	
		LM343	
	SiliconG	SG1436	
	TeledyneP	1332	
AM-464-2M	**Harris**	**HA-2640**	**3232,3287**
	Motorola	MC1536	
	National	LM143	
		LM1536	
AM-464-2M	SiliconG	SG1536	
AM-470-2	**Datel**	**AM-470-2C**	**2623**
		AM-470-2M	
	Harris	HA-2700	
		HA-2704	
		HA-2705	
	TeledyneP	1323	
AM-470-2C	Datel	AM-470-2	
		AM-470-2M	
	Harris	HA-2700	
		HA-2704	
		HA-2705	
	TeledyneP	1323	
AM-470-2M	Datel	AM-470-2	
		AM-470-2C	**2623**
	Harris	HA-2700	
		HA-2704	
		HA-2705	
	TeledyneP	1323	
AM-490-2	AD	AD510	
		AD517	
		ADOP-07	**3153**
	Burr-Brown	3510	
	Datel	AM-430	
	Fairchild	μA714	
	Harris	HA-2900	
		HA-2905	
		HA-5130	
		HA-5135	
	MicroPwr	MP517	
		MP5505	
		MP5507	
		OP-05	
		OP-07	
	National	**LH0044**	**3342**
	NEC-Electron	μPC725	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TeledyneP	1340	
	TI	OP-07	
AM-500	TeledyneP	1430	
DAC-08B	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC-562	AMD	AM6012	
	AD	AD562	
	Burr-Brown	DAC862	
	Datel	DAC-681	
		DAC-681C	
	Harris	HI562	
		HI562-5	
	MicroPwr	**MP562**	**401,2749**
	MicroEng	MCE-6012	
	Motorola	**AD562**	**2759**
	PMI	DAC12	
	Signetics	**AM6012**	**3383**
		DAC-312	
	TeledyneP	4068	
DAC-562	TeledyneP	4068	
DAC-608	National	DAC-0832	
DAC-610	National	DAC-1006	
DAC-612	National	DAC-1208	
DAC-681	AMD	AM6012	
	AD	AD562	
	Burr-Brown	DAC862	
	Datel	DAC-562	
		DAC-681C	
	Harris	HI562	
		HI562-5	
	MicroPwr	**MP562**	**401,2749**
	MicroEng	MCE-6012	
	Motorola	**AD562**	**2759**
	PMI	DAC12	
	Signetics	**AM6012**	**3383**
		DAC-312	
	TeledyneP	4068	
DAC-681C	AMD	AM6012	
	AD	AD562	
	Burr-Brown	DAC862	
	Datel	DAC-562	
		DAC-681	
	Harris	HI562	
		HI562-5	
	MicroPwr	**MP562**	**401,2749**
	MicroEng	MCE-6012	
	Motorola	**AD562**	**2759**
	PMI	DAC12	
	Signetics	**AM6012**	**3383**
		DAC-312	
	TeledyneP	4068	
DAC-681M	Harris	HI562-2	
DAC-687	AD	ADDAC87	
	Burr-Brown	DAC851	
		DAC87	
	Datel	DAC-87	
	HybridSys	DAC335	
		HSDAC87	
	MicroNet	MNDAC87	
DAC-71	AD	DAC71	
	Burr-Brown	DAC71	
		DAC72	
	Datel	DAC-72	
		DAC-HP16	
	MicroNet	MNDAC71	
DAC-72	AD	DAC71	
	Burr-Brown	DAC71	
		DAC72	
	Datel	DAC-71	
		DAC-HP16	
	MicroNet	MNDAC71	
DAC-7541	AD	AD7541	
	HybridSys	HS7541	
	Intersil	AD7541	
		ICL7541	
	MicroPwr	**MP7541**	**401,2749**
		MP7621	
	TeledyneS	7541	
DAC-85	AD	ADDAC80	
		ADDAC85	
	Burr-Brown	DAC80	
		DAC85	
	Datel	DAC-HZ12B	
	HybridSys	DAC335	
		DAC9356	
		HSDAC80	
	MicroNet	DAC80	
		DAC85	
	National	DAC1280	
		DAC1285	**3345**
DAC-87	AD	ADDAC87	
	Burr-Brown	DAC851	
		DAC87	
	Datel	DAC-687	
	HybridSys	DAC335	
		HSDAC87	
	MicroNet	MNDAC87	
DAC-HA10B	AD	AD7520	
	Intersil	AD7520	
	MicroPwr	MP7520	
	National	AD7520	
		DAC1020	**3320**
		DAC1021	**3320**
		DAC1022	**3320**
DAC-HA12B	AD	AD7521	
	HybridSys	DAC331-12	
	Intersil	AD7521	
	MicroPwr	MP7521	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Manufacturer Device	Replacement Source	Device	IC Master Page
Datel-Intersil (Cont'd)			
DAC-HA12B	National	AD7521	
		DAC1220	
		DAC1221	
		DAC1222	
DAC-HA14	HybridSys	HS3140	
	MicroPwr	MP3140	
DAC-HK	MicroNet	MNDACHK	
DAC-HP16	AD	DAC71	
	Burr-Brown	DAC71	
		DAC72	
	Datel	DAC-71	
		DAC-72	
	MicroNet	MNDAC71	
DAC-HZ12B	AD	ADDAC80	
		ADDAC85	
	Burr-Brown	DAC80	
		DAC85	
	Datel	DAC-85	
	HybridSys	DAC335	
		DAC9356	
		HSDAC80	
	MicroNet	DAC80	
		DAC85	
	National	DAC1280	
		DAC1285	**3345**
DAC-I8BC	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		µA0801	
		µA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	µPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC-IC10B	PMI	DAC-10	
DAC-IC10BM	**Motorola**	**MC3510**	**2759**
	Signetics	MC3510	
		NE5410	**3413**
		SE5410	**3413**
DAC-IC8B	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		µA0801	
		µA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
DAC-IC8B	NEC-Electron	µPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC-IC8BC	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
	Fairchild	DAC-08	
		MA0802M	
		µA0801	
		µA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
DAC-IC8BM	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
	Fairchild	DAC-08	
		MA0802M	
		µA0801	
		µA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	µPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC-UP10	Signetics	NE5020	
DAC-UP8B	AMD	AM6081	
	Signetics	NE5018	
		NE5019	
		NE5118	
		NE5119	
DAS-952	Mostek	MK50816	
	National	**ADC0816**	**3319**
DAS-952	TI	ADC0816	
MV-1606	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	**MX-1606**	**2622**
	Fairchild	F4067	
	Harris	HI1840	
		HI506	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	
	Motorola	MC14067	
	PMI	MUX-16	
	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
MV-808	AD	AD7503	
	Harris	HI1818A	
	MicroPwr	MP7503	
MVD-409	Harris	HI1828A	
MVD-807	AD	AD7507	
	Burr-Brown	MPC8D	
	Datel	**MXD-807**	**2622**
	Harris	HI507	
		HI507A	
	Intersil	IH6216	
	MicroPwr	MP7507	
	PMI	MUX-28	
	Siliconix	DG507	
		DG507A	**2802**
	TeledyneP	4551	
MX-1606	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
	Fairchild	F4067	
	Harris	HI1840	
		HI506	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	
	Motorola	MC14067	
	PMI	MUX-16	
	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
MX-1616	Burr-Brown	MPC800	
	Harris	HA-516	
MX-808	AD	AD7501	
	Burr-Brown	MPC8S	
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
MX-818	Burr-Brown	MPC801	
	Harris	HA-518	
MXD-409	Burr-Brown	MPC4D	
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**
	TeledyneP	4553	
MXD-807	AD	AD7507	
	Burr-Brown	MPC8D	
	Datel	**MXD-807**	**2622**
MXD-807	Harris	HI507	
		HI507A	
	Intersil	IH6216	
	MicroPwr	MP7507	
	PMI	MUX-28	
	Siliconix	DG507	
		DG507A	**2802**
	TeledyneP	4551	
SHM-IC-1	AD	AD583	
	Harris	**HA-2425**	**3214,3287**
	PMI	SMP-10	
		SMP-11	
	TeledyneP	4856	
VFQ-1	TeledyneP	4780	
	TeledyneS	9400	
		9400C	
VFQ-2	TeledyneP	4781	
	TeledyneS	9401	
VFQ-3	TeledyneP	4782	
	TeledyneS	9402	
VR-182	Ferranti	ZN458	
VR-8069	AD	AD589	
	Ferranti	ZN423	
	Intersil	ICL8069	
	MicroPwr	**MP5010**	**401,3292**
	National	**LM113**	**3304**
		LM313	**3304**
	TeledyneS	9491	
		9941	

Dionics Inc.

DI250	Cherry	CS250	
DI260	Cherry	CS260	
DI302	**Sprague**	**UDN-7183**	**2843**
DI507	**Sprague**	**UDN-6164**	**2843**
DI509	**Sprague**	**UDN-6116**	**2843**
DI512	**Sprague**	**UDN-6184**	**2843**
DI514	**Exar**	**XR6118**	**3205**
	Sanyo	LB1290	
	SiliconG	SG6118	
	Sprague	**UDN-6118**	**2843**
		ULN-6118	

EMM

2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	µPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
4044	AMD	4044	
		9244	
		AM9244E	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	µPD4104	
		µPD4104-3	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

EMM (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
4044	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	

Exar Integrated Systems

Manufacturer Device	Replacement Source	Device	IC Master Page
XR072	Fairchild	μAF772	
	PMI	OP-25	
	TI	TL072	
XR074	Motorola	MC34004	
	National	**LF347**	**3309,3326**
	TI	TL074	
		TL084C	
XR082	**RCA**	**CA082**	**3348**
	TI	TL082	
XR083	**RCA**	**CA083**	**3348**
	TI	TL083	
XR084	Fairchild	μAF774	
	RCA	**CA084**	**3348**
	TI	TL084	
XR1200	Cherry	CS1200	
XR1300	Cherry	CS1300	
XR1310	Hitachi	HA1156	
	National	**LM1310**	**3325,3328**
	RCA	CA1310	
	Sanyo	LA3350	
	Sprague	ULN-2211	
		ULN-3810	
	TI	SN76115	
	Toshiba	TA7157	
XR13600	**National**	**LM13600**	**3326**
	Raytheon	LM13600	
XR1400	Cherry	CS1400	
XR1458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
XR146	National	LM140	
	Raytheon	LM146	
XR1468	Exar	XR4195	
	Motorola	**MC1468**	**3296**
	Raytheon	RC4195	
	SiliconG	SG1468	
		SG2501A	
		SG3501A	
		SG4501	
XR1488	AMD	MC1488	
	Fairchild	μA1488	
	Harris	HA1488	
	Hitachi	HD75188	
	Motorola	**MC1488**	**2753**
	National	DS1488	
	Raytheon	RM1488	
	Signetics	MC1488	
	SiliconG	SG1488	
	TI	MC1488	
		SN75188	
XR1489	AMD	MC1489	
	Exar	**XR1489A**	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
XR1489A	AMD	MC1489	
	Exar	XR1489	
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
XR1524	**RCA**	**CA1524**	**3368**
	Signetics	SG1524	
	SiliconG	SG1524	
	TI	SG1524	
XR1568	**Motorola**	**MC1568**	**3296**
	Raytheon	RM4195	
	SiliconG	SG1501A	
		SG1568	
XR1588	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
XR1588	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
XR2001	**Exar**	**XR2201**	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
XR2002	**Exar**	**XR2202**	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
XR2003	**Exar**	**XR2203**	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
XR2201	Exar	XR2001	
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
XR2201	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
XR2202	Exar	XR2002	
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
XR2203	Exar	XR2003	
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
XR2204	Exar	XR2003	
		XR2203	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
XR2207	Raytheon	XR2207	
XR2211	Raytheon	XR2211	
XR2240	Fairchild	μA2240	
	Intersil	ICL8240	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Exar Integrated Systems (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
XR2240	TI	μA2240	
XR246	National	LM246	
	Raytheon	LM246	
XR2524	**RCA**	**CA2524**	**3368**
	Signetics	SG2524	
	SiliconG	SG2524	
	TI	SG2524	
XR2567	Exar	XR567	
	National	LM567	
	Raytheon	XR2567	
	Signetics	NE567	
		SE567	
XR300	**MicroEng**	**MCE-D15A**	**4437**
XR3403	AMD	LM324	
	Exar	XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
XR3403C	AMD	LM324	
	Exar	**XR3403**	**3207**
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
XR3403M	Raytheon	RM3403	
XR346	National	LM346	
	Raytheon	LM346	
XR3503	Motorola	MC3503	
	Raytheon	RC3503	
		RM3503	
		RM4137	
	Signetics	MC3503	
	SiliconG	SG3503	
	TI	MC3503	
XR3524	**RCA**	**CA3524**	**3368**
	Signetics	SG3524	
	SiliconG	SG3524	
	TI	SG3524	
XR400	**MicroEng**	**MCE-AD15C**	**4437**
XR4136	Exar	XR4136M	
	Fairchild	μA4136	
	MicroPwr	MP5509	
	PMI	OP-09	
		PM4136	
	Raytheon	RC4136	
		RM4136	
	SiliconG	SG4136	
		SG4136C	
	TI	RC4136	
		RM4136	
XR4136M	Exar	XR4136	
	Fairchild	μA4136	
	MicroPwr	MP5509	
	PMI	OP-09	
		PM4136	
	Raytheon	RC4136	
		RM4136	
	SiliconG	SG4136	
		SG4136C	
XR4136M	TI	RC4136	
		RM4136	
XR4151	Raytheon	RC4151	
		RM4151	
		RV4151	
	TI	XR4151	
XR4194	MicroEng	MCE-4194	
	Raytheon	RC4194	
		RM4194	
	SiliconG	SG4194	
XR4195	Exar	XR1468	
	Motorola	**MC1468**	**3296**
	Raytheon	RC4195	
	SiliconG	SG1468	
		SG2501A	
		SG3501A	
		SG4501	
XR4202	Plessey	TAB1042	
XR4212	AMD	LM148	
		LM248	
		LM348	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
XR4558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
XR4739	Fairchild	μA739	
		μA749	
	Motorola	MC1339	
	National	**LM1303**	**3325**
	Raytheon	RC4739	
	SGS	TBA231	
	TI	SN76131	
		SN76149	
XR500	**MicroEng**	**MCE-D15B**	**4437**
XR5532	Signetics	NE5532	
		NE5532A	
		SE5532	
		SE5532A	
	TI	NE5532	
		NE5532A	
XR5533	Signetics	NE5533	
		NE5533A	
		SE5533	
		SE5533A	
	TI	NE5533	
XR5534	Datel	AM-453-2C	
		AM-453-2M	
	Raytheon	RC5534	
		RM5534	
	Signetics	NE5534	
		NE5534A	
		SE5534	
		SE5534A	
	TI	NE5534	
		NE5534A	
XR555	Cherry	CS555	
	Exar	XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
XR555M	Cherry	CS555	
	Exar	XR555	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
XR556	AMD	LM555	
		LM556	
	Exar	XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
XR556M	AMD	LM555	
		LM556	
	Exar	XR556	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
XR558	Signetics	NE558	
		SE558	
XR567	Exar	XR2567	
	National	LM567	
XR567	Raytheon	XR2567	
	Signetics	NE567	
		SE567	
XR6118	Dionics	DI514	
	Sanyo	LB1290	
	SiliconG	SG6118	
	Sprague	**UDN-6118**	**2843**
		ULN-6118	
XR6128	Signetics	ULN-6128	
	Sprague	**UDN-6128**	**2843**
XR800	**MicroEng**	**MCE-D15D**	**4437**
XR8038	Intersil	ICL8038	
XRA100	**Interdesign**	**MOA**	**4433**
		MOM	**4433**
	MicroEng	MCE-A20	
		MCE-A20A	**4437**
XRB100	**Interdesign**	**MOB**	**4433**
	MicroEng	**MCE-A20B**	**4437**
XRC100A	**Interdesign**	**MOC**	**4433**
	MicroEng	**MCE-A20C**	**4437**
XRCMA	**Interdesign**	**MCA**	**4433**
	MasterLogic	ML100	
	MicroEng	**MGC110A**	**4437**
	Monosil	ML100	
	Nitron	NC5100	
XRCMB	**Interdesign**	**MCB**	**4433**
	MasterLogic	ML150	
	MicroEng	**MGC160B**	**4437**
	Monosil	ML150	
	Nitron	NC5150	
XRCMD	**Interdesign**	**MCD**	**4433**
	MasterLogic	ML350	
	MicroEng	**MGC350D**	**4437**
	Monosil	ML350	
	Nitron	NC5350	
XRD100	**Interdesign**	**MOD**	**4433**
	MicroEng	**MCE-A40D**	**4437**
XRE100	Cherry	CS2000	
	Interdesign	**MOE**	**4433**
	MicroEng	**MCE-A20E**	**4437**
XRF100	Cherry	CS3000	
	Interdesign	**MCF**	**4433**
		MOF	**4433**
	MicroEng	**MCE-A20F**	**4437**
XRG100	Cherry	CS2500	
	Interdesign	**MOG**	**4433**
	MicroEng	**MCE-A2CG**	**4437**
XRJ100	**Interdesign**	**MOJ**	**4433**
	MicroEng	**MCE-A20J**	**4437**
XRL555	Intersil	ICL7555	
XRL556	Intersil	ICL7556	
XRMC	**Interdesign**	**MCC**	**4433**
	MasterLogic	ML200	
	MicroEng	**MGC210C**	**4437**
	Monosil	ML200	
	Nitron	NC5200	

Fairchild

Manufacturer Device	Replacement Source	Device	IC Master Page
100415	AMD	AM100415	
	Signetics	100415	
11C01	Motorola	MC1688	
11C05	Motorola	MC1699	
	Plessey	SP8610	
		SP8616	
11C06	Motorola	MC1690	
11C24	Motorola	MC4024	
		MC4324	
11C44	Motorola	MC4044	
		MC4344	
11C58	Motorola	MC1658	
	Plessey	SP1658	
11C70	Motorola	MC1670	
	Plessey	SP1670	
11C90	Plessey	SP8680	
		SP8685	
11C91	Plessey	SP8740	
2102H	AMD	AM9102	
	National	MM2102A	
	Panasonic	MN2102	
	SGS	M2102A	
29704	AMD	AM29704	
29705	AMD	AM29705	
	Fairchild	29F705	
29F01	**AMD**	**AM2901A**	**1201**
	Fairchild	F2901A	
	National	IDM2901A	
29F10	AMD	AM2910	
	Fairchild	F2910	
	Motorola	MC2910	
29F705	AMD	AM29705	
	Fairchild	29705	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Fairchild (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
3341	AMD	3341	
	MMI	67401	
	Raytheon	67401	
3341A	AMD	2841	
3347	AMI	S2182	
		S2183	
		S2185	
	SMC	SR5015	
34XXX	Fairchild	F4XXX	
	Hitachi	HD14XXX	
	Motorola	MC14XXX	
	National	CD4XXX	
	OKI	MSM4XXX	
	SGS	HCF4XXX	
	SSS	SCL4XXX	
	Solitron	CM4XXX	
	TI	TP4000 series	
	Toshiba	TC4XXX	
3516	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	RO3-8316	
		RO3-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
3730	AMI	S1602	
	Fairchild	**F6850**	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
3850	Mostek	MK3850	
3851	Mostek	MK3851	
3852	Mostek	MK3852	
3853	Mostek	MK3853	
3854	Mostek	MK3854	
3861	Mostek	MK3861	
3870	Mostek	MK3870	
	SGS	M3870	
	SMC	MPU3870	
3871	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
3871	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
4736B	AMI	S6508	
	Harris	**HM6508**	
			669,1333,3754
	Intel	2125A	
	Motorola	MCM2125	
	National	MM74C929	
		NMC6508	
	NEC-Micro	μPD443	
	SSS	SCM21C02	
	Toshiba	TC5508	
5116	Mostek	MK5116	
	National	**TP5116**	**3337**
	SGS	M5116	
5116-1	Mostek	MK5117	
5151	Mostek	MK5151	
5156	Mostek	MK5156	
	National	**TP5156**	**3337**
	SGS	M5156	
5400	National	DM5400	
	Signetics	5400	
	TI	**SN5400**	**833**
5401	National	DM5401	
	TI	**SN5401**	**833**
5402	National	DM5402	
	TI	**SN5402**	**833**
5403	National	DM5403	
	TI	**SN5403**	**834**
5404	Fairchild	9016	
	National	DM5404	
		DM9016C	
	TI	**SN5404**	**834**
5405	National	DM5405	
	TI	**SN5405**	**834**
5406	National	DM5406	
	TI	**SN5406**	**835**
5407	National	DM5407	
	TI	**SN5407**	**835**
5408	National	DM5408	
	TI	**SN5408**	**835**
5409	National	DM5409	
	TI	**SN5409**	**836**
5410	National	DM5410	
	TI	**SN5410**	**836**
54107	Motorola	MC54107	
	National	DM54107	
	TI	**SN54107**	**869**
5411	National	DM5411	
	Signetics	5411	
	TI	SN5411	
5412	**TI**	**SN5412**	**837**
54121	Fairchild	9603	
	National	DM54121	
	Signetics	54121	
	TI	**SN54121**	**873**
54122	**TI**	**SN54122**	**873**
54123	National	DM54123	
	Signetics	54123	
	TI	**SN54123**	**874**
54125	National	DM54125	
		DM7093	
	TI	**SN54125**	**875**
		SN54425	**946**
54126	National	DM54126	
		DM7094	
	Signetics	54126	
	TI	**SN54126**	**875**
		SN54426	**946**
5413	National	DM5413	
	TI	**SN5413**	**837**
54132	National	DM54132	
	Signetics	54132	
	TI	**SN54132**	**877**
54136	**TI**	**SN54136**	**878**
5414	National	DM5414	
	Signetics	5414	
	TI	**SN5414**	**837**
54145	National	DM54145	
54145	**TI**	**SN54145**	**882**
54150	National	DM54150	
	TI	**SN54150**	**883**
54151A	National	DM54151	
	Signetics	54151	
	TI	SN54151	
		SN54151A	**884**
54152A	**TI**	**SN54152A**	**884**
54153	National	DM54153	
	Signetics	54153	
	TI	**SN54153**	**884**
54155	National	DM54155	
	TI	**SN54155**	**886**
54156	National	DM54156	
	TI	**SN54156**	**886**
54157	National	DM54157	
	Signetics	54157	
	TI	**SN54157**	**887**
54159	**TI**	**SN54159**	**888**
5416	National	DM5416	
	TI	**SN5416**	**838**
54160	Fairchild	9310	
	National	DM54160	
	Raytheon	RM9310	
	Signetics	54160	
	TI	**SN54160**	**889**
54161	National	DM54161	
	Signetics	54161	
	TI	**SN54161**	**889**
54162	National	DM54162	
	TI	**SN54162**	**890**
54163	National	DM54163	
	Signetics	54163	
	TI	**SN54163**	**890**
54164	National	DM54164	
		DM7570	
	Signetics	54164	
	TI	**SN54164**	**891**
54165	National	DM54165	
		DM7590	
	Signetics	54165	
	TI	**SN54165**	**891**
54166	National	DM54166	
	Signetics	54166	
	TI	**SN54166**	**891**
54167	TI	SN54167	
5417	National	DM5417	
	TI	**SN5417**	**838**
54170	National	DM54170	
	TI	**SN54170**	**893**
54173	National	DM54173	
		DM7551	
	Raytheon	RM8T10	
	TI	**SN54173**	**894**
54174	National	DM54174	
	Signetics	54174	
	TI	**SN54174**	**895**
54175	National	DM54175	
	Signetics	54175	
	TI	**SN54175**	**895**
54176	National	DM54176	
	Raytheon	RM8280	
	Signetics	54176	
		S8280	
	TI	**SN54176**	**896**
54177	National	DM54177	
		DM7281	
	Raytheon	RM8281	
	Signetics	54177	
		S7281	
		S8281	
	TI	**SN54177**	**896**
54178	Raytheon	RM8270	
	Signetics	S8270	
	TI	**SN54178**	**896**
54179	Raytheon	RM8271	
	Signetics	S8271	
	TI	**SN54179**	**897**
54180	National	DM54180	
	Signetics	54180	
	TI	**SN54180**	**897**
54181	Fairchild	9341	
	Hitachi	HD74181	
	National	DM54181	
		DM74181	
	Raytheon	RC9341	
		RM9341	
	Signetics	54181	
		74181	
	TI	**SN54181**	**897**
		SN74181	**897**
54182	Fairchild	9342	
	Hitachi	HD74182	
	National	DM54182	
		DM74182	
	Raytheon	RM9342	
	TI	**SN54182**	**898**
		SN74182	**898**
54190	National	DM54190	
	Signetics	54190	
	TI	**SN54190**	**901**
54191	National	DM54191	
	Signetics	54191	
	TI	**SN54191**	**901**
54192	National	DM54192	
		DM7560	
	TI	**SN54192**	**902**
54193	National	DM54193	
		DM7563	
	TI	**SN54193**	**902**
54195	Fairchild	9300	
	National	DM54195	
	TI	**SN54195**	**903**
54196	National	DM54196	
	Signetics	54196	
	TI	**SN54196**	**903**
54198	National	DM54198	
	TI	**SN54198**	**904**
54199	National	DM54199	
	TI	**SN54199**	**905**
5420	National	DM5420	
	Signetics	5420	
	TI	**SN5420**	**839**
5422	**TI**	**SN5422**	**840**
5423	National	DM5423	
	TI	**SN5423**	**840**
5425	National	DM5425	
	TI	SN5425	
5427	National	DM5427	
	TI	**SN5427**	**842**
54279	Signetics	54279	
	TI	**SN54279**	**921**
54283	**TI**	**SN54283**	**922**
54293	**TI**	**SN54293**	**925**
54298	**TI**	**SN54298**	**926**
5430	National	DM5430	
	TI	**SN5430**	**842**
5432	National	DM5432	
	Signetics	5432	
	TI	**SN5432**	**843**
5437	National	DM5437	
	TI	**SN5437**	**844**
5438	National	DM5438	
	TI	**SN5438**	**844**
5440	National	DM5440	
	TI	**SN5440**	**845**
5442A	National	DM5442	
	Signetics	5442	
	TI	SN5442	
5443A	Signetics	5443	
	TI	SN5443	
5444A	TI	SN5444	
		SN5444A	**846**
5445	National	DM5445	
	TI	**SN5445**	**846**
		SN5445A	
5446A	Fairchild	9317B	
		9317C	
	National	DM5446	
		DM5447	
	Signetics	5446	
	TI	SN5446	
		SN5446A	**847**
5447A	National	DM5447	
	Signetics	5447	
	TI	SN5447	
		SN5447A	**847**
5448	Fairchild	7448	
	National	DM5448	
		DM7448	
		DM8848	
	Signetics	N8T54	
	TI	**SN5448**	**847**
		SN5448A	
		SN7448	**847**
		SN7448A	
5449	**TI**	**SN5449**	**847**
5450	National	DM5450	
	TI	**SN5450**	**848**
5451	National	DM5451	
	TI	**SN5451**	**848**
5453	National	DM5453	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Fairchild (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
5453	TI	**SN5453**	849
5454	National	DM5454	
	TI	**SN5454**	850
5460	National	DM5460	
	TI	**SN5460**	852
5470	National	DM5470	
	TI	**SN5470**	855
5472	National	DM5472	
	TI	**SN5472**	856
5473	National	DM5473	
	Signetics	5473	
	TI	**SN5473**	856
5474	National	DM5474	
	Signetics	5474	
	TI	**SN5474**	857
5475	National	DM5475	
	Signetics	5475	
	TI	**SN5475**	858
5476	National	DM5476	
	Signetics	5476	
	TI	**SN5476**	858
5477	Signetics	5477	
	TI	**SN5477**	859
5480	TI	**SN5480**	860
5482	TI	**SN5482**	860
5483A	Signetics	5483A	
	TI	**SN5483A**	861
5485	National	DM5485	
	Signetics	5485	
	TI	**SN5485**	862
5486	National	DM5486	
	Signetics	5486	
	TI	**SN5486**	862
5488	National	DM5488	
	Signetics	S8224	
	TI	SN5488	
		SN5488A	
5490	National	DM5490	
	TI	SN5490	
		SN5490A	864
5491A	National	DM5491	
	Signetics	5491	
	TI	SN5491	
		SN5491A	864
5492	National	DM5492	
	TI	SN5492	
		SN5492A	864
5493A	National	DM5493	
	Signetics	5493	
	TI	SN5493	
		SN5493A	865
5494	TI	**SN5494**	865
		SN5494A	
5495A	National	DM5495	
	TI	SN5495	
		SN5495A	866
5496	National	DM5496	
	Signetics	5496	
	TI	**SN5496**	866
5497	TI	**SN5497**	866
54F00	Motorola	**MC54F00**	731
	Signetics	54F00	
54F02	Motorola	**MC54F02**	731
	Signetics	54F02	
54F04	Motorola	**MC54F04**	731
	Signetics	54F04	
54F08	Motorola	**MC54F08**	731
	Signetics	54F08	
54F10	Motorola	**MC54F10**	731
	Signetics	54F10	
54F109	Motorola	**MC54F109**	731
	Signetics	54F109	
54F11	Motorola	**MC54F11**	731
	Signetics	54F11	
54F138	Motorola	**MC54F138**	731
	Signetics	54F138	
54F139	Motorola	**MC54F139**	731
	Signetics	54F139	
54F20	Motorola	**MC54F20**	731
	Signetics	54F20	
54F240	Motorola	**MC54F240**	731
	Signetics	54F240	
54F241	Motorola	**MC54F241**	731
	Signetics	54F241	
54F242	Motorola	**MC54F242**	731
	Signetics	54F242	
54F243	Motorola	**MC54F243**	731
	Signetics	54F243	
54F244	Motorola	**MC54F244**	731
	Signetics	54F244	
54F32	Motorola	**MC54F32**	731
	Signetics	54F32	
54F333	Motorola	MC54F333	
	Signetics	54F333	
54F373	Motorola	**MC54F373**	731
	Signetics	54F373	
54F374	Motorola	**MC54F374**	731
	Signetics	54F374	
54F534	Motorola	**MC54F534**	731
	Signetics	54F534	
54F74	Motorola	**MC54F74**	731
	Signetics	54F74	
54H00	National	DM54H00	
	TI	SN54H00	
54H01	National	DM54H01	
	TI	**SN54H01**	833
54H04	National	DM54H04	
	TI	**SN54H04**	834
54H05	National	DM54H05	
	TI	**SN54H05**	834
54H08	National	DM54H08	
54H10	National	DM54H10	
	TI	**SN54H10**	836
54H101	TI	**SN54H101**	868
54H102	TI	**SN54H102**	868
54H103	National	DM54H103	
	TI	**SN54H103**	868
54H106	National	DM54H106	
	TI	**SN54H106**	869
54H108	National	DM54H108	
	TI	**SN54H108**	870
54H11	Motorola	3106	
	National	DM54H11	
	TI	**SN54H11**	836
54H183	Fairchild	934183	
	TI	**SN54H183**	898
54H20	National	DM54H20	
	TI	**SN54H20**	839
54H21	National	DM54H21	
	TI	**SN54H21**	840
54H22	National	DM54H22	
	TI	**SN54H22**	840
54H30	National	DM54H30	
	TI	**SN54H30**	842
54H40	National	DM54H40	
	TI	**SN54H40**	845
54H50	National	DM54H50	
	TI	**SN54H50**	848
54H51	National	DM54H51	
	TI	**SN54H51**	848,849
54H52	National	DM54H52	
	TI	SN54H52	
54H53	National	DM54H53	
	RCA	CD4029	
	Signetics	HEF4029	
	TI	**SN54H53**	849
54H54	National	DM54H54	
	TI	**SN54H54**	850
54H55	National	DM54H55	
	TI	**SN54H55**	851
54H60	National	DM54H60	
	TI	**SN54H60**	852
54H61	National	DM54H61	
	TI	**SN54H61**	852
54H62	National	DM54H62	
	TI	**SN54H62**	853
54H71	National	DM54H71	
	TI	**SN54H71**	855
54H72	National	DM54H72	
	TI	**SN54H72**	856
54H74	National	DM54H74	
	TI	**SN54H74**	857
54H76	National	DM54H76	
	TI	**SN54H76**	858
54H78	National	DM54H78	
	TI	**SN54H78**	859
54H87	TI	**SN54H87**	863
54LS00	Motorola	SN54LS00	
	National	DM54LS00	
	Raytheon	54LS00	
	Signetics	54LS00	
	TI	**SN54LS00**	833
54LS01	Motorola	SN54LS01	
	National	DM54LS01	
	Raytheon	54LS01	
	TI	**SN54LS01**	833
54LS02	Motorola	SN54LS02	
	National	DM54LS02	
	Raytheon	54LS02	
	Signetics	54LS02	
	TI	**SN54LS02**	833
54LS03	Motorola	SN54LS03	
54LS03	National	DM54LS03	
	Raytheon	54LS03	
	TI	**SN54LS03**	834
54LS04	Motorola	SN54LS04	
	National	DM54LS04	
	Raytheon	54LS04	
	Signetics	54LS04	
	TI	**SN54LS04**	834
54LS05	Motorola	SN54LS05	
	National	DM54LS05	
	Raytheon	54LS05	
	TI	**SN54LS05**	834
54LS08	Motorola	SN54LS08	
	National	DM54LS08	
	Raytheon	54LS08	
	Signetics	54LS08	
	TI	**SN54LS08**	835
54LS09	Motorola	SN54LS09	
	National	DM54LS09	
	Raytheon	54LS09	
	TI	**SN54LS09**	836
54LS10	Motorola	SN54LS10	
	National	DM54LS10	
	Raytheon	54LS10	
	Signetics	54LS10	
	TI	**SN54LS10**	836
54LS109	Motorola	SN54LS109A	
	National	DM54LS109	
		DM54LS109A	
	Raytheon	54LS109	
	Signetics	54LS109	
	TI	SN54LS109	
		SN54LS109A	870
54LS11	Motorola	SN54LS11	
	National	DM54LS11	
	Raytheon	54LS11	
	TI	**SN54LS11**	836
54LS112	Motorola	SN54LS112A	
	National	DM54LS112	
	Raytheon	54LS112	
	Signetics	54LS112	
	TI	SN54LS112	
		SN54LS112A	871
54LS113	Motorola	SN54LS113A	
	National	DM54LS113	
	Raytheon	54LS113	
	Signetics	54LS113	
	TI	SN54LS113	
		SN54LS113A	871
54LS114	Motorola	SN54LS114A	
	National	DM54LS114	
		DM54LS114A	
	Raytheon	54LS114	
	TI	SN54LS114	
		SN54LS114A	
54LS126	Fairchild	SN54LS126	
	Motorola	SN54LS126A	
	National	DM54LS126	
	Raytheon	54LS126	
	Signetics	54LS126A	
	TI	SN54LS126	
		SN54LS126A	
54LS13	Motorola	SN54LS13	
	National	DM54LS13	
	Raytheon	54LS13	
	TI	**SN54LS13**	837
		SN54S13	
54LS133	Motorola	SN54LS133	
54LS136	Motorola	SN54LS136	
	National	DM54LS136	
	Raytheon	54LS136	
	Signetics	54LS136	
	TI	**SN54LS136**	878
54LS138	AMD	SN54LS138	
	Motorola	SN54LS138	
	National	DM54LS138	
	Raytheon	54LS138	
	Signetics	54LS138	
	TI	**SN54LS138**	880
54LS139	AMD	SN54LS139	
	Motorola	SN54LS139	
	National	DM54LS139	
	Raytheon	54LS139	
	Signetics	54LS139	
	TI	**SN54LS139**	880
54LS14	Motorola	SN54LS14	
	National	DM54LS14	
	Raytheon	54LS14	
	Signetics	54LS14	
	TI	**SN54LS14**	837
54LS145	Motorola	SN54LS145	
54LS145	TI	**SN54LS145**	882
54LS15	Motorola	SN54LS15	
	National	DM54LS15	
	Raytheon	54LS15	
	TI	**SN54LS15**	838
54LS151	AMD	SN54LS151	
	Motorola	SN54LS151	
	National	DM54LS151	
	Raytheon	54LS151	
	Signetics	54LS151	
	TI	**SN54LS151**	884
54LS152	Raytheon	54LS152	
	TI	**SN54LS152**	884
54LS153	AMD	SN54LS153	
	Motorola	SN54LS153	
	National	DM54LS153	
	Raytheon	54LS153	
	Signetics	54LS153	
	TI	**SN54LS153**	884
54LS155	Motorola	SN54LS155	
	National	DM54LS155	
	Raytheon	54LS155	
		74LS155	
	TI	**SN54LS155**	886
54LS156	Motorola	SN54LS156	
	National	DM54LS156	
	Raytheon	54LS156	
	TI	**SN54LS156**	886
54LS157	AMD	SN54LS157	
	Motorola	SN54LS157	
	National	DM54LS157	
	Raytheon	54LS157	
	Signetics	54LS157	
	TI	**SN54LS157**	887
54LS158	AMD	SN54LS158	
	Motorola	SN54LS158	
	National	DM54LS158	
	Raytheon	54LS158	
	Signetics	54LS158	
	TI	**SN54LS158**	887
54LS161A	AMD	SN54LS161A	
	Motorola	SN54LS161A	
	National	DM54LS161A	
	Raytheon	54LS161	
	Signetics	54LS161A	
	TI	SN54LS161	
		SN54LS161A	889
54LS164	AMD	SN54LS164	
	Motorola	SN54LS164	
		SN54LS164A	
	National	DM54LS164	
		DM54LS164A	
	Raytheon	54LS164	
	Signetics	54LS164	
	TI	**SN54LS164**	891
		SN54LS164A	
54LS165	Motorola	SN54LS165	
	TI	**SN54LS165**	891
54LS168	AMD	SN54LS168A	
	Motorola	SN54LS168	
	National	DM54LS168	
	TI	SN54LS168	
54LS169	AMD	SN54LS169A	
	Motorola	SN54LS169	
	National	DM54LS169	
	TI	SN54LS169	
54LS170	Motorola	SN54LS170	
	National	DM54LS170	
	Raytheon	54LS170	
	TI	**SN54LS170**	893
54LS173	Motorola	SN54LS173A	
	National	DM54LS173	
	Signetics	54LS173	
	TI	**SN54LS173A**	894
54LS174	AMD	SN54LS174	
	Motorola	SN54LS174	
	National	DM54LS174	
	Raytheon	54LS174	
	Signetics	54LS174	
	TI	**SN54LS174**	895
54LS175	AMD	SN54LS175	
	Motorola	SN54LS175	
	National	DM54LS175	
	Raytheon	54LS175	
	Signetics	54LS175	
	TI	**SN54LS175**	895
54LS181	AMD	SN54LS181	
	Motorola	SN54LS181	
	Raytheon	54LS181	
	Signetics	54LS181	
	TI	**SN54LS181**	897
54LS189	Motorola	SN54LS189	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild		**(Cont'd)**	
54LS189	National	DM54LS189	
	TI	SN54LS189	
		SN54LS189A	
			440,900
54LS192	AMD	SN54LS192	
	Motorola	SN54LS192	
	National	DM54LS192	
	Raytheon	54LS192	
	Signetics	54LS192	
	TI	**SN54LS192**	**902**
54LS193	AMD	SN54LS193	
	Motorola	SN54LS193	
	National	DM54LS193	
	Raytheon	54LS193	
	Signetics	54LS193	
	TI	**SN54LS193**	**902**
54LS194A	AMD	SN54LS194A	
	Motorola	SN54LS194A	
	TI	**SN54LS194A**	**902**
54LS195A	AMD	SN54LS195A	
	Motorola	SN54LS195A	
	Raytheon	54LS195A	
	Signetics	54LS195A	
	TI	**SN54LS195A**	**903**
54LS20	Motorola	SN54LS20	
	National	DM54LS20	
	Raytheon	54LS20	
	Signetics	54LS20	
	TI	**SN54LS20**	**839**
54LS21	Motorola	SN54LS21	
	National	DM54LS21	
	Raytheon	54LS21	
	TI	**SN54LS21**	**840**
54LS22	Motorola	SN54LS22	
	National	DM54LS22	
	Raytheon	54LS22	
	TI	**SN54LS22**	**840**
54LS240	AMD	SN54LS240	
	MMI	54LS240	
	Motorola	SN54LS240	
	Raytheon	54LS240	
	TI	**SN54LS240**	**910**
54LS241	AMD	SN54LS241	
	MMI	54LS241	
	Motorola	SN54LS241	
	Raytheon	54LS241	
	TI	**SN54LS241**	**911**
54LS244	AMD	SN54LS244	
	MMI	54LS244	
	Motorola	SN54LS244	
	Raytheon	54LS244	
	TI	**SN54LS244**	**912**
54LS245	Motorola	SN54LS245	
	TI	**SN54LS245**	**913**
54LS247	Motorola	SN54LS247	
	National	DM54LS247	
	TI	**SN54LS247**	**913**
54LS248	Motorola	SN54LS248	
	National	DM54LS248	
	Signetics	54LS248	
	TI	**SN54LS248**	**914**
54LS249	Motorola	SN54LS249	
	National	DM54LS249	
	TI	**SN54LS249**	**914**
54LS251	AMD	SN54LS251	
	Motorola	SN54LS251	
	Raytheon	54LS251	
	Signetics	54LS251	
	TI	**SN54LS251**	**915**
54LS253	AMD	SN54LS253	
	Motorola	SN54LS253	
	National	DM54LS253	
		DM7214	
	Raytheon	54LS253	
	Signetics	54LS253	
	TI	SN54LS253	
54LS255	Raytheon	54LS255	
54LS256	Motorola	SN54LS256	
54LS258A	AMD	SN54LS258	
	Motorola	SN54LS258A	
	National	DM54LS258	
	Raytheon	54LS258	
	Signetics	54LS258	
	TI	SN54LS258	
		SN54LS258A	**917**
54LS259	Motorola	SN54LS259	
	TI	**SN54LS259**	**917**
54LS26	Motorola	SN54LS26	
	National	DM54LS26	
54LS26	Raytheon	54LS26	
	TI	**SN54LS26**	**841**
54LS260	Motorola	SN54LS260A	
	Signetics	54LS260A	
54LS266	Fairchild	9386	
	Motorola	SN54LS266	
	National	DM54LS266	
	Raytheon	54LS266	
	Signetics	54LS266	
	TI	**SN54LS266**	**918**
54LS27	Motorola	SN54LS27	
	National	DM54LS27	
	Raytheon	54LS27	
	TI	**SN54LS27**	**842**
54LS273	**AMD**	**SN54LS273**	**1227**
	Motorola	SN54LS273	
	Raytheon	54LS273	
	TI	**SN54LS273**	**919**
54LS279	Motorola	SN54LS279	
	National	DM54LS279	
	Raytheon	54LS279	
	Signetics	54LS279	
	TI	**SN54LS279**	**921**
54LS28	Motorola	SN54LS28	
	Raytheon	54LS28	
	Signetics	54LS194A	
		54LS28	
	TI	**SN54LS28**	**842**
54LS283	Motorola	SN54LS283	
	National	DM54LS283	
	Raytheon	54LS283	
	Signetics	54LS283	
	TI	**SN54LS283**	**922**
54LS289	National	DM54LS289	
	TI	SN54LS289	
		SN54LS289A	
			440,924
54LS293	Motorola	SN54LS293	
	National	DM54LS293	
	Raytheon	54LS293	
	Signetics	54LS293	
	TI	**SN54LS293**	**925**
54LS298	AMD	SN54LS298	
	Motorola	SN54LS298	
	Raytheon	54LS298	
	TI	**SN54LS298**	**926**
54LS299	**AMD**	**SN54LS299**	**1227**
	MMI	54LS299	
	Motorola	SN54LS299	
	Raytheon	54LS299	
	TI	**SN54LS299**	**927**
54LS30	Motorola	SN54LS30	
	National	DM54LS30	
	Raytheon	54LS30	
	Signetics	54LS30	
	TI	**SN54LS30**	**842**
54LS32	Fairchild	74LS32	
	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	**732**
		SN54LS32	
		SN74LS32	
	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN54LS32**	**843**
		SN74LS32	**843**
54LS323	AMD	SN54LS323	
		SN74LS323	
	Fairchild	74LS323	
	Motorola	SN54LS323	
		SN74LS323	
	Raytheon	54LS323	
		74LS323	
	TI	**SN54LS323**	**930**
		SN54LS323A	
		SN74LS323	**930**
54LS33	Motorola	SN54LS33	
	Raytheon	54LS33	
	TI	**SN54LS33**	**843**
54LS347	**TI**	**SN54LS347**	**931**
54LS352	Motorola	SN54LS352	
	National	DM54LS352	
	TI	**SN54LS352**	**932**
54LS353	Motorola	SN54LS353	
	National	DM54LS353	
	TI	**SN54LS353**	**933**
54LS365A	Motorola	SN54LS365A	
	Raytheon	54LS365	
	Signetics	54LS365	
		54LS365A	
	TI	SN54LS265A	
		SN54LS365A	**935**
54LS366A	Motorola	SN54LS366A	
	National	DM54LS366	
	Raytheon	54LS366	
	Signetics	54LS366A	
	TI	**SN54LS366A**	**935**
54LS367A	Motorola	SN54LS367A	
	National	DM54LS367	
	Raytheon	54LS367	
	Signetics	54LS367	
		54LS367A	
	TI	**SN54LS367A**	**936**
54LS368A	Motorola	SN54LS368A	
	National	DM54LS368	
	Raytheon	54LS368	
	Signetics	54LS368	
		54LS368A	
	TI	SN54LS368A	
		SN54LS368A	**936**
54LS37	Motorola	SN54LS37	
	National	DM54LS37	
	Raytheon	54LS37	
	Signetics	54LS37	
	TI	**SN54LS37**	**844**
54LS375	Motorola	SN54LS375	
	Raytheon	54LS375	
	Signetics	54LS375	
	TI	**SN54LS375**	**938**
54LS377	**AMD**	**SN54LS377**	**1227**
	Motorola	SN54LS377	
	Raytheon	54LS377	
	TI	**SN54LS377**	**939**
54LS378	AMD	SN54LS378	
	Motorola	SN54LS378	
	TI	**SN54LS378**	**939**
54LS379	AMD	SN54LS379	
	Motorola	SN54LS379	
	TI	SN54LS379	
54LS38	Motorola	SN54LS38	
	National	DM54LS38	
	Raytheon	54LS38	
	TI	**SN54LS38**	**844**
54LS390	Motorola	SN54LS390	
	TI	**SN54LS390**	**943**
54LS393	Motorola	SN54LS393	
	TI	**SN54LS393**	**943**
54LS399	AMD	SN54LS399	
	Motorola	SN54LS399	
	TI	**SN54LS399**	**944**
54LS40	Motorola	SN54LS40	
	National	DM54LS40	
	Raytheon	54LS40	
	TI	**SN54LS40**	**845**
54LS42	Motorola	SN54LS42	
	National	DM54LS42	
	Raytheon	54LS42	
	Signetics	54LS42	
	TI	**SN54LS42**	**845**
54LS47	Fairchild	74LS47	
	Hitachi	HD74LS47	
	Motorola	SN54LS47	
		SN74LS47	
	National	DM54LS47	
		DM74LS47	
	SGS	T74LS47	
	TI	**SN54LS47**	**847**
		SN74LS47	**847**
54LS48	Motorola	SN54LS48	
	National	DM54LS48	
	TI	**SN54LS48**	**847**
54LS49	Motorola	SN54LS49	
	National	DM54LS49	
	TI	**SN54LS49**	**847**
54LS490	Motorola	SN54LS490	
	TI	**SN54LS490**	**955**
54LS51	Motorola	SN54LS51	
	National	DM54LS51	
	Raytheon	54LS51	
	Signetics	54LS51	
	TI	**SN54LS51**	**848**
54LS54	Motorola	SN54LS54	
	National	DM54LS54	
	Raytheon	54LS54	
	TI	**SN54LS54**	**850**
54LS55	Motorola	SN54LS55	
	National	DM54LS55	
	Raytheon	54LS55	
54LS55	TI	54LS55	
		SN54LS55	**851**
54LS670	Motorola	54LS670	
		SN54LS670	
	National	DM54LS670	
	Raytheon	54LS670	
	Signetics	54LS670	
	TI	**SN54LS670**	**990**
54LS74	Motorola	SN54LS74A	
	National	DM54LS74	
		DM54LS74A	
	Raytheon	54LS74	
	Signetics	54LS74	
	TI	SN54LS74	
		SN54LS74A	**857**
54LS83A	Motorola	SN542S83A	
		SN54LS83A	
	National	DM54LS83A	
	Raytheon	54LS83A	
	Signetics	54LS83	
		54LS83A	
	TI	**SN54LS83A**	**861**
54LS85	Motorola	SN54LS85	
	National	DM54LS85	
	Raytheon	54LS85	
	Signetics	54LS85	
	TI	SN54LS85	
54LS93	Motorola	SN54LS93	
	National	DM54LS93	
	Raytheon	54LS93	
	Signetics	54LS93	
	TI	**SN54LS93**	**865**
54LS95B	Motorola	SN54LS95B	
	National	DM54LS95B	
	Raytheon	54LS95B	
	Signetics	54LS95B	
	TI	**SN54LS95B**	**866**
54S00	Signetics	54S00	
	TI	**SN54S00**	**833**
54S02	Signetics	54S02	
	TI	**SN54S02**	**833**
54S05A	**TI**	**SN54S05**	**834**
54S08	Signetics	54S08	
	TI	**SN54S08**	**835**
54S09	**TI**	**SN54S09**	**836**
54S10	**TI**	**SN54S10**	**836**
54S11	Signetics	54S11	
	TI	**SN54S11**	**836**
54S112	**TI**	**SN54S112**	**871**
54S113	**TI**	**SN54S113**	**871**
54S114	**TI**	**SN54S114**	**872**
54S132	**TI**	**SN54S132**	**877**
54S133	**TI**	**SN54S133**	**877**
54S134	**TI**	**SN54S134**	**877**
54S135	**TI**	**SN54S135**	**878**
54S138	AMD	SN54S138	
	TI	**SN54S138**	**880**
54S139	AMD	SN54S139	
	Signetics	54S139	
	TI	**SN54S139**	**880**
54S140	National	DM54S140	
	Signetics	54S140	
	TI	**SN54S140**	**881**
54S15	**TI**	**SN54S15**	**838**
54S151	AMD	SN54S151	
	Signetics	54S151	
	TI	**SN54S151**	**884**
54S153	AMD	SN54S153	
	Signetics	54S153	
	TI	**SN54S153**	**884**
54S157	AMD	SN54S157	
	Signetics	54S157	
	TI	**SN54S157**	**887**
54S158	AMD	SN54S158	
	Signetics	54S158	
	TI	**SN54S158**	**887**
54S174	AMD	SN54S174	
	TI	**SN54S174**	**895**
54S175	AMD	SN54S175	
	Fairchild	93S411	
	TI	**SN54S175**	**895**
54S182	Fairchild	93S42	
	MMI	54S182	
	TI	**SN54S182**	**898**
54S189	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	74S189	
		93405	

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild		**(Cont'd)**	
54S189	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
54S194	AMD	SN54S194	
	TI	**SN54S194**	**902**
54S195	AMD	SN54S195	
	Fairchild	93S00M	
54S20	**TI**	**SN54S20**	**839**
54S22	National	DM54S22	
	TI	**SN54S22**	**840**
54S253	AMD	SN54S253	
	Signetics	54S253	
54S258	AMD	SN54S258	
	Signetics	54S258	
	TI	**SN54S258**	**917**
54S260	Signetics	54S260	
	TI	**SN54S260**	**918**
54S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
54S30	**TI**	**SN54S30**	**842**
54S32	**TI**	**SN54S32**	**843**
54S40	**TI**	**SN54S40**	**845**
54S51	**TI**	**SN54S51**	**848**
54S64	**TI**	**SN54S64**	**853**
54S74	**TI**	**SN54S74**	**857**
54S86	Signetics	54S86	
	TI	**SN54S86**	**862**
55107	Motorola	MC55107	
	National	DS55107	
		LM55107A	
	TI	SN55107	
		SN55107B	
55108	Motorola	MC55108	
	National	DS55108	
		LM55108A	
	TI	SN55108	
		SN55108B	
55450	Signetics	55450	
	SiliconG	SG55450	
	TI	SN55450	
55451	National	DS55451	
	Signetics	55451	
	SiliconG	SG55451	
	TI	SN55451	
55452	National	DS55452	
	Signetics	55452	
	SiliconG	SG55452	
	TI	SN55452	
55453	National	DS55453	
		LM55453	
	Signetics	55453	
	SiliconG	SG55453	
	TI	SN55453	
68316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	RO3-8316	
		RO3-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
68316E	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		F3516	
		F35316	
		F68316	**1281**
	GI	RO3-8316	
		RO3-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
7400	Hitachi	HD7400	
	National	DM7400	
	Signetics	7400	
	TI	**SN7400**	**833**
	Toshiba	TC7400	
7401	Hitachi	HD7401	
	National	DM7401	
	TI	**SN7401**	**833**
7402	Hitachi	HD7402	
	National	DM7402	
	Signetics	7402	
	TI	**SN7402**	**833**
7403	Hitachi	HD7403	
	National	DM7403	
	Signetics	7403	
	TI	**SN7403**	**834**
7404	Hitachi	HD7404	
7404	National	DM7404	
	Signetics	7404	
	TI	**SN7404**	**834**
	Toshiba	TC7404	
7405	Hitachi	HD7405	
	National	DM7405	
	Signetics	7405	
	TI	**SN7405**	**834**
7406	Hitachi	HD7406	
	National	DM7406	
	Signetics	7406	
	TI	**SN7406**	**835**
7407	Hitachi	HD7407	
	National	DM7407	
	Signetics	7407	
	TI	**SN7407**	**835**
7408	Hitachi	HD7408	
	National	DM7408	
	Signetics	7408	
	TI	**SN7408**	**835**
7409	Hitachi	HD7409	
	National	DM7409	
	TI	**SN7409**	**836**
7410	Hitachi	HD7410	
	National	DM7410	
	Signetics	7410	
	TI	**SN7410**	**836**
	Toshiba	TC7410	
74107	Hitachi	HD74107	
	National	DM74107	
	Signetics	74107	
	TI	**SN74107**	**869**
7411	Hitachi	HD7411	
	National	DM7411	
	Signetics	7411	
7412	Hitachi	HD7412	
	TI	SN7412	
74121	Hitachi	HD74121	
	National	DM74121	
	Signetics	74121	
	TI	**SN74121**	**873**
74122	Fairchild	9601	
	National	DM8601	
		DM9601	
	Raytheon	RF8601	
		RF9601	
	Signetics	8T22	
		N8T22	
		S8T22	
	TI	**SN74122**	**873**
74123	National	DM74123	
	Signetics	74123	
	TI	**SN74123**	**874**
74125	Hitachi	HD74125	
	National	DM74125	
		DM8093	
	Signetics	74125	
	TI	**SN74125**	**875**
		SN74425	**946**
74126	Hitachi	HD74126	
	National	DM74126	
		DM8094	
	Signetics	74126	
	TI	**SN74126**	**875**
		SN74426	**946**
7413	Hitachi	HD7413	
	National	DM7413	
	Signetics	7413	
	TI	**SN7413**	**837**
74132	Hitachi	HD74132	
	National	DM74132	
	Signetics	74132	
	TI	**SN74132**	**877**
74136	Hitachi	HD74136	
	TI	**SN74136**	**878**
7414	Hitachi	HD7414	
	National	DM7414	
	Signetics	7414	
	TI	**SN7414**	**837**
74141	Fairchild	93141	
	Hitachi	HD74141	
		HD7441	
	National	DM74141	
		DM7441	
	Signetics	74141	
		7441	
	TI	**SN74141**	**881**
74145	Hitachi	HD74145	
	National	DM74145	
	Signetics	74145	
	TI	**SN74145**	**882**
74150	Hitachi	HD74150	
74150	National	DM74150	
	Signetics	74150	
	TI	**SN74150**	**883**
74151	Hitachi	HD74151	
	National	DM74151	
	Signetics	74151	
	TI	SN74151	
		SN74151A	**884**
74153	Hitachi	HD74153	
	National	DM74153	
	Signetics	74153	
	TI	**SN74153**	**884**
74155	National	DM74155	
	Signetics	74155	
	TI	**SN74155**	**886**
74156	Hitachi	HD74156	
	National	DM74156	
	Signetics	74156	
	TI	**SN74156**	**886**
74157	Fairchild	9322	
	Hitachi	HD74157	
	National	DM74157	
		DM8322	
		DM9322	
	Raytheon	RC9322	
		RM9322	
	Signetics	74157	
	TI	SN29322	
		SN29602	
		SN39322	
		SN74157	**887**
74159	**TI**	**SN74159**	**888**
7416	Hitachi	HD7416	
	National	DM7416	
	Signetics	7416	
	TI	**SN7416**	**838**
74160	Hitachi	HD74160	
	National	DM74160	
	Signetics	74160	
	TI	**SN74160**	**889**
74161	Hitachi	HD74161	
	National	DM74161	
	Signetics	74161	
	TI	**SN74161**	**889**
74162	Hitachi	HD74162	
	National	DM74162	
	TI	**SN74162**	**890**
74163	Hitachi	HD74163	
	National	DM74163	
	Signetics	74163	
	TI	**SN74163**	**890**
74164	AMD	74164	
	Hitachi	HD74164	
	National	DM74164	
		DM8570	
		DM8579	
	Signetics	74164	
	TI	**SN74164**	**891**
74165	National	DM74165	
		DM8590	
	Signetics	74165	
	TI	**SN74165**	**891**
74166	Hitachi	HD74166	
	National	DM74166	
	Signetics	74166	
	TI	**SN74166**	**891**
7417	Hitachi	HD7417	
	National	DM7417	
	Signetics	7417	
	TI	**SN7417**	**838**
74170	Hitachi	HD74170	
	National	DM74170	
	Signetics	74170	
	TI	**SN74170**	**893**
74173	National	DM74173	
		DM8551	
	Raytheon	RC8T10	
	Signetics	8T10	
		N8T10	
	TI	**SN74173**	**894**
74174	Hitachi	HD74174	
	National	DM74174	
	Signetics	74174	
	TI	**SN74174**	**895**
74175	Hitachi	HD74175	
	National	DM74175	
	Signetics	74175	
	TI	**SN74175**	**895**
74176	Fairchild	96176	
	National	DM74176	
		DM8280	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Fairchild (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
74176	Raytheon	RC8280	
	Signetics	74176	
		N8280	
	TI	**SN74176**	**896**
74177	National	DM74177	
		DM8281	
	Raytheon	RC8281	
	Signetics	74177	
		N8281	
	TI	**SN74177**	**896**
74179	Raytheon	RC8271	
	Signetics	N8271	
	TI	**SN74179**	**897**
74180	Hitachi	HD74180	
	National	DM74180	
	Signetics	74180	
	TI	**SN74180**	**897**
74190	Hitachi	HD74190	
	National	DM74190	
	Signetics	74190	
	TI	**SN74190**	**901**
74191	Hitachi	HD74191	
	National	DM74191	
	Signetics	74191	
	TI	**SN74191**	**901**
74192	Fairchild	9360	
	National	DM74192	
		DM8560	
	Raytheon	RC9360	
		RM9360	
	Signetics	74192	
	TI	**SN54192**	**902**
		SN74192	**902**
74193	National	DM74193	
		DM8563	
	Signetics	74193	
	TI	SN74129	
		SN74193	**902**
74194	Hitachi	HD74194	
	National	DM74194	
	Signetics	74194	
	TI	**SN74194**	**902**
74195	National	DM74195	
	Signetics	74195	
	TI	**SN74195**	**903**
74196	National	DM74196	
		DM8290	
	Raytheon	RC8290	
	Signetics	74196	
	TI	**SN74196**	**903**
74197	National	DM74197	
		DM8291	
	Raytheon	RC8291	
	Signetics	74197	
	TI	**SN74197**	**904**
74198	Hitachi	HD74198	
	National	DM74198	
	Signetics	74198	
	TI	**SN74198**	**904**
74199	National	DM74199	
	Signetics	74199	
	TI	**SN74199**	**905**
7420	Fairchild	9004	
	Hitachi	HD7420	
	National	DM7420	
		DM9004C	
	Signetics	7420	
	TI	**SN7420**	**839**
	Toshiba	TC7420	
7421	Signetics	7421	
7422	Hitachi	HD7422	
	TI	**SN7422**	**840**
7423	National	DM7423	
	TI	**SN7423**	**840**
7425	National	DM7425	
	TI	**SN7425**	**841**
7426	Hitachi	HD7426	
	National	DM7426	
		DM8810	
	Signetics	7426	
	TI	**SN7426**	**841**
7427	Hitachi	HD7427	
	National	DM7427	
	Signetics	7427	
	TI	**SN7427**	**842**
74279	Signetics	74279	
	TI	**SN74279**	**921**
74283	TI	**SN74283**	**922**
74290	TI	**SN74290**	**924**
74293	TI	**SN74293**	**925**
74298	Signetics	74298	
	TI	**SN74298**	**926**
7430	Hitachi	HD7430	
	National	DM7430	
	Signetics	7430	
	TI	**SN7430**	**842**
7432	Hitachi	HD7432	
	National	DM7432	
	Signetics	7432	
	TI	**SN7432**	**843**
7437	Hitachi	HD7437	
	National	DM7437	
	Signetics	7437	
	TI	**SN7437**	**844**
7438	Hitachi	HD7438	
	National	DM7438	
	Signetics	7438	
	TI	**SN7438**	**844**
7439	Signetics	7439	
7440	Hitachi	HD7440	
	National	DM7440	
	Signetics	7440	
	TI	**SN7440**	**845**
7442	Hitachi	HD7442	
	National	DM7442	
		DM8842	
	Signetics	7442	
	TI	SN7442	
		SN7442A	**845**
7445	Hitachi	HD7445	
	National	DM7445	
	Signetics	7445	
	TI	**SN7445**	**846**
7446	Hitachi	HD7446	
	National	DM7446	
	TI	SN7446	
		SN7446A	**847**
7447	Hitachi	HD7447	
	National	DM7447	
	TI	SN7447	
		SN7447A	**847**
7448	Fairchild	5448	
	National	DM5448	
		DM7448	
		DM8848	
	Signetics	N8T54	
	TI	**SN5448**	**847**
		SN5448A	
		SN7448	**847**
		SN7448A	
7450	Hitachi	HD7450	
	National	DM7450	
	Signetics	7450	
	TI	**SN7450**	**848**
7451	Hitachi	HD7451	
	National	DM7451	
	Signetics	7451	
	TI	**SN7451**	**848**
7453	Hitachi	HD7453	
	National	DM7453	
	TI	**SN7453**	**849**
7454	Hitachi	HD7454	
	National	DM7454	
	TI	**SN7454**	**850**
7460	Hitachi	HD7460	
	National	DM7460	
	TI	**SN7460**	**852**
7470	Hitachi	HD7470	
	National	DM7470	
	TI	**SN7470**	**855**
7472	Hitachi	HD7472	
	National	DM7472	
	TI	**SN7472**	**856**
7473	Hitachi	HD7473	
	National	DM7473	
	Signetics	7473	
	TI	**SN7473**	**856**
7474	Hitachi	HD7474	
	National	DM7474	
	Signetics	7474	
	TI	**SN7474**	**857**
7475	Hitachi	HD7475	
	National	DM7475	
	Signetics	7475	
	TI	**SN7475**	**858**
7476	Hitachi	HD7476	
	National	DM7476	
	Signetics	7476	
	TI	**SN7476**	**858**
7483	Hitachi	HD7483	
7483	National	DM7483	
	Signetics	7483	
	TI	SN7483	
		SN7483A	**861**
7485	Hitachi	HD7485	
	National	DM7485	
	Signetics	7485	
	TI	**SN7485**	**862**
7486	Hitachi	HD7486	
	National	DM7486	
	Signetics	7486	
	TI	**SN7486**	**862**
7488	Motorola	MC4002	
	National	DM7488	
	Signetics	7488	
		N8224	
	TI	SN7488	
		SN7488A	**863**
7489	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440.863**
		SN74S289	
7490	Hitachi	HD7490	
	National	DM7490	
	Signetics	7490	
	TI	SN7490	
		SN7490A	**864**
7491	Hitachi	HD7491	
	National	DM7491	
	Signetics	7491	
	TI	SN7491	
		SN7491A	**864**
7492	Hitachi	HD7492	
	National	DM7492	
	Signetics	7492	
	TI	SN7492	
		SN7492A	**864**
7493	Hitachi	HD7493	
	National	DM7493	
	Signetics	7493	
	TI	SN7493	
		SN7493A	**865**
7494	Hitachi	HD7494	
	Signetics	7494	
7494	TI	**SN7494**	**865**
7495	Hitachi	HD7495	
	National	DM7495	
	Signetics	7495	
	TI	SN7495	
		SN7495A	**866**
7496	Hitachi	HD7496	
	National	DM7496	
	Signetics	7496	
	TI	**SN7496**	**866**
7497	TI	**SN7497**	**866**
74F00	Motorola	**MC74F00**	**731**
	Signetics	74F00	
74F02	Motorola	**MC74F02**	**731**
	Signetics	74F02	
74F04	Motorola	**MC74F04**	**731**
	Signetics	74F04	
74F08	Motorola	**MC74F08**	**731**
	Signetics	74F08	
74F10	Motorola	**MC74F10**	**731**
	Signetics	74F10	
74F109	Motorola	**MC74F109**	**731**
	Signetics	74F109	
74F11	Motorola	**MC74F11**	**731**
	Signetics	74F11	
74F138	Motorola	**MC74F138**	**731**
	Signetics	74F138	
74F139	Motorola	**MC74F139**	**731**
	Signetics	74F139	
74F157	Signetics	74F157	
74F158	Signetics	74F158	
74F20	Motorola	**MC74F20**	**731**
	Signetics	74F20	
74F240	Motorola	**MC74F240**	**731**
	Signetics	74F240	
74F241	Motorola	**MC74F241**	**731**
	Signetics	74F241	
74F242	Motorola	**MC74F242**	**731**
	Signetics	74F242	
74F243	Motorola	**MC74F243**	**731**
	Signetics	74F243	
74F244	Motorola	**MC74F244**	**731**
	Signetics	74F244	
74F257	Signetics	74F257	
74F258	Signetics	74F258	
74F32	Motorola	**MC74F32**	**731**
	Signetics	74F32	
74F373	Motorola	**MC74F373**	**731**
	Signetics	74F373	
74F374	Motorola	**MC74F374**	**731**
	Signetics	74F374	
74F521	SGS	T74LS247	
	Signetics	74F521	
74F533	Motorola	**MC74F533**	**731**
	Signetics	74F533	
74F534	Motorola	**MC74F534**	**731**
	Signetics	74F534	
74F74	Motorola	**MC74F74**	**731**
	Signetics	74F74	
74F86	Signetics	74F86	
74H00	National	DM74H00	
	TI	**SN74H00**	**833**
74H01	Fairchild	74H08	
	National	DM74H01	
		DM74H08	
	TI	**SN74H01**	**833**
74H04	National	DM74H04	
	TI	**SN74H04**	**834**
74H05	TI	**SN74H05**	**834**
74H08	Fairchild	74H01	
	National	DM74H01	
		DM74H08	
	TI	**SN74H01**	**833**
74H10	National	DM74H10	
	TI	**SN74H10**	**836**
74H101	Signetics	74H101	
	TI	**SN74H101**	**868**
74H103	National	DM74H103	
	TI	**SN74H103**	**868**
74H105	Fairchild	9001	
	TI	SN29001	
		SN39001	
74H106	National	DM74H106	
	TI	**SN74H106**	**869**
74H108	National	DM74H108	
	TI	**SN74H108**	**870**
74H11	National	DM74H11	
	TI	**SN74H11**	**836**
74H183	Hitachi	HD74H183	
	TI	**SN74H183**	**898**
74H20	National	DM74H20	
	TI	**SN74H20**	**839**

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Fairchild (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
74H21	National	DM74H21	
	TI	**SN74H21**	**840**
74H22	**TI**	**SN74H22**	**840**
74H30	National	DM74H30	
	TI	**SN74H30**	**842**
74H40	National	DM74H40	
	TI	**SN74H40**	**845**
74H50	National	DM74H50	
	TI	**SN74H50**	**848**
74H51	National	DM74H51	
	TI	**SN74H51**	**848,849**
74H52	TI	SN74H52	
74H53	**TI**	**SN74H53**	**849**
74H54	**TI**	**SN74H54**	**850**
74H55	**TI**	**SN74H55**	**851**
74H61	**TI**	**SN74H61**	**852**
74H62	National	DM74H62	
	TI	**SN74H62**	**853**
74H72	**TI**	**SN74H72**	**856**
74H73	**TI**	**SN74H73**	**856**
74H74	National	DM74H74	
	TI	**SN74H74**	**857**
74H87	**TI**	**SN74H87**	**863**
74LS00	Hitachi	HD74LS00	
	Motorola	SN74LS00	
	National	DM74LS00	
	Raytheon	74LS00	
	SGS	T74LS00	
	Signetics	74LS00	
	TI	**SN74LS00**	**833**
74LS02	Hitachi	HD74LS02	
	Motorola	SN74LS02	
	National	DM74LS02	
	Raytheon	74LS02	
	SGS	T74LS02	
	Signetics	74LS02	
	TI	**SN74LS02**	**833**
74LS03	Hitachi	HD74LS03	
	Motorola	SN74LS03	
	National	DM74LS03	
	Raytheon	74LS03	
	SGS	T74LS03	
	TI	**SN74LS03**	**834**
74LS04	Hitachi	HD74LS04	
	Motorola	SN74LS04	
	National	DM74LS04	
	Raytheon	74LS04	
	SGS	T74LS04	
	Signetics	74LS04	
	TI	**SN74LS04**	**834**
74LS05	Hitachi	HD74LS05	
	Motorola	SN74LS05	
	National	DM74LS05	
	NEC-Electron	μPB74LS05	
	Raytheon	74LS05	
	SGS	T74LS05	
	Signetics	74LS05	
	TI	**SN74LS05**	**834**
74LS08	Hitachi	HD74LS08	
	Motorola	SN74LS08	
	National	DM74LS08	
	Raytheon	74LS08	
	SGS	T74LS08	
	Signetics	74LS08	
		SN74LS08	
	TI	**SN74LS08**	**835**
74LS09	Hitachi	HD74LS09	
	Motorola	SN74LS09	
	National	DM74LS09	
	Raytheon	74LS09	
	SGS	T74LS09	
	TI	**SN74LS09**	**836**
74LS10	Hitachi	HD74LS10	
	Motorola	SN74LS10	
	National	DM74LS10	
	Raytheon	74LS10	
	SGS	T74LS10	
	Signetics	74LS10	
	TI	**SN74LS10**	**836**
74LS109	Hitachi	HD74LS109	
	Motorola	SN74LS109	
		SN74LS109A	
	National	DM74LS109	
	Raytheon	74LS109	
	Signetics	74LS109	
	TI	**SN74LS109A**	**870**
		SN74S109A	
74LS11	Hitachi	HD74LS11	
	Motorola	SN74LS11	
74LS11	National	DM74LS11	
	Raytheon	74LS11	
	SGS	T74LS11	
	Signetics	74LS11	
	TI	**SN74LS11**	**836**
74LS112	Hitachi	HD74LS112	
	Motorola	SN74LS112A	
	National	DM74LS112	
	Raytheon	74LS112	
	SGS	T74LS112	
	Signetics	74LS112	
	TI	**SN74LS112A**	**871**
74LS113	Hitachi	HD74LS113	
	Motorola	SN74LS113A	
	National	DM74LS113	
	Raytheon	74LS113	
	SGS	T74LS113	
	Signetics	74LS113	
	TI	**SN74LS113A**	**871**
74LS114	Hitachi	HD74LS114	
	Motorola	74LS114A	
		SN74LS114A	
	National	DM74LS114	
	Raytheon	74LS114	
	TI	SN74LS114A	
74LS125A	Motorola	SN74LS125A	
	National	DM74LS125	
	Raytheon	74LS125	
	SGS	T74LS125	
	Signetics	74LS125A	
	TI	**SN74LS125A**	**875**
74LS126	Motorola	SN74LS126A	
	National	DM74LS126	
	Raytheon	74LS126	
	SGS	T74LS126	
	Signetics	74LS126A	
	TI	**SN74LS126A**	**875**
74LS13	Hitachi	HD74LS13	
	Motorola	SN74LS13	
	National	DM74LS13	
	Raytheon	74LS13	
	Signetics	74LS13	
	TI	**SN74LS13**	**837**
74LS132	Hitachi	HD74LS132	
	Motorola	SN74LS132	
	National	DM74LS132	
	Raytheon	74LS132	
	SGS	T74LS132	
	Signetics	74LS132	
	TI	SN74LS132	
74LS133	Motorola	SN74LS133	
74LS136	Hitachi	HD74LS136	
	Motorola	SN74LS136	
	National	DM74LS136	
	Raytheon	74LS136	
	SGS	T74LS136	
	Signetics	74LS136	
	TI	**SN74LS136**	**878**
74LS138	Hitachi	HD74LS138	
	Motorola	SN74LS138	
	National	DM74LS138	
	Raytheon	74LS138	
	SGS	T74LS138	
	Signetics	74LS138	
	TI	**SN74LS138**	**880**
74LS139	Hitachi	HD74LS139	
	Motorola	SN74LS139	
	National	DM74LS139	
	Raytheon	74LS139	
	SGS	T74LS139	
	Signetics	74LS139	
	TI	**SN74LS139**	**880**
74LS14	Hitachi	HD74LS14	
	Motorola	SN74LS14	
	National	DM74LS14	
	Raytheon	74LS14	
	Signetics	74LS14	
	TI	**SN74LS14**	**837**
74LS145	Motorola	SN74LS145	
	TI	**SN74LS145**	**882**
74LS15	Hitachi	HD74LS15	
	Motorola	SN74LS15	
	National	DM74LS15	
	Raytheon	74LS15	
	SGS	T74LS15	
	TI	**SN74LS15**	**838**
74LS151	Hitachi	HD74LS151	
		HD74LS151A	
	Motorola	SN74LS151	
	National	DM74LS151	
	Raytheon	74LS151	
	SGS	T74LS151	
74LS151	Signetics	74LS151	
	TI	**SN74LS151**	**884**
74LS153	Hitachi	HD74LS153	
	Motorola	SN74LS153	
	National	DM74LS153	
	Raytheon	74LS153	
	SGS	T74LS153	
	Signetics	74LS153	
	TI	**SN74LS153**	**884**
74LS155	Hitachi	HD74LS155	
	Motorola	SN74LS155	
	National	DM74LS155	
	Raytheon	74LS155	
	Signetics	74LS155	
	TI	**SN74LS155**	**886**
74LS156	Hitachi	HD74LS156	
	Motorola	SN74LS156	
	National	DM74LS156	
	Raytheon	74LS156	
	SGS	T74LS156	
	Signetics	74LS156	
	TI	**SN74LS156**	**885**
74LS157	Hitachi	HD74LS157	
	Motorola	SN74LS157	
	National	DM74LS157	
	Raytheon	74LS157	
	SGS	T74LS157	
	Signetics	74LS157	
	TI	**SN74LS157**	**887**
74LS158	Hitachi	HD74LS158	
	Motorola	SN74LS158	
	National	DM74LS158	
	Raytheon	74LS158	
	SGS	T74LS158	
	Signetics	74LS158	
	TI	**SN74LS158**	**887**
74LS160	Hitachi	HD74LS160A	
	Motorola	SN74LS160A	
	National	DM74LS160	
	Raytheon	74LS160	
	Signetics	74LS160	
		74LS160A	
	TI	**SN74LS160A**	**889**
74LS161A	AMD	SN74LS161	
	Hitachi	HD74LS161A	
	Motorola	SN74LS161A	
	National	DM74LS161	
	NEC-Electron	μPB74LS161	
	Raytheon	74LS161	
	Signetics	74LS161A	
	TI	**SN74LS161A**	**889**
74LS162	Hitachi	HD74LS162A	
	Motorola	SN74LS162A	
	National	DM74LS162	
	Raytheon	74LS162	
	SGS	T74LS162	
	Signetics	74LS162A	
	TI	SN74LS162A	
74LS163	Hitachi	HD74LS163	
		HD74LS163A	
	Motorola	SN74LS163A	
	National	DM74LS163	
	Raytheon	74LS163	
	SGS	T74LS163	
	Signetics	74LS163A	
	TI	**SN74LS163A**	**890**
74LS164	Hitachi	HD74LS164	
	Motorola	SN74LS164A	
	National	DM74LS164	
	Raytheon	74LS164	
	SGS	T74LS164	
	Signetics	74LS164	
		74LS164A	
	TI	**SN74LS164**	**891**
74LS165	Motorola	SN74LS165	
	SGS	T74LS165	
	TI	**SN74LS165**	**891**
74LS168	Hitachi	HD74LS168	
	Motorola	SN74LS168	
	National	DM74LS168	
	Signetics	74LS168A	
	TI	SN74LS168	
74LS169	Hitachi	HD74LS169	
	Motorola	SN74LS169	
	National	DM74LS169	
	Signetics	74LS169A	
74LS170	Motorola	SN74LS170	
	National	DM74LS170	
	Raytheon	74LS170	
	SGS	T74LS170	
	Signetics	74LS170	
74LS170	**TI**	**SN74LS170**	**893**
74LS173	Motorola	SN74LS173A	
	National	DM74LS173	
	Signetics	74LS173	
	TI	**SN74LS173A**	**894**
74LS174	Hitachi	HD74LS174	
	Motorola	SN74LS174	
	National	DM74LS174	
	Raytheon	74LS174	
	SGS	T74LS174	
	Signetics	74LS174	
	TI	**SN74LS174**	**895**
74LS175	Hitachi	HD74LS175	
	Motorola	SN74LS175	
	Raytheon	74LS175	
	SGS	T74LS175	
	Signetics	74LS175	
	TI	**SN74LS175**	**895**
74LS181	Hitachi	HD74LS181	
	Motorola	SN74LS181	
	Raytheon	74LS181	
	SGS	T74LS181	
	Signetics	74LS181	
	TI	**SN74LS181**	**897**
74LS189	Motorola	SN74LS189	
	National	DM74LS189	
74LS190	Hitachi	HD74LS190	
	Motorola	SN74LS190	
	National	DM74LS190	
	Raytheon	74LS190	
	SGS	T74LS190	
	TI	**SN74LS190**	**901**
74LS191	Hitachi	HD74LS191	
	Motorola	SN74LS191	
	National	DM74LS191	
	Raytheon	74LS191	
	SGS	T74LS191	
	Signetics	74LS191	
	TI	**SN74LS191**	**901**
74LS192	Hitachi	HD74LS192	
	Motorola	SN74LS192	
	National	DM74LS192	
	Raytheon	74LS192	
	SGS	T74LS192	
	Signetics	74LS192	
	TI	**SN74LS192**	**902**
74LS193	Hitachi	HD74LS193	
	Motorola	SN74LS193	
	National	DM74LS193	
	Raytheon	74LS193	
	SGS	T74LS193	
	Signetics	74LS193	
	TI	**SN74LS193**	**902**
74LS194A	Hitachi	HD74LS194A	
	Motorola	SN74LS194A	
	National	DM74LS194	
	SGS	T74LS194A	
	Signetics	74LS194A	
	TI	**SN74LS194A**	**902**
74LS195A	Hitachi	HD74LS195A	
	Motorola	SN74LS195A	
	National	DM74LS195	
	Raytheon	74LS195A	
	SGS	T74LS195A	
	Signetics	74LS195A	
	TI	**SN74LS195A**	**903**
74LS196	Hitachi	HD74LS196	
	Motorola	SN74LS196	
	National	DM74LS196	
	Raytheon	74LS196	
	Signetics	N82S80	
	TI	**SN74LS196**	**903**
74LS197	Hitachi	HD74LS197	
	Motorola	SN74LS197	
	National	DM74LS197	
	Raytheon	74LS197	
	Signetics	74LS197	
	TI	**SN74LS197**	**904**
74LS20	Hitachi	HD74LS20	
	Motorola	SN74LS20	
	National	DM74LS20	
	Raytheon	74LS20	
	SGS	T74LS20	
	Signetics	74LS20	
	TI	**SN74LS20**	**839**
74LS21	Hitachi	HD74LS21	
	Motorola	SN74LS21	
	National	DM74LS21	
	Raytheon	74LS21	
	SGS	T74LS21	
	Signetics	74LS21	
	TI	**SN74LS21**	**840**

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild		**(Cont'd)**	
74LS22	Hitachi	HD74LS22	
	Motorola	SN74LS22	
	National	DM74LS22	
	Raytheon	74LS22	
	SGS	T74LS22	
	TI	**SN74LS22**	**840**
74LS221	Hitachi	HD74LS221	
	Motorola	SN74LS221	
	National	DM74LS221	
	Raytheon	74LS221	
	TI	**SN74LS221**	**906**
74LS240	AMD	SN74LS240	
	Hitachi	HD74LS240	
	MMI	74LS240	
	Motorola	SN74LS240	
	Raytheon	74LS240	
	Signetics	74LS240	
	TI	**SN74LS240**	**910**
74LS241	AMD	SN74LS241	
	Hitachi	HD74LS241	
	MMI	74LS241	
	Motorola	SN74LS241	
	Raytheon	74LS241	
	Signetics	74LS241	
	TI	**SN74LS241**	**911**
74LS242A	AMD	SN74LS242	
	Motorola	SN74LS242	
	Raytheon	74LS242	
	Signetics	74LS242	
	TI	**SN74LS242**	**911**
74LS243A	AMD	SN74LS243	
	Motorola	SN74LS243	
	Raytheon	74LS243	
	Signetics	74LS243	
	TI	**SN74LS243**	**912**
74LS244	AMD	SN74LS244	
	Hitachi	HD74LS244	
	MMI	74LS244	
	Motorola	SN74LS244	
	Raytheon	74LS244	
	Signetics	74LS244	
	TI	**SN74LS244**	**912**
74LS245	GTEMicro	G74SC245	
	Mitsi	**MD74SC245**	**702.705**
	Motorola	SN74LS245	
	Plessey	MV74SC245	
	SPI	**SP74SC245**	**761**
	Signetics	**74LS245**	**779**
		N8T245	
	TI	**SN74LS245**	**913**
74LS247	Hitachi	HD74LS247	
	Motorola	SN74LS247	
	National	DM74LS247	
	TI	**SN74LS247**	**913**
74LS248	Hitachi	HD74LS248	
	Motorola	SN74LS248	
	National	DM74LS248	
	SGS	T74LS248	
	TI	**SN74LS248**	**914**
74LS249	Hitachi	HD74LS249	
	Motorola	SN74LS249	
	National	DM74LS249	
	SGS	T74LS249	
	TI	**SN74LS249**	**914**
74LS251	Hitachi	HD74LS251	
	Motorola	SN74LS251	
	National	DM74LS251	
	Raytheon	74LS251	
	SGS	T74LS251	
	Signetics	74LS251	
	TI	**SN74LS251**	**915**
74LS253	Hitachi	HD74LS253	
	Motorola	SN74LS253	
	National	DM74LS253	
		DM8214	
	Raytheon	74LS253	
	SGS	T74LS253	
	Signetics	74LS253	
	TI	SN74LS253	
74LS255	Raytheon	74LS255	
74LS256	Motorola	SN74LS256	
	Signetics	74LS256	
74LS257A	Hitachi	HD74LS257	
	Motorola	SN74LS257A	
	National	DM74LS257	
	Raytheon	74LS257	
	SGS	T74LS257	
	Signetics	74LS257	
		74LS257A	
74LS257A	TI	SN74LS257	
74LS258A	Hitachi	HD74LS258	
	Motorola	SN74LS258A	
	National	DM74LS258	
	Raytheon	74LS258	
	SGS	T74LS258	
	Signetics	74LS258	
	TI	SN74LS258	
74LS259	Motorola	SN74LS259	
	SGS	T74LS259	
	Signetics	74LS259	
	TI	**SN74LS259**	**917**
74LS26	Hitachi	HD74LS26	
	Motorola	SN74LS26	
	National	DM74LS26	
	Raytheon	74LS26	
	SGS	T74LS26	
	Signetics	74LS26	
	TI	**SN74LS26**	**841**
74LS260	Motorola	SN74LS260	
	Signetics	74LS260	
74LS266	Motorola	SN74LS266	
	National	DM74LS266	
	Raytheon	74LS266	
		RC8242	
	SGS	T74LS266	
	Signetics	74LS266	
		N8242	
	TI	**SN74LS266**	**918**
74LS27	Hitachi	HD74LS27	
	Motorola	SN74LS27	
	National	DM74LS27	
	Raytheon	74LS27	
	SGS	T74LS27	
	Signetics	74LS27	
	TI	**SN74LS27**	**842**
74LS273	**AMD**	**SN74LS273**	**1227**
	Motorola	SN74LS273	
	Raytheon	74LS273	
	SGS	T74LS273	
	Signetics	74LS273	
	TI	**SN74LS273**	**919**
74LS279	Hitachi	HD74LS279	
	Motorola	SN74LS279	
	National	DM74LS279	
	Raytheon	74LS279	
	Signetics	74LS279	
	TI	**SN74LS279**	**921**
74LS28	Motorola	SN74LS28	
	Raytheon	74LS28	
	SGS	T74LS28	
	TI	**SN74LS28**	**842**
74LS283	Hitachi	HD74LS283	
		HD74LS283A	
	Motorola	SN74LS283	
	National	DM74LS283	
	Raytheon	74LS283	
	SGS	T74LS283	
	Signetics	74LS283	
	TI	**SN74LS283**	**922**
74LS289	National	DM74LS289	
	TI	SN74LS289	
74LS290	Hitachi	HD74LS290	
	Motorola	SN74LS290	
	National	DM74LS290	
	Raytheon	74LS290	
	SGS	T74LS290	
	Signetics	74LS290	
	TI	**SN74LS290**	**924**
74LS293	Hitachi	HD74LS293	
	Motorola	SN74LS293	
	National	DM74LS293	
	SGS	T74LS293	
	Signetics	74LS293	
	TI	**SN74LS293**	**925**
74LS295A	Motorola	SN74LS295A	
	Raytheon	74LS295A	
	Signetics	74LS295A	
		74LS295B	
	TI	**SN74LS295B**	**925**
74LS298	Hitachi	HD74LS298	
	Motorola	SN74LS298	
	Raytheon	74LS298	
	SGS	T74LS298	
	Signetics	74LS298	
	TI	**SN74LS298**	**926**
74LS299	**AMD**	**SN74LS299**	**1227**
	Hitachi	HD74LS299	
	Motorola	SN74LS299	
	Raytheon	74LS299	
	SGS	T74LS299	
74LS299	**TI**	**SN74LS299**	**927**
74LS30	Hitachi	HD74LS30	
	Motorola	SN74LS30	
	National	DM74LS30	
	Raytheon	74LS30	
	SGS	T74LS30	
	Signetics	74LS30	
	TI	**SN74LS30**	**842**
74LS32	Fairchild	54LS32	
	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	**732**
		SN54LS32	
		SN74LS32	
	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN54LS32**	**843**
		SN74LS32	**843**
74LS322	AMD	SN74LS322	
	Motorola	SN74LS322	
	Raytheon	74LS322	
		74LS322A	
	TI	**SN74LS322A**	**930**
74LS323	AMD	SN54LS323	
		SN74LS323	
	Fairchild	54LS323	
	Motorola	SN54LS323	
		SN74LS323	
	Raytheon	54LS323	
		74LS323	
	TI	**SN54LS323**	**930**
		SN54LS323A	
		SN74LS323	**930**
74LS33	Motorola	SN74LS33	
	Raytheon	74LS33	
	Signetics	74LS33	
	TI	**SN74LS33**	**843**
74LS352	Motorola	SN74LS352	
	National	DM74LS352	
	SGS	T74LS352	
	TI	**SN74LS352**	**932**
74LS353	Motorola	DM74LS353	
		SN74LS353	
	National	DM74LS353	
	SGS	T74LS353	
	TI	**SN74LS353**	**933**
74LS365A	Motorola	SN74LS365A	
	National	DM74LS365	
	Raytheon	74LS365	
	SGS	T74LS365A	
	Signetics	74LS365	
		74LS365A	
	TI	**SN74LS365A**	**935**
74LS366A	Motorola	SN74LS366A	
	National	DM74LS366	
	Raytheon	74LS366	
	SGS	T74LS366A	
	Signetics	74LS366A	
	TI	**SN74LS366A**	**935**
74LS367A	Hitachi	HD74LS367	
		HD74LS367A	
	Motorola	SN74LS367A	
	National	DM74LS367	
	Raytheon	74LS367	
	SGS	T74LS367A	
	Signetics	74LS367	
		74LS367A	
	TI	**SN74LS367A**	**936**
74LS368A	Hitachi	HD74LS368	
	Motorola	SN73LS368A	
		SN74LS368A	
	National	DM74LS368	
	Raytheon	74LS368	
	SGS	T74LS3	
	Signetics	74LS368	
		74LS368A	
	TI	**SN74LS368A**	**936**
74LS37	Hitachi	HD74LS37	
	Motorola	SN74LS37	
	National	DM74LS37	
	Raytheon	74LS37	
	SGS	T74LS37	
	Signetics	74LS37	
	TI	**SN74LS37**	**844**
74LS373	**AMD**	**SN74LS373**	**1227**
	MMI	74LS373	
74LS373	Motorola	SN74LS373	
	Raytheon	74LS373	
	SGS	T74LS373	
	Signetics	**74LS373**	**783**
	TI	**SN74LS373**	**937**
74LS374	AMD	SN74LS374	
	MMI	74LS374	
	Motorola	SN74LS374	
	National	DM74LS374	
	Raytheon	74LS374	
	SGS	T74LS374	
	Signetics	74LS374	
	TI	**SN74LS374**	**938**
74LS375	Motorola	SN74LS375	
	Raytheon	74LS375	
	Signetics	74LS375	
	TI	**SN74LS375**	**938**
74LS377	**AMD**	**SN74LS377**	**1227**
	Motorola	SN74LS377	
	Raytheon	74LS377	
	SGS	T74LS377	
	Signetics	74LS377	
	TI	**SN74LS377**	**939**
74LS378	AMD	SN74LS378	
	Motorola	SN74LS378	
	SGS	T74LS378	
	Signetics	74LS378	
		SN74LS378	
	TI	**SN74LS378**	**939**
74LS379	AMD	SN74LS379	
	Motorola	SN74LS379	
	SGS	T74LS379	
	TI	**SN74LS379**	**940**
74LS38	Hitachi	HD74LS38	
	Motorola	SN74LS38	
	National	DM74LS38	
	Raytheon	74LS38	
	SGS	T74LS38	
	Signetics	74LS38	
	TI	**SN74LS38**	**844**
74LS390	Motorola	SN74LS390	
	SGS	T74LS390	
	TI	**SN74LS390**	**943**
74LS393	Motorola	SN74LS393	
	SGS	T74LS393	
	Signetics	74LS393	
	TI	**SN74LS393**	**943**
74LS395	Motorola	SN74LS395A	
	National	DM74LS395	
	Raytheon	74LS395A	
	Signetics	74LS395	
	TI	**SN74LS395A**	**943**
74LS40	Hitachi	HD74LS40	
	Motorola	SN74LS40	
	National	DM74LS40	
	Raytheon	74LS40	
	SGS	T74LS40	
	Signetics	74LS40	
	TI	**SN74LS40**	**845**
74LS42	Hitachi	HD74LS42	
	Motorola	SN74LS42	
	National	DM74LS42	
	Raytheon	74LS42	
	SGS	T74LS42	
	Signetics	74LS42	
	TI	**SN74LS42**	**845**
74LS47	Fairchild	54LS47	
	Hitachi	HD74LS47	
	Motorola	SN54LS47	
		SN74LS47	
	National	DM54LS47	
		DM74LS47	
	SGS	T74LS47	
	TI	**SN54LS47**	**847**
		SN74LS47	**847**
74LS48	Hitachi	HD74LS48	
	Motorola	SN74LS48	
	National	DM74LS48	
	SGS	T74LS48	
	Signetics	74LS48	
	TI	**SN74LS48**	**847**
74LS49	Hitachi	HD74LS49	
	Motorola	SN74LS49	
	National	DM74LS49	
	SGS	T74LS49	
	TI	**SN74LS49**	**847**
74LS490	Motorola	SN74LS490	
	SGS	T74LS490	
	Signetics	74LS490	
	TI	**SN74LS490**	**955**
74LS51	Hitachi	HD74LS51	

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild		**(Cont'd)**	
74LS51	Motorola	SN74LS51	
	National	DM74LS51	
	Raytheon	74LS51	
	SGS	T74LS51	
	Signetics	74LS51	
	TI	**SN74LS51**	**848**
74LS533	**AMD**	**SN74LS533**	**1227**
74LS534	**AMD**	**SN74LS534**	**1227**
74LS54	Hitachi	HD74LS54	
	Motorola	SN74LS54	
	National	DM74LS54	
	Raytheon	74LS54	
	SGS	T74LS54	
	Signetics	74LS54	
	TI	**SN74LS54**	**850**
74LS540	Motorola	SN74LS540	
	Signetics	**74LS540**	**2775**
	TI	**SN74LS540**	**960**
74LS541	Motorola	SN74LS541	
	Signetics	**74LS541**	**2775**
	TI	**SN74LS541**	**960**
74LS55	Hitachi	HD74LS55	
	Motorola	SN74LS55	
	National	DM74LS55	
	Raytheon	74LS55	
	SGS	T74LS55	
	TI	**SN74LS55**	**851**
74LS670	Motorola	SN74LS670	
	National	DM74LS670	
	Raytheon	74LS670	
	SGS	T74LS670	
	Signetics	74LS670	
	TI	**SN74LS670**	**990**
74LS74	Hitachi	HD74LS74	
		HD74LS74A	
	Motorola	SN74LS74A	
	National	DM74LS74	
	Raytheon	74LS74	
	SGS	T74LS74	
	Signetics	74LS74	
	TI	**SN74LS74A**	**857**
74LS83A	Hitachi	HD74LS183A	
		HD74LS83A	
	Motorola	SN74LS83A	
	National	DM74LS83A	
	Raytheon	74LS83	
		74LS83A	
	Signetics	74LS83	
		74LS83A	
	TI	**SN74LS83A**	**861**
74LS85	Hitachi	HD74LS85	
	Motorola	SN74LS85	
	National	DM74LS85	
	Raytheon	74LS85	
	Signetics	74LS85	
	TI	**SN74LS85**	**862**
74LS86	Hitachi	HD74LS86	
	Motorola	SN74LS86	
	National	DM74LS86	
	Raytheon	74LS86	
	SGS	T74LS86	
	Signetics	74LS86	
	TI	**SN74LS86**	**862**
74LS90	Motorola	SN74LS90	
	National	DM74LS90	
	Raytheon	74LS90	
	SGS	T74LS90	
	Signetics	74LS90	
	TI	**SN74LS90**	**864**
74LS92	Hitachi	HD74LS92	
	Motorola	SN74LS92	
	National	DM74LS92	
	Raytheon	74LS92	
	SGS	T74LS92	
	Signetics	74LS92	
	TI	**SN74LS92**	**864**
74LS93	Hitachi	HD74LS93	
	Motorola	SN74LS93	
	National	DM74LS93	
	Raytheon	74LS93	
	SGS	T74LS93	
	Signetics	74LS93	
	TI	**SN74LS93**	**865**
74LS95B	Hitachi	HD74LS95B	
	Motorola	SN74LS95B	
	National	DM74LS95B	
	Raytheon	74LS95B	
	SGS	T74LS95B	
	Signetics	74LS95B	
74LS95B	**TI**	**SN74LS95B**	**866**
74S00	Hitachi	HD74S00	
	National	DM74S00	
	Signetics	74S00	
	TI	**SN74S00**	**833**
74S02	Hitachi	HD74S02	
	National	DM74S02	
	Signetics	74S02	
	TI	**SN74S02**	**833**
		SN74S32	**843**
74S03	Hitachi	HD74S03	
	National	DM74S03	
	Signetics	74S03	
	TI	**SN74S03**	**834**
74S04	Hitachi	HD74S04	
	National	DM74S04	
	Signetics	74S04	
	TI	**SN74S04**	**834**
74S05	Hitachi	HD74S05	
	National	DM74S05	
	Signetics	74S05	
	TI	**SN74S05**	**834**
74S08	Signetics	74S08	
	TI	**SN74S08**	**835**
74S10	Hitachi	HD74S10	
	National	DM74S10	
	Signetics	74S10	
	TI	**SN74S10**	**836**
74S109	TI	SN74S109	
74S11	Hitachi	HD74S11	
	National	DM74S11	
	Signetics	74S11	
	TI	**SN74S11**	**836**
74S112	Hitachi	HD74S112	
	Motorola	SN74S112	
	National	DM74S112	
	Signetics	74S112	
	TI	**SN74S112**	**871**
74S113	Hitachi	HD74S113	
	National	DM74S113	
	Signetics	74S113	
	TI	**SN74S113**	**871**
74S132	**TI**	**SN74S132**	**877**
74S133	Hitachi	HD74S133	
	National	DM74S133	
	Signetics	74S133	
	TI	**SN74S133**	**877**
74S135	Hitachi	HD74S135	
	National	DM74S135	
	Signetics	74S135	
	TI	**SN74S135**	**878**
74S138	AMD	SN74S138	
	National	DM74S138	
	Signetics	74S138	
	TI	**SN74S138**	**880**
74S139	AMD	SN74S139	
	National	DM74S139	
	Signetics	74S139	
	TI	**SN74S139**	**880**
74S140	Hitachi	HD74S140	
	National	DM74S140	
	Signetics	74S140	
	TI	**SN74S140**	**881**
74S15	Hitachi	HD74S15	
	National	DM74S15	
	TI	**SN74S15**	**838**
74S151	AMD	SN74S151	
	Hitachi	HD74S151	
	National	DM74S151	
	Signetics	74S151	
	TI	**SN74S151**	**884**
74S153	AMD	SN74S153	
	Hitachi	HD74S153	
	National	DM74S153	
	Signetics	74S153	
	TI	**SN74S153**	**884**
74S157	AMD	SN74S157	
	Hitachi	HD74S157	
	National	DM74S157	
	Signetics	74S157	
	TI	**SN74S157**	**887**
74S158	AMD	SN74S158	
	Hitachi	HD74S158	
	National	DM74S158	
	Signetics	74S158	
	TI	**SN74S158**	**887**
74S174	AMD	SN74S174	
	Hitachi	HD74S174	
	National	DM74S174	
	Signetics	74S174	
	TI	**SN74S174**	**895**
74S175	AMD	SN74S175	
74S175	Hitachi	HD74S175	
	National	DM74S175	
	Signetics	74S175	
	TI	**SN74S175**	**895**
74S182	Hitachi	HD74S182	
	MMI	74S182	
	National	DM74S182	
	Signetics	74S182	
	TI	**SN74S182**	**898**
74S189	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
74S194	AMD	SN74S194	
	Signetics	74S194	
	TI	**SN74S194**	**902**
74S195	AMD	SN74S195	
	Fairchild	93S00C	
	National	DM74S195	
	Signetics	74S195	
	TI	**SN74S195**	**903**
74S20	Hitachi	HD74S20	
	National	DM74S20	
	Signetics	74S20	
	TI	**SN74S20**	**839**
74S22	Hitachi	HD74S22	
	National	DM74S22	
	TI	**SN74S22**	**840**
74S253	AMD	SN74S253	
	National	DM74S253	
	Signetics	74S253	
74S257	AMD	SN54S257	
		SN74S257	
	Hitachi	HD74S257	
	National	DM7123	
		DM74S257	
		DM8123	
	Signetics	54S257	
		74S257	
	TI	**SN54S257**	**916**
		SN74S257	**916**
74S258	AMD	SN74S258	
	Hitachi	HD74S258	
	Signetics	74S258	
	TI	**SN74S258**	**917**
74S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
74S289	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
74S30	National	DM74S30	
	TI	**SN74S30**	**842**
74S32	Signetics	74S32	
74S40	Hitachi	HD74S40	
	National	DM74S40	
	Signetics	74S40	
	TI	**SN74S40**	**845**
74S51	Hitachi	HD74S51	
	National	DM74S51	
	Signetics	74S51	
	TI	**SN74S51**	**848**
74S65	Hitachi	HD74S65	
	National	DM74S65	
	TI	**SN74S65**	**853**
74S74	Hitachi	HD74S74	
	National	DM74S74	
	Signetics	74S74	
	TI	**SN74S74**	**857**
74S86	Hitachi	HD74S86	
	National	DM74S86	
	Signetics	74S86	
	TI	**SN74S86**	**862**
75107	Motorola	MC75107	
	National	DS75107	
		LM75107A	
	TI	SN75107	
		SN75107B	
75108	Motorola	MC75108	
	National	DS75108	
		LM75108A	
	TI	SN75108	
		SN75108B	
75110	Hitachi	HD75110	
	Motorola	MC75110	
	National	LM75110	
	TI	SN75110	
		SN75110A	
75150	National	DS75150	
	TI	SN75150	
75154	Hitachi	HD75154	
	National	DS75154	
	SiliconG	SG75154	
	TI	SN75154	
7520	Motorola	MC7520	
	SiliconG	SG7520	
	TI	SN7520	
7521	Motorola	MC7521	
	National	LM7521	
	SiliconG	SG7521	
	TI	SN7521	
7525	AMD	7525	
	Motorola	MC7525	
	National	LM7525	
	SiliconG	SG7525	
7529	Motorola	MC7529	
	National	LM7529	
	Raytheon	RC7529	
	SiliconG	SG7529	
7538	Motorola	MC7538	
	National	LM7538	
	SiliconG	SG7538	
7539	Motorola	MC7539	
	National	LM7539	
	SiliconG	SG7539	
75430	TI	SN75430	
75450	Motorola	MC75450	
	National	DS75450	
	SiliconG	SG75450	
	TI	SN75450	
75451	Motorola	MC75451	
	National	DS75451	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild			**(Cont'd)**
75451	SiliconG	SG75451	
	TI	SN75451	
75452	Hitachi	HD75452	
	Motorola	MC75452	
	National	DS75452	
	SiliconG	SG75452	
	TI	SN75452	
75453	Hitachi	HD75453	
	Motorola	MC75453	
	National	DS75453	
		LM75453	
	SiliconG	SG75453	
	TI	SN75453	
75461	Motorola	MC75401	
		MC75461	
	National	DS75461	
	SiliconG	SG75461	
	TI	SN75461	
75462	Motorola	MC75402	
		MC75462	
	National	DS75462	
	SiliconG	SG75462	
	TI	SN75462	
75471	SiliconG	SG7541	
		SG75471	
	TI	SN75471	
75472	SiliconG	SG7542	
		SG75472	
	TI	SN75472	
75491	Motorola	MC75491	
	National	DS75491	
	TI	SN75491	
75492	Motorola	MC75492	
	National	DS75492	
	TI	SN75492	
75S234	TI	SN75234	
75S24	Hitachi	HA1902	
	Motorola	MC7524	
	National	75S24	
	Signetics	SN7524	
	SiliconG	SG7524	
	TI	SN75224	
		SN7524	
9001	Fairchild	74H105	
	TI	SN29001	
		SN39001	
9004	Fairchild	7420	
	Hitachi	HD7420	
	National	DM7420	
		DM9004C	
	Signetics	7420	
	TI	**SN7420**	**839**
	Toshiba	TC7420	
9016	Fairchild	5404	
	National	DM5404	
		DM9016C	
	TI	**SN5404**	**834**
9031	Fairchild	9301	
	National	DM8301	
		DM9301	
	Raytheon	RC8252	
		RM8252	
	Signetics	N8252	
		S8252	
	TI	SN29301	
		SN39301	
9093	Motorola	MC853	
		MC953	
	National	DM9093	
	Raytheon	RC993	
		RM993	
	TI	SN158093	
		SN159093	
9094	Motorola	MC856	
		MC956	
	National	DM9094	
	Raytheon	RC994	
		RM9094	
		RM994	
	TI	SN158094	
		SN159094	
9097	Motorola	MC855	
		MC955	
	National	DM9097	
	Raytheon	RC997	
		RM997	
	TI	SN158097	
		SN159097	
9099	Motorola	MC952	
	Raytheon	RM952	
		RM999	
9135	Motorola	MC835	
		MC935	
	National	DM935	
	Raytheon	RC935	
		RM935	
9157	Motorola	MC857	
		MC957	
	National	DM9567	
		DM957	
	Raytheon	RC957	
		RM957	
9158	Motorola	MC858	
		MC958	
	National	DM958	
	Raytheon	RC958	
		RM958	
930	Fairchild	9930	
	Motorola	MC830	
		MC930	
	National	DM930	
	Raytheon	RC930	
		RM930	
9300	Fairchild	54195	
	National	DM54195	
	TI	**SN54195**	**903**
9301	Fairchild	9031	
	National	DM8301	
		DM9301	
	Raytheon	RC8252	
		RM8252	
	Signetics	N8252	
		S8252	
	TI	SN29301	
		SN39301	
9304	Raytheon	RC9304	
		RM9304	
9308	Raytheon	RC9308	
		RM9308	
	TI	SN29308	
		SN39308	
		SN74116	**872**
9309	National	DM8309	
		DM9309	
	TI	SN29309	
		SN39309	
9310	Fairchild	54160	
	National	DM54160	
	Raytheon	RM9310	
	Signetics	54160	
	TI	**SN54160**	**889**
9311	Hitachi	HD74154	
	National	DM54154	
		DM7213	
		DM74154	
		DM8311	
		DM9311	
	Raytheon	RC9311	
		RM9311	
	Signetics	54154	
		74154	
	TI	SN29311	
		SN39311	
		SN54154	**885**
		SN74154	**885**
9312	National	DM8312	
		DM9312	
	Raytheon	RC8230	
		RC9312	
		RM8230	
		RM9312	
	Signetics	N8230	
	TI	SN29312	
		SN39312	
93141	Fairchild	74141	
	Hitachi	HD74141	
		HD7441	
	National	DM74141	
		DM7441	
	Signetics	74141	
		7441	
	TI	**SN74141**	**881**
9315	National	DM54141	
	Signetics	54141	
	TI	SN54141	
9316	National	DM9316	
	Raytheon	RC9316	
		RM9316	
	TI	SN29316	
		SN39316	
9317B	Fairchild	5446A	
		9317C	
	National	DM5446	
		DM5447	
	Signetics	5446	
	TI	SN5446	
		SN5446A	**847**
9317C	Fairchild	5446A	
		9317B	
	National	DM5446	
		DM5447	
	Signetics	5446	
	TI	SN5446	
		SN5446A	**847**
9318	Hitachi	HD74148	
	National	DM54148	
		DM74148	
		DM8318	
		DM9318	
	Signetics	54148	
		74148	
		N82148	
	TI	**SN54148**	**883**
		SN74148	**883**
932	Fairchild	9932	
	Motorola	MC932	
	National	DM932	
	Raytheon	RC932	
		RM932	
9322	Fairchild	74157	
	Hitachi	HD74157	
	National	DM74157	
		DM8322	
		DM9322	
	Raytheon	RC9322	
		RM9322	
	Signetics	74157	
	TI	SN29322	
		SN29602	
		SN39322	
		SN74157	**887**
9328	Raytheon	RC8277	
	Signetics	N8277	
933	Motorola	MC933	
	National	DM933	
	Raytheon	RC933	
		RM933	
9334	National	DM8334	
		DM9334	
	TI	SN29334	
		SN39334	
		SN54259	**917**
		SN74259	**917**
93405	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
9341	Fairchild	54181	
	Hitachi	HD74181	
	National	DM54181	
		DM74181	
	Raytheon	RC9341	
		RM9341	
	Signetics	54181	
		74181	
	TI	**SN54181**	**897**
		SN74181	**897**
93411	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93L411	
	Intel	3107	
	MMI	5530	
		6530	
93411	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
93412	AMD	AM93412	
	Motorola	MCM93412	
93415	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
93417	AMD	AM27S20	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	**3696**
	Intel	M3601	
	MMI	5300-1	
		6300-1	**3826**
	National	DM54S387	
		DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
	TI	**TBP24SA10**	**440,3967**
		TBP24SA10?!	**440,3967**
934183	Fairchild	54H183	
	TI	**SN54H183**	**898**
93419	Signetics	N82S09	
		S82S09	
9342	Fairchild	54182	
	Hitachi	HD74182	
	National	DM54182	
		DM74182	
	Raytheon	RM9342	
	TI	**SN54182**	**898**
		SN74182	**898**
93421	AMD	AM27LS00	
		AM29721	
	Fairchild	93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
93422	AMD	AM93422	
	Motorola	MCM93422	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild			**(Cont'd)**
93425A	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
93436	AMD	AM27S12	
	Harris	HM7620	
	Intel	M3602	
	MMI	5305	
		6305	
	National	DM54S570	
		DM74S570	
	Raytheon	29610	
	Signetics	N82S130	
		S82S130	
93438	AMD	AM27S30	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	**TBP28SA46**	**440**
93446	AMD	AM27S13	
	Harris	HM7621	
	Intel	M3622	
	MMI	5306	
		6306	
	National	DM54S571	
		DM74S571	
	Raytheon	29611	
	Signetics	N82S131	
		S82S131	
93448	AMD	AM27S31	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	**3826**
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	**TBP28S46**	**440,3976**
		TBP28S46M	**440,3976**
93450	AMD	AM27S180	
		AM27S280	
	Fairchild	**93Z450**	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
93450	TI	TBP28SA86	
		TBP28SA86M	**3978**
93451M	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	**93Z451**	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
93452	AMD	AM27S32	
	Fujitsu	MB7121	
	Harris	HM7642	
		HM7642-2	**3705**
	Intel	M3605	
	MMI	5352-1	
		6352	
	National	DM54S572	
		DM74S572	
	Raytheon	29640	
	Signetics	N82S136	
		S82S136	
	TI	**TBP24SA41**	**440,3968**
		TBP24SA41M	**440,3968**
93453	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
93453C	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
93458	Signetics	N82S101	
		S82S101	
93459	Signetics	N82S100	
		S82S100	
93475	AMD	9148	
		AM9148	
	Fujitsu	MBM2148	
		MBM2149	
	Hitachi	**HM6148**	**3789**
	Intel	2148H	
		2149H	
	National	NMC2148	
	Synertek	SY2148	
		SY2149	
93479	Signetics	82S212	
		N82S212	
		S82S212	
93510	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	
	National	DM77S190	
		DM87S190	
	Raytheon	29680	
		29683	
	Signetics	82S190	
		N82S190	
		S82S190	
	Supertex	MM82S190	
93511	AMD	AM27S191	
	Fairchild	93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	**440,3979**
936	Motorola	MC936	
	National	DM936	
	Raytheon	RC936	
		RM936	
9360	Fairchild	74192	
	National	DM74192	
		DM8560	
	Raytheon	RC9360	
		RM9360	
	Signetics	74192	
	TI	**SN54192**	**902**
		SN74192	**902**
9368	Mitel	MD4368	
937	Motorola	MC837	
		MC937	
	National	DM937	
	Raytheon	RC937	
		RM937	
9374	Signetics	N8T74	
9386	Fairchild	54LS266	
	Motorola	SN54LS266	
	National	DM54LS266	
	Raytheon	54LS266	
	Signetics	54LS266	
	TI	**SN54LS266**	**918**
939	National	DM939	
93L411	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
93L415	TI	SN54LS314	
93L420	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L421	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Fairchild (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
93L420	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
93L421	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
93L422	AMD	AM93L422	
	Motorola	MCM93L422	
93L451	Signetics	N82LS181	
		S82LS181	
	TI	**TBP28L86**	**440,3972**
93S00C	AMD	SN74S195	
	Fairchild	74S195	
	National	DM74S195	
	Signetics	74S195	
	TI	**SN74S195**	**903**
93S00M	AMD	SN54S195	
	Fairchild	54S195	
93S10	AMD	SN54LS160A	
		SN74S160	**1227**
	Motorola	SN54LS160A	
	National	DM54LS160	
	Raytheon	54LS160	
	Signetics	54LS160	
		54LS160A	
	TI	**SN54LS160A**	**889**
93S12	Signetics	S82S30	
93S411	AMD	SN54S175	
	Fairchild	54S175	
	TI	**SN54S175**	**895**
93S41C	AMD	SN74S181	
	Hitachi	HD74S181	
	Signetics	74S181	
	TI	SN74S181	
93S41M	AMD	SN54S181	
	Signetics	54S181	
	TI	**SN54S181**	**897**
93S42	Fairchild	54S182	
	MMI	54S182	
	TI	**SN54S182**	**898**
93S46	Fairchild	93S47	
	National	DM7160	
		DM8160	
93S47	Fairchild	93S46	
	National	DM7160	
		DM8160	
93S62	Signetics	S82S62	
93Z450	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
93Z451	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25099	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
93Z510	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	
	National	DM77S190	
		DM87S190	
	Raytheon	29680	
		29683	
	Signetics	82S190	
		N82S190	
		S82S190	
	Supertex	MM82S190	
93Z511	AMD	AM27S191	
	Fairchild	93511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	**440,3979**
9401	Fairchild	F9401	
	Motorola	MC8503	
	Signetics	9401	
9403	Fairchild	F9403	
	Signetics	9403	
944	Motorola	MC944	
	National	DM944	
	Raytheon	RC944	
		RM944	
945	Motorola	MC945	
	National	DM945	
	Raytheon	RC945	
		RM945	
946	Motorola	MC946	
	National	DM946	
	Raytheon	RC946	
		RM946	
948	Motorola	MC948	
	National	DM948	
	Raytheon	RC948	
		RM948	
949	Motorola	MC949	
	National	DM949	
	Raytheon	RC949	
		RM949	
950	Motorola	MC950	
	Raytheon	RC950	
		RM950	
951	Fairchild	9951	
	Motorola	MC851	
		MC852	
		MC951	
	Raytheon	RC951	
		RM951	
	TI	SN15851	
		SN15951	
95H90	Plessey	SP8640	
		SP8647	
9601	Fairchild	74122	
	National	DM8601	
		DM9601	
	Raytheon	RF8601	
		RF9601	
	Signetics	8T22	
		N8T22	
		S8T22	
	TI	**SN74122**	**873**
9602	National	DM8602	
		DM9602	
	Raytheon	RF8602	
		RF9602	
	TI	SN39602	
9603	Fairchild	54121	
	National	DM54121	
	Signetics	54121	
	TI	**SN54121**	**873**
961	Motorola	MC961	
	National	DM961	
		DM962	
	Raytheon	RC961	
		RM961	
96114	Fairchild	9614	
	TI	SN55114	
		SN75114	
96115	Fairchild	9615	
	TI	9615	
		SN55115	
		SN75115	
9614	Fairchild	96114	
	TI	SN55114	
		SN75114	
9615	Fairchild	96115	
	TI	9615	
		SN55115	
		SN75115	
96176	Fairchild	74176	
	National	DM74176	
		DM8280	
	Raytheon	RC8280	
	Signetics	74176	
		N8280	
	TI	**SN74176**	**896**
962	Motorola	MC962	
	National	DM962	
	Raytheon	RC962	
		RM962	
9627	TI	SN75152	
963	Fairchild	9963	
	Motorola	MC963	
	National	DM963	
	Raytheon	RC963	
		RM963	
9636A	Motorola	MC3488	
	TI	9636	
		9636A	
9637A	TI	9637	
		9637A	
9640	AMD	AM26S10	
	Motorola	DC26S10	
	National	DS26S10	
	TI	AM26	
9643	TI	9643	
9665	Exar	XR2001	
		XR2201	**3200**
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
9666	Exar	XR2002	
		XR2202	**3200**
	Fairchild	MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
9667	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
9668	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Fairchild (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
9668	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
97L412	AMD	AM93L412	
9930	Fairchild	930	
	Motorola	MC830	
		MC930	
	National	DM930	
	Raytheon	RC930	
		RM930	
9932	Fairchild	932	
	Motorola	MC932	
	National	DM932	
	Raytheon	RC932	
		RM932	
9933	Raytheon	RM933	
9935	Raytheon	RM935	
9936	Raytheon	RM936	
9937	Raytheon	RM937	
9941	Raytheon	RM941	
9944	Raytheon	RM944	
9945	Raytheon	RM945	
9946	Raytheon	RM946	
9948	Raytheon	RM948	
9950	Raytheon	RM950	
9951	Fairchild	951	
	Motorola	MC851	
		MC852	
		MC951	
	Raytheon	RC951	
		RM951	
	TI	SN15851	
		SN15951	
9961	Raytheon	RM961	
9962	Raytheon	RM962	
9963	Fairchild	963	
	Motorola	MC963	
	National	DM963	
	Raytheon	RC963	
		RM963	
DAC-08	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
F-3564-25	AMD	AM92640	
	AMI	S68B364	
F-3564-25	Mostek	MK36000-4	
	Motorola	MCM67365-25	
	NEC-EA	μPD2/8364-20	
	Signetics	2064-20	
	Synertek	SY2364-2	
F100101	Signetics	100101	
F100102	Signetics	100102	
F100107	Signetics	100107	
F100114	Signetics	100114	
F100117	Signetics	100117	
F100118	Signetics	100118	
F100122	Signetics	100122	
F100155	Signetics	100155	
F100158	Signetics	100158	
F100160	Signetics	100160	
F100163	Signetics	100163	
F100166	Signetics	100166	
F100171	Signetics	100171	
F100470	AMD	AM100470	
	Fujitsu	**MBM100470**	**3681**
F100474	AMD	AM100474	
	Hitachi	HM100474	
F10100	Motorola	MC10100	
	Signetics	10100	
F10101	Hitachi	HD10101	
	Motorola	MC10101	
	Signetics	10101	
F10102	Hitachi	HD10102	
	Motorola	MC10102	
	Signetics	10102	
F10103	Motorola	MC10103	
	Signetics	10103	
F10104	Hitachi	HD10104	
	Motorola	MC10104	
	Signetics	10104	
F10105	Hitachi	HD10105	
	Motorola	MC10105	
	Signetics	10105	
F10106	Hitachi	HD10106	
	Motorola	MC10106	
	Signetics	10106	
F10107	Hitachi	HD10107	
	Motorola	MC10107	
	Signetics	10107	
F10109	Hitachi	HD10109	
	Motorola	MC10109	
	Signetics	10109	
F10110	Hitachi	HD10110	
	Motorola	MC10110	
	Signetics	10110	
F10111	Hitachi	HD10111	
	Motorola	MC10111	
	Signetics	10111	
F10113	Motorola	MC10113	
	Signetics	10113	
F10114	Motorola	MC10114	
	Signetics	10114	
F10115	Motorola	MC10115	
	Signetics	10115	
F10116	Hitachi	HD10116	
	Motorola	MC10116	
	National	DM10116	
	Signetics	10116	
F10117	Hitachi	HD10117	
	Motorola	MC10117	
	Signetics	10117	
F10118	Hitachi	HD10118	
	Motorola	MC10118	
	Signetics	10118	
F10119	Hitachi	HD10119	
	Motorola	MC10119	
	Signetics	10119	
F10121	Hitachi	HD10121	
	Motorola	MC10121	
	Signetics	10121	
F10123	Motorola	MC10123	
	Signetics	10123	
F10124	Hitachi	HD10124	
	Motorola	MC10124	
	Signetics	10124	
F10125	Hitachi	HD10125	
	Motorola	MC10125	
	Signetics	10125	
F10130	Hitachi	HD10130	
	Motorola	MC10130	
	Signetics	1010130	
		10130	
F10131	Hitachi	HD10131	
	Motorola	MC10131	
	Signetics	10131	
F10132	Hitachi	HD10132	
F10132	Motorola	MC10132	
	Signetics	10132	
F10133	Hitachi	HD10133	
	Motorola	MC10133	
	Signetics	10133	
F10134	Hitachi	HD10134	
	Motorola	MC10134	
	Signetics	10134	
F10135	Motorola	MC10135	
	Signetics	10135	
F10136	Hitachi	HD10136	
	Motorola	MC10136	
	Signetics	10136	
F10137	Motorola	MC10137	
	Signetics	10137	
F10141	Motorola	MC10141	
	Signetics	10141	
F10144	**Motorola**	**MCM10144**	**3839**
	Signetics	10144	
	TI	SN10144	
F10145A	**Motorola**	**MCM10145**	**3839**
	Signetics	N10145	
F10158	Motorola	MC10158	
	Signetics	10158	
F10159	Motorola	MC10159	
	Signetics	10159	
F10160	Hitachi	HD10160	
	Motorola	MC10160	
	Signetics	10160	
F10161	Hitachi	HD10161	
	Motorola	MC10161	
	NEC-Electron	μPB10161	
	Signetics	10161	
F10162	Hitachi	HD10162	
	Motorola	MC10162	
	Signetics	10162	
F10164	Hitachi	HD10164	
	Motorola	MC10164	
	Signetics	10164	
	TI	SN10164	
F10165	Hitachi	HD10165	
	Motorola	MC10165	
	Signetics	10165	
F10168	Motorola	MC10168	
F10171	Motorola	MC10171	
	Signetics	10171	
F10172	Motorola	MC10172	
	Signetics	10172	
F10173	Motorola	MC10173	
	Signetics	10173	
F10174	Hitachi	HD10174	
	Motorola	MC10174	
	Signetics	10174	
	TI	SN10174	
F10175	Hitachi	HD10175	
	Motorola	MC10175	
	Signetics	10175	
	TI	SN10175	
F10176	Motorola	MC10176	
	Signetics	10176	
F10177	Motorola	MC10177	
F10178	Motorola	MC10178	
	Signetics	10178	
F10179	Hitachi	HD10179	
	Motorola	MC10179	
	Signetics	10179	
F10180	Hitachi	HD10180	
	Motorola	MC10180	
	Signetics	10180	
F10181	Hitachi	HD10181	
	Motorola	MC10181	
	Signetics	10181	
F10186	Motorola	MC10186	
	Signetics	10186	
F10192	Motorola	MC10192	
	Signetics	10192	
F10210	Motorola	MC10210	
	Signetics	10210	
F10211	Motorola	MC10211	
	Signetics	10211	
F10212	Motorola	MC10212	
	Signetics	10212	
F10216	Motorola	MC10216	
	Signetics	10216	
F10231	Motorola	MC10231	
	Signetics	10231	
F10414	**Motorola**	**MCM10152**	**3839**
	National	DM10414	
F10415	AMD	AM10415	
	Hitachi	**HM2110**	**3789**
		HM2112	**3789**
F10415	**Motorola**	**MCM10146**	**3839**
	National	DM10415	
	Siemens	GXB10415	
	Signetics	10146	
F10416	Motorola	MCM10149	
	Signetics	10149	
		N10149	
F10422	Fujitsu	MBM10422	
	Hitachi	**HM10422**	**3789**
	Motorola	**MCM10422**	**3839**
	National	**DM10422**	**3854**
F10470	AMD	AM10470	
	Fujitsu	**MBM10470**	**3681**
	Hitachi	**HM10470**	**3789**
	Motorola	MCM10470	
	National	**DM10470**	**3855**
	Signetics	10470	
F10474	AMD	AM10474	
	Fujitsu	**MBM10474**	**3681**
	Hitachi	**HM10470**	**3789**
F10501	Motorola	MC10501	
F10502	Motorola	MC10502	
F10503	Motorola	MC10503	
F10504	Motorola	MC10504	
F10505	Motorola	MC10505	
F10506	Motorola	MC10506	
F10507	Motorola	MC10507	
F10509	Motorola	MC10509	
F10513	Motorola	MC10513	
F10514	Motorola	MC10514	
F10515	Motorola	MC10515	
F10516	Motorola	MC10516	
F10524	Motorola	MC10524	
F10525	Motorola	MC10525	
F10530	Motorola	MC10530	
F10531	Motorola	MC10531	
F10535	Motorola	MC10535	
F10541	Motorola	MC10541	
F10558	Motorola	MC10558	
F10562	Motorola	MC10562	
F10564	Motorola	MC10564	
F10566	Motorola	MC10566	
F10574	Motorola	MC10574	
F10576	Motorola	MC10576	
F16008	National	NS16008	
F16016	National	NS16016	
F16032	National	NS16032	
F16081	**National**	**NS16081**	**1426**
F16082	**National**	**NS16082**	**1428**
F16105	National	NS16105	
F16201	National	NS16201	
F16202	National	NS16202	
F16203	National	NS16203	
F16413	National	NS16413	
F16425	National	NS16425	
F16456	National	NS16456	
F16488	National	NS16488	
F16802	National	NS16802	
F16K	AMD	9016	
		AM9016	
	Fairchild	F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
F2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	

◇ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild		**(Cont'd)**	
F2114	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
F2708	AMD	2708	
	Hitachi	HN462708	
	Motorola	MC27A08	
		MCM2708	
	National	MM2708	
	NEC-EA	EA2708	
	Panasonic	MN2708	
	Rockwell	2708	
	SGS	M2708	
	TI	TMS2708	
F2716	AMD	2716	
	Fujitsu	MBM2716	
	Hitachi	**HN462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
F2732	AMD	2732	
	Hitachi	**HN462732**	**3789**
	Intel	2732	
		2732A	**3819,3822**
		M2732	
	Mitsubishi	M5L2732	
	National	MM2732	
		NMC2732	
	NEC-Micro	μPD2732	
	Toshiba	TMM2732	
		TMM324C	
	Universal	UM2732	
F2847	AMD	2847	
F2901A	**AMD**	**AM2901A**	**1201**
	Fairchild	29F01	
	National	IDM2901A	
F2903	**AMD**	**AM2903**	**1203**
	Motorola	MC2903	
F2910	AMD	AM2910	
	Fairchild	29F10	
	Motorola	MC2910	
F29704	AMD	29704	
F29705	AMD	29705	
F3516	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F35316	
		F68316	**1281**
	GI	RO3-8316	
		RO3-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
F3516	Toshiba	TMM331A	
F3528	AD	AD515	
	Burr-Brown	3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
F35316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F68316	**1281**
	GI	RO3-8316	
		RO3-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
F3532	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	GI	RO3-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	R0M4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
F3532-35	Universal	UM2332-35	
F3533	AMD	AM9233	
	AMI	**S2333**	**3608**
	CSG	MPS2333	
	GI	RO3-9333	
	Intel	2332	
	NEC-EA	8332	
		EA8333	
	RCA	CDM5332	
	Signetics	2332	
	Synertek	**SY2333**	**3950**
	Toshiba	TM2332	
	Universal	UM2333-45	
F3533-35	Universal	UM2333-35	
F3872	Motorola	MC14006	
	RCA	CD4006	
	SGS	M3872	
	Signetics	HEF4006	
F4001	Hitachi	HD14001	
	Motorola	MC14001	
	National	CD4001	
		MM74C02	
	OKI	MSM4001	
	RCA	CD4001	
F4001	Sanyo	LC4001B	
	SGS	HCF4001	
	Signetics	HEF4001	
	SSS	SCL4001	
	Solitron	CM4001	
	Toshiba	TC4001	
F40014	Hitachi	HD14584	
	Motorola	MC14584	
	National	CD40106	
		CD4584	
		MM54C14	
		MM74C14	
	RCA	CD40106	
	SGS	HCF40106	
	Signetics	HEF40106	
	SSS	SCL4584	
F4002	Hitachi	HD14002	
	Motorola	MC14002	
	National	CD4002	
	RCA	CD4002	
	SGS	HCF4002	
	Signetics	HEF4002	
	SSS	SCL4002	
	Solitron	CM4002	
	TI	TP4002	
	Toshiba	TC4002	
F4006	Hitachi	HD14006	
	Motorola	MC14006	
	National	CD4006	
	RCA	CD4006	
	SGS	HCF4006	
	SSS	SCL4006	
	Solitron	CM4006	
	Toshiba	TC4006	
F4007	Hitachi	HD14007	
	Motorola	MC14007	
	National	CD4007	
	RCA	CD4007	
	SGS	HCF4007	
	Signetics	HEF4007	
	SSS	SCL4007	
	Solitron	CM4007	
	Toshiba	TC4007	
F4008	Hitachi	HD14008	
	Motorola	MC14008	
	National	CD4008	
		MM74C83	
	RCA	CD4008	
	SGS	HCF4008	
	Signetics	HEF4008	
	SSS	SCL4008	
	Solitron	CM4008	
	Toshiba	TC4008	
F40085	Hitachi	HD14585	
	Motorola	MC14585	
	National	MM74C85	
	RCA	CD4585	
	Signetics	HEF4585	
	SSS	SCL4585	
	Toshiba	TC4585	
F40089	National	MM74C89	
F40097	Hitachi	HD14503	
	Motorola	MC14503	
	National	CD4503	
		MM80C97	
	RCA	CD4503	
	Signetics	HEF40097	
F40098	National	MM80C98	
	Signetics	HEF40098	
F4011	Hitachi	HD14011	
	Motorola	MC14011	
	National	CD4011	
		MM74C00	
	OKI	MSM4011	
	RCA	CD4011	
	Sanyo	LC4011	
	SGS	HCF4011	
	Signetics	HEF4011	
	SSS	SCL4011	
	Solitron	CM4011	
	Toshiba	TC4011	
F4012	Hitachi	HD14012	
	Motorola	MC14012	
	National	CD4012	
	RCA	CD4012	
	SGS	HCF4012	
	Signetics	HEF4012	
	SSS	SCL4012	
	Solitron	CM4012	
	Toshiba	TC4012	
F4013	Hitachi	HD14013	
F4013	Motorola	MC14013	
	National	CD4013	
		MM74C74	
	OKI	MSM4013	
	RCA	CD4013	
	Sanyo	LC4013	
	SGS	HCF4013	
	Signetics	HEF4013	
	SSS	SCL4013	
	Solitron	CM4013	
	Toshiba	TC4013	
F4014	Hitachi	HD14014	
	Motorola	MC14014	
	National	CD4014	
	RCA	CD4014	
	SGS	HCF4014	
	Signetics	HEF4014	
	SSS	SCL4014	
	Solitron	CM4014	
	Toshiba	TC4014	
F4015	Hitachi	HD14015	
	Motorola	MC14015	
	National	CD4015	
		MM74C164	
	OKI	MSM4015	
	RCA	CD4015	
	Sanyo	LC4015	
	SGS	HCF4015	
	Signetics	HEF4015	
	SSS	SCL4015	
	Solitron	CM4015	
	Toshiba	TC4015	
F4016	Fairchild	F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
F40160	Hitachi	HD14160	
	Motorola	MC14160	
	National	CD40160	
		MM54C160	
		MM74C160	
	RCA	CD40160	
	SGS	HCF40160	
	Signetics	HEF4060	
	SSS	SCL4160	
	Toshiba	TC40160	
F40161	Hitachi	HD14161	
	Motorola	MC14161	
	National	CD40161	
		MM54C161	
		MM74C161	
	RCA	CD40161	
	SGS	HCF40161	
	Signetics	HEF40161	
	SSS	SCL4161	
	Toshiba	TC40161	
F40162	Hitachi	HD14162	
	Motorola	MC14162	
	National	CD40162	
		MM54C162	
		MM74C162	
	RCA	CD40162	
	SGS	HCF40162	
	Signetics	HEF40162	
	SSS	SCL4162	
	Toshiba	TC40162	
F40163	Hitachi	HD14163	
	Motorola	MC14163	
	National	CD40163	
		MM54C163	
		MM74C163	

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Fairchild (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
F40163	RCA	CD40163	
	SGS	HCF40163	
	Signetics	HEF40163	
	SSS	SCL4163	
	Toshiba	TC40163	
F4017	Hitachi	HD14017	
	Motorola	MC14017	
	National	CD4017	
	RCA	CD4017	
	SGS	HCF4017	
	Signetics	HEF4017	
	SSS	SCL4017	
	Solitron	CM4017	
	Toshiba	TC4017	
F40174	Hitachi	HD14174	
	Motorola	MC14174	
	National	CD40174	
		MM54C174	
		MM74C174	
	RCA	CD40174	
	SGS	HCF40174	
	Signetics	HEF40174	
	SSS	SCL4174	
	Toshiba	TC40174	
F40175	Hitachi	HD14175	
	Motorola	MC14175	
	National	CD40175	
		MM54C175	
		MM74C175	
	Signetics	HEF40175	
	Toshiba	TC40175	
F4018	Hitachi	HD14018	
	Motorola	MC14018	
	National	CD4018	
	RCA	CD4018	
	SGS	HCF4018	
	Signetics	HEF4018	
	SSS	SCL4018	
	Solitron	CM4018	
	Toshiba	TC4018	
F4019	National	CD4019	
	OKI	MSM4019	
	RCA	CD4019	
	Sanyo	LC4019	
	SGS	HCF4019	
	Signetics	HEF4019	
	SSS	SCL4019	
	Solitron	CM4019	
	Toshiba	TC4019	
F40192	National	MM54C192	
		MM74C192	
F40193	National	CD40193	
		MM54C193	
		MM74C193	
	RCA	CD40193	
	SGS	HCF40193	
	Signetics	HEF40193	
	SSS	SCL4193	
	Toshiba	TC40193	
F40194	Hitachi	HD14194	
	Motorola	MC14194	
	RCA	CD40194	
	SGS	HCF40194	
	Signetics	HEF40194	
F40195	National	CD40195	
		MM74C195	
F4020	Hitachi	HD14020	
	Motorola	MC14020	
	National	CD4020	
	RCA	CD4020	
	SGS	HCF4020	
	Signetics	HEF4020	
	SSS	SCL4020	
	Solitron	CM4020	
	Toshiba	TC4020	
F4021	Hitachi	HD14021	
	Motorola	MC14021	
	National	CD4021	
	RCA	CD4021	
	SGS	HCF4021	
	Signetics	HEF4021	
	SSS	SCL4021	
	Solitron	CM4021	
	Toshiba	TC4021	
F4022	Hitachi	HD14022	
	Motorola	MC14022	
	National	CD4022	
	RCA	CD4022	
	SGS	HCF4022	
	Signetics	HEF4022	
F4022	SSS	SCL4022	
	Solitron	CM4022	
	Toshiba	TC4022	
F4023	Hitachi	HD14023	
	Motorola	MC14023	
	National	CD4023	
		MM74C10	
	RCA	CD4023	
	SGS	HCF4023	
	Signetics	HEF4023	
	SSS	SCL4023	
	Solitron	CM4023	
	Toshiba	TC4023	
F4024	Hitachi	HD14024	
	Motorola	MC14024	
	National	CD4024	
	RCA	CD4024	
	SGS	HCF4024	
	Signetics	HEF4024	
	SSS	SCL4024	
	Solitron	CM4024	
	Toshiba	TC4024	
F4025	Hitachi	HD14025	
	Motorola	MC14025	
	National	CD4025	
	RCA	CD4025	
	SGS	HCF4025	
	Signetics	HEF4025	
	SSS	SCL4025	
	Solitron	CM4025	
	Toshiba	TC4025	
F4027	Hitachi	HD14027	
	Motorola	MC14027	
	National	CD4027	
		MM74C76	
	OKI	MSM4027	
	RCA	CD4027	
	Sanyo	LC4027	
	SGS	HCF4027	
	Signetics	HEF4027	
	SSS	SCL4027	
	Solitron	CM4027	
F4028	Hitachi	HD14028	
	Motorola	MC14028	
	National	CD4028	
		MM74C42	
	OKI	MSM4028	
	Sanyo	LC4028	
	SGS	HCF4028	
	Signetics	HEF4028	
	SSS	SCL4028	
	Solitron	CM4028	
	Toshiba	TC4028	
F4029	Motorola	MC14029	
	National	CD40192	
		CD4029	
	RCA	CD40192	
		CD4029	
	SGS	HCF40192	
		HCF4029	
	Signetics	HEF40192	
	SSS	SCL4029	
		SCL4192	
	Solitron	CM4029	
	Toshiba	TC40192	
		TC4029	
F4030	National	CD4030	
	RCA	CD4030	
	SGS	HCF4030	
	Signetics	HEF4030	
	SSS	SCL4030	
	Solitron	CM4030	
	Toshiba	TC4030	
F4031	National	CD4031	
	RCA	CD4031	
	SGS	HCF4031	
	Signetics	HEF4731	
F4034	Hitachi	HD14034	
	Motorola	MC14034	
	National	CD4034	
	RCA	CD4034	
	SGS	HCF4034	
	SSS	SCL4034	
	Solitron	CM4034	
	Toshiba	TC4034	
F4035	Hitachi	HD14035	
	Motorola	MC14035	
	National	CD4035	
	RCA	CD4035	
	SGS	HCF4035	
	Signetics	HEF4035	
	SSS	SCL4035	
F4035	Solitron	CM4035	
	Toshiba	TC4035	
F4040	Hitachi	HD14040	
	Motorola	MC14040	
	National	CD4040	
	RCA	CD4040	
	SGS	HCF4040	
	Signetics	HEF4040	
	SSS	SCL4040	
	Solitron	CM4040	
	Toshiba	TC4040	
F4041	Fairchild	F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
F4042	Fairchild	F4041	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
F4044	Hitachi	HD14044	
	Motorola	MC14044	
	National	CD4044	
	RCA	CD4044	
	SGS	HCF4044	
	Signetics	HEF4044	
	SSS	SCL4044	
	Solitron	CM4044	
	Toshiba	TC4044	
F4046	Hitachi	HD14046	
	Motorola	MC14046	
	National	CD4046	
	RCA	CD4046	
	SGS	HCF4046	
	SSS	SCL4046	
	Solitron	CM4046	
F4047	National	CD4047	
	RCA	CD4047	
	SGS	HCF4047	
	Signetics	HEF4042	
		HEF4047	
	SSS	SCL4047	
	Solitron	CM4047	
	Toshiba	TC4047	
F4049	Hitachi	HD14049	
	Motorola	MC14049	
	National	CD4049	
	OKI	MSM4049	
	RCA	CD4009	
		CD4049	
	Sanyo	LC4049	
	SGS	HCF4049	
	Signetics	HEF4049	
	SSS	SCL4049	
	Solitron	CM4049	
	Toshiba	TC4049	
F4050	Hitachi	HD14050	
	Motorola	MC14050	
	National	CD4050	
	RCA	CD4010	
		CD4050	
	SGS	HCF4050	
	Signetics	HEF4050	
	SSS	SCL4050	
	Solitron	CM4050	
	Toshiba	TC4050	
F4051	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
F4051	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
F4052	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**
	TeledyneP	4553	
F4053	Motorola	MC14053	
	National	CD4053	
	RCA	CD4053	
	SGS	HCF4052	
	Signetics	HEF4053	
	SSS	SCL4053	
	Solitron	CM4053	
	Toshiba	TC4053B	
F4066	Fairchild	F4016	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
F4067	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
		MX-1606	**2622**
	Harris	HI1840	
		HI506	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	
	Motorola	MC14067	
	PMI	MUX-16	
	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
F4068	Hitachi	HD14068	
	Motorola	MC14068	
	RCA	CD4068	
	SGS	HCF4068	
	Signetics	HEF4068	
	SSS	SCL4068	
		SCL4412	
	Solitron	CM4068	
	TI	UCN4810	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild		**(Cont'd)**	
F4068	Toshiba	TC4068	
F4069	Hitachi	HD14069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
		MM74C04	
	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	
	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
F4070	Hitachi	HD14070	
	Motorola	MC14070	
	National	CD4070	
		MM74C86	
	RCA	CD4070	
	SGS	HCF4070	
	Signetics	HEF4070	
	SSS	SCL4070	
	Solitron	CM4070	
F4071	Hitachi	HD14071	
	Motorola	MC14071	
	National	CD4071	
		MM74C32	
	OKI	MSM4071	
	RCA	CD4071	
	Sanyo	LC4071	
	SGS	HCF4071	
	Signetics	HEF4071	
	SSS	SCL4071	
	Solitron	CM4071	
	Toshiba	TC4071	
F4072	Hitachi	HD14072	
	Motorola	MC14072	
	National	CD4072	
	RCA	CD4072	
	SGS	HCF4072	
	Signetics	HEF4072	
	SSS	SCL4072	
	Toshiba	TC4072	
F4073	Hitachi	HD14073	
	Motorola	MC14073	
	National	CD4073	
	RCA	CD4073	
	SGS	HCF4073	
	Signetics	HEF4073	
	SSS	SCL4073	
	Solitron	CM4073	
	Toshiba	TC4073	
F4075	Hitachi	HD14075	
	Motorola	MC14075	
	National	CD4075	
	RCA	CD4075	
	SGS	HCF4075	
	Signetics	HEF4075	
	SSS	SCL4075	
	Solitron	CM4075	
	Toshiba	TC4075	
F4076	Hitachi	HD14076	
	Motorola	MC14076	
	National	CD4076	
		MM54C173	
		MM74C173	
	RCA	CD4076	
	SGS	HCF4076	
	Signetics	HEF4076	
	SSS	SCL4076	
	Solitron	CM4076	
	Toshiba	TC4076	
F4077	Hitachi	HD14077	
	Motorola	MC14077	
	National	CD4077	
	RCA	CD4077	
	SGS	HCF4077	
	Signetics	HEF4077	
	SSS	SCL4077	
	Solitron	CM4077	
F4078	Hitachi	HD14078	
	Motorola	MC14078	
	RCA	CD4078	
	SGS	HCF4078	
	Signetics	HEF4078	
	SSS	SCL4078	
	Solitron	CM4078	
	Toshiba	TC4078	
F4081	Hitachi	HD14081	
	Motorola	MC14081	
	National	CD4081	
		MM74C08	
	OKI	MSM4081	
	RCA	CD4081	
	Sanyo	LC4081	
	SGS	HCF4081	
	Signetics	HEF4081	
	SSS	SCL4081	
	Solitron	CM4081	
	Toshiba	TC4081	
F4082	Hitachi	HD14082	
	Motorola	MC14082	
	National	CD4082	
	RCA	CD4082	
	SGS	HCF4082	
	Signetics	HEF4082	
	SSS	SCL4082	
	Toshiba	TC4082	
F4085	National	CD4085	
	RCA	CD4085	
	SGS	HCF4085	
	Signetics	HEF4085	
	SSS	SCL4085	
	Toshiba	TC4085	
F4086	RCA	CD4086	
	SGS	HCF4086	
	Signetics	HEF4086	
	SSS	SCL4086	
	Toshiba	TC4086	
F4093	Hitachi	HD14093	
	Motorola	MC14093	
	National	CD4093	
	OKI	MSM4093	
	RCA	CD4093	
	Sanyo	LC4093	
	SGS	HCF4093	
	Signetics	HEF4093	
	SSS	SCL4093	
	Toshiba	TC4093	
F4097	Motorola	MC14097	
	RCA	CD4097	
	SGS	HCF4097	
F4104	GTEMicro	G4104	
	Mitel	MD4104	
	Motorola	MC14504	
	National	MM4104	
	RCA	CD40109	
	SGS	HCF40109	
	Signetics	HEF4104	
F4116	AMD	9016	
		AM9016	
	Fairchild	F16K	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
F4510	Hitachi	HD14510	
	Motorola	MC14510	
	National	CD4510	
	RCA	CD4510	
	SGS	HCF4510	
	Signetics	HEF4510	
	SSS	SCL4510	
	Solitron	CM4510	
	Toshiba	TC4510	
F4511	Hitachi	HD14511	
	Mitel	MD4511	
	MMI	4511	
	Motorola	MC14511	
	National	CD4511	
	NEC-Micro	μPD4511	
	RCA	CD4511	
	SGS	HCF4511	
	Signetics	HEF4511	
	SSS	SCL4511	
F4511	Solitron	CM4511	
	Toshiba	TC4511	
F4512	Hitachi	HD14512	
	Motorola	MC14512	
	National	CD4512	
	RCA	CD4512	
	SGS	HCF4512	
	SSS	SCL4512	
	Toshiba	TC4512	
F4514	Hitachi	HD14514	
	Motorola	MC14514	
	National	CD4514	
	RCA	CD4514	
	SGS	HCF4514	
	Signetics	HEF4514	
	SSS	SCL4514	
	Solitron	CM4514	
	Toshiba	TC4514	
F4515	Hitachi	HD14515	
	Motorola	MC14515	
	National	CD4515	
	RCA	CD4515	
	SGS	HCF4515	
	Signetics	HEF4515	
	SSS	SCL4515	
	Solitron	CM4515	
	Toshiba	TC4515	
F4516	Hitachi	HD14516	
	Motorola	MC14516	
	National	CD4516	
	RCA	CD4516	
	SGS	HCF4516	
	Signetics	HEF4516	
	SSS	SCL4516	
	Solitron	CM4516	
	Toshiba	TC4516	
F4518	Hitachi	HD14518	
	Motorola	MC14518	
	National	CD4518	
	RCA	CD4518	
	SGS	HCF4518	
	Signetics	HEF4518	
	SSS	SCL4518	
	Solitron	CM4518	
	Toshiba	TC4518	
F4520	Hitachi	HD14520	
	Motorola	MC14520	
	National	CD4520	
	OKI	MSM4520	
	RCA	CD4520	
	Sanyo	LC4520	
	SGS	HCF4520	
	Signetics	HEF4520	
	SSS	SCL4520	
	Solitron	CM4520	
	Toshiba	TC4520	
F4521	Motorola	MC14521	
	RCA	CD4045	
	SGS	HCF4045	
	Signetics	HEF4521	
	SSS	SCL4445	
	Solitron	CM4045	
	Toshiba	TC4521	
F4522	Hitachi	HD14522	
	Motorola	MC14522	
	National	CD4522	
	RCA	CD4522	
	Signetics	HEF4522	
	SSS	SCL4522	
	Toshiba	TC4522	
F4526	Hitachi	HD14526	
	Motorola	MC14526	
	National	CD4526	
	Signetics	HEF4526	
	SSS	SCL4526	
	Toshiba	TC4526	
F4527	Hitachi	HD14527	
	Motorola	MC14527	
	National	CD4527	
	RCA	CD4527	
	SGS	HCF4527	
	Signetics	HEF4527	
	SSS	SCL4527	
	Toshiba	TC4527	
		TR4527	
F4528	Hitachi	HD14528	
	Motorola	MC14528	
	National	CD4528	
		MM74C221	
	RCA	CD4098	
	SGS	HCF4098	
F4528	Signetics	HEF4528	
	SSS	SCL4528	
	Toshiba	TC4528	
F4531	Hitachi	HD14531	
	Motorola	MC14531	
	RCA	CD40101	
	SGS	HCF40101	
	Signetics	HEF4531	
	SSS	SCL4531	
	Toshiba	TC4531	
F4532	Hitachi	HD14532	
	Motorola	MC14532	
	RCA	CD4532	
	SGS	HCF4532	
	Signetics	HEF4532	
	SSS	SCL4532	
	Toshiba	TC4532	
F4539	Hitachi	HD14539	
	Motorola	MC14539	
	Signetics	HEF4539	
	Toshiba	TC4539	
F4543	Hitachi	HD14543	
	Motorola	MC14543	
	National	CD4543	
	RCA	CD4055	
		CD4056	
		CD4543	
	Signetics	HEF4543	
	Toshiba	TC4543	
F4553	Hitachi	HD14553	
	Motorola	MC14533	
		MC14553	
F4555	Hitachi	HD14555	
	Motorola	MC14555	
	RCA	CD4555	
	SGS	HCF4555	
	Signetics	HEF4555	
	SSS	SCL4555	
	Toshiba	TC4555	
F4556	Motorola	MC14556	
	RCA	CD4556	
	SGS	HCF4556	
	Signetics	HEF4556	
	SSS	SCL4556	
	Toshiba	TC4556	
F4557	Hitachi	HD14557	
	Motorola	MC14557	
	Signetics	HEF4557	
F4582	Hitachi	HD14582	
	Motorola	MC14582	
	RCA	CD40182	
	SGS	HCF40182	
	SSS	SCL4582	
F4583	Hitachi	HD14583	
	Motorola	MC14583	
	Toshiba	TC4583	
F4702	Harris	HD4702	
F4720	Signetics	HEF4720	
F4723	National	CD4723	
F4724	RCA	CD4724	
F4727	Signetics	HEF4724	
F4XXX	Fairchild	34XXX	
	Hitachi	HD14XXX	
	Motorola	MC14XXX	
	National	CD4XXX	
	OKI	MSM4XXX	
	SGS	HCF4XXX	
	SSS	SCL4XXX	
	Solitron	CM4XXX	
	TI	TP4000 series	
	Toshiba	TC4XXX	
F64K	Fujitsu	MB8264	
		MB8265	
	Hitachi	HM4864	
	Intel	2164	
	Motorola	MCM6664	
		MCM6665	
	National	NMC4164	
	NEC-Micro	μPD4164	
	TI	TMS4164	
	Toshiba	TMM4164	
F6800A	**Hitachi**	**HD6800**	**1345**
		HD68A00	**1345**
		HD68B00	**1345**
	Motorola	**MC6800**	**1351**
F6802	AMI	S6802	
	Hitachi	**HD6802**	**1345**
	Motorola	**MC6802**	**1351**
F6808	AMI	S6808	
	Hitachi	HD6808	
	Motorola	**MC6808**	**1351**
F6810	AMI	S6810	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild			**(Cont'd)**
F6810	Hitachi	HD6810	
		HD68A10	
	Motorola	MC6810	
		MCM6810	**1351,3839**
F6821	AMI	S6821	
	Hitachi	**HD6821**	**1345**
		HD68A21	**1345**
		HD68B21	**1345**
	Motorola	**MC6821**	**1351**
F68308	Motorola	MCM68308	
F68316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
F6840	AMI	S6840	
	Hitachi	HD46840	
		HD6840	**1345**
		HD68A40	**1345**
		HD68B40	**1345**
	Motorola	**MC6840**	**1351**
F6846	AMI	S6846	
	Hitachi	HD46846	
		HD6846P	
	Motorola	**MC6846**	**1351**
F68488	AMI	S68488	
	Motorola	**MC68488**	**1351**
F6850	AMI	S1602	
	Fairchild	3730	
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
F6852	AMI	S6852	
	Hitachi	**HD6852**	**1345**
		HD68A52	**1345**
	Motorola	**MC2652**	**1359**
		MC6852	**1351**
		MC68652	**1359**
	Signetics	SCN2652	
	SSS	SND5025	
	SMC	COM5025	
F6854	AMI	S6854	
	Motorola	**MC6854**	**1351**
F6860	**Motorola**	**MC6860**	**1351,3298**
F6862	**Motorola**	**MC6862**	**1351**
F68708	AMD	9708	
	Motorola	MCM68708	
F68B10	**Motorola**	**MCM68B10**	**3839**
F68B308	**Motorola**	**MCM68B308**	**3840**
F8804	Mitel	MT8804	
F93419	Fujitsu	MBM93419	
F93451	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
F9401	Fairchild	9401	
	Motorola	MC8503	
	Signetics	9401	
F9403	Fairchild	9403	
	Signetics	9403	
FC193A	Fairchild	μA193	
	Motorola	LM193	
	National	**LM193A**	**3317**
	Signetics	LM193	
	TI	LM193	
FQ3724	Motorola	MQ3724	
	Raytheon	SP3724	
	RCA	CA3724	
FQ3725	Motorola	MQ3725	
	National	DH3725	
	Raytheon	SP3725	
	RCA	CA3725	
HD74LS01	Hitachi	HD74LS01	
	Motorola	SN74LS01	
	National	DM74LS01	
	Raytheon	74LS01	
	Signetics	74LS01	
	TI	**SN74LS01**	**833**
LM301	AD	AD301	
	Fairchild	μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
M4027	Mostek	MK4027	
	SGS	M4027	
MA0802M	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		μA0801	
		μA0802	
MA0802M	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
MA306	AMD	LM306	
	National	**LM306**	**3317**
	TI	LM306	
MC1412	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
MC1413	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
MC5524	Motorola	MC5524	
	National	LM5524	
	Raytheon	RM5524	
	SiliconG	SG5524	
	TI	SN5524	
MC5525	Motorola	MC5525	
	National	LM5525	
	SiliconG	SG5525	
MC5528	Motorola	MC5528	
	National	LM5528	
	SiliconG	SG5528	
	TI	SN5528	
MC5529	Motorola	MC5529	
	National	LM5529	
	SiliconG	SG5529	
MC55325	Motorola	MC55325	
	National	DS55325	
		LM55325	
MC55325	Signetics	55325	
	SiliconG	SG55325	
	TI	SN55325	
MC5534	Motorola	MC5534	
	National	LM5534	
	SiliconG	SG5534	
MC7905	Lambda	LMC7905	
	Motorola	MC7905	
	SiliconG	SG7905	
MC7908	Fairchild	μA7908	
		μA79M08	
	Lambda	LMC7908	
		LμA7908	
	Motorola	MC7908	
	SiliconG	SG7908	
	TI	μA7908	
		μA79M08	
SH0323	Fairchild	SH323	
		μA78H05	
	Lambda	LAS1405	
		LAS1905	
	Motorola	**LM323**	**3294**
		MC78T05C	
	National	**LM323**	**3299**
	SiliconG	SG323	
SH2001	Motorola	MC943	
SH3002	Siliconix	SI3002	
SH323	Fairchild	SH0323	
		μA78H05	
	Lambda	LAS1405	
		LAS1905	
	Motorola	**LM323**	**3294**
		MC78T05C	
	National	**LM323**	**3299**
	SiliconG	SG323	
SN54LS126	Fairchild	54LS126	
	Motorola	SN54LS126A	
	National	DM54LS126	
	Raytheon	54LS126	
	Signetics	54LS126A	
	TI	SN54LS126	
		SN54LS126A	
TBA800	Plessey	TBA800	
	SGS	TBA800	
	Thomson-CSF	TBA800	
TBA810	RCA	CA810	
	SGS	TBA810	
	Signetics	TBA810	
TDA1194	Hitachi	HA1364	
	RCA	CA1190	
	SGS	TDA1190	
		TDA1190Z	
		TDA3190	
	Sprague	ULN-2290	
TDA2002	SGS	TDA2002	
	Sprague	ULN-3701	
TDA2003	SGS	TDA2003	
UA7327	Sprague	ULN-2270	
ULN-2136	Motorola	MC1352	
		MC1357	
	RCA	CA1352	
		CA2111	
		CA3014	
	Sanyo	LA1352	
	Sprague	ULN-2111	
		ULN-2136	
	TI	SN76642	
		SN76643	
		SN76650	
		SN76669	
μA0801	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild		**(Cont'd)**	
µA0801	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	µPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
µA0802	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		µA0801	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	µPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
µA101	AMD	LM101	
	AD	AD101	
	Intersil	AD101	
	Motorola	LM101	
	Raytheon	LM101	
	Signetics	LM101	
	SiliconG	SG101	
	TI	LM101	
	Thomson-CSF	SFC2101	
µA105	AMD	LM105	
	Intersil	LM105	
	National	LM105	
	SiliconG	SG105	
	Thomson-CSF	SFC2105	
µA108	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	µA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
µA108	NEC-Electron	µPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	µA714	
µA109	Motorola	LM109	
	National	LM109	
	SiliconG	SG109	
	TI	SN55109	
	Thomson-CSF	SFC2109	
µA111	AMD	LM111	
	AD	AD111	
	Intersil	LM111	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM111	
	National	**LM111**	**3317**
	PMI	PM111	
	Raytheon	LM111	
	Signetics	LM111	
	SiliconG	SG111	
	TI	LM111	
	Thomson-CSF	SFC2111	
µA139	AMD	LM139	
	Motorola	LM139	
	National	**LM139**	**3317**
	PMI	CMP-04	
		PM139	
	Raytheon	LM139	
	RCA	CA139	
	Signetics	LM139	
	SiliconG	SG139	
	TI	LM139	
µA1458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	µA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	µPC1458	
		µPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
µA1488	AMD	MC1488	
	Exar	**XR1488**	**3188**
µA1488	Harris	HA1488	
	Hitachi	HD75188	
	Motorola	**MC1488**	**2753**
	National	DS1488	
	Raytheon	RM1488	
	Signetics	MC1488	
	SiliconG	SG1488	
	TI	MC1488	
		SN75188	
µA1489	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	µA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
µA1489A	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	µA1489	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
◆µA1558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	µA1458	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	µPC1458	
		µPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
µA193	Fairchild	FC193A	
	Motorola	LM193	
µA193	**National**	**LM193A**	**3317**
	Signetics	LM193	
	TI	LM193	
µA201	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	µA748	
	Intersil	LM748	
		µA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		µA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		µA748	
	Thomson-CSF	SFC2201	
		SFC2748	
µA208	AMD	LM208	
	AD	**AD208**	**3153**
	MicroPwr	MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM208	
	National	LM208	
	PMI	OP-08	
		OP05	
		PM208	
	SiliconG	SG208	
	TI	µA714	
µA209	Lambda	LLM209	
	Motorola	LM209	
	National	LM209	
	SiliconG	SG209	
	Thomson-CSF	SFC2209	
µA224	AMD	LM224	
	Motorola	LM224	
	National	LM224	
	Raytheon	LM224	
	RCA	CA224	
	Signetics	LM224	
	SiliconG	SG224	
	TI	LM224	
µA2240	Exar	XR2240	
	Intersil	ICL8240	
	TI	µA2240	
µA239	AMD	LM239	
	Motorola	LM239	
	National	**LM239**	**3317**
	PMI	CMP-04	
		PM239	
	Raytheon	LM239	
	RCA	CA239	
	Signetics	LM239	
	SiliconG	SG239	
	TI	LM239	
µA2901	Fairchild	µA3302	
	Motorola	LM2901	
		MC3302	
	National	LM2901	
		LM3302	
	NEC-Electron	µPC2901	
	PMI	CMP-04	
	Raytheon	LM2901	
		RV3302	
	RCA	CA3302	
	Signetics	LM2901	
		MC3302	
	SiliconG	SG3302	
	TI	LM2901	
		LM3302	
µA2902	Hitachi	HA17902	
	Motorola	LM2902	
	National	LM2902	
	NEC-Electron	µPC2902	
	Raytheon	LM2902	
	TI	LM2902	
µA2903	AMD	LM311	
	AD	AD311	
	Fairchild	µA311	
	Intersil	LM311	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild		**(Cont'd)**	
µA2903	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	µPC271	
		µPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
µA293	Motorola	LM293	
	National	**LM293**	**3317**
	Signetics	LM293	
	TI	LM293	
µA301A	AD	AD301	
	Fairchild	LM301	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Elcctron	µPC157	
		µPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
µA3045	Hitachi	HA1127	
	National	LM3045	
	Plessey	SL3045	
	RCA	CA3045	
	SiliconG	SG3045	
µA305	AMD	LM305	
	Intersil	LM305	
	National	LM305	
	NEC-Electron	µPC141	
	SiliconG	SG305	
	Thomson-CSF	SFC2305	
µA308	AMD	LM308	
	AD	**AD308**	**3153**
	Burr-Brown	3500	
		3501	
	Intersil	AD308	
		LM308	
	MicroPwr	MP5505	
	Motorola	LM308	
	National	LM308	
	Raytheon	LM308	
	SiliconG	SG308	
µA3086	Motorola	MC3386	
	National	LM3086	
	Plessey	SL3046	
		SL3086	
	RCA	CA3046	
		CA3086	
	SiliconG	SG3086	
		SG3821	
		SG3886	
	Sprague	ULN-2046	
		ULN-2086	
µA309	AMD	LM309	
	Fairchild	µA7805	
	Lambda	LLM309	
		LMC7805	
		LµA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	µPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	µA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
µA311	AMD	LM311	

Manufacturer Device	Replacement Source	Device	IC Master Page
µA311	AD	AD311	
	Fairchild	µA2903	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	µPC271	
		µPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
µA317	MicroEng	MCE-LM317	
	Motorola	**LM317**	**3295**
	National	**LM317**	**3299**
	SiliconG	SG317	
	TI	LM317	
µA318	AMD	LM218	
		LM318	
	AD	**AD518**	**3155**
	National	LM218	
		LM318	
	NEC-Electron	µPC159	
	TI	LM218	
		LM318	
µA324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	µA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	µPC324	
	NEC-Micro	µPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
µA3302	Fairchild	µA2901	
	Motorola	LM2901	
		MC3302	
	National	LM2901	
		LM3302	
	NEC-Electron	µPC2901	
	PMI	CMP-04	
	Raytheon	LM2901	
		RV3302	
	RCA	CA3302	
	Signetics	LM2901	
		MC3302	
	SiliconG	SG3302	
	TI	LM2901	
		LM3302	
µA3303	Motorola	MC3303	
	Signetics	MC3303	
	TI	MC3303	
µA339	AMD	LM339	
		LM339A	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	µPC339	
	NEC-Micro	µPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
		LM339	
	SiliconG	SG339	
	TI	LM339	
µA3403	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	µA324	
	Motorola	LM324	
		MC3403	

Manufacturer Device	Replacement Source	Device	IC Master Page
µA3403	National	LM324	
	NEC-Electron	µPC324	
	NEC-Micro	µPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
µA3448A	**Motorola**	**MC3448A**	**2753**
µA348	National	LM348	
	TI	LM348	
µA376	National	LM376	
µA393	Motorola	LM393	
	National	**LM393**	**3317**
	Sanyo	LA6393	
	Signetics	LM393	
	TI	LM393	
µA4136	Exar	XR4136	
		XR4136M	
	MicroPwr	MP5509	
	PMI	OP-09	
		PM4136	
	Raytheon	RC4136	
		RM4136	
	SiliconG	SG4136	
		SG4136C	
	TI	RC4136	
		RM4136	
µA431	Motorola	TL431	
	TI	TL431	
µA494	Motorola	TL494	
	TI	TL494	
µA555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	µPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
µA556	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
µA565	AD	AD565	
	MicroEng	MCE-565	
µA571	AD	AD571	
	MicroPwr	MP571	
	MicroEng	MCE-571	
µA709	Hitachi	HA1303	
	Motorola	MC1709	
	National	LM1709	
		LM709	
	NEC-Electron	µPC255	
		µPC55	
	Raytheon	RC709	
		RM709	
	RCA	CA3038	
	TI	µA709	
	Thomson-CSF	SFC2709	
	Toshiba	TA7502	
µA710	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM710	
		MC1710	

Manufacturer Device	Replacement Source	Device	IC Master Page
µA710	**National**	**LM710**	**3317**
	PMI	CMP-01	
		CMP-02	
	Raytheon	RM710	
	SiliconG	SG710	
	TI	µA710	
	Thomson-CSF	SFC2710	
µA711	Motorola	MC1711	
	National	**LM711**	**3317**
	SiliconG	SG711	
	TI	µA711	
	Thomson-CSF	SFC2711	
µA714	AD	AD510	
		AD517	
		ADOP-07	**3153**
	Burr-Brown	3510	
	Datel	AM-430	
		AM-490-2	
	Harris	HA-2900	
		HA-2905	
		HA-5130	
		HA-5135	
	MicroPwr	MP517	
		MP5505	
		MP5507	
		OP-05	
		OP-07	
	National	**LH0044**	**3342**
	NEC-Electron	µPC725	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TeledyneP	1340	
	TI	OP-07	
µA715	AMD	715	
µA723	Hitachi	HA17723	
	Intersil	LM723	
	Motorola	**MC1723**	**3295**
	National	LM723	
	Raytheon	RC723	
		RM723	
	RCA	CA723	
		LM723	
	SGS	L123	
	Signetics	µA723	
	SiliconG	SG723	
	TI	µA723	
	Thomson-CSF	SFC2723	
µA725	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	µA108	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	µPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	µA714	
µA733	AMD	AM592	
		NE592	
		SE592	
	Hitachi	HA17733	
	Intersil	µA733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		µA733	
	SiliconG	SG733	
	TI	µA733	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild		**(Cont'd)**	
μA739	Exar	XR4739	
	Fairchild	μA749	
	Motorola	MC1339	
	National	**LM1303**	**3325**
	Raytheon	RC4739	
	SGS	TBA231	
	TI	SN76131	
		SN76149	
μA741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401.3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
μA747	AMD	747	
	Hitachi	HA17747	
	Motorola	MC1747	
	National	LM747	
	NEC-Electron	μPC251	
	PMI	OP-04	
		PM747	
	Raytheon	RC747	
		RM747	
	RCA	CA747	
	Signetics	μA747	
	SiliconG	SG747	
	TeledyneS	747	
	TI	μA747	
μA747-1	TI	μA747-1	
μA748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
μA749	Exar	XR4739	
	Fairchild	μA739	
	Motorola	MC1339	
	National	**LM1303**	**3325**
	Raytheon	RC4739	
	SGS	TBA231	
	TI	SN76131	
		SN76149	
μA760	**National**	**LM160**	**3317**
	PMI	CMP05	
μA776	**Harris**	**HA-2720**	**3236**
	Intersil	ICL8021	
		LM4250	
μA776	Motorola	MC1776	
	National	LM4250	
	SiliconG	SG4250	
	Solitron	UC4250	
μA7805	AMD	LM309	
	Fairchild	μA309	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
μA7806	Lambda	LMC7806	
		LμA7806	
	Motorola	MC7806	
	SiliconG	SG340-6	
		SG7806	
	TI	μA7806	
μA7808	Lambda	LMC7808	
		LμA7808	
	Motorola	**MC7808**	**3294**
	NEC-Electron	μPC7808	
	SiliconG	SG340-8	
		SG7808	
	TI	LM340-8	
		μA7808	
μA7812	Lambda	LMC7812	
		LμA7812	
	Motorola	**MC7812**	**3294**
	National	LM7812	
	NEC-Electron	μPC7812	
	SGS	L7812	
	SiliconG	SG7812	
	TI	μA7812	
	Toshiba	TA78012	
μA7815	Fairchild	μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
μA7818	Lambda	LMC7818	
	NEC-Electron	μPC7818	
	SiliconG	SG340-18	
		SG7818	
	TI	LM340-18	
		μA7818	
μA7824	Lambda	LMC7824	
		LμA7824	
	Motorola	MC7824	
	NEC-Electron	μPC7824	
	SGS	L7824	
	SiliconG	SG7824	
	TI	LM340-24	
		μA7824	
μA78H05	Fairchild	SH0323	
		SH323	
	Lambda	LAS1405	
		LAS1905	
	Motorola	**LM323**	**3294**
		MC78T05C	
	National	**LM323**	**3299**
	SiliconG	SG323	
μA78H12A	Lambda	LAS1912	
μA78HGA	**Motorola**	**LM350**	**3295**
	National	**LM350**	**3299**
	SiliconG	SG350	
μA78L02	Motorola	MC7802	
	TI	μA78L02	
μA78L02A	TI	μA78L02A	
μA78L05	Motorola	MC78L05	
	National	LM340LA-5	
		LM78L05	
	NEC-Electron	μPC78L05	
	TI	μA78L05	
μA78L05A	TI	μA78L05A	
μA78L06	Motorola	MC78L06	
	TI	μA78L06	
		μA87L06	
μA78L06A	TI	μA78L06A	
◆μA78L08A	TI	μA78L08A	
◆μA78L09A	TI	μA78L09A	
◆μA78L10A	TI	μA78L10A	
μA78L12	Motorola	MC78L12	
	National	**LM340LA-12**	**3299**
		LM78L12	
	NEC-Electron	μPC78L12	
	TI	μA78L12	
μA78L12A	TI	μA78L12A	
μA78L15	Fairchild	μA7815	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
μA78L15A	TI	μA78L15A	
μA78M05	Motorola	MC78M05	
	National	**LM341-5**	**3300**
		LM342-05	
		LM78M05	
	NEC-Electron	μPC78M05	
	NEC-Micro	μPC78M05	
	Sanyo	L78M05	
	TI	μA78M05	
μA78M06	Motorola	MC78M06	
	Sanyo	L78M06	
	TI	μA78M06	
μA78M08	Motorola	MC78M08	
	NEC-Electron	μPC78M08	
	NEC-Micro	μPC78M08	
	Sanyo	L78M08	
	TI	μA78M08	
μA78M10	TI	μA78M10	
μA78M12	Motorola	MC78M12	
	National	**LM341-12**	**3300**
		LM342-12	**3299**
		LM78M12	
	NEC-Electron	μPC78M12	
	NEC-Micro	μPC78M12	
	Sanyo	L78M12	
μA78M15	Motorola	MC78M15	
	National	**LM341-15**	**3300**
		LM342-15	**3299**
		LM78M15	
	NEC-Electron	μPC78M15	
	NEC-Micro	μPC78M15	
	Sanyo	L78M15	
μA78M24	Motorola	MC78M24	
	Sanyo	L78M24	
	TI	μA78M24	
μA78P05	Lambda	LAS3905	
μA78S40	Motorola	μA78S40	
μA7902	Lambda	LMC7902	
		LμA7902	
	Motorola	MC7902	
μA7905	Fairchild	μA79M05	
	Lambda	LMC7905	
		LμA7905	
	Motorola	MC7905	
	National	LM320MP5	
		LM7905	
		LM79M05	
	SiliconG	SG120-5	
		SG320-05	
		SG320P-5	
		SG7905	
μA7905	TI	μA7905	
μA7908	Fairchild	MC7908	
		μA79M08	
	Lambda	LMC7908	
		LμA7908	
	Motorola	MC7908	
	SiliconG	SG7908	
	TI	μA7908	
		μA79M08	
μA7912	Fairchild	μA79M12	
	Motorola	MC7912	
	National	LM120-12	
		LM320MP12	
		LM7912	
		LM79M12	
	SiliconG	SG120-12	
		SG320P-12	
		SG7912	
	TI	μA7912	
μA7915	Lambda	LμA7915	
	Motorola	MC7915	
	National	LM120-15	
		LM320-15	
		LM320T15	
		LM7915	
	SiliconG	SG120-15	
		SG320-15	
		SG7915	
	TI	μA7915	
μA796	Motorola	MC1496	
		MC1596	
	National	LM1496	
		LM1596	
	Plessey	SL1496	
		SL1596	
	Signetics	MC1496	
		MC1596	
	SiliconG	SG1496	
		SG1596	
μA798	Motorola	MC3458	
		MC3558	
μA79HG	Lambda	AL518μ	
μA79M05	Fairchild	μA7905	
	Lambda	LMC7905	
		LμA7905	
	Motorola	MC7905	
	National	LM320MP5	
		LM7905	
		LM79M05	
	SiliconG	SG120-5	
		SG320-05	
		SG320P-5	
		SG7905	
	TI	μA7905	
μA79M06	TI	μA79M06	
μA79M08	Fairchild	MC7908	
		μA7908	
	Lambda	LMC7908	
		LμA7908	
	Motorola	MC7908	
	SiliconG	SG7908	
	TI	μA7908	
		μA79M08	
μA79M12	Fairchild	μA7912	
	Motorola	MC7912	
	National	LM120-12	
		LM320MP12	
		LM7912	
		LM79M12	
	SiliconG	SG120-12	
		SG320P-12	
		SG7912	
	TI	μA7912	
μA8T26A	AMD	N8T26	
		N8T26A	
	Hitachi	HD268T26	
	Motorola	MC6880A	
		MC8T26	
		MC8T26A	
	National	DS8T26A	
	Signetics	N8T26	
		N8T26A	
	TI	N8T26A	
μA8T28	National	DS8T28	
μA9636	TI	μA9636	
μA9636A	TI	μA9636A	
μA9637	TI	μA9637	
μA9637A	TI	μA9637A	
μA9638	TI	μA9638	
μA9708	Motorola	MC14443	
		MC14447	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Manufacturer Device	Replacement Source	Device	IC Master Page
Fairchild (Cont'd)			
μAF398	National	LF398	
		LM298	
	PMI	SMP-10	
	Signetics	NE5537	
μAF771	**RCA**	**CA081**	**3348**
	TI	TL081	
μAF772	Exar	XR072	
	PMI	OP-25	
	TI	TL072	
μAF774	**Exar**	**XR084**	**3206**
	RCA	**CA084**	**3348**
	TI	TL084	
Ferranti Electric			
ULA1G000	Interdesign	1G000	
ULA1U000	Interdesign	1U000	
ULA2000	**Interdesign**	**MUA**	**4433**
ULA2C000	**Interdesign**	**MSA**	**4433**
ULA2H000	**Interdesign**	**MUC**	**4433**
ULA2L000	**Interdesign**	**MUB**	**4433**
ULA2U000	Interdesign	2U000	
ULA3U000	Interdesign	3U000	
ULA5C000	**Interdesign**	**MSB**	**4433**
ULA9C000	**Interdesign**	**MSC**	**4433**
ZN1060	**Signetics**	**NE5560**	**3402**
		SE5560	**3402**
	Sprague	ULN-8160	
		ULS-8160	
ZN423	AD	AD589	
	Datel	VR-8069	
	Intersil	ICL8069	
	MicroPwr	**MP5010**	**401,3292**
	National	**LM113**	**3304**
		LM313	**3304**
	TeledyneS	9491	
		9941	
ZN425	Datel	ADC-MC8	
ZN433	Datel	ADC-856	
ZN458	Datel	VR-182	
Fujitsu Microelectronics, Inc.			
2147	National	NMC2147H	
	Universal	2147	
27128	**Intel**	**27128**	**3821**
	SEEQ	**5143**	**3896**
4044	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
7138	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	

Manufacturer Device	Replacement Source	Device	IC Master Page
7138	**TI**	**TBP28S166**	**440,3979**
93415	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
93425	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
MB4111	SiliconSys	104	
MB4112	SiliconSys	105	
MB7053	AMD	AM27S13	
	Fairchild	93446	
	Harris	HM7621	
	Intel	3622	
	MMI	6306	
	Motorola	MCM7621	
	National	DM74S571	
	Signetics	82S131	
	TI	SN74S571	
MB7057	AMD	AM27S20	
	Fairchild	93417	
	Harris	HM7610	
		HM7610-2	**3696**
	Intel	M3601	
	MMI	5300-1	
		6300-1	**3826**
	National	DM54S387	
		DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
	TI	**TBP24SA10**	**440,3967**
		TBP24SA10M	**440,3967**
MB7121	AMD	AM27S32	
	Fairchild	93452	
	Harris	HM7642	
		HM7642-2	**3705**
	Intel	M3605	
	MMI	5352-1	
		6352	
	National	DM54S572	
		DM74S572	
	Raytheon	29640	
	Signetics	N82S136	
		S82S136	
	TI	**TBP24SA41**	**440,3968**
		TBP24SA41M	**440,3968**
MB7122	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	

Manufacturer Device	Replacement Source	Device	IC Master Page
MB7122	Fujitsu	MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
MB7123	AMD	AM27S28	
	Fujitsu	MB7124	
		MC7124	
	Harris	HM7648	
	MMI	5348	
		6348	
	National	DM54S473	
		DM74S473	
	Raytheon	29620	
	Signetics	N82S146	
		S82S146	
	TI	**TBP28SA42**	**440,3976**
MB7124	AMD	AM27S29	
	Fujitsu	MBM7124	
	Harris	HM7649	
	MMI	5349-1	
		6349-1	**3826**
	Motorola	MCM7649	
	National	DM54S472	
		DM74S472	
	Raytheon	29621	
	Signetics	N82S147	
		S82S147	
	TI	DM54S472	
		TBP28S42	**440,3975**
		TBP28S42M	**440,3975**
MB7126	AMD	AM27S31	
	Fairchild	93448	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	**3826**
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	**TBP28S46**	**440,3976**
		TBP28S46M	**440,3976**
MB7127	AMD	AM27S184	
	Harris	HM7684	
	MMI	53100	
		63100	
	Motorola	MCM7684	
	National	DM77S184	
		DM87S184	
	Raytheon	29650	
	Signetics	N82S184	
	TI	**TBP24SA81**	**440,3969**
MB7128	AMD	AM27S185	
	Harris	HM7685	
		HM7685-2	**3714**

Manufacturer Device	Replacement Source	Device	IC Master Page
MB7128	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	**440,3968**
		TBP24S81M	**440,3968**
MB7131	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
MB7132	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132H**	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
MB7132H	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Fujitsu Microelectronics, Inc. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MB7132H	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	82S181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
MB7134	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3958**
		TBP24S41M	**440,3958**
		TBP28S41	
		TBP28S41M	
MB7137	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MBM7138	
	Harris	HM76160	
	MMI	631681	
	National	DM77S190	
		DM87S190	
	Raytheon	29680	
		29683	
	Signetics	82S190	
		N82S190	
		S82S190	
	Supertex	MM82S190	
MB7138	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	**440,3979**
MB7142	AMD	AM27S43	
MB7142	Intel	3632	
	Signetics	82S321	
		N82S321	
		S82S321	
MB7768A	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
MB8114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
MB8116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
MB8118	AMD	AM4516	
	Hitachi	HM4816	
		HM4816A	
	Intel	2118	
	Intersil	IM7118	
	Mostek	4516	
		MK4516	
	National	NMC5295	
	NEC-Micro	2118	
	TI	TMS4516	
MB8128	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	**MB8416**	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
MB8128	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
◇ MB8167	**Hitachi**	**HM6167**	**3789**
	IMS	1400	
	IDT	IDT6167	
	Intel	2167	
	NEC-Micro	μPD2167	
MB8168	IMS	IMS1420	
	Intel	2168	
MB8243	AMD	8243	
	Intel	8243	
	NEC-Micro	μPD8243	
	Signetics	8243	
MB82464	Mitsubishi	M5K4164	
MB8264	Fairchild	F64K	
	Fujitsu	MB8265	
	Hitachi	HM4864	
	Intel	2164	
	Motorola	MCM6664	
		MCM6665	
	National	NMC4164	
	NEC-Micro	μPD4164	
	TI	TMS4164	
	Toshiba	TMM4164	
MB8265	Fairchild	F64K	
	Fujitsu	MB8264	
	Hitachi	HM4864	
	Intel	2164	
	Motorola	MCM6664	
		MCM6665	
	National	NMC4164	
	NEC-Micro	μPD4164	
	TI	TMS4164	
	Toshiba	TMM4164	
MB8404	Intersil	IM6504	
	National	NMC6504	
	RCA	CDM5104	
MB8414	Harris	HM6514	
	Hitachi	**HM4334**	**3789**
	Intersil	IM6514	
	MicroPwr	MP6514	
	Mitsubishi	M58981	
	National	NMC6514	
	NEC-Micro	μPD444/6514	
		μPD6514	
	OKI	**MSM5115**	**3873**
	RCA	MWS5114	
		MWS5514	
	Toshiba	TC5514	
MB8416	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
MB8417	MicroPwr	MP6118	
	Toshiba	TC5517	
MB8418	Toshiba	TC5518	
◇ MB8866	**Fujitsu**	**MB8876**	**1308**
	Siemens	SAB1791	
	SMC	FDC1791	
	Western	FD1791	
MB8868A	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
MB8868A	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
MB8876	Siemens	SAB1791	
	SMC	FDC1791	
	Western	FD1791	
MB8877	Siemens	SAB1793	
	SMC	FDC1793	
	Western	FD1793	
MBL8035	AMD	8035	
		D8035	
		ID8035	
		P8035	
	Intel	8035	
		D8035	
		ID8035	
		P8035	
	National	INS8035	
	NEC-Micro	μPD8035	
		μPD80C35	
	Signetics	SCN8035	
MBL8039	AMD	D8039	
		ID8039	
	Intel	8039	
		D8039	
		ID8039	
	National	INS8039	
	NEC-Micro	μPD8039	
	Signetics	SCN8039	
MBL8048	AMD	8048	
	Intel	8048	
	National	INS8048	
	NEC-Micro	μPD8048	
		μPD80C48	
	Signetics	SCN8048	
	Toshiba	TMP8048	
MBL8049	Intel	8049	
	National	INS8049	
	NEC-Micro	μPD8049	
	Signetics	SCN8049	
MBM100470	AMD	AM100470	
	Fairchild	**F100470**	**3615,3628**
MBM10422	**Fairchild**	**F10422**	**3615,3620**
	Hitachi	**HM10422**	**3789**
	Motorola	**MCM10422**	**3839**
	National	**DM10422**	**3854**
MBM10470	AMD	AM10470	
	Fairchild	**F10470**	**3615,3621**
	Hitachi	**HM10470**	**3789**
	Motorola	MCM10470	
	National	**DM10470**	**3855**
	Signetics	10470	
MBM10474	AMD	AM10474	
	Fairchild	F10474	
	Hitachi	**HM10470**	**3789**
MBM2147	AMD	9147	
	AMI	4017	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
MBM2147H	Intel	2147-3	
MBM2148	AMD	9148	
		AM9148	
	Fairchild	**93475**	**3615,3646**
	Fujitsu	MBM2149	
	Hitachi	**HM6148**	**3789**
	Intel	2148H	
		2149H	
	National	NMC2148	
	Synertek	SY2148	
		SY2149	
MBM2149	AMD	9148	
		AM9148	
	Fairchild	**93475**	**3615,3646**
	Fujitsu	MBM2148	
	Hitachi	**HM6148**	**3789**
	Intel	2148H	
		2149H	

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

ADVERTISERS INDEX

Advanced Micro Devices
Digital 601-617
Microprocessor 1201-1246
Microprocessor Development Systems 1701-1705
Microcomputer Boards 1901-1910
Interface 2601-2608
Linear 3101-3137
Memory 3601-3607
American Automation
Microprocessor Development Systems 1706
American Microsystems, Inc.
Digital 618
Microprocessor 1247-1252
Interface 2609-2611
Linear 3138-3150
Memory 3608-3614
Custom/Semicustom 4301-4308
Analog Devices
Linear 3151-3186
Arrow Electronics
357, 1720, 2300
Burr-Brown
1984
California Devices
Custom/Semicustom 4309
Computer Aided Engineering
Custom/Semicustom 4310
Creative Micro Systems
Microcomputer Boards 1911-1912
Cromemco
Microcomputer Boards 1913-1932
Custom MOS Arrays, Inc.
Custom/Semicustom 4311
Datel-Intersil
Microcomputer Boards 1933
Interface 2613-2623
Digelec
PROM Programmers 4101
Diplomat Electronics Corp.
Manufacturers and Distributors Directory
Emulogic
Microprocessor Development Systems 1708-1709
Exar Integrated Systems, Inc.
Linear 3187-3209
Custom/Semicustom 4312-4315
Fairchild
Digital 619-668
Microprocessor 1253-1304
Microprocessor Development Systems 1711-1718
Memory 3615-3666
Custom/Semicustom 4316-4317
Fujitsu America
Memory 3668-3671
Fujitsu Microelectronics
Microprocessor 1305-1308
Memory 3672-3681
Custom/Semicustom 4318-4320
General Instrument
Microprocessor 1309-1332
Memory 3683-3692
Harris Semiconductor
Digital 669-695
Microprocessor 1333-1344
Interface 2624-2742
Linear 3210-3291
Memory 3693-3788
Custom/Semicustom 4321-4430
Hilevel Technology
Microprocessor Development Systems 1719

© IC MASTER 1983

Hitachi America
Microprocessor 1345
Memory 3789
Holt, Inc.
Custom/Semicustom 4431
Hybrid Systems Corp.
Interface 2743-2748
Inmos Corp.
Memory 3790-3792
Integrated Device Technology
Memory 3793-3807
Intel
Microprocessor 1347-1350
Microprocessor Development Systems 1721-1728
Memory 3808-3825
Interdesign, Inc.
Custom/Semicustom 4433
International Microelectronic Products
Custom/Semicustom 4435
Kontron Electronics
PROM Programmers 4103
LSI Computer Systems, Inc.
Digital 696
Custom/Semicustom 4436
Micro Circuit Engineering
Custom/Semicustom 4437-4440
Micro Power Systems
Military 401
Interface 2749
Linear 3292
Mitel Semiconductor
Digital 697-714
Monolithic Memories, Inc.
Digital 715-728
Memory 3826-3838
Custom/Semicustom 4442-4478
Motorola Semiconductor
Digital 729-733
Microprocessor 1351-1360
Microprocessor Development Systems 1729-1738
Microcomputer Boards 1935-1945
Interface 2750-2761
Linear 3293-3298
Memory 3839-3849
Custom/Semicustom 4479-4480
National Semiconductor
Military 402-405
Digital 729-733
Microprocessor 1361-1456
Microcomputer Boards 1946-1955
Interface 2762-2771
Linear 3299-3345
Memory 3850-3871
Custom/Semicustom 4481-4499
OKI Semiconductor
Memory 3872-3873
Oliver Advanced Engineering
PROM Programmer 4104
Optical Electronics
Linear 3346-3347
Plessey Semiconductors
Custom/Semicustom 4501-4516
RCA
Military 406-409
Digital 739-760
Microprocessor 1457-1491
Microcomputer Boards 1956-1961
Linear 3348-3371
Memory 3874-3881
Custom/Semicustom 4517-4521
Schweber Electronics
349, 2064, Volume II opp. page 2401,
Seeq Technology, Inc.
Microprocessor 1492-1500
Memory 3882-3896
Semi Processes Inc.
Digital 761-771
Signetics
Military 410-423
Digital 773-810
Microprocessor 1501-1525
Microprocessor Development Systems 1739-1746
Microcomputer Boards 1962-1979
Interface 2772-2778
Linear 3372-3421
Memory 3897-3939
Custom/Semicustom 4522-4526
Silicon Systems
Custom/Semicustom 4528-4529
Siliconix
Interface 2779-2842
Sprague Electric
Interface 2843
Stag Microsystems
PROM Programmers 4105
Structured Design
PROM Programmers 4106
Sunrise Electronics
PROM Programmers 4107
Synertek
Military 424-432
Microprocessor 1526-1550
Microprocessor Development Systems 1747
Microcomputer Boards 1980-1983
Memory 3940-3957
Custom/Semicustom 4531-4537
TRW LSI Products
Digital 812-819
Linear 3438-3442
Teledyne Semiconductor
Interface 2845-2854
Texas Instruments
Military 433-443
Digital 821-1034
Microprocessor 1552-1564
Microprocessor Development Systems 1748-1749
Interface 2855-2868
Linear 3422-3437
Memory 3958-3980
Custom/Semicustom 4539-4560
Unitrode Corporation
Linear 3444-3446
VTI
Memory 3981-3993
Custom/Semicustom 4561-4562
Weitek
Digital 1036-1041
Western Digital
Microprocessor 1566-1579
Interface 2869-2880
Memory 3994-3997
Custom/Semicustom 4563-4564
Xicor
Memory 3998-3999
Zilog
Microprocessor 1581-1604

© IC MASTER 1983

Fujitsu Microelectronics, Inc. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MBM2149	National	NMC2148	
	Synertek	SY2148	
		SY2149	
MBM2716	AMD	2716	
	Fairchild	F2716	
	Hitachi	**HN462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
MBM2732	AMD	2732	
	Fairchild	F2732	
	Hitachi	**HN462732**	**3789**
	Intel	2732	
		2732A	**3819,3822**
		M2732	
	Mitsubishi	M5L2732	
	National	MM2732	
		NMC2732	
	NEC-Micro	μPD2732	
	Toshiba	TMM2732	
		TMM324C	
	Universal	UM2732	
MBM2732A	AMD	2732	
	Fairchild	F2732	
	Hitachi	**HN462732**	**3789**
	Intel	2732	
		2732A	**3819,3822**
		M2732	
	Mitsubishi	M5L2732	
	National	MM2732	
		NMC2732	
	NEC-Micro	μPD2732	
	Toshiba	TMM2732	
		TMM324C	
	Universal	UM2732	
MBM2764	Hitachi	HN462764	
		HN482764	**3789**
	Intel	**2764**	**3820,3822**
		M2764	
	Intersil	2764	
	Mostek	MK2764	
	National	NMC2764	
	NEC-Micro	μPD2764	
	SEEQ	5133	
	Toshiba	TMM2764	
MBM7124	AMD	AM27S29	
	Fujitsu	MB7124	
	Harris	HM7649	
	MMI	5349-1	
		6349-1	**3826**
	Motorola	MCM7649	
	National	DM54S472	
		DM74S472	
	Raytheon	29621	
	Signetics	N82S147	
		S82S147	
	TI	DM54S472	
		TBP28S42	**440,3975**
		TBP28S42M	**440,3975**
MBM7138	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
MBM7138	TI	**TBP28S166**	**440,3979**
MBM93419	Fairchild	F93419	
MC7124	AMD	AM27S28	
	Fujitsu	MB7123	
		MB7124	
	Harris	HM7648	
	MMI	5348	
		6348	
	National	DM54S473	
		DM74S473	
	Raytheon	29620	
	Signetics	N82S146	
		S82S146	
	TI	**TBP28SA42**	**440,3976**

General Instrument

Manufacturer Device	Replacement Source	Device	IC Master Page
AY-3-8913	TI	SN76489	
AY-5-8116	SMC	COM8116	
AY-5-8136	SMC	COM8136	
AY-5-9559	AMI	S2859	
	Mitel	MT5087	
	Mostek	MK5087	
	National	TP5087	
	Plessey	MV5087	
AY3-1015	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
AY6-1013	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
ER1400	Mitsubishi	M5G1400	
	NCR	NCR1400	
	Nitron	NC1400	
ER2051	NCR	NCR2051	
	Nitron	NC7051	
ER2055	GI	ER2810	
	NCR	NCR2811	
	Nitron	NC7810	
ER2810	GI	ER2055	
	NCR	NCR2811	
	Nitron	NC7810	
ER3400	Hughes	HNVM3704	
	NCR	NCR3400	
	Nitron	NC7451	
ER5716	**Hitachi**	**HN48016**	**3789**
	Motorola	MCM2816	
	NCR	NCR2168	
ER5816	GI	ER5916	
	Intel	**2816**	**3824**
	National	NMC2816	
	NCR	NCR2161	
ER5916	GI	ER5816	
	Intel	**2816**	**3824**
	National	NMC2816	
	NCR	NCR2161	
PIC1650A	Plessey	PIC1650A	
PIC1655A	Plessey	PIC1655A	
PIC1656	Plessey	PIC1656	

Manufacturer Device	Replacement Source	Device	IC Master Page
R03-8316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
R03-9316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
R03-9332	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
R03-9333	AMD	AM9233	
	AMI	**S2333**	**3603**
	CSG	MPS2333	
	Fairchild	F3533	
	Intel	2332	
	NEC-EA	8332	
		EA8333	
	RCA	CDM5332	
	Signetics	2332	
	Synertek	**SY2333**	**3950**
	Toshiba	TM2332	
	Universal	UM2333-45	
R03-9367	**AMI**	**S2364**	**3609**
	Mostek	MK37000	
	Signetics	**2364-20**	**3899**

Manufacturer Device	Replacement Source	Device	IC Master Page
R03-9367	**Synertek**	**SY2365**	**3951**
		SY2365-2	**3951**

GTE Microcircuits

Manufacturer Device	Replacement Source	Device	IC Master Page
2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
2316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
2332	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
2364	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

GTE Microcircuits (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
2364	**Motorola**	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
2364-3	AMD	AM9264	
	AMI	S4264	
	Mostek	MK36000-5	
	NEC-EA	UPD2/8364-30	
	Signetics	**2664A-30**	**3907**
	Synertek	SY2364-3	
	Toshiba	TMM2364	
	Weitek	SC8164	
G4104	Fairchild	F4104	
	Mitel	MD4104	
	Motorola	MC14504	
	National	MM4104	
	RCA	CD40109	
	SGS	HCF40109	
	Signetics	HEF4104	
G4320	ITT	DF320	
	Mitel	MT4320	
	Nitron	NC2320	
	Siliconix	DF320	
G5050	Mitel	MA5050	
G5100	Mitel	MA5100	
G5150	Mitel	MA5150	
G74SC137	**Mitel**	**MD74SC137**	**697**
	Plessey	MV74SC137	
	SPI	SP74SC137	
G74SC138	**Mitel**	**MD74SC138**	**697**
	Plessey	MV74SC138	
	RCA	CDP1873	
	SPI	SP74SC138	
G74SC139	**Mitel**	**MD74SC139**	**697**
	Plessey	MV74SC139	
	SPI	SP74SC139	
G74SC237	**Mitel**	**MD74SC237**	**697**
G74SC238	**Mitel**	**MD74SC238**	**697**
	SPI	SP74SC238	
G74SC239	**Mitel**	**MD74SC239**	**697**
	SPI	SP74SC239	
G74SC240	**Mitel**	**MD74SC240**	**702**
	Plessey	MV74SC240	
	SPI	**SP74SC240**	**761**
G74SC241	**Mitel**	**MD74SC241**	**702**
	Plessey	MV74SC241	
	SPI	**SP74SC241**	**761**
G74SC244	**Mitel**	**MD74SC244**	**702**
	Plessey	MV74SC244	
	SPI	**SP74SC244**	**761**
G74SC245	Fairchild	74LS245	
	Mitel	**MD74SC245**	**702,706**
	Motorola	SN74LS245	
	Plessey	MV74SC245	
	SPI	**SP74SC245**	**761**
	Signetics	**74LS245**	**779**
		N8T245	
	TI	**SN74LS245**	**913**
G74SC373	Mitel	74SC373	
		MD74SC373	**710**
	Plessey	MV74SC373	
	SPI	**SP74SC373**	**761**
G74SC374	**Mitel**	**MD74SC374**	**710**
	Plessey	MV74SC374	
	SPI	**SP74SC374**	**761**
G74SC533	**Mitel**	**MD74SC533**	**710**
G74SC534	Mitel	MD74SC234	
G74SC540	**Mitel**	**MD74SC540**	**702**
	SPI	SP74SC540	
G74SC541	**Mitel**	**MD74SC541**	**702**
	SPI	SP74SC541	
G74SC563	**Mitel**	**MD74SC563**	**710**
G74SC564	Mitel	MD74SC564	
G74SC573	**Mitel**	**MD74SC573**	**710**
	SPI	**SP74SC573**	**761**
G74SC574	**Mitel**	**MD74SC574**	**710**
	SPI	**SP74SC574**	**761**
G8865	Mitel	MT8865	
G8865	Mostek	MK8865	
	Plessey	MV8865	
G8912	Intel	2912	
	Mostek	MK5912	
		MK8912	
	Plessey	MV8912	

Harris Semiconductor

Manufacturer Device	Replacement Source	Device	IC Master Page
6518	**Harris**	**HM6518**	**669,1333,3756**
	Intersil	IM6518-1	
	National	MM74C930	
HA-2425	AD	AD583	
	Datel	**SHM-IC-1**	**2622**
	PMI	SMP-10	
		SMP-11	
	TeledyneP	4856	
HA-2500	Intersil	HA2500	
HA-2502	Datel	AM-450-2M	
	Intersil	HA2502	
HA-2505	AD	AD540	
	Burr-Brown	3503	
	Datel	**AM-450-2**	**2622**
	Intersil	HA2505	
		HA2525	
	MicroPwr	MP5501	
	PMI	OP01	
HA-2507	Intersil	HA2507	
HA-2510	Intersil	HA2510	
HA-2512	Intersil	HA2512	
HA-2515	Intersil	HA2515	
HA-2517	Fairchild	F40085	
	Intersil	HA2517	
HA-2522	Datel	AM-452-2M	
	Intersil	HA2522	
HA-2527	Intersil	HA2527	
HA-2600	Intersil	HA2600	
	Motorola	MC1556	
	Signetics	MC1556	
	SiliconG	SG1556	
	TeledyneP	1326	
	TI	MC1556	
HA-2602	Datel	AM-460-2M	
	Intersil	HA2602	
HA-2605	**Datel**	**AM-460-2**	**2622**
	Intersil	HA-2602	
		HA-2605	
		HA2605	
	Motorola	MC1456	
	Signetics	MC1456	
	SiliconG	SG1456	
	TI	MC1456	
HA-2607	Intersil	HA2607	
HA-2620	AD	AD507	
	Burr-Brown	3508	
	Datel	AM-462-1	
		AM-462-2	**2622**
	Harris	**HA-2622**	**3228,3287**
		HA-2625	**3228,3287**
	Intersil	HA-2622	
		HA-2625	
		HA2620	
		HA2625	
HA-2622	AD	AD507	
	Burr-Brown	3508	
	Datel	AM-462-1	
		AM-462-2	**2622**
	Harris	**HA-2620**	**3228,3287**
		HA-2625	**3228,3287**
	Intersil	HA-2622	
		HA-2625	
		HA2620	
		HA2625	
HA-2625	AD	AD507	
	Burr-Brown	3508	
	Datel	AM-462-1	
		AM-462-2	**2622**
	Harris	**HA-2620**	**3228,3287**
		HA-2622	**3228,3287**
	Intersil	HA-2622	
		HA-2625	
		HA2620	
		HA2625	
HA-2627	Intersil	HA2627	
HA-2640	Datel	AM-464-2M	
	Motorola	MC1536	
	National	LM143	
		LM1536	
	SiliconG	SG1536	
HA-2645	**Datel**	**AM-464-2**	**2622**
HA-2645	Motorola	MC1436	
		MC1439	
	National	LM1436	
		LM343	
	SiliconG	SG1436	
	TeledyneP	1332	
HA-2650	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2655**	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
HA-2655	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
HA-2655	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
HA-2665	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
HA-2700	Datel	AM-470-2	
		AM-470-2C	**2623**
		AM-470-2M	
	Harris	HA-2704	
		HA-2705	
	TeledyneP	1323	
HA-2704	Datel	AM-470-2	
		AM-470-2C	**2623**
		AM-470-2M	
	Harris	HA-2700	
		HA-2705	
	TeledyneP	1323	
HA-2705	Datel	AM-470-2	
		AM-470-2C	**2623**
		AM-470-2M	
	Harris	HA-2700	
		HA-2704	
	TeledyneP	1323	
HA-2720	Fairchild	μA776	
	Intersil	ICL8021	
		LM4250	
	Motorola	MC1776	
	National	LM4250	
	SiliconG	SG4250	
	Solitron	UC4250	
HA-2900	AD	AD510	
		AD517	
		AD0P-07	**3153**
	Burr-Brown	3510	
	Datel	AM-430	
		AM-490-2	
	Fairchild	μA714	
	Harris	HA-2905	
		HA-5130	
		HA-5135	
	MicroPwr	MP517	
		MP5505	
		MP5507	
		OP-05	
		OP-07	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

ALTERNATE SOURCE DIRECTORY

Harris Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HA-2900	**National**	**LH0044**	**3342**
	NEC-Electron	μPC725	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TeledyneP	1340	
	TI	OP-07	
HA-2905	AD	AD510	
		AD517	
		ADOP-07	**3153**
	Burr-Brown	3510	
	Datel	AM-430	
		AM-490-2	
	Fairchild	μA714	
	Harris	HA-2900	
		HA-5130	
		HA-5135	
	MicroPwr	MP517	
		MP5505	
		MP5507	
		OP-05	
		OP-07	
	National	**LH0044**	**3342**
	NEC-Electron	μPC725	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TeledyneP	1340	
	TI	OP-07	
HA-4741	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
HA-5100	Datel	AM-410-2M	
HA-5105	Datel	AM-410-2	
HA-5110	Datel	AM-411-2M	
HA-5115	Datel	AM-411-2	
HA-5130	AD	AD510	
		AD517	
		ADOP-07	**3153**
	Burr-Brown	3510	
	Datel	AM-430	
		AM-490-2	
	Fairchild	μA714	
	Harris	HA-2900	
		HA-2905	
		HA-5135	
	MicroPwr	MP517	
		MP5505	
		MP5507	
		OP-05	
		OP-07	
	National	**LH0044**	**3342**
	NEC-Electron	μPC725	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TeledyneP	1340	
	TI	OP-07	
HA-5135	AD	AD510	
		AD517	
		ADOP-07	**3153**
	Burr-Brown	3510	
	Datel	AM-430	
		AM-490-2	
	Fairchild	μA714	
	Harris	HA-2900	
		HA-2905	
		HA-5130	
	MicroPwr	MP517	
		MP5505	
		MP5507	
		OP-05	
		OP-07	
HA-5135	**National**	**LH0044**	**3342**
	NEC-Electron	μPC725	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TeledyneP	1340	
	TI	OP-07	
HA-516	Burr-Brown	MPC800	
	Datel	MX-1616	
HA-518	Burr-Brown	MPC801	
	Datel	MX-818	
HA1488	AMD	MC1488	
	Exar	**XR1488**	**3188**
	Fairchild	μA1488	
	Hitachi	HD75188	
	Motorola	**MC1488**	**2753**
	National	DS1488	
	Raytheon	RM1488	
	Signetics	MC1488	
	SiliconG	SG1488	
	TI	MC1488	
		SN75188	
HD4702	Fairchild	F4702	
HD6101	Intersil	IM6101	
HI-5050	**Harris**	**HI387**	**2635,3288**
		HI5050	
	Intersil	DG187	
		IH5050	
	Siliconix	DG187	
		DG387	
HI-5051	Intersil	DG190	
		IH5051	
	Siliconix	DG190	
HI1818	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
HI1818A	AD	AD7503	
	Datel	**MV-808**	**2622**
	MicroPwr	MP7503	
HI1828	AD	AD7502	
	Fairchild	F4052	
	MicroPwr	MP7502	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
HI1828A	**Datel**	**MVD-409**	**2622**
HI1840	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
		MX-1606	**2622**
	Fairchild	F4067	
	Harris	HI506	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	
	Motorola	MC14067	
	PMI	MUX-16	
	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
HI200	AD	ADG200	
	Intersil	IH200	
	MicroPwr	MP200	
		MP7513	
	PMI	SW-05	
	Siliconix	DG200	
HI201	AD	ADG201	
	MicroPwr	MP201	
	National	**LF11201**	**3318**
		LF13201	**3318**
	PMI	SW-01	
		SW-201	
HI201	Siliconix	DG201	
HI300	Siliconix	DG300	
HI301	Siliconix	DG301	
HI302	Siliconix	DG302	
HI303	Siliconix	DG303	
HI304	Siliconix	DG304	
HI305	Siliconix	DG305	
HI306	Siliconix	DG306	
HI307	Siliconix	DG307	
HI381	Harris	HI5048	
	Intersil	DG181	
		IH5048	
	Siliconix	DG181	
		DG381	
HI384	Harris	HI5049	
	Intersil	DG184	
		IH5049	
	Siliconix	DG184	
		DG384	
HI387	Harris	HI-5050	
		HI5050	
	Intersil	DG187	
		IH5050	
	Siliconix	DG187	
		DG387	
HI390	Siliconix	DG390	
HI5040	Intersil	IH5040	
	Siliconix	DG5040	
HI5041	Intersil	IH5041	
	Siliconix	DG5041	
HI5042	Intersil	DG188	
		IH5042	
	Siliconix	DG188	
		DG5042	
	TI	TL188	
HI5043	Intersil	DG191	
		IH5043	
	Siliconix	DG191	
		DG243	
		DG5043	
HI5044	Intersil	IH5044	
	Siliconix	DG5044	
HI5045	Intersil	DG185	
		IH5045	
	Siliconix	DG185	
		DG5045	
	TI	TL185	
HI5046	Intersil	IH5046	
HI5047	Intersil	IH5047	
HI5048	**Harris**	**HI381**	**2635,3288**
	Intersil	DG181	
		IH5048	
	Siliconix	DG181	
		DG381	
HI5049	**Harris**	**HI384**	**2635,3288**
	Intersil	DG184	
		IH5049	
	Siliconix	DG184	
		DG384	
HI5050	Harris	HI-5050	
		HI387	**2635,3288**
	Intersil	DG187	
		IH5050	
	Siliconix	DG187	
		DG387	
HI506	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
		MX-1606	**2622**
	Fairchild	F4067	
	Harris	HI1840	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	
	Motorola	MC14067	
	PMI	MUX-16	
	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
HI506A	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
		MX-1606	**2622**
	Fairchild	F4067	
	Harris	HI1840	
		HI506	
	Intersil	IH6116	
	MicroPwr	MP7506	
	Motorola	MC14067	
	PMI	MUX-16	
HI506A	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
HI507	AD	AD7507	
	Burr-Brown	MPC8D	
	Datel	**MVD-807**	**2622**
		MXD-807	**2622**
	Harris	HI507A	
	Intersil	IH6216	
	MicroPwr	MP7507	
	PMI	MUX-28	
	Siliconix	DG507	
		DG507A	**2802**
	TeledyneP	4551	
HI507A	AD	AD7507	
	Burr-Brown	MPC8D	
	Datel	**MVD-807**	**2622**
		MXD-807	**2622**
	Harris	HI507	
	Intersil	IH6216	
	MicroPwr	MP7507	
	PMI	MUX-28	
	Siliconix	DG507	
		DG507A	**2802**
	TeledyneP	4551	
HI508	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
HI508A	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
HI509	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**
	TeledyneP	4553	
HI509A	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
	Intersil	IH6208	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Harris Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HI509A	MicroPwr	MP7509	
	Motorola	MC14052	
	National	LF11509	3318
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	2804
	TeledyneP	4553	
HI562	AMD	AM6012	
	AD	AD562	
	Burr-Brown	DAC862	
	Datel	DAC-562	
		DAC-681	
		DAC-681C	
	Harris	HI562-5	
	MicroPwr	MP562	401,2749
	MicroEng	MCE-6012	
	Motorola	AD562	2759
	PMI	DAC12	
	Signetics	AM6012	3383
		DAC-312	
	TeledyneP	4068	
HI562-2	Datel	DAC-681M	
HI562-5	AMD	AM6012	
	AD	AD562	
	Burr-Brown	DAC862	
	Datel	DAC-562	
		DAC-681	
		DAC-681C	
	Harris	HI562	
	MicroPwr	MP562	401,2749
	MicroEng	MCE-6012	
	Motorola	AD562	2759
	PMI	DAC12	
	Signetics	AM6012	3383
		DAC-312	
	TeledyneP	4068	
HM6100	Intersil	IM6100	
HM6116	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	3676
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	MSM2128	3873
		MSM5128	3873
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
HM6322	Intersil	IM6312	
HM6402	AMI	S1602	
	Fairchild	3730	
		F6350	1230
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Hitachi	HD6850	1345
		HD6850A50	1345
	Motorola	MC6350	1351
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
HM6503	National	NMC6503	
◇HM6504-9	MicroPwr	MP6504	
HM6508	AMI	S6508	
	Fairchild	4736B	
	Intel	2125A	
	Motorola	MCM2125	
	National	MM74C929	
		NMC6508	
	NEC-Micro	μPD443	
	SSS	SCM21C02	
HM6508	Toshiba	TC5508	
HM6514	Fujitsu	MB8414	
	Hitachi	HM4334	3789
	Intersil	IM6514	
	MicroPwr	MP6514	
	Mitsubishi	M58981	
	National	NMC6514	
	NEC-Micro	μPD444/6514	
		μPD6514	
	OKI	MSM5115	3873
	RCA	MWS5114	
		MWS5514	
	Toshiba	TC5514	
HM6518	Harris	6518	
	Intersil	IM6518-1	
	National	MM74C930	
HM6551	Intersil	IM6551	
	National	MM74C920	
		NMC6551	
	NEC-Micro	μPD5101	
	RCA	MWS5101	
HM6561	Intersil	IM6561	
HM6758	TI	TMS2508	
		TMS2758	
HM7602	AMD	AM27S18	
	MMI	5330-1	
		6330-1	3826
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
HM7603	AMD	AM27LS19	
		AM27S19	
	MMI	5331-1	
		53LS081	
		6331-1	3826
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	TBP18S030	
			440,3965
		TBP18S030M	
			440,3965
HM7608	Raytheon	29635	
	Signetics	N82S2708	
		S82S2708	
	TI	TBP28S2708	3980
HM7610	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610-2	3696
	Intel	M3601	
	MMI	5300-1	
		6300-1	3826
	National	DM54S387	
		DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
	TI	TBP24SA10	
			440,3967
		TBP24SA10M	
			440,3967
HM7610-2	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
	Intel	M3601	
	MMI	5300-1	
		6300-1	3826
	National	DM54S387	
		DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
HM7610-2	TI	TBP24SA10	
			440,3967
		TBP24SA10M	
			440,3967
HM7611	AMD	AM27S11	
		AM27S21	
	Harris	HM7611-2	3696
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	3826
	National	DM54S287	
		DM74S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
	TI	TBP24S10	
			440,3967
HM7611-2	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	3826
	National	DM54S287	
		DM74S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
	TI	TBP24S10	
			440,3967
HM76160	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	MMI	631681	
	National	DM77S190	
		DM87S190	
	Raytheon	29680	
		29683	
	Signetics	82S190	
		N82S190	
		S82S190	
	Supertex	MM82S190	
HM76161	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	TBP28S166	
			440,3979
HM76164	AMD	AM27S40	
HM76165	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM7643	
		HM7643-2	3705
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
HM76165	MMI	5353	
		53S1641	3836
		6353-1	3826
		63S1641	
			3826,3836
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	TBP24S41	
			440,3968
		TBP24S41M	
			440,3968
		TBP28S41	
		TBP28S41M	
HM7620	AMD	AM27S12	
	Fairchild	93436	
	Intel	M3602	
	MMI	5305	
		6305	
	National	DM54S570	
		DM74S570	
	Raytheon	29610	
	Signetics	N82S130	
		S82S130	
HM7621	AMD	AM27S13	
	Fairchild	93446	
	Intel	M3622	
	MMI	5306	
		6306	
	National	DM54S571	
		DM74S571	
	Raytheon	29611	
	Signetics	N82S131	
		S82S131	
HM7640	AMD	AM27S30	
	Fairchild	93438	
	Intel	M3604	
	MMI	5340-1	
		6340-1	3826
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	TBP28SA46	440
HM7641	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Intel	M3624	
	MMI	5341-1	
		6341-1	3826
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	TBP28S46	
			440,3976
		TBP28S46M	
			440,3976
HM7642	AMD	AM27S32	
	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642-2	3705
	Intel	M3605	
	MMI	5352-1	
		6352	
	National	DM54S572	
		DM74S572	
	Raytheon	29640	
	Signetics	N82S136	
		S82S136	

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Harris Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HM7642	TI	**TBP24SA41**	**440,3968**
		TBP24SA41M	**440,3968**
HM7642-2	AMD	AM27S32	
	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642	
	Intel	M3605	
	MMI	5352-1	
		6352	
	National	DM54S572	
		DM74S572	
	Raytheon	29640	
	Signetics	N82S136	
		S82S136	
	TI	**TBP24SA41**	**440,3968**
		TBP24SA41M	**440,3968**
HM7643	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
HM7643-2	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
HM7643-2	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
HM7643A	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
HM7647R	AMD	AM27S15	
	Signetics	N82S115	
		S82S115	
HM7648	AMD	AM27S28	
	Fujitsu	MB7123	
		MB7124	
		MC7124	
	MMI	5348	
		6348	
	National	DM54S473	
		DM74S473	
	Raytheon	29620	
	Signetics	N82S146	
		S82S146	
	TI	**TBP28SA42**	**440,3976**
HM7649	AMD	AM27S29	
	Fujitsu	MB7124	
		MBM7124	
	MMI	5349-1	
		6349-1	**3826**
	Motorola	MCM7649	
	National	DM54S472	
		DM74S472	
	Raytheon	29621	
	Signetics	N82S147	
		S82S147	
	TI	DM54S472	
		TBP28S42	**440,3975**
		TBP28S42M	**440,3975**
HM7680	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
HM7680	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
HM7681	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	**HM7681-2**	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
HM7681-2	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
HM7684	AMD	AM27S184	
	Fujitsu	MB7127	
	MMI	53100	
		63100	
	Motorola	MCM7684	
	National	DM77S184	
		DM87S184	
	Raytheon	29650	
	Signetics	N82S184	
	TI	**TBP24SA81**	**440,3969**
HM7685	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	**HM7685-2**	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
HM7685	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	**440,3968**
		TBP24S81M	**440,3968**
HM7685-2	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	**440,3968**
		TBP24S81M	**440,3968**
HM7686	Motorola	MCM7686	
	National	DM87S186	
HM7687	Motorola	MCM7687	
	National	DM87S187	

Hitachi America, Ltd.

Manufacturer Device	Replacement Source	Device	IC Master Page
472114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
HA1110	RCA	CA3001	
	SiliconG	SG3001	
HA1127	Fairchild	μA3045	
	National	LM3045	
	Plessey	SL3045	
	RCA	CA3045	
	SiliconG	SG3045	
HA1137	Hitachi	LA1230	
	Motorola	MC1389	
	National	CA3089	
		LM3089	**3325,3327**
	RCA	CA3089	
	Sanyo	LA1230	
		LA3089	
	SGS	TCA3089	
		TDA1200	
	Signetics	CA3089	
	Siliconix	CA3089	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Hitachi America, Ltd. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HA1137	TI	SN76689	
HA1148	RCA	CA3217	
HA1156	Exar	XR1310	
	National	**LM1310**	**3325,3328**
	RCA	CA1310	
	Sanyo	LA3350	
	Sprague	ULN-2211	
		ULN-3810	
	TI	SN76115	
	Toshiba	TA7157	
HA1197	Sanyo	LA1240	
HA1199	Sprague	ULN-2249	
HA12402	Motorola	MC14094	
	RCA	CD4094	
	Sprague	ULN-2204	
	Telefunken	TDA1083	
	Toshiba	TA7613	
HA1303	Fairchild	μA709	
	Motorola	MC1709	
	National	LM1709	
		LM709	
	NEC-Electron	μPC255	
		μPC55	
	Raytheon	RC709	
		RM709	
	RCA	CA3038	
	TI	μA709	
	Thomson-CSF	SFC2709	
	Toshiba	TA7502	
HA1364	Fairchild	TDA1194	
	RCA	CA1190	
	SGS	TDA1190	
		TDA1190Z	
		TDA3190	
	Sprague	ULN-2290	
HA17301	Motorola	LM2900	
		MC3301	
	National	LM2900	
		LM3301	
	Raytheon	LM2900	
		RC3301	
	TI	LM2900	
HA17458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
HA17555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
HA17723	Fairchild	μA723	
	Intersil	LM723	
	Motorola	**MC1723**	**3295**
	National	LM723	
	Raytheon	RC723	
		RM723	
	RCA	CA723	
		LM723	
	SGS	L123	
	Signetics	μA723	
	SiliconG	SG723	
	TI	μA723	
	Thomson-CSF	SFC2723	
HA17733	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Intersil	μA733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		μA733	
	SiliconG	SG733	
	TI	μA733	
HA17741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
HA17747	AMD	747	
	Fairchild	μA747	
	Motorola	MC1747	
	National	LM747	
	NEC-Electron	μPC251	
	PMI	OP-04	
		PM747	
	Raytheon	RC747	
		RM747	
	RCA	CA747	
	Signetics	μA747	
	SiliconG	SG747	
	TeledyneS	747	
	TI	μA747	
HA17901	AMD	LM339	
		LM339A	
HA17901	Fairchild	μA339	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
		LM339	
	SiliconG	SG339	
	TI	LM339	
HA17902	Fairchild	μA2902	
	Motorola	LM2902	
	National	LM2902	
	NEC-Electron	μPC2902	
	Raytheon	LM2902	
	TI	LM2902	
HA1902	Fairchild	75S24	
	Motorola	MC7524	
	National	75S24	
	Signetics	SN7524	
	SiliconG	SG7524	
	TI	SN75224	
		SN7524	
HD10101	Fairchild	F10101	
	Motorola	MC10101	
	Signetics	10101	
HD10102	Fairchild	F10102	
	Motorola	MC10102	
	Signetics	10102	
HD10104	Fairchild	F10104	
	Motorola	MC10104	
	Signetics	10104	
HD10105	Fairchild	F10105	
	Motorola	MC10105	
	Signetics	10105	
HD10106	Fairchild	F10106	
	Motorola	MC10106	
	Signetics	10106	
HD10107	Fairchild	F10107	
	Motorola	MC10107	
	Signetics	10107	
HD10109	Fairchild	F10109	
	Motorola	MC10109	
	Signetics	10109	
HD10110	Fairchild	F10110	
	Motorola	MC10110	
	Signetics	10110	
HD10111	Fairchild	F10111	
	Motorola	MC10111	
	Signetics	10111	
HD10116	Fairchild	F10116	
	Motorola	MC10116	
	National	DM10116	
	Signetics	10116	
HD10117	Fairchild	F10117	
	Motorola	MC10117	
	Signetics	10117	
HD10118	Fairchild	F10118	
	Motorola	MC10118	
	Signetics	10118	
HD10119	Fairchild	F10119	
	Motorola	MC10119	
	Signetics	10119	
HD10121	Fairchild	F10121	
	Motorola	MC10121	
	Signetics	10121	
HD10124	Fairchild	F10124	
	Motorola	MC10124	
	Signetics	10124	
HD10125	Fairchild	F10125	
	Motorola	MC10125	
	Signetics	10125	
HD10130	Fairchild	F10130	
	Motorola	MC10130	
	Signetics	1010130	
		10130	
HD10131	Fairchild	F10131	
	Motorola	MC10131	
	Signetics	10131	
HD10132	Fairchild	F10132	
	Motorola	MC10132	
	Signetics	10132	
HD10133	Fairchild	F10133	
	Motorola	MC10133	
	Signetics	10133	
HD10134	Fairchild	F10134	
	Motorola	MC10134	
	Signetics	10134	
HD10136	Fairchild	F10136	
	Motorola	MC10136	
	Signetics	10136	
HD10148	**Motorola**	**MCM10148**	**3839**
	NEC-Electron	μPB10148	
	Signetics	10148	
	TI	SN10148	
HD10160	Fairchild	F10160	
	Motorola	MC10160	
	Signetics	10160	
HD10161	Fairchild	F10161	
	Motorola	MC10161	
	NEC-Electron	μPB10161	
	Signetics	10161	
HD10162	Fairchild	F10162	
	Motorola	MC10162	
	Signetics	10162	
HD10164	Fairchild	F10164	
	Motorola	MC10164	
	Signetics	10164	
	TI	SN10164	
HD10165	Fairchild	F10165	
	Motorola	MC10165	
	Signetics	10165	
HD10174	Fairchild	F10174	
	Motorola	MC10174	
	Signetics	10174	
	TI	SN10174	
HD10175	Fairchild	F10175	
	Motorola	MC10175	
	Signetics	10175	
	TI	SN10175	
HD10179	Fairchild	F10179	
	Motorola	MC10179	
	Signetics	10179	
HD10180	Fairchild	F10180	
	Motorola	MC10180	
	Signetics	10180	
HD10181	Fairchild	F10181	
	Motorola	MC10181	
	Signetics	10181	
HD103461	Motorola	MC3461	
HD14001	Fairchild	F4001	
	Motorola	MC14001	
	National	CD4001	
		MM74C02	
	OKI	MSM4001	
	RCA	CD4001	
	Sanyo	LC4001B	
	SGS	HCF4001	
	Signetics	HEF4001	
	SSS	SCL4001	
	Solitron	CM4001	
	Toshiba	TC4001	
HD14002	Fairchild	F4002	
	Motorola	MC14002	
	National	CD4002	
	RCA	CD4002	
	SGS	HCF4002	
	Signetics	HEF4002	
	SSS	SCL4002	
	Solitron	CM4002	
	TI	TP4002	
	Toshiba	TC4002	
HD14006	Fairchild	F4006	
	Motorola	MC14006	
	National	CD4006	
	RCA	CD4006	
	SGS	HCF4006	
	SSS	SCL4006	
	Solitron	CM4006	
	Toshiba	TC4006	
HD14007	Fairchild	F4007	
	Motorola	MC14007	
	National	CD4007	
	RCA	CD4007	
	SGS	HCF4007	
	Signetics	HEF4007	
	SSS	SCL4007	
	Solitron	CM4007	
	Toshiba	TC4007	
HD14008	Fairchild	F4008	
	Motorola	MC14008	
	National	CD4008	
		MM74C83	
	RCA	CD4008	
	SGS	HCF4008	
	Signetics	HEF4008	
	SSS	SCL4008	
	Solitron	CM4008	
	Toshiba	TC4008	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Hitachi America, Ltd. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HD14009	National	CD4009	
	RCA	CD4009	
	SGS	HCF4009	
	SSS	SCL4009	
	Solitron	CM4009	
	Toshiba	TC4009	
HD14010	National	CD4010	
	RCA	CD4010	
	SGS	HCF4010	
	SSS	SCL4010	
	Solitron	CM4010	
	Toshiba	TC4010	
HD14011	Fairchild	F4011	
	Motorola	MC14011	
	National	CD4011	
		MM74C00	
	OKI	MSM4011	
	RCA	CD4011	
	Sanyo	LC4011	
	SGS	HCF4011	
	Signetics	HEF4011	
	SSS	SCL4011	
	Solitron	CM4011	
	Toshiba	TC4011	
HD14012	Fairchild	F4012	
	Motorola	MC14012	
	National	CD4012	
	RCA	CD4012	
	SGS	HCF4012	
	Signetics	HEF4012	
	SSS	SCL4012	
	Solitron	CM4012	
	Toshiba	TC4012	
HD14013	Fairchild	F4013	
	Motorola	MC14013	
	National	CD4013	
		MM74C74	
	OKI	MSM4013	
	RCA	CD4013	
	Sanyo	LC4013	
	SGS	HCF4013	
	Signetics	HEF4013	
	SSS	SCL4013	
	Solitron	CM4013	
	Toshiba	TC4013	
HD14014	Fairchild	F4014	
	Motorola	MC14014	
	National	CD4014	
	RCA	CD4014	
	SGS	HCF4014	
	Signetics	HEF4014	
	SSS	SCL4014	
	Solitron	CM4014	
	Toshiba	TC4014	
HD14015	Fairchild	F4015	
	Motorola	MC14015	
	National	CD4015	
		MM74C164	
	OKI	MSM4015	
	RCA	CD4015	
	Sanyo	LC4015	
	SGS	HCF4015	
	Signetics	HEF4015	
	SSS	SCL4015	
	Solitron	CM4015	
	Toshiba	TC4015	
HD14016	Fairchild	F4016	
		F4066	
	Hitachi	HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
HD14017	Fairchild	F4017	
	Motorola	MC14017	
	National	CD4017	
	RCA	CD4017	
	SGS	HCF4017	
	Signetics	HEF4017	
	SSS	SCL4017	
	Solitron	CM4017	
	Toshiba	TC4017	
HD14018	Fairchild	F4018	
	Motorola	MC14018	
	National	CD4018	
	RCA	CD4018	
	SGS	HCF4018	
	Signetics	HEF4018	
	SSS	SCL4018	
	Solitron	CM4018	
	Toshiba	TC4018	
HD14020	Fairchild	F4020	
	Motorola	MC14020	
	National	CD4020	
	RCA	CD4020	
	SGS	HCF4020	
	Signetics	HEF4020	
	SSS	SCL4020	
	Solitron	CM4020	
	Toshiba	TC4020	
HD14021	Fairchild	F4021	
	Motorola	MC14021	
	National	CD4021	
	RCA	CD4021	
	SGS	HCF4021	
	Signetics	HEF4021	
	SSS	SCL4021	
	Solitron	CM4021	
	Toshiba	TC4021	
HD14022	Fairchild	F4022	
	Motorola	MC14022	
	National	CD4022	
	RCA	CD4022	
	SGS	HCF4022	
	Signetics	HEF4022	
	SSS	SCL4022	
	Solitron	CM4022	
	Toshiba	TC4022	
HD14023	Fairchild	F4023	
	Motorola	MC14023	
	National	CD4023	
		MM74C10	
	RCA	CD4023	
	SGS	HCF4023	
	Signetics	HEF4023	
	SSS	SCL4023	
	Solitron	CM4023	
	Toshiba	TC4023	
HD14024	Fairchild	F4024	
	Motorola	MC14024	
	National	CD4024	
	RCA	CD4024	
	SGS	HCF4024	
	Signetics	HEF4024	
	SSS	SCL4024	
	Solitron	CM4024	
	Toshiba	TC4024	
HD14025	Fairchild	F4025	
	Motorola	MC14025	
	National	CD4025	
	RCA	CD4025	
	SGS	HCF4025	
	Signetics	HEF4025	
	SSS	SCL4025	
	Solitron	CM4025	
	Toshiba	TC4025	
HD14027	Fairchild	F4027	
	Motorola	MC14027	
	National	CD4027	
		MM74C76	
	OKI	MSM4027	
	RCA	CD4027	
	Sanyo	LC4027	
	SGS	HCF4027	
	Signetics	HEF4027	
	SSS	SCL4027	
	Solitron	CM4027	
HD14028	Fairchild	F4028	
	Motorola	MC14028	
	National	CD4028	
		MM74C42	
	OKI	MSM4028	
	Sanyo	LC4028	
	SGS	HCF4028	
	Signetics	HEF4028	
HD14028	SSS	SCL4028	
	Solitron	CM4028	
	Toshiba	TC4028	
HD14032	Motorola	MC14032	
	RCA	CD4032	
	SGS	HCF4032	
	Solitron	CM4032	
	Toshiba	TC4032	
HD14034	Fairchild	F4034	
	Motorola	MC14034	
	National	CD4034	
	RCA	CD4034	
	SGS	HCF4034	
	SSS	SCL4034	
	Solitron	CM4034	
	Toshiba	TC4034	
HD14035	Fairchild	F4035	
	Motorola	MC14035	
	National	CD4035	
	RCA	CD4035	
	SGS	HCF4035	
	Signetics	HEF4035	
	SSS	SCL4035	
	Solitron	CM4035	
	Toshiba	TC4035	
HD14038	Motorola	MC14038	
	RCA	CD4038	
	SGS	HCF4038	
	Solitron	CM4038	
	Toshiba	TC4038	
HD14040	Fairchild	F4040	
	Motorola	MC14040	
	National	CD4040	
	RCA	CD4040	
	SGS	HCF4040	
	Signetics	HEF4040	
	SSS	SCL4040	
	Solitron	CM4040	
	Toshiba	TC4040	
HD14042	Fairchild	F4041	
		F4042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
HD14043	Motorola	MC14043	
	National	CD4043	
	RCA	CD4043	
	SGS	HCF4043	
	Signetics	HEF4043	
	SSS	SCL4043	
	Solitron	CM4043	
	Toshiba	TC4043	
HD14044	Fairchild	F4044	
	Motorola	MC14044	
	National	CD4044	
	RCA	CD4044	
	SGS	HCF4044	
	Signetics	HEF4044	
	SSS	SCL4044	
	Solitron	CM4044	
	Toshiba	TC4044	
HD14046	Fairchild	F4046	
	Motorola	MC14046	
	National	CD4046	
	RCA	CD4046	
	SGS	HCF4046	
	SSS	SCL4046	
	Solitron	CM4046	
HD14049	Fairchild	F4049	
	Motorola	MC14049	
	National	CD4049	
	OKI	MSM4049	
	RCA	CD4009	
		CD4049	
	Sanyo	LC4049	
	SGS	HCF4049	
	Signetics	HEF4049	
	SSS	SCL4049	
	Solitron	CM4049	
	Toshiba	TC4049	
HD14050	Fairchild	F4050	
	Motorola	MC14050	
	National	CD4050	
	RCA	CD4010	
		CD4050	
	SGS	HCF4050	
	Signetics	HEF4050	
	SSS	SCL4050	
	Solitron	CM4050	
	Toshiba	TC4050	
HD14051	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
HD14052	Fairchild	F4052	
	Motorola	MC14052	
	National	CD4052	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	SSS	SCL4052	
	Solitron	CM4052	
	Toshiba	TC4052	
HD14053	Fairchild	F4053	
	Motorola	MC14053	
	National	CD4053	
	RCA	CD4053	
	SGS	HCF4052	
	Signetics	HEF4053	
HD14066	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
HD14068	Fairchild	F4068	
	Motorola	MC14068	
	RCA	CD4068	
	SGS	HCF4068	
	Signetics	HEF4068	
	SSS	SCL4068	
		SCL4412	
	Solitron	CM4068	
	TI	UCN4810	
	Toshiba	TC4068	
HD14069	Fairchild	F4069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
		MM74C04	
	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	

◇ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Hitachi America, Ltd. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HD14069	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
HD14070	Fairchild	F4070	
	Motorola	MC14070	
	National	CD4070	
		MM74C86	
	RCA	CD4070	
	SGS	HCF4070	
	Signetics	HEF4070	
	SSS	SCL4070	
	Solitron	CM4070	
HD14071	Fairchild	F4071	
	Motorola	MC14071	
	National	CD4071	
		MM74C32	
	OKI	MSM4071	
	RCA	CD4071	
	Sanyo	LC4071	
	SGS	HCF4071	
	Signetics	HEF4071	
	SSS	SCL4071	
	Solitron	CM4071	
	Toshiba	TC4071	
HD14072	Fairchild	F4072	
	Motorola	MC14072	
	National	CD4072	
	RCA	CD4072	
	SGS	HCF4072	
	Signetics	HEF4072	
	SSS	SCL4072	
	Toshiba	TC4072	
HD14073	Fairchild	F4073	
	Motorola	MC14073	
	National	CD4073	
	RCA	CD4073	
	SGS	HCF4073	
	Signetics	HEF4073	
	SSS	SCL4073	
	Solitron	CM4073	
	Toshiba	TC4073	
HD14075	Fairchild	F4075	
	Motorola	MC14075	
	National	CD4075	
	RCA	CD4075	
	SGS	HCF4075	
	Signetics	HEF4075	
	SSS	SCL4075	
	Solitron	CM4075	
	Toshiba	TC4075	
HD14076	Fairchild	F4076	
	Motorola	MC14076	
	National	CD4076	
		MM54C173	
		MM74C173	
	RCA	CD4076	
	SGS	HCF4076	
	Signetics	HEF4076	
	SSS	SCL4076	
	Solitron	CM4076	
	Toshiba	TC4076	
HD14077	Fairchild	F4077	
	Motorola	MC14077	
	National	CD4077	
	RCA	CD4077	
	SGS	HCF4077	
	Signetics	HEF4077	
	SSS	SCL4077	
	Solitron	CM4077	
HD14078	Fairchild	F4078	
	Motorola	MC14078	
	RCA	CD4078	
	SGS	HCF4078	
	Signetics	HEF4078	
	SSS	SCL4078	
	Solitron	CM4078	
	Toshiba	TC4078	
HD14081	Fairchild	F4081	
	Motorola	MC14081	
	National	CD4081	
		MM74C08	
	OKI	MSM4081	
	RCA	CD4081	
	Sanyo	LC4081	
	SGS	HCF4081	
	Signetics	HEF4081	
	SSS	SCL4081	
HD14081	Solitron	CM4081	
	Toshiba	TC4081	
HD14082	Fairchild	F4082	
	Motorola	MC14082	
	National	CD4082	
	RCA	CD4082	
	SGS	HCF4082	
	Signetics	HEF4082	
	SSS	SCL4082	
	Toshiba	TC4082	
HD14093	Fairchild	F4093	
	Motorola	MC14093	
	National	CD4093	
	OKI	MSM4093	
	RCA	CD4093	
	Sanyo	LC4093	
	SGS	HCF4093	
	Signetics	HEF4093	
	SSS	SCL4093	
	Toshiba	TC4093	
HD14094	Motorola	MC14094	
	RCA	CD4094	
	SGS	HCF4094	
	Signetics	HEF4094	
	SSS	SCL4094	
	Toshiba	TC4094	
HD14099	Motorola	MC14099	
	National	CD4099	
	RCA	CD4099	
	SGS	HCF4099	
	SSS	SCL4099	
	Toshiba	TC4099	
HD14160	Fairchild	F40160	
	Motorola	MC14160	
	National	CD40160	
		MM54C160	
		MM74C160	
	RCA	CD40160	
	SGS	HCF40160	
	Signetics	HEF4060	
	SSS	SCL4160	
	Toshiba	TC40160	
HD14161	Fairchild	F40161	
	Motorola	MC14161	
	National	CD40161	
		MM54C161	
		MM74C161	
	RCA	CD40161	
	SGS	HCF40161	
	Signetics	HEF40161	
	SSS	SCL4161	
	Toshiba	TC40161	
HD14162	Fairchild	F40162	
	Motorola	MC14162	
	National	CD40162	
		MM54C162	
		MM74C162	
	RCA	CD40162	
	SGS	HCF40162	
	Signetics	HEF40162	
	SSS	SCL4162	
	Toshiba	TC40162	
HD14163	Fairchild	F40163	
	Motorola	MC14163	
	National	CD40163	
		MM54C163	
		MM74C163	
	RCA	CD40163	
	SGS	HCF40163	
	Signetics	HEF40163	
	SSS	SCL4163	
	Toshiba	TC40163	
HD14174	Fairchild	F40174	
	Motorola	MC14174	
	National	CD40174	
		MM54C174	
		MM74C174	
	RCA	CD40174	
	SGS	HCF40174	
	Signetics	HEF40174	
	SSS	SCL4174	
	Toshiba	TC40174	
HD14175	Fairchild	F40175	
	Motorola	MC14175	
	National	CD40175	
		MM54C175	
		MM74C175	
	Signetics	HEF40175	
	Toshiba	TC40175	
HD14194	Fairchild	F40194	
	Motorola	MC14194	
HD14194	RCA	CD40194	
	SGS	HCF40194	
	Signetics	HEF40194	
HD14502	Motorola	MC14502	
	RCA	CD4502	
	SGS	HCF4502	
	Signetics	HEF4502	
	SSS	SCL4502	
HD14503	Fairchild	F40097	
	Motorola	MC14503	
	National	CD4503	
		MM80C97	
	RCA	CD4503	
	Signetics	HEF40097	
HD14508	Hitachi	HD74147	
	Motorola	MC14508	
	National	DM74147	
	RCA	CD4508	
	SGS	HCF4508	
	Signetics	74147	
		HEF4508	
		N82147	
	SSS	SCL4508	
	Solitron	CM4508	
	TI	SN74147	882
	Toshiba	TC4508	
HD14510	Fairchild	F4510	
	Motorola	MC14510	
	National	CD4510	
	RCA	CD4510	
	SGS	HCF4510	
	Signetics	HEF4510	
	SSS	SCL4510	
	Solitron	CM4510	
	Toshiba	TC4510	
HD14511	Fairchild	F4511	
	Mitel	MD4511	
	MMI	4511	
	Motorola	MC14511	
	National	CD4511	
	NEC-Micro	μPD4511	
	RCA	CD4511	
	SGS	HCF4511	
	Signetics	HEF4511	
	SSS	SCL4511	
	Solitron	CM4511	
	Toshiba	TC4511	
HD14512	Fairchild	F4512	
	Motorola	MC14512	
	National	CD4512	
	RCA	CD4512	
	SGS	HCF4512	
	SSS	SCL4512	
	Toshiba	TC4512	
HD14514	Fairchild	F4514	
	Motorola	MC14514	
	National	CD4514	
	RCA	CD4514	
	SGS	HCF4514	
	Signetics	HEF4514	
	SSS	SCL4514	
	Solitron	CM4514	
	Toshiba	TC4514	
HD14515	Fairchild	F4515	
	Motorola	MC14515	
	National	CD4515	
	RCA	CD4515	
	SGS	HCF4515	
	Signetics	HEF4515	
	SSS	SCL4515	
	Solitron	CM4515	
	Toshiba	TC4515	
HD14516	Fairchild	F4516	
	Motorola	MC14516	
	National	CD4516	
	RCA	CD4516	
	SGS	HCF4516	
	Signetics	HEF4516	
	SSS	SCL4516	
	Solitron	CM4516	
	Toshiba	TC4516	
HD14517	Motorola	MC14517	
	RCA	CD4517	
	Signetics	HEF4517	
	SSS	SCL4517	
HD14518	Fairchild	F4518	
	Motorola	MC14518	
	National	CD4518	
	RCA	CD4518	
	SGS	HCF4518	
	Signetics	HEF4518	
	SSS	SCL4518	
HD14518	Solitron	CM4518	
	Toshiba	TC4518	
HD14519	Hitachi	HD4519	
	Motorola	MC14519	
	National	CD4519	
	RCA	CD4519	
	Signetics	HEF4519	
HD14520	Fairchild	F4520	
	Motorola	MC14520	
	National	CD4520	
	OKI	MSM4520	
	RCA	CD4520	
	Sanyo	LC4520	
	SGS	HCF4520	
	Signetics	HEF4520	
	SSS	SCL4520	
	Solitron	CM4520	
	Toshiba	TC4520	
HD14522	Fairchild	F4522	
	Motorola	MC14522	
	National	CD4522	
	RCA	CD4522	
	Signetics	HEF4522	
	SSS	SCL4522	
	Toshiba	TC4522	
HD14526	Fairchild	F4526	
	Motorola	MC14526	
	National	CD4526	
	Signetics	HEF4526	
	SSS	SCL4526	
	Toshiba	TC4526	
HD14527	Fairchild	F4527	
	Motorola	MC14527	
	National	CD4527	
	RCA	CD4527	
	SGS	HCF4527	
	Signetics	HEF4527	
	SSS	SCL4527	
	Toshiba	TC4527	
		TR4527	
HD14528	Fairchild	F4528	
	Motorola	MC14528	
	National	CD4528	
		MM74C221	
	RCA	CD4098	
	SGS	HCF4098	
	Signetics	HEF4528	
	SSS	SCL4528	
	Toshiba	TC4528	
HD14531	Fairchild	F4531	
	Motorola	MC14531	
	RCA	CD40101	
	SGS	HCF40101	
	Signetics	HEF4531	
	SSS	SCL4531	
	Toshiba	TC4531	
HD14532	Fairchild	F4532	
	Motorola	MC14532	
	RCA	CD4532	
	SGS	HCF4532	
	Signetics	HEF4532	
	SSS	SCL4532	
	Toshiba	TC4532	
HD14534	Motorola	MC14534	
	Signetics	HEF4534	
HD14539	Fairchild	F4539	
	Motorola	MC14539	
	Signetics	HEF4539	
	Toshiba	TC4539	
HD14543	Fairchild	F4543	
	Motorola	MC14543	
	National	CD4543	
	RCA	CD4055	
		CD4056	
		CD4543	
	Signetics	HEF4543	
	Toshiba	TC4543	
HD14553	Fairchild	F4553	
	Motorola	MC14533	
		MC14553	
HD14555	Fairchild	F4555	
	Motorola	MC14555	
	RCA	CD4555	
	SGS	HCF4555	
	Signetics	HEF4555	
	SSS	SCL4555	
	Toshiba	TC4555	
HD14557	Fairchild	F4557	
	Motorola	MC14557	
	Signetics	HEF4557	
HD14558	Motorola	MC14558	
	RCA	CD4055	

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Hitachi America, Ltd. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HD14560	Motorola	MC14560	
	Toshiba	TC4560	
HD14561	Motorola	MC14561	
	Toshiba	TC4561	
HD14566	Motorola	MC14566	
HD14568	Motorola	MC14568	
HD14569	Motorola	MC14569	
	RCA	CD4059	
	Signetics	HEF4059	
HD14572	Motorola	MC14572	
	Toshiba	TC4572	
HD14580	Motorola	MC14580	
	RCA	CD40108	
HD14581	Motorola	MC14581	
	RCA	CD40181	
		CD4057	
	SGS	HCF40181	
	SSS	SCL4581	
HD14582	Fairchild	F4582	
	Motorola	MC14582	
	RCA	CD40182	
	SGS	HCF40182	
	SSS	SCL4582	
HD14583	Fairchild	F4583	
	Motorola	MC14583	
	Toshiba	TC4583	
HD14584	Fairchild	F40014	
	Motorola	MC14584	
	National	CD40106	
		CD4584	
		MM54C14	
		MM74C14	
	RCA	CD40106	
	SGS	HCF40106	
	Signetics	HEF40106	
	SSS	SCL4584	
HD14585	Fairchild	F40085	
	Motorola	MC14585	
	National	MM74C85	
	RCA	CD4585	
	Signetics	HEF4585	
	SSS	SCL4585	
	Toshiba	TC4585	
HD14XXX	Fairchild	34XXX	
		F4XXX	
	Motorola	MC14XXX	
	National	CD4XXX	
	OKI	MSM4XXX	
	SGS	HCF4XXX	
	SSS	SCL4XXX	
	Solitron	CM4XXX	
	TI	TP4000 series	
	Toshiba	TC4XXX	
HD268T26	AMD	N8T26	
		N8T26A	
	Fairchild	μA8T26A	
	Motorola	MC6880A	
		MC8T26	
		MC8T26A	
	National	DS8T26A	
	Signetics	N8T26	
		N8T26A	
	TI	N8T26A	
HD4519	Hitachi	HD14519	
	Motorola	MC14519	
	National	CD4519	
	RCA	CD4519	
	Signetics	HEF4519	
HD46840	AMI	S6840	
	Fairchild	**F6840**	**1279**
	Hitachi	**HD6840**	**1345**
		HD68A40	**1345**
		HD68B40	**1345**
	Motorola	**MC6840**	**1351**
HD46846	AMI	S6846	
	Fairchild	**F6846**	**1280**
	Hitachi	HD6846P	
	Motorola	**MC6846**	**1351**
HD6800	Fairchild	F6800A	
	Hitachi	**HD68A00**	**1345**
		HD68B00	**1345**
	Motorola	**MC6800**	**1351**
HD68000	Mostek	MK68000	
	Motorola	MC68000	
	Rockwell	R68000	
	Signetics	**SCM68000**	**1524**
HD6801	AMI	S6801	
	Motorola	**MC6801**	**1351,1730**
HD6802	AMI	S6802	
HD6802	**Fairchild**	**F6802**	**1278**
	Motorola	**MC6802**	**1351**
HD6803	**Motorola**	**MC6803**	**1351**
HD6805	**AMI**	**S6805**	**1248**
	Motorola	MC6805	
HD6808	AMI	S6808	
	Fairchild	**F6808**	**1278**
	Motorola	**MC6808**	**1351**
HD6809	**AMI**	**S6809**	**1247**
	Hitachi	**HD68A09**	**1345**
		HD68B09	**1345**
	Motorola	**MC6809**	**1352**
HD6810	AMI	S6810	
	Fairchild	**F6810**	**1278**
	Hitachi	HD68A10	
	Motorola	MC6810	
		MCM6810	**1351,3839**
HD6821	AMI	S6821	
	Fairchild	**F6821**	**1279**
	Hitachi	**HD68A21**	**1345**
		HD68B21	**1345**
	Motorola	**MC6821**	**1351**
HD6840	AMI	S6840	
	Fairchild	**F6840**	**1279**
	Hitachi	HD46840	
		HD68A40	**1345**
		HD68B40	**1345**
	Motorola	**MC6840**	**1351**
HD6843	**Motorola**	**MC6843**	**1351**
HD6844	**Motorola**	**MC6844**	**1351**
HD6845	CSG	MPS6545	
	Hitachi	**HD68A45**	**1345**
		HD68B45	**1345**
	Motorola	**MC6845**	**1351**
	Rockwell	R6545	
	Synertek	SY6545	
HD68450	Motorola	MC68450	
HD6846P	AMI	S6846	
	Fairchild	**F6846**	**1280**
	Hitachi	HD46846	
	Motorola	**MC6846**	**1351**
HD6850	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD68A50**	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
HD6852	AMI	S6852	
	Fairchild	**F6852**	**1281**
	Hitachi	**HD68A52**	**1345**
	Motorola	**MC2652**	**1359**
		MC6852	**1351**
		MC68652	**1359**
	Signetics	SCN2652	
	SSS	SND5025	
	SMC	COM5025	
HD68A00	Fairchild	F6800A	
	Hitachi	**HD6800**	**1345**
		HD68B00	**1345**
	Motorola	**MC6800**	**1351**
HD68A09	**AMI**	**S6809**	**1247**
	Hitachi	**HD6809**	**1345**
		HD68B09	**1345**
	Motorola	**MC6809**	**1352**
HD68A10	AMI	S6810	
	Fairchild	**F6810**	**1278**
	Hitachi	HD6810	
	Motorola	MC6810	
		MCM6810	**1351,3839**
HD68A21	AMI	S6821	
	Fairchild	**F6821**	**1279**
	Hitachi	**HD6821**	**1345**
		HD68B21	**1345**
	Motorola	**MC6821**	**1351**
HD68A40	AMI	S6840	
HD68A40	**Fairchild**	**F6840**	**1279**
	Hitachi	HD46840	
		HD6840	**1345**
		HD68B40	**1345**
	Motorola	**MC6840**	**1351**
HD68A45	CSG	MPS6545	
	Hitachi	**HD6845**	**1345**
		HD68B45	**1345**
	Motorola	**MC6845**	**1351**
	Rockwell	R6545	
	Synertek	SY6545	
HD68A50	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
HD68A52	AMI	S6852	
	Fairchild	**F6852**	**1281**
	Hitachi	**HD6852**	**1345**
	Motorola	**MC2652**	**1359**
		MC6852	**1351**
		MC68652	**1359**
	Signetics	SCN2652	
	SSS	SND5025	
	SMC	COM5025	
HD68B00	Fairchild	F6800A	
	Hitachi	**HD6800**	**1345**
		HD68A00	**1345**
	Motorola	**MC6800**	**1351**
HD68B09	**AMI**	**S6809**	**1247**
	Hitachi	**HD6809**	**1345**
		HD68A09	**1345**
	Motorola	**MC6809**	**1352**
HD68B21	AMI	S6821	
	Fairchild	**F6821**	**1279**
	Hitachi	**HD6821**	**1345**
		HD68A21	**1345**
	Motorola	**MC6821**	**1351**
HD68B40	AMI	S6840	
	Fairchild	**F6840**	**1279**
	Hitachi	HD46840	
		HD6840	**1345**
		HD68A40	**1345**
	Motorola	**MC6840**	**1351**
HD68B45	CSG	MPS6545	
	Hitachi	**HD6845**	**1345**
		HD68A45	**1345**
	Motorola	**MC6845**	**1351**
	Rockwell	R6545	
	Synertek	SY6545	
HD7400	Fairchild	7400	
	National	DM7400	
	Signetics	7400	
	TI	**SN7400**	**833**
	Toshiba	TC7400	
HD7401	Fairchild	7401	
	National	DM7401	
	TI	**SN7401**	**833**
HD7402	Fairchild	7402	
	National	DM7402	
	Signetics	7402	
	TI	**SN7402**	**833**
HD7403	Fairchild	7403	
	National	DM7403	
	Signetics	7403	
	TI	**SN7403**	**834**
HD7404	Fairchild	7404	
	National	DM7404	
	Signetics	7404	
	TI	**SN7404**	**834**
	Toshiba	TC7404	
HD7405	Fairchild	7405	
	National	DM7405	
	Signetics	7405	
	TI	**SN7405**	**834**
HD7406	Fairchild	7406	
	National	DM7406	
	Signetics	7406	
	TI	**SN7406**	**835**
HD7407	Fairchild	7407	
	National	DM7407	
	Signetics	7407	
	TI	**SN7407**	**835**
HD7408	Fairchild	7408	
	National	DM7408	
	Signetics	7408	
	TI	**SN7408**	**835**
HD7409	Fairchild	7409	
	National	DM7409	
	TI	**SN7409**	**836**
HD7410	Fairchild	7410	
	National	DM7410	
	Signetics	7410	
	TI	**SN7410**	**836**
	Toshiba	TC7410	
HD74107	Fairchild	74107	
	National	DM74107	
	Signetics	74107	
	TI	**SN74107**	**869**
HD7411	Fairchild	7411	
	National	DM7411	
	Signetics	7411	
HD7412	Fairchild	7412	
	TI	SN7412	
HD74121	Fairchild	74121	
	National	DM74121	
	Signetics	74121	
	TI	**SN74121**	**873**
HD74125	Fairchild	74125	
	National	DM74125	
		DM8093	
	Signetics	74125	
	TI	**SN74125**	**875**
		SN74425	**946**
HD74126	Fairchild	74126	
	National	DM74126	
		DM8094	
	Signetics	74126	
	TI	**SN74126**	**875**
		SN74426	**946**
HD7413	Fairchild	7413	
	National	DM7413	
	Signetics	7413	
	TI	**SN7413**	**837**
HD74132	Fairchild	74132	
	National	DM74132	
	Signetics	74132	
	TI	**SN74132**	**877**
HD74136	Fairchild	74136	
	TI	**SN74136**	**878**
HD7414	Fairchild	7414	
	National	DM7414	
	Signetics	7414	
	TI	**SN7414**	**837**
HD74141	Fairchild	74141	
		93141	
	Hitachi	HD7441	
	National	DM74141	
		DM7441	
	Signetics	74141	
		7441	
	TI	**SN74141**	**881**
HD74145	Fairchild	74145	
	National	DM74145	
	Signetics	74145	
	TI	**SN74145**	**882**
HD74147	Hitachi	HD14508	
	Motorola	MC14508	
	National	DM74147	
	RCA	CD4508	
	SGS	HCF4508	
	Signetics	74147	
		HEF4508	
		N82147	
	SSS	SCL4508	
	Solitron	CM4508	
	TI	**SN74147**	**882**
	Toshiba	TC4508	
HD74148	Fairchild	9318	
	National	DM54148	
		DM74148	
		DM8318	
		DM9318	
	Signetics	54148	
		74148	
		N82148	
	TI	**SN54148**	**883**
		SN74148	**883**
HD74150	Fairchild	74150	
	National	DM74150	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Hitachi America, Ltd. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HD74150	Signetics	74150	
	TI	**SN74150**	**883**
HD74151	Fairchild	74151	
	National	DM74151	
	Signetics	74151	
	TI	SN74151	
		SN74151A	**884**
HD74153	Fairchild	74153	
	National	DM74153	
	Signetics	74153	
	TI	**SN74153**	**884**
HD74154	Fairchild	9311	
	National	DM54154	
		DM7213	
		DM74154	
		DM8311	
		DM9311	
	Raytheon	RC9311	
		RM9311	
	Signetics	54154	
		74154	
	TI	SN29311	
		SN39311	
		SN54154	**885**
		SN74154	**885**
HD74156	Fairchild	74156	
	National	DM74156	
	Signetics	74156	
	TI	**SN74156**	**886**
HD74157	Fairchild	74157	
		9322	
	National	DM74157	
		DM8322	
		DM9322	
	Raytheon	RC9322	
		RM9322	
	Signetics	74157	
	TI	SN29322	
		SN29602	
		SN39322	
		SN74157	**887**
HD7416	Fairchild	7416	
	National	DM7416	
	Signetics	7416	
	TI	**SN7416**	**838**
HD74160	Fairchild	74160	
	National	DM74160	
	Signetics	74160	
	TI	**SN74160**	**889**
HD74161	Fairchild	74161	
	National	DM74161	
	Signetics	74161	
	TI	**SN74161**	**889**
HD74162	Fairchild	74162	
	National	DM74162	
	TI	**SN74162**	**890**
HD74163	Fairchild	74163	
	National	DM74163	
	Signetics	74163	
	TI	**SN74163**	**890**
HD74164	AMD	74164	
	Fairchild	74164	
	National	DM74164	
		DM8570	
		DM8579	
	Signetics	74164	
	TI	**SN74164**	**891**
HD74166	Fairchild	74166	
	National	DM74166	
	Signetics	74166	
	TI	**SN74166**	**891**
HD7417	Fairchild	7417	
	National	DM7417	
	Signetics	7417	
	TI	**SN7417**	**838**
HD74170	Fairchild	74170	
	National	DM74170	
	Signetics	74170	
	TI	**SN74170**	**893**
HD74174	Fairchild	74174	
	National	DM74174	
	Signetics	74174	
	TI	**SN74174**	**895**
HD74175	Fairchild	74175	
	National	DM74175	
	Signetics	74175	
	TI	**SN74175**	**895**
HD74180	Fairchild	74180	
	National	DM74180	
HD74180	Signetics	74180	
	TI	**SN74180**	**897**
HD74181	Fairchild	54181	
		9341	
	National	DM54181	
		DM74181	
	Raytheon	RC9341	
		RM9341	
	Signetics	54181	
		74181	
	TI	**SN54181**	**897**
		SN74181	**897**
HD74182	Fairchild	54182	
		9342	
	National	DM54182	
		DM74182	
	Raytheon	RM9342	
	TI	**SN54182**	**898**
		SN74182	**898**
HD74190	Fairchild	74190	
	National	DM74190	
	Signetics	74190	
	TI	**SN74190**	**901**
HD74191	Fairchild	74191	
	National	DM74191	
	Signetics	74191	
	TI	**SN74191**	**901**
HD74194	Fairchild	74194	
	National	DM74194	
	Signetics	74194	
	TI	**SN74194**	**902**
HD74198	Fairchild	74198	
	National	DM74198	
	Signetics	74198	
	TI	**SN74198**	**904**
HD7420	Fairchild	7420	
		9004	
	National	DM7420	
		DM9004C	
	Signetics	7420	
	TI	**SN7420**	**839**
	Toshiba	TC7420	
HD7422	Fairchild	7422	
	TI	**SN7422**	**840**
HD7426	Fairchild	7426	
	National	DM7426	
		DM8810	
	Signetics	7426	
	TI	**SN7426**	**841**
HD7427	Fairchild	7427	
	National	DM7427	
	Signetics	7427	
	TI	**SN7427**	**842**
HD7430	Fairchild	7430	
	National	DM7430	
	Signetics	7430	
	TI	**SN7430**	**842**
HD7432	Fairchild	7432	
	National	DM7432	
	Signetics	7432	
	TI	**SN7432**	**843**
HD7437	Fairchild	7437	
	National	DM7437	
	Signetics	7437	
	TI	**SN7437**	**844**
HD7438	Fairchild	7438	
	National	DM7438	
	Signetics	7438	
	TI	**SN7438**	**844**
HD7440	Fairchild	7440	
	National	DM7440	
	Signetics	7440	
	TI	**SN7440**	**845**
HD7441	Fairchild	74141	
		93141	
	Hitachi	HD74141	
	National	DM74141	
		DM7441	
	Signetics	74141	
		7441	
	TI	**SN74141**	**881**
HD7442	Fairchild	7442	
	National	DM7442	
		DM8842	
	Signetics	7442	
	TI	SN7442	
		SN7442A	**845**
HD7443	TI	SN7443	
HD7444	TI	SN7444	
HD7445	Fairchild	7445	
	National	DM7445	
HD7445	Signetics	7445	
	TI	**SN7445**	**846**
HD7446	Fairchild	7446	
	National	DM7446	
	TI	SN7446	
		SN7446A	**847**
HD7447	Fairchild	7447	
	National	DM7447	
	TI	SN7447	
		SN7447A	**847**
HD7450	Fairchild	7450	
	National	DM7450	
	Signetics	7450	
	TI	**SN7450**	**848**
HD7451	Fairchild	7451	
	National	DM7451	
	Signetics	7451	
	TI	**SN7451**	**848**
HD7453	Fairchild	7453	
	National	DM7453	
	TI	**SN7453**	**849**
HD7454	Fairchild	7454	
	National	DM7454	
	TI	**SN7454**	**850**
HD7460	Fairchild	7460	
	National	DM7460	
	TI	**SN7460**	**852**
HD7470	Fairchild	7470	
	National	DM7470	
	TI	**SN7470**	**855**
HD7472	Fairchild	7472	
	National	DM7472	
	TI	**SN7472**	**856**
HD7473	Fairchild	7473	
	National	DM7473	
	Signetics	7473	
	TI	**SN7473**	**856**
HD7474	Fairchild	7474	
	National	DM7474	
	Signetics	7474	
	TI	**SN7474**	**857**
HD7475	Fairchild	7475	
	National	DM7475	
	Signetics	7475	
	TI	**SN7475**	**858**
HD7476	Fairchild	7476	
	National	DM7476	
	Signetics	7476	
	TI	**SN7476**	**858**
HD7482	National	DM7482	
	TI	**SN7482**	**860**
HD7483	Fairchild	7483	
	National	DM7483	
	Signetics	7483	
	TI	SN7483	
		SN7483A	**861**
HD7485	Fairchild	7485	
	National	DM7485	
	Signetics	7485	
	TI	**SN7485**	**862**
HD7486	Fairchild	7486	
	National	DM7486	
	Signetics	7486	
	TI	**SN7486**	**862**
HD7489	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
HD7489	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
HD7490	Fairchild	7490	
	National	DM7490	
	Signetics	7490	
	TI	SN7490	
		SN7490A	**864**
HD7491	Fairchild	7491	
	National	DM7491	
	Signetics	7491	
	TI	SN7491	
		SN7491A	**864**
HD7492	Fairchild	7492	
	National	DM7492	
	Signetics	7492	
	TI	SN7492	
		SN7492A	**864**
HD7493	Fairchild	7493	
	National	DM7493	
	Signetics	7493	
	TI	SN7493	
		SN7493A	**865**
HD7494	Fairchild	7494	
	Signetics	7494	
	TI	**SN7494**	**865**
HD7495	Fairchild	7495	
	National	DM7495	
	Signetics	7495	
	TI	SN7495	
		SN7495A	**866**
HD7496	Fairchild	7496	
	National	DM7496	
	Signetics	7496	
	TI	**SN7496**	**866**
HD74H183	Fairchild	74H183	
	TI	**SN74H183**	**898**
HD74LS00	Fairchild	74LS00	
	Motorola	SN74LS00	
	National	DM74LS00	
	Raytheon	74LS00	
	SGS	T74LS00	
	Signetics	74LS00	
	TI	**SN74LS00**	**833**
HD74LS01	Fairchild	HD74LS01	
	Motorola	SN74LS01	
	National	DM74LS01	
	Raytheon	74LS01	
	Signetics	74LS01	
	TI	**SN74LS01**	**833**
HD74LS02	Fairchild	74LS02	
	Motorola	SN74LS02	
	National	DM74LS02	
	Raytheon	74LS02	
	SGS	T74LS02	
	Signetics	74LS02	
	TI	**SN74LS02**	**833**
HD74LS03	Fairchild	74LS03	
	Motorola	SN74LS03	
	National	DM74LS03	
	Raytheon	74LS03	
	SGS	T74LS03	
	TI	**SN74LS03**	**834**
HD74LS04	Fairchild	74LS04	
	Motorola	SN74LS04	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Hitachi America, Ltd. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HD74LS04	National	DM74LS04	
	Raytheon	74LS04	
	SGS	T74LS04	
	Signetics	74LS04	
	TI	**SN74LS04**	**834**
HD74LS05	Fairchild	74LS05	
	Motorola	SN74LS05	
	National	DM74LS05	
	NEC-Electron	μPB74LS05	
	Raytheon	74LS05	
	SGS	T74LS05	
	Signetics	74LS05	
	TI	**SN74LS05**	**834**
HD74LS08	Fairchild	74LS08	
	Motorola	SN74LS08	
	National	DM74LS08	
	Raytheon	74LS08	
	SGS	T74LS08	
	Signetics	74LS08	
		SN74LS08	
	TI	**SN74LS08**	**835**
HD74LS09	Fairchild	74LS09	
	Motorola	SN74LS09	
	National	DM74LS09	
	Raytheon	74LS09	
	SGS	T74LS09	
	TI	**SN74LS09**	**836**
HD74LS10	Fairchild	74LS10	
	Motorola	SN74LS10	
	National	DM74LS10	
	Raytheon	74LS10	
	SGS	T74LS10	
	Signetics	74LS10	
	TI	**SN74LS10**	**836**
HD74LS107	Motorola	SN74LS107A	
	National	DM74LS107	
	Raytheon	74LS107	
	Signetics	74LS107	
	TI	**SN74LS107A**	**869**
HD74LS109	Fairchild	74LS109	
	Motorola	SN74LS109	
		SN74LS109A	
	National	DM74LS109	
	Raytheon	74LS109	
	Signetics	74LS109	
	TI	**SN74LS109A**	**870**
		SN74S109A	
HD74LS11	Fairchild	74LS11	
	Motorola	SN74LS11	
	National	DM74LS11	
	Raytheon	74LS11	
	SGS	T74LS11	
	Signetics	74LS11	
	TI	**SN74LS11**	**836**
HD74LS112	Fairchild	74LS112	
	Motorola	SN74LS112A	
	National	DM74LS112	
	Raytheon	74LS112	
	SGS	T74LS112	
	Signetics	74LS112	
	TI	**SN74LS112A**	**871**
HD74LS113	Fairchild	74LS113	
	Motorola	SN74LS113A	
	National	DM74LS113	
	Raytheon	74LS113	
	SGS	T74LS113	
	Signetics	74LS113	
	TI	**SN74LS113A**	**871**
HD74LS114	Fairchild	74LS114	
	Motorola	74LS114A	
		SN74LS114A	
	National	DM74LS114	
	Raytheon	74LS114	
	TI	SN74LS114A	
HD74LS12	Motorola	SN74LS12	
	National	DM74LS12	
	Raytheon	74LS12	
	Signetics	74LS12	
	TI	**SN74LS12**	**837**
HD74LS122	Motorola	SN74LS122	
	National	DM74LS122	
	Raytheon	74LS122	
	TI	**SN74LS122**	**873**
HD74LS123	Motorola	SN74LS123	
	National	DM74LS123	
	Raytheon	74LS123	
	TI	**SN74LS123**	**874**
HD74LS13	Fairchild	74LS13	
	Motorola	SN74LS13	
HD74LS13	National	DM74LS13	
	Raytheon	74LS13	
	Signetics	74LS13	
	TI	**SN74LS13**	**837**
HD74LS132	Fairchild	74LS132	
	Motorola	SN74LS132	
	National	DM74LS132	
	Raytheon	74LS132	
	SGS	T74LS132	
	Signetics	74LS132	
	TI	SN74LS132	
HD74LS136	Fairchild	74LS136	
	Motorola	SN74LS136	
	National	DM74LS136	
	Raytheon	74LS136	
	SGS	T74LS136	
	Signetics	74LS136	
	TI	**SN74LS136**	**878**
HD74LS138	Fairchild	74LS138	
	Motorola	SN74LS138	
	National	DM74LS138	
	Raytheon	74LS138	
	SGS	T74LS138	
	Signetics	74LS138	
	TI	**SN74LS138**	**880**
HD74LS139	Fairchild	74LS139	
	Motorola	SN74LS139	
	National	DM74LS139	
	Raytheon	74LS139	
	SGS	T74LS139	
	Signetics	74LS139	
	TI	**SN74LS139**	**660**
HD74LS14	Fairchild	74LS14	
	Motorola	SN74LS14	
	National	DM74LS14	
	Raytheon	74LS14	
	Signetics	74LS14	
	TI	**SN74LS14**	**837**
HD74LS148	Motorola	SN74LS148	
	TI	**SN74LS148**	**883**
HD74LS15	Fairchild	74LS15	
	Motorola	SN74LS15	
	National	DM74LS15	
	Raytheon	74LS15	
	SGS	T74LS15	
	TI	**SN74LS15**	**838**
HD74LS151	Fairchild	74LS151	
	Hitachi	HD74LS151A	
	Motorola	SN74LS151	
	National	DM74LS151	
	Raytheon	74LS151	
	SGS	T74LS151	
	Signetics	74LS151	
	TI	**SN74LS151**	**884**
HD74LS151A	Fairchild	74LS151	
	Hitachi	HD74LS151	
	Motorola	SN74LS151	
	National	DM74LS151	
	Raytheon	74LS151	
	SGS	T74LS151	
	Signetics	74LS151	
	TI	**SN74LS151**	**884**
HD74LS152	Raytheon	74LS152	
HD74LS153	Fairchild	74LS153	
	Motorola	SN74LS153	
	National	DM74LS153	
	Raytheon	74LS153	
	SGS	T74LS153	
	Signetics	74LS153	
	TI	**SN74LS153**	**884**
HD74LS155	Fairchild	74LS155	
	Motorola	SN74LS155	
	National	DM74LS155	
	Raytheon	74LS155	
	Signetics	74LS155	
	TI	**SN74LS155**	**886**
HD74LS156	Fairchild	74LS156	
	Motorola	SN74LS156	
	National	DM74LS156	
	Raytheon	74LS156	
	SGS	T74LS156	
	Signetics	74LS156	
	TI	**SN74LS156**	**886**
HD74LS157	Fairchild	74LS157	
	Motorola	SN74LS157	
	National	DM74LS157	
	Raytheon	74LS157	
	SGS	T74LS157	
	Signetics	74LS157	
	TI	**SN74LS157**	**887**
HD74LS158	Fairchild	74LS158	
	Motorola	SN74LS158	
HD74LS158	National	DM74LS158	
	Raytheon	74LS158	
	SGS	T74LS158	
	Signetics	74LS158	
	TI	**SN74LS158**	**887**
HD74LS160A	Fairchild	74LS160	
	Motorola	SN74LS160A	
	National	DM74LS160	
	Raytheon	74LS160	
	Signetics	74LS160	
		74LS160A	
	TI	**SN74LS160A**	**889**
HD74LS161A	AMD	SN74LS161	
	Fairchild	74LS161A	
	Motorola	SN74LS161A	
	National	DM74LS161	
	NEC-Electron	μPB74LS161	
	Raytheon	74LS161	
	Signetics	74LS161A	
	TI	**SN74LS161A**	**889**
HD74LS162A	Fairchild	74LS162	
	Motorola	SN74LS162A	
	National	DM74LS162	
	Raytheon	74LS162	
	SGS	T74LS162	
	Signetics	74LS162A	
	TI	SN74LS162A	
HD74LS163	Fairchild	74LS163	
	Hitachi	HD74LS163A	
	Motorola	SN74LS163A	
	National	DM74LS163	
	Raytheon	74LS163	
	SGS	T74LS163	
	Signetics	74LS163A	
	TI	**SN74LS163A**	**890**
HD74LS163A	Fairchild	74LS163	
	Hitachi	HD74LS163	
	Motorola	SN74LS163A	
	National	DM74LS163	
	Raytheon	74LS163	
	SGS	T74LS163	
	Signetics	74LS163A	
	TI	**SN74LS163A**	**890**
HD74LS164	Fairchild	74LS164	
	Motorola	SN74LS164A	
	National	DM74LS164	
	Raytheon	74LS164	
	SGS	T74LS164	
	Signetics	74LS164	
		74LS164A	
	TI	**SN74LS164**	**891**
HD74LS168	Fairchild	74LS168	
	Motorola	SN74LS168	
	National	DM74LS168	
	Signetics	74LS168A	
	TI	SN74LS168	
HD74LS169	Fairchild	74LS169	
	Motorola	SN74LS169	
	National	DM74LS169	
	Signetics	74LS169A	
HD74LS174	Fairchild	74LS174	
	Motorola	SN74LS174	
	National	DM74LS174	
	Raytheon	74LS174	
	SGS	T74LS174	
	Signetics	74LS174	
	TI	**SN74LS174**	**895**
HD74LS175	Fairchild	74LS175	
	Motorola	SN74LS175	
	Raytheon	74LS175	
	SGS	T74LS175	
	Signetics	74LS175	
	TI	**SN74LS175**	**895**
HD74LS181	Fairchild	74LS181	
	Motorola	SN74LS181	
	Raytheon	74LS181	
	SGS	T74LS181	
	Signetics	74LS181	
	TI	**SN74LS181**	**897**
HD74LS183A	Fairchild	74LS83A	
	Hitachi	HD74LS83A	
	Motorola	SN74LS83A	
	National	DM74LS83A	
	Raytheon	74LS83	
		74LS83A	
	Signetics	74LS83	
		74LS83A	
	TI	**SN74LS83A**	**861**
HD74LS190	Fairchild	74LS190	
	Motorola	SN74LS190	
	National	DM74LS190	
HD74LS190	Raytheon	74LS190	
	SGS	T74LS190	
	TI	**SN74LS190**	**901**
HD74LS191	Fairchild	74LS191	
	Motorola	SN74LS191	
	National	DM74LS191	
	Raytheon	74LS191	
	SGS	T74LS191	
	Signetics	74LS191	
	TI	**SN74LS191**	**901**
HD74LS192	Fairchild	74LS192	
	Motorola	SN74LS192	
	National	DM74LS192	
	Raytheon	74LS192	
	SGS	T74LS192	
	Signetics	74LS192	
	TI	**SN74LS192**	**902**
HD74LS193	Fairchild	74LS193	
	Motorola	SN74LS193	
	National	DM74LS193	
	Raytheon	74LS193	
	SGS	T74LS193	
	Signetics	74LS193	
	TI	**SN74LS193**	**902**
HD74LS194A	Fairchild	74LS194A	
	Motorola	SN74LS194A	
	National	DM74LS194	
	SGS	T74LS194A	
	Signetics	74LS194A	
	TI	**SN74LS194A**	**902**
HD74LS195A	Fairchild	74LS195A	
	Motorola	SN74LS195A	
	National	DM74LS195	
	Raytheon	74LS195A	
	SGS	T74LS195A	
	Signetics	74LS195A	
	TI	**SN74LS195A**	**903**
HD74LS196	Fairchild	74LS196	
	Motorola	SN74LS196	
	National	DM74LS196	
	Raytheon	74LS196	
	Signetics	N82S80	
	TI	**SN74LS196**	**903**
HD74LS197	Fairchild	74LS197	
	Motorola	SN74LS197	
	National	DM74LS197	
	Raytheon	74LS197	
	Signetics	74LS197	
	TI	**SN74LS197**	**904**
HD74LS20	Fairchild	74LS20	
	Motorola	SN74LS20	
	National	DM74LS20	
	Raytheon	74LS20	
	SGS	T74LS20	
	Signetics	74LS20	
	TI	**SN74LS20**	**839**
HD74LS21	Fairchild	74LS21	
	Motorola	SN74LS21	
	National	DM74LS21	
	Raytheon	74LS21	
	SGS	T74LS21	
	Signetics	74LS21	
	TI	**SN74LS21**	**840**
HD74LS22	Fairchild	74LS22	
	Motorola	SN74LS22	
	National	DM74LS22	
	Raytheon	74LS22	
	SGS	T74LS22	
	TI	**SN74LS22**	**840**
HD74LS221	Fairchild	74LS221	
	Motorola	SN74LS221	
	National	DM74LS221	
	Raytheon	74LS221	
	TI	**SN74LS221**	**905**
HD74LS240	AMD	SN74LS240	
	Fairchild	74LS240	
	MMI	74LS240	
	Motorola	SN74LS240	
	Raytheon	74LS240	
	Signetics	74LS240	
	TI	**SN74LS240**	**910**
HD74LS241	AMD	SN74LS241	
	Fairchild	74LS241	
	MMI	74LS241	
	Motorola	SN74LS241	
	Raytheon	74LS241	
	Signetics	74LS241	
	TI	**SN74LS241**	**911**
HD74LS244	AMD	SN74LS244	
	Fairchild	74LS244	
	MMI	74LS244	
	Motorola	SN74LS244	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Hitachi America, Ltd. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HD74LS244	Raytheon	74LS244	
	Signetics	74LS244	
	TI	**SN74LS244**	**912**
HD74LS247	Fairchild	74LS247	
	Motorola	SN74LS247	
	National	DM74LS247	
	TI	**SN74LS247**	**913**
HD74LS248	Fairchild	74LS248	
	Motorola	SN74LS248	
	National	DM74LS248	
	SGS	T74LS248	
	TI	**SN74LS248**	**914**
HD74LS249	Fairchild	74LS249	
	Motorola	SN74LS249	
	National	DM74LS249	
	SGS	T74LS249	
	TI	**SN74LS249**	**914**
HD74LS251	Fairchild	74LS251	
	Motorola	SN74LS251	
	National	DM74LS251	
	Raytheon	74LS251	
	SGS	T74LS251	
	Signetics	74LS251	
	TI	**SN74LS251**	**915**
HD74LS253	Fairchild	74LS253	
	Motorola	SN74LS253	
	National	DM74LS253	
		DM8214	
	Raytheon	74LS253	
	SGS	T74LS253	
	Signetics	74LS253	
	TI	SN74LS253	
HD74LS257	Fairchild	74LS257A	
	Motorola	SN74LS257A	
	National	DM74LS257	
	Raytheon	74LS257	
	SGS	T74LS257	
	Signetics	74LS257	
		74LS257A	
	TI	SN74LS257	
HD74LS258	Fairchild	74LS258A	
	Motorola	SN74LS258A	
	National	DM74LS258	
	Raytheon	74LS258	
	SGS	T74LS258	
	Signetics	74LS258	
	TI	SN74LS258	
HD74LS26	Fairchild	74LS26	
	Motorola	SN74LS26	
	National	DM74LS26	
	Raytheon	74LS26	
	SGS	T74LS26	
	Signetics	74LS26	
	TI	**SN74LS26**	**841**
HD74LS27	Fairchild	74LS27	
	Motorola	SN74LS27	
	National	DM74LS27	
	Raytheon	74LS27	
	SGS	T74LS27	
	Signetics	74LS27	
	TI	**SN74LS27**	**842**
HD74LS279	Fairchild	74LS279	
	Motorola	SN74LS279	
	National	DM74LS279	
	Raytheon	74LS279	
	Signetics	74LS279	
	TI	**SN74LS279**	**921**
HD74LS280	Motorola	SN74LS280	
	TI	**SN74LS280**	**921**
HD74LS283	Fairchild	74LS283	
	Hitachi	HD74LS283A	
	Motorola	SN74LS283	
	National	DM74LS283	
	Raytheon	74LS283	
	SGS	T74LS283	
	Signetics	74LS283	
	TI	**SN74LS283**	**922**
HD74LS283A	Fairchild	74LS283	
	Hitachi	HD74LS283	
	Motorola	SN74LS283	
	National	DM74LS283	
	Raytheon	74LS283	
	SGS	T74LS283	
	Signetics	74LS283	
	TI	**SN74LS283**	**922**
HD74LS290	Fairchild	74LS290	
	Motorola	SN74LS290	
	National	DM74LS290	
	Raytheon	74LS290	
HD74LS290	SGS	T74LS290	
	Signetics	74LS290	
	TI	**SN74LS290**	**924**
HD74LS293	Fairchild	74LS293	
	Motorola	SN74LS293	
	National	DM74LS293	
	SGS	T74LS293	
	Signetics	74LS293	
	TI	**SN74LS293**	**925**
HD74LS298	Fairchild	74LS298	
	Motorola	SN74LS298	
	Raytheon	74LS298	
	SGS	T74LS298	
	Signetics	74LS298	
	TI	**SN74LS298**	**926**
HD74LS299	**AMD**	**SN74LS299**	**1227**
	Fairchild	74LS299	
	Motorola	SN74LS299	
	Raytheon	74LS299	
	SGS	T74LS299	
	TI	**SN74LS299**	**927**
HD74LS30	Fairchild	74LS30	
	Motorola	SN74LS30	
	National	DM74LS30	
	Raytheon	74LS30	
	SGS	T74LS30	
	Signetics	74LS30	
	TI	**SN74LS30**	**842**
HD74LS32	Fairchild	54LS32	
		74LS32	
	Motorola	**SN54ALS32**	**732**
		SN54LS32	
		SN74LS32	
	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN54LS32**	**843**
		SN74LS32	**843**
HD74LS367	Fairchild	74LS367A	
	Hitachi	HD74LS367A	
	Motorola	SN74LS367A	
	National	DM74LS367	
	Raytheon	74LS367	
	SGS	T74LS367A	
	Signetics	74LS367	
		74LS367A	
	TI	**SN74LS367A**	**936**
HD74LS367A	Fairchild	74LS367A	
	Hitachi	HD74LS367	
	Motorola	SN74LS367A	
	National	DM74LS367	
	Raytheon	74LS367	
	SGS	T74LS367A	
	Signetics	74LS367	
		74LS367A	
	TI	**SN74LS367A**	**936**
HD74LS368	Fairchild	74LS368A	
	Motorola	SN73LS368A	
		SN74LS368A	
	National	DM74LS368	
	Raytheon	74LS368	
	SGS	T74LS3	
	Signetics	74LS368	
		74LS368A	
	TI	**SN74LS368A**	**936**
HD74LS37	Fairchild	74LS37	
	Motorola	SN74LS37	
	National	DM74LS37	
	Raytheon	74LS37	
	SGS	T74LS37	
	Signetics	74LS37	
	TI	**SN74LS37**	**844**
HD74LS38	Fairchild	74LS38	
	Motorola	SN74LS38	
	National	DM74LS38	
	Raytheon	74LS38	
	SGS	T74LS38	
	Signetics	74LS38	
	TI	**SN74LS38**	**844**
HD74LS386	Motorola	SN74LS386	
	National	DM74LS386	
	Raytheon	74LS386	
	TI	**SN74LS386**	**942**
HD74LS40	Fairchild	74LS40	
	Motorola	SN74LS40	
	National	DM74LS40	
HD74LS40	Raytheon	74LS40	
	SGS	T74LS40	
	Signetics	74LS40	
	TI	**SN74LS40**	**845**
HD74LS42	Fairchild	74LS42	
	Motorola	SN74LS42	
	National	DM74LS42	
	Raytheon	74LS42	
	SGS	T74LS42	
	Signetics	74LS42	
	TI	**SN74LS42**	**845**
HD74LS47	Fairchild	54LS47	
		74LS47	
	Motorola	SN54LS47	
		SN74LS47	
	National	DM54LS47	
		DM74LS47	
	SGS	T74LS47	
	TI	**SN54LS47**	**847**
		SN74LS47	**847**
HD74LS48	Fairchild	74LS48	
	Motorola	SN74LS48	
	National	DM74LS48	
	SGS	T74LS48	
	Signetics	74LS48	
	TI	**SN74LS48**	**847**
HD74LS49	Fairchild	74LS49	
	Motorola	SN74LS49	
	National	DM74LS49	
	SGS	T74LS49	
	TI	**SN74LS49**	**847**
HD74LS51	Fairchild	74LS51	
	Motorola	SN74LS51	
	National	DM74LS51	
	Raytheon	74LS51	
	SGS	T74LS51	
	Signetics	74LS51	
	TI	**SN74LS51**	**848**
HD74LS54	Fairchild	74LS54	
	Motorola	SN74LS54	
	National	DM74LS54	
	Raytheon	74LS54	
	SGS	T74LS54	
	Signetics	74LS54	
	TI	**SN74LS54**	**850**
HD74LS55	Fairchild	74LS55	
	Motorola	SN74LS55	
	National	DM74LS55	
	Raytheon	74LS55	
	SGS	T74LS55	
	TI	**SN74LS55**	**851**
HD74LS73	Motorola	SN74LS73A	
	National	DM74LS73	
	Raytheon	74LS73	
	Signetics	74LS73	
	TI	**SN74LS73A**	**856**
HD74LS74	Fairchild	74LS74	
	Hitachi	HD74LS74A	
	Motorola	SN74LS74A	
	National	DM74LS74	
	Raytheon	74LS74	
	SGS	T74LS74	
	Signetics	74LS74	
	TI	**SN74LS74A**	**857**
HD74LS74A	Fairchild	74LS74	
	Hitachi	HD74LS74	
	Motorola	SN74LS74A	
	National	DM74LS74	
	Raytheon	74LS74	
	SGS	T74LS74	
	Signetics	74LS74	
	TI	**SN74LS74A**	**857**
HD74LS75	Motorola	SN74LS75	
	National	DM74LS75	
	Raytheon	74LS75	
	Signetics	74LS75	
	TI	**SN74LS75**	**858**
HD74LS76	Motorola	SN74LS76A	
	National	DM74LS76	
	Raytheon	74LS76	
	Signetics	74LS76	
	TI	**SN74LS76A**	**858**
HD74LS78	Motorola	SN74LS78A	
	National	DM74LS78	
	Raytheon	74LS78	
	TI	**SN74LS78A**	**859**
HD74LS83A	Fairchild	74LS83A	
	Hitachi	HD74LS183A	
	Motorola	SN74LS83A	
	National	DM74LS83A	
	Raytheon	74LS83	
		74LS83A	
HD74LS83A	Signetics	74LS83	
		74LS83A	
	TI	**SN74LS83A**	**861**
HD74LS85	Fairchild	74LS85	
	Motorola	SN74LS85	
	National	DM74LS85	
	Raytheon	74LS85	
	Signetics	74LS85	
	TI	**SN74LS85**	**862**
HD74LS86	Fairchild	74LS86	
	Motorola	SN74LS86	
	National	DM74LS86	
	Raytheon	74LS86	
	SGS	T74LS86	
	Signetics	74LS86	
	TI	**SN74LS86**	**862**
HD74LS91	Motorola	SN74LS91	
	Raytheon	74LS91	
	TI	**SN74LS91**	**864**
HD74LS92	Fairchild	74LS92	
	Motorola	SN74LS92	
	National	DM74LS92	
	Raytheon	74LS92	
	SGS	T74LS92	
	Signetics	74LS92	
	TI	**SN74LS92**	**864**
HD74LS93	Fairchild	74LS93	
	Motorola	SN74LS93	
	National	DM74LS93	
	Raytheon	74LS93	
	SGS	T74LS93	
	Signetics	74LS93	
	TI	**SN74LS93**	**865**
HD74LS95B	Fairchild	74LS95B	
	Motorola	SN74LS95B	
	National	DM74LS95B	
	Raytheon	74LS95B	
	SGS	T74LS95B	
	Signetics	74LS95B	
	TI	**SN74LS95B**	**866**
HD74S00	Fairchild	74S00	
	National	DM74S00	
	Signetics	74S00	
	TI	**SN74S00**	**833**
HD74S02	Fairchild	74S02	
	National	DM74S02	
	Signetics	74S02	
	TI	**SN74S02**	**833**
		SN74S32	**843**
HD74S03	Fairchild	74S03	
	National	DM74S03	
	Signetics	74S03	
	TI	**SN74S03**	**834**
HD74S04	Fairchild	74S04	
	National	DM74S04	
	Signetics	74S04	
	TI	**SN74S04**	**834**
HD74S05	Fairchild	74S05	
	National	DM74S05	
	Signetics	74S05	
	TI	**SN74S05**	**834**
HD74S10	Fairchild	74S10	
	National	DM74S10	
	Signetics	74S10	
	TI	**SN74S10**	**836**
HD74S11	Fairchild	74S11	
	National	DM74S11	
	Signetics	74S11	
	TI	**SN74S11**	**836**
HD74S112	Fairchild	74S112	
	Motorola	SN74S112	
	National	DM74S112	
	Signetics	74S112	
	TI	**SN74S112**	**871**
HD74S113	Fairchild	74S113	
	National	DM74S113	
	Signetics	74S113	
	TI	**SN74S113**	**871**
HD74S114	National	DM74S114	
	TI	**SN74S114**	**872**
HD74S12	TI	SN74S12	
HD74S133	Fairchild	74S133	
	National	DM74S133	
	Signetics	74S133	
	TI	**SN74S133**	**877**
HD74S134	National	DM74S134	
	Signetics	74S134	
	TI	**SN74S134**	**877**
HD74S135	Fairchild	74S135	
	National	DM74S135	
	Signetics	74S135	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Hitachi America, Ltd. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HD74S135	**TI**	**SN74S135**	**878**
HD74S140	Fairchild	74S140	
	National	DM74S140	
	Signetics	74S140	
	TI	**SN74S140**	**881**
HD74S15	Fairchild	74S15	
	National	DM74S15	
	TI	**SN74S15**	**838**
HD74S151	AMD	SN74S151	
	Fairchild	74S151	
	National	DM74S151	
	Signetics	74S151	
	TI	**SN74S151**	**884**
HD74S153	AMD	SN74S153	
	Fairchild	74S153	
	National	DM74S153	
	Signetics	74S153	
	TI	**SN74S153**	**884**
HD74S157	AMD	SN74S157	
	Fairchild	74S157	
	National	DM74S157	
	Signetics	74S157	
	TI	**SN74S157**	**887**
HD74S158	AMD	SN74S158	
	Fairchild	74S158	
	National	DM74S158	
	Signetics	74S158	
	TI	**SN74S158**	**887**
HD74S174	AMD	SN74S174	
	Fairchild	74S174	
	National	DM74S174	
	Signetics	74S174	
	TI	**SN74S174**	**895**
HD74S175	AMD	SN74S175	
	Fairchild	74S175	
	National	DM74S175	
	Signetics	74S175	
	TI	**SN74S175**	**895**
HD74S181	AMD	SN74S181	
	Fairchild	93S41C	
	Signetics	74S181	
	TI	SN74S181	
HD74S182	Fairchild	74S182	
	MMI	74S182	
	National	DM74S182	
	Signetics	74S182	
	TI	**SN74S182**	**898**
HD74S189	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
HD74S20	Fairchild	74S20	
	National	DM74S20	
	Signetics	74S20	
	TI	**SN74S20**	**839**
HD74S22	Fairchild	74S22	
	National	DM74S22	
	TI	**SN74S22**	**840**
HD74S251	AMD	SN74S251	
	National	DM74S251	
	Signetics	74S251	
	TI	**SN74S251**	**915**
HD74S257	AMD	SN54S257	
		SN74S257	
	Fairchild	74S257	
	National	DM7123	
		DM74S257	
		DM8123	
	Signetics	54S257	
		74S257	
	TI	**SN54S257**	**916**
		SN74S257	**916**
HD74S258	AMD	SN74S258	
	Fairchild	74S258	
HD74S258	Signetics	74S258	
	TI	**SN74S258**	**917**
HD74S280	National	DM74S280	
	Signetics	74S280	
	TI	**SN74S280**	**921**
HD74S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
HD74S40	Fairchild	74S40	
	National	DM74S40	
	Signetics	74S40	
	TI	**SN74S40**	**845**
HD74S51	Fairchild	74S51	
	National	DM74S51	
	Signetics	74S51	
	TI	**SN74S51**	**848**
HD74S65	Fairchild	74S65	
	National	DM74S65	
	TI	**SN74S65**	**853**
HD74S74	Fairchild	74S74	
	National	DM74S74	
	Signetics	74S74	
	TI	**SN74S74**	**857**
HD74S86	Fairchild	74S86	
	National	DM74S86	
	Signetics	74S86	
	TI	**SN74S86**	**862**
HD75107A	TI	SN75107A	
HD75108A	TI	SN75108A	
HD75109	TI	SN75109	
HD75110	Fairchild	75110	
	Motorola	MC75110	
	National	LM75110	
	TI	SN75110	
		SN75110A	
HD75154	Fairchild	75154	
	National	DS75154	
	SiliconG	SG75154	
	TI	SN75154	
HD75188	AMD	MC1488	
	Exar	**XR1488**	**3188**
	Fairchild	μA1488	
	Harris	HA1488	
HD75188	**Motorola**	**MC1488**	**2753**
	National	DS1488	
	Raytheon	RM1488	
	Signetics	MC1488	
	SiliconG	SG1488	
	TI	MC1488	
		SN75188	
HD75189	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
HD75450A	TI	SN75450A	
HD75451A	TI	SN75451A	
HD75452	Fairchild	75452	
	Motorola	MC75452	
	National	DS75452	
	SiliconG	SG75452	
	TI	SN75452	
HD75453	Fairchild	75453	
	Motorola	MC75453	
	National	DS75453	
		LM75453	
	SiliconG	SG75453	
	TI	SN75453	
HD75454	TI	SN75454	
HM100474	AMD	AM100474	
	Fairchild	**F100474**	
			3615,3629
HM10422	**Fairchild**	**F10422**	**3615,3620**
	Fujitsu	MBM10422	
	Motorola	**MCM10422**	**3839**
	National	**DM10422**	**3854**
HM10470	AMD	AM10470	
	Fairchild	**F10470**	**3615,3621**
	Fujitsu	**MBM10470**	**3681**
	Motorola	MCM10470	
	National	**DM10470**	**3855**
	Signetics	10470	
HM2110	AMD	AM10415	
	Fairchild	**F10415**	**3615,3618**
	Hitachi	**HM2112**	**3789**
	Motorola	**MCM10146**	**3839**
	National	DM10415	
	Siemens	GXB10415	
	Signetics	10146	
HM2112	AMD	AM10415	
	Fairchild	**F10415**	**3615,3618**
	Hitachi	**HM2110**	**3789**
	Motorola	**MCM10146**	**3839**
	National	DM10415	
	Siemens	GXB10415	
	Signetics	10146	
HM2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
HM2114	Toshiba	TMM314	
		TMM314A	
HM2510	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2511**	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
HM2511	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
HM4315	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
HM4334	Fujitsu	MB8414	
	Harris	HM6514	
	Intersil	IM6514	
	MicroPwr	MP6514	
	Mitsubishi	M58981	
	National	NMC6514	
	NEC-Micro	μPD444/6514	
		μPD6514	
	OKI	**MSM5115**	**3873**
	RCA	MWS5114	
		MWS5514	
	Toshiba	TC5514	
HM468A10	**Motorola**	**MCM68A10**	**3839**
HM4716	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Hitachi America, Ltd. (Cont'd)			
HM4716	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
HM472114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
HM4816	AMD	AM4516	
	Fujitsu	MB8118	
	Hitachi	HM4816A	
	Intel	2118	
	Intersil	IM7118	
	Mostek	4516	
		MK4516	
	National	NMC5295	
	NEC-Micro	2118	
	TI	TMS4516	
HM4816A	AMD	AM4516	
	Fujitsu	MB8118	
	Hitachi	HM4816	
	Intel	2118	
	Intersil	IM7118	
	Mostek	4516	
		MK4516	
	National	NMC5295	
	NEC-Micro	2118	
	TI	TMS4516	
HM4847	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	**HM5147**	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
HM4864	Fairchild	F64K	
	Fujitsu	MB8264	
		MB8265	
	Intel	2164	
	Motorola	MCM6664	
		MCM6665	
	National	NMC4164	
	NEC-Micro	μPD4164	
	TI	TMS4164	
	Toshiba	TMM4164	
HM6116	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
HM6116	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
HM6117	MicroPwr	MP6117	
	NEC-Micro	μPD447	
HM6147	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
HM6148	AMD	9148	
		AM9148	
	Fairchild	**93475**	**3615,3646**
	Fujitsu	MBM2148	
		MBM2149	
	Intel	2148H	
		2149H	
	National	NMC2148	
	Synertek	SY2148	
		SY2149	
HM6167	IMS	1400	
	IDT	IDT6167	
	Intel	2167	
	NEC-Micro	μPD2167	
HM6464	Toshiba	TC5565	
HN25045	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3835**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3963**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
HN25089	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
HN25089	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
HN25169	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S165**	**440,3979**
HN35600	Intel	4001	
HN35800	Intel	4308	
HN462532	Motorola	MCM2532	
	National	MM2532	
		NMC2532	
		TDA2530	
		TDA2532	
	Plessey	TDA2530	
	Siemens	TDA2530	
	Signetics	TDA2530	
		TDA2532	
	SiliconG	SG2532	
	TI	TMS2532	
	Universal	UM2532	
HN462708	AMD	2708	
	Fairchild	F2708	
	Motorola	MC27A08	
		MCM2708	
	National	MM2708	
	NEC-EA	EA2708	
	Panasonic	MN2708	
	Rockwell	2708	
	SGS	M2708	
	TI	TMS2708	
HN462716	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
HN462732	AMD	2732	
	Fairchild	F2732	
	Intel	2732	
		2732A	**3819,3822**
		M2732	
	Mitsubishi	M5L2732	
	National	MM2732	
		NMC2732	
	NEC-Micro	μPD2732	
	Toshiba	TMM2732	
		TMM324C	
	Universal	UM2732	
HN462764	Fujitsu	MBM2764	
	Hitachi	**HN462764**	**3789**
	Intel	**2764**	**3820,3822**
		M2764	
HN462764	Intersil	2764	
	Mostek	MK2764	
	National	NMC2764	
	NEC-Micro	μPD2764	
	SEEQ	5133	
	Toshiba	TMM2764	
HN46830	Motorola	MCM68A30	
HN48016	**GI**	**ER5716**	**3683**
	Motorola	MCM2816	
	NCR	NCR2168	
HN482764	Fujitsu	MBM2764	
	Hitachi	HN462764	
	Intel	**2764**	**3820,3822**
		M2764	
	Intersil	2764	
	Mostek	MK2764	
	National	NMC2764	
	NEC-Micro	μPD2764	
	SEEQ	5133	
	Toshiba	TMM2764	
LA1230	Hitachi	HA1137	
	Motorola	MC1389	
	National	CA3089	
		LM3089	**3325 3327**
	RCA	CA3089	
	Sanyo	LA1230	
		LA3089	
	SGS	TCA3089	
		TDA1200	
	Signetics	CA3089	
	Siliconix	CA3089	
	TI	SN76689	

Holt Inc.

HI8000	Nitron	NC8000	

Hughes Aircraft, Solid State Products

HCL0438	Mitel	MD4332	
HCMP1802A	**RCA**	**CDP1802**	**1459**
HCMP1824	**RCA**	**CDP1824**	**3874**
HCMP1831	**RCA**	**CDP1831**	**3876**
HCMP1832	RCA	CDP1832	
HCMP1833	**RCA**	**CDP1833**	**3876**
HCMP1834	**RCA**	**CDP1834**	**3877**
HCMP1851	**RCA**	**CDP1851**	**1475**
HCMP1852	**RCA**	**CDP1852**	**1471**
HCMP1853	**RCA**	**CDP1853**	**1466**
HCMP1854	**RCA**	**CDP1854**	**1476**
HCMP1855	**RCA**	**CDP1855**	**1478**
HCMP1856	**RCA**	**CDP1856**	**1472**
HCMP1857	**RCA**	**CDP1857**	**1472**
HCMP1858	**RCA**	**CDP1858**	**1468**
HCMP1859	**RCA**	**CDP1859**	**1468**
HCMP1861	**RCA**	**CDP1861**	**1486**
HLCD0438	**AMI**	**S4521**	**2610**
	RCA	CD0438	
HNVM3704	GI	ER3400	
	NCR	NCR3400	
	Nitron	NC7451	

Hybrid Systems

ADC542	Burr-Brown	ADC82	
	HybridSys	HSADC82	
ADC581	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Hybrid Systems (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
ADC581	TeledyneP	TDADC84	
		TPADC87	
ADC581B	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADC582	**Datel**	**ADC-5216**	**2621**
	HybridSys	HS5216	
	DDC	DDC5216	
	MicroNet	MN5216	
DAC331-12	AD	AD7521	
	Datel	DAC-HA12B	
	Intersil	AD7521	
	MicroPwr	MP7521	
	National	AD7521	
		DAC1220	
		DAC1221	
		DAC1222	
DAC335	AD	ADDAC80	
		ADDAC85	
	Burr-Brown	DAC80	
		DAC85	
	Datel	DAC-85	
		DAC-HZ12B	
	HybridSys	DAC9356	
		HSDAC80	
	MicroNet	DAC80	
		DAC85	
	National	DAC1280	
		DAC1285	**3345**
DAC337-0	MicroNet	MN3000	
DAC337-1	MicroNet	MN3001	
DAC337-2	MicroNet	MN3002	
DAC337-3	MicroNet	MN3003	
DAC337-4	MicroNet	MN3004	
DAC337-5	MicroNet	MN3005	
DAC337-6	MicroNet	MN3006	
DAC337-7	MicroNet	MN3007	
DAC346	AD	AD370	
		AD371	
	HybridSys	DAC347	
	MicroNet	MN3210	
		MN3211	
		MN370	
		MN371	
DAC347	AD	AD370	
		AD371	
	HybridSys	DAC346	
	MicroNet	MN3210	
		MN3211	
		MN370	
		MN371	
DAC349	MicroNet	MN3349	
DAC370	MicroPwr	MP370	
DAC377	MicroPwr	MP377	
DAC377-18	MicroPwr	MP377-18	
DAC397	DDC	ADH-030	
DAC397-12	HyComp	DA4000	
	DDC	ADH-030	
DAC9331	HybridSys	DAC9337	
	MicroPwr	MP9331	
DAC9337	HybridSys	DAC9331	
	MicroPwr	MP9331	
DAC9356	AD	ADDAC80	
		ADDAC85	
	Burr-Brown	DAC80	
		DAC85	
DAC9356	Datel	DAC-85	
		DAC-HZ12B	
	HybridSys	DAC335	
		HSDAC80	
	MicroNet	DAC80	
		DAC85	
	National	DAC1280	
		DAC1285	**3345**
DAC9377	MicroPwr	9377	
		MP377	
DAC9377-16	**MicroPwr**	**MP9377-16**	**401 2749**
HS3120	AD	AD7622	
	MicroPwr	MP7622	
HS3140	Datel	DAC-HA14	
	MicroPwr	MP3140	
HS346	MicroNet	MN346	
HS5131	MicroNet	MN5131	
HS5150	MicroNet	MN5150	
HS5210	**AD**	**AD5210**	**3174**
	Datel	**ADC-5210**	**2621**
	DDC	DDC5210	
	MicroNet	MN5210	
	TeledyneP	TP5210	
HS5211	**Datel**	**ADC-5211**	**2621**
	DDC	DDC5211	
	MicroNet	MN5211	
	TeledyneP	TP5211	
HS5212	**Datel**	**ADC-5212**	**2621**
	DDC	DDC5212	
	MicroNet	MN5212	
	TeledyneP	TP5212	
HS5213	**Datel**	**ADC-5213**	**2621**
	HybridSys	MN5214	
	MicroNet	MN5213	
		MN5214	
	TeledyneP	TP5213	
		TP5214	
HS5215	**Datel**	**ADC-5214**	**2621**
	MicroNet	MN5215	
	TeledyneP	TP5215	
HS5216	**Datel**	**ADC-5216**	**2621**
	HybridSys	ADC582	
	DDC	DDC5216	
	MicroNet	MN5216	
HS7541	AD	AD7541	
	Datel	DAC-7541	
	Intersil	AD7541	
		ICL7541	
	MicroPwr	**MP7541**	**401,2749**
		MP7621	
	TeledyneS	7541	
HSADC82	Burr-Brown	ADC82	
	HybridSys	ADC542	
HSADC85	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
HSADC85C	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
HSADC85C	HybridSys	ADC581	
		ADC581B	
		HSADC85	
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
HSDAC80	AD	ADDAC80	
		ADDAC85	
	Burr-Brown	DAC80	
		DAC85	
	Datel	DAC-85	
		DAC-HZ12B	
	HybridSys	DAC335	
		DAC9356	
	MicroNet	DAC80	
		DAC85	
	National	DAC1280	
		DAC1285	**3345**
HSDAC87	AD	ADDAC87	
	Burr-Brown	DAC851	
		DAC87	
	Datel	DAC-687	
		DAC-87	
	HybridSys	DAC335	
	MicroNet	MNDAC87	
HSREF01	**MicroPwr**	**MP5532**	**401,3292**
		REF-01	
	Motorola	**MC1404-10**	**2761**
		MC1504-10	**2761**
	PMI	REF-01	
	TeledyneS	9496	
MN5214	**Datel**	**ADC-5213**	**2621**
	HybridSys	HS5213	
	MicroNet	MN5213	
		MN5214	
	TeledyneP	TP5213	
		TP5214	
R675-3	AD	AD2702	
R675-4	AD	AD2700	
R675-5	AD	AD2701	

HyComp

Manufacturer Device	Replacement Source	Device	IC Master Page
DA4000	HybridSys	DAC397-12	
	DDC	ADH-030	

ILC Data Device Corporation

Manufacturer Device	Replacement Source	Device	IC Master Page
ADC4454	Datel	ADC-EH12B	
	TeledyneP	TP4134	
ADH-030	HybridSys	DAC397-12	
	HyComp	DA4000	
ADH-8585	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADH-8586	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
ADH-8586	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
ADH85101	**Datel**	**ADC-5101**	**2621**
	DDC	DDC5101	
	MicroNet	MN5101	
◆ ADH8585	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
◆ ADH8585-1	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
DAC-SL	MicroNet	MN3860	
◆ DAC3528	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

ILC Data Device Corporation (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
◆DAC3528	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
DAC8528	TeledyneP	4058	
DDC5101	**Datel**	**ADC-5101**	**2621**
	MicroNet	MN5101	
DDC5210	**AD**	**AD5210**	**3174**
	Datel	**ADC-5210**	**2621**
	HybridSys	HS5210	
	MicroNet	MN5210	
	TeledyneP	TP5210	
DDC5211	**Datel**	**ADC-5211**	**2621**
	HybridSys	HS5211	
	MicroNet	MN5211	
	TeledyneP	TP5211	
DDC5212	**Datel**	**ADC-5212**	**2621**
	HybridSys	HS5212	
	MicroNet	MN5212	
	TeledyneP	TP5212	
DDC5216	**Datel**	**ADC-5216**	**2621**
	HybridSys	ADC582	
		HS5216	
	MicroNet	MN5216	
DDC5240	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
DDCADC85	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
DDCADC87	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
DDCADC87	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
DDCDAC87	AD	ADDAC87	
	Burr-Brown	DAC851	
		DAC87	
	Datel	DAC-687	
		DAC-87	
	HybridSys	DAC335	
		HSDAC87	
	MicroNet	MNDAC87	

Industrial Micro-systems Inc.

1400	**Hitachi**	**HM6167**	**3789**
	IDT	IDT6167	
	Intel	2167	
	NEC-Micro	μPD2167	
IMS1420	Fujitsu	MB8168	
	Intel	2168	

Integrated Device Technology

IDT6116	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
IDT6167	**Hitachi**	**HM6167**	**3789**
	IMS	1400	
	Intel	2167	
	NEC-Micro	μPD2167	

Intel

1101	Solitron	μA2556	
		μA2656	
		μA3556	
		μA3656	
2102	SGS	M2102	
2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
2114	Toshiba	TMM314	
		TMM314A	
2114A	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
2115A	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
2117	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
2118	AMD	AM4516	
	Fujitsu	MB8118	
	Hitachi	HM4816	
		HM4816A	
	Intersil	IM7118	
	Mostek	4516	
		MK4516	
	National	NMC5295	
	NEC-Micro	2118	
	TI	TMS4516	
2125A	AMI	S6508	
	Fairchild	4736B	
	Harris	**HM6508**	**669,1333,3754**
	Motorola	MCM2125	
	National	MM74C929	
		NMC6508	
	NEC-Micro	μPD443	
	SSS	SCM21C02	
2125A	Toshiba	TC5508	
2141	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
2141-2	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
2142	National	MM2142	
2142-2	National	NMC2142A	
2147	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
2147-3	Fujitsu	MBM2147H	
2148H	AMD	9148	
		AM9148	
	Fairchild	**93475**	**3615,3646**
	Fujitsu	MBM2148	
		MBM2149	
	Hitachi	**HM6148**	**3789**
	Intel	2149H	
	National	NMC2148	
	Synertek	SY2148	
		SY2149	
2149H	AMD	9148	
		AM9148	
	Fairchild	**93475**	**3615,3646**
	Fujitsu	MBM2148	
		MBM2149	
	Hitachi	**HM6148**	**3789**
	Intel	2148H	
	National	NMC2148	
	Synertek	SY2148	
		SY2149	
2164	Fairchild	F64K	
	Fujitsu	MB8264	
		MB8265	
	Hitachi	HM4864	
	Motorola	MCM6664	
		MCM6665	
	National	NMC4164	
	NEC-Micro	μPD4164	
	TI	TMS4164	
	Toshiba	TMM4164	
2167	**Hitachi**	**HM6167**	**3789**
	IMS	1400	
	IDT	IDT6167	
	NEC-Micro	μPD2167	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Intel (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
2168	Fujitsu	MB8168	
	IMS	IMS1420	
2316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	RO3-8316	
		RO3-9316	
	GTEMicro	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
2332	AMD	AM9233	
	AMI	**S2333**	**3608**
	CSG	MPS2333	
	Fairchild	F3533	
	GI	RO3-9333	
	NEC-EA	8332	
		EA8333	
	RCA	CDM5332	
	Signetics	2332	
	Synertek	**SY2333**	**3950**
	Toshiba	TM2332	
	Universal	UM2333-45	
2364	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
2364A	MicroPwr	MP2365	
27128	Fujitsu	27128	
	SEEQ	**5143**	**3896**
2716	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HN462716**	**3789**
	Intel	M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
2732	AMD	2732	
	Fairchild	F2732	
	Hitachi	**HN462732**	**3789**
	Intel	**2732A**	**3819 3822**
		M2732	
	Mitsubishi	M5L2732	
	National	MM2732	
		NMC2732	
2732	NEC-Micro	μPD2732	
	Toshiba	TMM2732	
		TMM324C	
	Universal	UM2732	
2732A	AMD	2732	
	Fairchild	F2732	
	Hitachi	**HN462732**	**3789**
	Intel	2732	
		M2732	
	Mitsubishi	M5L2732	
	National	MM2732	
		NMC2732	
	NEC-Micro	μPD2732	
	Toshiba	TMM2732	
		TMM324C	
	Universal	UM2732	
2764	Fujitsu	MBM2764	
	Hitachi	HN462764	
		HN482764	**3789**
	Intel	M2764	
	Intersil	2764	
	Mostek	MK2764	
	National	NMC2764	
	NEC-Micro	μPD2764	
	SEEQ	5133	
	Toshiba	TMM2764	
2816	GI	ER5816	
		ER5916	
	National	NMC2816	
	NCR	NCR2161	
2912	GTEMicro	G8912	
	Mostek	MK5912	
		MK8912	
	Plessey	MV8912	
3001	Signetics	3001	
		N3001	
3002	Signetics	3002	
		N3002	
3101	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
3106	AMD	AM27LS00	
		AM29721	
3106	Fairchild	93421	
		93L420	
		93L421	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
3107	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
3216	AMD	3216	
3226	AMD	3226	
3242	Motorola	MC3242A	
3245	Motorola	MC3245	
	National	DS3245	
3404	Signetics	N8T3404	
3622	AMD	AM27S13	
	Fairchild	93446	
	Fujitsu	MB7053	
	Harris	HM7621	
	MMI	6306	
	Motorola	MCM7621	
	National	DM74S571	
	Signetics	82S131	
	TI	SN74S571	
3625A	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	
			3826,3836
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
3625A	TI	**TBP24S41**	
			440,3968
		TDP24S41	
			440,3968
		TBP28S41	
		TBP28S41M	
3628	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
3628A	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
3628B	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		M3628	
	MMI	5381-1	
		6381-1	**3826**

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Manufacturer Device	Replacement Source	Device	IC Master Page
Intel		**(Cont'd)**	
3628B	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
3632	AMD	AM27S43	
	Fujitsu	MB7142	
	Signetics	82S321	
		N82S321	
		S82S321	
3636B	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	**440,3979**
4001	Hitachi	HN35600	
4201	National	DP4201	
4308	Hitachi	HN35800	
4702	AMD	4702	
7800	NEC-Micro	μPD7800	
7801	NEC-Micro	μPD7801	
8021	NEC-Micro	μPD8021	
	Signetics	8021	
8022	NEC-Micro	μPD8022	
8035	AMD	8035	
		D8035	
		ID8035	
		P8035	
	Fujitsu	MBL8035	
	Intel	D8035	
		ID8035	
		P8035	
	National	INS8035	
	NEC-Micro	μPD8035	
		μPD80C35	
	Signetics	SCN8035	
8039	AMD	D8039	
		ID8039	
	Fujitsu	MBL8039	
	Intel	D8039	
		ID8039	
	National	INS8039	
	NEC-Micro	μPD8039	
	Signetics	SCN8039	
8041A	AMD	8041	
		D8041	
		P8041	
	Intel	D8041	
		P8041	
	NEC-Micro	μPD8041A	
8048	AMD	8048	
	Fujitsu	MBL8048	
	National	INS8048	
	NEC-Micro	μPD8048	
		μPD80C48	
	Signetics	SCN8048	
	Toshiba	TMP8048	
8049	Fujitsu	MBL8049	
	National	INS8049	
	NEC-Micro	μPD8049	
	Signetics	SCN8049	
8080A	AMD	9080	
		9080A	
		AM9080	
	Intel	D8080	
		MD8080	
		P8080	
	National	DP8080A	
		INS8080A	
	NEC-Micro	μPD8080	
	TI	TMS8080	
		TMS8080A	
8085	AMD	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	Intel	8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	NEC-Micro	μPD8085	
	Toshiba	TMP8085A	
8085A	AMD	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	Intel	8085	
		D8085	
		ID8085	
		MD8085	
		P8085	
	NEC-Micro	μPD8085	
	Toshiba	TMP8085A	
8086	AMD	D8086	
		ID8086	
		MD8086	
	Intel	D8086	
		ID8086	
		MD8086	
	NEC-Micro	μPD8086	
8101A	AMD	2101A	
		91L01	
	NEC-Micro	μPD2101	
	Synertek	SY2101	
8102A	NEC-Micro	μPD2102	
	SGS	M330	
8111	AMD	2111A	
		91L11	
	NEC-Micro	μPD2111	
	Synertek	SY2111	
8155	AMD	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	Intel	D8155	
		ID8155	
		MD8155	
		P8155	
	NEC-Micro	μPD8155	
	Toshiba	TMP8155	
8156	AMD	8156	
		D8156	
		ID8156	
		P8156	
	Intel	D8156	
		ID8156	
		P8156	
	NEC-Micro	μPD8156	
8156-2	NEC-Micro	8156-2	
8212	AMD	3212	
		8212	
	National	DP8212	
		INS8212	
	NEC-Micro	μPB8212	
	TI	**SN54S412**	**945**
		SN74S412	**945**
8214	AMD	8214	
	National	INS8214	
	NEC-Micro	μPB8214	
8216	AMD	8216	
	National	DP8216	
		INS8216	
	NEC-Micro	μPB8216	
8224	AMD	8224	
	National	DP8224	
		INS8224	
8224	NEC-Micro	μPB8224	
8226	AMD	8226	
	National	DP8226	
		INS8226	
	NEC-Micro	μPB8226	
8228	AMD	8228	
	National	DP8228	
		INS8228	
	NEC-Micro	μPB8228	
	TI	**SN74S428**	**946**
		TIM8228	**3980**
8237-5	NEC-Micro	μPB8237-5	
8238	AMD	8238	
	National	DP8238	
		INS8238	
	NEC-Micro	μPB8238	
	TI	**SN74S438**	**946**
		TIM8238	**3980**
8243	AMD	8243	
	Fujitsu	MB8243	
	NEC-Micro	μPD8243	
	Signetics	8243	
8251A	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	D8251	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	
8253	AMD	8253	
		D8253	
		ID8253	
		P8253	
	Intel	D8253	
		ID8253	
		P82	
	National	INS8253	
	NEC-Micro	μPD8253	
8253-5	AMD	8253-5	
		D8253-5	
		P8253-5	
	Intel	D8253-5	
		P8253-5	
	National	INS8253-5	
	NEC-Micro	μPD8253-5	
8255A-5	AMD	8255A-5	
		9555	
		D8255	
		ID8255	
		P8255	
	Intel	D8255	
		ID8255	
		P8255	
	National	INS8255	
	NEC-Micro	8255A	
		μPB8255	
		μPD8225	
		μPD8255	
8257	AMD	8257	
	NEC-Micro	μPD8257	
8259	AMD	D8259	
		ID8259	
		MD8259	
		P8259	
	Intel	D8259	
		ID8259	
		M8259	
		P8259	
	National	INS8259	
	NEC-Micro	μPD8259	
8272	Intel	8274	
	NEC-Micro	μPD7201	
		μPD765	
8274	Intel	8272	
	NEC-Micro	μPD7201	
		μPD765	
8279	AMD	8279-5	
		D8279-5	
		P8279-5	
	Intel	8279-5	
		D8279-5	
		P8279-5	
8279	NEC-Micro	μPD8279-5	
8279-5	AMD	8279-5	
		D8279-5	
		P8279-5	
	Intel	8279	
		D8279-5	
		P8279-5	
	NEC-Micro	μPD8279-5	
8282	NEC-Micro	μPB8282	
8283	NEC-Micro	μPB8283	
8284	NEC-Micro	μPB8284	
8286	AMD	8304	
		DP8304	
	Intel	8304	
	National	DP8304	
	NEC-Micro	μPB8286	
8287	NEC-Micro	μPB8287	
8288	NEC-Micro	μPB8288	
8304	AMD	8304	
		DP8304	
	Intel	8286	
	National	DP8304	
	NEC-Micro	μPB8286	
8355	AMD	8355	
	NEC-Micro	μPD8355	
	Toshiba	TMP8355	
8702	AMD	8702	
8741A	NEC-Micro	μPD8741A	
8748	**National**	**NS80CX48**	**1448**
	NEC-Micro	μPD8748	
8755	NEC-Micro	μPD8755	
8755A	NEC-Micro	μPD8755A	
	Toshiba	TMP8755	
C8231	AMD	AM9511	
	Intel	MC8231	
C8232	AMD	AM9512	
D8035	AMD	8035	
		D8035	
		ID8035	
		P8035	
	Fujitsu	MBL8035	
	Intel	8035	
		ID8035	
		P8035	
	National	INS8035	
	NEC-Micro	μPD8035	
		μPD80C35	
	Signetics	SCN8035	
D8039	AMD	D8039	
		ID8039	
	Fujitsu	MBL8039	
	Intel	8039	
		ID8039	
	National	INS8039	
	NEC-Micro	μPD8039	
	Signetics	SCN8039	
D8041	AMD	8041	
		D8041	
		P8041	
	Intel	8041A	
		P8041	
	NEC-Micro	μPD8041A	
D8080	AMD	9080	
		9080A	
		AM9080	
	Intel	8080A	
		MD8080	
		P8080	
	National	DP8080A	
		INS8080A	
	NEC-Micro	μPD8080	
	TI	TMS8080	
		TMS8080A	
D8085	AMD	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	Intel	8085	
		8085A	
		ID8085	
		MD8085	
		P8085	
	NEC-Micro	μPD8085	
	Toshiba	TMP8085A	
D8086	AMD	D8086	
		ID8086	
		MD8086	
	Intel	8086	
		ID8086	
		MD8086	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Intel (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
D8086	NEC-Micro	μPD8086	
D8088	AMD	D8088	
D8155	AMD	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	Intel	8155	
		ID8155	
		MD8155	
		P8155	
	NEC-Micro	μPD8155	
	Toshiba	TMP8155	
D8156	AMD	8156	
		D8156	
		ID8156	
		P8156	
	Intel	8156	
		ID8156	
		P8156	
	NEC-Micro	μPD8156	
D8212	AMD	D8212	
	NEC-Micro	PD8212	
D8216	AMD	D8216	
	NEC-Micro	PD8216	
D8224	AMD	D8224	
	NEC-Micro	PD8224	
D8226	AMD	D8226	
	NEC-Micro	PD8226	
D8228	AMD	D8228	
	NEC-Micro	PD8228	
D8237	AMD	AM9517	
	Intel	P8237	
D8238	AMD	D8238	
D8251	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	
D8253	AMD	8253	
		D8253	
		ID8253	
		P8253	
	Intel	8253	
		ID8253	
		P82	
	National	INS8253	
	NEC-Micro	μPD8253	
D8253-5	AMD	8253-5	
		D8253-5	
		P8253-5	
	Intel	8253-5	
		P8253-5	
	National	INS8253-5	
	NEC-Micro	μPD8253-5	
D8255	AMD	8255A-5	
		9555	
		D8255	
		ID8255	
		P8255	
	Intel	8255A-5	
		ID8255	
		P8255	
	National	INS8255	
	NEC-Micro	8255A	
		μPB8255	
		μPD8225	
		μPD8255	
D8259	AMD	D8259	
		ID8259	
		MD8259	
		P8259	
	Intel	8259	
		ID8259	
		M8259	
		P8259	
	National	INS8259	
	NEC-Micro	μPD8259	
D8279	AMD	D8279	
D8279-5	AMD	8279-5,	
		D8279-5	
		P8279-5	
	Intel	8279	
		8279-5	
		P8279-5	
	NEC-Micro	μPD8279-5	
D8286	AMD	D8286	
	NEC-Micro	PD8286	
D8287	AMD	D8287	
	NEC-Micro	PD8287	
ID2910	**National**	**TP3020**	**3332**
ID2911	**National**	**TP3021**	**3332**
ID2912	National	TP3040	
ID8035	AMD	8035	
		D8035	
		ID8035	
		P8035	
	Fujitsu	MBL8035	
	Intel	8035	
		D8035	
		P8035	
	National	INS8035	
	NEC-Micro	μPD8035	
		μPD80C35	
	Signetics	SCN8035	
ID8039	AMD	D8039	
		ID8039	
	Fujitsu	MBL8039	
	Intel	8039	
		D8039	
	National	INS8039	
	NEC-Micro	μPD8039	
	Signetics	SCN8039	
ID8085	AMD	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	Intel	8085	
		8085A	
		D8085	
		MD8085	
		P8085	
	NEC-Micro	μPD8085	
	Toshiba	TMP8085A	
ID8086	AMD	D8086	
		ID8086	
		MD8086	
	Intel	8086	
		D8086	
		MD8086	
	NEC-Micro	μPD8086	
ID8155	AMD	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	Intel	8155	
		D8155	
		MD8155	
		P8155	
	NEC-Micro	μPD8155	
	Toshiba	TMP8155	
ID8156	AMD	8156	
		D8156	
		ID8156	
		P8156	
	Intel	8156	
		D8156	
		P8156	
	NEC-Micro	μPD8156	
ID8212	AMD	ID8212	
ID8216	AMD	ID8216	
ID8226	AMD	ID8226	
ID8251	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
ID8251	SMC	COM8251A	
	Western	TR1983	
ID8253	AMD	8253	
		D8253	
		ID8253	
		P8253	
	Intel	8253	
		D8253	
		P82	
	National	INS8253	
	NEC-Micro	μPD8253	
ID8255	AMD	8255A-5	
		9555	
		D8255	
		ID8255	
		P8255	
	Intel	8255A-5	
		D8255	
		P8255	
	National	INS8255	
	NEC-Micro	8255A	
		μPB8255	
		μPD8225	
		μPD8255	
ID8259	AMD	D8259	
		ID8259	
		MD8259	
		P8259	
	Intel	8259	
		D8259	
		M8259	
		P8259	
	National	INS8259	
	NEC-Micro	μPD8259	
ID8279	AMD	ID8279	
ID8286	AMD	ID8286	
ID8287	AMD	ID8287	
ISBC108	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
ISBC80/30	National	BLC80/316	
M2716	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HN462716**	**3789**
	Intel	**2716**	**3818,3822**
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
M2732	AMD	2732	
	Fairchild	F2732	
	Hitachi	**HN462732**	**3789**
	Intel	2732	
		2732A	**3819,3822**
	Mitsubishi	M5L2732	
	National	MM2732	
		NMC2732	
	NEC-Micro	μPD2732	
	Toshiba	TMM2732	
		TMM324C	
M2732	Universal	UM2732	
M2764	Fujitsu	MBM2764	
	Hitachi	HN462764	
		HN482764	**3789**
	Intel	**2764**	**3820 3822**
	Intersil	2764	
	Mostek	MK2764	
	National	NMC2764	
	NEC-Micro	μPD2764	
	SEEQ	5133	
	Toshiba	TMM2764	
M3601	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	**3696**
	MMI	5300-1	
		6300-1	**3826**
	National	DM54S387	
		DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
	TI	**TBP24SA10**	
			440,3967
		TBP24SA10M	
			440,3967
M3602	AMD	AM27S12	
	Fairchild	93436	
	Harris	HM7620	
	MMI	5305	
		6305	
	National	DM54S570	
		DM74S570	
	Raytheon	29610	
	Signetics	N82S130	
		S82S130	
M3604	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	MMI	5340-1	
		6340-1	**3826**
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	**TBP28SA46**	**440**
M3605	AMD	AM27S32	
	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642	
		HM7642-2	**3705**
	MMI	5352-1	
		6352	
	National	DM54S572	
		DM74S572	
	Raytheon	29640	
	Signetics	N82S136	
		S82S136	
	TI	**TBP24SA41**	
			440,3968
		TBP24SA41M	
			440,3968
M3621	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
		HM7611-2	**3696**
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	**3826**
	National	DM54S287	
		DM74S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
	TI	**TBP24S10**	
			440,3967
M3622	AMD	AM27S13	
	Fairchild	93446	
	Harris	HM7621	
	MMI	5306	
		6306	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Intel (Cont'd)			
M3622	National	DM54S571	
		DM74S571	
	Raytheon	29611	
	Signetics	N82S131	
		S82S131	
M3624	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	MMI	5341-1	
		6341-1	**3826**
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	**TBP28S46**	**440,3976**
		TBP28S46M	**440,3976**
M3625	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
M3628	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
M3628	Signetics	82S181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
M3636	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	**440,3979**
M8259	AMD	D8259	
		ID8259	
		MD8259	
		P8259	
	Intel	8259	
		D8259	
		ID8259	
		P8259	
	National	INS8259	
	NEC-Micro	μPD8259	
MC8231	AMD	AM9511	
	Intel	C8231	
MD8080	AMD	9080	
		9080A	
		AM9080	
	Intel	8080A	
		D8080	
		P8080	
	National	DP8080A	
		INS8080A	
	NEC-Micro	μPD8080	
	TI	TMS8080	
		TMS8080A	
MD8085	AMD	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	Intel	8085	
		8085A	
		D8085	
		ID8085	
		P8085	
	NEC-Micro	μPD8085	
	Toshiba	TMP8085A	
MD8086	AMD	D8086	
		ID8086	
		MD8086	
	Intel	8086	
		D8086	
		ID8086	
	NEC-Micro	μPD8086	
MD8155	AMD	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	Intel	8155	
		D8155	
		ID8155	
		P8155	
	NEC-Micro	μPD8155	
	Toshiba	TMP8155	
MD8212	AMD	MD8212	
MD8216	AMD	MD8216	
MD8224	AMD	MD8224	
MD8226	AMD	MD8226	
MD8228	AMD	MD8228	
MD8251	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	
MD8286	AMD	MD8286	
MD8287	Amperex	MD8287	
P8035	AMD	8035	
		D8035	
		ID8035	
		P8035	
	Fujitsu	MBL8035	
	Intel	8035	
		D8035	
		ID8035	
	National	INS8035	
	NEC-Micro	μPD8035	
		μPD80C35	
	Signetics	SCN8035	
P8041	AMD	8041	
		D8041	
		P8041	
	Intel	8041A	
		D8041	
	NEC-Micro	μPD8041A	
P8080	AMD	9080	
		9080A	
		AM9080	
	Intel	8080A	
		D8080	
		MD8080	
	National	DP8080A	
		INS8080A	
	NEC-Micro	μPD8080	
	TI	TMS8080	
		TMS8080A	
P8085	AMD	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	Intel	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
	NEC-Micro	μPD8085	
	Toshiba	TMP8085A	
P8088	AMD	P8088	
P8155	AMD	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	Intel	8155	
		D8155	
		ID8155	
		MD8155	
	NEC-Micro	μPD8155	
	Toshiba	TMP8155	
P8156	AMD	8156	
		D8156	
		ID8156	
		P8156	
	Intel	8156	
		D8156	
		ID8156	
	NEC-Micro	μPD8156	
P82	AMD	8253	
		D8253	
		ID8253	
		P8253	
	Intel	8253	
		D8253	
		ID8253	
	National	INS8253	
	NEC-Micro	μPD8253	
P8216	AMD	P8216	
P8224	AMD	P8224	
P8226	AMD	P8226	
P8228	AMD	P8228	
P8237	AMD	AM9517	
	Intel	D8237	
P8238	AMD	P8238	
P8251	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	
P8253-5	AMD	8253-5	
		D8253-5	
		P8253-5	
	Intel	8253-5	
		D8253-5	
	National	INS8253-5	
	NEC-Micro	μPD8253-5	
P8255	AMD	8255A-5	
		9555	
		D8255	
		ID8255	
		P8255	
	Intel	8255A-5	
		D8255	
		ID8255	
	National	INS8255	
	NEC-Micro	8255A	
		μPB8255	
		μPD8225	
		μPD8255	
P8259	AMD	D8259	
		ID8259	
		MD8259	
		P8259	
	Intel	8259	
		D8259	
		ID8259	
		M8259	
	National	INS8259	
	NEC-Micro	μPD8259	
P8279	AMD	P8279	
P8279-5	AMD	8279-5	
		D8279-5	
		P8279-5	
	Intel	8279	
		8279-5	
		D8279-5	
	NEC-Micro	μPD8279-5	
P8286	AMD	P8286	
P8287	AMD	P8287	
SBC-337	National	BLC-337	

Interdesign

1G000	Ferranti	ULA1G000	
1U000	Ferranti	ULA1U000	
2U000	Ferranti	ULA2U000	
3U000	Ferranti	ULA3U000	
ADVFC32	Cherry	CS4000	
MCA	Exar	XRCMA	
	MasterLogic	ML100	
	MicroEng	**MGC110A**	**4437**
	Monosil	ML100	
	Nitron	NC5100	
MCB	Exar	XRCMB	
	MasterLogic	ML150	
	MicroEng	**MGC160B**	**4437**
	Monosil	ML150	
	Nitron	NC5150	
MCC	Exar	XRMC	
	MasterLogic	ML200	
	MicroEng	**MGC210C**	**4437**
	Monosil	ML200	
	Nitron	NC5200	
MCD	Exar	XRCMD	
	MasterLogic	ML350	
	MicroEng	**MGC350D**	**4437**
	Monosil	ML350	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Interdesign (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MCD	Nitron	NC5350	
MCF	Cherry	CS3000	
	Exar	XRF100	
	Interdesign	**MOF**	**4433**
	MicroEng	**MCE-A20F**	**4437**
MOA	Exar	XRA100	
	Interdesign	**MOH**	**4433**
	MicroEng	MCE-A20	
		MCE-A20A	**4437**
MOB	Exar	XRB100	
	MicroEng	**MCE-A20B**	**4437**
MOC	Exar	XRC100A	
	MicroEng	**MCE-A20C**	**4437**
MOD	Exar	XRD100	
	MicroEng	**MCE-A40D**	**4437**
MOE	Cherry	CS2000	
	Exar	XRE100	
	MicroEng	**MCE-A20E**	**4437**
MOF	Cherry	CS3000	
	Exar	XRF100	
	Interdesign	**MOF**	**4433**
	MicroEng	**MCE-A20F**	**4437**
MOG	Cherry	CS2500	
	Exar	XRG100	
	MicroEng	**MCE-A20G**	**4437**
MOH	**MicroEng**	**MCE-A20H**	**4437**
MOJ	Exar	XRJ100	
	MicroEng	**MCE-A20J**	**4437**
MOL	Cherry	CS3200	
	MicroEng	**MCE-A20L**	**4437**
MOM	Exar	XRA100	
	Interdesign	**MOA**	**4433**
	MicroEng	MCE-A20	
		MCE-A20A	**4437**
MSA	Ferranti	ULA2C000	
MSB	Ferranti	ULA5C000	
MSC	Ferranti	ULA9C000	
MUA	Ferranti	ULA2000	
MUB	Ferranti	ULA2L000	
MUC	Ferranti	ULA2H000	

International Microcircuits, Inc.

MASTER MOS	Monosil	Master MOS

Intersil

1CL7109	TeledyneS	7109	
2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
2147	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
2147	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
2764	Fujitsu	MBM2764	
	Hitachi	HN462764	
		HN482764	**3789**
	Intel	**2764**	**3820,3822**
		M2764	
	Mostek	MK2764	
	National	NMC2764	
	NEC-Micro	μPD2764	
	SEEQ	5133	
	Toshiba	TMM2764	
5501	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
AD101	AMD	LM101	
	AD	AD101	
	Fairchild	μA101	
	Motorola	LM101	
	Raytheon	LM101	
	Signetics	LM101	
	SiliconG	SG101	
	TI	LM101	
	Thomson-CSF	SFC2101	
AD301	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
AD308	AMD	LM308	
	AD	**AD308**	**3153**
AD308	Burr-Brown	3500	
		3501	
	Fairchild	μA308	
	Intersil	LM308	
	MicroPwr	MP5505	
	Motorola	LM308	
	National	LM308	
	Raytheon	LM308	
	SiliconG	SG308	
AD503	AD	AD0042	
		AD503	
	Intersil	LH0042	
	National	**LH0042**	**3342**
AD590	AD	AD590	
AD741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
AD7520	AD	AD7520	
	Datel	DAC-HA10B	
	MicroPwr	MP7520	
	National	AD7520	
		DAC1020	**3320**
		DAC1021	**3320**
		DAC1022	**3320**
AD7521	AD	AD7521	
	Datel	DAC-HA12B	
	HybridSys	DAC331-12	
	MicroPwr	MP7521	
	National	AD7521	
		DAC1220	
		DAC1221	
		DAC1222	
AD7523	AD	AD7523	
	MicroPwr	MP7523	
AD7533	AD	AD7533	
	MicroPwr	MP7533	
	National	AD7533	
AD7541	AD	AD7541	
	Datel	DAC-7541	
	HybridSys	HS7541	
	Intersil	ICL7541	
	MicroPwr	**MP7541**	**401,2749**
		MP7621	
	TeledyneS	7541	
ADC0801	National	ADC0801	
	TI	ADC0801	
ADC0802	**National**	**ADC0802**	**3319**
	TI	ADC0802	
ADC0803	Datel	ADC-830	
	National	**ADC0803**	**3319**
	TI	ADC0803	
ADC0804	National	ADC0804	
	TI	ADC0804	
D123	Siliconix	D123	
D125	Siliconix	D125	
	TeledyneC	CDR125	
DG111	Siliconix	DG111	
		DGM111	
DG118	Siliconix	DG172	
DG123	Siliconix	DG123	
DG125	Siliconix	DG125	
DG126	Siliconix	DG126	
DG129	Siliconix	DG129	
DG133	Siliconix	DG133	
DG134	Siliconix	DG134	
DG139	Siliconix	DG139	
DG140	Siliconix	DG140	
DG141	Siliconix	DG141	
DG142	Siliconix	DG142	
DG143	Siliconix	DG143	
DG144	Siliconix	DG144	
DG145	Siliconix	DG145	
DG146	Siliconix	DG146	
DG151	Siliconix	DG151	
DG152	Siliconix	DG152	
DG153	Siliconix	DG153	
DG154	Siliconix	DG154	
DG161	Siliconix	DG161	
DG162	Siliconix	DG162	
DG163	Siliconix	DG163	
DG164	Siliconix	DG164	
DG180	Siliconix	DG180	
DG181	**Harris**	**HI381**	**2635,3288**
		HI5048	
	Intersil	IH5048	
	Siliconix	DG181	
		DG381	
DG182	Siliconix	DG182	
	TI	TL182	
DG183	Siliconix	DG183	
DG184	**Harris**	**HI384**	**2635,3288**
		HI5049	
	Intersil	IH5049	
	Siliconix	DG184	
		DG384	
DG185	Harris	HI5045	
	Intersil	IH5045	
	Siliconix	DG185	
		DG5045	
	TI	TL185	
DG186	Siliconix	DG186	
DG187	Harris	HI-5050	
		HI387	**2635,3288**
		HI5050	
	Intersil	IH5050	
	Siliconix	DG187	
		DG387	
DG188	Harris	HI5042	
	Intersil	IH5042	
	Siliconix	DG188	
		DG5042	
	TI	TL188	
DG189	Siliconix	DG189	
DG190	Harris	HI-5051	
	Intersil	IH5051	
	Siliconix	DG190	
DG191	Harris	HI5043	
	Intersil	IH5043	
	Siliconix	DG191	
		DG243	
		DG5043	
DG426	Siliconix	DG126	
DG464	Siliconix	DG164	
G115	Siliconix	G115	
G116	Siliconix	G116	
G117	Siliconix	G117	
G118	Siliconix	G118	
G119	Siliconix	G119	
G123	Siliconix	G123	
G125	Siliconix	G125	
G126	Siliconix	G126	
G127	Siliconix	G127	
G128	Siliconix	G128	
G129	Siliconix	G129	
G130	Siliconix	G130	
G131	Siliconix	G131	
G132	Siliconix	G132	
HA-2602	**Datel**	**AM-460-2**	**2622**
	Harris	**HA-2605**	**3226,3287**
	Intersil	HA-2605	
		HA2605	
	Motorola	MC1456	
	Signetics	MC1456	
	SiliconG	SG1456	
	TI	MC1456	
HA-2605	**Datel**	**AM-460-2**	**2622**
	Harris	**HA-2605**	**3226,3287**
	Intersil	HA-2602	
		HA2605	
	Motorola	MC1456	
	Signetics	MC1456	
	SiliconG	SG1456	
	TI	MC1456	
HA-2622	AD	AD507	
	Burr-Brown	3508	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Intersil		**(Cont'd)**	
HA-2622	Datel	AM-462-1	
		AM-462-2	**2622**
	Harris	**HA-2620**	**3228,3287**
		HA-2622	**3228,3287**
		HA-2625	**3228,3287**
	Intersil	HA-2625	
		HA2620	
		HA2625	
HA-2625	AD	AD507	
	Burr-Brown	3508	
	Datel	AM-462-1	
		AM-462-2	**2622**
	Harris	**HA-2620**	**3228,3287**
		HA-2622	**3228,3287**
		HA-2625	**3228,3287**
	Intersil	HA-2622	
		HA2620	
		HA2625	
HA2500	**Harris**	**HA-2500**	**3216,3287**
HA2502	Datel	AM-450-2M	
	Harris	**HA-2502**	**3216,3287**
HA2505	AD	AD540	
	Burr-Brown	3503	
	Datel	**AM-450-2**	**2622**
	Harris	**HA-2505**	**3216,3287**
	Intersil	HA2525	
	MicroPwr	MP5501	
	PMI	OP01	
HA2507	Harris	HA-2507	
HA2510	**Harris**	**HA-2510**	**3218,3287**
HA2512	**Harris**	**HA-2512**	**3218,3287**
HA2515	**Harris**	**HA-2515**	**3218,3287**
HA2517	Fairchild	F40085	
	Harris	HA-2517	
HA2522	Datel	AM-452-2M	
	Harris	**HA-2522**	**3220,3287**
HA2525	AD	AD540	
	Burr-Brown	3503	
	Datel	**AM-450-2**	**2622**
	Harris	**HA-2505**	**3216,3287**
	Intersil	HA2505	
	MicroPwr	MP5501	
	PMI	OP01	
HA2527	Harris	HA-2527	
HA2600	**Harris**	**HA-2600**	**3226,3287**
	Motorola	MC1556	
	Signetics	MC1556	
	SiliconG	SG1556	
	TeledyneP	1326	
	TI	MC1556	
HA2602	Datel	AM-460-2M	
	Harris	**HA-2602**	**3226,3287**
HA2605	**Datel**	**AM-460-2**	**2622**
	Harris	**HA-2605**	**3226,3287**
	Intersil	HA-2602	
		HA-2605	
	Motorola	MC1456	
	Signetics	MC1456	
	SiliconG	SG1456	
	TI	MC1456	
HA2607	Harris	HA-2607	
HA2620	AD	AD507	
	Burr-Brown	3508	
	Datel	AM-462-1	
		AM-462-2	**2622**
	Harris	**HA-2620**	**3228,3287**
		HA-2622	**3228,3287**
		HA-2625	**3228,3287**
	Intersil	HA-2622	
		HA-2625	
		HA2625	
HA2625	AD	AD507	
	Burr-Brown	3508	
	Datel	AM-462-1	
		AM-462-2	**2622**
	Harris	**HA-2620**	**3228,3287**
		HA-2622	**3228,3287**
		HA-2625	**3228,3287**
	Intersil	HA-2622	
		HA-2625	
		HA2620	
HA2627	Harris	HA-2627	
ICL108	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	µA108	
		µA725	
	Intel	ISBC108	
	Intersil	LM108	
ICL108	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	µPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	µA714	
ICL7106	**MicroPwr**	**MP7138**	**401,2749**
	Siliconix	LD131	
	TeledyneS	7106	
		8751	
ICL7107	TeledyneS	7107	
ICL7116	TeledyneS	7116	
ICL7117	TeledyneS	7117	
ICL7126	TeledyneS	7126	
ICL7211	Siliconix	DF412	
ICL741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		µA741	
	Hitachi	HA17741	
	Intersil	AD741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	µPC151	
		µPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	µA741	
	SiliconG	SG300	
		SG741	
	TI	µA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
ICL741HS	PMI	OP-19	
ICL7541	AD	AD7541	
	Datel	DAC-7541	
	HybridSys	HS7541	
	Intersil	AD7541	
	MicroPwr	**MP7541**	**401,2749**
		MP7621	
	TeledyneS	7541	
ICL7555	Exar	XRL555	
ICL7556	Exar	XRL556	
ICL8007	AD	AD8007	
ICL8013	AD	AD530	
		AD533	
	Burr-Brown	4203	
ICL8021	Fairchild	µA776	
	Harris	**HA-2720**	**3236**
	Intersil	LM4250	
	Motorola	MC1776	
	National	LM4250	
	SiliconG	SG4250	
	Solitron	UC4250	
ICL8038	**Exar**	**XR8038**	**3198**
ICL8069	AD	AD589	
	Datel	VR-8069	
	Ferranti	ZN423	
	MicroPwr	**MP5010**	**401,3292**
	National	**LM113**	**3304**
		LM313	**3304**
	TeledyneS	9491	
		9941	
ICL8240	Exar	XR2240	
	Fairchild	µA2240	
	TI	µA2240	
IH200	AD	ADG200	
	Harris	HI200	
	MicroPwr	MP200	
		MP7513	
	PMI	SW-05	
	Siliconix	DG200	
IH5009	National	AH5009	
		AM9709	
		AM97C09	
IH5010	National	AH5010	
		AM9710	
		AM97C10	
IH5011	National	AH5011	
		AM9711	
		AM97C11	
IH5012	National	AH5012	
		AM9712	
		AM97C12	
IH5013	National	AH5013	
IH5014	National	AH5014	
IH5015	National	AH5015	
IH5016	National	AH5016	
IH5040	Harris	HI5040	
	Siliconix	DG5040	
IH5041	Harris	HI5041	
	Siliconix	DG5041	
IH5042	Harris	HI5042	
	Intersil	DG188	
	Siliconix	DG188	
		DG5042	
	TI	TL188	
IH5043	Harris	HI5043	
	Intersil	DG191	
	Siliconix	DG191	
		DG243	
		DG5043	
IH5044	Harris	HI5044	
	Siliconix	DG5044	
IH5045	Harris	HI5045	
	Intersil	DG185	
	Siliconix	DG185	
		DG5045	
	TI	TL185	
IH5046	Harris	HI5046	
IH5047	Harris	HI5047	
IH5048	**Harris**	**HI381**	**2635,3288**
		HI5048	
	Intersil	DG181	
	Siliconix	DG181	
		DG381	
IH5049	**Harris**	**HI384**	**2635,3288**
		HI5049	
	Intersil	DG184	
	Siliconix	DG184	
		DG384	
IH5050	Harris	HI-5050	
		HI387	**2635,3288**
		HI5050	
	Intersil	DG187	
	Siliconix	DG187	
		DG387	
IH5051	Harris	HI-5051	
	Intersil	DG190	
	Siliconix	DG190	
IH5052	Siliconix	DG211	
IH6108	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
IH6116	AD	AD7506	
IH6116	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
		MX-1606	**2622**
	Fairchild	F4067	
	Harris	HI1840	
		HI506	
		HI506A	
	MicroPwr	MP7506	
	Motorola	MC14067	
	PMI	MUX-16	
	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
IH6208	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**
	TeledyneP	4553	
IH6216	AD	AD7507	
	Burr-Brown	MPC8D	
	Datel	**MVD-807**	**2622**
		MXD-807	**2622**
	Harris	HI507	
		HI507A	
	MicroPwr	MP7507	
	PMI	MUX-28	
	Siliconix	DG507	
		DG507A	**2802**
	TeledyneP	4551	
IM2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	µPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
◆IM5603	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	**3696**
	Intel	M3601	
	MMI	5300-1	
		6300-1	**3826**
	National	DM54S387	
		DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
	TI	**TBP24SA10**	
			440,3967
		TBP24SA10M	
			440,3967
◆IM5610	AMD	AM27LS19	
		AM27S19	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Intersil (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
◆IM5610	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	**3826**
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	**TBP18S030**	**440,3965**
		TBP18S030M	**440,3965**
IM5623	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
		HM7611-2	**3696**
	Intel	M3621	
	MMI	5301-1	
		6301-1	**3826**
	National	DM54S287	
		DM74S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
	TI	**TBP24S10**	**440,3967**
IM6100	Harris	HM6100	
IM6101	Harris	HD6101	
IM6312	Harris	HM6322	
IM6504	Fujitsu	MB8404	
	National	NMC6504	
	RCA	CDM5104	
IM6514	Fujitsu	MB8414	
	Harris	HM6514	
	Hitachi	**HM4334**	**3789**
	MicroPwr	MP6514	
	Mitsubishi	M58981	
	National	NMC6514	
	NEC-Micro	μPD444/6514	
		μPD6514	
	OKI	**MSM5115**	**3873**
	RCA	MWS5114	
		MWS5514	
	Toshiba	TC5514	
IM6518-1	Harris	6518	
		HM6518	**669,1333,3756**
	National	MM74C930	
IM6551	**Harris**	**HM6551**	**669,1333,3758**
	National	MM74C920	
		NMC6551	
	NEC-Micro	μPD5101	
	RCA	MWS5101	
IM6561	**Harris**	**HM6561**	**669,1333,3760**
IM7027	Mostek	MK4027	
	SGS	M4027	
IM7116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
IM7118	AMD	AM4516	
IM7118	Fujitsu	MB8118	
	Hitachi	HM4816	
		HM4816A	
	Intel	2118	
	Mostek	4516	
		MK4516	
	National	NMC5295	
	NEC-Micro	2118	
	TI	TMS4516	
IM7141	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
IM7332	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
IM7364	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
LF155	AMD	LF155	
	Motorola	LF155	
	National	**LF155**	**3309**
	PMI	PM155	
	Signetics	LF155	
LF156	AMD	LF156	
	MicroPwr	OP-16	
	Motorola	LF156	
	National	**LF156**	**3309**
	PMI	OP-16	
		PM156	
	Signetics	LF156	
LF157	AMD	LF157	
	MicroPwr	OP-17	
	Motorola	LF157	
	National	**LF157**	**3309**
	PMI	OP-17	
		PM157	
LF355	AMD	LF355	
	Motorola	LF355	
	National	**LF355**	**3309**
	PMI	PM355	
	Signetics	LF355	
LF356	AMD	LF356	
	Motorola	LF356	
	National	**LF356**	**3309**
	PMI	PM356	
	Signetics	LF356	
LF357	AMD	LF357	
	Motorola	LF357	
	National	**LF357**	**3309**
	PMI	PM357	
LH0042	AD	AD0042	
		AD503	
	Intersil	AD503	
	National	**LH0042**	**3342**
LH2101	AMD	LH2101	
	National	LH2101	
	Raytheon	LH2101	
	Signetics	LH2101	
LH2108	**National**	**LH2108**	**3342**
	PMI	PM2108	
LH2108A	**National**	**LH2108A**	**3342**
	PMI	PM2108A	
LH2110	**National**	**LH2110**	**3342**
LH2111	AMD	LH2111	
	National	**LH2111**	**3317**
	Raytheon	LH2111	
LH2208A	**National**	**LH2208A**	**3342**
	PMI	PM2208A	
LH2301	AMD	LH2301	
	National	LH2301	
LH2308	**National**	**LH2308**	**3342**
	PMI	PM2308	
	Signetics	LH2308	
LH2308A	**National**	**LH2308A**	**3342**
	PMI	PM2308A	
LH2310	National	LH2310	
LH2311	AMD	LH2311	
	National	LH2311	
LM105	AMD	LM105	
	Fairchild	μA105	
	National	LM105	
	SiliconG	SG105	
	Thomson-CSF	SFC2105	
LM107	AMD	LM107	
	AD	**AD741S**	**3153**
	National	LM107	
	Raytheon	LM107	
	SiliconG	SG107	
	TI	LM107	
		SN55107	
	Thomson-CSF	SFC2107	
LM108	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
LM110	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM310	
	National	LM110	
		LM210	
		LM310	
LM110	PMI	BUF-01	
		BUF-02	
		BUF-03	
	SiliconG	SG110	
		SG210	
		SG310	
LM111	AMD	LM111	
	AD	AD111	
	Fairchild	μA111	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM111	
	National	**LM111**	**3317**
	PMI	PM111	
	Raytheon	LM111	
	Signetics	LM111	
	SiliconG	SG111	
	TI	LM111	
	Thomson-CSF	SFC2111	
LM124A	AMD	LM124A	
	Motorola	LM124A	
	National	LM124A	
	Raytheon	LM124A	
	RCA	CA124A	
	Signetics	LM124A	
	SiliconG	SG124	
	TI	LM124A	
LM139	AMD	LM139	
	Fairchild	μA139	
	Motorola	LM139	
	National	**LM139**	**3317**
	PMI	CMP-04	
		PM139	
	Raytheon	LM139	
	RCA	CA139	
	Signetics	LM139	
	SiliconG	SG139	
	TI	LM139	
◆LM139A	AMD	LM139A	
	Motorola	LM139A	
	National	**LM139A**	**3317**
	PMI	CMP-04	
		PM139A	
	RCA	CA139A	
	SiliconG	SG139A	
LM2902	Fairchild	μA2902	
	Hitachi	HA17902	
	Motorola	LM2902	
	National	LM2902	
	NEC-Electron	μPC2902	
	Raytheon	LM2902	
	TI	LM2902	
LM302	AMD	LM302	
	National	LM302	
	SiliconG	SG302	
LM305	AMD	LM305	
	Fairchild	μA305	
	National	LM305	
	NEC-Electron	μPC141	
	SiliconG	SG305	
	Thomson-CSF	SFC2305	
LM307	AMD	LM307	
	AD	**AD741J**	**3153**
	Motorola	LM307	
	National	LM307	
	Raytheon	LM307	
	RCA	CA307	
	SiliconG	SG307	
	TI	LM307	
	Thomson-CSF	SFC2307	
LM308	AMD	LM308	
	AD	**AD308**	**3153**
	Burr-Brown	3500	
		3501	
	Fairchild	μA308	
	Intersil	AD308	
	MicroPwr	MP5505	
	Motorola	LM308	
	National	LM308	
	Raytheon	LM308	
	SiliconG	SG308	
LM310	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM110	
	National	LM110	
		LM210	
		LM310	
	PMI	BUF-01	
		BUF-02	
		BUF-03	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Intersil (Cont'd)			
LM310	SiliconG	SG110	
		SG210	
		SG310	
LM311	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
◆LM324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
LM339	AMD	LM339	
		LM339A	
	Fairchild	μA339	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
		LM339	
	SiliconG	SG339	
	TI	LM339	
◆LM348	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
LM4250	Fairchild	μA776	
	Harris	**HA-2720**	**3236**
	Intersil	ICL8021	
	Motorola	MC1776	
	National	LM4250	
	SiliconG	SG4250	
	Solitron	UC4250	
LM723	Fairchild	μA723	
LM723	Hitachi	HA17723	
	Motorola	**MC1723**	**3295**
	National	LM723	
	Raytheon	RC723	
		RM723	
	RCA	CA723	
		LM723	
	SGS	L123	
	Signetics	μA723	
	SiliconG	SG723	
	TI	μA723	
	Thomson-CSF	SFC2723	
LM740	Signetics	NE536	
		μA740	
LM748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
MM452	Siliconix	SI452	
MM455	Siliconix	SI455	
◆MM552	Siliconix	SI552	
◆MM555	Siliconix	SI555	
NE555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
NE556	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
SE555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
SE555	SiliconG	SG555	
	TI	NE555	
		SE555	
SU536	Signetics	SU536	
μA733	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		μA733	
	SiliconG	SG733	
	TI	μA733	
μA748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
μA777	TI	μA777	

ITT Semiconductors

Manufacturer Device	Replacement Source	Device	IC Master Page
4547	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
88205	Mitel	MH88205	
		MH88305	
DF320	GTEMicro	G4320	
	Mitel	MT4320	
	Nitron	NC2320	
	Siliconix	DF320	
DF322	Mitel	MT4322	
	Nitron	NC2322	
ITT4116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
TBA950	National	TBA950	
	Plessey	TBA950	

Lambda Semiconductors

Manufacturer Device	Replacement Source	Device	IC Master Page
ALS18μ	Fairchild	μA79HG	
LAS1405	Fairchild	SH0323	
		SH323	
		μA78H05	
	Lambda	LAS1905	
	Motorola	**LM323**	**3294**
		MC78T05C	
	National	**LM323**	**3299**
	SiliconG	SG323	
LAS1905	Fairchild	SH0323	
		SH323	
		μA78H05	
	Lambda	LAS1405	
	Motorola	**LM323**	**3294**
		MC78T05C	
	National	**LM323**	**3299**
	SiliconG	SG323	
LAS1912	Fairchild	μA78H12A	
LAS3905	Fairchild	μA78P05	
LLM209	Fairchild	μA209	
	Motorola	LM209	
	National	LM209	
	SiliconG	SG209	
	Thomson-CSF	SFC2209	
LLM220	National	LM220	
	SiliconG	SG220	
LLM223	**Motorola**	**LM223**	**3294**
	National	**LM223**	**3299**
	SiliconG	SG223	
LLM309	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
LLM320	National	LM320	
LLM340	National	LM340	
LMC7805	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
LMC7806	Fairchild	μA7806	
	Lambda	LμA7806	
	Motorola	MC7806	
	SiliconG	SG340-6	
		SG7806	
	TI	μA7806	
LMC7808	Fairchild	μA7808	
	Lambda	LμA7808	
	Motorola	**MC7808**	**3294**
	NEC-Electron	μPC7808	
	SiliconG	SG340-8	
		SG7808	
	TI	LM340-8	
		μA7808	
LMC7812	Fairchild	μA7812	
	Lambda	LμA7812	
	Motorola	**MC7812**	**3294**
	National	LM7812	
	NEC-Electron	μPC7812	
	SGS	L7812	
	SiliconG	SG7812	
	TI	μA7812	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Lambda Semiconductors (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LMC7812	Toshiba	TA78012	
LMC7815	Fairchild	μA7815	
		μA78L15	
	Lambda	LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
LMC7818	Fairchild	μA7818	
	NEC-Electron	μPC7818	
	SiliconG	SG340-18	
		SG7818	
	TI	LM340-18	
		μA7818	
LMC7824	Fairchild	μA7824	
	Lambda	LμA7824	
	Motorola	MC7824	
	NEC-Electron	μPC7824	
	SGS	L7824	
	SiliconG	SG7824	
	TI	LM340-24	
		μA7824	
LMC7902	Fairchild	μA7902	
	Lambda	LμA7902	
	Motorola	MC7902	
LMC7905	Fairchild	μA7905	
		μA79M05	
	Lambda	LμA7905	
	Motorola	MC7905	
	National	LM320MP5	
		LM7905	
		LM79M05	
	SiliconG	SG120-5	
		SG320-05	
		SG320P-5	
		SG7905	
	TI	μA7905	
	Fairchild	MC7905	
	Motorola	MC7905	
	SiliconG	SG7905	
LMC7906	Motorola	MC7906	
	TI	μA7906	
LMC7908	Fairchild	MC7908	
		μA7908	
		μA79M08	
	Lambda	LμA7908	
	Motorola	MC7908	
	SiliconG	SG7908	
	TI	μA7908	
		μA79M08	
LMC7912	Motorola	MC7912	
	SiliconG	SG7912	
LMC7924	Motorola	MC7924	
	TI	μA7924	
LμA7805	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
LμA7806	Fairchild	μA7806	
	Lambda	LMC7806	
	Motorola	MC7806	
	SiliconG	SG340-6	
		SG7806	
LμA7806	TI	μA7806	
LμA7808	Fairchild	μA7808	
	Lambda	LMC7808	
	Motorola	**MC7808**	**3294**
	NEC-Electron	μPC7808	
	SiliconG	SG340-8	
		SG7808	
	TI	LM340-8	
		μA7808	
LμA7812	Fairchild	μA7812	
	Lambda	LMC7812	
	Motorola	**MC7812**	**3294**
	National	LM7812	
	NEC-Electron	μPC7812	
	SGS	L7812	
	SiliconG	SG7812	
	TI	μA7812	
	Toshiba	TA78012	
LμA7815	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
LμA7824	Fairchild	μA7824	
	Lambda	LMC7824	
	Motorola	MC7824	
	NEC-Electron	μPC7824	
	SGS	L7824	
	SiliconG	SG7824	
	TI	LM340-24	
		μA7824	
LμA7902	Fairchild	μA7902	
	Lambda	LMC7902	
	Motorola	MC7902	
LμA7905	Fairchild	μA7905	
		μA79M05	
	Lambda	LMC7905	
	Motorola	MC7905	
	National	LM320MP5	
		LM7905	
		LM79M05	
	SiliconG	SG120-5	
		SG320-05	
		SG320P-5	
		SG7905	
	TI	μA7905	
LμA7908	Fairchild	MC7908	
		μA7908	
		μA79M08	
	Lambda	LMC7908	
	Motorola	MC7908	
	SiliconG	SG7908	
	TI	μA7908	
		μA79M08	
LμA7915	Fairchild	μA7915	
	Motorola	MC7915	
	National	LM120-15	
		LM320-15	
		LM320T15	
		LM7915	
	SiliconG	SG120-15	
		SG320-15	
		SG7915	
	TI	μA7915	
LμA7918	Motorola	MC7918	
	TI	μA7918	

LSI logic

Manufacturer Device	Replacement Source	Device	IC Master Page
LC10000	AMI	UA-5	
	CalDevices	HC10000	
LC12600	AMI	UA-6	
	CalDevices	HC12600	
LC3100	AMI	UA-1	
	CalDevices	HC3100	
LC4100	AMI	UA-2	
	CalDevices	HC4100	
LC5400	AMI	UA-3	
	CalDevices	HC5400	
LC7700	AMI	UA-4	
	CalDevices	HC7700	
LCA1200	National	MCA1200	
LCA600	National	MCA600	

Master Logic Corporation

Manufacturer Device	Replacement Source	Device	IC Master Page
MASTERMOS	Monosil	MONOLOGIC	
ML100	Exar	XRCMA	
	Interdesign	**MCA**	**4433**
	MicroEng	**MGC110A**	**4437**
	Monosil	ML100	
	Nitron	NC5100	
ML150	Exar	XRCMB	
	Interdesign	**MCB**	**4433**
	MicroEng	**MGC160B**	**4437**
	Monosil	ML150	
	Nitron	NC5150	
ML200	Exar	XRMC	
	Interdesign	**MCC**	**4433**
	MicroEng	**MGC210C**	**4437**
	Monosil	ML200	
	Nitron	NC5200	
ML350	Exar	XRCMD	
	Interdesign	**MCD**	**4433**
	MicroEng	**MGC350D**	**4437**
	Monosil	ML350	
	Nitron	NC5350	
ML50	**MicroEng**	**MGC50**	**4437**
	Monosil	ML50	
	Nitron	NC5050	
ML500	**MicroEng**	**MGC500**	**4437**
	Monosil	ML500	
	Nitron	NC5500	
ML600	**MicroEng**	**MGC600**	**4437**
	Monosil	ML600	
	Nitron	NC5600	
ML7003	SPI	SP7003	
ML7005	SPI	SP7005	
ML7010	SPI	SP7010	
ML7015	SPI	SP7015	
ML7020	SPI	SP7020	

Micro Networks

Manufacturer Device	Replacement Source	Device	IC Master Page
DAC80	AD	ADDAC80	
		ADDAC85	
	Burr-Brown	DAC80	
		DAC85	
	Datel	DAC-85	
		DAC-HZ12B	
	HybridSys	DAC335	
		DAC9356	
		HSDAC80	
	MicroNet	DAC85	
	National	DAC1280	
		DAC1285	**3345**
DAC85	AD	ADDAC80	
		ADDAC85	
	Burr-Brown	DAC80	
		DAC85	
	Datel	DAC-85	
		DAC-HZ12B	
	HybridSys	DAC335	
		DAC9356	
		HSDAC80	
	MicroNet	DAC80	
	National	DAC1280	
		DAC1285	**3345**
MN3000	HybridSys	DAC337-0	
MN3001	HybridSys	DAC337-1	
MN3002	HybridSys	DAC337-2	
MN3003	HybridSys	DAC337-3	
MN3004	HybridSys	DAC337-4	
MN3005	HybridSys	DAC337-5	
MN3006	HybridSys	DAC337-6	
MN3007	HybridSys	DAC337-7	
◆MN301	MicroPwr	DAC01	
		MP5520	
	PMI	DAC-01	
		DAC01	
MN3210	AD	AD370	
		AD371	
	HybridSys	DAC346	
		DAC347	
	MicroNet	MN3211	
		MN370	
		MN371	
MN3211	AD	AD370	
		AD371	
MN3211	HybridSys	DAC346	
		DAC347	
	MicroNet	MN3210	
		MN370	
		MN371	
MN3349	HybridSys	DAC349	
MN346	HybridSys	HS346	
MN370	AD	AD370	
		AD371	
	HybridSys	DAC346	
		DAC347	
	MicroNet	MN3210	
		MN3211	
		MN371	
MN371	AD	AD370	
		AD371	
	HybridSys	DAC346	
		DAC347	
	MicroNet	MN3210	
		MN3211	
		MN370	
MN3860	DDC	DAC-SL	
MN5101	**Datel**	**ADC-5101**	**2621**
	DDC	DDC5101	
MN5131	HybridSys	HS5131	
MN5150	HybridSys	HS5150	
MN5201	AD	AD5201	
MN5202	AD	AD5202	
MN5203	AD	AD5203	
MN5204	AD	AD5204	
MN5205	AD	AD5205	
MN5206	AD	AD5206	
MN5207	AD	AD5207	
MN5210	**AD**	**AD5210**	**3174**
	Datel	**ADC-5210**	**2621**
	HybridSys	HS5210	
	DDC	DDC5210	
	TeledyneP	TP5210	
MN5211	**Datel**	**ADC-5211**	**2621**
	HybridSys	HS5211	
	DDC	DDC5211	
	TeledyneP	TP5211	
MN5212	**Datel**	**ADC-5212**	**2621**
	HybridSys	HS5212	
	DDC	DDC5212	
	TeledyneP	TP5212	
MN5213	**Datel**	**ADC-5213**	**2621**
	HybridSys	HS5213	
		MN5214	
	MicroNet	MN5214	
	TeledyneP	TP5213	
		TP5214	
MN5214	**Datel**	**ADC-5213**	**2621**
	HybridSys	HS5213	
		MN5214	
	MicroNet	MN5213	
	TeledyneP	TP5213	
		TP5214	
MN5215	**Datel**	**ADC-5214**	**2621**
	HybridSys	HS5215	
	TeledyneP	TP5215	
MN5216	**Datel**	**ADC-5216**	**2621**
	HybridSys	ADC582	
		HS5216	
	DDC	DDC5216	
MN5240	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Micro Networks (Cont'd)			
MNAD787	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
MNADC84	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC85	
	TeledyneP	TDADC84	
		TPADC87	
MNADC85	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
	TeledyneP	TDADC84	
		TPADC87	
MNDAC71	AD	DAC71	
	Burr-Brown	DAC71	
		DAC72	
	Datel	DAC-71	
		DAC-72	
		DAC-HP16	
MNDAC87	AD	ADDAC87	
	Burr-Brown	DAC851	
		DAC87	
	Datel	DAC-687	
		DAC-87	
MNDAC87	HybridSys	DAC335	
		HSDAC87	
MNDACHK	Datel	DAC-HK	

Micro Power Systems

Manufacturer Device	Replacement Source	Device	IC Master Page
9377	HybridSys	DAC9377	
	MicroPwr	MP377	
COMP-01	MicroPwr	COMP-02	
	PMI	CMP-01	
		CMP-02	
COMP-02	MicroPwr	COMP-01	
	PMI	CMP-01	
		CMP-02	
DAC-100	PMI	DAC-100	
DAC01	MicroPwr	MP5520	
	PMI	DAC-01	
		DAC01	
MP200	AD	ADG200	
	Harris	HI200	
	Intersil	IH200	
	MicroPwr	MP7513	
	PMI	SW-05	
	Siliconix	DG200	
MP201	AD	ADG201	
	Harris	HI201	
	National	**LF11201**	**3318**
		LF13201	**3318**
	PMI	SW-01	
		SW-201	
	Siliconix	DG201	
MP2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
MP2114C	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
MP2364	AMI	9264	
		9265	
MP2364	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
MP2365	Intel	2364A	
MP3140	Datel	DAC-HA14	
	HybridSys	HS3140	
MP370	HybridSys	DAC370	
MP377	HybridSys	DAC9377	
	MicroPwr	9377	
MP377-18	**HybridSys**	**DAC377-18**	**2745**
MP5010	AD	AD589	
	Datel	VR-8069	
	Ferranti	ZN423	
	Intersil	ICL8069	
	National	**LM113**	**3304**
		LM313	**3304**
	TeledyneS	9491	
		9941	
MP5071	MicroPwr	MP5701	
	Motorola	MC3357	
MP5078	**Motorola**	**MC3420**	**3297**
		MC3520	**3297**
MP517	AD	AD510	
		AD517	
		ADOP-07	**3153**
	Burr-Brown	3510	
	Datel	AM-430	
		AM-490-2	
	Fairchild	μA714	
	Harris	HA-2900	
		HA-2905	
		HA-5130	
		HA-5135	
	MicroPwr	MP5505	
		MP5507	
		OP-05	
		OP-07	
	National	**LH0044**	**3342**
	NEC-Electron	μPC725	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TeledyneP	1340	
	TI	OP-07	
MP5501	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
MP5502	AMD	SSS741	
	MicroPwr	MP5501	
		OP-02	
	PMI	OP-02	
		SSS741	
MP5505	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
MP5507	**AD**	**ADOP-07**	**3153**
	MicroPwr	MP5505	
		OP-05	
		OP-07	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TI	OP-07	
MP5508	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
MP5509	Exar	XR4136	
		XR4136M	
	Fairchild	μA4136	
	PMI	OP-09	
		PM4136	
	Raytheon	RC4136	
		RM4136	
	SiliconG	SG4136	
		SG4136C	
	TI	RC4136	
		RM4136	
MP5510	MicroPwr	OP-10	
	PMI	OP-10	
MP5511	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Micro Power Systems (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MP5511	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
MP5520	MicroPwr	DAC01	
	PMI	DAC-01	
		DAC01	
MP5524	MicroPwr	OP24	
	PMI	OP12	
		OP24	
MP5527	MicroPwr	OP27	
	PMI	OP27	
MP5531	MicroPwr	REF-02	
	PMI	REF-02	
	TeledyneS	9495	
MP5532	HybridSys	HSREF01	
	MicroPwr	REF-01	
	Motorola	**MC1404-10**	**2761**
		MC1504-10	**2761**
	PMI	REF-01	
	TeledyneS	9496	
MP5534	MicroPwr	OP34	
	PMI	OP34	
MP5537	MicroPwr	OP37	
	PMI	OP37	
MP561	AD	AD561	
MP562	AMD	AM6012	
	AD	AD562	
	Burr-Brown	DAC862	
	Datel	DAC-562	
		DAC-681	
		DAC-681C	
	Harris	HI562	
		HI562-5	
	MicroEng	MCE-6012	
	Motorola	**AD562**	**2759**
	PMI	DAC12	
	Signetics	**AM6012**	**3383**
		DAC-312	
	TeledyneP	4068	
MP5701	MicroPwr	MP5071	
	Motorola	MC3357	
MP571	AD	AD571	
	Fairchild	μA571	
	MicroEng	MCE-571	
MP6116	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
MP6117	Hitachi	HM6117	
	NEC-Micro	μPD447	
MP6118	**Fujitsu**	**MB8417**	**3676**
	Toshiba	TC5517	
MP6504	**Harris**	**HM6504-9**	**669,1333,3762**
MP6514	Fujitsu	MB8414	
	Harris	HM6514	
	Hitachi	**HM4334**	**3789**
	Intersil	IM6514	
	Mitsubishi	M58981	
	National	NMC6514	
	NEC-Micro	μPD444/6514	
		μPD6514	
	OKI	**MSM5115**	**3873**
	RCA	MWS5114	
		MWS5514	
MP6514	Toshiba	TC5514	
MP7138	Intersil	ICL7106	
	Siliconix	LD131	
	TeledyneS	7106	
		8751	
MP7501	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
MP7502	AD	AD7502	
	Fairchild	F4052	
	Harris	HI1828	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
MP7503	AD	AD7503	
	Datel	**MV-808**	**2622**
	Harris	HI1818A	
MP7506	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
		MX-1606	**2622**
	Fairchild	F4067	
	Harris	HI1840	
		HI506	
		HI506A	
	Intersil	IH6116	
	Motorola	MC14067	
	PMI	MUX-16	
	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
MP7507	AD	AD7507	
	Burr-Brown	MPC8D	
	Datel	**MVD-807**	**2622**
		MXD-807	**2622**
	Harris	HI507	
		HI507A	
	Intersil	IH6216	
	PMI	MUX-28	
	Siliconix	DG507	
		DG507A	**2802**
	TeledyneP	4551	
MP7508	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
MP7509	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	Motorola	MC14052	
MP7509	**National**	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**
	TeledyneP	4553	
MP7510	AD	AD7510	
	PMI	SW7510	
MP7511	AD	AD7511	
	PMI	SW7511	
MP7512	AD	AD7512	
MP7513	AD	ADG200	
	Harris	HI200	
	Intersil	IH200	
	MicroPwr	MP200	
	PMI	SW-05	
	Siliconix	DG200	
MP7516	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
MP7520	AD	AD7520	
	Datel	DAC-HA10B	
	Intersil	AD7520	
	National	AD7520	
		DAC1020	**3320**
		DAC1021	**3320**
		DAC1022	**3320**
MP7521	AD	AD7521	
	Datel	DAC-HA12B	
	HybridSys	DAC331-12	
	Intersil	AD7521	
	National	AD7521	
		DAC1220	
		DAC1221	
		DAC1222	
MP7522	AD	AD7522	
MP7523	AD	AD7523	
	Intersil	AD7523	
MP7524	AD	AD7524	
MP7530	AD	AD7530	
MP7531	AD	AD7531	
MP7533	AD	AD7533	
	Intersil	AD7533	
	National	AD7533	
MP7541	AD	AD7541	
	Datel	DAC-7541	
	HybridSys	HS7541	
	Intersil	AD7541	
		ICL7541	
	MicroPwr	MP7621	
	TeledyneS	7541	
MP7550	AD	AD7550	
MP7570	AD	AD7570	
MP7574	AD	AD7574	
MP7581	AD	AD7581	
MP7616	AD	AD7546	
	MicroPwr	**MP7623**	**401,2749**
MP7621	AD	AD7541	
	Datel	DAC-7541	
	HybridSys	HS7541	
	Intersil	AD7541	
		ICL7541	
	MicroPwr	**MP7541**	**401,2749**
	TeledyneS	7541	
MP7622	AD	AD7622	
	HybridSys	HS3120	
MP7623	AD	AD7546	
	MicroPwr	MP7616	
MP9331	HybridSys	DAC9331	
		DAC9337	
MP9377-16	HybridSys	DAC9377-16	
OP-02	AMD	SSS741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
	PMI	OP-02	
		SSS741	
OP-05	**AD**	**ADOP-07**	**3153**
	MicroPwr	MP5505	
		MP5507	
		OP-07	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TI	OP-07	
OP-07	**AD**	**ADOP-07**	**3153**
	MicroPwr	MP5505	
		MP5507	
		OP-05	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TI	OP-07	
OP-10	MicroPwr	MP5510	
	PMI	OP-10	
OP-15	PMI	OP-15	
OP-16	PMI	OP-16	
OP-17	PMI	OP-17	
OP08	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
OP24	**MicroPwr**	**MP5524**	**401,3292**
	PMI	OP12	
		OP24	
OP27	**MicroPwr**	**MP5527**	**401,3292**
	PMI	OP27	
OP34	**MicroPwr**	**MP5534**	**401,3292**
	PMI	OP34	
OP37	**MicroPwr**	**MP5537**	**401,3292**
	PMI	OP37	
REF-01	HybridSys	HSREF01	
	MicroPwr	**MP5532**	**401,3292**
	Motorola	**MC1404-10**	**2761**
		MC1504-10	**2761**
	PMI	REF-01	
	TeledyneS	9496	
REF-02	**MicroPwr**	**MP5531**	**401,3292**
	PMI	REF-02	
	TeledyneS	9495	

Micro-Circuit Engineering, Inc.

MCE-4194	Exar	XR4194	
	Raytheon	RC4194	
		RM4194	
	SiliconG	SG4194	
MCE-565	AD	AD565	
	Fairchild	μA565	
MCE-566	AD	AD566	
MCE-570	AD	AD570	
MCE-571	AD	AD571	
	Fairchild	μA571	
	MicroPwr	MP571	
MCE-574	AD	AD574	
MCE-6012	AMD	AM6012	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Micro-Circuit Engineering, Inc. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MCE-6012	AD	AD562	
	Burr-Brown	DAC862	
	Datel	DAC-562	
		DAC-681	
		DAC-681C	
	Harris	HI562	
		HI562-5	
	MicroPwr	**MP562**	**401,2749**
	Motorola	**AD562**	**2759**
	PMI	DAC12	
	Signetics	**AM6012**	**3383**
		DAC-312	
	TeledyneP	4068	
MCE-A20	Exar	XRA100	
	Interdesign	**MOA**	**4433**
		MOM	**4433**
	MicroEng	**MCE-A20A**	**4437**
MCE-A20A	Exar	XRA100	
	Interdesign	**MOA**	**4433**
		MOM	**4433**
	MicroEng	MCE-A20	
MCE-A20B	Exar	XRB100	
	Interdesign	**MOB**	**4433**
MCE-A20C	Exar	XRC100A	
	Interdesign	**MOC**	**4433**
MCE-A20E	Cherry	CS2000	
	Exar	XRE100	
	Interdesign	**MOE**	**4433**
MCE-A20F	Cherry	CS3000	
	Exar	XRF100	
	Interdesign	**MOF**	**4433**
		MOF	**4433**
MCE-A20G	Cherry	CS2500	
	Exar	XRG100	
	Interdesign	**MOG**	**4433**
MCE-A20H	**Interdesign**	**MOH**	**4433**
MCE-A20J	Exar	XRJ100	
	Interdesign	**MOJ**	**4433**
MCE-A20L	Cherry	CS3200	
	Interdesign	**MOL**	**4433**
MCE-A40D	Exar	XRD100	
	Interdesign	**MOD**	**4433**
◆MCE-AD15	Exar	XR400	
	MicroEng	**MCE-AD15C**	**4437**
MCE-AD15C	Exar	XR400	
MCE-D15A	Exar	XR300	
MCE-D15B	Exar	XR500	
MCE-D15D	Exar	XR800	
MCE-LM10	National	LM10	
MCE-LM117	**Motorola**	**LM117**	**3295**
	National	**LM117**	**3299**
	SiliconG	SG117	
	TI	LM117	
MCE-LM137	**Motorola**	**LM137**	**3295**
	National	**LM137**	**3301**
	TI	LM137	
MCE-LM217	**Motorola**	**LM217**	**3295**
	National	**LM217**	**3299**
	SiliconG	SG217	
	TI	LM217	
MCE-LM237	**National**	**LM237**	**3301**
	TI	LM237	
MCE-LM317	Fairchild	μA317	
	Motorola	**LM317**	**3295**
	National	**LM317**	**3299**
	SiliconG	SG317	
	TI	LM317	
MCE-LM337	**National**	**LM337**	**3301**
	TI	LM337	
MCE-VFC32	AD	ADVFC32	
	Burr-Brown	VFC32	
MGC110A	Exar	XRCMA	
	Interdesign	**MCA**	**4433**
	MasterLogic	ML100	
	Monosil	ML100	
	Nitron	NC5100	
MGC160B	Exar	XRCMB	
	Interdesign	**MCB**	**4433**
	MasterLogic	ML150	
	Monosil	ML150	
	Nitron	NC5150	
MGC210C	Exar	XRMC	
	Interdesign	**MCC**	**4433**
	MasterLogic	ML200	
	Monosil	ML200	
	Nitron	NC5200	
MGC350D	Exar	XRCMD	
	Interdesign	**MCD**	**4433**
MGC350D	MasterLogic	ML350	
	Monosil	ML350	
	Nitron	NC5350	
MGC50	MasterLogic	ML50	
	Monosil	ML50	
	Nitron	NC5050	
MGC500	MasterLogic	ML500	
	Monosil	ML500	
	Nitron	NC5500	
MGC600	MasterLogic	ML600	
	Monosil	ML600	
	Nitron	NC5600	

Mitel Semiconductor

Manufacturer Device	Replacement Source	Device	IC Master Page
74SC373	GTEMicro	G74SC373	
	Mitel	**MD74SC373**	**710**
	Plessey	MV74SC373	
	SPI	**SP74SC373**	**761**
M54562	Sprague	UDN-2982	
M54563	Sprague	UDN-2981	
M5K4116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
MA5050	GTEMicro	G5050	
MA5100	GTEMicro	G5100	
MA5150	GTEMicro	G5150	
MD4055	RCA	CD4055	
	SGS	HCF4055	
	Toshiba	TC4055	
MD4056	RCA	CD4056	
	SGS	HCF4056	
	Toshiba	TC4056	
MD4104	Fairchild	F4104	
	GTEMicro	G4104	
	Motorola	MC14504	
	National	MM4104	
	RCA	CD40109	
	SGS	HCF40109	
	Signetics	HEF4104	
MD4332	Hughes	HCL0438	
MD4368	Fairchild	9368	
MD4511	Fairchild	F4511	
	Hitachi	HD14511	
	MMI	4511	
	Motorola	MC14511	
	National	CD4511	
	NEC-Micro	μPD4511	
	RCA	CD4511	
	SGS	HCF4511	
	Signetics	HEF4511	
	SSS	SCL4511	
	Solitron	CM4511	
	Toshiba	TC4511	
MD54SC137	SPI	SP54SC137	
MD54SC138	SPI	SP54SC138	
MD54SC139	SPI	SP54SC139	
MD54SC238	SPI	SP54SC238	
MD54SC239	SPI	SP54SC239	
MD54SC240	SPI	SP54SC240	
MD54SC241	SPI	SP54SC241	
MD54SC244	SPI	SP54SC244	
MD54SC245	SPI	SP54SC245	
MD54SC373	SPI	SP54SC373	
MD54SC374	SPI	SP54SC374	
MD54SC540	SPI	SP54SC540	
MD54SC541	SPI	SP54SC541	
MD54SC573	SPI	SP54SC573	
MD54SC574	SPI	SP54SC574	
MD74SC137	GTEMicro	G74SC137	
	Plessey	MV74SC137	
MD74SC137	SPI	SP74SC137	
MD74SC138	GTEMicro	G74SC138	
	Plessey	MV74SC138	
	RCA	CDP1873	
	SPI	SP74SC138	
MD74SC139	GTEMicro	G74SC139	
	Plessey	MV74SC139	
	SPI	SP74SC139	
MD74SC234	GTEMicro	G74SC534	
MD74SC237	GTEMicro	G74SC237	
MD74SC238	GTEMicro	G74SC238	
	SPI	SP74SC238	
MD74SC239	GTEMicro	G74SC239	
	SPI	SP74SC239	
MD74SC240	GTEMicro	G74SC240	
	Plessey	MV74SC240	
	SPI	**SP74SC240**	**761**
MD74SC241	GTEMicro	G74SC241	
	Plessey	MV74SC241	
	SPI	**SP74SC241**	**761**
MD74SC244	GTEMicro	G74SC244	
	Plessey	MV74SC244	
	SPI	**SP74SC244**	**761**
MD74SC245	Fairchild	74LS245	
	GTEMicro	G74SC245	
	Motorola	SN74LS245	
	Plessey	MV74SC245	
	SPI	**SP74SC245**	**761**
	Signetics	**74LS245**	**779**
		N8T245	
	TI	**SN74LS245**	**913**
MD74SC373	GTEMicro	G74SC373	
	Mitel	74SC373	
	Plessey	MV74SC373	
	SPI	**SP74SC373**	**761**
MD74SC374	GTEMicro	G74SC374	
	Plessey	MV74SC374	
	SPI	**SP74SC374**	**761**
MD74SC533	GTEMicro	G74SC533	
MD74SC540	GTEMicro	G74SC540	
	SPI	SP74SC540	
MD74SC541	GTEMicro	G74SC541	
	SPI	SP74SC541	
MD74SC563	GTEMicro	G74SC563	
MD74SC564	GTEMicro	G74SC564	
MD74SC573	GTEMicro	G74SC573	
	SPI	**SP74SC573**	**761**
MD74SC574	GTEMicro	G74SC574	
	SPI	**SP74SC574**	**761**
MH88205	ITT	88205	
	Mitel	MH88305	
MH88305	ITT	88205	
	Mitel	MH88205	
ML8204	Cherry	CS8204	
ML8205	Cherry	CS8205	
MT4320	GTEMicro	G4320	
	ITT	DF320	
	Nitron	NC2320	
	Siliconix	DF320	
MT4322	ITT	DF322	
	Nitron	NC2322	
MT5087	AMI	S2859	
	GI	AY-5-9559	
	Mostek	MK5087	
	National	TP5087	
	Plessey	MV5087	
MT5089	AMI	S25089	
	Mostek	MK5089	
	National	TP5089	
	Plessey	MV5089	
MT5091	Mostek	MK5091	
MT5092	Mostek	MK5092	
	National	TP5092	
MT8804	Fairchild	F8804	
MT88205	Aptek	ITT88205-5NC	
MT8865	GTEMicro	G8865	
	Mostek	MK8865	
	Plessey	MV8865	

Mitsubishi Electronics America, Inc.

Manufacturer Device	Replacement Source	Device	IC Master Page
M54524	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
M54524	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
M54525	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
M58981	Fujitsu	MB8414	
	Harris	HM6514	
	Hitachi	**HM4334**	**3789**
	Intersil	IM6514	
	MicroPwr	MP6514	
	National	NMC6514	
	NEC-Micro	μPD444/6514	
		μPD6514	
	OKI	**MSM5115**	**3873**
	RCA	MWS5114	
		MWS5514	
	Toshiba	TC5514	
M5G1400	GI	ER1400	
	NCR	NCR1400	
	Nitron	NC1400	
M5K4164	Fujitsu	MB82464	
M5K8725	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
M5L2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Mitsubishi Electronics America, Inc. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
M5L2114	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
M5L2716	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HM462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
M5L2732	AMD	2732	
	Fairchild	F2732	
	Hitachi	**HM462732**	**3789**
	Intel	2732	
		2732A	**3819,3822**
		M2732	
	National	MM2732	
		NMC2732	
	NEC-Micro	μPD2732	
	Toshiba	TMM2732	
		TMM324C	
	Universal	UM2732	

Monolithic Memories, Inc.

Manufacturer Device	Replacement Source	Device	IC Master Page
4511	Fairchild	F4511	
	Hitachi	HD14511	
	Mitel	MD4511	
	Motorola	MC14511	
	National	CD4511	
	NEC-Micro	μPD4511	
	RCA	CD4511	
	SGS	HCF4511	
	Signetics	HEF4511	
	SSS	SCL4511	
	Solitron	CM4511	
	Toshiba	TC4511	
5275-1	Signetics	82S291	
		87S290	
5280-1	National	DM87S29	
5281-1	National	DM87S29	
5300-1	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	**3696**
	Intel	M3601	
	MMI	**6300-1**	**3826**
	National	DM54S387	
		DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
	TI	**TBP24SA10**	**440,3967**
		TBP24SA10M	**440,3967**
5301-1	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
		HM7611-2	**3696**
	Intel	M3621	
	Intersil	IM5623	
	MMI	**6301-1**	**3826**
	National	DM54S287	
		DM74S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
	TI	**TBP24S10**	**440,3967**
5305	AMD	AM27S12	
	Fairchild	93436	
	Harris	HM7620	
	Intel	M3602	
	MMI	6305	
	National	DM54S570	
		DM74S570	
5305	Raytheon	29610	
	Signetics	N82S130	
		S82S130	
5306	AMD	AM27S13	
	Fairchild	93446	
	Harris	HM7621	
	Intel	M3622	
	MMI	6306	
	National	DM54S571	
		DM74S571	
	Raytheon	29611	
	Signetics	N82S131	
		S82S131	
5308-1	**MMI**	**6308-1**	**3826**
	TI	**TBP28LA22**	**440,3969**
		TBP28LA22M	**440,3969**
5309-1	**MMI**	**6309-1**	**3826**
	TI	**TBP28L22**	**440,3969**
		TBP28L22M	**440,3969**
53100	AMD	AM27S184	
	Fujitsu	MB7127	
	Harris	HM7684	
	MMI	63100	
	Motorola	MCM7684	
	National	DM77S184	
		DM87S184	
	Raytheon	29650	
	Signetics	N82S184	
	TI	**TBP24SA81**	**440,3969**
53101	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	**440,3968**
		TBP24S81M	**440,3968**
5330-1	AMD	AM27S18	
	Harris	HM7602	
	MMI	**6330-1**	**3826**
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
5331-1	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	53LS081	
		6331-1	**3826**
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	**TBP18S030**	**440,3965**
		TBP18S030M	**440,3965**
5340-1	AMD	AM27S30	
	Fairchild	93438	
5340-1	Harris	HM7640	
	Intel	M3604	
	MMI	**6340-1**	**3826**
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	**TBP28SA46**	**440**
5341-1	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	**6341-1**	**3826**
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	**TBP28S46**	**440,3976**
		TBP28S46M	**440,3976**
5348	AMD	AM27S28	
	Fujitsu	MB7123	
		MB7124	
		MC7124	
	Harris	HM7648	
	MMI	6348	
	National	DM54S473	
		DM74S473	
	Raytheon	29620	
	Signetics	N82S146	
		S82S146	
	TI	**TBP28SA42**	**440,3976**
5349-1	AMD	AM27S29	
	Fujitsu	MB7124	
		MBM7124	
	Harris	HM7649	
	MMI	**6349-1**	**3826**
	Motorola	MCM7649	
	National	DM54S472	
		DM74S472	
	Raytheon	29621	
	Signetics	N82S147	
		S82S147	
	TI	DM54S472	
		TBP28S42	**440,3975**
		TBP28S42M	**440,3975**
5352-1	AMD	AM27S32	
	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642	
		HM7642-2	**3705**
	Intel	M3605	
	MMI	6352	
	National	DM54S572	
		DM74S572	
	Raytheon	29640	
	Signetics	N82S136	
		S82S136	
	TI	**TBP24SA41**	**440,3968**
		TBP24SA41M	**440,3968**
5353	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
5353	**MMI**	**53S1641**	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
5380-1	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	**6380-1**	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
5381-1	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	**6381-1**	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
53LS080	AMD	AM25LS2518	
	MMI	63LS080	
	Signetics	N82S23	
		S82S23	
	TI	TBP18SA030	
53LS081	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		6331-1	**3826**
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Monolithic Memories, Inc. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
53LS081	Supertex	MM74S288	
		SM74S288	
	TI	TBP18S030	440,3965
		TBP18S030M	440,3965
53S1641	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	3705
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		6353-1	3826
		63S1641	3826,3836
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	TBP24S41	440,3968
		TBP24S41M	440,3968
		TBP28S41	
		TBP28S41M	
54LS240	AMD	SN54LS240	
	Fairchild	54LS240	
	Motorola	SN54LS240	
	Raytheon	54LS240	
	TI	SN54LS240	910
54LS241	AMD	SN54LS241	
	Fairchild	54LS241	
	Motorola	SN54LS241	
	Raytheon	54LS241	
	TI	SN54LS241	911
54LS244	AMD	SN54LS244	
	Fairchild	54LS244	
	Motorola	SN54LS244	
	Raytheon	54LS244	
	TI	SN54LS244	912
54LS299	AMD	SN54LS299	1227
	Fairchild	54LS299	
	Motorola	SN54LS299	
	Raytheon	54LS299	
	TI	SN54LS299	927
54LS373	AMD	SN54LS373	1227
	Motorola	SN54LS373	
	Raytheon	54LS373	
	Signetics	54LS373	783
	TI	SN54LS373	937
54LS374	AMD	SN54LS374	1227
	Motorola	SN54LS374	
	National	DM54LS374	
	Raytheon	54LS374	
	TI	SN54LS374	938
54S182	Fairchild	54S182	
		93S42	
	TI	SN54S182	898
54S240	AMD	SN54S240	
	MMI	SN54S240	715
	Raytheon	54S240	
	TI	SN54S240	910
54S241	AMD	SN54S241	
	MMI	SN54S241	715
	Raytheon	54S241	
	TI	SN54S241	911
54S244	AMD	SN54S244	
	MMI	SN54S244	715
	Raytheon	54S244	
54S244	TI	SN54S244	912
54S283	TI	SN54S283	922
54S373	MMI	SN54S373	715
	TI	SN54S373	937
54S374	MMI	SN54S374	715
	TI	SN54S374	938
54S381	TI	SN54S381	940
5530	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	927
5531	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	440,905
5560	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
5560	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	440,863
		SN74S289	
5561	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
6246-1	Signetics	N8204	
6247-1	Signetics	N8205	
6280-1	National	DM85S29	
6281-1	National	DM85S28	
6300-1	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	3696
	Intel	M3601	
	MMI	5300-1	
	National	DM54S387	
		DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
	TI	TBP24SA10	440,3967
		TBP24SA10M	440,3967
6301-1	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
		HM7611-2	3696
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
	National	DM54S287	
		DM74S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
	TI	TBP24S10	440,3967
6305	AMD	AM27S12	
	Fairchild	93436	
	Harris	HM7620	
	Intel	M3602	
	MMI	5305	
	National	DM54S570	
		DM74S570	
	Raytheon	29610	
	Signetics	N82S130	
		S82S130	
6306	AMD	AM27S13	
	Fairchild	93446	
	Harris	HM7621	
	Intel	M3622	
	MMI	5306	
	National	DM54S571	
		DM74S571	
6306	Raytheon	29611	
	Signetics	N82S131	
		S82S131	
6308-1	MMI	5308-1	
	TI	TBP28LA22	440,3969
		TBP28LA22M	440,3969
6309-1	MMI	5309-1	
	TI	TBP28L22	440,3969
		TBP28L22M	440,3969
63100	AMD	AM27S184	
	Fujitsu	MB7127	
	Harris	HM7684	
	MMI	53100	
	Motorola	MCM7684	
	National	DM77S184	
		DM87S184	
	Raytheon	29650	
	Signetics	N82S184	
	TI	TBP24SA81	440,3969
63101	AMD	AM27S185	
	Fujitsu	MB7128	3679
	Harris	HM7685	
		HM7685-2	3714
	MMI	53101	
		63S841	3826,3833
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	440,3968
		TBP24S81M	440,3968
631681	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	National	DM77S190	
		DM87S190	
	Raytheon	29680	
		29683	
	Signetics	82S190	
		N82S190	
		S82S190	
	Supertex	MM82S190	
6330-1	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
6331-1	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Monolithic Memories, Inc. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
6331-1	TI	TBP18S030	440,3965
		TBP18S030N	440,3965
6340-1	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	TBP28SA46	440
6341-1	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	TBP28S46	440,3976
		TBP28S46N	440,3976
6348	AMD	AM27S28	
	Fujitsu	MB7123	
		MB7124	
		MC7124	
	Harris	HM7648	
	MMI	5348	
	National	DM54S473	
		DM74S473	
	Raytheon	29620	
	Signetics	N82S146	
		S82S146	
	TI	TBP28SA42	440,3976
6349-1	AMD	AM27S29	
	Fujitsu	MB7124	
		MBM7124	
	Harris	HM7649	
	MMI	5349-1	
	Motorola	MCM7649	
	National	DM54S472	
		DM74S472	
	Raytheon	29621	
	Signetics	N82S147	
		S82S147	
	TI	DM54S472	
		TBP28S42	440,3975
		TBP28S42N	440,3975
6352	AMD	AM27S32	
	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642	
		HM7642-2	3705
	Intel	M3605	
	MMI	5352-1	
	National	DM54S572	
		DM74S572	
	Raytheon	29640	
	Signetics	N82S136	
		S82S136	
	TI	TBP24SA41	440,3968
		TBP24SA41N	440,3968
6353-1	AMD	AM27S33	
		AM27S33M	
		AM27S41	
6353-1	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	3705
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	3836
		63S1641	3826,3836
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	TBP24S41	440,3968
		TBP24S41N	440,3968
		TBP28S41	
		TBP28S41M	
6380-1	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	3652
	Fujitsu	MB7131	3679
	Harris	HM7680	
	MMI	5380-1	
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86N	3978
6381-1	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	3652
		F93451	
	Fujitsu	MB7132	3679
		MB7132H	3679
	Harris	HM7681	
		HM7681-2	3711
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
63LS080	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		63S80-1	3826
63LS080	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
63LS081	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		63S81-1	3826
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	TBP18S030	440,3965
		TBP18S030N	440,3965
63S1641	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	3705
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	3836
		63S81-1	3826
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	TBP24S41	440,3968
		TBP24S41N	440,3968
		TBP28S41	
		TBP28S41M	
63S841	AMD	AM27S185	
	Fujitsu	MB7128	3679
	Harris	HM7685	
		HM7685-2	3714
	MMI	53101	
		63101	
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	440,3968
		TBP24S81N	440,3968
6530	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	927
6531	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	440,905
6560	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Monolithic Memories, Inc. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
6560	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,663**
		SN74S289	
6561	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
67401	AMD	3341	
	Fairchild	3341	
	Raytheon	67401	
74LS240	AMD	SN74LS240	
	Fairchild	74LS240	
	Hitachi	HD74LS240	
	Motorola	SN74LS240	
	Raytheon	74LS240	
	Signetics	74LS240	
	TI	**SN74LS240**	**910**
74LS241	AMD	SN74LS241	
	Fairchild	74LS241	
	Hitachi	HD74LS241	
	Motorola	SN74LS241	
	Raytheon	74LS241	
	Signetics	74LS241	
	TI	**SN74LS241**	**911**
74LS244	AMD	SN74LS244	
	Fairchild	74LS244	
	Hitachi	HD74LS244	
	Motorola	SN74LS244	
	Raytheon	74LS244	
	Signetics	74LS244	
	TI	**SN74LS244**	**912**
74LS373	**AMD**	**SN74LS373**	**1227**
	Fairchild	74LS373	
	Motorola	SN74LS373	
	Raytheon	74LS373	
	SGS	T74LS373	
	Signetics	**74LS373**	**703**
	TI	**SN74LS373**	**937**
74LS374	AMD	SN74LS374	
	Fairchild	74LS374	
	Motorola	SN74LS374	
	National	DM74LS374	
	Raytheon	74LS374	
	SGS	T74LS374	
	Signetics	74LS374	
	TI	**SN74LS374**	**938**
74S182	Fairchild	74S182	
	Hitachi	HD74S182	
	National	DM74S182	
	Signetics	74S182	
	TI	**SN74S182**	**698**
74S240	AMD	SN74S240	
	MMI	**SN74S240**	**715**
	Signetics	74S240	
	TI	**SN74S240**	**910**
74S241	AMD	SN74S241	
	MMI	**SN74S241**	**715**
74S241	Signetics	74S241	
	TI	**SN74S241**	**911**
74S373	**MMI**	**SN74S373**	**715**
	Signetics	74S373	
	TI	**SN74S373**	**937**
74S374	**MMI**	**SN74S374**	**715**
	Signetics	74S374	
	TI	**SN74S374**	**938**
PAL10H8	National	DMPAL10H8	
PAL10L8	National	DMPAL10L8	
	Raytheon	PAL10L8	
PAL12H10	National	DMPAL12H10	
PAL12H6	National	DMPAL12H6	
PAL12L10	National	DMPAL12L10	
PAL12L6	National	DMPAL12L6	
	Raytheon	PAL12L6	
PAL14H4	National	DMPAL14H4	
PAL14H8	National	DMPAL14H8	
PAL14L4	National	DMPAL14L4	
PAL14L8	National	DMPAL14L8	
PAL16A4	National	DMPAL16A4	
PAL16C1	National	DMPAL16C1	
PAL16H2	National	DMPAL16H2	
PAL16H6	National	DMPAL16H6	
PAL16L2	National	DMPAL16L2	
PAL16L8	National	DMPAL16L8	
	TI	FP4ALS16L8	
PAL16R4	National	DMPAL16R4	
	TI	FP74ALS16R4	
PAL16R6	National	DMPAL16R6	
	TI	FPμ4ALS16R6	
PAL16R8	National	DMPAL16R8	
	TI	FP74ALS16R8	
PAL16X4	National	DMPAL16X4	
	Raytheon	PAL16X4	
PAL18H4	National	DMPAL18H4	
PAL20C1	National	DMPAL20C1	
PAL20H2	National	DMPAL20H2	
PAL20L10	National	DMPAL20L10	
PAL20L2	National	DMPAL20L2	
SN54S240	AMD	SN54S240	
	MMI	54S240	
	Raytheon	54S240	
	TI	**SN54S240**	**910**
SN54S241	AMD	SN54S241	
	MMI	54S241	
	Raytheon	54S241	
	TI	**SN54S241**	**911**
SN54S244	AMD	SN54S244	
	MMI	54S244	
	Raytheon	54S244	
	TI	**SN54S244**	**912**
SN54S373	MMI	54S373	
	TI	**SN54S373**	**937**
SN54S374	MMI	54S374	
	TI	**SN54S374**	**938**
SN74S240	AMD	SN74S240	
	MMI	74S240	
	Signetics	74S240	
	TI	**SN74S240**	**910**
SN74S241	AMD	SN74S241	
	MMI	74S241	
	Signetics	74S241	
	TI	**SN74S241**	**911**
SN74S244	TI	SN74S244	
SN74S373	MMI	74S373	
	Signetics	74S373	
	TI	**SN74S373**	**937**
SN74S374	MMI	74S374	
	Signetics	74S374	
	TI	**SN74S374**	**938**

Monosil

Manufacturer Device	Replacement Source	Device	IC Master Page
ML100	Exar	XRCMA	
	Interdesign	**MCA**	**4433**
	MasterLogic	ML100	
	MicroEng	**MGC110A**	**4437**
	Nitron	NC5100	
ML150	Exar	XRCMB	
	Interdesign	**MCB**	**4433**
	MasterLogic	ML150	
	MicroEng	**MGC160B**	**4437**
	Nitron	NC5150	
ML200	Exar	XRMC	
	Interdesign	**MCC**	**4433**
	MasterLogic	ML200	
	MicroEng	**MGC210C**	**4437**
	Nitron	NC5200	
ML350	Exar	XRCMD	
	Interdesign	**MCD**	**4433**
	MasterLogic	ML350	
ML350	**MicroEng**	**MGC350D**	**4437**
	Nitron	NC5350	
ML50	MasterLogic	ML50	
	MicroEng	**MGC50**	**4437**
	Nitron	NC5050	
ML500	MasterLogic	ML500	
	MicroEng	**MGC500**	**4437**
	Nitron	NC5500	
ML600	MasterLogic	ML600	
	MicroEng	**MGC600**	**4437**
	Nitron	NC5600	
MONOLOGIC	MasterLogic	MASTERMOS	
Master MOS	IMI	MASTER MOS	

Mostek

Manufacturer Device	Replacement Source	Device	IC Master Page
4516	AMD	AM4516	
	Fujitsu	MB8118	
	Hitachi	HM4816	
		HM4816A	
	Intel	2118	
	Intersil	IM7118	
	Mostek	MK4516	
	National	NMC5295	
	NEC-Micro	2118	
	TI	TMS4516	
MK0808	**National**	**ADC0808**	**3319**
	TI	ADC0808	
MK1002	AMD	1002	
MK2716	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HN462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
MK2764	Fujitsu	MBM2764	
	Hitachi	HN462764	
		HN462764	**3789**
	Intel	**2764**	**3820,3822**
		M2764	
	Intersil	2764	
	National	NMC2764	
	NEC-Micro	μPD2764	
	SEEQ	5133	
	Toshiba	TMM2764	
MK34000	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
MK36000	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
MK36000	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
MK36000-4	AMD	AM92640	
	AMI	S68B364	
	Fairchild	F-3564-25	
	Motorola	MCM67365-25	
	NEC-EA	μPD2/8364-20	
	Signetics	2064-20	
	Synertek	SY2364-2	
MK36000-5	AMD	AM9264	
	AMI	S4264	
	GTEMicro	2364-3	
	NEC-EA	UPD2/8364-30	
	Signetics	**2664A-30**	**3907**
	Synertek	SY2364-3	
	Toshiba	TMM2364	
	Weitek	SC8164	
MK37000	**AMI**	**S2364**	**3609**
	GI	R03-9367	
	Signetics	**2364-20**	**3899**
	Synertek	**SY2365**	**3951**
		SY2365-2	**3951**
MK38000	NEC-EA	μPD2/83256	
	Toshiba	TMM23256	
MK3850	Fairchild	3850	
MK3851	Fairchild	3851	
MK3852	Fairchild	3852	
MK3853	Fairchild	3853	
MK3854	Fairchild	3854	
MK3861	Fairchild	3861	
MK3870	Fairchild	3870	
	SGS	M3870	
	SMC	MPU3870	
MK3871	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
◇MK3872	**Fairchild**	**F3872**	**1254**
	Motorola	MC14006	
	RCA	CD4006	
	SGS	M3872	
	Signetics	HEF4006	
◇MK3876	Fairchild	F3876	
◇MK3878	Fairchild	F3878	
MK3880	NEC-Micro	μPD780	
	SGS	Z80	
		Z80-CPU	
		Z80CPUB	
	Zilog	**Z80**	**1581**
		Z80-CPU	
MK3881	SGS	Z80-PI	
		Z80CPUB	
	Zilog	**Z80-PIO**	**1581**
MK3882	SGS	Z80-CTC	
		Z80CPUB	

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Mostek (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MK3882	**Zilog**	**Z80-CTC**	**1581**
MK3883	SGS	Z80	
		Z80CPUB	
	Zilog	**Z80-DMA**	**1581**
MK3884	Mostek	MK3885	
		MK3887	
	SGS	Z80-SIO	
		Z80CPUB	
	Zilog	**Z80-SIO**	**1581**
MK3885	Mostek	MK3884	
		MK3887	
	SGS	Z80-SIO	
		Z80CPUB	
	Zilog	**Z80-SIO**	**1581**
MK3887	Mostek	MK3884	
		MK3885	
	SGS	Z80-SIO	
		Z80CPUB	
	Zilog	**Z80-SIO**	**1581**
◆MK4007	Intel	1101	
	Solitron	μA2556	
		μA2656	
		μA3556	
		μA3656	
MK4027	Fairchild	M4027	
	SGS	M4027	
MK4104	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
◆MK4114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
MK4116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
MK4116	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
MK4118A	CSG	MPS4118	
	Mostek	MK4801A	
	Rockwell	R8118	
◆MK4164	Fairchild	F64K	
	Fujitsu	MB8264	
		MB8265	
	Hitachi	HM4864	
	Intel	2164	
	Motorola	MCM6664	
		MCM6665	
	National	NMC4164	
	NEC-Micro	μPD4164	
	TI	TMS4164	
	Toshiba	TMM4164	
◆MK4167	**Hitachi**	**HM6167**	**3789**
	IMS	1400	
	IDT	IDT6167	
	Intel	2167	
	NEC-Micro	μPD2167	
MK4516	AMD	AM4516	
	Fujitsu	MB8118	
	Hitachi	HM4816	
		HM4816A	
	Intel	2118	
	Intersil	IM7118	
	Mostek	4516	
	National	NMC5295	
	NEC-Micro	2118	
	TI	TMS4516	
MK4564	Motorola	MCM6664	
	NEC-Micro	μPD4164	
	TI	TMS4164	
MK4801A	CSG	MPS4118	
	Mostek	MK4118A	
	Rockwell	R8118	
◆MK4802	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
MK50240	AMI	S50240	
MK50241	AMI	S50241	
MK50242	AMI	S50242	
MK50809	**National**	**ADC0809**	**3319**
	TI	ADC0809	
MK50816	Datel	DAS-952	
	National	**ADC0816**	**3319**
	TI	ADC0816	
MK50817	**National**	**ADC0817**	**3319**
MK5087	AMI	S2859	
	GI	AY-5-9559	
	Mitel	MT5087	
	National	TP5087	
	Plessey	MV5087	
MK5089	AMI	S25089	
	Mitel	MT5089	
	National	TP5089	
	Plessey	MV5089	
MK5091	Mitel	MT5091	
MK5092	Mitel	MT5092	
	National	TP5092	
MK5094	National	TP5094	
MK50981	National	TP50981	
MK50982	National	TP50982	
MK5116	Fairchild	5116	
	National	**TP5116**	**3337**
	SGS	M5116	
MK5117	Fairchild	5116-1	
MK5151	Fairchild	5151	
MK5156	Fairchild	5156	
MK5156	**National**	**TP5156**	**3337**
	SGS	M5156	
MK5912	GTEMicro	G8912	
	Intel	2912	
	Mostek	MK8912	
	Plessey	MV8912	
MK68000	Hitachi	HD68000	
	Motorola	MC68000	
	Rockwell	R68000	
	Signetics	**SCN68000**	**1524**
MK68200	Motorola	MC68200	
MK68564	Motorola	MC68564	
MK68901	Motorola	MC68901	
MK8865	GTEMicro	G8865	
	Mitel	MT8865	
	Plessey	MV8865	
MK8912	GTEMicro	G8912	
	Intel	2912	
	Mostek	MK5912	
	Plessey	MV8912	

Motorola Semiconductor Products

Manufacturer Device	Replacement Source	Device	IC Master Page
100416	Signetics	100149	
3106	Fairchild	54H11	
	National	DM54H11	
	TI	**SN54H11**	**836**
4064	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
4256	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
4256	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
54LS670	Fairchild	54LS670	
	Motorola	SN54LS670	
	National	DM54LS670	
	Raytheon	54LS670	
	Signetics	54LS670	
	TI	**SN54LS670**	**990**
6821	Synertek	SY6521	
74LS114A	Fairchild	74LS114	
	Hitachi	HD74LS114	
	Motorola	SN74LS114A	
	National	DM74LS114	
	Raytheon	74LS114	
	TI	SN74LS114A	
81LS97	National	74LS797	
81LS98	National	54LS798	
		74LS798	
AD562	AMD	AM6012	
	AD	AD562	
	Burr-Brown	DAC862	
	Datel	DAC-562	
		DAC-681	
		DAC-681C	
	Harris	HI562	
		HI562-5	
	MicroPwr	**MP562**	**401,2749**
	MicroEng	MCE-6012	
	PMI	DAC12	
	Signetics	**AM6012**	**3383**
		DAC-312	
	TeledyneP	4068	
AD563	AD	AD563	
	Burr-Brown	DAC863	
AM26LS31	AMD	AM26LS31	
	National	DS26LS31	
	TI	AM26LS31	
CA3054	RCA	CA3026	
		CA3054	
	SiliconG	SG3822	
	Sprague	ULN-2054	
	Thomson-CSF	SFC2054	
CA3059	RCA	CA3059	
	SiliconG	SG3059	
CA3079	RCA	CA3079	
	SiliconG	SG3079	
CA3139	RCA	CA3139	
DAC-08	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DAC-08	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DC26S10	AMD	AM26S10	
	Fairchild	9640	
	National	DS26S10	
	TI	AM26	
DM74LS353	Fairchild	74LS353	
	Motorola	SN74LS353	
	National	DM74LS353	
	SGS	T74LS353	
	TI	**SN74LS353**	**933**
DS36147	National	DS36147	
DS36177	National	DS36177	
DS8641	National	DS8641	
LF155	AMD	LF155	
	Intersil	LF155	
	National	**LF155**	**3309**
	PMI	PM155	
	Signetics	LF155	
LF156	AMD	LF156	
	Intersil	LF156	
	MicroPwr	OP-16	
	National	**LF156**	**3309**
	PMI	OP-16	
		PM156	
	Signetics	LF156	
LF157	AMD	LF157	
	Intersil	LF157	
	MicroPwr	OP-17	
	National	**LF157**	**3309**
	PMI	OP-17	
		PM157	
LF255	AMD	LF255	
	National	**LF255**	**3309**
	PMI	PM255	
LF256	AMD	LF256	
	National	**LF256**	**3309**
	PMI	PM256	
LF257	AMD	LF257	
	National	**LF257**	**3309**
	PMI	PM257	
LF355	AMD	LF355	
	Intersil	LF355	
	National	**LF355**	**3309**
	PMI	PM355	
	Signetics	LF355	
LF356	AMD	LF356	
	Intersil	LF356	
	National	**LF356**	**3309**
	PMI	PM356	
	Signetics	LF356	
LF357	AMD	LF357	
	Intersil	LF357	
	National	**LF357**	**3309**
	PMI	PM357	
LM101	AMD	LM101	
	AD	AD101	
	Fairchild	μA101	
	Intersil	AD101	
	Raytheon	LM101	
	Signetics	LM101	
	SiliconG	SG101	
	TI	LM101	
	Thomson-CSF	SFC2101	
◆LM107	AMD	LM107	
	AD	**AD741S**	**3153**
	Intersil	LM107	
	National	LM107	
	Raytheon	LM107	
	SiliconG	SG107	
	TI	LM107	
		SN55107	
	Thomson-CSF	SFC2107	
LM108	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401.3292**
		OP-05	
		OP08	
LM108	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
LM109	Fairchild	μA109	
	National	LM109	
	SiliconG	SG109	
	TI	SN55109	
	Thomson-CSF	SFC2109	
LM11	National	LM11	
LM111	AMD	LM111	
	AD	AD111	
	Fairchild	μA111	
	Intersil	LM111	
	MicroPwr	COMP-01	
		COMP-02	
	National	**LM111**	**3317**
	PMI	PM111	
	Raytheon	LM111	
	Signetics	LM111	
	SiliconG	SG111	
	TI	LM111	
	Thomson-CSF	SFC2111	
LM112	AMD	LM112	
	National	LM112	
LM117	MicroEng	MCE-LM117	
	National	**LM117**	**3299**
	SiliconG	SG117	
	TI	LM117	
LM123	Motorola	MC78T05	
	National	**LM123**	**3299**
	SiliconG	SG123	
	TI	SN55123	
LM124A	AMD	LM124A	
	National	LM124A	
	Raytheon	LM124A	
	RCA	CA124A	
	Signetics	LM124A	
	SiliconG	SG124	
	TI	LM124A	
LM137	MicroEng	MCE-LM137	
	National	**LM137**	**3301**
	TI	LM137	
LM139	AMD	LM139	
	Fairchild	μA139	
	National	**LM139**	**3317**
	PMI	CMP-04	
		PM139	
	Raytheon	LM139	
	RCA	CA139	
	Signetics	LM139	
	SiliconG	SG139	
	TI	LM139	
LM139A	AMD	LM139A	
	National	**LM139A**	**3317**
	PMI	CMP-04	
		PM139A	
	RCA	CA139A	
	SiliconG	SG139A	
LM150	**National**	**LM150**	**3299**
	SiliconG	SG150	
LM158	National	LM158A	
	Raytheon	RM4139	
	RCA	CA158A	
	Signetics	LM158	
	TI	LM158	
LM185	**National**	**LM185**	**3304**
LM193	Fairchild	FC193A	
		μA193	
	National	**LM193A**	**3317**
	Signetics	LM193	
	TI	LM193	
LM201	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
LM201	Motorola	MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
◆LM207	AMD	LM207	
	National	LM207	
	RCA	CA207	
	SiliconG	SG207	
	TI	SN55207	
	Thomson-CSF	SFC2207	
LM208	AMD	LM208	
	AD	**AD208**	**3153**
	Fairchild	μA208	
	MicroPwr	MP5505	
		MP5508	**401.3292**
		OP-05	
		OP08	
	National	LM208	
	PMI	OP-08	
		OP05	
		PM208	
	SiliconG	SG208	
	TI	μA714	
LM209	Fairchild	μA209	
	Lambda	LLM209	
	National	LM209	
	SiliconG	SG209	
	Thomson-CSF	SFC2209	
◆LM210	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM210	
		LM310	
	PMI	BUF-01	
		BUF-02	
		BUF-03	
	SiliconG	SG110	
		SG210	
		SG310	
LM211	AMD	LM211	
	AD	AD211	
	National	**LM211**	**3317**
	PMI	PM211	
	RCA	LM211	
	Signetics	LM211	
	SiliconG	SG211	
	TI	LM211	
	Thomson-CSF	SFC2211	
LM212	AMD	LM212	
	SiliconG	SG212	
LM217	MicroEng	MCE-LM217	
	National	**LM217**	**3299**
	SiliconG	SG217	
	TI	LM217	
LM223	Lambda	LLM223	
	National	**LM223**	**3299**
	SiliconG	SG223	
LM224	AMD	LM224	
	Fairchild	μA224	
	National	LM224	
	Raytheon	LM224	
	RCA	CA224	
	Signetics	LM224	
	SiliconG	SG224	
	TI	LM224	
LM239	AMD	LM239	
	Fairchild	μA239	
	National	**LM239**	**3317**
	PMI	CMP-04	
		PM239	
	Raytheon	LM239	
	RCA	CA239	
	Signetics	LM239	
	SiliconG	SG239	
	TI	LM239	
LM239A	AMD	LM239A	
LM239A	**National**	**LM239A**	**3317**
	PMI	CMP-04	
		PM239A	
	RCA	CA239A	
	SiliconG	SG239A	
LM250	**National**	**LM250**	**3299**
	SiliconG	SG250	
LM258	National	LM258A	
	RCA	CA258A	
	Signetics	LM258	
	TI	LM258	
LM285	**National**	**LM285**	**3304**
LM2900	Hitachi	HA17301	
	Motorola	MC3301	
	National	LM2900	
		LM3301	
	Raytheon	LM2900	
		RC3301	
	TI	LM2900	
LM2901	Fairchild	μA2901	
		μA3302	
	Motorola	MC3302	
	National	LM2901	
		LM3302	
	NEC-Electron	μPC2901	
	PMI	CMP-04	
	Raytheon	LM2901	
		RV3302	
	RCA	CA3302	
	Signetics	LM2901	
		MC3302	
	SiliconG	SG3302	
	TI	LM2901	
		LM3302	
LM2902	Fairchild	μA2902	
	Hitachi	HA17902	
	National	LM2902	
	NEC-Electron	μPC2902	
	Raytheon	LM2902	
	TI	LM2902	
LM2903	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
LM2904	National	LM2904	
	RCA	CA2904	
	TI	LM2904	
LM293	Fairchild	μA293	
	National	**LM293**	**3317**
	Signetics	LM293	
	TI	LM293	
LM301	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
LM307	AMD	LM307	
	AD	**AD741J**	**3153**
	Intersil	LM307	
	National	LM307	
	Raytheon	LM307	
	RCA	CA307	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LM307	SiliconG	SG307	
	TI	LM307	
	Thomson-CSF	SFC2307	
LM308	AMD	LM308	
	AD	**AD308**	**3153**
	Burr-Brown	3500	
		3501	
	Fairchild	μA308	
	Intersil	AD308	
		LM308	
	MicroPwr	MP5505	
	National	LM308	
	Raytheon	LM308	
	SiliconG	SG308	
LM309	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
◆LM310	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM210	
		LM310	
	PMI	BUF-01	
		BUF-02	
		BUF-03	
	SiliconG	SG110	
		SG210	
		SG310	
LM311	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
LM312	AMD	AMLM112	
		AMLM212	
		AMLM312	
		LM312	
	National	LM312	
	SiliconG	SG3118	
LM317	Fairchild	μA317	
	MicroEng	MCE-LM317	
	National	**LM317**	**3299**
	SiliconG	SG317	
	TI	LM317	
LM317M	National	LM317M	
LM323	Fairchild	SH0323	
		SH323	
		μA78H05	
	Lambda	LAS1405	
		LAS1905	
	Motorola	MC78T05C	
	National	**LM323**	**3299**
	SiliconG	SG323	
LM324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
LM339	AMD	LM339	
		LM339A	
	Fairchild	μA339	
	Hitachi	HA17901	
	National	**LM339**	**3317**
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
		LM339	
	SiliconG	SG339	
	TI	LM339	
LM350	Fairchild	μA78HGA	
	National	**LM350**	**3299**
	SiliconG	SG350	
LM358	National	LM358A	
	NEC-Electron	μPC358	
	RCA	CA358A	
		LM358	
	Sanyo	LA6358	
	Signetics	LM358	
		NE532	
	TI	LM358	
LM385	National	LM385	
LM393	Fairchild	μA393	
	National	**LM393**	**3317**
	Sanyo	LA6393	
	Signetics	LM393	
	TI	LM393	
LM710	Fairchild	μA710	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	MC1710	
	National	**LM710**	**3317**
	PMI	CMP-01	
		CMP-02	
	Raytheon	RM710	
	SiliconG	SG710	
	TI	μA710	
	Thomson-CSF	SFC2710	
LM741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
LM741	Toshiba	TA7504	
M5140	Motorola	MC1358	
		MC1364	
	National	LM3064	
	RCA	CA3064	
		CA3065	
	Sanyo	LA1365	
	TI	SN76666	
MC10100	Fairchild	F10100	
	Signetics	10100	
MC10101	Fairchild	F10101	
	Hitachi	HD10101	
	Signetics	10101	
MC10102	Fairchild	F10102	
	Hitachi	HD10102	
	Signetics	10102	
MC10103	Fairchild	F10103	
	Signetics	10103	
MC10104	Fairchild	F10104	
	Hitachi	HD10104	
	Signetics	10104	
MC10105	Fairchild	F10105	
	Hitachi	HD10105	
	Signetics	10105	
MC10106	Fairchild	F10106	
	Hitachi	HD10106	
	Signetics	10106	
MC10107	Fairchild	F10107	
	Hitachi	HD10107	
	Signetics	10107	
MC10109	Fairchild	F10109	
	Hitachi	HD10109	
	Signetics	10109	
MC10110	Fairchild	F10110	
	Hitachi	HD10110	
	Signetics	10110	
MC10111	Fairchild	F10111	
	Hitachi	HD10111	
	Signetics	10111	
MC10113	Fairchild	F10113	
	Signetics	10113	
MC10114	Fairchild	F10114	
	Signetics	10114	
MC10115	Fairchild	F10115	
	Signetics	10115	
MC10116	Fairchild	F10116	
	Hitachi	HD10116	
	National	DM10116	
	Signetics	10116	
MC10117	Fairchild	F10117	
	Hitachi	HD10117	
	Signetics	10117	
MC10118	Fairchild	F10118	
	Hitachi	HD10118	
	Signetics	10118	
MC10119	Fairchild	F10119	
	Hitachi	HD10119	
	Signetics	10119	
MC10121	Fairchild	F10121	
	Hitachi	HD10121	
	Signetics	10121	
MC10123	Fairchild	F10123	
	Signetics	10123	
MC10124	Fairchild	F10124	
	Hitachi	HD10124	
	Signetics	10124	
MC10125	Fairchild	F10125	
	Hitachi	HD10125	
	Signetics	10125	
MC10128	Signetics	10128	
MC10129	Signetics	10129	
MC10130	Fairchild	F10130	
	Hitachi	HD10130	
	Signetics	1010130	
		10130	
MC10131	Fairchild	F10131	
	Hitachi	HD10131	
	Signetics	10131	
MC10132	Fairchild	F10132	
	Hitachi	HD10132	
	Signetics	10132	
MC10133	Fairchild	F10133	
	Hitachi	HD10133	
	Signetics	10133	
MC10134	Fairchild	F10134	
	Hitachi	HD10134	
	Signetics	10134	
MC10135	Fairchild	F10135	
	Signetics	10135	
MC10136	Fairchild	F10136	
	Hitachi	HD10136	
MC10136	Signetics	10136	
MC10137	Fairchild	F10137	
	Signetics	10137	
MC10138	Signetics	10138	
MC10141	Fairchild	F10141	
	Signetics	10141	
MC10158	Fairchild	F10158	
	Signetics	10158	
MC10159	Fairchild	F10159	
	Signetics	10159	
MC10160	Fairchild	F10160	
	Hitachi	HD10160	
	Signetics	10160	
MC10161	Fairchild	F10161	
	Hitachi	HD10161	
	NEC-Electron	μPB10161	
	Signetics	10161	
MC10162	Fairchild	F10162	
	Hitachi	HD10162	
	Signetics	10162	
MC10164	Fairchild	F10164	
	Hitachi	HD10164	
	Signetics	10164	
	TI	SN10164	
MC10165	Fairchild	F10165	
	Hitachi	HD10165	
	Signetics	10165	
MC10168	Fairchild	F10168	
MC10170	Signetics	10170	
MC10171	Fairchild	F10171	
	Signetics	10171	
MC10172	Fairchild	F10172	
	Signetics	10172	
MC10173	Fairchild	F10173	
	Signetics	10173	
MC10174	Fairchild	F10174	
	Hitachi	HD10174	
	Signetics	10174	
	TI	SN10174	
MC10175	Fairchild	F10175	
	Hitachi	HD10175	
	Signetics	10175	
	TI	SN10175	
MC10176	Fairchild	F10176	
	Signetics	10176	
MC10177	Fairchild	F10177	
MC10178	Fairchild	F10178	
	Signetics	10178	
MC10179	Fairchild	F10179	
	Hitachi	HD10179	
	Signetics	10179	
MC10180	Fairchild	F10180	
	Hitachi	HD10180	
	Signetics	10180	
MC10181	Fairchild	F10181	
	Hitachi	HD10181	
	Signetics	10181	
MC10186	Fairchild	F10186	
	Signetics	10186	
MC10188	Signetics	10188	
MC10189	Signetics	10189	
MC10190	Signetics	10190	
MC10191	Signetics	10191	
MC10192	Fairchild	F10192	
	Signetics	10192	
MC10195	Signetics	10195	
MC10210	Fairchild	F10210	
	Signetics	10210	
MC10211	Fairchild	F10211	
	Signetics	10211	
MC10212	Fairchild	F10212	
	Signetics	10212	
MC10216	Fairchild	F10216	
	Signetics	10216	
MC10231	Fairchild	F10231	
	Signetics	10231	
MC10501	Fairchild	F10501	
MC10502	Fairchild	F10502	
MC10503	Fairchild	F10503	
MC10504	Fairchild	F10504	
MC10505	Fairchild	F10505	
MC10506	Fairchild	F10506	
MC10507	Fairchild	F10507	
MC10509	Fairchild	F10509	
MC10513	Fairchild	F10513	
MC10514	Fairchild	F10514	
MC10515	Fairchild	F10515	
MC10516	Fairchild	F10516	
MC10524	Fairchild	F10524	
MC10525	Fairchild	F10525	
MC10530	Fairchild	F10530	
MC10531	Fairchild	F10531	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MC10535	Fairchild	F10535	
MC10541	Fairchild	F10541	
MC10558	Fairchild	F10558	
MC10562	Fairchild	F10562	
MC10564	Fairchild	F10564	
MC10566	Fairchild	F10566	
MC10574	Fairchild	F10574	
MC10576	Fairchild	F10576	
MC12015	**National**	**DS8615**	**2771**
MC12016	**National**	**DS8616**	**2771**
	Plessey	SP8793	
MC12017	**National**	**DS8617**	**2771**
MC12071	National	DS8621	
MC1309	Sprague	ULN-3809	
MC1324	Sprague	ULN-2224	
MC1327	Motorola	TDA1327	
	TI	SN76227	
MC1339	Exar	XR4739	
	Fairchild	μA739	
		μA749	
	National	**LM1303**	**3325**
	Raytheon	RC4739	
	SGS	TBA231	
	TI	SN76131	
		SN76149	
MC1350	TI	SN76600	
	Thomson-CSF	ESM1350	
MC1351	TI	SN76651	
MC1352	Fairchild	ULN-2136	
	Motorola	MC1357	
	RCA	CA1352	
		CA2111	
		CA3014	
	Sanyo	LA1352	
	Sprague	ULN-2111	
		ULN-2136	
	TI	SN76642	
		SN76643	
		SN76650	
		SN76669	
MC1355	RCA	CA3013	
MC1357	Fairchild	ULN-2136	
	Motorola	MC1352	
	RCA	CA1352	
		CA2111	
		CA3014	
	Sanyo	LA1352	
	Sprague	ULN-2111	
		ULN-2136	
	TI	SN76642	
		SN76643	
		SN76650	
		SN76669	
MC1358	Motorola	M5140	
		MC1364	
	National	LM3064	
	RCA	CA3064	
		CA3065	
	Sanyo	LA1365	
	TI	SN76666	
MC1364	Motorola	M5140	
		MC1358	
	National	LM3064	
	RCA	CA3064	
		CA3065	
	Sanyo	LA1365	
	TI	SN76666	
MC1389	Hitachi	HA1137	
		LA1230	
	National	CA3089	
		LM3089	**3325,3327**
	RCA	CA3089	
	Sanyo	LA1230	
		LA3089	
	SGS	TCA3089	
		TDA1200	
	Signetics	CA3089	
	Siliconix	CA3089	
	TI	SN76689	
MC1391	National	LM1391	
	RCA	CA1391	
	TI	SN76591	
MC1394	National	LM1394	
	RCA	CA1394	
	TI	SN76594	
MC1398	RCA	CA1398	
	TI	SN76298	
MC14000	National	CD4000	
MC14000	RCA	CD4000	
	SGS	HCF4000	
	Signetics	HEF400	
	SSS	SCL4000	
	Solitron	CM4000	
MC14001	Fairchild	F4001	
	Hitachi	HD14001	
	National	CD4001	
		MM74C02	
	OKI	MSM4001	
	RCA	CD4001	
	Sanyo	LC4001B	
	SGS	HCF4001	
	Signetics	HEF4001	
	SSS	SCL4001	
	Solitron	CM4001	
	Toshiba	TC4001	
MC14002	Fairchild	F4002	
	Hitachi	HD14002	
	National	CD4002	
	RCA	CD4002	
	SGS	HCF4002	
	Signetics	HEF4002	
	SSS	SCL4002	
	Solitron	CM4002	
	TI	TP4002	
	Toshiba	TC4002	
MC14006	Fairchild	F4006	
	Hitachi	HD14006	
	National	CD4006	
	RCA	CD4006	
	SGS	HCF4006	
	SSS	SCL4006	
	Solitron	CM4006	
	Toshiba	TC4006	
MC14007	Fairchild	F4007	
	Hitachi	HD14007	
	National	CD4007	
	RCA	CD4007	
	SGS	HCF4007	
	Signetics	HEF4007	
	SSS	SCL4007	
	Solitron	CM4007	
	Toshiba	TC4007	
MC14008	Fairchild	F4008	
	Hitachi	HD14008	
	National	CD4008	
		MM74C83	
	RCA	CD4008	
	SGS	HCF4008	
	Signetics	HEF4008	
	SSS	SCL4008	
	Solitron	CM4008	
	Toshiba	TC4008	
MC1400AU10	PMI	REF-01EZ	
MC1400AU5	PMI	REF-02EZ	
MC14011	Fairchild	F4011	
	Hitachi	HD14011	
	National	CD4011	
		MM74C00	
	OKI	MSM4011	
	RCA	CD4011	
	Sanyo	LC4011	
	SGS	HCF4011	
	Signetics	HEF4011	
	SSS	SCL4011	
	Solitron	CM4011	
	Toshiba	TC4011	
MC14012	Fairchild	F4012	
	Hitachi	HD14012	
	National	CD4012	
	RCA	CD4012	
	SGS	HCF4012	
	Signetics	HEF4012	
	SSS	SCL4012	
	Solitron	CM4012	
	Toshiba	TC4012	
MC14013	Fairchild	F4013	
	Hitachi	HD14013	
	National	CD4013	
		MM74C74	
	OKI	MSM4013	
	RCA	CD4013	
	Sanyo	LC4013	
	SGS	HCF4013	
	Signetics	HEF4013	
	SSS	SCL4013	
	Solitron	CM4013	
	Toshiba	TC4013	
MC14014	Fairchild	F4014	
	Hitachi	HD14014	
MC14014	National	CD4014	
	RCA	CD4014	
	SGS	HCF4014	
	Signetics	HEF4014	
	SSS	SCL4014	
	Solitron	CM4014	
	Toshiba	TC4014	
MC14015	Fairchild	F4015	
	Hitachi	HD14015	
	National	CD4015	
		MM74C164	
	OKI	MSM4015	
	RCA	CD4015	
	Sanyo	LC4015	
	SGS	HCF4015	
	Signetics	HEF4015	
	SSS	SCL4015	
	Solitron	CM4015	
	Toshiba	TC4015	
MC14016	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
MC14017	Fairchild	F4017	
	Hitachi	HD14017	
	National	CD4017	
	RCA	CD4017	
	SGS	HCF4017	
	Signetics	HEF4017	
	SSS	SCL4017	
	Solitron	CM4017	
	Toshiba	TC4017	
MC14018	Fairchild	F4018	
	Hitachi	HD14018	
	National	CD4018	
	RCA	CD4018	
	SGS	HCF4018	
	Signetics	HEF4018	
	SSS	SCL4018	
	Solitron	CM4018	
	Toshiba	TC4018	
◆MC14020	Fairchild	F4020	
	Hitachi	HD14020	
	National	CD4020	
	RCA	CD4020	
	SGS	HCF4020	
	Signetics	HEF4020	
	SSS	SCL4020	
	Solitron	CM4020	
	Toshiba	TC4020	
◆MC14021	Fairchild	F4021	
	Hitachi	HD14021	
	National	CD4021	
	RCA	CD4021	
	SGS	HCF4021	
	Signetics	HEF4021	
	SSS	SCL4021	
	Solitron	CM4021	
	Toshiba	TC4021	
◆MC14022	Fairchild	F4022	
	Hitachi	HD14022	
	National	CD4022	
	RCA	CD4022	
	SGS	HCF4022	
	Signetics	HEF4022	
	SSS	SCL4022	
	Solitron	CM4022	
	Toshiba	TC4022	
◆MC14023	Fairchild	F4023	
	Hitachi	HD14023	
	National	CD4023	
		MM74C10	
◆MC14023	RCA	CD4023	
	SGS	HCF4023	
	Signetics	HEF4023	
	SSS	SCL4023	
	Solitron	CM4023	
	Toshiba	TC4023	
◆MC14024	Fairchild	F4024	
	Hitachi	HD14024	
	National	CD4024	
	RCA	CD4024	
	SGS	HCF4024	
	Signetics	HEF4024	
	SSS	SCL4024	
	Solitron	CM4024	
	Toshiba	TC4024	
◆MC14025	Fairchild	F4025	
	Hitachi	HD14025	
	National	CD4025	
	RCA	CD4025	
	SGS	HCF4025	
	Signetics	HEF4025	
	SSS	SCL4025	
	Solitron	CM4025	
	Toshiba	TC4025	
◆MC14027	Fairchild	F4027	
	Hitachi	HD14027	
	National	CD4027	
		MM74C76	
	OKI	MSM4027	
	RCA	CD4027	
	Sanyo	LC4027	
	SGS	HCF4027	
	Signetics	HEF4027	
	SSS	SCL4027	
	Solitron	CM4027	
◆MC14028	Fairchild	F4028	
	Hitachi	HD14028	
	National	CD4028	
		MM74C42	
	OKI	MSM4028	
	Sanyo	LC4028	
	SGS	HCF4028	
	Signetics	HEF4028	
	SSS	SCL4028	
	Solitron	CM4028	
	Toshiba	TC4028	
◆MC14029	Fairchild	F4029	
	National	CD40192	
		CD4029	
	RCA	CD40192	
		CD4029	
	SGS	HCF40192	
		HCF4029	
	Signetics	HEF40192	
	SSS	SCL4029	
		SCL4192	
	Solitron	CM4029	
	Toshiba	TC40192	
		TC4029	
MC1403	**AD**	**AD1403**	**3178**
	SiliconG	SG1403	
MC14032	Hitachi	HD14032	
	RCA	CD4032	
	SGS	HCF4032	
	Solitron	CM4032	
	Toshiba	TC4032	
MC14034	Fairchild	F4034	
	Hitachi	HD14034	
	National	CD4034	
	RCA	CD4034	
	SGS	HCF4034	
	SSS	SCL4034	
	Solitron	CM4034	
	Toshiba	TC4034	
MC14035	Fairchild	F4035	
	Hitachi	HD14035	
	National	CD4035	
	RCA	CD4035	
	SGS	HCF4035	
	Signetics	HEF4035	
	SSS	SCL4035	
	Solitron	CM4035	
	Toshiba	TC4035	
MC14038	Hitachi	HD14038	
	RCA	CD4038	
	SGS	HCF4038	
	Solitron	CM4038	
	Toshiba	TC4038	
MC1404-10	HybridSys	HSREF01	
	MicroPwr	**MP5532**	**401,3292**
		REF-01	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MC1404-10	**Motorola**	**MC1504-10**	**2761**
	PMI	REF-01	
	TeledyneS	9496	
MC1404-5	PMI	REF-02	
MC14040	Fairchild	F4040	
	Hitachi	HD14040	
	National	CD4040	
	RCA	CD4040	
	SGS	HCF4040	
	Signetics	HEF4040	
	SSS	SCL4040	
	Solitron	CM4040	
	Toshiba	TC4040	
MC14042	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
MC14043	Hitachi	HD14043	
	National	CD4043	
	RCA	CD4043	
	SGS	HCF4043	
	Signetics	HEF4043	
	SSS	SCL4043	
	Solitron	CM4043	
	Toshiba	TC4043	
MC14044	Fairchild	F4044	
	Hitachi	HD14044	
	National	CD4044	
	RCA	CD4044	
	SGS	HCF4044	
	Signetics	HEF4044	
	SSS	SCL4044	
	Solitron	CM4044	
	Toshiba	TC4044	
MC14046	Fairchild	F4046	
	Hitachi	HD14046	
	National	CD4046	
	RCA	CD4046	
	SGS	HCF4046	
	SSS	SCL4046	
	Solitron	CM4046	
MC14049	Fairchild	F4049	
	Hitachi	HD14049	
	National	CD4049	
	OKI	MSM4049	
	RCA	CD4009	
		CD4049	
	Sanyo	LC4049	
	SGS	HCF4049	
	Signetics	HEF4049	
	SSS	SCL4049	
	Solitron	CM4049	
	Toshiba	TC4049	
MC1405	Siliconix	LD111	
MC14050	Fairchild	F4050	
	Hitachi	HD14050	
	National	CD4050	
	RCA	CD4010	
		CD4050	
	SGS	HCF4050	
	Signetics	HEF4050	
	SSS	SCL4050	
	Solitron	CM4050	
	Toshiba	TC4050	
MC14051	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	National	**LF11508**	**3318**
		LF13508	
MC14051	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
MC14052	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	National	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**
	TeledyneP	4553	
MC14053	Fairchild	F4053	
	National	CD4053	
	RCA	CD4053	
	SGS	HCF4052	
	Signetics	HEF4053	
	SSS	SCL4053	
	Solitron	CM4053	
	Toshiba	TC4053B	
MC14060	National	CD4060	
	RCA	CD4060	
	SGS	HCF4060	
	Signetics	HEF4060	
	SSS	SCL4060	
MC14066	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
MC14067	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
		MX-1606	**2622**
	Fairchild	F4067	
	Harris	HI1840	
		HI506	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	
	PMI	MUX-16	
	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
MC14068	Fairchild	F4068	
	Hitachi	HD14068	
	RCA	CD4068	
	SGS	HCF4068	
	Signetics	HEF4068	
	SSS	SCL4068	
		SCL4412	
	Solitron	CM4068	
	TI	UCN4810	
	Toshiba	TC4068	
MC14069	Fairchild	F4069	
	Hitachi	HD14069	
	National	CD4069	
		MM54C04	
		MM74C04	
MC14069	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	
	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
MC14070	Fairchild	F4070	
	Hitachi	HD14070	
	National	CD4070	
		MM74C86	
	RCA	CD4070	
	SGS	HCF4070	
	Signetics	HEF4070	
	SSS	SCL4070	
	Solitron	CM4070	
MC14071	Fairchild	F4071	
	Hitachi	HD14071	
	National	CD4071	
		MM74C32	
	OKI	MSM4071	
	RCA	CD4071	
	Sanyo	LC4071	
	SGS	HCF4071	
	Signetics	HEF4071	
	SSS	SCL4071	
	Solitron	CM4071	
	Toshiba	TC4071	
MC14072	Fairchild	F4072	
	Hitachi	HD14072	
	National	CD4072	
	RCA	CD4072	
	SGS	HCF4072	
	Signetics	HEF4072	
	SSS	SCL4072	
	Toshiba	TC4072	
MC14073	Fairchild	F4073	
	Hitachi	HD14073	
	National	CD4073	
	RCA	CD4073	
	SGS	HCF4073	
	Signetics	HEF4073	
	SSS	SCL4073	
	Solitron	CM4073	
	Toshiba	TC4073	
MC14075	Fairchild	F4075	
	Hitachi	HD14075	
	National	CD4075	
	RCA	CD4075	
	SGS	HCF4075	
	Signetics	HEF4075	
	SSS	SCL4075	
	Solitron	CM4075	
	Toshiba	TC4075	
MC14076	Fairchild	F4076	
	Hitachi	HD14076	
	National	CD4076	
		MM54C173	
		MM74C173	
	RCA	CD4076	
	SGS	HCF4076	
	Signetics	HEF4076	
	SSS	SCL4076	
	Solitron	CM4076	
	Toshiba	TC4076	
MC14077	Fairchild	F4077	
	Hitachi	HD14077	
	National	CD4077	
	RCA	CD4077	
	SGS	HCF4077	
	Signetics	HEF4077	
	SSS	SCL4077	
	Solitron	CM4077	
MC14078	Fairchild	F4078	
	Hitachi	HD14078	
	RCA	CD4078	
	SGS	HCF4078	
	Signetics	HEF4078	
	SSS	SCL4078	
	Solitron	CM4078	
	Toshiba	TC4078	
MC1408	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
MC1408	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
MC14081	Fairchild	F4081	
	Hitachi	HD14081	
	National	CD4081	
		MM74C08	
	OKI	MSM4081	
	RCA	CD4081	
	Sanyo	LC4081	
	SGS	HCF4081	
	Signetics	HEF4081	
	SSS	SCL4081	
	Solitron	CM4081	
	Toshiba	TC4081	
MC14082	Fairchild	F4082	
	Hitachi	HD14082	
	National	CD4082	
	RCA	CD4082	
	SGS	HCF4082	
	Signetics	HEF4082	
	SSS	SCL4082	
	Toshiba	TC4082	
MC14093	Fairchild	F4093	
	Hitachi	HD14093	
	National	CD4093	
	OKI	MSM4093	
	RCA	CD4093	
	Sanyo	LC4093	
	SGS	HCF4093	
	Signetics	HEF4093	
	SSS	SCL4093	
	Toshiba	TC4093	
MC14094	Hitachi	HD14094	
	RCA	CD4094	
	SGS	HCF4094	
	Signetics	HEF4094	
	SSS	SCL4094	
	Toshiba	TC4094	
MC14097	Fairchild	F4097	
	RCA	CD4097	
	SGS	HCF4097	
MC14099	Hitachi	HD14099	
	National	CD4099	
	RCA	CD4099	
	SGS	HCF4099	
	SSS	SCL4099	
	Toshiba	TC4099	
MC1411	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

ALTERNATE SOURCE DIRECTORY

© IC MASTER 1983

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MC1411	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
MC1412	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
MC1413	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1416**	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
MC1414	**National**	**LM1414**	**3317**
	TI	TL514	
		TL720	
MC1416	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
MC14160	Fairchild	F40160	
	Hitachi	HD14160	
	National	CD40160	
		MM54C160	
		MM74C160	
	RCA	CD40160	
	SGS	HCF40160	
	Signetics	HEF4060	
	SSS	SCL4160	
	Toshiba	TC40160	
MC14161	Fairchild	F40161	
	Hitachi	HD14161	
	National	CD40161	
		MM54C161	
		MM74C161	
	RCA	CD40161	
	SGS	HCF40161	
	Signetics	HEF40161	
	SSS	SCL4161	
	Toshiba	TC40161	
MC14162	Fairchild	F40162	
	Hitachi	HD14162	
	National	CD40162	
		MM54C162	
		MM74C162	
	RCA	CD40162	
	SGS	HCF40162	
	Signetics	HEF40162	
	SSS	SCL4162	
	Toshiba	TC40162	
MC14163	Fairchild	F40163	
	Hitachi	HD14163	
	National	CD40163	
		MM54C163	
		MM74C163	
	RCA	CD40163	
	SGS	HCF40163	
	Signetics	HEF40163	
	SSS	SCL4163	
	Toshiba	TC40163	
MC14174	Fairchild	F40174	
	Hitachi	HD14174	
	National	CD40174	
		MM54C174	
		MM74C174	
	RCA	CD40174	
	SGS	HCF40174	
	Signetics	HEF40174	
	SSS	SCL4174	
	Toshiba	TC40174	
MC14175	Fairchild	F40175	
	Hitachi	HD14175	
	National	CD40175	
		MM54C175	
		MM74C175	
	Signetics	HEF40175	
	Toshiba	TC40175	
MC14194	Fairchild	F40194	
	Hitachi	HD14194	
	RCA	CD40194	
	SGS	HCF40194	
	Signetics	HEF40194	
MC1436	**Datel**	**AM-464-2**	**2622**
	Harris	**HA-2645**	**3232,3287**
	Motorola	MC1439	
	National	LM1436	
		LM343	
	SiliconG	SG1436	
	TeledyneP	1332	
MC1439	**Datel**	**AM-464-2**	**2622**
	Harris	**HA-2645**	**3232,3287**
	Motorola	MC1436	
	National	LM1436	
		LM343	
	SiliconG	SG1436	
	TeledyneP	1332	
MC14404	**RCA**	**CD22404**	**749**
MC14413	**RCA**	**CD22413**	**749**
MC14414	**RCA**	**CD22414**	**749**
MC14416	**RCA**	**CD22416**	**749**
MC14419	**RCA**	**CD22419**	**749**
MC14433	TeledyneS	14433	
		14433A	
MC14443	Fairchild	μA9708	
	Motorola	MC14447	
MC14447	Fairchild	μA9708	
	Motorola	MC14443	
MC1445	TI	MC1445	
MC14502	Hitachi	HD14502	
	RCA	CD4502	
	SGS	HCF4502	
MC14502	Signetics	HEF4502	
	SSS	SCL4502	
MC14503	Fairchild	F40097	
	Hitachi	HD14503	
	National	CD4503	
		MM80C97	
	RCA	CD4503	
	Signetics	HEF40097	
MC14504	Fairchild	F4104	
	GTEMicro	G4104	
	Mitel	MD4104	
	National	MM4104	
	RCA	CD40109	
	SGS	HCF40109	
	Signetics	HEF4104	
MC14505	Signetics	HEF4505	
MC14508	Hitachi	HD14508	
		HD74147	
	National	DM74147	
	RCA	CD4508	
	SGS	HCF4508	
	Signetics	74147	
		HEF4508	
		N82147	
	SSS	SCL4508	
	Solitron	CM4508	
	TI	**SN74147**	**882**
	Toshiba	TC4508	
MC14510	Fairchild	F4510	
	Hitachi	HD14510	
	National	CD4510	
	RCA	CD4510	
	SGS	HCF4510	
	Signetics	HEF4510	
	SSS	SCL4510	
	Solitron	CM4510	
	Toshiba	TC4510	
MC14511	Fairchild	F4511	
	Hitachi	HD14511	
	Mitel	MD4511	
	MMI	4511	
	National	CD4511	
	NEC-Micro	μPD4511	
	RCA	CD4511	
	SGS	HCF4511	
	Signetics	HEF4511	
	SSS	SCL4511	
	Solitron	CM4511	
	Toshiba	TC4511	
MC14512	Fairchild	F4512	
	Hitachi	HD14512	
	National	CD4512	
	RCA	CD4512	
	SGS	HCF4512	
	SSS	SCL4512	
	Toshiba	TC4512	
MC14514	Fairchild	F4514	
	Hitachi	HD14514	
	National	CD4514	
	RCA	CD4514	
	SGS	HCF4514	
	Signetics	HEF4514	
	SSS	SCL4514	
	Solitron	CM4514	
	Toshiba	TC4514	
MC14515	Fairchild	F4515	
	Hitachi	HD14515	
	National	CD4515	
	RCA	CD4515	
	SGS	HCF4515	
	Signetics	HEF4515	
	SSS	SCL4515	
	Solitron	CM4515	
	Toshiba	TC4515	
MC14516	Fairchild	F4516	
	Hitachi	HD14516	
	National	CD4516	
	RCA	CD4516	
	SGS	HCF4516	
	Signetics	HEF4516	
	SSS	SCL4516	
	Solitron	CM4516	
	Toshiba	TC4516	
MC14517	Hitachi	HD14517	
	RCA	CD4517	
	Signetics	HEF4517	
	SSS	SCL4517	
MC14518	Fairchild	F4518	
	Hitachi	HD14518	
	National	CD4518	
	RCA	CD4518	
	SGS	HCF4518	
MC14518	Signetics	HEF4518	
	SSS	SCL4518	
	Solitron	CM4518	
	Toshiba	TC4518	
MC14519	Hitachi	HD14519	
		HD4519	
	National	CD4519	
	RCA	CD4519	
	Signetics	HEF4519	
MC14520	Fairchild	F4520	
	Hitachi	HD14520	
	National	CD4520	
	OKI	MSM4520	
	RCA	CD4520	
	Sanyo	LC4520	
	SGS	HCF4520	
	Signetics	HEF4520	
	SSS	SCL4520	
	Solitron	CM4520	
	Toshiba	TC4520	
MC14521	Fairchild	F4521	
	RCA	CD4045	
	SGS	HCF4045	
	Signetics	HEF4521	
	SSS	SCL4445	
	Solitron	CM4045	
	Toshiba	TC4521	
MC1452100	**RCA**	**CD22100**	**749,753**
	SGS	M22100	
MC14522	Fairchild	F4522	
	Hitachi	HD14522	
	National	CD4522	
	RCA	CD4522	
	Signetics	HEF4522	
	SSS	SCL4522	
	Toshiba	TC4522	
MC14526	Fairchild	F4526	
	Hitachi	HD14526	
	National	CD4526	
	Signetics	HEF4526	
	SSS	SCL4526	
	Toshiba	TC4526	
MC14527	Fairchild	F4527	
	Hitachi	HD14527	
	National	CD4527	
	RCA	CD4527	
	SGS	HCF4527	
	Signetics	HEF4527	
	SSS	SCL4527	
	Toshiba	TC4527	
		TR4527	
MC14528	Fairchild	F4528	
	Hitachi	HD14528	
	National	CD4528	
		MM74C221	
	RCA	CD4098	
	SGS	HCF4098	
	Signetics	HEF4528	
	SSS	SCL4528	
	Toshiba	TC4528	
MC14531	Fairchild	F4531	
	Hitachi	HD14531	
	RCA	CD40101	
	SGS	HCF40101	
	Signetics	HEF4531	
	SSS	SCL4531	
	Toshiba	TC4531	
MC14532	Fairchild	F4532	
	Hitachi	HD14532	
	RCA	CD4532	
	SGS	HCF4532	
	Signetics	HEF4532	
	SSS	SCL4532	
	Toshiba	TC4532	
MC14533	Fairchild	F4553	
	Hitachi	HD14553	
	Motorola	MC14553	
MC14534	Hitachi	HD14534	
	Signetics	HEF4534	
MC14536	RCA	CD4536	
MC14538	National	CD4538	
	OKI	MSM4538	
	Signetics	HEF4538	
MC14539	Fairchild	F4539	
	Hitachi	HD14539	
	Signetics	HEF4539	
	Toshiba	TC4539	
MC14541B	RCA	CD4541B	
	Signetics	HEF4591	
MC14543	Fairchild	F4543	
	Hitachi	HD14543	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MC14543	National	CD4543	
	RCA	CD4055	
		CD4056	
		CD4543	
	Signetics	HEF4543	
	Toshiba	TC4543	
MC14543B	RCA	CD4543B	
MC1455	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
MC14553	Fairchild	F4553	
	Hitachi	HD14553	
	Motorola	MC14533	
MC14555	Fairchild	F4555	
	Hitachi	HD14555	
	RCA	CD4555	
	SGS	HCF4555	
	Signetics	HEF4555	
	SSS	SCL4555	
	Toshiba	TC4555	
MC14556	Fairchild	F4556	
	RCA	CD4556	
	SGS	HCF4556	
	Signetics	HEF4556	
	SSS	SCL4556	
	Toshiba	TC4556	
MC14557	Fairchild	F4557	
	Hitachi	HD14557	
	Signetics	HEF4557	
MC14558	Hitachi	HD14558	
	RCA	CD4055	
MC1456	**Datel**	**AM-460-2**	**2622**
	Harris	**HA-2605**	**3226,3287**
	Intersil	HA-2602	
		HA-2605	
		HA2605	
	Signetics	MC1456	
	SiliconG	SG1456	
	TI	MC1456	
MC14560	Hitachi	HD14560	
	Toshiba	TC4560	
MC14561	Hitachi	HD14561	
	Toshiba	TC4561	
MC14566	Hitachi	HD14566	
MC14568	Hitachi	HD14568	
MC14569	Hitachi	HD14569	
	RCA	CD4059	
	Signetics	HEF4059	
MC14572	Hitachi	HD14572	
	Toshiba	TC4572	
MC1458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
MC1458	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
MC14580	Hitachi	HD14580	
	RCA	CD40108	
MC14581	Hitachi	HD14581	
	RCA	CD40181	
		CD4057	
	SGS	HCF40181	
	SSS	SCL4581	
MC14582	Fairchild	F4582	
	Hitachi	HD14582	
	RCA	CD40182	
	SGS	HCF40182	
	SSS	SCL4582	
MC14583	Fairchild	F4583	
	Hitachi	HD14583	
	Toshiba	TC4583	
MC14584	Fairchild	F40014	
	Hitachi	HD14584	
	National	CD40106	
		CD4584	
		MM54C14	
		MM74C14	
	RCA	CD40106	
	SGS	HCF40106	
	Signetics	HEF40106	
	SSS	SCL4584	
MC14585	Fairchild	F40085	
	Hitachi	HD14585	
	National	MM74C85	
	RCA	CD4585	
	Signetics	HEF4585	
	SSS	SCL4585	
	Toshiba	TC4585	
MC1463	Toshiba	TA7085	
MC1468	Exar	XR1468	
		XR4195	
	Raytheon	RC4195	
	SiliconG	SG1468	
		SG2501A	
		SG3501A	
		SG4501	
MC1472	Sprague	UDN-5712	
	TI	SN75475	
		SN75477	
MC1488	AMD	MC1488	
	Exar	**XR1488**	**3188**
	Fairchild	μA1488	
	Harris	HA1488	
	Hitachi	HD75188	
	National	DS1488	
	Raytheon	RM1488	
	Signetics	MC1488	
	SiliconG	SG1488	
	TI	MC1488	
		SN75188	
MC1489	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489A**	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
MC1489	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
MC1489A	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
MC1495	SiliconG	SG1495	
MC1496	Fairchild	μA796	
	Motorola	MC1596	
	National	LM1496	
		LM1596	
	Plessey	SL1496	
		SL1596	
	Signetics	MC1496	
		MC1596	
	SiliconG	SG1496	
		SG1596	
MC14XXX	Fairchild	34XXX	
		F4XXX	
	Hitachi	HD14XXX	
	National	CD4XXX	
	OKI	MSM4XXX	
	SGS	HCF4XXX	
	SSS	SCL4XXX	
	Solitron	CM4XXX	
	TI	TP4000 series	
	Toshiba	TC4XXX	
MC1500AU10	PMI	REF-01AZ	
MC1500AU5	PMI	REF-02AZ	
MC1504-10	HybridSys	HSREF01	
	MicroPwr	**MP5532**	**401,3292**
		REF-01	
	Motorola	**MC1404-10**	**2761**
	PMI	REF-01	
	TeledyneS	9496	
MC1508	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC08C	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
MC1514	**National**	**LM1514**	**3317**
	TI	TL514	
MC1536	Datel	AM-464-2M	
	Harris	**HA-2640**	**3232,3287**
	National	LM143	
		LM1536	
MC1536	SiliconG	SG1536	
MC1537	Raytheon	RM1537	
MC1555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
MC1556	**Harris**	**HA-2600**	**3226,3287**
	Intersil	HA2600	
	Signetics	MC1556	
	SiliconG	SG1556	
	TeledyneP	1326	
	TI	MC1556	
MC1558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
MC1568	Exar	XR1568	
	Raytheon	RM4195	
	SiliconG	SG1501A	
		SG1568	
MC1590	RCA	CA3011	
		CA3012	
MC1595	SiliconG	SG1595	
MC1596	Fairchild	μA796	
	Motorola	MC1496	
	National	LM1496	
		LM1596	
	Plessey	SL1496	
		SL1596	
	Signetics	MC1496	
		MC1596	
	SiliconG	SG1496	
		SG1596	
MC1648	Plessey	SP1648	
MC1650	Plessey	SP1650	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MC1651	Plessey	SP1651	
MC1658	Fairchild	11C58	
	Plessey	SP1658	
MC1660	Plessey	SP1660	
MC1662	Plessey	SP1662	
MC1664	Plessey	SP1664	
MC1666	Plessey	SP1666	
MC1668	Plessey	SP1668	
MC1670	Fairchild	11C70	
	Plessey	SP1670	
MC1671	Plessey	SP1671	
MC1672	Plessey	SP1672	
MC1674	Plessey	SP1674	
MC1688	Fairchild	11C01	
MC1690	Fairchild	11C06	
MC1692	Plessey	SP1692	
MC1699	Fairchild	11C05	
	Plessey	SP8610	
		SP8616	
MC1709	Fairchild	μA709	
	Hitachi	HA1303	
	National	LM1709	
		LM709	
	NEC-Electron	μPC255	
		μPC55	
	Raytheon	RC709	
		RM709	
	RCA	CA3038	
	TI	μA709	
	Thomson-CSF	SFC2709	
	Toshiba	TA7502	
MC1710	Fairchild	μA710	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM710	
	National	**LM710**	**3317**
	PMI	CMP-01	
		CMP-02	
	Raytheon	RM710	
	SiliconG	SG710	
	TI	μA710	
	Thomson-CSF	SFC2710	
MC1711	Fairchild	μA711	
	National	**LM711**	**3317**
	SiliconG	SG711	
	TI	μA711	
	Thomson-CSF	SFC2711	
MC1712	NEC-Electron	μPC51	
MC1723	Fairchild	μA723	
	Hitachi	HA17723	
	Intersil	LM723	
	National	LM723	
	Raytheon	RC723	
		RM723	
	RCA	CA723	
		LM723	
	SGS	L123	
	Signetics	μA723	
	SiliconG	SG723	
	TI	μA723	
	Thomson-CSF	SFC2723	
MC1733	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		μA733	
	SiliconG	SG733	
	TI	μA733	
MC1741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
MC1741	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
MC1747	AMD	747	
	Fairchild	μA747	
	Hitachi	HA17747	
	National	LM747	
	NEC-Electron	μPC251	
	PMI	OP-04	
		PM747	
	Raytheon	RC747	
		RM747	
	RCA	CA747	
	Signetics	μA747	
	SiliconG	SG747	
	TeledyneS	747	
	TI	μA747	
MC1748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
MC1776	Fairchild	μA776	
	Harris	**HA-2720**	**3236**
	Intersil	ICL8021	
		LM4250	
	National	LM4250	
	SiliconG	SG4250	
	Solitron	UC4250	
MC2257	Nitron	NC2257	
MC2259	Nitron	NC2259	
MC2260	Nitron	NC2260	
MC2652	AMI	S6852	
	Fairchild	**F6852**	**1281**
	Hitachi	**HD6852**	**1345**
		HD68A52	**1345**
	Motorola	**MC6852**	**1351**
		MC68652	**1359**
	Signetics	SCN2652	
	SSS	SND5025	
	SMC	COM5025	
MC2653	**Motorola**	**MC68653**	**1360**
	Signetics	SCN2653	
MC2661	Motorola	MC68661	
	Signetics	SCN2661	
	SMC	COM2661	
	Synertek	2661	
MC2681	Signetics	2681	
MC2682	Signetics	2682	
MC27A08	AMD	2708	
	Fairchild	F2708	
	Hitachi	HN462708	
	Motorola	MCM2708	
	National	MM2708	
	NEC-EA	EA2708	
	Panasonic	MN2708	
	Rockwell	2708	
	SGS	M2708	
MC27A08	TI	TMS2708	
MC2903	**AMD**	**AM2903**	**1203**
	Fairchild	F2903	
MC2910	AMD	AM2910	
	Fairchild	29F10	
		F2910	
MC3242A	Intel	3242	
MC3245	Intel	3245	
	National	DS3245	
MC3301	Hitachi	HA17301	
	Motorola	LM2900	
	National	LM2900	
		LM3301	
	Raytheon	LM2900	
		RC3301	
	TI	LM2900	
MC3302	Fairchild	μA2901	
		μA3302	
	Motorola	LM2901	
	National	LM2901	
		LM3302	
	NEC-Electron	μPC2901	
	PMI	CMP-04	
	Raytheon	LM2901	
		RV3302	
	RCA	CA3302	
	Signetics	LM2901	
		MC3302	
	SiliconG	SG3302	
	TI	LM2901	
		LM3302	
MC3303	Fairchild	μA3303	
	Signetics	MC3303	
	TI	MC3303	
MC3346	National	LM3046	
	Plessey	SL3146	
	RCA	CA3046	
		CA3146	
	SiliconG	SG3046	
		SG3146	
	Sprague	ULN-2046	
MC3357	MicroPwr	MP5071	
		MP5701	
MC3386	Fairchild	μA3086	
	National	LM3086	
	Plessey	SL3046	
		SL3086	
	RCA	CA3046	
		CA3086	
	SiliconG	SG3086	
		SG3821	
		SG3886	
	Sprague	ULN-2046	
		ULN-2086	
MC34001	TI	TL081C	
MC34001A	TI	LL081BC	
MC34001B	TI	TL081AC	
MC34002	TI	TL082C	
MC34002A	TI	TL082BC	
MC34002B	TI	TL082AC	
MC34004	Exar	XR074	
	National	**LF347**	**3309,3326**
	TI	TL074	
		TL084C	
MC34004A	TI	TL084BC	
MC34004B	TI	TL084AC	
MC3401	National	LM3401	
		LM3900	
	Raytheon	LM3900	
		RC3401	
	RCA	CA3401	
	TI	LM3900	
MC34022	PMI	OP-215	
MC3403	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
MC3403	SiliconG	SG324	
	TI	LM324	
		MC3403	
MC3410	Signetics	MC3410	
MC3412	**AD**	**AD565J**	**3165**
MC3416	Raytheon	RC4444	
MC3420	MicroPwr	MP5078	
	Motorola	**MC3520**	**3297**
MC3423	SiliconG	SG3423	
	TI	MC3423	
MC3430	Motorola	MC3441	
	National	DS3651	
MC3432	National	DS3653	
MC3437	National	DS8837	
	Signetics	N8T37	
MC3438	AMD	DS8838	
	National	DS8838	
	Signetics	N8T38	
MC3441	Motorola	MC3430	
	National	DS3651	
MC3446	**Motorola**	**MC3446A**	**2753**
	TI	MC3446	
MC3446A	Motorola	MC3446	
	TI	MC3446	
MC3448A	Fairchild	μA3448A	
MC3450	National	DS3650	
MC3452	National	DS3652	
MC3456	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
MC3458	Fairchild	μA798	
	Motorola	MC3558	
MC3460	National	DS3674	
MC3461	Hitachi	HD103461	
MC3481	TI	SN75126	
MC3485	TI	SN75126	
MC3486	National	DS3486	
	TI	MC3486	
MC3487	National	DS3487	
		DS3687	
	TI	MC3487	
MC3488	Fairchild	9636A	
	TI	9636	
		9636A	
MC3491	National	DS8889	
MC35001B	TI	TL081M	
MC35002B	TI	TL082M	
MC35004	TI	TL084M	
MC3503	**Exar**	**XR3503**	**3207**
	Raytheon	RC3503	
		RM3503	
		RM4137	
	Signetics	MC3503	
	SiliconG	SG3503	
	TI	MC3503	
MC3510	Datel	DAC-IC10BM	
	Signetics	MC3510	
		NE5410	**3413**
		SE5410	**3413**
MC3512	**AD**	**AD565S**	**3165**
MC3520	MicroPwr	MP5078	
	Motorola	**MC3420**	**3297**
MC3523	SiliconG	SG3523	
	TI	MC3523	
MC3556	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
MC3558	Fairchild	μA798	
	Motorola	MC3458	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

© IC MASTER 1983

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MC4002	Fairchild	7488	
	National	DM7488	
	Signetics	7488	
		N8224	
	TI	SN7488	
		SN7488A	**863**
MC40175	RCA	CD40175	
MC4024	Fairchild	11C24	
	Motorola	MC4324	
MC4044	Fairchild	11C44	
	Motorola	MC4344	
MC4324	Fairchild	11C24	
	Motorola	MC4024	
MC4344	Fairchild	11C44	
	Motorola	MC4044	
MC4558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650 3234,3287**	
		HA-2655 3234,3287	
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
MC4558C	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650 3234,3287**	
		HA-2655 3234,3287	
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
MC4558C	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
MC4741	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
◆MC54107	Fairchild	54107	
	National	DM54107	
	TI	**SN54107**	**869**
MC54F00	Fairchild	54F00	
	Signetics	54F00	
MC54F02	Fairchild	54F02	
	Signetics	54F02	
MC54F04	Fairchild	54F04	
	Signetics	54F04	
MC54F08	Fairchild	54F08	
	Signetics	54F08	
MC54F10	Fairchild	54F10	
	Signetics	54F10	
MC54F109	Fairchild	54F109	
	Signetics	54F109	
MC54F11	Fairchild	54F11	
	Signetics	54F11	
MC54F138	Fairchild	54F138	
	Signetics	54F138	
MC54F139	Fairchild	54F139	
	Signetics	54F139	
MC54F20	Fairchild	54F20	
	Signetics	54F20	
MC54F240	**Fairchild**	**54F240**	**630**
	Signetics	54F240	
MC54F241	**Fairchild**	**54F241**	**630**
	Signetics	54F241	
MC54F242	Fairchild	54F242	
	Signetics	54F242	
MC54F243	Fairchild	54F243	
	Signetics	54F243	
MC54F244	**Fairchild**	**54F244**	**630**
	Signetics	54F244	
MC54F32	Fairchild	54F32	
	Signetics	54F32	
MC54F333	Fairchild	54F333	
	Signetics	54F333	
MC54F373	**Fairchild**	**54F373**	**632**
	Signetics	54F373	
MC54F374	**Fairchild**	**54F374**	**634**
	Signetics	54F374	
MC54F534	Fairchild	54F534	
	Signetics	54F534	
MC54F74	Fairchild	54F74	
	Signetics	54F74	
MC54HC00	National	MM54HC00	
	RCA	**CD54HC00**	**740**
	Signetics	PCF54HC00	
MC54HC02	National	MM54HC02	
	RCA	**CD54HC02**	**740**
MC54HC02	Signetics	PCF54HC02	
MC54HC04	National	MM54HC04	
	RCA	**CD54HC04**	**740**
	Signetics	PCF54HC04	
MC54HC08	National	MM54HC08	
	RCA	**CD54HC08**	**740**
	Signetics	PCF54HC08	
MC54HC10	National	MM54HC10	
	RCA	**CD54HC10**	**740**
	Signetics	PCF54HC10	
MC54HC107	National	MM54HC107	
	RCA	**CD54HC107**	**739**
	Signetics	PCF54HC107	
MC54HC109	National	MM54HC109	
	RCA	**CD54HC109**	**739**
	Signetics	PCF54HC109	
MC54HC11	National	MM54HC11	
	RCA	**CD54HC11**	**740**
	Signetics	PCF54HC11	
MC54HC112	National	MM54HC112	
	RCA	**CD54HC112**	**739**
	Signetics	PCF54HC112	
MC54HC123	National	MM54HC123	
	RCA	CD54HC123	
	Signetics	PCF54HC123	
MC54HC132	National	MM54HC132	
	RCA	CD54HC132	
	Signetics	PCF54HC132	
MC54HC133	National	MM54HC133	
	RCA	**CD54HC133**	**740**
	Signetics	PCF54HC133	
MC54HC138	National	MM54HC138	
	RCA	**CD54HC138**	**739**
	Signetics	PCF54HC138	
MC54HC139	National	MM54HC139	
	RCA	**CD54HC139**	**739**
	Signetics	PCF54HC139	
MC54HC14	National	MM54HC14	
	RCA	**CD54HC14**	**740**
	Signetics	PCF54HC14	
MC54HC147	National	MM54HC147	
	RCA	**CD54HC147**	**739**
	Signetics	PC54HC147	
MC54HC151	National	MM54HC151	
	RCA	**CD54HC151**	**740**
	Signetics	PCF54HC151	
MC54HC153	National	MM54HC153	
	RCA	**CD54HC153**	**740**
	Signetics	PCF54HC153	
MC54HC154	National	MM54HC154	
	RCA	**CD54HC154**	**739**
	Signetics	PCF54HC154	
MC54HC157	RCA	CD54HC157	
	Signetics	PCF54HC157	
MC54HC158	National	MM54HC158	
	RCA	CD54HC158	
	Signetics	PCF54HC158	
MC54HC160	National	MM54HC160	
	RCA	**CD54HC160**	**739**
	Signetics	PCF54HC160	
MC54HC161	National	MM54HC161	
	RCA	**CD54HC161**	**739**
	Signetics	PCF54HC161	
MC54HC162	National	MM54HC162	
	RCA	**CD54HC162**	**739**
	Signetics	PCF54HC162	
MC54HC163	National	MM54HC163	
	RCA	**CD54HC163**	**739**
	Signetics	PCF54HC163	
MC54HC164	National	MM54HC164	
	RCA	**CD54HC164**	**740**
	Signetics	PCF54HC164	
MC54HC165	National	MM54HC165	
	RCA	**CD54HC165**	**740**
	Signetics	PCF54HC165	
MC54HC173	National	MM54HC173	
	RCA	**CD54HC173**	**739**
	Signetics	PCF54HC173	
MC54HC174	National	MM54HC174	
	RCA	**CD54HC174**	**739**
	Signetics	PCF54HC174	
MC54HC175	National	MM54HC175	
	RCA	**CD54HC175**	**739**
	Signetics	PCF54HC175	
MC54HC192	National	MM54HC192	
	RCA	**CD54HC192**	**739**
	Signetics	PCF54HC192	
MC54HC193	National	MM54HC193	
	RCA	**CD54HC193**	**739**
	Signetics	PCF54HC193	
MC54HC194	National	MM54HC194	
	RCA	**CD54HC194**	**740**
MC54HC194	Signetics	PCF54HC194	
MC54HC195	National	MM54HC195	
	RCA	**CD54HC195**	**740**
	Signetics	PCF54HC195	
MC54HC20	National	MM54HC20	
	RCA	**CD54HC20**	**740**
	Signetics	PCF54HC20	
MC54HC221	National	MM54HC221	
	RCA	**CD54HC221**	**740**
	Signetics	PCF54HC221	
MC54HC240	National	MM54HC240	
	RCA	**CD54HC240**	**740**
	Signetics	PCF54HC240	
MC54HC241	National	MM54HC241	
	RCA	**CD54HC241**	**740**
	Signetics	PCF54HC241	
MC54HC242	National	MM54HC242	
	RCA	**CD54HC242**	**739**
	Signetics	PCF54HC242	
MC54HC243	National	MM54HC243	
	RCA	**CD54HC243**	**739**
	Signetics	PCF54HC243	
MC54HC244	National	MM54HC244	
	RCA	**CD54HC244**	**740**
	Signetics	PCF54HC244	
MC54HC245	National	MM54HC245	
	RCA	**CD54HC245**	**739**
	Signetics	PCF54HC245	
MC54HC251	National	MM54HC251	
	RCA	**CD54HC251**	**740**
	Signetics	PCF54HC251	
MC54HC253	National	MM54HC253	
	RCA	CD54HC253	
	Signetics	PCF54HC253	
MC54HC257	National	MM54HC257	
	RCA	**CD54HC257**	**740**
	Signetics	PCF54HC257	
MC54HC259	National	MM54HC259	
	RCA	**CD54HC259**	**739**
	Signetics	PCF54HC259	
MC54HC266	National	MM54HC266	
	RCA	**CD54HC266**	**740**
	Signetics	PCF54HC266	
MC54HC27	National	MM54HC27	
	RCA	**CD54HC27**	**740**
	Signetics	PCF54HC27	
MC54HC273	RCA	CD54HC273	
	Signetics	PCF54HC273	
MC54HC280	National	MM54HC280	
	RCA	**CD54HC280**	**739**
	Signetics	PCF54HC280	
MC54HC299	National	MM54HC299	
	RCA	CD54HC299	
	Signetics	PCF54HC299	
MC54HC30	National	MM54HC30	
	RCA	**CD54HC30**	**740**
	Signetics	PCF54HC30	
MC54HC32	National	MM54HC32	
	RCA	**CD54HC32**	**740**
	Signetics	PCF54HC32	
MC54HC354	National	MM54HC354	
	RCA	**CD54HC354**	**740**
	Signetics	PCF54HC354	
MC54HC356	National	MM54HC356	
	RCA	**CD54HC356**	**740**
	Signetics	PCF54HC356	
MC54HC365	National	MM54HC365	
	RCA	**CD54HC365**	**740**
	Signetics	PCF54HC365	
MC54HC366	National	MM54HC366	
	RCA	**CD54HC366**	**740**
	Signetics	PCF54HC366	
MC54HC367	National	MM54HC367	
	RCA	**CD54HC367**	**740**
	Signetics	PCF54HC367	
MC54HC368	National	MM54HC368	
	RCA	**CD54HC368**	**740**
	Signetics	PCF54HC368	
MC54HC373	National	MM54HC373	
	RCA	**CD54HC373**	**739**
	Signetics	PCF54HC373	
MC54HC374	National	MM54HC374	
	RCA	**CD54HC374**	**739**
	Signetics	PCF54HC374	
MC54HC390	Motorola	MC74HC365	
	National	MM54HC390	
		MM74HC365	
	RCA	**CD54HC390**	**739**
		CD74HC365	**740**
	SPI	**SP74HC365**	**771**
	Signetics	PCF54HC390	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MC54HC393	National	MM54GC393	
	RCA	CD54HG393	
	Signetics	PCF54HC393	
MC54HC4002	National	MM54HC4002	
	RCA	**CD54HC4002**	**740**
	Signetics	PCF54HC4002	
MC54HC4017	**RCA**	**CD54HC4017**	**739**
	Signetics	PCF54HC4017	
MC54HC4020	National	MM54HC4020	
	RCA	**CD54HC4020**	**739**
	Signetics	PCF54HC4020	
MC54HC4024	**RCA**	**CD54HC4024**	**739**
	Signetics	PCF54HC4024	
MC54HC4040	National	MM54HC4040	
	RCA	**CD54HC4040**	**739**
	Signetics	PCF54HC4040	
MC54HC4049	National	MM54HC4049	
	RCA	CD54HC4049	
	Signetics	PCF54HC4049	
MC54HC4050	National	MM54HC4050	
	RCA	**CD54HC4050**	**740**
	Signetics	PCF54HC4050	
MC54HC4051	RCA	CD54HC4051	
	Signetics	PCF54HC4051	
MC54HC4052	RCA	CD54HC4052	
	Signetics	PCF54HC4052	
MC54HC4053	RCA	CD54HC4053	
	Signetics	PCF54HC4053	
MC54HC4060	National	MM54HC4060	
	RCA	**CD54HC4060**	**739**
	Signetics	PCF54HC4060	
MC54HC42	National	MM54HC42	
	RCA	**CD54HC42**	**739**
	Signetics	PCF54HC42	
MC54HC4511	National	MM54HC4511	
	RCA	**CD54HC4511**	**739**
	Signetics	PCF54HC4511	
MC54HC4514	National	MM54HC4514	
	RCA	**CD54HC4514**	**739**
	Signetics	PCF54HC4514	
MC54HC4538	National	MM54HC4538	
	RCA	**CD54HC4538**	**740**
	Signetics	PCF54HC4538	
MC54HC533	National	MM54HC533	
	RCA	**CD54HC533**	**739**
	Signetics	PCF54HC533	
MC54HC534	National	MM54HC534	
	RCA	**CD54HC534**	**739**
	Signetics	PCF54HC534	
MC54HC573	National	MM54HC573	
	RCA	**CD54HC573**	**739**
	Signetics	PCF54HC573	
MC54HC574	National	MM54HC574	
	RCA	**CD54HC574**	**739**
	Signetics	PCF54HC574	
MC54HC640	National	MM54HC640	
	RCA	**CD54HC640**	**739**
	Signetics	PCF54HC640	
MC54HC643	National	MM54HC643	
	RCA	**CD54HC643**	**739**
	Signetics	PCF54HC643	
MC54HC645	National	MM54HC645	
	RCA	**CD54HC645**	**739**
	Signetics	PCF54HC645	
MC54HC646	National	MM54HC646	
	RCA	**CD54HC646**	**739**
	Signetics	PCF54HC646	
MC54HC648	National	MM54HC648	
	RCA	**CD54HC648**	**739**
	Signetics	PCF54HC648	
MC54HC688	National	MM54HC688	
	RCA	**CD54HC688**	**739**
	Signetics	PCF54HC688	
MC54HC73	National	MM54HC73	
	RCA	**CD54HC73**	**739**
	Signetics	PCF54HC73	
MC54HC74	National	MM54HC74	
	RCA	**CD54HC74**	**739**
	Signetics	PCF54HC74	
MC54HC75	National	MM54HC75	
	RCA	CD54HC75	
	Signetics	PCF54HC75	
MC54HC76	National	MM54HC76	
	RCA	**CD54HC76**	**739**
	Signetics	PCF54HC76	
MC54HC85	National	MM54HC85	
	RCA	**CD54HC85**	**739**
	Signetics	PCF54HC85	
MC54HC86	National	MM54HC86	
MC54HC86	**RCA**	**CD54HC86**	**740**
	Signetics	PCF54HC86	
MC55107	Fairchild	55107	
	National	DS55107	
		LM55107A	
	TI	SN55107	
		SN55107B	
MC55108	Fairchild	55108	
	National	DS55108	
		LM55108A	
	TI	SN55108	
		SN55108B	
MC5522	Motorola	MC5523	
	National	LM5522	
	SiliconG	SG5522	
	TI	SN5522	
MC5523	Motorola	MC5522	
	National	LM5522	
	SiliconG	SG5522	
	TI	SN5522	
MC5524	Fairchild	MC5524	
	National	LM5524	
	Raytheon	RM5524	
	SiliconG	SG5524	
	TI	SN5524	
MC5525	Fairchild	MC5525	
	National	LM5525	
	SiliconG	SG5525	
MC5528	Fairchild	MC5528	
	National	LM5528	
	SiliconG	SG5528	
	TI	SN5528	
MC5529	Fairchild	MC5529	
	National	LM5529	
	SiliconG	SG5529	
MC55325	Fairchild	MC55325	
	National	DS55325	
		LM55325	
	Signetics	55325	
	SiliconG	SG55325	
	TI	SN55325	
MC5534	Fairchild	MC5534	
	National	LM5534	
	SiliconG	SG5534	
MC5535	National	LM5535	
	SiliconG	SG5535	
	TI	SN5535	
MC5539	National	LM5539	
	SiliconG	SG5539	
MC6800	Fairchild	F6800A	
	Hitachi	**HD6800**	**1345**
		HD68A00	**1345**
		HD68B00	**1345**
MC68000	Hitachi	HD68000	
	Mostek	MK68000	
	Rockwell	R68000	
	Signetics	**SCN68000**	**1524**
MC6801	AMI	S6801	
	Hitachi	HD6801	
MC6802	AMI	S6802	
	Fairchild	**F6802**	**1278**
	Hitachi	**HD6802**	**1345**
MC6803	**Hitachi**	**HD6803**	**1345**
MC6805	**AMI**	**S6805**	**1248**
	Hitachi	HD6805	
MC6808	AMI	S6808	
	Fairchild	**F6808**	**1278**
	Hitachi	HD6808	
MC6809	**AMI**	**S6809**	**1247**
	Hitachi	**HD6809**	**1345**
		HD68A09	**1345**
		HD68B09	**1345**
MC6810	AMI	S6810	
	Fairchild	**F6810**	**1278**
	Hitachi	HD6810	
		HD68A10	
	Motorola	**MCM6810**	**1351,3839**
MC68120	Signetics	SCN68120	
MC68200	Mostek	MK68200	
MC6821	AMI	S6821	
	Fairchild	**F6821**	**1279**
	Hitachi	**HD6821**	**1345**
		HD68A21	**1345**
		HD68B21	**1345**
MC68230	Signetics	SCN68230	
MC68332	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
MC68332	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
MC6840	AMI	S6840	
	Fairchild	**F6840**	**1279**
	Hitachi	HD46840	
		HD6840	**1345**
		HD68A40	**1345**
		HD68B40	**1345**
MC6843	**Hitachi**	**HD6843**	**1345**
MC6844	**Hitachi**	**HD6844**	**1345**
MC6845	CSG	MPS6545	
	Hitachi	**HD6845**	**1345**
		HD68A45	**1345**
		HD68B45	**1345**
	Rockwell	R6545	
	Synertek	SY6545	
MC68450	**Hitachi**	**HD68450**	**1345**
MC6846	AMI	S6846	
	Fairchild	**F6846**	**1280**
	Hitachi	HD46846	
		HD6846P	
MC68488	AMI	S68488	
	Fairchild	**F68488**	**1280**
MC6850	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
MC6852	AMI	S6852	
	Fairchild	**F6852**	**1281**
	Hitachi	**HD6852**	**1345**
		HD68A52	**1345**
	Motorola	**MC2652**	**1359**
		MC68552	**1359**
	Signetics	SCN2652	
	SSS	SND5025	
	SMC	COM5025	
MC6854	AMI	S6854	
	Fairchild	**F6854**	**1281**
MC68564	Mostek	MK68564	
MC6860	Fairchild	F6860	
MC6862	Fairchild	F6862	
MC68652	AMI	S6852	
	Fairchild	**F6852**	**1281**
	Hitachi	**HD6852**	**1345**
		HD68A52	**1345**
	Motorola	**MC2652**	**1359**
		MC6852	**1351**
	Signetics	SCN2652	
	SSS	SND5025	
	SMC	COM5025	
MC68653	**Motorola**	**MC2653**	**1360**
	Signetics	SCN2653	
MC68661	Motorola	MC2661	
	Signetics	SCN2661	
	SMC	COM2661	
	Synertek	2661	
MC68681	Signetics	SCN68681	
MC68682	Signetics	68682	
MC6880A	AMD	N8T26	
		N8T26A	
	Fairchild	μA8T26A	
	Hitachi	HD268T26	
MC6880A	Motorola	MC8T26	
		MC8T26A	
	National	DS8T26A	
	Signetics	N8T26	
		N8T26A	
	TI	N8T26A	
MC6885	Motorola	MC8T95	
	National	DM8095	
	Signetics	N8T95	
	TI	SN74365	
MC6886	Motorola	MC8T96	
	National	DM8096	
	Signetics	N8T96	
	TI	SN74366	
MC6887	Motorola	MC8T97	
	National	DM8097	
	Signetics	N8T97	
	TI	SN74367	
MC6888	Motorola	MC8T98	
	National	DM7098	
		DM8098	
		DS8674	
	Signetics	N8T98	
		S8T98	
	TI	SN54368	
		SN74368	
MC68901	Mostek	MK68901	
MC68A00	AMI	S68A00	
MC68A10	AMI	S68A10	
MC68A21	AMI	S68A21	
MC68A50	AMI	S68A50	
MC68A54	AMI	S68A54	
MC68B00	AMI	S68B00	
MC68B10	AMI	S68B10	
MC68B21	AMI	S68B21	
MC68B50	AMI	S68B50	
MC68B54	AMI	S68B54	
MC74164	AMD	74164	
	Fairchild	74164	
	Hitachi	HD74164	
	National	DM74164	
		DM8570	
		DM8579	
	Signetics	74164	
	TI	**SN74164**	**891**
MC74F00	Fairchild	74F00	
	Signetics	74F00	
MC74F02	Fairchild	74F02	
	Signetics	74F02	
MC74F04	Fairchild	74F04	
	Signetics	74F04	
MC74F08	Fairchild	74F08	
	Signetics	74F08	
MC74F10	Fairchild	74F10	
	Signetics	74F10	
MC74F109	Fairchild	74F109	
	Signetics	74F109	
MC74F11	Fairchild	74F11	
	Signetics	74F11	
MC74F138	Fairchild	74F138	
	Signetics	74F138	
MC74F139	Fairchild	74F139	
	Signetics	74F139	
MC74F20	Fairchild	74F20	
	Signetics	74F20	
MC74F240	**Fairchild**	**74F240**	**630**
	Signetics	74F240	
MC74F241	**Fairchild**	**74F241**	**630**
	Signetics	74F241	
MC74F242	Fairchild	74F242	
	Signetics	74F242	
MC74F243	Fairchild	74F243	
	Signetics	74F243	
MC74F244	**Fairchild**	**74F244**	**630**
	Signetics	74F244	
MC74F32	Fairchild	74F32	
	Signetics	74F32	
MC74F373	**Fairchild**	**74F373**	**632**
	Signetics	74F373	
MC74F374	**Fairchild**	**74F374**	**634**
	Signetics	74F374	
MC74F533	Fairchild	74F533	
	Signetics	74F533	
MC74F534	Fairchild	74F534	
	Signetics	74F534	
MC74F74	Fairchild	74F74	
	Signetics	74F74	
MC74HC10	Motorola	MC74HC10	
	National	MM74HC10	
	RCA	CD74H10	
		CD74HC10	**740**

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MC74HC10	**SPI**	**SP74HC10**	**766**
	Signetics	PCF74HC10	
	Toshiba	TC40H010	
MC74HC109	Motorola	MC74HC109	
	National	MM74HC109	
	RCA	**CD74HC109**	**739**
	SPI	**SP74HC109**	**768**
	Signetics	PCF74HC109	
MC74HC00	National	MM74HC00	
	RCA	**CD74HC00**	**740**
	SPI	**SP74HC00**	**766**
	Signetics	PCF74HC00	
	Toshiba	TC40H000	
MC74HC02	National	MM74HC02	
	RCA	**CD74HC02**	**740**
	SPI	**SP74HC02**	**766**
	Signetics	PCF74HC02	
	Toshiba	TC40H002	
MC74HC04	National	MM74HC04	
	RCA	**CD74HC04**	**740**
	SPI	**SP74HC04**	**766**
	Toshiba	TC40H004	
MC74HC08	National	MM74HC08	
	RCA	**CD74HC08**	**740**
	Signetics	PCF74HC08	
MC74HC10	Motorola	MC74HC10	
	National	MM74HC10	
	RCA	CD74H10	
		CD74HC10	**740**
	SPI	**SP74HC10**	**766**
	Signetics	PCF74HC10	
	Toshiba	TC40H010	
MC74HC107	National	MM74HC107	
	RCA	**CD74HC107**	**739**
	SPI	**SP74HC107**	**768**
	Signetics	PCF74HC107	
	Toshiba	TC40H107	
MC74HC109	Motorola	MC74HC109	
	National	MM74HC109	
	RCA	**CD74HC109**	**739**
	SPI	**SP74HC109**	**768**
	Signetics	PCF74HC109	
MC74HC11	National	MM74HC11	
	RCA	**CD74HC11**	**740**
	SPI	**SP74HC11**	**766**
	Signetics	PCF74HC11	
	Toshiba	TC40H011	
MC74HC112	National	MM74HC112	
	RCA	**CD74HC112**	**739**
	SPI	SP74HC112N	
	Signetics	PCF74HC112	
MC74HC123	National	MM74HC123	
	RCA	CD74HC123	
	Signetics	PCF74HC123	
MC74HC132	National	MM74HC132	
	RCA	CD74HC132	
	Signetics	PCF74HC132	
MC74HC133	National	MM74HC133	
	RCA	**CD74HC133**	**740**
	Signetics	PCF74HC133	
MC74HC138	National	MM74HC138	
	RCA	**CD74HC138**	**739**
	SPI	SP74HC138	
	Signetics	PCF74HC138	
MC74HC139	National	MM74HC139	
	RCA	**CD74HC139**	**739**
	SPI	**SP74HC139**	**769**
	Signetics	PCF74HC139	
	Toshiba	TC40H139	
MC74HC14	National	MM74HC14	
	RCA	**CD74HC14**	**740**
	SPI	**SP74HC14**	**765**
	Signetics	PCF74HC14	
MC74HC147	National	MM74HC147	
	RCA	**CD74HC147**	**739**
	SPI	**SP74HC147**	**769**
	Signetics	PCF74HC147	
MC74HC151	National	MM74HC151	
	RCA	**CD74HC151**	**740**
	Signetics	PCF74HC151	
MC74HC153	National	MM74HC153	
	RCA	**CD74HC153**	**740**
	SPI	**SP74HC153**	**769**
	Signetics	PCF74HC153	
	Toshiba	TC40H153	
MC74HC154	National	MM74HC154	
	RCA	**CD74HC154**	**739**
	Signetics	PCF74HC154	
MC74HC157	National	MM74HC157	
MC74HC157	RCA	CD74HC157	
	SPI	**SP74HC157**	**769**
	Signetics	PCF74HC157	
	Toshiba	TC40H157	
MC74HC158	National	MM74HC158	
	RCA	CD74HC158	
	SPI	**SP74HC158**	**769**
	Signetics	PCF74HC158	
	Toshiba	TC40H158	
MC74HC160	National	MM74HC160	
	RCA	**CD74HC160**	**739**
	Signetics	PCF74HC160	
MC74HC161	National	MM74HC161	
	RCA	**CD74HC161**	**739**
	SPI	**SP74HC161**	**770**
	Signetics	PCF74HC161	
MC74HC162	National	MM74HC162	
	RCA	**CD74HC162**	**739**
	SPI	**SP74HC162**	**770**
	Signetics	PCF74HC162	
MC74HC163	National	MM74HC163	
	RCA	**CD74HC163**	**739**
	SPI	**SP74HC163**	**770**
	Signetics	PCF74HC163	
MC74HC164	National	MM74HC164	
	RCA	**CD74HC164**	**740**
	Signetics	PCF74HC164	
MC74HC165	National	MM74HC165	
	RCA	**CD74HC165**	**740**
	Signetics	PCF74HC165	
MC74HC173	National	MM74HC173	
	RCA	**CD74HC173**	**739**
	Signetics	PCF74HC173	
MC74HC174	National	MM74HC174	
	RCA	**CD74HC174**	**739**
	SPI	**SP74HC174**	**770**
	Signetics	PCF74HC174	
	Toshiba	TC40H174	
MC74HC175	National	MM74HC175	
	RCA	**CD74HC175**	**739**
	SPI	**SP74HC175**	**770**
	Signetics	PCF74HC175	
	Toshiba	TC40H175	
MC74HC192	National	MM74HC192	
	RCA	**CD74HC192**	**739**
	SPI	**SP74HC192**	**770**
	Signetics	PCF74HC192	
	Toshiba	TC40H192	
MC74HC193	National	MM74HC193	
	RCA	**CD74HC193**	**739**
	SPI	**SP74HC193**	**770**
	Signetics	PCF74HC193	
	Toshiba	TC40H193	
MC74HC194	National	MM74HC194	
	RCA	**CD74HC194**	**740**
	Signetics	PCF74HC194	
MC74HC195	National	MM74HC195	
	RCA	**CD74HC195**	**740**
	Signetics	PCF74HC195	
MC74HC20	National	MM74HC20	
	RCA	**CD74HC20**	**740**
	SPI	**SP74HC20**	**766**
	Signetics	PCF74HC20	
	Toshiba	TC40H020	
MC74HC221	National	MM74HC221	
	RCA	**CD74HC221**	**740**
	Signetics	PCF74HC221	
MC74HC240	National	MM74HC240	
	RCA	**CD74HC240**	**740**
	SPI	**SP74HC240**	**770**
	Signetics	PCF74HC240	
	Toshiba	TC40H240	
MC74HC241	National	MM74HC241	
	RCA	**CD74HC241**	**740**
	Signetics	PCF74HC241	
MC74HC242	National	MM74HC242	
	RCA	**CD74HC242**	**739**
		SGN	
MC74HC243	National	MM74HC243	
	RCA	**CD74HC243**	**739**
	Signetics	PCF74HC243	
MC74HC244	National	MM74HC244	
	RCA	**CD74HC244**	**740**
	Signetics	PCF74HC244	
MC74HC245	National	MM74HC245	
	RCA	**CD74HC245**	**739**
	Signetics	PCF74HC245	
MC74HC251	National	MM74HC251	
	RCA	**CD74HC251**	**740**
	Signetics	PCF74HC251	
MC74HC253	National	MM74HC253	
	RCA	CD74HC253	
MC74HC253	**SPI**	**SP74HC253**	**771**
	Signetics	PCF74HC253	
MC74HC257	National	MM74HC257	
	RCA	**CD74HC257**	**740**
	SPI	**SP74HC257**	**771**
	Signetics	PCF74HC257	
MC74HC259	National	MM74HC259	
	RCA	**CD74HC259**	**739**
	Signetics	PCF74HC259	
MC74HC266	National	MM74HC266	
	RCA	**CD74HC266**	**740**
	SPI	**SP74HC266**	**771**
	Signetics	PCF74HC266	
MC74HC27	National	MM74HC27	
	RCA	**CD74HC27**	**740**
	SPI	**SP74HC27**	**766**
	Signetics	PCF74HC27	
	Toshiba	TC40H027	
MC74HC273	RCA	CD74HC273	
	Signetics	PCF74HC273	
MC74HC280	National	MM74HC280	
	RCA	**CD74HC280**	**739**
	SPI	**SP74HC280**	**771**
	Signetics	PCF74HC280	
MC74HC299	National	MM74HC299	
	RCA	CD74HC299	
	Signetics	PCF74HC299	
MC74HC30	National	MM74HC30	
	RCA	**CD74HC30**	**740**
	Signetics	PCF74HC30	
MC74HC32	National	MM74HC32	
	RCA	**CD74HC32**	**740**
	SPI	**SP74HC32**	**767**
	Signetics	PCF74HC32	
	Toshiba	TC40H032	
MC74HC354	National	MM74HC354	
	RCA	**CD74HC354**	**740**
	Signetics	PCF74HC354	
MC74HC356	National	MM74HC356	
	RCA	**CD74HC356**	**740**
	Signetics	PCF73HC356	
MC74HC365	Motorola	MC54HC390	
	National	MM54HC390	
		MM74HC365	
	RCA	**CD54HC390**	**739**
		CD74HC365	**740**
	SPI	**SP74HC365**	**771**
	Signetics	PCF54HC390	
MC74HC366	National	MM74HC366	
	RCA	**CD74HC366**	**740**
	Signetics	PCF74HC366	
MC74HC367	National	MM74HC367	
	RCA	**CD74HC367**	**740**
	Signetics	PCF74HC367	
MC74HC368	National	MM74HC368	
	RCA	**CD74HC368**	**740**
	Signetics	PCF74HC368	
MC74HC373	National	MM74HC373	
	RCA	**CD74HC373**	**739**
	Signetics	PCF74HC373	
MC74HC374	National	MM74HC374	
	RCA	**CD74HC374**	**739**
	Signetics	PCF74HC374	
MC74HC390	National	MM74HC390	
	RCA	**CD74HC390**	**739**
	Signetics	PCF74HC390	
MC74HC393	National	MM74HC393	
	RCA	**CD74HC393**	**739**
	Signetics	PCF74HC393	
MC74HC4002	National	MM74HC4002	
	RCA	**CD74HC4002**	**740**
	Signetics	PCF74HC4002	
MC74HC4017	National	MM74HC4017	
	RCA	**CD74HC4017**	**739**
	Signetics	PCF74HC4017	
MC74HC4020	National	MM74HC4020	
	RCA	**CD74HC4020**	**739**
	Signetics	PCF74HC4020	
MC74HC4024	**RCA**	**CD74HC4024**	**739**
	Signetics	PCF74HC4024	
MC74HC4040	National	MM74HC4040	
	RCA	**CD74HC4040**	**739**
	Signetics	PCF74HC4040	
MC74HC4049	National	MM74HC4049	
	RCA	CD74HC4049	
	Signetics	PCF74HC4049	
MC74HC4050	National	MM74HC4050	
	RCA	**CD74HC4050**	**740**
	Signetics	PCF74HC4050	
MC74HC4051	RCA	CD74HC4051	
	Signetics	PCF74HC4051	
MC74HC4052	RCA	CD74HC4052	
MC74HC4052	Signetics	PCF74HC4052	
MC74HC4053	RCA	CD74HC4053†	
	Signetics	PCF74HC4053	
MC74HC4060	National	MM74HC4060	
	RCA	**CD74HC4060**	**739**
	Signetics	PCF74HC4060	
MC74HC42	National	MM74HC42	
	RCA	**CD74HC42**	**739**
	SPI	**SP74HC42**	**767**
	Signetics	PCF74HC42	
MC74HC4511	National	MM74HC4511	
	RCA	**CD74HC4511**	**739**
	Signetics	PCF74HC4511	
MC74HC4514	National	MM74HC4514	
	RCA	**CD74HC4514**	**739**
	Signetics	PCF74HC4514	
MC74HC4538	National	MM74HC4538	
	RCA	**CD74HC4538**	**740**
	Signetics	PCF74HC4538	
MC74HC533	National	MM74HC533	
	RCA	**CD74HC533**	**739**
	Signetics	PCF74HC533	
MC74HC534	National	MM74HC534	
	RCA	**CD74HC534**	**739**
	Signetics	PCF74HC534	
MC74HC573	National	MM74HC573	
	RCA	**CD74HC573**	**739**
	Signetics	PCF74HC573	
MC74HC574	National	MM74HC574	
	RCA	**CD74HC574**	**739**
	Signetics	PCF74HC574	
MC74HC640	National	MM74HC640	
	RCA	**CD74HC640**	**739**
	Signetics	PCF74HC640	
MC74HC643	National	MM74HC643	
	RCA	**CD74HC643**	**739**
	Signetics	PCF74HC643	
MC74HC645	National	MM74HC645	
	RCA	**CD74HC645**	**739**
	Signetics	PCF74HC645	
MC74HC646	National	MM74HC646	
	RCA	**CD74HC646**	**739**
	Signetics	PCF74HC646	
MC74HC648	National	MM74HC648	
	RCA	**CD74HC648**	**739**
	Signetics	PCF74HC648	
MC74HC688	National	MM74HC688	
	RCA	**CD74HC688**	**739**
	Signetics	PCF74HC688	
MC74HC73	National	MM74HC73	
	RCA	**CD74HC73**	**739**
	SPI	**SP74HC73**	**767**
	Signetics	PCF74HC73	
MC74HC74	National	MM74HC74	
	RCA	**CD74HC74**	**739**
	SPI	SD74HC74	
	Signetics	PCF74HC74	
	Toshiba	TC40H074	
MC74HC75	National	MM74HC75	
	RCA	CD74HC75	
	Signetics	PCF74HC75	
MC74HC76	National	MM74HC76	
	RCA	**CD74HC76**	**739**
	SPI	**SP74HC76**	**767**
	Signetics	PCF74HC76	
	Toshiba	TC40H076	
MC74HC85	National	MM74HC85	
	RCA	**CD74HC85**	**739**
	Signetics	PCF74HC85	
MC74HC86	National	MM74HC86	
	RCA	**CD74HC86**	**740**
	SPI	SP74HC86N	
	Signetics	PCF74HC86	
MC75107	Fairchild	75107	
	National	DS75107	
		LM75107A	
	TI	SN75107	
		SN75107B	
MC75108	Fairchild	75108	
	National	DS75108	
		LM75108A	
	TI	SN75108	
		SN75108B	
MC75109	TI	SN75109	
		SN75109A	
MC75110	Fairchild	75110	
	Hitachi	HD75110	
	National	LM75110	
	TI	SN75110	
		SN75110A	
MC75125	National	DS75125	
	TI	SN75125	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MC75127	National	DS75127	
	TI	SN75127	
MC75128	National	DS75128	
	TI	SN75128	
MC75129	National	DS75129	
	TI	SN75129	
MC75140	TI	SN75140	
MC7520	Fairchild	7520	
	SiliconG	SG7520	
	TI	SN7520	
MC7521	Fairchild	7521	
	National	LM7521	
	SiliconG	SG7521	
	TI	SN7521	
MC7522	SiliconG	SG7522	
	TI	SN7522	
MC7523	National	LM7523	
	Raytheon	RC7523	
	SiliconG	SG7523	
	TI	SN7523	
MC75235	TI	SN75235	
MC7524	Fairchild	75S24	
	Hitachi	HA1902	
	National	75S24	
	Signetics	SN7524	
	SiliconG	SG7524	
	TI	SN75224	
		SN7524	
MC7525	AMD	7525	
	Fairchild	7525	
	National	LM7525	
	SiliconG	SG7525	
MC7528	Raytheon	RC7528	
	SiliconG	SG7528	
	TI	SN7528	
	Thomson-CSF	SFC2528	
MC7529	Fairchild	7529	
	National	LM7529	
	Raytheon	RC7529	
	SiliconG	SG7529	
MC75325	National	DS75325	
	SiliconG	SG75325	
	TI	SN75325	
MC7534	SiliconG	SG7534	
MC7535	National	LM7535	
	SiliconG	SG7535	
MC75358	Motorola	MC75368	
	TI	SN75368	
MC75365	National	DS75365	
	TI	SN75365	
MC75368	Motorola	MC75358	
	TI	SN75368	
MC7538	Fairchild	7538	
	National	LM7538	
	SiliconG	SG7538	
MC7539	Fairchild	7539	
	National	LM7539	
	SiliconG	SG7539	
MC75401	Fairchild	75461	
	Motorola	MC75461	
	National	DS75461	
	SiliconG	SG75461	
	TI	SN75461	
MC75402	Fairchild	75462	
	Motorola	MC75462	
	National	DS75462	
	SiliconG	SG75462	
	TI	SN75462	
MC75403	Motorola	MC75463	
	National	DS75463	
	SiliconG	SG75463	
	TI	SN75463	
MC75404	Motorola	MC75464	
	National	DS75464	
	TI	SN75464	
MC75450	Fairchild	75450	
	National	DS75450	
	SiliconG	SG75450	
	TI	SN75450	
MC75451	Fairchild	75451	
	National	DS75451	
	SiliconG	SG75451	
	TI	SN75451	
MC75452	Fairchild	75452	
	Hitachi	HD75452	
	National	DS75452	
	SiliconG	SG75452	
	TI	SN75452	
MC75453	Fairchild	75453	
	Hitachi	HD75453	
	National	DS75453	
		LM75453	
	SiliconG	SG75453	
	TI	SN75453	
MC75454	National	DS75454	
	SiliconG	SG75454	
	TI	SN75454	
MC75460	National	DS75460	
	SiliconG	SG75460	
	TI	SN75460	
MC75461	Fairchild	75461	
	Motorola	MC75401	
	National	DS75461	
	SiliconG	SG75461	
	TI	SN75461	
MC75462	Fairchild	75462	
	Motorola	MC75402	
	National	DS75462	
	SiliconG	SG75462	
	TI	SN75462	
MC75463	Motorola	MC75403	
	National	DS75463	
	SiliconG	SG75463	
	TI	SN75463	
MC75464	Motorola	MC75404	
	National	DS75464	
	TI	SN75464	
MC75491	Fairchild	75491	
	National	DS75491	
	TI	SN75491	
MC75492	Fairchild	75492	
	National	DS75492	
	TI	SN75492	
MC7802	Fairchild	μA78L02	
	TI	μA78L02	
MC7805	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
MC7806	Fairchild	μA7806	
	Lambda	LMC7806	
		LμA7806	
	SiliconG	SG340-6	
		SG7806	
	TI	μA7806	
MC7808	Fairchild	μA7808	
	Lambda	LMC7808	
		LμA7808	
	NEC-Electron	μPC7808	
	SiliconG	SG340-8	
		SG7808	
	TI	LM340-8	
		μA7808	
MC7812	Fairchild	μA7812	
	Lambda	LMC7812	
		LμA7812	
	National	LM7812	
	NEC-Electron	μPC7812	
	SGS	L7812	
	SiliconG	SG7812	
	TI	μA7812	
	Toshiba	TA78012	
MC7815	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
MC7815	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
MC7818	SGS	L7818	
MC7824	Fairchild	μA7824	
	Lambda	LMC7824	
		LμA7824	
	NEC-Electron	μPC7824	
	SGS	L7824	
	SiliconG	SG7824	
	TI	LM340-24	
		μA7824	
MC78L02	Fairchild	μA78L02	
	Motorola	MC7802	
	TI	μA78L02	
MC78L05	Fairchild	μA78L05	
	National	LM340LA-5	
		LM78L05	
	NEC-Electron	μPC78L05	
	TI	μA78L05	
MC78L06	Fairchild	μA78L06	
	Motorola	MC78L06	
	TI	μA78L06	
		μA87L06	
	Fairchild	μA78L06	
	TI	μA78L06	
		μA87L06	
MC78L08	NEC-Electron	μPC78L08	
	TI	μA78L08	
MC78L12	Fairchild	μA78L12	
	National	**LM340LA-12**	**3299**
		LM78L12	
	NEC-Electron	μPC78L12	
	TI	μA78L12	
MC78L15	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
MC78M05	Fairchild	μA78M05	
	National	**LM341-5**	**3300**
		LM342-05	
		LM78M05	
	NEC-Electron	μPC78M05	
	NEC-Micro	μPC78M05	
	Sanyo	L78M05	
	TI	μA78M05	
MC78M06	Fairchild	μA78M06	
	Sanyo	L78M06	
	TI	μA78M06	
MC78M08	Fairchild	μA78M08	
	NEC-Electron	μPC78M08	
	NEC-Micro	μPC78M08	
	Sanyo	L78M08	
	TI	μA78M08	
MC78M12	Fairchild	μA78M12	
	National	**LM341-12**	**3300**
		LM342-12	**3299**
		LM78M12	
	NEC-Electron	μPC78M12	
	NEC-Micro	μPC78M12	
	Sanyo	L78M12	
MC78M15	Fairchild	μA78M15	
	National	**LM341-15**	**3300**
		LM342-15	**3299**
		LM78M15	
	NEC-Electron	μPC78M15	
	NEC-Micro	μPC78M15	
	Sanyo	L78M15	
MC78M18	Sanyo	L78M18	
MC78M20	TI	μA78M20	
MC78M24	Fairchild	μA78M24	
	Sanyo	L78M24	
	TI	μA78M24	
MC78T05	**Motorola**	**LM123**	**3294**
	National	**LM123**	**3299**
	SiliconG	SG123	
	TI	SN55123	
MC78T05C	Fairchild	SH0323	
		SH323	
		μA78H05	
	Lambda	LAS1405	
		LAS1905	
	Motorola	**LM323**	**3294**
	National	**LM323**	**3299**
	SiliconG	SG323	
MC7902	Fairchild	μA7902	
	Lambda	LMC7902	
		LμA7902	
MC7905	Fairchild	μA7905	
		μA79M05	
	Lambda	LMC7905	
		LμA7905	
	National	LM320MP5	
		LM7905	
		LM79M05	
	SiliconG	SG120-5	
		SG320-05	
		SG320P-5	
		SG7905	
	TI	μA7905	
	Fairchild	MC7905	
	Lambda	LMC7905	
	SiliconG	SG7905	
MC7906	Lambda	LMC7906	
	TI	μA7906	
MC7908	Fairchild	MC7908	
		μA7908	
		μA79M08	
	Lambda	LMC7908	
		LμA7908	
	SiliconG	SG7908	
	TI	μA7908	
		μA79M08	
MC7912	Fairchild	μA7912	
		μA79M12	
	National	LM120-12	
		LM320MP12	
		LM7912	
		LM79M12	
	SiliconG	SG120-12	
		SG320P-12	
		SG7912	
	TI	μA7912	
MC7915	Fairchild	μA7915	
	Lambda	LμA7915	
	National	LM120-15	
		LM320-15	
		LM320T15	
		LM7915	
	SiliconG	SG120-15	
		SG320-15	
		SG7915	
	TI	μA7915	
MC7918	Lambda	LμA7918	
	TI	μA7918	
MC7924	Lambda	LMC7924	
	TI	μA7924	
MC7952	SiliconG	SG320-5	
MC830	Fairchild	930	
		9930	
	Motorola	MC930	
	National	DM930	
	Raytheon	RC930	
		RM930	
MC831	TI	SN15831	
MC834	TI	SN15834	
MC835	Fairchild	9135	
	Motorola	MC935	
	National	DM935	
	Raytheon	RC935	
		RM935	
MC837	Fairchild	937	
	Motorola	MC937	
	National	DM937	
	Raytheon	RC937	
		RM937	
MC841	Raytheon	RC941	
MC8500	SiliconSys	SSI8500	
MC8502	SiliconSys	SSI8502	
MC8503	Fairchild	9401	
		F9401	
	Signetics	9401	
MC851	Fairchild	951	
		9951	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MC851	Motorola	MC852	
		MC951	
	Raytheon	RC951	
		RM951	
	TI	SN15851	
		SN15951	
MC852	Fairchild	951	
		9951	
	Motorola	MC851	
		MC951	
	Raytheon	RC951	
		RM951	
	TI	SN15851	
		SN15951	
MC8520	SiliconSys	SSI8520	
MC853	Fairchild	9093	
	Motorola	MC953	
	National	DM9093	
	Raytheon	RC993	
		RM993	
	TI	SN158093	
		SN159093	
MC855	Fairchild	9097	
	Motorola	MC955	
	National	DM9097	
	Raytheon	RC997	
		RM997	
	TI	SN158097	
		SN159097	
MC856	Fairchild	9094	
	Motorola	MC956	
	National	DM9094	
	Raytheon	RC994	
		RM9094	
		RM994	
	TI	SN158094	
		SN159094	
MC857	Fairchild	9157	
	Motorola	MC957	
	National	DM9567	
		DM957	
	Raytheon	RC957	
		RM957	
MC858	Fairchild	9158	
	Motorola	MC958	
	National	DM958	
	Raytheon	RC958	
		RM958	
MC8T13	National	DS75121	
		LM75121	
	Signetics	N8T13	
	TI	N8T13	
		SN75121	
MC8T14	National	DS75122	
		LM75122	
	Signetics	N8T14	
	TI	N8T14	
		SN75122	
MC8T23	National	DS75123	
		LM75123	
	Signetics	N8T23	
	TI	N8T23	
		SN75123	
MC8T24	National	DS75124	
		LM75124	
	Signetics	N8T24	
	TI	N8T24	
		SN75124	
MC8T26	AMD	N8T26	
		N8T26A	
	Fairchild	μA8T26A	
	Hitachi	HD268T26	
	Motorola	MC6880A	
		MC8T26A	
	National	DS8T26A	
	Signetics	N8T26	
		N8T26A	
	TI	N8T26A	
MC8T26A	AMD	N8T26	
		N8T26A	
	Fairchild	μA8T26A	
	Hitachi	HD268T26	
	Motorola	MC6880A	
		MC8T26	
	National	DS8T26A	
	Signetics	N8T26	
		N8T26A	
	TI	N8T26A	
MC8T28	AMD	N8T28	
MC8T28	Signetics	N8T28	
MC8T95	Motorola	MC6885	
	National	DM8095	
	Signetics	N8T95	
	TI	SN74365	
MC8T96	Motorola	MC6886	
	National	DM8096	
	Signetics	N8T96	
	TI	SN74366	
MC8T97	Motorola	MC6887	
	National	DM8097	
	Signetics	N8T97	
	TI	SN74367	
MC8T98	Motorola	MC6888	
	National	DM7098	
		DM8098	
		DS8674	
	Signetics	N8T98	
		S8T98	
	TI	SN54368	
		SN74368	
MC930	Fairchild	930	
		9930	
	Motorola	MC830	
	National	DM930	
	Raytheon	RC930	
		RM930	
MC932	Fairchild	932	
		9932	
	National	DM932	
	Raytheon	RC932	
		RM932	
MC933	Fairchild	933	
	National	DM933	
	Raytheon	RC933	
		RM933	
MC934	Raytheon	RC934	
		RM934	
	TI	SN15834	
		SN15934	
MC935	Fairchild	9135	
	Motorola	MC835	
	National	DM935	
	Raytheon	RC935	
		RM935	
MC936	Fairchild	936	
	National	DM936	
	Raytheon	RC936	
		RM936	
MC937	Fairchild	937	
	Motorola	MC837	
	National	DM937	
	Raytheon	RC937	
		RM937	
MC941	Raytheon	RM941	
MC943	Fairchild	SH2001	
MC944	Fairchild	944	
	National	DM944	
	Raytheon	RC944	
		RM944	
MC945	Fairchild	945	
	National	DM945	
	Raytheon	RC945	
		RM945	
MC946	Fairchild	946	
	National	DM946	
	Raytheon	RC946	
		RM946	
MC948	Fairchild	948	
	National	DM948	
	Raytheon	RC948	
		RM948	
MC949	Fairchild	949	
	National	DM949	
	Raytheon	RC949	
		RM949	
MC950	Fairchild	950	
	Raytheon	RC950	
		RM950	
MC951	Fairchild	951	
		9951	
	Motorola	MC851	
		MC852	
	Raytheon	RC951	
		RM951	
	TI	SN15851	
		SN15951	
MC952	Fairchild	9099	
	Raytheon	RM952	
		RM999	
MC953	Fairchild	9093	
	Motorola	MC853	
MC953	National	DM9093	
	Raytheon	RC993	
		RM993	
	TI	SN158093	
		SN159093	
MC955	Fairchild	9097	
	Motorola	MC855	
	National	DM9097	
	Raytheon	RC997	
		RM997	
	TI	SN158097	
		SN159097	
MC956	Fairchild	9094	
	Motorola	MC856	
	National	DM9094	
	Raytheon	RC994	
		RM9094	
		RM994	
	TI	SN158094	
		SN159094	
MC957	Fairchild	9157	
	Motorola	MC857	
	National	DM9567	
		DM957	
	Raytheon	RC957	
		RM957	
MC958	Fairchild	9158	
	Motorola	MC858	
	National	DM958	
	Raytheon	RC958	
		RM958	
MC961	Fairchild	961	
	National	DM961	
		DM962	
	Raytheon	RC961	
		RM961	
MC962	Fairchild	962	
	National	DM962	
	Raytheon	RC962	
		RM962	
MC963	Fairchild	963	
		9963	
	National	DM963	
	Raytheon	RC963	
		RM963	
◇MCA1200	LSILogic	LCA1200	
	National	MCA1200	
MCA1300	National	MCA1300	
MCA500	National	MCA500	
◇MCA600	LSILogic	LCA600	
	National	MCA600	
MCM10139	Signetics	10139	
MCM10141	Fairchild	F10141	
	Motorola	MC10141	
	Signetics	10141	
MCM10144	Fairchild	F10144	
	Signetics	10144	
	TI	SN10144	
MCM10145	Fairchild	F10145A	
	Signetics	N10145	
MCM10146	AMD	AM10415	
	Fairchild	**F10415**	**3615,3618**
	Hitachi	**HM2110**	**3789**
		HM2112	**3789**
	National	DM10415	
	Siemens	GXB10415	
	Signetics	10146	
MCM10147	TI	SN10147	
MCM10148	Hitachi	HD10148	
	NEC-Electron	μPB10148	
	Signetics	10148	
	TI	SN10148	
MCM10149	Fairchild	F10416	
	Signetics	10149	
		N10149	
MCM10152	Fairchild	F10414	
	National	DM10414	
MCM10422	**Fairchild**	**F10422**	**3615,3620**
	Fujitsu	MBM10422	
	Hitachi	**HM10422**	**3789**
	National	**DM10422**	**3854**
MCM10470	AMD	AM10470	
	Fairchild	**F10470**	**3615,3621**
	Fujitsu	**MBM10470**	**3681**
	Hitachi	**HM10470**	**3789**
	National	**DM10470**	**3855**
	Signetics	10470	
◇MCM10545	Fairchild	F10545	
MCM146508	AMI	S6508	
	Fairchild	4736B	
	Harris	**HM6508**	**669,1333,3754**
MCM146508	Intel	2125A	
	Motorola	MCM2125	
	National	MM74C929	
		NMC6508	
	NEC-Micro	μPD443	
	SSS	SCM21C02	
	Toshiba	TC5508	
◇MCM146518	Intersil	IM6508-1	
MCM2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
MCM2115	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
MCM2125	AMI	S6508	
	Fairchild	4736B	
	Harris	**HM6508**	**669,1333,3754**
	Intel	2125A	
	National	MM74C929	
		NMC6508	
	NEC-Micro	μPD443	
	SSS	SCM21C02	
	Toshiba	TC5508	
MCM2147	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
MCM21L14	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	

◇ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MCM21L14	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
MCM2532	**Hitachi**	**HN462532**	**3789**
	National	MM2532	
		NMC2532	
		TDA2530	
		TDA2532	
	Plessey	TDA2530	
	Siemens	TDA2530	
	Signetics	TDA2530	
		TDA2532	
	SiliconG	SG2532	
	TI	TMS2532	
	Universal	UM2532	
MCM2708	AMD	2708	
	Fairchild	F2708	
	Hitachi	HN462708	
	Motorola	MC27A08	
	National	MM2708	
	NEC-EA	EA2708	
	Panasonic	MN2708	
	Rockwell	2708	
	SGS	M2708	
	TI	TMS2708	
MCM2716	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HN462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
MCM2801	NCR	NCR52801	
MCM2816	**GI**	**ER5716**	**3683**
	Hitachi	**HN48016**	**3789**
	NCR	NCR2168	
◆MCM4016	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
MCM4116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	National	MM5290	
	NEC-Micro	μPD416	
MCM4116	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
MCM6516	AMD	AM4516	
	Fujitsu	MB8118	
	Hitachi	HM4816	
		HM4816A	
	Intel	2118	
	Intersil	IM7118	
	Mostek	4516	
		MK4516	
	National	NMC5295	
	NEC-Micro	2118	
	TI	TMS4516	
MCM6641	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
MCM6664	Fairchild	F64K	
	Fujitsu	MB8264	
		MB8265	
	Hitachi	HM4864	
	Intel	2164	
	Motorola	MCM6665	
	National	NMC4164	
	NEC-Micro	μPD4164	
	TI	TMS4164	
	Toshiba	TMM4164	
MCM6665	Fairchild	F64K	
	Fujitsu	MB8264	
		MB8265	
	Hitachi	HM4864	
	Intel	2164	
	Motorola	MCM6664	
	National	NMC4164	
	NEC-Micro	μPD4164	
	TI	TMS4164	
	Toshiba	TMM4164	
MCM66L41	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
MCM67365-25	AMD	AM92640	
	AMI	S68B364	
	Fairchild	F-3564-25	
	Mostek	MK36000-4	
	NEC-EA	μPD2/8364-20	
	Signetics	2064-20	
	Synertek	SY2364-2	
MCM6810	AMI	S6810	
	Fairchild	**F6810**	**1278**
	Hitachi	HD6810	
		HD68A10	
MCM6810	Motorola	MC6810	
MCM68308	Fairchild	F68308	
MCM68316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
MCM68332	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
MCM68364	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
MCM68708	AMD	9708	
	Fairchild	F68708	
MCM68A10	Hitachi	HM468A10	
MCM68A30	Hitachi	HN46830	
MCM68A308	AMD	8308	
		9208	
	NEC-EA	EA8308	
	NEC-Micro	μPD2308	
MCM68A316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
MCM68A316	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
MCM68A332	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
MCM68B10	Fairchild	F68B10	
MCM68B308	Fairchild	F68B308	
MCM7621	AMD	AM27S13	
	Fairchild	93446	
	Fujitsu	MB7053	
	Harris	HM7621	
	Intel	3622	
	MMI	6306	
	National	DM74S571	
	Signetics	82S131	
	TI	SN74S571	
MCM7641	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	**3826**
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	**TBP28S46**	
			440,3976
		TBP28S46M	
			440,3976
MCM7643	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	
			3826,3836
	Motorola	MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MCM7643	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	
			440,3968
		TBP24S41M	
			440,3968
		TBP28S41	
		TBP28S41M	
MCM7643M	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	
			3826,3836
	Motorola	MCM7643	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	
			440,3968
		TBP24S41M	
			440,3968
		TBP28S41	
		TBP28S41M	
MCM7649	AMD	AM27S29	
	Fujitsu	MB7124	
		MBM7124	
	Harris	HM7649	
	MMI	5349-1	
		6349-1	**3826**
	National	DM54S472	
		DM74S472	
	Raytheon	29621	
	Signetics	N82S147	
		S82S147	
	TI	DM54S472	
		TBP28S42	
			440,3975
		TBP28S42M	
			440,3975
MCM7680	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
MCM7681	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
MCM7681	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
MCM7684	AMD	AM27S184	
	Fujitsu	MB7127	
	Harris	HM7684	
	MMI	53100	
		63100	
	National	DM77S184	
		DM87S184	
	Raytheon	29650	
	Signetics	N82S184	
	TI	**TBP24SA81**	
			440,3969
MCM7685	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	
			440,3968
		TBP24S81M	
			440,3968
MCM7686	Harris	HM7686	
	National	DM87S186	
MCM7687	Harris	HM7687	
	National	DM87S187	
MCM82707	Signetics	N82S707	
MCM82708	Signetics	N82S708	
MCM93412	AMD	AM93412	
	Fairchild	93412	
MCM93415	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
MCM93422	AMD	AM93422	
	Fairchild	93422	
MCM93L422	AMD	AM93L422	
	Fairchild	93L422	
MLM139	AMD	LM139	
	Fairchild	μA139	
	Motorola	LM139	
	National	**LM139**	**3317**
	PMI	CMP-04	
		PM139	
	Raytheon	LM139	
	RCA	CA139	
	Signetics	LM139	
	SiliconG	SG139	
	TI	LM139	
MM2316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
MMH0026	AMD	MMH0026	
	National	DS0026	
		MH0026	
MQ3724	Fairchild	FQ3724	
	Raytheon	SP3724	
	RCA	CA3724	
MQ3725	Fairchild	FQ3725	
	National	DH3725	
	Raytheon	SP3725	
	RCA	CA3725	
NE592	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	MC1733	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		μA733	
	SiliconG	SG733	
	TI	μA733	
RC1558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
RC1558	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
		SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
RC4558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
SE592	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	MC1733	
		NE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		μA733	
	SiliconG	SG733	
	TI	μA733	
SG1525A	SiliconG	SG1525A	
	Siliconix	PWM25A	
SG1526	Sprague	ULN-8126	
SG1527A	SiliconG	SG1527A	
	Siliconix	PWM27A	
SG2525A	SiliconG	SG2525A	
	Siliconix	PWM25B	
SG2526	**Motorola**	**SG3526**	**3297**
	SiliconG	SG2526	
	Sprague	ULQ-8126	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SG2527A	SiliconG	SG2527A	
	Siliconix	PWM27B	
SG3525A	SiliconG	SG3525A	
	Siliconix	PWM25C	
	TI	SG3525A	
SG3526	**Motorola**	**SG2526**	**3297**
	SiliconG	SG2526	
	Sprague	ULQ-8126	
SG3527A	SiliconG	SG3527A	
	Siliconix	PWM27C	
	TI	SG3527A	
SN542S83A	Fairchild	54LS83A	
	Motorola	SN54LS83A	
	National	DM54LS83A	
	Raytheon	54LS83A	
	Signetics	54LS83	
		54LS83A	
	TI	**SN54LS83A**	**861**
SN54ALS00	National	DM54ALS00	
	TI	**SN54ALS00**	**833**
SN54ALS02	National	DM54ALS02	
	TI	**SN54ALS02**	**833**
SN54ALS04	National	DM54ALS04	
	TI	**SN54ALS04**	**834**
SN54ALS08	National	DM54ALS08	
	TI	**SN54ALS08**	**835**
SN54ALS09	National	DM54ALS09	
	TI	**SN54ALS09**	**836**
SN54ALS160	National	DM54ALS160	
	TI	**SN54ALS160**	**889**
SN54ALS161	National	DM54ALS161	
	TI	**SN54ALS161**	**889**
SN54ALS162	National	DM54ALS162	
	TI	**SN54ALS162**	**890**
SN54ALS163	National	DM54ALS163	
	TI	**SN54ALS163**	**890**
SN54ALS240	National	DM54ALS240	
SN54ALS241	National	DM54ALS241	
	TI	**SN54ALS241**	**911**
SN54ALS242	National	DM54ALS242	
SN54ALS243	National	DM54ALS243	
	TI	**SN54ALS243**	**912**
		SN54ALS244	**912**
SN54ALS244	National	DM54ALS244	
SN54ALS245	National	DM54ALS245	
	TI	**SN54ALS245**	**913**
SN54ALS273	National	DM54ALS273	
	TI	**SN54ALS273**	**919**
SN54ALS32	Fairchild	54LS32	
		74LS32	
	Hitachi	HD74LS32	
	Motorola	SN54LS32	
		SN74LS32	
	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN54LS32**	**843**
		SN74LS32	**843**
SN54ALS373	National	DM54ALS373	
	TI	SN54ALS373	
SN54ALS374	National	DM54ALS374	
	TI	SN54ALS374	
SN54ALS377	National	DM54ALS377	
SN54ALS573	National	DM54ALS573	
	TI	**SN54ALS573**	**954**
SN54ALS574	National	DM54ALS574	
	TI	**SN54ALS574**	**954**
SN54ALS576	National	DM54ALS576	
	TI	**SN54ALS576**	**965**
SN54ALS580	National	DM54ALS580	
	TI	**SN54ALS580**	**966**
SN54ALS620	National	DM54ALS620	
	TI	**SN54ALS620**	**976**
SN54ALS621	National	DM54ALS621	
	TI	**SN54ALS621**	**976**
SN54ALS622	National	DM54ALS622	
SN54ALS623	National	DM54ALS623	
	TI	SN54ALS623	
SN54ALS640	National	DM54ALS640	
	TI	**SN54ALS640**	**984**
SN54ALS641	National	DM54ALS641	
SN54ALS642	National	DM54ALS642	
SN54ALS643	National	DM54ALS643	
SN54ALS644	National	DM54ALS644	
SN54ALS644	**TI**	**SN54ALS644**	**984**
SN54ALS646	National	DM54ALS646	
SN54ALS647	National	DM54ALS647	
SN54ALS648	National	DM54ALS648	
SN54ALS649	National	DM54ALS649	
SN54ALS690	National	DM54ALS690	
SN54ALS691	National	DM54ALS691	
SN54ALS692	National	DM54ALS692	
SN54ALS693	National	DM54ALS693	
SN54ALS696	National	DM54ALS696	
SN54ALS697	National	DM54ALS697	
SN54ALS698	National	DM54ALS698	
SN54ALS699	National	DM54ALS699	
SN54ALS74	National	DM54ALS74	
	TI	**SN54ALS74**	**857**
SN54ALS873	National	DM54ALS873	
	TI	**SN54ALS873**	**1008**
SN54ALS874	National	DM54ALS874	
	TI	**SN54ALS874**	**1008**
SN54ALS876	National	DM54ALS876	
	TI	**SN54ALS876**	**1009**
SN54ALS880	National	DM54ALS880	
	TI	**SN54ALS880**	**1011**
SN54LS00	Fairchild	54LS00	
	National	DM54LS00	
	Raytheon	54LS00	
	Signetics	54LS00	
	TI	**SN54LS00**	**833**
SN54LS01	Fairchild	54LS01	
	National	DM54LS01	
	Raytheon	54LS01	
	TI	**SN54LS01**	**833**
SN54LS02	Fairchild	54LS02	
	National	DM54LS02	
	Raytheon	54LS02	
	Signetics	54LS02	
	TI	**SN54LS02**	**833**
SN54LS03	Fairchild	54LS03	
	National	DM54LS03	
	Raytheon	54LS03	
	TI	**SN54LS03**	**834**
SN54LS04	Fairchild	54LS04	
	National	DM54LS04	
	Raytheon	54LS04	
	Signetics	54LS04	
	TI	**SN54LS04**	**834**
SN54LS05	Fairchild	54LS05	
	National	DM54LS05	
	Raytheon	54LS05	
	TI	**SN54LS05**	**834**
SN54LS08	Fairchild	54LS08	
	National	DM54LS08	
	Raytheon	54LS08	
	Signetics	54LS08	
	TI	**SN54LS08**	**835**
SN54LS09	Fairchild	54LS09	
	National	DM54LS09	
	Raytheon	54LS09	
	TI	**SN54LS09**	**836**
SN54LS10	Fairchild	54LS10	
	National	DM54LS10	
	Raytheon	54LS10	
	Signetics	54LS10	
	TI	**SN54LS10**	**836**
SN54LS107	National	DM54LS107	
		DM54LS107A	
	Raytheon	54LS107	
	Signetics	54LS107	
	TI	SN54LS107	
◆SN54LS107A	National	DM54LS107	
	Raytheon	54LS107	
	Signetics	54LS107	
	TI	**SN54LS107A**	**869**
◆SN54LS109A	Fairchild	54LS109	
	National	DM54LS109	
		DM54LS109A	
	Raytheon	54LS109	
	Signetics	54LS109	
	TI	SN54LS109	
		SN54LS109A	**870**
SN54LS11	Fairchild	54LS11	
	National	DM54LS11	
	Raytheon	54LS11	
	TI	**SN54LS11**	**836**
SN54LS112A	Fairchild	54LS112	
	National	DM54LS112	
	Raytheon	54LS112	
	Signetics	54LS112	
	TI	SN54LS112	
		SN54LS112A	**871**
SN54LS113A	Fairchild	54LS113	
	National	DM54LS113	
SN54LS113A	Raytheon	54LS113	
	Signetics	54LS113	
	TI	SN54LS113	
		SN54LS113A	**871**
◆SN54LS114A	Fairchild	54LS114	
	National	DM54LS114	
		DM54LS114A	
	Raytheon	54LS114	
	TI	SN54LS114	
		SN54LS114A	
SN54LS12	National	DM54LS12	
	Raytheon	54LS12	
	TI	**SN54LS12**	**837**
SN54LS122	National	DM54LS122	
	Raytheon	54LS122	
	TI	**SN54LS122**	**873**
SN54LS123	National	DM54LS123	
	Raytheon	54LS123	
	TI	**SN54LS123**	**874**
SN54LS125A	National	DM54LS125	
	Raytheon	54LS125	
	Signetics	54LS125A	
	TI	**SN54LS125A**	**875**
◆SN54LS126A	Fairchild	54LS126	
		SN54LS126	
	National	DM54LS126	
	Raytheon	54LS126	
	Signetics	54LS126A	
	TI	SN54LS126	
		SN54LS126A	
SN54LS13	Fairchild	54LS13	
	National	DM54LS13	
	Raytheon	54LS13	
	TI	**SN54LS13**	**837**
		SN54S13	
SN54LS132	National	DM54LS132	
	Raytheon	54LS132	
	Signetics	54LS132	
	TI	**SN54LS132**	**877**
SN54LS133	Fairchild	54LS133	
SN54LS136	Fairchild	54LS136	
	National	DM54LS136	
	Raytheon	54LS136	
	Signetics	54LS136	
	TI	**SN54LS136**	**878**
SN54LS137	**TI**	**SN54LS137**	**879**
SN54LS138	AMD	SN54LS138	
	Fairchild	54LS138	
	National	DM54LS138	
	Raytheon	54LS138	
	Signetics	54LS138	
	TI	**SN54LS138**	**880**
SN54LS139	AMD	SN54LS139	
	Fairchild	54LS139	
	National	DM54LS139	
	Raytheon	54LS139	
	Signetics	54LS139	
	TI	**SN54LS139**	**880**
SN54LS14	Fairchild	54LS14	
	National	DM54LS14	
	Raytheon	54LS14	
	Signetics	54LS14	
	TI	**SN54LS14**	**837**
SN54LS145	Fairchild	54LS145	
	TI	**SN54LS145**	**882**
SN54LS147	**TI**	**SN54LS147**	**882**
SN54LS148	AMD	SN54LS148	
	TI	**SN54LS148**	**883**
SN54LS15	Fairchild	54LS15	
	National	DM54LS15	
	Raytheon	54LS15	
	TI	**SN54LS15**	**838**
SN54LS151	AMD	SN54LS151	
	Fairchild	54LS151	
	National	DM54LS151	
	Raytheon	54LS151	
	Signetics	54LS151	
	TI	**SN54LS151**	**884**
SN54LS153	AMD	SN54LS153	
	Fairchild	54LS153	
	National	DM54LS153	
	Raytheon	54LS153	
	Signetics	54LS153	
	TI	**SN54LS153**	**884**
SN54LS155	Fairchild	54LS155	
	National	DM54LS155	
	Raytheon	54LS155	
		74LS155	
	TI	**SN54LS155**	**886**
SN54LS156	Fairchild	54LS156	
	National	DM54LS156	
	Raytheon	54LS156	
SN54LS156	**TI**	**SN54LS156**	**886**
SN54LS157	AMD	SN54LS157	
	Fairchild	54LS157	
	National	DM54LS157	
	Raytheon	54LS157	
	Signetics	54LS157	
	TI	**SN54LS157**	**887**
SN54LS158	AMD	SN54LS158	
	Fairchild	54LS158	
	National	DM54LS158	
	Raytheon	54LS158	
	Signetics	54LS158	
	TI	**SN54LS158**	**887**
◆SN54LS160A	AMD	SN54LS160A	
		SN74S160	**1227**
	Fairchild	93S10	
	National	DM54LS160	
	Raytheon	54LS160	
	Signetics	54LS160	
		54LS160A	
	TI	**SN54LS160A**	**889**
◆SN54LS161A	AMD	SN54LS161A	
	Fairchild	54LS161A	
	National	DM54LS161A	
	Raytheon	54LS161	
	Signetics	54LS161A	
	TI	SN54LS161	
	TI	**SN54LS161A**	**889**
◆SN54LS162A	AMD	SN54LS162A	
	National	DM54LS162A	
	Raytheon	54LS162	
	Signetics	54LS162A	
	TI	SN54LS162	
	TI	**SN54LS162A**	**890**
◆SN54LS163A	AMD	SN54LS163A	
	National	DM54LS163	
		DM54LS163A	
	Raytheon	54LS163	
	Signetics	54LS163A	
	TI	54LS163A	
		SN54LS163	
		SN54LS163A	
SN54LS164	AMD	SN54LS164	
	Fairchild	54LS164	
	Motorola	SN54LS164A	
	National	DM54LS164	
		DM54LS164A	
	Raytheon	54LS164	
	Signetics	54LS164	
	TI	**SN54LS164**	**891**
SN54LS164A	AMD	SN54LS164	
	Fairchild	54LS164	
	Motorola	SN54LS164	
	National	DM54LS164	
		DM54LS164A	
	Raytheon	54LS164	
	Signetics	54LS164	
	TI	**SN54LS164**	**891**
SN54LS165	Fairchild	54LS165	
	TI	**SN54LS165**	**891**
SN54LS166	**TI**	**SN54LS166**	**891**
SN54LS168	AMD	SN54LS168A	
	Fairchild	54LS168	
	National	DM54LS168	
	TI	SN54LS168	
SN54LS169	AMD	SN54LS169A	
	Fairchild	54LS169	
	National	DM54LS169	
	TI	SN54LS169	
SN54LS170	Fairchild	54LS170	
	National	DM54LS170	
	Raytheon	54LS170	
	TI	**SN54LS170**	**893**
◆SN54LS173	Fairchild	54LS173	
	Motorola	SN54LS173A	
	National	DM54LS173	
	Signetics	54LS173	
	TI	**SN54LS173A**	**894**
◆SN54LS173A	Fairchild	54LS173	
	National	DM54LS173	
	Signetics	54LS173	
	TI	**SN54LS173A**	**894**
SN54LS174	AMD	SN54LS174	
	Fairchild	54LS174	
	National	DM54LS174	
	Raytheon	54LS174	
	Signetics	54LS174	
	TI	**SN54LS174**	**895**
SN54LS175	AMD	SN54LS175	
	Fairchild	54LS175	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN54LS175	National	DM54LS175	
	Raytheon	54LS175	
	Signetics	54LS175	
	TI	**SN54LS175**	**895**
SN54LS181	AMD	SN54LS181	
	Fairchild	54LS181	
	Raytheon	54LS181	
	Signetics	54LS181	
	TI	**SN54LS181**	**897**
SN54LS182	TI	SN54LS182	
SN54LS189	Fairchild	54LS189	
	National	DM54LS189	
	TI	SN54LS189	
		SN54LS189A	**440.900**
SN54LS190	AMD	SN54LS190	
	National	DM54LS190	
	Raytheon	54LS190	
	Signetics	54LS190	
	TI	**SN54LS190**	**901**
SN54LS191	AMD	SN54LS191	
	National	DM54LS191	
	Raytheon	54LS191	
	Signetics	54LS191	
	TI	**SN54LS191**	**901**
SN54LS192	AMD	SN54LS192	
	Fairchild	54LS192	
	National	DM54LS192	
	Raytheon	54LS192	
	Signetics	54LS192	
	TI	**SN54LS192**	**902**
SN54LS193	AMD	SN54LS193	
	Fairchild	54LS193	
	National	DM54LS193	
	Raytheon	54LS193	
	Signetics	54LS193	
	TI	**SN54LS193**	**902**
◆SN54LS194A	AMD	SN54LS194A	
	Fairchild	54LS194A	
	TI	**SN54LS194A**	**902**
◆SN54LS195A	AMD	SN54LS195A	
	Fairchild	54LS195A	
	Raytheon	54LS195A	
	Signetics	54LS195A	
	TI	**SN54LS195A**	**903**
SN54LS196	National	DM54LS196	
	Raytheon	54LS196	
	TI	**SN54LS196**	**903**
SN54LS197	National	DM54LS197	
	Raytheon	54LS197	
	Signetics	54LS197	
	TI	**SN54LS197**	**904**
SN54LS20	Fairchild	54LS20	
	National	DM54LS20	
	Raytheon	54LS20	
	Signetics	54LS20	
	TI	**SN54LS20**	**839**
SN54LS21	Fairchild	54LS21	
	National	DM54LS21	
	Raytheon	54LS21	
	TI	**SN54LS21**	**840**
SN54LS22	Fairchild	54LS22	
	National	DM54LS22	
	Raytheon	54LS22	
	TI	**SN54LS22**	**840**
SN54LS221	National	DM54LS221	
	Raytheon	54LS221	
	Signetics	54LS221	
	TI	**SN54LS221**	**906**
SN54LS240	AMD	SN54LS240	
	Fairchild	54LS240	
	MMI	54LS240	
	Raytheon	54LS240	
	TI	**SN54LS240**	**910**
SN54LS241	AMD	SN54LS241	
	Fairchild	54LS241	
	MMI	54LS241	
	Raytheon	54LS241	
	TI	**SN54LS241**	**911**
SN54LS242	AMD	SN54LS242	
	Raytheon	54LS242	
	TI	**SN54LS242**	**911**
SN54LS243	AMD	SN54LS243	
	Raytheon	54LS243	
	TI	**SN54LS243**	**912**
SN54LS244	AMD	SN54LS244	
	Fairchild	54LS244	
	MMI	54LS244	
	Raytheon	54LS244	
SN54LS244	**TI**	**SN54LS244**	**912**
SN54LS245	Fairchild	54LS245	
	TI	**SN54LS245**	**913**
SN54LS247	Fairchild	54LS247	
	National	DM54LS247	
	TI	**SN54LS247**	**913**
SN54LS248	Fairchild	54LS248	
	National	DM54LS248	
	Signetics	54LS248	
	TI	**SN54LS248**	**914**
SN54LS249	Fairchild	54LS249	
	National	DM54LS249	
	TI	**SN54LS249**	**914**
SN54LS251	AMD	SN54LS251	
	Fairchild	54LS251	
	Raytheon	54LS251	
	Signetics	54LS251	
	TI	**SN54LS251**	**915**
SN54LS253	AMD	SN54LS253	
	Fairchild	54LS253	
	National	DM54LS253	
		DM7214	
	Raytheon	54LS253	
	Signetics	54LS253	
	TI	SN54LS253	
SN54LS256	Fairchild	54LS256	
◆SN54LS257A	AMD	SN54LS257	
	National	DM54LS257	
	Raytheon	54LS257	
	Signetics	54LS257	
	TI	SN54LS257	
		SN54LS257A	**916**
◆SN54LS258A	AMD	SN54LS258	
	Fairchild	54LS258A	
	National	DM54LS258	
	Raytheon	54LS258	
	Signetics	54LS258	
	TI	SN54LS258	
		SN54LS258A	**917**
SN54LS259	Fairchild	54LS259	
	TI	**SN54LS259**	**917**
SN54LS26	Fairchild	54LS26	
	National	DM54LS26	
	Raytheon	54LS26	
	TI	**SN54LS26**	**841**
SN54LS260	Fairchild	54LS260	
	Motorola	SN54LS260A	
	Signetics	54LS260A	
SN54LS260A	Fairchild	54LS260	
	Signetics	54LS260A	
SN54LS266	Fairchild	54LS266	
		9386	
	National	DM54LS266	
	Raytheon	54LS266	
	Signetics	54LS266	
	TI	**SN54LS266**	**918**
SN54LS27	Fairchild	54LS27	
	National	DM54LS27	
	Raytheon	54LS27	
	TI	**SN54LS27**	**842**
SN54LS273	**AMD**	**SN54LS273**	**1227**
	Fairchild	54LS273	
	Raytheon	54LS273	
	TI	**SN54LS273**	**919**
SN54LS279	Fairchild	54LS279	
	National	DM54LS279	
	Raytheon	54LS279	
	Signetics	54LS279	
	TI	**SN54LS279**	**921**
SN54LS28	Fairchild	54LS28	
	Raytheon	54LS28	
	Signetics	54LS194A	
		54LS28	
	TI	**SN54LS28**	**842**
SN54LS280	**TI**	**SN54LS280**	**921**
SN54LS283	Fairchild	54LS283	
	National	DM54LS283	
	Raytheon	54LS283	
	Signetics	54LS283	
	TI	**SN54LS283**	**922**
SN54LS290	National	DM54LS290	
	Raytheon	54LS290	
	Signetics	54LS290	
	TI	**SN54LS290**	**924**
SN54LS293	Fairchild	54LS293	
	National	DM54LS293	
	Raytheon	54LS293	
	Signetics	54LS293	
	TI	**SN54LS293**	**925**
◆SN54LS295A	Raytheon	54LS295A	
	TI	**SN54LS295B**	**925**
SN54LS298	AMD	SN54LS298	
	Fairchild	54LS298	
	Raytheon	54LS298	
	TI	**SN54LS298**	**926**
SN54LS299	**AMD**	**SN54LS299**	**1227**
	Fairchild	54LS299	
	MMI	54LS299	
	Raytheon	54LS299	
	TI	**SN54LS299**	**927**
SN54LS30	Fairchild	54LS30	
	National	DM54LS30	
	Raytheon	54LS30	
	Signetics	54LS30	
	TI	**SN54LS30**	**842**
SN54LS32	Fairchild	54LS32	
		74LS32	
	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	**732**
		SN74LS32	
	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN54LS32**	**843**
		SN74LS32	**843**
SN54LS322	AMD	SN54LS322	
	Raytheon	54LS322	
		54LS322A	
	TI	SN54LS322	
		SN54LS322A	**930**
SN54LS323	AMD	SN54LS323	
		SN74LS323	
	Fairchild	54LS323	
		74LS323	
	Motorola	SN74LS323	
	Raytheon	54LS323	
		74LS323	
	TI	**SN54LS323**	**930**
		SN54LS323A	
		SN74LS323	**930**
SN54LS33	Fairchild	54LS33	
	Raytheon	54LS33	
	TI	**SN54LS33**	**843**
SN54LS352	Fairchild	54LS352	
	National	DM54LS352	
	TI	**SN54LS352**	**932**
SN54LS353	Fairchild	54LS353	
	National	DM54LS353	
	TI	**SN54LS353**	**933**
SN54LS365A	Fairchild	54LS365A	
	Raytheon	54LS365	
	Signetics	54LS365	
		54LS365A	
	TI	SN54LS265A	
		SN54LS365A	**935**
◆SN54LS366A	Fairchild	54LS366A	
	National	DM54LS366	
	Raytheon	54LS366	
	Signetics	54LS366A	
	TI	**SN54LS366A**	**935**
SN54LS367A	Fairchild	54LS367A	
	National	DM54LS367	
	Raytheon	54LS367	
	Signetics	54LS367	
		54LS367A	
	TI	**SN54LS367A**	**936**
SN54LS368A	Fairchild	54LS368A	
	National	DM54LS368	
	Raytheon	54LS368	
	Signetics	54LS368	
		54LS368A	
	TI	SN54LS368A	
		SN54LS368A	**936**
SN54LS37	Fairchild	54LS37	
	National	DM54LS37	
	Raytheon	54LS37	
	Signetics	54LS37	
	TI	**SN54LS37**	**844**
SN54LS373	**AMD**	**SN54LS373**	**1227**
	MMI	54LS373	
	Raytheon	54LS373	
	Signetics	**54LS373**	**783**
	TI	**SN54LS373**	**937**
SN54LS374	**AMD**	**SN54LS374**	**1227**
	MMI	54LS374	
	National	DM54LS374	
	Raytheon	54LS374	
SN54LS374	**TI**	**SN54LS374**	**938**
SN54LS375	Fairchild	54LS375	
	Raytheon	54LS375	
	Signetics	54LS375	
	TI	**SN54LS375**	**938**
SN54LS377	**AMD**	**SN54LS377**	**1227**
	Fairchild	54LS377	
	Raytheon	54LS377	
	TI	**SN54LS377**	**939**
SN54LS378	AMD	SN54LS378	
	Fairchild	54LS378	
	TI	**SN54LS378**	**939**
SN54LS379	AMD	SN54LS379	
	Fairchild	54LS379	
	TI	SN54LS379	
SN54LS38	Fairchild	54LS38	
	National	DM54LS38	
	Raytheon	54LS38	
	TI	**SN54LS38**	**844**
SN54LS384	AMD	SN54LS384	
	Raytheon	54LS384	
	TI	**SN54LS384**	**941**
SN54LS385	AMD	SN54LS385	
	Raytheon	54LS385	
	TI	**SN54LS385**	**942**
SN54LS386	National	DM54LS386	
	Raytheon	54LS386	
		RM8241	
	Signetics	S82S41	
	TI	54LS386	
		SN54LS386	**942**
SN54LS390	Fairchild	54LS390	
	TI	**SN54LS390**	**943**
SN54LS393	Fairchild	54LS393	
	TI	**SN54LS393**	**943**
SN54LS395A	National	DM54LS395	
	Raytheon	54LS395A	
	Signetics	54LS395	
	TI	SN54LS395	
		SN54LS395A	**943**
SN54LS398	**TI**	**SN54LS398**	**944**
SN54LS399	AMD	SN54LS399	
	Fairchild	54LS399	
	TI	**SN54LS399**	**944**
SN54LS40	Fairchild	54LS40	
	National	DM54LS40	
	Raytheon	54LS40	
	TI	**SN54LS40**	**845**
SN54LS42	Fairchild	54LS42	
	National	DM54LS42	
	Raytheon	54LS42	
	Signetics	54LS42	
	TI	**SN54LS42**	**845**
SN54LS47	Fairchild	54LS47	
		74LS47	
	Hitachi	HD74LS47	
	Motorola	SN74LS47	
	National	DM54LS47	
		DM74LS47	
	SGS	T74LS47	
	TI	**SN54LS47**	**847**
		SN74LS47	**847**
SN54LS48	Fairchild	54LS48	
	National	DM54LS48	
	TI	**SN54LS48**	**847**
SN54LS49	Fairchild	54LS49	
	National	DM54LS49	
	TI	**SN54LS49**	**847**
SN54LS490	Fairchild	54LS490	
	TI	**SN54LS490**	**955**
SN54LS51	Fairchild	54LS51	
	National	DM54LS51	
	Raytheon	54LS51	
	Signetics	54LS51	
	TI	**SN54LS51**	**848**
SN54LS54	Fairchild	54LS54	
	National	DM54LS54	
	Raytheon	54LS54	
	TI	**SN54LS54**	**850**
SN54LS540	**TI**	**SN54LS540**	**950**
SN54LS55	Fairchild	54LS55	
	National	DM54LS55	
	Raytheon	54LS55	
	TI	54LS55	
		SN54LS55	**851**
SN54LS568	AMD	SN54LS568	
SN54LS569	AMD	SN54LS569	
SN54LS604	**TI**	**SN54LS604**	**973**
SN54LS605	**TI**	**SN54LS605**	**973**
SN54LS606	**TI**	**SN54LS606**	**973**
SN54LS607	**TI**	**SN54LS607**	**973**

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN54LS620	TI	**SN54LS620**	**976**
SN54LS621	TI	**SN54LS621**	**976**
SN54LS622	TI	**SN54LS622**	**976**
SN54LS623	TI	**SN54LS623**	**976**
SN54LS640	TI	**SN54LS640**	**984**
SN54LS641	TI	**SN54LS641**	**984**
SN54LS642	TI	**SN54LS642**	**984**
SN54LS644	TI	**SN54LS644**	**984**
SN54LS645	TI	**SN54LS645**	**984**
SN54LS668	TI	**SN54LS668**	**990**
SN54LS669	TI	**SN54LS669**	**990**
SN54LS670	Fairchild	54LS670	
	Motorola	54LS670	
	National	DM54LS670	
	Raytheon	54LS670	
	Signetics	54LS670	
	TI	**SN54LS670**	**990**
SN54LS673	TI	**SN54LS673**	**992**
SN54LS674	TI	**SN54LS674**	**992**
◇SN54LS73A	National	DM54LS73	
	Raytheon	54LS73	
	Signetics	54LS73	
	TI	SN54LS73	
		SN54LS73A	**856**
◇SN54LS74A	Fairchild	54LS74	
	National	DM54LS74	
		DM54LS74A	
	Raytheon	54LS74	
	Signetics	54LS74	
	TI	SN54LS74	
		SN54LS74A	**857**
SN54LS75	National	DM54LS75	
	Raytheon	54LS75	
	Signetics	54LS75	
	TI	**SN54LS75**	**858**
SN54LS76A	National	DM54LS76	
	Raytheon	54LS76	
	Signetics	54LS76	
	TI	SN54LS76	
		SN54LS76A	**858**
SN54LS77	Raytheon	54LS77	
	TI	**SN54LS77**	**859**
SN54LS78A	National	DM54LS78	
	Raytheon	54LS78	
	TI	SN54LS78	
		SN54LS78A	**859**
SN54LS795	TI	SN54LS795	
SN54LS796	TI	SN54LS796	
◇SN54LS83A	Fairchild	54LS83A	
	Motorola	SN542S83A	
	National	DM54LS83A	
	Raytheon	54LS83A	
	Signetics	54LS83	
		54LS83A	
	TI	**SN54LS83A**	**861**
SN54LS85	Fairchild	54LS85	
	National	DM54LS85	
	Raytheon	54LS85	
	Signetics	54LS85	
	TI	SN54LS85	
SN54LS86	National	DM54LS86	
	Raytheon	54LS86	
	Signetics	54LS86	
	TI	**SN54LS86**	**862**
SN54LS89	Signetics	54LS89	
SN54LS90	National	DM54LS90	
	Raytheon	54LS90	
	Signetics	54LS90	
	TI	**SN54LS90**	**864**
SN54LS91	Raytheon	54LS91	
	TI	**SN54LS91**	**864**
SN54LS92	National	DM54LS92	
	Raytheon	54LS92	
	Signetics	54LS92	
	TI	**SN54LS92**	**864**
SN54LS93	Fairchild	54LS93	
	National	DM54LS93	
	Raytheon	54LS93	
	Signetics	54LS93	
	TI	**SN54LS93**	**865**
SN54LS95B	Fairchild	54LS95B	
	National	DM54LS95B	
	Raytheon	54LS95B	
	Signetics	54LS95B	
	TI	**SN54LS95B**	**866**
SN73LS368A	Fairchild	74LS368A	
	Hitachi	HD74LS368	
	Motorola	SN74LS368A	
SN73LS368A	National	DM74LS368	
	Raytheon	74LS368	
	SGS	T74LS3	
	Signetics	74LS368	
		74LS368A	
	TI	**SN74LS368A**	**936**
SN74ALS00	National	DM74ALS00	
	TI	**SN74ALS00**	**833**
SN74ALS02	National	DM74ALS02	
	TI	**SN74ALS02**	**833**
SN74ALS04	National	DM74ALS04	
	TI	**SN74ALS04**	**834**
SN74ALS08	National	DM74ALS08	
	TI	**SN74ALS08**	**835**
SN74ALS09	National	DM74ALS09	
	TI	**SN74ALS09**	**836**
SN74ALS160	National	DM74ALS160	
	TI	**SN74ALS880**	**1011**
SN74ALS161	National	DM74ALS161	
	TI	**SN74ALS160**	**889**
SN74ALS162	National	DM74ALS162	
	TI	**SN74ALS161**	**889**
SN74ALS163	National	DM74ALS163	
	TI	**SN74ALS162**	**890**
		SN74ALS163	**890**
SN74ALS240	National	DM74ALS240	
SN74ALS241	National	DM74ALS241	
	TI	**SN74ALS241**	**911**
SN74ALS242	National	DM74ALS242	
	TI	**SN74ALS242**	**911**
SN74ALS243	National	DM74ALS243	
	TI	**SN74ALS243**	**912**
SN74ALS244	National	DM74ALS244	
	TI	**SN74ALS244**	**912**
SN74ALS245	National	DM74ALS245	
	TI	**SN74ALS245**	**913**
SN74ALS273	National	DM74ALS273	
	TI	**SN74ALS273**	**919**
SN74ALS32	National	DM74ALS32	
	TI	**SN74ALS32**	**843**
SN74ALS373	National	DM74ALS373	
	TI	SN74ALS373	
SN74ALS374	National	DM74ALS374	
	TI	SN74ALS374	
SN74ALS377	National	DM74ALS377	
SN74ALS573	National	DM74ALS573	
	TI	**SN74ALS573**	**964**
SN74ALS574	National	DM74ALS574	
	TI	**SN74ALS574**	**964**
SN74ALS576	National	DN74ALS576	
	TI	**SN74ALS576**	**965**
SN74ALS580	National	DM74ALS580	
	TI	**SN74ALS580**	**966**
SN74ALS620	National	DM74ALS620	
	TI	**SN74ALS620**	**976**
SN74ALS621	National	DM74ALS621	
	TI	**SN74ALS621**	**976**
SN74ALS622	National	DM74ALS22	
SN74ALS623	National	DM74ALS623	
	TI	SN74ALS623	
SN74ALS640	National	DM74ALS640	
SN74ALS641	National	DM74ALS641	
SN74ALS642	National	DM74ALS642	
SN74ALS643	National	DM74ALS643	
	TI	**SN74ALS640**	**984**
SN74ALS644	National	DM74ALS644	
	TI	**SN74ALS644**	**984**
SN74ALS646	National	DM74ALS646	
SN74ALS647	National	DM74ALS647	
SN74ALS648	National	DM74ALS648	
SN74ALS649	National	DM74ALS649	
SN74ALS690	National	DM74ALS690	
SN74ALS691	National	DM74ALS691	
	TI	**SN54ALS242**	**911**
SN74ALS692	National	DM74ALS692	
SN74ALS693	National	DM74ALS693	
SN74ALS697	National	DM74ALS697	
SN74ALS698	National	DM74ALS698	
SN74ALS699	National	DM74ALS699	
SN74ALS74	National	DM74ALS74	
	TI	**SN74ALS74**	**857**
SN74ALS873	National	DM74ALS873	
	TI	**SN74ALS873**	**1008**
SN74ALS874	National	DM74ALS874	
	TI	**SN74ALS874**	**1008**
SN74ALS876	National	DM74ALS876	
	TI	**SN74ALS876**	**1009**
SN74ALS880	National	DM74ALS880	
SN74LS00	Fairchild	74LS00	
	Hitachi	HD74LS00	
	National	DM74LS00	
SN74LS00	Raytheon	74LS00	
	SGS	T74LS00	
	Signetics	74LS00	
	TI	**SN74LS00**	**833**
SN74LS01	Fairchild	HD74LS01	
	Hitachi	HD74LS01	
	National	DM74LS01	
	Raytheon	74LS01	
	Signetics	74LS01	
	TI	**SN74LS01**	**833**
SN74LS02	Fairchild	74LS02	
	Hitachi	HD74LS02	
	National	DM74LS02	
	Raytheon	74LS02	
	SGS	T74LS02	
	Signetics	74LS02	
	TI	**SN74LS02**	**833**
SN74LS03	Fairchild	74LS03	
	Hitachi	HD74LS03	
	National	DM74LS03	
	Raytheon	74LS03	
	SGS	T74LS03	
	TI	**SN74LS03**	**834**
SN74LS04	Fairchild	74LS04	
	Hitachi	HD74LS04	
	National	DM74LS04	
	Raytheon	74LS04	
	SGS	T74LS04	
	Signetics	74LS04	
	TI	**SN74LS04**	**834**
SN74LS05	Fairchild	74LS05	
	Hitachi	HD74LS05	
	National	DM74LS05	
	NEC-Electron	μPB74LS05	
	Raytheon	74LS05	
	SGS	T74LS05	
	Signetics	74LS05	
	TI	**SN74LS05**	**834**
SN74LS08	Fairchild	74LS08	
	Hitachi	HD74LS08	
	National	DM74LS08	
	Raytheon	74LS08	
	SGS	T74LS08	
	Signetics	74LS08	
		SN74LS08	
	TI	**SN74LS08**	**835**
SN74LS09	Fairchild	74LS09	
	Hitachi	HD74LS09	
	National	DM74LS09	
	Raytheon	74LS09	
	SGS	T74LS09	
	TI	**SN74LS09**	**836**
SN74LS10	Fairchild	74LS10	
	Hitachi	HD74LS10	
	National	DM74LS10	
	Raytheon	74LS10	
	SGS	T74LS10	
	Signetics	74LS10	
	TI	**SN74LS10**	**836**
SN74LS107A	Hitachi	HD74LS107	
	National	DM74LS107	
	Raytheon	74LS107	
	Signetics	74LS107	
	TI	**SN74LS107A**	**869**
SN74LS109	Fairchild	74LS109	
	Hitachi	HD74LS109	
	Motorola	SN74LS109A	
	National	DM74LS109	
	Raytheon	74LS109	
	Signetics	74LS109	
	TI	**SN74LS109A**	**870**
		SN74S109A	
SN74LS109A	Fairchild	74LS109	
	Hitachi	HD74LS109	
	Motorola	SN74LS109	
	National	DM74LS109	
	Raytheon	74LS109	
	Signetics	74LS109	
	TI	**SN74LS109A**	**870**
		SN74S109A	
SN74LS11	Fairchild	74LS11	
	Hitachi	HD74LS11	
	National	DM74LS11	
	Raytheon	74LS11	
	SGS	T74LS11	
	Signetics	74LS11	
	TI	**SN74LS11**	**836**
SN74LS112A	Fairchild	74LS112	
	Hitachi	HD74LS112	
	National	DM74LS112	
	Raytheon	74LS112	
	SGS	T74LS112	
SN74LS112A	Signetics	74LS112	
	TI	**SN74LS112A**	**871**
SN74LS113A	Fairchild	74LS113	
	Hitachi	HD74LS113	
	National	DM74LS113	
	Raytheon	74LS113	
	SGS	T74LS113	
	Signetics	74LS113	
	TI	**SN74LS113A**	**871**
◇SN74LS114A	Fairchild	74LS114	
	Hitachi	HD74LS114	
	Motorola	74LS114A	
	National	DM74LS114	
	Raytheon	74LS114	
	TI	SN74LS114A	
SN74LS12	Hitachi	HD74LS12	
	National	DM74LS12	
	Raytheon	74LS12	
	Signetics	74LS12	
	TI	**SN74LS12**	**837**
SN74LS122	Hitachi	HD74LS122	
	National	DM74LS122	
	Raytheon	74LS122	
	TI	**SN74LS122**	**873**
SN74LS123	Hitachi	HD74LS123	
	National	DM74LS123	
	Raytheon	74LS123	
	TI	**SN74LS123**	**874**
SN74LS124	TI	SN74LS124	
SN74LS125A	Fairchild	74LS125A	
	National	DM74LS125	
	Raytheon	74LS125	
	SGS	T74LS125	
	Signetics	74LS125A	
	TI	**SN74LS125A**	**875**
◇SN74LS126	Fairchild	74LS126	
	Motorola	SN74LS126A	
	National	DM74LS126	
	Raytheon	74LS126	
	SGS	T74LS126	
	Signetics	74LS126A	
	TI	**SN74LS126A**	**875**
◇SN74LS126A	Fairchild	74LS126	
	National	DM74LS126	
	Raytheon	74LS126	
	SGS	T74LS126	
	Signetics	74LS126A	
	TI	**SN74LS126A**	**875**
SN74LS13	Fairchild	74LS13	
	Hitachi	HD74LS13	
	National	DM74LS13	
	Raytheon	74LS13	
	Signetics	74LS13	
	TI	**SN74LS13**	**837**
SN74LS132	Fairchild	74LS132	
	Hitachi	HD74LS132	
	National	DM74LS132	
	Raytheon	74LS132	
	SGS	T74LS132	
	Signetics	74LS132	
	TI	SN74LS132	
SN74LS133	Fairchild	74LS133	
SN74LS136	Fairchild	74LS136	
	Hitachi	HD74LS136	
	National	DM74LS136	
	Raytheon	74LS136	
	SGS	T74LS136	
	Signetics	74LS136	
	TI	**SN74LS136**	**878**
SN74LS137	TI	**SN74LS137**	**879**
SN74LS138	Fairchild	74LS138	
	Hitachi	HD74LS138	
	National	DM74LS138	
	Raytheon	74LS138	
	SGS	T74LS138	
	Signetics	74LS138	
	TI	**SN74LS138**	**880**
SN74LS139	Fairchild	74LS139	
	Hitachi	HD74LS139	
	National	DM74LS139	
	Raytheon	74LS139	
	SGS	T74LS139	
	Signetics	74LS139	
	TI	**SN74LS139**	**880**
SN74LS14	Fairchild	74LS14	
	Hitachi	HD74LS14	
	National	DM74LS14	
	Raytheon	74LS14	
	Signetics	74LS14	
	TI	**SN74LS14**	**837**
SN74LS145	Fairchild	74LS145	
	TI	**SN74LS145**	**882**

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN74LS147	TI	SM74LS147	
SN74LS148	Hitachi	HD74LS148	
	TI	**SN74LS148**	883
SN74LS15	Fairchild	74LS15	
	Hitachi	HD74LS15	
	National	DM74LS15	
	Raytheon	74LS15	
	SGS	T74LS15	
	TI	**SN74LS15**	838
SN74LS151	Fairchild	74LS151	
	Hitachi	HD74LS151	
		HD74LS151A	
	National	DM74LS151	
	Raytheon	74LS151	
	SGS	T74LS151	
	Signetics	74LS151	
	TI	**SN74LS151**	884
SN74LS153	Fairchild	74LS153	
	Hitachi	HD74LS153	
	National	DM74LS153	
	Raytheon	74LS153	
	SGS	T74LS153	
	Signetics	74LS153	
	TI	**SN74LS153**	884
SN74LS155	Fairchild	74LS155	
	Hitachi	HD74LS155	
	National	DM74LS155	
	Raytheon	74LS155	
	Signetics	74LS155	
	TI	**SN74LS155**	886
SN74LS156	Fairchild	74LS156	
	Hitachi	HD74LS156	
	National	DM74LS156	
	Raytheon	74LS156	
	SGS	T74LS156	
	Signetics	74LS156	
	TI	**SN74LS156**	886
SN74LS157	Fairchild	74LS157	
	Hitachi	HD74LS157	
	National	DM74LS157	
	Raytheon	74LS157	
	SGS	T74LS157	
	Signetics	74LS157	
	TI	**SN74LS157**	887
SN74LS158	Fairchild	74LS158	
	Hitachi	HD74LS158	
	National	DM74LS158	
	Raytheon	74LS158	
	SGS	T74LS158	
	Signetics	74LS158	
	TI	**SN74LS158**	887
SN74LS160A	Fairchild	74LS160	
	Hitachi	HD74LS160A	
	National	DM74LS160	
	Raytheon	74LS160	
	Signetics	74LS160	
		74LS160A	
	TI	**SN74LS160A**	889
SN74LS161A	AMD	SN74LS161	
	Fairchild	74LS161A	
	Hitachi	HD74LS161A	
	National	DM74LS161	
	NEC-Electron	μPB74LS161	
	Raytheon	74LS161	
	Signetics	74LS161A	
	TI	**SN74LS161A**	889
SN74LS162A	Fairchild	74LS162	
	Hitachi	HD74LS162A	
	National	DM74LS162	
	Raytheon	74LS162	
	SGS	T74LS162	
	Signetics	74LS162A	
	TI	SN74LS162A	
SN74LS163A	Fairchild	74LS163	
	Hitachi	HD74LS163	
		HD74LS163A	
	National	DM74LS163	
	Raytheon	74LS163	
	SGS	T74LS163	
	Signetics	74LS163A	
	TI	**SN74LS163A**	890
SN74LS164	Fairchild	74LS164	
	Hitachi	HD74LS164	
	Motorola	SN74LS164A	
	National	DM74LS164	
	Raytheon	74LS164	
	SGS	T74LS164	
	Signetics	74LS164	
		74LS164A	
SN74LS164	TI	**SN74LS164**	891
SN74LS164A	Fairchild	74LS164	
	Hitachi	HD74LS164	
	National	DM74LS164	
	Raytheon	74LS164	
	SGS	T74LS164	
	Signetics	74LS164	
		74LS164A	
	TI	**SN74LS164**	891
SN74LS165	Fairchild	74LS165	
	SGS	T74LS165	
	TI	**SN74LS165**	891
SN74LS166	TI	SN74LS166A	
SN74LS168	Fairchild	74LS168	
	Hitachi	HD74LS168	
	National	DM74LS168	
	Signetics	74LS168A	
	TI	SN74LS168	
SN74LS169	Fairchild	74LS169	
	Hitachi	HD74LS169	
	National	DM74LS169	
	Signetics	74LS169A	
SN74LS170	Fairchild	74LS170	
	National	DM74LS170	
	Raytheon	74LS170	
	SGS	T74LS170	
	Signetics	74LS170	
	TI	**SN74LS170**	893
◆SN74LS173	Fairchild	74LS173	
	Motorola	SN74LS173A	
	National	DM74LS173	
	Signetics	74LS173	
	TI	**SN74LS173A**	894
◆SN74LS173A	Fairchild	74LS173	
	National	DM74LS173	
	Signetics	74LS173	
	TI	**SN74LS173A**	894
SN74LS174	Fairchild	74LS174	
	Hitachi	HD74LS174	
	National	DM74LS174	
	Raytheon	74LS174	
	SGS	T74LS174	
	Signetics	74LS174	
	TI	**SN74LS174**	895
SN74LS175	Fairchild	74LS175	
	Hitachi	HD74LS175	
	Raytheon	74LS175	
	SGS	T74LS175	
	Signetics	74LS175	
	TI	**SN74LS175**	895
SN74LS181	Fairchild	74LS181	
	Hitachi	HD74LS181	
	Raytheon	74LS181	
	SGS	T74LS181	
	Signetics	74LS181	
	TI	**SN74LS181**	897
SN74LS182	TI	SN74LS182	
SN74LS183	TI	**SN74LS183**	898
SN74LS189	Fairchild	74LS189	
	National	DM74LS189	
SN74LS190	Fairchild	74LS190	
	Hitachi	HD74LS190	
	National	DM74LS190	
	Raytheon	74LS190	
	SGS	T74LS190	
	TI	**SN74LS190**	901
SN74LS191	Fairchild	74LS191	
	Hitachi	HD74LS191	
	National	DM74LS191	
	Raytheon	74LS191	
	SGS	T74LS191	
	Signetics	74LS191	
	TI	**SN74LS191**	901
SN74LS192	Fairchild	74LS192	
	Hitachi	HD74LS192	
	National	DM74LS192	
	Raytheon	74LS192	
	SGS	T74LS192	
	Signetics	74LS192	
	TI	**SN74LS192**	902
SN74LS193	Fairchild	74LS193	
	Hitachi	HD74LS193	
	National	DM74LS193	
	Raytheon	74LS193	
	SGS	T74LS193	
	Signetics	74LS193	
	TI	**SN74LS193**	902
◆SN74LS194A	Fairchild	74LS194A	
	Hitachi	HD74LS194A	
	National	DM74LS194	
	SGS	T74LS194A	
	Signetics	74LS194A	
◆SN74LS194A	TI	**SN74LS194A**	902
◆SN74LS195A	Fairchild	74LS195A	
	Hitachi	HD74LS195A	
	National	DM74LS195	
	Raytheon	74LS195A	
	SGS	T74LS195A	
	Signetics	74LS195A	
	TI	**SN74LS195A**	903
SN74LS196	Fairchild	74LS196	
	Hitachi	HD74LS196	
	National	DM74LS196	
	Raytheon	74LS196	
	Signetics	N82S80	
	TI	**SN74LS196**	903
SN74LS197	Fairchild	74LS197	
	Hitachi	HD74LS197	
	National	DM74LS197	
	Raytheon	74LS197	
	Signetics	74LS197	
	TI	**SN74LS197**	904
SN74LS20	Fairchild	74LS20	
	Hitachi	HD74LS20	
	National	DM74LS20	
	Raytheon	74LS20	
	SGS	T74LS20	
	Signetics	74LS20	
	TI	**SN74LS20**	839
SN74LS21	Fairchild	74LS21	
	Hitachi	HD74LS21	
	National	DM74LS21	
	Raytheon	74LS21	
	SGS	T74LS21	
	Signetics	74LS21	
	TI	**SN74LS21**	840
SN74LS22	Fairchild	74LS22	
	Hitachi	HD74LS22	
	National	DM74LS22	
	Raytheon	74LS22	
	SGS	T74LS22	
	TI	**SN74LS22**	840
SN74LS221	Fairchild	74LS221	
	Hitachi	HD74LS221	
	National	DM74LS221	
	Raytheon	74LS221	
	TI	**SN74LS221**	906
SN74LS240	AMD	SN74LS240	
	Fairchild	74LS240	
	Hitachi	HD74LS240	
	MMI	74LS240	
	Raytheon	74LS240	
	Signetics	74LS240	
	TI	**SN74LS240**	910
SN74LS241	AMD	SN74LS241	
	Fairchild	74LS241	
	Hitachi	HD74LS241	
	MMI	74LS241	
	Raytheon	74LS241	
	Signetics	74LS241	
	TI	**SN74LS241**	911
SN74LS242	AMD	SN74LS242	
	Fairchild	74LS242A	
	Raytheon	74LS242	
	Signetics	74LS242	
	TI	**SN74LS242**	911
SN74LS243	AMD	SN74LS243	
	Fairchild	74LS243A	
	Raytheon	74LS243	
	Signetics	74LS243	
	TI	**SN74LS243**	912
SN74LS244	AMD	SN74LS244	
	Fairchild	74LS244	
	Hitachi	HD74LS244	
	MMI	74LS244	
	Raytheon	74LS244	
	Signetics	74LS244	
	TI	**SN74LS244**	912
SN74LS245	Fairchild	74LS245	
	GTEMicro	G74SC245	
	Mitel	**MD74SC245**	
			702,706
	Plessey	MV74SC245	
	SPI	**SP74SC245**	761
	Signetics	**74LS245**	779
		N8T245	
	TI	**SN74LS245**	913
SN74LS247	Fairchild	74LS247	
	Hitachi	HD74LS247	
	National	DM74LS247	
	TI	**SN74LS247**	913
SN74LS248	Fairchild	74LS248	
	Hitachi	HD74LS248	
	National	DM74LS248	
SN74LS248	SGS	T74LS248	
	TI	**SN74LS248**	914
SN74LS249	Fairchild	74LS249	
	Hitachi	HD74LS249	
	National	DM74LS249	
	SGS	T74LS249	
	TI	**SN74LS249**	914
SN74LS251	Fairchild	74LS251	
	Hitachi	HD74LS251	
	National	DM74LS251	
	Raytheon	74LS251	
	SGS	T74LS251	
	Signetics	74LS251	
	TI	**SN74LS251**	915
SN74LS253	Fairchild	74LS253	
	Hitachi	HD74LS253	
	National	DM74LS253	
		DM8214	
	Raytheon	74LS253	
	SGS	T74LS253	
	Signetics	74LS253	
	TI	SN74LS253	
SN74LS256	Fairchild	74LS256	
	Signetics	74LS256	
SN74LS257A	Fairchild	74LS257A	
	Hitachi	HD74LS257	
	National	DM74LS257	
	Raytheon	74LS257	
	SGS	T74LS257	
	Signetics	74LS257	
		74LS257A	
	TI	SN74LS257	
SN74LS258A	Fairchild	74LS258A	
	Hitachi	HD74LS258	
	National	DM74LS258	
	Raytheon	74LS258	
	SGS	T74LS258	
	Signetics	74LS258	
	TI	SN74LS258	
SN74LS259	Fairchild	74LS259	
	SGS	T74LS259	
	Signetics	74LS259	
	TI	**SN74LS259**	917
SN74LS26	Fairchild	74LS26	
	Hitachi	HD74LS26	
	National	DM74LS26	
	Raytheon	74LS26	
	SGS	T74LS26	
	Signetics	74LS26	
	TI	**SN74LS26**	841
SN74LS260	Fairchild	74LS260	
	Signetics	74LS260	
SN74LS266	Fairchild	74LS266	
	National	DM74LS266	
	Raytheon	74LS266	
		RC8242	
	SGS	T74LS266	
	Signetics	74LS266	
		N8242	
	TI	**SN74LS266**	918
SN74LS27	Fairchild	74LS27	
	Hitachi	HD74LS27	
	National	DM74LS27	
	Raytheon	74LS27	
	SGS	T74LS27	
	Signetics	74LS27	
	TI	**SN74LS27**	842
SN74LS273	AMD	**SN74LS273**	1227
	Fairchild	74LS273	
	Raytheon	74LS273	
	SGS	T74LS273	
	Signetics	74LS273	
	TI	**SN74LS273**	919
SN74LS279	Fairchild	74LS279	
	Hitachi	HD74LS279	
	National	DM74LS279	
	Raytheon	74LS279	
	Signetics	74LS279	
	TI	**SN74LS279**	921
SN74LS28	Fairchild	74LS28	
	Raytheon	74LS28	
	SGS	T74LS28	
	TI	**SN74LS28**	842
SN74LS280	Hitachi	HD74LS280	
	TI	**SN74LS280**	921
SN74LS283	Fairchild	74LS283	
	Hitachi	HD74LS283	
		HD74LS283A	
	National	DM74LS283	
	Raytheon	74LS283	
	SGS	T74LS283	
	Signetics	74LS283	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN74LS283	TI	**SN74LS283**	**922**
SN74LS290	Fairchild	74LS290	
	Hitachi	HD74LS290	
	National	DM74LS290	
	Raytheon	74LS290	
	SGS	T74LS290	
	Signetics	74LS290	
	TI	**SN74LS290**	**924**
SN74LS293	Fairchild	74LS293	
	Hitachi	HD74LS293	
	National	DM74LS293	
	SGS	T74LS293	
	Signetics	74LS293	
	TI	**SN74LS293**	**925**
SN74LS295A	Fairchild	74LS295A	
	Raytheon	74LS295A	
	Signetics	74LS295A	
		74LS295B	
	TI	**SN74LS295B**	**925**
SN74LS298	Fairchild	74LS298	
	Hitachi	HD74LS298	
	Raytheon	74LS298	
	SGS	T74LS298	
	Signetics	74LS298	
	TI	**SN74LS298**	**926**
SN74LS299	AMD	**SN74LS299**	**1227**
	Fairchild	74LS299	
	Hitachi	HD74LS299	
	Raytheon	74LS299	
	SGS	T74LS299	
	TI	**SN74LS299**	**927**
SN74LS30	Fairchild	74LS30	
	Hitachi	HD74LS30	
	National	DM74LS30	
	Raytheon	74LS30	
	SGS	T74LS30	
	Signetics	74LS30	
	TI	**SN74LS30**	**842**
SN74LS32	Fairchild	54LS32	
		74LS32	
	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	**732**
		SN54LS32	
	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN54LS32**	**843**
		SN74LS32	**843**
SN74LS322	AMD	SN74LS322	
	Fairchild	74LS322	
	Raytheon	74LS322	
		74LS322A	
	TI	**SN74LS322A**	**930**
SN74LS323	AMD	SN54LS323	
		SN74LS323	
	Fairchild	54LS323	
		74LS323	
	Motorola	SN54LS323	
	Raytheon	54LS323	
		74LS323	
	TI	**SN54LS323**	**930**
		SN54LS323A	
		SN74LS323	**930**
SN74LS33	Fairchild	74LS33	
	Raytheon	74LS33	
	Signetics	74LS33	
	TI	**SN74LS33**	**843**
SN74LS352	Fairchild	74LS352	
	National	DM74LS352	
	SGS	T74LS352	
	TI	**SN74LS352**	**932**
SN74LS353	Fairchild	74LS353	
	Motorola	DM74LS353	
	National	DM74LS353	
	SGS	T74LS353	
	TI	**SN74LS353**	**933**
◇SN74LS365A	Fairchild	74LS365A	
	National	DM74LS365	
	Raytheon	74LS365	
	SGS	T74LS365A	
	Signetics	74LS365	
		74LS365A	
	TI	**SN74LS365A**	**935**
◇SN74LS366A	Fairchild	74LS366A	
◇SN74LS366A	National	DM74LS366	
	Raytheon	74LS366	
	SGS	T74LS366A	
	Signetics	74LS366A	
	TI	**SN74LS366A**	**935**
◇SN74LS367A	Fairchild	74LS367A	
	Hitachi	HD74LS367	
		HD74LS367A	
	National	DM74LS367	
	Raytheon	74LS367	
	SGS	T74LS367A	
	Signetics	74LS367	
		74LS367A	
	TI	**SN74LS367A**	**936**
SN74LS368	Signetics	74LS368	
◇SN74LS368A	Fairchild	74LS368A	
	Hitachi	HD74LS368	
	Motorola	SN73LS368A	
	National	DM74LS368	
	Raytheon	74LS368	
	SGS	T74LS3	
	Signetics	74LS368	
		74LS368A	
	TI	**SN74LS368A**	**936**
SN74LS37	Fairchild	74LS37	
	Hitachi	HD74LS37	
	National	DM74LS37	
	Raytheon	74LS37	
	SGS	T74LS37	
	Signetics	74LS37	
	TI	**SN74LS37**	**844**
SN74LS373	AMD	**SN74LS373**	**1227**
	Fairchild	74LS373	
	MMI	74LS373	
	Raytheon	74LS373	
	SGS	T74LS373	
	Signetics	**74LS373**	**783**
	TI	**SN74LS373**	**937**
SN74LS374	AMD	SN74LS374	
	Fairchild	74LS374	
	MMI	74LS374	
	National	DM74LS374	
	Raytheon	74LS374	
	SGS	T74LS374	
	Signetics	74LS374	
	TI	**SN74LS374**	**938**
SN74LS375	Fairchild	74LS375	
	Raytheon	74LS375	
	Signetics	74LS375	
	TI	**SN74LS375**	**938**
SN74LS377	AMD	**SN74LS377**	**1227**
	Fairchild	74LS377	
	Raytheon	74LS377	
	SGS	T74LS377	
	Signetics	74LS377	
	TI	**SN74LS377**	**939**
SN74LS378	AMD	SN74LS378	
	Fairchild	74LS378	
	SGS	T74LS378	
	Signetics	74LS378	
		SN74LS378	
	TI	**SN74LS378**	**939**
SN74LS379	AMD	SN74LS379	
	Fairchild	74LS379	
	SGS	T74LS379	
	TI	**SN74LS379**	**940**
SN74LS38	Fairchild	74LS38	
	Hitachi	HD74LS38	
	National	DM74LS38	
	Raytheon	74LS38	
	SGS	T74LS38	
	Signetics	74LS38	
	TI	**SN74LS38**	**844**
SN74LS384	AMD	SN74LS384	
	Raytheon	74LS384	
	TI	**SN74LS384**	**941**
SN74LS385	AMD	SN74LS385	
	Raytheon	74LS385	
	TI	**SN74LS385**	**942**
SN74LS386	Hitachi	HD74LS386	
	National	DM74LS386	
	Raytheon	74LS386	
	TI	**SN74LS386**	**942**
SN74LS390	Fairchild	74LS390	
	SGS	T74LS390	
	TI	**SN74LS390**	**943**
SN74LS393	Fairchild	74LS393	
	SGS	T74LS393	
	Signetics	74LS393	
	TI	**SN74LS393**	**943**
SN74LS395A	Fairchild	74LS395	
SN74LS395A	National	DM74LS395	
	Raytheon	74LS395A	
	Signetics	74LS395	
	TI	**SN74LS395A**	**943**
SN74LS398	TI	**SN74LS398**	**944**
SN74LS399	AMD	SN74LS399	
	TI	**SN74LS399**	**944**
SN74LS40	Fairchild	74LS40	
	Hitachi	HD74LS40	
	National	DM74LS40	
	Raytheon	74LS40	
	SGS	T74LS40	
	Signetics	74LS40	
	TI	**SN74LS40**	**845**
SN74LS42	Fairchild	74LS42	
	Hitachi	HD74LS42	
	National	DM74LS42	
	Raytheon	74LS42	
	SGS	T74LS42	
	Signetics	74LS42	
	TI	**SN74LS42**	**845**
SN74LS47	Fairchild	54LS47	
		74LS47	
	Hitachi	HD74LS47	
	Motorola	SN54LS47	
	National	DM54LS47	
		DM74LS47	
	SGS	T74LS47	
	TI	**SN54LS47**	**847**
	TI	**SN74LS47**	**847**
SN74LS48	Fairchild	74LS48	
	Hitachi	HD74LS48	
	National	DM74LS48	
	SGS	T74LS48	
	Signetics	74LS48	
	TI	**SN74LS48**	**847**
SN74LS49	Fairchild	74LS49	
	Hitachi	HD74LS49	
	National	DM74LS49	
	SGS	T74LS49	
	TI	**SN74LS49**	**847**
SN74LS490	Fairchild	74LS490	
	SGS	T74LS490	
	Signetics	74LS490	
	TI	**SN74LS490**	**955**
◇SN74LS503	Fairchild	74LS503	
SN74LS51	Fairchild	74LS51	
	Hitachi	HD74LS51	
	National	DM74LS51	
	Raytheon	74LS51	
	SGS	T74LS51	
	Signetics	74LS51	
	TI	**SN74LS51**	**848**
SN74LS54	Fairchild	74LS54	
	Hitachi	HD74LS54	
	National	DM74LS54	
	Raytheon	74LS54	
	SGS	T74LS54	
	Signetics	74LS54	
	TI	**SN74LS54**	**850**
SN74LS540	Fairchild	74LS540	
	Signetics	**74LS540**	**2775**
	TI	**SN74LS540**	**960**
SN74LS541	Fairchild	74LS541	
	Signetics	**74LS541**	**2775**
	TI	**SN74LS541**	**960**
SN74LS55	Fairchild	74LS55	
	Hitachi	HD74LS55	
	National	DM74LS55	
	Raytheon	74LS55	
	SGS	T74LS55	
	TI	**SN74LS55**	**851**
SN74LS568	AMD	SN74LS568	
SN74LS569	AMD	SN74LS569	
SN74LS604	TI	**SN74LS604**	**973**
SN74LS605	TI	**SN74LS605**	**973**
SN74LS606	TI	**SN74LS606**	**973**
SN74LS607	TI	**SN74LS607**	**973**
SN74LS621	TI	**SN74LS621**	**976**
SN74LS622	TI	**SN74LS622**	**976**
SN74LS640	Signetics	74LS640	
		8T125	
		N8T125	
	TI	**SN74LS640**	**984**
SN74LS641	Signetics	74LS641	
	TI	**SN74LS641**	**984**
SN74LS642	Signetics	**74LS642**	**2772**
	TI	**SN74LS642**	**984**
SN74LS643	TI	**SN74LS643**	**984**
SN74LS644	TI	**SN74LS644**	**984**
SN74LS645	Signetics	74LS645	
SN74LS645	TI	**SN74LS645**	**984**
SN74LS668	TI	**SN74LS668**	**990**
SN74LS669	TI	**SN74LS669**	**990**
SN74LS670	Fairchild	74LS670	
	National	DM74LS670	
	Raytheon	74LS670	
	SGS	T74LS670	
	Signetics	74LS670	
	TI	**SN74LS670**	**990**
SN74LS673	TI	**SN74LS673**	**992**
SN74LS674	TI	**SN74LS674**	**992**
SN74LS696	National	DM74ALS696	
◇SN74LS73A	Hitachi	HD74LS73	
	National	DM74LS73	
	Raytheon	74LS73	
	Signetics	74LS73	
	TI	**SN74LS73A**	**856**
◇SN74LS74A	Fairchild	74LS74	
	Hitachi	HD74LS74	
		HD74LS74A	
	National	DM74LS74	
	Raytheon	74LS74	
	SGS	T74LS74	
	Signetics	74LS74	
	TI	**SN74LS74A**	**857**
SN74LS75	Hitachi	HD74LS75	
	National	DM74LS75	
	Raytheon	74LS75	
	Signetics	74LS75	
	TI	**SN74LS75**	**858**
SN74LS76A	Hitachi	HD74LS76	
	National	DM74LS76	
	Raytheon	74LS76	
	Signetics	74LS76	
	TI	**SN74LS76A**	**858**
SN74LS77	National	DM54LS77	
	Raytheon	54LS77	
SN74LS78A	Hitachi	HD74LS78	
	National	DM74LS78	
	Raytheon	74LS78	
	TI	**SN74LS78A**	**859**
SN74LS795	TI	SN74LS795	
SN74LS796	TI	SN74LS796	
◇SN74LS83A	Fairchild	74LS83A	
	Hitachi	HD74LS183A	
		HD74LS83A	
	National	DM74LS83A	
	Raytheon	74LS83	
		74LS83A	
	Signetics	74LS83	
		74LS83A	
	TI	**SN74LS83A**	**861**
SN74LS85	Fairchild	74LS85	
	Hitachi	HD74LS85	
	National	DM74LS85	
	Raytheon	74LS85	
	Signetics	74LS85	
	TI	**SN74LS85**	**862**
SN74LS86	Fairchild	74LS86	
	Hitachi	HD74LS86	
	National	DM74LS86	
	Raytheon	74LS86	
	SGS	T74LS86	
	Signetics	74LS86	
	TI	**SN74LS86**	**862**
SN74LS89	Signetics	74LS89	
SN74LS90	Fairchild	74LS90	
	National	DM74LS90	
	Raytheon	74LS90	
	SGS	T74LS90	
	Signetics	74LS90	
	TI	**SN74LS90**	**864**
SN74LS91	Hitachi	HD74LS91	
	Raytheon	74LS91	
	TI	**SN74LS91**	**864**
SN74LS92	Fairchild	74LS92	
	Hitachi	HD74LS92	
	National	DM74LS92	
	Raytheon	74LS92	
	SGS	T74LS92	
	Signetics	74LS92	
	TI	**SN74LS92**	**864**
SN74LS93	Fairchild	74LS93	
	Hitachi	HD74LS93	
	National	DM74LS93	
	Raytheon	74LS93	
	SGS	T74LS93	
	Signetics	74LS93	
	TI	**SN74LS93**	**865**
◇SN74LS95B	Fairchild	74LS95B	
	Hitachi	HD74LS95B	

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Motorola Semiconductor Products (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
◆SN74LS95B	National	DM74LS95B	
	Raytheon	74LS95B	
	SGS	T74LS95B	
	Signetics	74LS95B	
	TI	**SN74LS95B**	**866**
SN74S112	Fairchild	74S112	
	Hitachi	HD74S112	
	National	DM74S112	
	Signetics	74S112	
	TI	**SN74S112**	**871**
TBA396	Signetics	TBA396	
TCA4500	National	LM4500	
	Siemens	TCA4500	
TDA1085	Plessey	TDA1085	
TDA1085A	Plessey	TDA1085A	
TDA1090	Sprague	ULN-2242	
TDA1327	Motorola	MC1327	
	TI	SN76227	
TL431	Fairchild	μA431	
	TI	TL431	
TL493	TI	TL493	
TL494	Fairchild	μA494	
	TI	TL494	
TL495	TI	TL495	
ULN20003	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
ULN2001	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
ULN2002	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
ULN2002	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
ULN2003	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
ULN2004	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
ULN2068	Sprague	ULN-2068	
	TI	ULN2068	
ULN2074	Sprague	ULN-2074	
	TI	ULN2074	
	Toshiba	TD62074	
XR2201	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
μA758	**National**	**LM1800**	**3325,3328**
	RCA	CA758	
	Signetics	μA758	
	TI	SN76111	
		SN76116	
μA78S40	Fairchild	μA78S40	

National Semiconductor

Manufacturer Device	Replacement Source	Device	IC Master Page
2652	Signetics	INS2652	
54LS798	Motorola	81LS98	
	National	74LS798	
74LS797	Motorola	81LS97	
74LS798	Motorola	81LS98	
	National	54LS798	
74S573	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
75S24	Fairchild	75S24	
	Hitachi	HA1902	
	Motorola	MC7524	
	Signetics	SN7524	
	SiliconG	SG7524	
	TI	SN75224	
		SN7524	
87S181	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
87S181	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
87S191	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	**440,3979**
93L420	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
93L421	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	425G	
	National	93L420	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
AD7520	AD	AD7520	
	Datel	DAC-HA10B	
	Intersil	AD7520	
	MicroPwr	MP7520	
	National	**DAC1020**	**3320**
		DAC1021	**3320**
		DAC1022	**3320**
AD7521	AD	AD7521	
	Datel	DAC-HA12B	
	HybridSys	DAC331-12	
	Intersil	AD7521	
	MicroPwr	MP7521	
	National	DAC1220	
		DAC1221	
		DAC1222	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
AD7533	AD	AD7533	
	Intersil	AD7533	
	MicroPwr	MP7533	
ADC0801	Intersil	ADC0801	
	TI	ADC0801	
ADC0802	Intersil	ADC0802	
	TI	ADC0802	
ADC0803	Datel	ADC-830	
	Intersil	ADC0803	
	TI	ADC0803	
ADC0804	Intersil	ADC0804	
	TI	ADC0804	
ADC0808	Mostek	MK0808	
	TI	ADC0808	
ADC0809	Mostek	MK50809	
	TI	ADC0809	
ADC0816	Datel	DAS-952	
	Mostek	MK50816	
	TI	ADC0816	
ADC0817	Mostek	MK50817	
AH0126	Siliconix	DG126	
AH0129	Siliconix	DG129	
AH0133	Siliconix	DG133	
AH0134	Siliconix	DG134	
AH0139	Siliconix	DG139	
AH0140	Siliconix	DG140	
AH0141	Siliconix	DG141	
AH0142	Siliconix	DG142	
AH0143	Siliconix	DG143	
AH0144	Siliconix	DG144	
AH0145	Siliconix	DG145	
AH0146	Siliconix	DG146	
AH0151	Siliconix	DG151	
AH0152	Siliconix	DG152	
AH0153	Siliconix	DG153	
AH0154	Siliconix	DG154	
AH0161	Siliconix	DG161	
AH0162	Siliconix	DG162	
AH0163	Siliconix	DG163	
AH0164	Siliconix	DG164	
AH5009	Intersil	IH5009	
	National	AM9709	
		AM97C09	
AH5010	Intersil	IH5010	
	National	AM9710	
		AM97C10	
AH5011	Intersil	IH5011	
	National	AM9711	
		AM97C11	
AH5012	Intersil	IH5012	
	National	AM9712	
		AM97C12	
AH5013	Intersil	IH5013	
AH5014	Intersil	IH5014	
AH5015	Intersil	IH5015	
AH5016	Intersil	IH5016	
AM0154	Siliconix	DG154	
AM0163	Siliconix	DG163	
AM0164	Siliconix	DG164	
AM9709	Intersil	IH5009	
	National	AH5009	
		AM97C09	
AM9710	Intersil	IH5010	
	National	AH5010	
		AM97C10	
AM9711	Intersil	IH5011	
	National	AH5011	
		AM97C11	
AM9712	Intersil	IH5012	
	National	AH5012	
		AM97C12	
AM97C09	Intersil	IH5009	
	National	AH5009	
		AM9709	
AM97C10	Intersil	IH5010	
	National	AH5010	
		AM9710	
AM97C11	Intersil	IH5011	
	National	AH5011	
		AM9711	
AM97C12	Intersil	IH5012	
	National	AH5012	
		AM9712	
BLC-337	Intel	SBC-337	
BLC80/316	Intel	ISBC80/30	
CA3089	Hitachi	HA1137	
		LA1230	
	Motorola	MC1389	
	National	**LM3089**	**3325,3327**
CA3089	RCA	CA3089	
	Sanyo	LA1230	
		LA3089	
	SGS	TCA3089	
		TDA1200	
	Signetics	CA3089	
	Siliconix	CA3089	
	TI	SN76689	
CD4000	Motorola	MC14000	
	RCA	CD4000	
	SGS	HCF4000	
	Signetics	HEF400	
	SSS	SCL4000	
	Solitron	CM4000	
CD4001	Fairchild	F4001	
	Hitachi	HD14001	
	Motorola	MC14001	
	National	MM74C02	
	OKI	MSM4001	
	RCA	CD4001	
	Sanyo	LC4001B	
	SGS	HCF4001	
	Signetics	HEF4001	
	SSS	SCL4001	
	Solitron	CM4001	
	Toshiba	TC4001	
CD4002	Fairchild	F4002	
	Hitachi	HD14002	
	Motorola	MC14002	
	RCA	CD4002	
	SGS	HCF4002	
	Signetics	HEF4002	
	SSS	SCL4002	
	Solitron	CM4002	
	TI	TP4002	
	Toshiba	TC4002	
CD4006	Fairchild	F4006	
	Hitachi	HD14006	
	Motorola	MC14006	
	RCA	CD4006	
	SGS	HCF4006	
	SSS	SCL4006	
	Solitron	CM4006	
	Toshiba	TC4006	
CD4007	Fairchild	F4007	
	Hitachi	HD14007	
	Motorola	MC14007	
	RCA	CD4007	
	SGS	HCF4007	
	Signetics	HEF4007	
	SSS	SCL4007	
	Solitron	CM4007	
	Toshiba	TC4007	
CD4008	Fairchild	F4008	
	Hitachi	HD14008	
	Motorola	MC14008	
	National	MM74C83	
	RCA	CD4008	
	SGS	HCF4008	
	Signetics	HEF4008	
	SSS	SCL4008	
	Solitron	CM4008	
	Toshiba	TC4008	
CD4009	Hitachi	HD14009	
	RCA	CD4009	
	SGS	HCF4009	
	SSS	SCL4009	
	Solitron	CM4009	
	Toshiba	TC4009	
CD4010	Hitachi	HD14010	
	RCA	CD4010	
	SGS	HCF4010	
	SSS	SCL4010	
	Solitron	CM4010	
	Toshiba	TC4010	
CD40106	Fairchild	F40014	
	Hitachi	HD14584	
	Motorola	MC14584	
	National	CD4584	
		MM54C14	
		MM74C14	
	RCA	CD40106	
	SGS	HCF40106	
	Signetics	HEF40106	
	SSS	SCL4584	
CD4011	Fairchild	F4011	
	Hitachi	HD14011	
	Motorola	MC14011	
	National	MM74C00	
	OKI	MSM4011	
	RCA	CD4011	
CD4011	Sanyo	LC4011	
	SGS	HCF4011	
	Signetics	HEF4011	
	SSS	SCL4011	
	Solitron	CM4011	
	Toshiba	TC4011	
CD4012	Fairchild	F4012	
	Hitachi	HD14012	
	Motorola	MC14012	
	RCA	CD4012	
	SGS	HCF4012	
	Signetics	HEF4012	
	SSS	SCL4012	
	Solitron	CM4012	
	Toshiba	TC4012	
CD4013	Fairchild	F4013	
	Hitachi	HD14013	
	Motorola	MC14013	
	National	MM74C74	
	OKI	MSM4013	
	RCA	CD4013	
	Sanyo	LC4013	
	SGS	HCF4013	
	Signetics	HEF4013	
	SSS	SCL4013	
	Solitron	CM4013	
	Toshiba	TC4013	
CD4014	Fairchild	F4014	
	Hitachi	HD14014	
	Motorola	MC14014	
	RCA	CD4014	
	SGS	HCF4014	
	Signetics	HEF4014	
	SSS	SCL4014	
	Solitron	CM4014	
	Toshiba	TC4014	
CD4015	Fairchild	F4015	
	Hitachi	HD14015	
	Motorola	MC14015	
	National	MM74C164	
	OKI	MSM4015	
	RCA	CD4015	
	Sanyo	LC4015	
	SGS	HCF4015	
	Signetics	HEF4015	
	SSS	SCL4015	
	Solitron	CM4015	
	Toshiba	TC4015	
CD4016	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
CD40160	Fairchild	F40160	
	Hitachi	HD14160	
	Motorola	MC14160	
	National	MM54C160	
		MM74C160	
	RCA	CD40160	
	SGS	HCF40160	
	Signetics	HEF4060	
	SSS	SCL4160	
	Toshiba	TC40160	
CD40161	Fairchild	F40161	
	Hitachi	HD14161	
	Motorola	MC14161	
	National	MM54C161	
		MM74C161	
	RCA	CD40161	
	SGS	HCF40161	
	Signetics	HEF40161	
	SSS	SCL4161	
CD40161	Toshiba	TC40161	
CD40162	Fairchild	F40162	
	Hitachi	HD14162	
	Motorola	MC14162	
	National	MM54C162	
		MM74C162	
	RCA	CD40162	
	SGS	HCF40162	
	Signetics	HEF40162	
	SSS	SCL4162	
	Toshiba	TC40162	
CD40163	Fairchild	F40163	
	Hitachi	HD14163	
	Motorola	MC14163	
	National	MM54C163	
		MM74C163	
	RCA	CD40163	
	SGS	HCF40163	
	Signetics	HEF40163	
	SSS	SCL4163	
	Toshiba	TC40163	
CD4017	Fairchild	F4017	
	Hitachi	HD14017	
	Motorola	MC14017	
	RCA	CD4017	
	SGS	HCF4017	
	Signetics	HEF4017	
	SSS	SCL4017	
	Solitron	CM4017	
	Toshiba	TC4017	
CD40174	Fairchild	F40174	
	Hitachi	HD14174	
	Motorola	MC14174	
	National	MM54C174	
		MM74C174	
	RCA	CD40174	
	SGS	HCF40174	
	Signetics	HEF40174	
	SSS	SCL4174	
	Toshiba	TC40174	
CD40175	Fairchild	F40175	
	Hitachi	HD14175	
	Motorola	MC14175	
	National	MM54C175	
		MM74C175	
	Signetics	HEF40175	
	Toshiba	TC40175	
CD4018	Fairchild	F4018	
	Hitachi	HD14018	
	Motorola	MC14018	
	RCA	CD4018	
	SGS	HCF4018	
	Signetics	HEF4018	
	SSS	SCL4018	
	Solitron	CM4018	
	Toshiba	TC4018	
CD4019	Fairchild	F4019	
	OKI	MSM4019	
	RCA	CD4019	
	Sanyo	LC4019	
	SGS	HCF4019	
	Signetics	HEF4019	
	SSS	SCL4019	
	Solitron	CM4019	
	Toshiba	TC4019	
CD40192	Fairchild	F4029	
	Motorola	MC14029	
	National	CD4029	
	RCA	CD40192	
		CD4029	
	SGS	HCF40192	
		HCF4029	
	Signetics	HEF40192	
	SSS	SCL4029	
		SCL4192	
	Solitron	CM4029	
	Toshiba	TC40192	
		TC4029	
CD40193	Fairchild	F40193	
	National	MM54C193	
		MM74C193	
	RCA	CD40193	
	SGS	HCF40193	
	Signetics	HEF40193	
	SSS	SCL4193	
	Toshiba	TC40193	
CD40195	Fairchild	F40195	
	National	MM74C195	
CD4020	Fairchild	F4020	
	Hitachi	HD14020	
	Motorola	MC14020	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
CD4020	RCA	CD4020	
	SGS	HCF4020	
	Signetics	HEF4020	
	SSS	SCL4020	
	Solitron	CM4020	
	Toshiba	TC4020	
CD4021	Fairchild	F4021	
	Hitachi	HD14021	
	Motorola	MC14021	
	RCA	CD4021	
	SGS	HCF4021	
	Signetics	HEF4021	
	SSS	SCL4021	
	Solitron	CM4021	
	Toshiba	TC4021	
CD4022	Fairchild	F4022	
	Hitachi	HD14022	
	Motorola	MC14022	
	RCA	CD4022	
	SGS	HCF4022	
	Signetics	HEF4022	
	SSS	SCL4022	
	Solitron	CM4022	
	Toshiba	TC4022	
CD4023	Fairchild	F4023	
	Hitachi	HD14023	
	Motorola	MC14023	
	National	MM74C10	
	RCA	CD4023	
	SGS	HCF4023	
	Signetics	HEF4023	
	SSS	SCL4023	
	Solitron	CM4023	
	Toshiba	TC4023	
CD4024	Fairchild	F4024	
	Hitachi	HD14024	
	Motorola	MC14024	
	RCA	CD4024	
	SGS	HCF4024	
	Signetics	HEF4024	
	SSS	SCL4024	
	Solitron	CM4024	
	Toshiba	TC4024	
CD4025	Fairchild	F4025	
	Hitachi	HD14025	
	Motorola	MC14025	
	RCA	CD4025	
	SGS	HCF4025	
	Signetics	HEF4025	
	SSS	SCL4025	
	Solitron	CM4025	
	Toshiba	TC4025	
CD4027	Fairchild	F4027	
	Hitachi	HD14027	
	Motorola	MC14027	
	National	MM74C76	
	OKI	MSM4027	
	RCA	CD4027	
	Sanyo	LC4027	
	SGS	HCF4027	
	Signetics	HEF4027	
	SSS	SCL4027	
	Solitron	CM4027	
CD4028	Fairchild	F4028	
	Hitachi	HD14028	
	Motorola	MC14028	
	National	MM74C42	
	OKI	MSM4028	
	Sanyo	LC4028	
	SGS	HCF4028	
	Signetics	HEF4028	
	SSS	SCL4028	
	Solitron	CM4028	
	Toshiba	TC4028	
CD4029	Fairchild	F4029	
	Motorola	MC14029	
	National	CD40192	
	RCA	CD40192	
		CD4029	
	SGS	HCF40192	
		HCF4029	
	Signetics	HEF40192	
	SSS	SCL4029	
		SCL4192	
	Solitron	CM4029	
	Toshiba	TC40192	
		TC4029	
CD4030	Fairchild	F4030	
	RCA	CD4030	
CD4030	SGS	HCF4030	
	Signetics	HEF4030	
	SSS	SCL4030	
	Solitron	CM4030	
	Toshiba	TC4030	
CD4031	Fairchild	F4031	
	RCA	CD4031	
	SGS	HCF4031	
	Signetics	HEF4731	
CD4034	Fairchild	F4034	
	Hitachi	HD14034	
	Motorola	MC14034	
	RCA	CD4034	
	SGS	HCF4034	
	SSS	SCL4034	
	Solitron	CM4034	
	Toshiba	TC4034	
CD4035	Fairchild	F4035	
	Hitachi	HD14035	
	Motorola	MC14035	
	RCA	CD4035	
	SGS	HCF4035	
	Signetics	HEF4035	
	SSS	SCL4035	
	Solitron	CM4035	
	Toshiba	TC4035	
CD4040	Fairchild	F4040	
	Hitachi	HD14040	
	Motorola	MC14040	
	RCA	CD4040	
	SGS	HCF4040	
	Signetics	HEF4040	
	SSS	SCL4040	
	Solitron	CM4040	
	Toshiba	TC4040	
CD4041	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
CD4042	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
CD4043	Hitachi	HD14043	
	Motorola	MC14043	
	RCA	CD4043	
	SGS	HCF4043	
	Signetics	HEF4043	
	SSS	SCL4043	
	Solitron	CM4043	
	Toshiba	TC4043	
CD4044	Fairchild	F4044	
	Hitachi	HD14044	
	Motorola	MC14044	
	RCA	CD4044	
	SGS	HCF4044	
	Signetics	HEF4044	
	SSS	SCL4044	
	Solitron	CM4044	
	Toshiba	TC4044	
CD4046	Fairchild	F4046	
	Hitachi	HD14046	
	Motorola	MC14046	
	RCA	CD4046	
	SGS	HCF4046	
	SSS	SCL4046	
	Solitron	CM4046	
CD4047	Fairchild	F4047	
CD4047	RCA	CD4047	
	SGS	HCF4047	
	Signetics	HEF4042	
		HEF4047	
	SSS	SCL4047	
	Solitron	CM4047	
	Toshiba	TC4047	
CD4048	RCA	CD4048	
	SGS	HCF4048	
	SSS	SCL4402	
	Solitron	CM4048	
CD4049	Fairchild	F4049	
	Hitachi	HD14049	
	Motorola	MC14049	
	OKI	MSM4049	
	RCA	CD4009	
		CD4049	
	Sanyo	LC4049	
	SGS	HCF4049	
	Signetics	HEF4049	
	SSS	SCL4049	
	Solitron	CM4049	
	Toshiba	TC4049	
CD4050	Fairchild	F4050	
	Hitachi	HD14050	
	Motorola	MC14050	
	RCA	CD4010	
		CD4050	
	SGS	HCF4050	
	Signetics	HEF4050	
	SSS	SCL4050	
	Solitron	CM4050	
	Toshiba	TC4050	
CD4051	Fairchild	F4051	
	Motorola	MC14051	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4046	
		HEF4051	
	SSS	SCL4051	
	Solitron	CM4051	
	Toshiba	TC4051	
CD4052	Fairchild	F4052	
	Hitachi	HD14052	
	Motorola	MC14052	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	SSS	SCL4052	
	Solitron	CM4052	
	Toshiba	TC4052	
CD4053	Fairchild	F4053	
	Motorola	MC14053	
	RCA	CD4053	
	SGS	HCF4052	
	Signetics	HEF4053	
	SSS	SCL4053	
	Solitron	CM4053	
	Toshiba	TC4053B	
CD4060	Motorola	MC14060	
	RCA	CD4060	
	SGS	HCF4060	
	Signetics	HEF4060	
	SSS	SCL4060	
CD4066	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
CD4069	Fairchild	F4069	
	Hitachi	HD14069	
CD4069	Motorola	MC14069	
	National	MM54C04	
		MM74C04	
	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	
	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
CD4070	Fairchild	F4070	
	Hitachi	HD14070	
	Motorola	MC14070	
	National	MM74C86	
	RCA	CD4070	
	SGS	HCF4070	
	Signetics	HEF4070	
	SSS	SCL4070	
	Solitron	CM4070	
CD4071	Fairchild	F4071	
	Hitachi	HD14071	
	Motorola	MC14071	
	National	MM74C32	
	OKI	MSM4071	
	RCA	CD4071	
	Sanyo	LC4071	
	SGS	HCF4071	
	Signetics	HEF4071	
	SSS	SCL4071	
	Solitron	CM4071	
	Toshiba	TC4071	
CD4072	Fairchild	F4072	
	Hitachi	HD14072	
	Motorola	MC14072	
	RCA	CD4072	
	SGS	HCF4072	
	Signetics	HEF4072	
	SSS	SCL4072	
	Toshiba	TC4072	
CD4073	Fairchild	F4073	
	Hitachi	HD14073	
	Motorola	MC14073	
	RCA	CD4073	
	SGS	HCF4073	
	Signetics	HEF4073	
	SSS	SCL4073	
	Solitron	CM4073	
	Toshiba	TC4073	
CD4075	Fairchild	F4075	
	Hitachi	HD14075	
	Motorola	MC14075	
	RCA	CD4075	
	SGS	HCF4075	
	Signetics	HEF4075	
	SSS	SCL4075	
	Solitron	CM4075	
	Toshiba	TC4075	
CD4076	Fairchild	F4076	
	Hitachi	HD14076	
	Motorola	MC14076	
	National	MM54C173	
		MM74C173	
	RCA	CD4076	
	SGS	HCF4076	
	Signetics	HEF4076	
	SSS	SCL4076	
	Solitron	CM4076	
	Toshiba	TC4076	
CD4077	Fairchild	F4077	
	Hitachi	HD14077	
	Motorola	MC14077	
	RCA	CD4077	
	SGS	HCF4077	
	Signetics	HEF4077	
	SSS	SCL4077	
	Solitron	CM4077	
CD4081	Fairchild	F4081	
	Hitachi	HD14081	
	Motorola	MC14081	
	National	MM74C08	
	OKI	MSM4081	
	RCA	CD4081	
	Sanyo	LC4081	
	SGS	HCF4081	
	Signetics	HEF4081	
	SSS	SCL4081	
	Solitron	CM4081	
	Toshiba	TC4081	

◇ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
CD4082	Fairchild	F4082	
	Hitachi	HD14082	
	Motorola	MC14082	
	RCA	CD4082	
	SGS	HCF4082	
	Signetics	HEF4082	
	SSS	SCL4082	
	Toshiba	TC4082	
CD4085	Fairchild	F4085	
	RCA	CD4085	
	SGS	HCF4085	
	Signetics	HEF4085	
	SSS	SCL4085	
	Toshiba	TC4085	
CD4089	RCA	CD4089	
	SGS	HCF4089	
CD4093	Fairchild	F4093	
	Hitachi	HD14093	
	Motorola	MC14093	
	OKI	MSM4093	
	RCA	CD4093	
	Sanyo	LC4093	
	SGS	HCF4093	
	Signetics	HEF4093	
	SSS	SCL4093	
	Toshiba	TC4093	
CD4099	Hitachi	HD14099	
	Motorola	MC14099	
	RCA	CD4099	
	SGS	HCF4099	
	SSS	SCL4099	
	Toshiba	TC4099	
CD4503	Fairchild	F40097	
	Hitachi	HD14503	
	Motorola	MC14503	
	National	MM80C97	
	RCA	CD4503	
	Signetics	HEF40097	
CD4510	Fairchild	F4510	
	Hitachi	HD14510	
	Motorola	MC14510	
	RCA	CD4510	
	SGS	HCF4510	
	Signetics	HEF4510	
	SSS	SCL4510	
	Solitron	CM4510	
	Toshiba	TC4510	
CD4511	Fairchild	F4511	
	Hitachi	HD14511	
	Mitel	MD4511	
	MMI	4511	
	Motorola	MC14511	
	NEC-Micro	μPD4511	
	RCA	CD4511	
	SGS	HCF4511	
	Signetics	HEF4511	
	SSS	SCL4511	
	Solitron	CM4511	
	Toshiba	TC4511	
CD4512	Fairchild	F4512	
	Hitachi	HD14512	
	Motorola	MC14512	
	RCA	CD4512	
	SGS	HCF4512	
	SSS	SCL4512	
	Toshiba	TC4512	
CD4514	Fairchild	F4514	
	Hitachi	HD14514	
	Motorola	MC14514	
	RCA	CD4514	
	SGS	HCF4514	
	Signetics	HEF4514	
	SSS	SCL4514	
	Solitron	CM4514	
	Toshiba	TC4514	
CD4515	Fairchild	F4515	
	Hitachi	HD14515	
	Motorola	MC14515	
	RCA	CD4515	
	SGS	HCF4515	
	Signetics	HEF4515	
	SSS	SCL4515	
	Solitron	CM4515	
	Toshiba	TC4515	
CD4516	Fairchild	F4516	
	Hitachi	HD14516	
	Motorola	MC14516	
	RCA	CD4516	
	SGS	HCF4516	
CD4516	Signetics	HEF4516	
	SSS	SCL4516	
	Solitron	CM4516	
	Toshiba	TC4516	
CD4518	Fairchild	F4518	
	Hitachi	HD14518	
	Motorola	MC14518	
	RCA	CD4518	
	SGS	HCF4518	
	Signetics	HEF4518	
	SSS	SCL4518	
	Solitron	CM4518	
	Toshiba	TC4518	
CD4519	Hitachi	HD14519	
		HD4519	
	Motorola	MC14519	
	RCA	CD4519	
	Signetics	HEF4519	
CD4520	Fairchild	F4520	
	Hitachi	HD14520	
	Motorola	MC14520	
	OKI	MSM4520	
	RCA	CD4520	
	Sanyo	LC4520	
	SGS	HCF4520	
	Signetics	HEF4520	
	SSS	SCL4520	
	Solitron	CM4520	
	Toshiba	TC4520	
CD4522	Fairchild	F4522	
	Hitachi	HD14522	
	Motorola	MC14522	
	RCA	CD4522	
	Signetics	HEF4522	
	SSS	SCL4522	
	Toshiba	TC4522	
CD4526	Fairchild	F4526	
	Hitachi	HD14526	
	Motorola	MC14526	
	Signetics	HEF4526	
	SSS	SCL4526	
	Toshiba	TC4526	
CD4527	Fairchild	F4527	
	Hitachi	HD14527	
	Motorola	MC14527	
	RCA	CD4527	
	SGS	HCF4527	
	Signetics	HEF4527	
	SSS	SCL4527	
	Toshiba	TC4527	
		TR4527	
CD4528	Fairchild	F4528	
	Hitachi	HD14528	
	Motorola	MC14528	
	National	MM74C221	
	RCA	CD4098	
	SGS	HCF4098	
	Signetics	HEF4528	
	SSS	SCL4528	
	Toshiba	TC4528	
CD4538	Motorola	MC14538	
	OKI	MSM4538	
	Signetics	HEF4538	
CD4543	Fairchild	F4543	
	Hitachi	HD14543	
	Motorola	MC14543	
	RCA	CD4055	
		CD4056	
		CD4543	
	Signetics	HEF4543	
	Toshiba	TC4543	
CD4584	Fairchild	F40014	
	Hitachi	HD14584	
	Motorola	MC14584	
	National	CD40106	
		MM54C14	
		MM74C14	
	RCA	CD40106	
	SGS	HCF40106	
	Signetics	HEF40106	
	SSS	SCL4584	
CD4723	Fairchild	F4723	
CD4XXX	Fairchild	34XXX	
		F4XXX	
	Hitachi	HD14XXX	
	Motorola	MC14XXX	
	OKI	MSM4XXX	
	SGS	HCF4XXX	
	SSS	SCL4XXX	
	Solitron	CM4XXX	
	TI	TP4000 series	
	Toshiba	TC4XXX	
DAC-0800	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	**DAC0800**	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC-0832	Datel	DAC-608	
DAC-1006	Datel	DAC-610	
DAC-1208	Datel	DAC-612	
DAC0800	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC0801	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC0802	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
DAC0806	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	

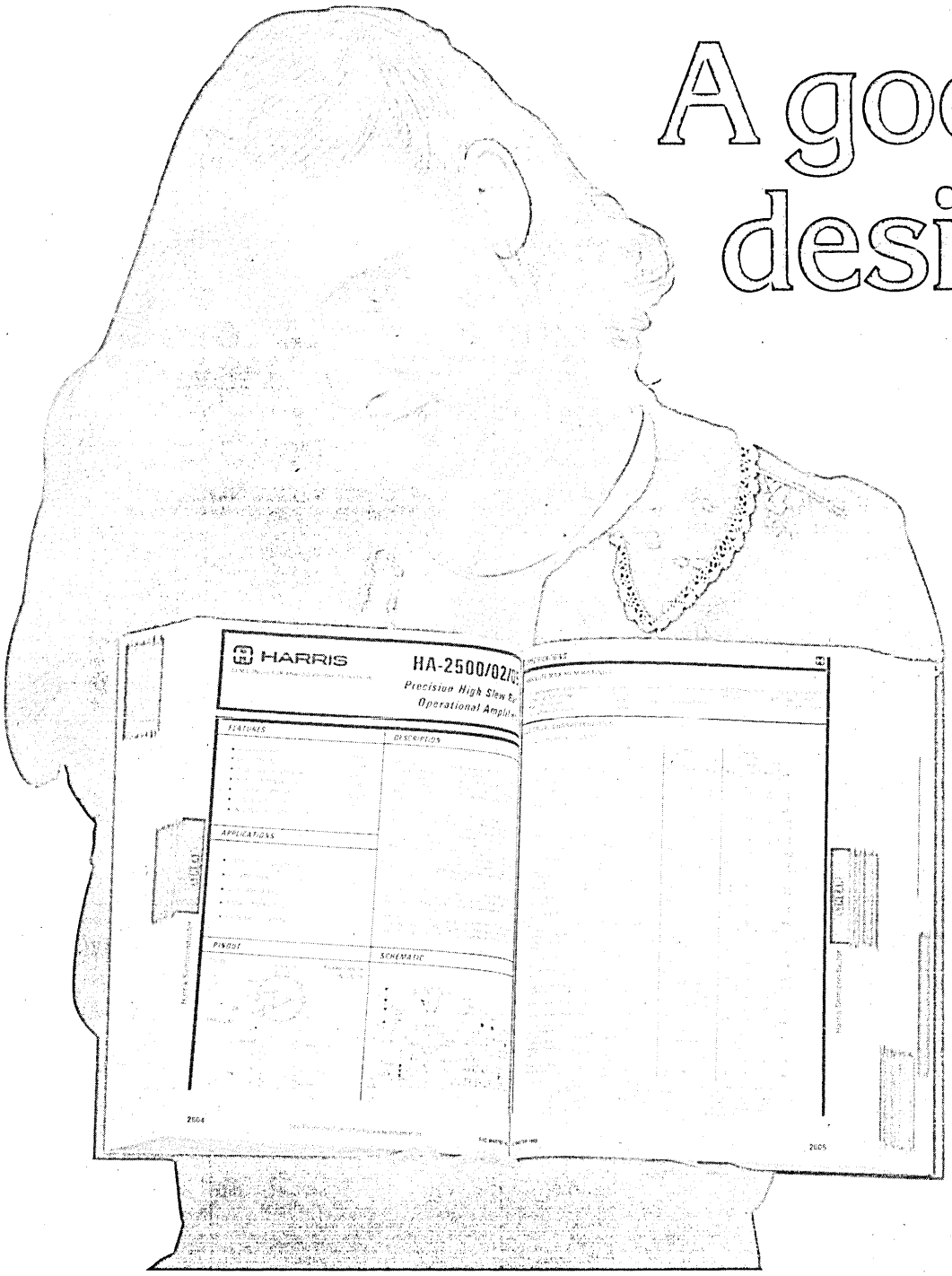
◆ Discontinued

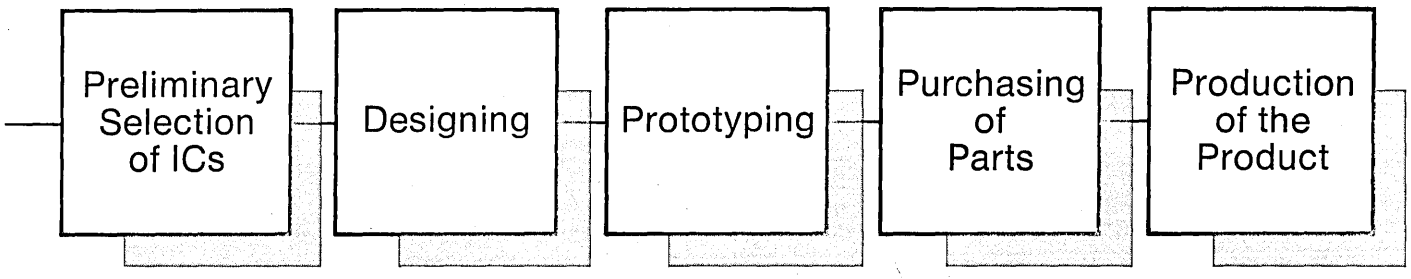
The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

SIX KEY PHASES OF NEW SYSTEM DEVELOPMENT

Planning

A good design





is "mastered" early.

When is the best time for an engineer to pick the integrated circuits that will go into his next design?

The best time is at an early stage in the design process when the engineer's plans are still flexible enough to take full advantage of the features selected.

There is a point in the early phases of every design when engineers focus on selecting integrated circuits. Specifications are examined, relative strengths and weaknesses of various devices are weighed, and the field of candidates is chosen. This is the critical time in the design cycle when designers want to be sure the right devices are in serious contention for their applications.

It is at this moment that the engineer reaches into his technical reference library. Of the material on his shelves, **IC MASTER** is the only reference source that has been especially prepared for this moment.

The engineer can look up each precise function that he needs and see all of the devices and their manufacturers that might satisfy his requirements. He sees this information for all manufacturers, not just for advertisers. But if an IC maker has chosen to include technical data for his products in **IC MASTER,** the engineer sees each index listing for that manufacturer in **bold face type** accompanied by the **page number** on which the data appears; the engineer can then turn immediately to the advertiser's technical data and see if the device fits his needs.

Next time, begin with the MASTER.

IC MASTER

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DAC0806	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC0807	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC0808	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC1020	AD	AD7520	
	Datel	DAC-HA10B	
	Intersil	AD7520	
	MicroPwr	MP7520	
	National	AD7520	
		DAC1021	**3320**
		DAC1022	**3320**
DAC1021	AD	AD7520	
	Datel	DAC-HA10B	
	Intersil	AD7520	
	MicroPwr	MP7520	
DAC1021	National	AD7520	
		DAC1020	**3320**
		DAC1022	**3320**
DAC1022	AD	AD7520	
	Datel	DAC-HA10B	
	Intersil	AD7520	
	MicroPwr	MP7520	
	National	AD7520	
		DAC1020	**3320**
		DAC1021	**3320**
DAC1220	AD	AD7521	
	Datel	DAC-HA12B	
	HybridSys	DAC331-12	
	Intersil	AD7521	
	MicroPwr	MP7521	
	National	AD7521	
		DAC1221	
		DAC1222	
DAC1221	AD	AD7521	
	Datel	DAC-HA12B	
	HybridSys	DAC331-12	
	Intersil	AD7521	
	MicroPwr	MP7521	
	National	AD7521	
		DAC1220	
		DAC1222	
DAC1222	AD	AD7521	
	Datel	DAC-HA12B	
	HybridSys	DAC331-12	
	Intersil	AD7521	
	MicroPwr	MP7521	
	National	AD7521	
		DAC1220	
		DAC1221	
DAC1280	AD	ADDAC80	
		ADDAC85	
	Burr-Brown	DAC80	
		DAC85	
	Datel	DAC-85	
		DAC-HZ12B	
	HybridSys	DAC335	
		DAC9356	
		HSDAC80	
	MicroNet	DAC80	
		DAC85	
	National	**DAC1285**	**3345**
DAC1285	AD	ADDAC80	
		ADDAC85	
	Burr-Brown	DAC80	
		DAC85	
	Datel	DAC-85	
		DAC-HZ12B	
	HybridSys	DAC335	
		DAC9356	
		HSDAC80	
	MicroNet	DAC80	
		DAC85	
	National	DAC1280	
DAC1287	Burr-Brown	DAC85/CCD	
DH3725	Fairchild	FQ3725	
	Motorola	MQ3725	
	Raytheon	SP3725	
	RCA	CA3725	
DM10116	Fairchild	F10116	
	Hitachi	HD10116	
	Motorola	MC10116	
	Signetics	10116	
DM10414	Fairchild	F10414	
	Motorola	**MCM10152**	**3839**
DM10415	AMD	AM10415	
	Fairchild	**F10415**	**3615,3618**
	Hitachi	**HM2110**	**3789**
		HM2112	**3789**
	Motorola	**MCM10146**	**3839**
	Siemens	GXB10415	
	Signetics	10146	
DM10422	**Fairchild**	**F10422**	**3615,3620**
	Fujitsu	MBM10422	
	Hitachi	**HM10422**	**3789**
	Motorola	**MCM10422**	**3839**
DM10470	AMD	AM10470	
	Fairchild	**F10470**	**3615,3621**
	Fujitsu	**MBM10470**	**3681**
	Hitachi	**HM10470**	**3789**
	Motorola	MCM10470	
	Signetics	10470	
DM5400	Fairchild	5400	
	Signetics	5400	
	TI	**SN5400**	**833**
DM5401	Fairchild	5401	
	TI	**SN5401**	**833**
DM5402	Fairchild	5402	
	TI	**SN5402**	**833**
DM5403	Fairchild	5403	
	TI	**SN5403**	**834**
DM5404	Fairchild	5404	
		9016	
	National	DM9016C	
	TI	**SN5404**	**834**
DM5405	Fairchild	5405	
	TI	**SN5405**	**834**
DM5406	Fairchild	5406	
	TI	**SN5406**	**835**
DM5407	Fairchild	5407	
	TI	**SN5407**	**835**
DM5408	Fairchild	5408	
	TI	**SN5408**	**835**
DM5409	Fairchild	5409	
	TI	**SN5409**	**836**
DM5410	Fairchild	5410	
	TI	**SN5410**	**836**
DM54107	Fairchild	54107	
	Motorola	MC54107	
	TI	**SN54107**	**869**
DM54109	Signetics	54109	
	TI	**SN54109**	**870**
DM5411	Fairchild	5411	
	Signetics	5411	
	TI	SN5411	
DM54121	Fairchild	54121	
		9603	
	Signetics	54121	
	TI	**SN54121**	**873**
DM54123	Fairchild	54123	
	Signetics	54123	
	TI	**SN54123**	**874**
DM54125	Fairchild	54125	
	National	DM7093	
	TI	**SN54125**	**875**
		SN54425	**946**
DM54126	Fairchild	54126	
	National	DM7094	
	Signetics	54126	
	TI	**SN54126**	**875**
		SN54426	**946**
DM5413	Fairchild	5413	
	TI	**SN5413**	**837**
DM54132	Fairchild	54132	
	Signetics	54132	
	TI	**SN54132**	**877**
DM5414	Fairchild	5414	
	Signetics	5414	
	TI	**SN5414**	**837**
DM54141	Fairchild	9315	
	Signetics	54141	
	TI	SN54141	
DM54145	Fairchild	54145	
	TI	**SN54145**	**882**
	TI	**SN54153**	**884**
DM54154	Fairchild	9311	
	Hitachi	HD74154	
	National	DM7213	
		DM74154	
		DM8311	
		DM9311	
	Raytheon	RC9311	
		RM9311	
	Signetics	54154	
		74154	
	TI	SN29311	
		SN39311	
		SN54154	**885**
		SN74154	**885**
DM54155	Fairchild	54155	
	TI	**SN54155**	**886**
DM54156	Fairchild	54156	
	TI	**SN54156**	**886**
DM54157	Fairchild	54157	
	Signetics	54157	
	TI	**SN54157**	**887**
DM5416	Fairchild	5416	
	TI	**SN5416**	**838**
DM54160	Fairchild	54160	
		9310	
	Raytheon	RM9310	
	Signetics	54160	
	TI	**SN54160**	**889**
DM54161	Fairchild	54161	
	Signetics	54161	
	TI	**SN54161**	**889**
DM54162	Fairchild	54162	
	TI	**SN54162**	**890**
DM54163	Fairchild	54163	
	Signetics	54163	
	TI	**SN54163**	**890**
DM54164	Fairchild	54164	
	National	DM7570	
	Signetics	54164	
	TI	**SN54164**	**891**
DM54165	Fairchild	54165	
	National	DM7590	
	Signetics	54165	
	TI	**SN54165**	**891**
DM54166	Fairchild	54166	
	Signetics	54166	
	TI	**SN54166**	**891**
DM5417	Fairchild	5417	
	TI	**SN5417**	**838**
DM54170	Fairchild	54170	
	TI	**SN54170**	**893**
DM54173	Fairchild	54173	
	National	DM7551	
	Raytheon	RM8T10	
	TI	**SN54173**	**894**
DM54174	Fairchild	54174	
	Signetics	54174	
	TI	**SN54174**	**895**
DM54175	Fairchild	54175	
	Signetics	54175	
	TI	**SN54175**	**895**
DM54176	Fairchild	54176	
	Raytheon	RM8280	
	Signetics	54176	
		S8280	
	TI	**SN54176**	**896**
DM54177	Fairchild	54177	
	National	DM7281	
	Raytheon	RM8281	
	Signetics	54177	
		S7281	
		S8281	
	TI	**SN54177**	**896**
DM54180	Fairchild	54180	
	Signetics	54180	
	TI	**SN54180**	**897**
DM54181	Fairchild	54181	
		9341	
	Hitachi	HD74181	
	National	DM74181	
	Raytheon	RC9341	
		RM9341	
	Signetics	54181	
		74181	
	TI	**SN54181**	**897**
		SN74181	**897**
DM54182	Fairchild	54182	
		9342	
	Hitachi	HD74182	
	National	DM74182	
	Raytheon	RM9342	
	TI	**SN54182**	**898**
		SN74182	**898**
DM54184	**TI**	**SN54184**	**440,899**
DM54185	TI	SN54185	
DM54185A	**TI**	**SN54185A**	**900**
DM54187	TI	SN54187	
DM54190	Fairchild	54190	
	Signetics	54190	
	TI	**SN54190**	**901**
DM54191	Fairchild	54191	
	Signetics	54191	
	TI	**SN54191**	**901**
DM54192	Fairchild	54192	
	National	DM7560	
	TI	**SN54192**	**902**
DM54193	Fairchild	54193	
	National	DM7563	
	TI	**SN54193**	**902**
DM54194	Signetics	54194	
	TI	**SN54194**	**902**
DM54195	Fairchild	54195	
		9300	
	TI	**SN54195**	**903**
DM54196	Fairchild	54196	
	Signetics	54196	
	TI	**SN54196**	**903**
DM54198	Fairchild	54198	
	TI	**SN54198**	**904**
DM54199	Fairchild	54199	
	TI	**SN54199**	**905**
DM5420	Fairchild	5420	
	Signetics	5420	
	TI	**SN5420**	**839**
DM5423	Fairchild	5423	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DM5423	TI	SN5423	840
DM5425	Fairchild	5425	
	TI	SN5425	
DM5426	Signetics	5426	
	TI	SN5426	841
DM5427	Fairchild	5427	
	TI	SN5427	842
DM5430	Fairchild	5430	
	TI	SN5430	842
DM5432	Fairchild	5432	
	Signetics	5432	
	TI	SN5432	843
DM5437	Fairchild	5437	
	TI	SN5437	844
DM5438	Fairchild	5438	
	TI	SN5438	844
DM5440	Fairchild	5440	
	TI	SN5440	845
DM5442	Fairchild	5442A	
	Signetics	5442	
	TI	SN5442	
DM5445	Fairchild	5445	
	TI	SN5445	846
		SN5445A	
DM5446	Fairchild	5446A	
		9317B	
		9317C	
	National	DM5447	
	Signetics	5446	
	TI	SN5446	
		SN5446A	847
DM5447	Fairchild	5446A	
		9317B	
		9317C	
	National	DM5446	
	Signetics	5446	
	TI	SN5446	
		SN5446A	847
DM5448	Fairchild	5448	
		7448	
	National	DM7448	
		DM8848	
	Signetics	N8T54	
	TI	SN5448	847
		SN5448A	
		SN7448	847
		SN7448A	
DM5450	Fairchild	5450	
	TI	SN5450	848
DM5451	Fairchild	5451	
	TI	SN5451	848
DM5453	Fairchild	5453	
	TI	SN5453	849
DM5454	Fairchild	5454	
	TI	SN5454	850
DM5460	Fairchild	5460	
	TI	SN5460	852
DM5470	Fairchild	5470	
	TI	SN5470	855
DM5472	Fairchild	5472	
	TI	SN5472	856
DM5473	Fairchild	5473	
	Signetics	5473	
	TI	SN5473	856
DM5474	Fairchild	5474	
	Signetics	5474	
	TI	SN5474	857
DM5475	Fairchild	5475	
	Signetics	5475	
	TI	SN5475	858
DM5476	Fairchild	5476	
	Signetics	5476	
	TI	SN5476	859
DM5485	Fairchild	5485	
	Signetics	5485	
	TI	SN5485	862
DM5486	Fairchild	5486	
	Signetics	5486	
	TI	SN5486	862
DM5488	Fairchild	5488	
	Signetics	S8224	
	TI	SN5488	
		SN5488A	
DM5489	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	440,863
		SN74S289	
DM5490	Fairchild	5490	
	TI	SN5490	
		SN5490A	864
DM5491	Fairchild	5491A	
	Signetics	5491	
	TI	SN5491	
		SN5491A	864
DM5492	Fairchild	5492	
	TI	SN5492	
		SN5492A	864
DM5493	Fairchild	5493A	
	Signetics	5493	
	TI	SN5493	
		SN5493A	865
DM5495	Fairchild	5495A	
	TI	SN5495	
		SN5495A	866
DM5496	Fairchild	5496	
	Signetics	5496	
	TI	SN5496	866
DM54ALS00	Motorola	SN54ALS00	732
	TI	SN54ALS00	833
DM54ALS02	Motorola	SN54ALS02	732
	TI	SN54ALS02	833
DM54ALS04	Motorola	SN54ALS04	732
	TI	SN54ALS04	834
DM54ALS08	Motorola	SN54ALS08	732
	TI	SN54ALS08	835
DM54ALS09	Motorola	SN54ALS09	732
	TI	SN54ALS09	836
DM54ALS160	Motorola	SN54ALS160	732
	TI	SN54ALS160	889
DM54ALS161	Motorola	SN54ALS161	732
	TI	SN54ALS161	889
DM54ALS162	Motorola	SN54ALS162	732
	TI	SN54ALS162	890
DM54ALS163	Motorola	SN54ALS163	732
	TI	SN54ALS163	890
DM54ALS240	Motorola	SN54ALS240	732
DM54ALS241	Motorola	SN54ALS241	732
	TI	SN54ALS241	911
DM54ALS242	Motorola	SN54ALS242	732
DM54ALS243	Motorola	SN54ALS243	732
	TI	SN54ALS243	912
		SN54ALS244	912
DM54ALS244	Motorola	SN54ALS244	732
DM54ALS245	Motorola	SN54ALS245	732
	TI	SN54ALS245	913
DM54ALS273	Motorola	SN54ALS273	732
	TI	SN54ALS273	919
DM54ALS32	Fairchild	54LS32	
		74LS32	
	Hitachi	HD74LS32	
	Motorola	SN54ALS32	732
		SN54LS32	
		SN74LS32	
	National	DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	SN54ALS32	843
		SN74LS32	843
DM54ALS373	Motorola	SN54ALS373	732
	TI	SN54ALS373	
DM54ALS374	Motorola	SN54ALS374	732
	TI	SN54ALS374	
DM54ALS377	Motorola	SN54ALS377	732
DM54ALS573	Motorola	SN54ALS573	732
	TI	SN54ALS573	964
DM54ALS574	Motorola	SN54ALS574	732
	TI	SN54ALS574	964
DM54ALS576	Motorola	SN54ALS576	732
	TI	SN54ALS576	965
DM54ALS580	Motorola	SN54ALS580	732
	TI	SN54ALS580	966
DM54ALS620	Motorola	SN54ALS620	732
	TI	SN54ALS620	976
DM54ALS621	Motorola	SN54ALS621	732
	TI	SN54ALS621	976
DM54ALS622	Motorola	SN54ALS622	732
DM54ALS623	Motorola	SN54ALS623	732
	TI	SN54ALS623	
DM54ALS640	Motorola	SN54ALS640	732
	TI	SN54ALS640	984
DM54ALS641	Motorola	SN54ALS641	732
DM54ALS642	Motorola	SN54ALS642	732
DM54ALS643	Motorola	SN54ALS643	732
DM54ALS644	Motorola	SN54ALS644	732
	TI	SN54ALS644	984
DM54ALS646	Motorola	SN54ALS646	732
DM54ALS647	Motorola	SN54ALS647	732
DM54ALS648	Motorola	SN54ALS648	732
DM54ALS649	Motorola	SN54ALS649	732
DM54ALS690	Motorola	SN54ALS690	732
DM54ALS691	Motorola	SN54ALS691	732
DM54ALS692	Motorola	SN54ALS692	732
DM54ALS693	Motorola	SN54ALS693	732
DM54ALS696	Motorola	SN54ALS696	732
DM54ALS697	Motorola	SN54ALS697	732
DM54ALS698	Motorola	SN54ALS698	732
DM54ALS699	Motorola	SN54ALS699	
DM54ALS74	Motorola	SN54ALS74	732
	TI	SN54ALS74	857
DM54ALS873	Motorola	SN54ALS873	732
	TI	SN54ALS873	1003
DM54ALS874	Motorola	SN54ALS874	732
	TI	SN54ALS874	1008
DM54ALS876	Motorola	SN54ALS876	732
	TI	SN54ALS876	1009
DM54ALS880	Motorola	SN54ALS880	732
	TI	SN54ALS880	1011
DM54H00	Fairchild	54H00	
	TI	SN54H00	
DM54H01	Fairchild	54H01	
	TI	SN54H01	833
DM54H04	Fairchild	54H04	
	TI	SN54H04	834
DM54H05	Fairchild	54H05	
	TI	SN54H05	834
DM54H08	Fairchild	54H08	
DM54H10	Fairchild	54H10	
	TI	SN54H10	836
DM54H103	Fairchild	54H103	
	TI	SN54H103	868
DM54H106	Fairchild	54H106	
	TI	SN54H106	869
DM54H108	Fairchild	54H108	
	TI	SN54H108	870
DM54H11	Fairchild	54H11	
	Motorola	3106	
DM54H11	TI	SN54H11	836
DM54H20	Fairchild	54H20	
	TI	SN54H20	839
DM54H21	Fairchild	54H21	
	TI	SN54H21	840
DM54H22	Fairchild	54H22	
	TI	SN54H22	840
DM54H30	Fairchild	54H30	
	TI	SN54H30	842
DM54H40	Fairchild	54H40	
	TI	SN54H40	845
DM54H50	Fairchild	54H50	
	TI	SN54H50	848
DM54H51	Fairchild	54H51	
	TI	SN54H51	848 849
DM54H52	Fairchild	54H52	
	TI	SN54H52	
DM54H53	Fairchild	54H53	
	RCA	CD4029	
	Signetics	HEF4029	
	TI	SN54H53	849
DM54H54	Fairchild	54H54	
	TI	SN54H54	850
DM54H55	Fairchild	54H55	
	TI	SN54H55	851
DM54H60	Fairchild	54H60	
	TI	SN54H60	852
DM54H61	Fairchild	54H61	
	TI	SN54H61	852
DM54H62	Fairchild	54H62	
	TI	SN54H62	853
DM54H71	Fairchild	54H71	
	TI	SN54H71	855
DM54H72	Fairchild	54H72	
	TI	SN54H72	856
DM54H74	Fairchild	54H74	
	TI	SN54H74	857
DM54H76	Fairchild	54H76	
	TI	SN54H76	858
DM54H78	Fairchild	54H78	
	TI	SN54H78	859
DM54L01	TI	SN54L01	
DM54L02	TI	SN54L02	
DM54L03	TI	SN54L03	834
DM54L10	TI	SN54L10	836
DM54L164	National	DM76L70	
	TI	SN54L164	891
DM54L192	TI	SN54L192	902
DM54L193	TI	SN54L193	902
DM54L20	TI	SN54L20	839
DM54L30	TI	SN54L30	842
DM54L42A	TI	SN54L42A	
DM54L51	TI	SN54L51	848
DM54L55	TI	SN54L55	851
DM54L71	TI	SN54L71	
DM54L72	TI	SN54L72	856
DM54L73	TI	SN54L73	856
DM54L74	TI	SN54L74	
DM54L75	TI	SN54L75	
DM54L78	TI	SN54L78	
DM54L85	TI	SN54L85	
DM54L86	TI	SN54L86	
DM54L90	TI	SN54L90	
DM54L93	TI	SN54L93	
DM54L95	TI	SN54L95	866
DM54L98	TI	SN54L98	
DM54LS00	Fairchild	54LS00	
	Motorola	SN54LS00	
	Raytheon	54LS00	
	Signetics	54LS00	
	TI	SN54LS00	833
DM54LS01	Fairchild	54LS01	
	Motorola	SN54LS01	
	Raytheon	54LS01	
	TI	SN54LS01	833
DM54LS02	Fairchild	54LS02	
	Motorola	SN54LS02	
	Raytheon	54LS02	
	Signetics	54LS02	
	TI	SN54LS02	833
DM54LS03	Fairchild	54LS03	
	Motorola	SN54LS03	
	Raytheon	54LS03	
	TI	SN54LS03	834
DM54LS04	Fairchild	54LS04	
	Motorola	SN54LS04	
	Raytheon	54LS04	
	Signetics	54LS04	
	TI	SN54LS04	834
DM54LS05	Fairchild	54LS05	
	Motorola	SN54LS05	
	Raytheon	54LS05	

◊ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DM54LS05	TI	**SN54LS05**	834
DM54LS08	Fairchild	54LS08	
	Motorola	SN54LS08	
	Raytheon	54LS08	
	Signetics	54LS08	
	TI	**SN54LS08**	835
DM54LS09	Fairchild	54LS09	
	Motorola	SN54LS09	
	Raytheon	54LS09	
	TI	**SN54LS09**	836
DM54LS10	Fairchild	54LS10	
	Motorola	SN54LS10	
	Raytheon	54LS10	
	Signetics	54LS10	
	TI	**SN54LS10**	836
DM54LS107	Motorola	SN54LS107A	
	Raytheon	54LS107	
	Signetics	54LS107	
	TI	**SN54LS107A**	869
DM54LS107A	National	DM54LS107	
	Raytheon	54LS107	
	Signetics	54LS107	
	TI	SN54LS107	
DM54LS109	Fairchild	54LS109	
	Motorola	SN54LS109A	
	National	DM54LS109A	
	Raytheon	54LS109	
	Signetics	54LS109	
	TI	SN54LS109	
		SN54LS109A	870
DM54LS109A	Fairchild	54LS109	
	Motorola	SN54LS109A	
	National	DM54LS109	
	Raytheon	54LS109	
	Signetics	54LS109	
	TI	SN54LS109	
		SN54LS109A	870
DM54LS11	Fairchild	54LS11	
	Motorola	SN54LS11	
	Raytheon	54LS11	
	TI	**SN54LS11**	836
DM54LS112	Fairchild	54LS112	
	Motorola	SN54LS112A	
	Raytheon	54LS112	
	Signetics	54LS112	
	TI	SN54LS112	
		SN54LS112A	871
DM54LS113	Fairchild	54LS113	
	Motorola	SN54LS113A	
	Raytheon	54LS113	
	Signetics	54LS113	
	TI	SN54LS113	
		SN54LS113A	871
DM54LS114	Fairchild	54LS114	
	Motorola	SN54LS114A	
	National	DM54LS114A	
	Raytheon	54LS114	
	TI	SN54LS114	
		SN54LS114A	
DM54LS114A	Fairchild	54LS114	
	Motorola	SN54LS114A	
	National	DM54LS114	
	Raytheon	54LS114	
	TI	SN54LS114	
		SN54LS114A	
DM54LS12	Motorola	SN54LS12	
	Raytheon	54LS12	
	TI	**SN54LS12**	837
DM54LS122	Motorola	SN54LS122	
	Raytheon	54LS122	
	TI	**SN54LS122**	873
DM54LS123	Motorola	SN54LS123	
	Raytheon	54LS123	
	TI	**SN54LS123**	874
DM54LS125	Motorola	SN54LS125A	
	Raytheon	54LS125	
	Signetics	54LS125A	
	TI	**SN54LS125A**	875
DM54LS126	Fairchild	54LS126	
		SN54LS126	
	Motorola	SN54LS126A	
	Raytheon	54LS126	
	Signetics	54LS126A	
	TI	SN54LS126	
		SN54LS126A	
DM54LS13	Fairchild	54LS13	
	Motorola	SN54LS13	
	Raytheon	54LS13	
	TI	**SN54LS13**	837
		SN54S13	
DM54LS132	Motorola	SN54LS132	
	Raytheon	54LS132	
	Signetics	54LS132	
	TI	**SN54LS132**	877
DM54LS136	Fairchild	54LS136	
	Motorola	SN54LS136	
	Raytheon	54LS136	
	Signetics	54LS136	
	TI	**SN54LS136**	878
DM54LS138	AMD	SN54LS138	
	Fairchild	54LS138	
	Motorola	SN54LS138	
	Raytheon	54LS138	
	Signetics	54LS138	
	TI	**SN54LS138**	880
DM54LS139	AMD	SN54LS139	
	Fairchild	54LS139	
	Motorola	SN54LS139	
	Raytheon	54LS139	
	Signetics	54LS139	
	TI	**SN54LS139**	880
DM54LS14	Fairchild	54LS14	
	Motorola	SN54LS14	
	Raytheon	54LS14	
	Signetics	54LS14	
	TI	**SN54LS14**	837
DM54LS15	Fairchild	54LS15	
	Motorola	SN54LS15	
	Raytheon	54LS15	
	TI	**SN54LS15**	838
DM54LS151	AMD	SN54LS151	
	Fairchild	54LS151	
	Motorola	SN54LS151	
	Raytheon	54LS151	
	Signetics	54LS151	
	TI	**SN54LS151**	884
DM54LS153	AMD	SN54LS153	
	Fairchild	54LS153	
	Motorola	SN54LS153	
	Raytheon	54LS153	
	Signetics	54LS153	
	TI	**SN54LS153**	884
DM54LS154	Signetics	54LS154	
DM54LS155	Fairchild	54LS155	
	Motorola	SN54LS155	
	Raytheon	54LS155	
		74LS155	
	TI	**SN54LS155**	886
DM54LS156	Fairchild	54LS156	
	Motorola	SN54LS156	
	Raytheon	54LS156	
	TI	**SN54LS156**	886
DM54LS157	AMD	SN54LS157	
	Fairchild	54LS157	
	Motorola	SN54LS157	
	Raytheon	54LS157	
	Signetics	54LS157	
	TI	**SN54LS157**	887
DM54LS158	AMD	SN54LS158	
	Fairchild	54LS158	
	Motorola	SN54LS158	
	Raytheon	54LS158	
	Signetics	54LS158	
	TI	**SN54LS158**	887
DM54LS160	AMD	SN54LS160A	
		SN74S160	1227
	Fairchild	93S10	
	Motorola	SN54LS160A	
	Raytheon	54LS160	
	Signetics	54LS160	
		54LS160A	
	TI	**SN54LS160A**	889
DM54LS160A	TI	SN54LS160	
DM54LS161A	AMD	SN54LS161A	
	Fairchild	54LS161A	
	Motorola	SN54LS161A	
	Raytheon	54LS161	
	Signetics	54LS161A	
	TI	SN54LS161	
		SN54LS161A	889
DM54LS162A	AMD	SN54LS162A	
	Motorola	SN54LS162A	
	Raytheon	54LS162	
	Signetics	54LS162A	
	TI	SN54LS162	
		SN54LS162A	890
DM54LS163	AMD	SN54LS163A	
	Motorola	SN54LS163A	
DM54LS163	National	DM54LS163A	
	Raytheon	54LS163	
	Signetics	54LS163A	
	TI	54LS163A	
		SN54LS163	
		SN54LS163A	
DM54LS163A	AMD	SN54LS163A	
	Motorola	SN54LS163A	
	National	DM54LS163	
	Raytheon	54LS163	
	Signetics	54LS163A	
	TI	54LS163A	
		SN54LS163	
		SN54LS163A	
DM54LS164	AMD	SN54LS164	
	Fairchild	54LS164	
	Motorola	SN54LS164	
		SN54LS164A	
	National	DM54LS164A	
	Raytheon	54LS164	
	Signetics	54LS164	
	TI	**SN54LS164**	891
		SN54LS164A	
DM54LS164A	AMD	SN54LS164	
	Fairchild	54LS164	
	Motorola	SN54LS164	
		SN54LS164A	
	National	DM54LS164	
	Raytheon	54LS164	
	Signetics	54LS164	
	TI	**SN54LS164**	891
		SN54LS164A	
DM54LS168	AMD	SN54LS168A	
	Fairchild	54LS168	
	Motorola	SN54LS168	
	TI	SN54LS168	
DM54LS169	AMD	SN54LS169A	
	Fairchild	54LS169	
	Motorola	SN54LS169	
	TI	SN54LS169	
DM54LS170	Fairchild	54LS170	
	Motorola	SN54LS170	
	Raytheon	54LS170	
	TI	**SN54LS170**	893
DM54LS173	Fairchild	54LS173	
	Motorola	SN54LS173A	
	Signetics	54LS173	
	TI	**SN54LS173A**	894
DM54LS174	AMD	SN54LS174	
	Fairchild	54LS174	
	Motorola	SN54LS174	
	Raytheon	54LS174	
	Signetics	54LS174	
	TI	**SN54LS174**	895
DM54LS175	AMD	SN54LS175	
	Fairchild	54LS175	
	Motorola	SN54LS175	
	Raytheon	54LS175	
	Signetics	54LS175	
	TI	**SN54LS175**	895
DM54LS189	Fairchild	54LS189	
	Motorola	SN54LS189	
	TI	SN54LS189	
		SN54LS189A	440,900
DM54LS190	AMD	SN54LS190	
	Motorola	SN54LS190	
	Raytheon	54LS190	
	Signetics	54LS190	
	TI	**SN54LS190**	901
DM54LS191	AMD	SN54LS191	
	Motorola	SN54LS191	
	Raytheon	54LS191	
	Signetics	54LS191	
	TI	**SN54LS191**	901
DM54LS192	AMD	SN54LS192	
	Fairchild	54LS192	
	Motorola	SN54LS192	
	Raytheon	54LS192	
	Signetics	54LS192	
	TI	**SN54LS192**	902
DM54LS193	AMD	SN54LS193	
	Fairchild	54LS193	
	Motorola	SN54LS193	
	Raytheon	54LS193	
	Signetics	54LS193	
	TI	**SN54LS193**	902
DM54LS196	Motorola	SN54LS196	
	Raytheon	54LS196	
	TI	**SN54LS196**	903
DM54LS197	Motorola	SN54LS197	
	Raytheon	54LS197	
	Signetics	54LS197	
	TI	**SN54LS197**	904
DM54LS20	Fairchild	54LS20	
	Motorola	SN54LS20	
	Raytheon	54LS20	
	Signetics	54LS20	
	TI	**SN54LS20**	839
DM54LS21	Fairchild	54LS21	
	Motorola	SN54LS21	
	Raytheon	54LS21	
	TI	**SN54LS21**	840
DM54LS22	Fairchild	54LS22	
	Motorola	SN54LS22	
	Raytheon	54LS22	
	TI	**SN54LS22**	840
DM54LS221	Motorola	SN54LS221	
	Raytheon	54LS221	
	Signetics	54LS221	
	TI	**SN54LS221**	906
DM54LS247	Fairchild	54LS247	
	Motorola	SN54LS247	
	TI	**SN54LS247**	913
DM54LS248	Fairchild	54LS248	
	Motorola	SN54LS248	
	Signetics	54LS248	
	TI	**SN54LS248**	914
DM54LS249	Fairchild	54LS249	
	Motorola	SN54LS249	
	TI	**SN54LS249**	914
DM54LS253	AMD	SN54LS253	
	Fairchild	54LS253	
	Motorola	SN54LS253	
	National	DM7214	
	Raytheon	54LS253	
	Signetics	54LS253	
	TI	SN54LS253	
DM54LS257	AMD	SN54LS257	
	Motorola	SN54LS257A	
	Raytheon	54LS257	
	Signetics	54LS257	
	TI	SN54LS257	
		SN54LS257A	916
DM54LS258	AMD	SN54LS258	
	Fairchild	54LS258A	
	Motorola	SN54LS258A	
	Raytheon	54LS258	
	Signetics	54LS258	
	TI	SN54LS258	
		SN54LS258A	917
DM54LS26	Fairchild	54LS26	
	Motorola	SN54LS26	
	Raytheon	54LS26	
	TI	**SN54LS26**	841
DM54LS266	Fairchild	54LS266	
		9386	
	Motorola	SN54LS266	
	Raytheon	54LS266	
	Signetics	54LS266	
	TI	**SN54LS266**	918
DM54LS27	Fairchild	54LS27	
	Motorola	SN54LS27	
	Raytheon	54LS27	
	TI	**SN54LS27**	842
DM54LS279	Fairchild	54LS279	
	Motorola	SN54LS279	
	Raytheon	54LS279	
	Signetics	54LS279	
	TI	**SN54LS279**	921
DM54LS283	Fairchild	54LS283	
	Motorola	SN54LS283	
	Raytheon	54LS283	
	Signetics	54LS283	
	TI	**SN54LS283**	922
DM54LS289	Fairchild	54LS289	
	TI	SN54LS289	
		SN54LS289A	440,924
DM54LS290	Motorola	SN54LS290	
	Raytheon	54LS290	
	Signetics	54LS290	
	TI	**SN54LS290**	924
DM54LS293	Fairchild	54LS293	
	Motorola	SN54LS293	
	Raytheon	54LS293	
	Signetics	54LS293	
	TI	**SN54LS293**	925
DM54LS30	Fairchild	54LS30	
	Motorola	SN54LS30	
	Raytheon	54LS30	
	Signetics	54LS30	
	TI	**SN54LS30**	842

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DM54LS32	Fairchild	54LS32	
		74LS32	
	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	**732**
		SN54LS32	
		SN74LS32	
	National	DM54ALS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN54LS32**	**843**
		SN74LS32	**843**
DM54LS352	Fairchild	54LS352	
	Motorola	SN54LS352	
	TI	**SN54LS352**	**932**
DM54LS353	Fairchild	54LS353	
	Motorola	SN54LS353	
	TI	**SN54LS353**	**933**
DM54LS366	Fairchild	54LS366A	
	Motorola	SN54LS366A	
	Raytheon	54LS366	
	Signetics	54LS366A	
	TI	**SN54LS366A**	**935**
DM54LS367	Fairchild	54LS367A	
	Motorola	SN54LS367A	
	Raytheon	54LS367	
	Signetics	54LS367	
		54LS367A	
	TI	**SN54LS367A**	**936**
DM54LS368	Fairchild	54LS368A	
	Motorola	SN54LS368A	
	Raytheon	54LS368	
	Signetics	54LS368	
		54LS368A	
	TI	SN54L368A	
		SN54LS368A	**936**
DM54LS37	Fairchild	54LS37	
	Motorola	SN54LS37	
	Raytheon	54LS37	
	Signetics	54LS37	
	TI	**SN54LS37**	**844**
DM54LS374	AMD	**SN54LS374**	**1227**
	MMI	54LS374	
	Motorola	SN54LS374	
	Raytheon	54LS374	
	TI	**SN54LS374**	**938**
DM54LS38	Fairchild	54LS38	
	Motorola	SN54LS38	
	Raytheon	54LS38	
	TI	**SN54LS38**	**844**
DM54LS386	Motorola	SN54LS386	
	Raytheon	54LS386	
		RM8241	
	Signetics	S82S41	
	TI	54LS386	
		SN54LS386	**942**
DM54LS395	Motorola	SN54LS395A	
	Raytheon	54LS395A	
	Signetics	54LS395	
	TI	SN54LS395	
		SN54LS395A	**943**
DM54LS40	Fairchild	54LS40	
	Motorola	SN54LS40	
	Raytheon	54LS40	
	TI	**SN54LS40**	**845**
DM54LS42	Fairchild	54LS42	
	Motorola	SN54LS42	
	Raytheon	54LS42	
	Signetics	54LS42	
	TI	**SN54LS42**	**845**
DM54LS47	Fairchild	54LS47	
		74LS47	
	Hitachi	HD74LS47	
	Motorola	SN54LS47	
		SN74LS47	
	National	DM74LS47	
	SGS	T74LS47	
	TI	**SN54LS47**	**847**
		SN74LS47	**847**
DM54LS48	Fairchild	54LS48	
	Motorola	SN54LS48	
	TI	**SN54LS48**	**847**
DM54LS49	Fairchild	54LS49	
	Motorola	SN54LS49	
	TI	**SN54LS49**	**847**
DM54LS51	Fairchild	54LS51	
	Motorola	SN54LS51	
	Raytheon	54LS51	
	Signetics	54LS51	
	TI	**SN54LS51**	**848**
DM54LS54	Fairchild	54LS54	
	Motorola	SN54LS54	
	Raytheon	54LS54	
	TI	**SN54LS54**	**850**
DM54LS55	Fairchild	54LS55	
	Motorola	SN54LS55	
	Raytheon	54LS55	
	TI	54LS55	
		SN54LS55	**851**
DM54LS670	Fairchild	54LS670	
	Motorola	54LS670	
		SN54LS670	
	Raytheon	54LS670	
	Signetics	54LS670	
	TI	**SN54LS670**	**990**
DM54LS73	Motorola	SN54LS73A	
	Raytheon	54LS73	
	Signetics	54LS73	
	TI	SN54LS73	
		SN54LS73A	**856**
DM54LS73A	TI	SN54LS73	
DM54LS74	Fairchild	54LS74	
	Motorola	SN54LS74A	
	National	DM54LS74A	
	Raytheon	54LS74	
	Signetics	54LS74	
	TI	SN54LS74	
		SN54LS74A	**857**
DM54LS74A	Fairchild	54LS74	
	Motorola	SN54LS74A	
	National	DM54LS74	
	Raytheon	54LS74	
	Signetics	54LS74	
	TI	SN54LS74	
		SN54LS74A	**857**
DM54LS75	Motorola	SN54LS75	
	Raytheon	54LS75	
	Signetics	54LS75	
	TI	**SN54LS75**	**858**
DM54LS76	Motorola	SN54LS76A	
	Raytheon	54LS76	
	Signetics	54LS76	
	TI	SN54LS76	
		SN54LS76A	**858**
DM54LS77	Motorola	SN74LS77	
	Raytheon	54LS77	
DM54LS78	Motorola	SN54LS78A	
	Raytheon	54LS78	
	TI	SN54LS78	
		SN54LS78A	**859**
DM54LS83A	Fairchild	54LS83A	
	Motorola	SN542S83A	
		SN54LS83A	
	Raytheon	54LS83A	
	Signetics	54LS83	
		54LS83A	
	TI	**SN54LS83A**	**861**
DM54LS85	Fairchild	54LS85	
	Motorola	SN54LS85	
	Raytheon	54LS85	
	Signetics	54LS85	
	TI	SN54LS85	
DM54LS86	Motorola	SN54LS86	
	Raytheon	54LS86	
	Signetics	54LS86	
	TI	**SN54LS86**	**862**
DM54LS90	Motorola	SN54LS90	
	Raytheon	54LS90	
	Signetics	54LS90	
	TI	**SN54LS90**	**864**
DM54LS92	Motorola	SN54LS92	
	Raytheon	54LS92	
	Signetics	54LS92	
	TI	**SN54LS92**	**864**
DM54LS93	Fairchild	54LS93	
	Motorola	SN54LS93	
	Raytheon	54LS93	
	Signetics	54LS93	
	TI	**SN54LS93**	**865**
DM54LS95B	Fairchild	54LS95B	
	Motorola	SN54LS95B	
	Raytheon	54LS95B	
	Signetics	54LS95B	
	TI	**SN54LS95B**	**866**
DM54S140	Fairchild	54S140	
	Signetics	54S140	
DM54S140	TI	**SN54S140**	**881**
DM54S188	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		6330-1	**3826**
		63LS080	
	National	DM59S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
DM54S189	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
DM54S200	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
DM54S22	Fairchild	54S22	
	TI	**SN54S22**	**840**
DM54S287	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
		HM7611-2	**3696**
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	**3826**
	National	DM74S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
	TI	**TBP24S10**	
			440,3967
DM54S288	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	**3826**
		63LS081	
	National	DM74S288	
		DM7578	
		DM8578	
DM54S288	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	**TBP18S030**	
			440,3965
		TBP18S030M	
			440,3965
DM54S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
DM54S387	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	**3696**
	Intel	M3601	
	MMI	5300-1	
		6300-1	**3826**
	National	DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
	TI	**TBP24SA10**	
			440,3967
		TBP24SA10M	
			440,3967
DM54S472	AMD	AM27S29	
	Fujitsu	MB7124	
		MBM7124	
	Harris	HM7649	
	MMI	5349-1	
		6349-1	**3826**
	Motorola	MCM7649	
	National	DM74S472	
	Raytheon	29621	
	Signetics	N82S147	
		S82S147	
	TI	DM54S472	
		TBP28S42	
			440,3975
		TBP28S42M	
			440,3975

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DM54S473	AMD	AM27S28	
	Fujitsu	MB7123	
		MB7124	
		MC7124	
	Harris	HM7648	
	MMI	5348	
		6348	
	National	DM74S473	
	Raytheon	29620	
	Signetics	N82S146	
		S82S146	
	TI	**TBP28SA42**	**440,3976**
DM54S474	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	**3826**
	Motorola	MCM7641	
	National	DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	**TBP28S46**	**440,3976**
		TBP28S46M	**440,3976**
DM54S475	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**
	National	DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	**TBP28SA46**	**440**
DM54S570	AMD	AM27S12	
	Fairchild	93436	
	Harris	HM7620	
	Intel	M3602	
	MMI	5305	
		6305	
	National	DM74S570	
	Raytheon	29610	
	Signetics	N82S130	
		S82S130	
DM54S571	AMD	AM27S13	
	Fairchild	93446	
	Harris	HM7621	
	Intel	M3622	
	MMI	5306	
		6306	
	National	DM74S571	
	Raytheon	29611	
	Signetics	N82S131	
		S82S131	
DM54S572	AMD	AM27S32	
	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642	
		HM7642-2	**3705**
	Intel	M3605	
	MMI	5352-1	
		6352	
	National	DM74S572	
	Raytheon	29640	
	Signetics	N82S136	
		S82S136	
	TI	**TBP24SA41**	**440,3968**
		TBP24SA41M	**440,3968**
DM54S573	AMD	AM27S33	
		AM27S33M	
		AM27S41	
DM54S573	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
DM54S573A	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
DM59S188	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		6330-1	**3826**
		63LS080	
	National	DM54S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
DM7093	Fairchild	54125	
	National	DM54125	
DM7093	TI	**SN54125**	**875**
		SN54425	**946**
DM7094	Fairchild	54126	
	National	DM54126	
	Signetics	54126	
	TI	**SN54126**	**875**
		SN54426	**946**
DM7095	Signetics	S8T95	
	TI	SN54365	
DM7096	TI	SN54366	
DM7097	Signetics	S8T97	
	TI	SN54367	
DM7098	Motorola	MC6888	
		MC8T98	
	National	DM8098	
		DS8674	
	Signetics	N8T98	
		S8T98	
	TI	SN54368	
		SN74368	
DM7121	National	SM54251	
	TI	**SN54251**	**915**
DM7123	AMD	SN54S257	
		SN74S257	
	Fairchild	74S257	
	Hitachi	HD74S257	
	National	DM74S257	
		DM8123	
	Signetics	54S257	
		74S257	
	TI	**SN54S257**	**916**
		SN74S257	**916**
DM7160	Fairchild	93S46	
		93S47	
	National	DM8160	
DM71L22	TI	SN54L157	
DM71LS95	AMD	DM71LS95	
DM71LS96	AMD	DM71LS96	
DM71LS97	AMD	DM71LS97	
DM71LS98	AMD	DM71LS98	
DM7213	Fairchild	9311	
	Hitachi	HD74154	
	National	DM54154	
		DM74154	
		DM8311	
		DM9311	
	Raytheon	RC9311	
		RM9311	
	Signetics	54154	
		74154	
	TI	SN29311	
		SN39311	
		SN54154	**885**
		SN74154	**885**
DM7214	AMD	SN54LS253	
	Fairchild	54LS253	
	Motorola	SN54LS253	
	National	DM54LS253	
	Raytheon	54LS253	
	Signetics	54LS253	
	TI	SN54LS253	
DM7281	Fairchild	54177	
	National	DM54177	
	Raytheon	RM8281	
	Signetics	54177	
		S7281	
		S8281	
	TI	**SN54177**	**896**
DM7283	TI	SN54836	
DM7400	Fairchild	7400	
	Hitachi	HD7400	
	Signetics	7400	
	TI	**SN7400**	**833**
	Toshiba	TC7400	
DM7401	Fairchild	7401	
	Hitachi	HD7401	
	TI	**SN7401**	**833**
DM7402	Fairchild	7402	
	Hitachi	HD7402	
	Signetics	7402	
	TI	**SN7402**	**833**
DM7403	Fairchild	7403	
	Hitachi	HD7403	
	Signetics	7403	
	TI	**SN7403**	**834**
DM7404	Fairchild	7404	
	Hitachi	HD7404	
	Signetics	7404	
	TI	**SN7404**	**834**
	Toshiba	TC7404	
DM7405	Fairchild	7405	
DM7405	Hitachi	HD7405	
	Signetics	7405	
	TI	**SN7405**	**834**
DM7406	Fairchild	7406	
	Hitachi	HD7406	
	Signetics	7406	
	TI	**SN7406**	**835**
DM7407	Fairchild	7407	
	Hitachi	HD7407	
	Signetics	7407	
	TI	**SN7407**	**835**
DM7408	Fairchild	7408	
	Hitachi	HD7408	
	Signetics	7408	
	TI	**SN7408**	**835**
DM7409	Fairchild	7409	
	Hitachi	HD7409	
	TI	**SN7409**	**836**
DM7410	Fairchild	7410	
	Hitachi	HD7410	
	Signetics	7410	
	TI	**SN7410**	**836**
	Toshiba	TC7410	
DM74107	Fairchild	74107	
	Hitachi	HD74107	
	Signetics	74107	
	TI	**SN74107**	**869**
DM74109	Signetics	74109	
	TI	**SN74109**	**870**
DM7411	Fairchild	7411	
	Hitachi	HD7411	
	Signetics	7411	
DM74121	Fairchild	74121	
	Hitachi	HD74121	
	Signetics	74121	
	TI	**SN74121**	**873**
DM74123	Fairchild	74123	
	Signetics	74123	
	TI	**SN74123**	**874**
DM74125	Fairchild	74125	
	Hitachi	HD74125	
	National	DM8093	
	Signetics	74125	
	TI	**SN74125**	**875**
		SN74425	**946**
DM74126	Fairchild	74126	
	Hitachi	HD74126	
	National	DM8094	
	Signetics	74126	
	TI	**SN74126**	**875**
		SN74426	**946**
DM7413	Fairchild	7413	
	Hitachi	HD7413	
	Signetics	7413	
	TI	**SN7413**	**837**
DM74132	Fairchild	74132	
	Hitachi	HD74132	
	Signetics	74132	
	TI	**SN74132**	**877**
DM7414	Fairchild	7414	
	Hitachi	HD7414	
	Signetics	7414	
	TI	**SN7414**	**837**
DM74141	Fairchild	74141	
		93141	
	Hitachi	HD74141	
		HD7441	
	National	DM7441	
	Signetics	74141	
		7441	
	TI	**SN74141**	**881**
DM74145	Fairchild	74145	
	Hitachi	HD74145	
	Signetics	74145	
	TI	**SN74145**	**882**
DM74147	Hitachi	HD14508	
		HD74147	
	Motorola	MC14508	
	RCA	CD4508	
	SGS	HCF4508	
	Signetics	74147	
		HEF4508	
		N82147	
	SSS	SCL4508	
	Solitron	CM4508	
	TI	**SN74147**	**882**
	Toshiba	TC4508	
DM74148	Fairchild	9318	
	Hitachi	HD74148	
	National	DM54148	
		DM8318	
		DM9318	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DM74148	Signetics	54148	
		74148	
		N82148	
	TI	**SN54148**	**883**
		SN74148	**883**
DM74150	Fairchild	74150	
	Hitachi	HD74150	
	Signetics	74150	
	TI	**SN74150**	**883**
DM74151	Fairchild	74151	
	Hitachi	HD74151	
	Signetics	74151	
	TI	SN74151	
		SN74151A	**884**
DM74153	Fairchild	74153	
	Hitachi	HD74153	
	Signetics	74153	
	TI	**SN74153**	**884**
DM74154	Fairchild	9311	
	Hitachi	HD74154	
	National	DM54154	
		DM7213	
		DM8311	
		DM9311	
	Raytheon	RC9311	
		RM9311	
	Signetics	54154	
		74154	
	TI	SN29311	
		SN39311	
		SN54154	**885**
		SN74154	**885**
DM74155	Fairchild	74155	
	Signetics	74155	
	TI	**SN74155**	**886**
DM74156	Fairchild	74156	
	Hitachi	HD74156	
	Signetics	74156	
	TI	**SN74156**	**886**
DM74157	Fairchild	74157	
		9322	
	Hitachi	HD74157	
	National	DM8322	
		DM9322	
	Raytheon	RC9322	
		RM9322	
	Signetics	74157	
	TI	SN29322	
		SN29602	
		SN39322	
		SN74157	**887**
DM7416	Fairchild	7416	
	Hitachi	HD7416	
	Signetics	7416	
	TI	**SN7416**	**838**
DM74160	Fairchild	74160	
	Hitachi	HD74160	
	Signetics	74160	
	TI	**SN74160**	**889**
DM74161	Fairchild	74161	
	Hitachi	HD74161	
	Signetics	74161	
	TI	**SN74161**	**889**
DM74162	Fairchild	74162	
	Hitachi	HD74162	
	TI	**SN74162**	**890**
DM74163	Fairchild	74163	
	Hitachi	HD74163	
	Signetics	74163	
	TI	**SN74163**	**890**
DM74164	AMD	74164	
	Fairchild	74164	
	Hitachi	HD74164	
	National	DM8570	
		DM8579	
	Signetics	74164	
	TI	**SN74164**	**891**
DM74165	Fairchild	74165	
	National	DM8590	
	Signetics	74165	
	TI	**SN74165**	**891**
DM74166	Fairchild	74166	
	Hitachi	HD74166	
	Signetics	74166	
	TI	**SN74166**	**891**
DM7417	Fairchild	7417	
	Hitachi	HD7417	
	Signetics	7417	
	TI	**SN7417**	**838**
DM74170	Fairchild	74170	
	Hitachi	HD74170	
	Signetics	74170	
	TI	**SN74170**	**893**
DM74173	Fairchild	74173	
	National	DM8551	
	Raytheon	RC8T10	
	Signetics	8T10	
		N8T10	
	TI	**SN74173**	**894**
DM74174	Fairchild	74174	
	Hitachi	HD74174	
	Signetics	74174	
	TI	**SN74174**	**895**
DM74175	Fairchild	74175	
	Hitachi	HD74175	
	Signetics	74175	
	TI	**SN74175**	**895**
DM74176	Fairchild	74176	
		96176	
	National	DM8280	
	Raytheon	RC8280	
	Signetics	74176	
		N8280	
	TI	**SN74176**	**896**
DM74177	Fairchild	74177	
	National	DM8281	
	Raytheon	RC8281	
	Signetics	74177	
		N8281	
	TI	**SN74177**	**896**
DM74180	Fairchild	74180	
	Hitachi	HD74180	
	Signetics	74180	
	TI	**SN74180**	**897**
DM74181	Fairchild	54181	
		9341	
	Hitachi	HD74181	
	National	DM54181	
	Raytheon	RC9341	
		RM9341	
	Signetics	54181	
		74181	
	TI	**SN54181**	**897**
		SN74181	**897**
DM74182	Fairchild	54182	
		9342	
	Hitachi	HD74182	
	National	DM54182	
	Raytheon	RM9342	
	TI	**SN54182**	**898**
		SN74182	**898**
DM74184	TI	**SN74184**	**899**
DM74185	TI	SN74185	
DM74185A	TI	**SN74185A**	**900**
DM74187	TI	**SN74187**	**900**
DM74190	Fairchild	74190	
	Hitachi	HD74190	
	Signetics	74190	
	TI	**SN74190**	**901**
DM74191	Fairchild	74191	
	Hitachi	HD74191	
	Signetics	74191	
	TI	**SN74191**	**901**
DM74192	Fairchild	74192	
		9360	
	National	DM8560	
	Raytheon	RC9360	
		RM9360	
	Signetics	74192	
	TI	**SN54192**	**902**
		SN74192	**902**
DM74193	Fairchild	74193	
	National	DM8563	
	Signetics	74193	
	TI	SN74129	
		SN74193	**902**
DM74194	Fairchild	74194	
	Hitachi	HD74194	
	Signetics	74194	
	TI	**SN74194**	**902**
DM74195	Fairchild	74195	
	Signetics	74195	
	TI	**SN74195**	**903**
DM74196	Fairchild	74196	
	National	DM8290	
	Raytheon	RC8290	
	Signetics	74196	
	TI	**SN74196**	**903**
DM74197	Fairchild	74197	
	National	DM8291	
DM74197	Raytheon	RC8291	
	Signetics	74197	
	TI	**SN74197**	**904**
DM74198	Fairchild	74198	
	Hitachi	HD74198	
	Signetics	74198	
	TI	**SN74198**	**904**
DM74199	Fairchild	74199	
	Signetics	74199	
	TI	**SN74199**	**905**
DM7420	Fairchild	7420	
		9004	
	Hitachi	HD7420	
	National	DM9004C	
	Signetics	7420	
	TI	**SN7420**	**839**
	Toshiba	TC7420	
DM7423	Fairchild	7423	
	TI	**SN7423**	**840**
DM7425	Fairchild	7425	
	TI	**SN7425**	**841**
DM74251	National	DM8121	
	TI	**SN74251**	**915**
DM7426	Fairchild	7426	
	Hitachi	HD7426	
	National	DM8810	
	Signetics	7426	
	TI	**SN7426**	**841**
DM7427	Fairchild	7427	
	Hitachi	HD7427	
	Signetics	7427	
	TI	**SN7427**	**842**
DM7430	Fairchild	7430	
	Hitachi	HD7430	
	Signetics	7430	
	TI	**SN7430**	**842**
DM7432	Fairchild	7432	
	Hitachi	HD7432	
	Signetics	7432	
	TI	**SN7432**	**843**
DM7437	Fairchild	7437	
	Hitachi	HD7437	
	Signetics	7437	
	TI	**SN7437**	**844**
DM7438	Fairchild	7438	
	Hitachi	HD7438	
	Signetics	7438	
	TI	**SN7438**	**844**
DM7440	Fairchild	7440	
	Hitachi	HD7440	
	Signetics	7440	
	TI	**SN7440**	**845**
DM7441	Fairchild	74141	
		93141	
	Hitachi	HD74141	
		HD7441	
	National	DM74141	
	Signetics	74141	
		7441	
	TI	**SN74141**	**881**
DM7442	Fairchild	7442	
	Hitachi	HD7442	
	National	DM8842	
	Signetics	7442	
	TI	SN7442	
		SN7442A	**845**
DM7445	Fairchild	7445	
	Hitachi	HD7445	
	Signetics	7445	
	TI	**SN7445**	**846**
DM7446	Fairchild	7446	
	Hitachi	HD7446	
	TI	SN7446	
		SN7446A	**847**
DM7447	Fairchild	7447	
	Hitachi	HD7447	
	TI	SN7447	
		SN7447A	**847**
DM7448	Fairchild	5448	
		7448	
	National	DM5448	
		DM8848	
	Signetics	N8T54	
	TI	**SN5448**	**847**
		SN5448A	
		SN7448	**847**
		SN7448A	
DM7450	Fairchild	7450	
	Hitachi	HD7450	
	Signetics	7450	
	TI	**SN7450**	**848**
DM7451	Fairchild	7451	
	Hitachi	HD7451	
	Signetics	7451	
	TI	**SN7451**	**848**
DM7453	Fairchild	7453	
	Hitachi	HD7453	
	TI	**SN7453**	**849**
DM7454	Fairchild	7454	
	Hitachi	HD7454	
	TI	**SN7454**	**850**
DM7460	Fairchild	7460	
	Hitachi	HD7460	
	TI	**SN7460**	**852**
DM7470	Fairchild	7470	
	Hitachi	HD7470	
	TI	**SN7470**	**855**
DM7472	Fairchild	7472	
	Hitachi	HD7472	
	TI	**SN7472**	**856**
DM7473	Fairchild	7473	
	Hitachi	HD7473	
	Signetics	7473	
	TI	**SN7473**	**856**
DM7474	Fairchild	7474	
	Hitachi	HD7474	
	Signetics	7474	
	TI	**SN7474**	**857**
DM7475	Fairchild	7475	
	Hitachi	HD7475	
	Signetics	7475	
	TI	**SN7475**	**858**
DM7476	Fairchild	7476	
	Hitachi	HD7476	
	Signetics	7476	
	TI	**SN7476**	**858**
DM7482	Hitachi	HD7482	
	TI	**SN7482**	**860**
DM7483	Fairchild	7483	
	Hitachi	HD7483	
	Signetics	7483	
	TI	SN7483	
		SN7483A	**861**
DM7485	Fairchild	7485	
	Hitachi	HD7485	
	Signetics	7485	
	TI	**SN7485**	**862**
DM7486	Fairchild	7486	
	Hitachi	HD7486	
	Signetics	7486	
	TI	**SN7486**	**862**
DM7488	Fairchild	7488	
	Motorola	MC4002	
	Signetics	7488	
		N8224	
	TI	SN7488	
		SN7488A	**863**
DM7489	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DM7489	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
DM7490	Fairchild	7490	
	Hitachi	HD7490	
	Signetics	7490	
	TI	SN7490	
		SN7490A	**864**
DM7491	Fairchild	7491	
	Hitachi	HD7491	
	Signetics	7491	
	TI	SN7491	
		SN7491A	**864**
DM7492	Fairchild	7492	
	Hitachi	HD7492	
	Signetics	7492	
	TI	SN7492	
		SN7492A	**864**
DM7493	Fairchild	7493	
	Hitachi	HD7493	
	Signetics	7493	
	TI	SN7493	
		SN7493A	**865**
DM7495	Fairchild	7495	
	Hitachi	HD7495	
	Signetics	7495	
	TI	SN7495	
		SN7495A	**866**
DM7496	Fairchild	7496	
	Hitachi	HD7496	
	Signetics	7496	
	TI	**SN7496**	**866**
DM74ALS00	Motorola	**SN74ALS00**	**732**
	TI	**SN74ALS00**	**833**
DM74ALS02	Motorola	**SN74ALS02**	**732**
	TI	**SN74ALS02**	**833**
DM74ALS04	Motorola	**SN74ALS04**	**732**
	TI	**SN74ALS04**	**834**
DM74ALS08	Motorola	**SN74ALS08**	**732**
	TI	**SN74ALS08**	**835**
DM74ALS09	Motorola	**SN74ALS09**	**732**
	TI	**SN74ALS09**	**836**
DM74ALS160	Motorola	**SN74ALS160**	**732**
	TI	**SN74ALS880**	**1011**
DM74ALS161	Motorola	**SN74ALS161**	**732**
	TI	**SN74ALS160**	**889**
DM74ALS162	Motorola	**SN74ALS162**	**732**
	TI	**SN74ALS161**	**889**
DM74ALS163	Motorola	**SN74ALS163**	**732**
	TI	**SN74ALS162**	**890**
		SN74ALS163	**890**
DM74ALS22	Motorola	**SN74ALS622**	**732**
DM74ALS240	Motorola	**SN74ALS240**	**732**
DM74ALS241	Motorola	**SN74ALS241**	**732**
	TI	**SN74ALS241**	**911**
DM74ALS242	Motorola	**SN74ALS242**	**732**
	TI	**SN74ALS242**	**911**
DM74ALS243	Motorola	**SN74ALS243**	**732**
	TI	**SN74ALS243**	**912**
DM74ALS244	Motorola	**SN74ALS244**	**732**
	TI	**SN74ALS244**	**912**
DM74ALS245	Motorola	SN74ALS245	
	TI	**SN74ALS245**	**913**
DM74ALS273	Motorola	**SN74ALS273**	**732**
	TI	**SN74ALS273**	**919**
DM74ALS32	Motorola	**SN74ALS32**	**732**
	TI	**SN74ALS32**	**843**
DM74ALS373	Motorola	**SN74ALS373**	**732**
	TI	SN74ALS373	
DM74ALS374	Motorola	**SN74ALS374**	**732**
	TI	SN74ALS374	
DM74ALS377	Motorola	**SN74ALS377**	**732**
DM74ALS573	Motorola	**SN74ALS573**	**732**
DM74ALS573	TI	**SN74ALS573**	**964**
DM74ALS574	Motorola	SN74ALS574	
	TI	**SN74ALS574**	**964**
DM74ALS580	Motorola	**SN74ALS580**	**732**
	TI	**SN74ALS580**	**966**
DM74ALS620	Motorola	**SN74ALS620**	**732**
	TI	**SN74ALS620**	**976**
DM74ALS621	Motorola	**SN74ALS621**	**732**
	TI	**SN74ALS621**	**976**
DM74ALS623	Motorola	**SN74ALS623**	**732**
	TI	SN74ALS623	
DM74ALS640	Motorola	**SN74ALS640**	**732**
DM74ALS641	Motorola	**SN74ALS641**	**732**
DM74ALS642	Motorola	**SN74ALS642**	**732**
DM74ALS643	Motorola	**SN74ALS643**	**732**
	TI	**SN74ALS640**	**984**
DM74ALS644	Motorola	**SN74ALS644**	**732**
	TI	**SN74ALS644**	**984**
DM74ALS646	Motorola	**SN74ALS646**	**732**
DM74ALS647	Motorola	**SN74ALS647**	**732**
DM74ALS648	Motorola	**SN74ALS648**	**732**
DM74ALS649	Motorola	**SN74ALS649**	**732**
DM74ALS690	Motorola	**SN74ALS690**	**732**
DM74ALS691	Motorola	**SN74ALS691**	**732**
	TI	**SN54ALS242**	**911**
DM74ALS692	Motorola	**SN74ALS692**	**732**
DM74ALS693	Motorola	**SN74ALS693**	**732**
DM74ALS696	Motorola	SN74LS696	
DM74ALS697	Motorola	**SN74ALS697**	**732**
DM74ALS698	Motorola	**SN74ALS698**	**732**
DM74ALS699	Motorola	**SN74ALS699**	**732**
DM74ALS74	Motorola	**SN74ALS74**	**732**
	TI	**SN74ALS74**	**857**
DM74ALS873	Motorola	**SN74ALS873**	**732**
	TI	**SN74ALS873**	**1008**
DM74ALS874	Motorola	**SN74ALS874**	**732**
	TI	**SN74ALS874**	**1008**
DM74ALS876	Motorola	**SN74ALS876**	**732**
	TI	**SN74ALS876**	**1009**
DM74ALS880	Motorola	**SN74ALS880**	**732**
DM74H00	Fairchild	74H00	
	TI	**SN74H00**	**833**
DM74H01	Fairchild	74H01	
		74H08	
	National	DM74H08	
	TI	**SN74H01**	**833**
DM74H04	Fairchild	74H04	
	TI	**SN74H04**	**834**
DM74H05	Fairchild	74H05	
	TI	**SN74H05**	**834**
DM74H08	Fairchild	74H01	
		74H08	
	National	DM74H01	
	TI	**SN74H01**	**833**
DM74H10	Fairchild	74H10	
	TI	**SN74H10**	**836**
DM74H103	Fairchild	74H103	
	TI	**SN74H103**	**868**
DM74H106	Fairchild	74H106	
	TI	**SN74H106**	**869**
DM74H108	Fairchild	74H108	
	TI	**SN74H108**	**870**
DM74H11	Fairchild	74H11	
	TI	**SN74H11**	**836**
DM74H20	Fairchild	74H20	
	TI	**SN74H20**	**839**
DM74H21	Fairchild	74H21	
	TI	**SN74H21**	**840**
DM74H22	Fairchild	74H22	
	TI	**SN74H22**	**840**
DM74H30	Fairchild	74H30	
	TI	**SN74H30**	**842**
DM74H40	Fairchild	74H40	
	TI	**SN74H40**	**845**
DM74H50	Fairchild	74H50	
	TI	**SN74H50**	**848**
DM74H51	Fairchild	74H51	
	TI	**SN74H51**	**848,849**
DM74H52	Fairchild	74H52	
	TI	SN74H52	
DM74H53	Fairchild	74H53	
	TI	**SN74H53**	**849**
DM74H54	Fairchild	74H54	
	TI	**SN74H54**	**850**
DM74H55	Fairchild	74H55	
	TI	**SN74H55**	**851**
DM74H60	TI	**SN74H60**	**852**
DM74H61	Fairchild	74H61	
	TI	**SN74H61**	**852**
DM74H62	Fairchild	74H62	
	TI	**SN74H62**	**853**
DM74H71	TI	**SN74H71**	**855**
DM74H72	Fairchild	74H72	
	TI	**SN74H72**	**856**
DM74H73	Fairchild	74H73	
	TI	**SN74H73**	**856**
DM74H74	Fairchild	74H74	
	TI	**SN74H74**	**857**
DM74H76	TI	**SN74H76**	**858**
DM74H78	TI	**SN74H78**	**859**
DM74L164	National	DM86L70	
DM74L192	National	DM85L60	
DM74L193	National	DM85L63	
DM74L63	TI	**SN54L193**	**902**
DM74LS00	Fairchild	74LS00	
	Hitachi	HD74LS00	
	Motorola	SN74LS00	
	Raytheon	74LS00	
	SGS	T74LS00	
	Signetics	74LS00	
	TI	**SN74LS00**	**833**
DM74LS01	Fairchild	HD74LS01	
	Hitachi	HD74LS01	
	Motorola	SN74LS01	
	Raytheon	74LS01	
	Signetics	74LS01	
	TI	**SN74LS01**	**833**
DM74LS02	Fairchild	74LS02	
	Hitachi	HD74LS02	
	Motorola	SN74LS02	
	Raytheon	74LS02	
	SGS	T74LS02	
	Signetics	74LS02	
	TI	**SN74LS02**	**833**
DM74LS03	Fairchild	74LS03	
	Hitachi	HD74LS03	
	Motorola	SN74LS03	
	Raytheon	74LS03	
	SGS	T74LS03	
	TI	**SN74LS03**	**834**
DM74LS04	Fairchild	74LS04	
	Hitachi	HD74LS04	
	Motorola	SN74LS04	
	Raytheon	74LS04	
	SGS	T74LS04	
	Signetics	74LS04	
	TI	**SN74LS04**	**834**
DM74LS05	Fairchild	74LS05	
	Hitachi	HD74LS05	
	Motorola	SN74LS05	
	NEC-Electron	μPB74LS05	
	Raytheon	74LS05	
	SGS	T74LS05	
	Signetics	74LS05	
	TI	**SN74LS05**	**834**
DM74LS08	Fairchild	74LS08	
	Hitachi	HD74LS08	
	Motorola	SN74LS08	
	Raytheon	74LS08	
	SGS	T74LS08	
	Signetics	74LS08	
		SN74LS08	
	TI	**SN74LS08**	**835**
DM74LS09	Fairchild	74LS09	
	Hitachi	HD74LS09	
	Motorola	SN74LS09	
	Raytheon	74LS09	
	SGS	T74LS09	
	TI	**SN74LS09**	**836**
DM74LS10	Fairchild	74LS10	
	Hitachi	HD74LS10	
	Motorola	SN74LS10	
	Raytheon	74LS10	
	SGS	T74LS10	
	Signetics	74LS10	
	TI	**SN74LS10**	**836**
DM74LS107	Hitachi	HD74LS107	
	Motorola	SN74LS107A	
	Raytheon	74LS107	
	Signetics	74LS107	
	TI	**SN74LS107A**	**869**
DM74LS109	Fairchild	74LS109	
	Hitachi	HD74LS109	
	Motorola	SN74LS109	
		SN74LS109A	
	Raytheon	74LS109	
	Signetics	74LS109	
	TI	**SN74LS109A**	**870**
		SN74S109A	
DM74LS11	Fairchild	74LS11	
	Hitachi	HD74LS11	
	Motorola	SN74LS11	
	Raytheon	74LS11	
DM74LS11	SGS	T74LS11	
	Signetics	74LS11	
	TI	**SN74LS11**	**836**
DM74LS112	Fairchild	74LS112	
	Hitachi	HD74LS112	
	Motorola	SN74LS112A	
	Raytheon	74LS112	
	SGS	T74LS112	
	Signetics	74LS112	
	TI	**SN74LS112A**	**871**
DM74LS113	Fairchild	74LS113	
	Hitachi	HD74LS113	
	Motorola	SN74LS113A	
	Raytheon	74LS113	
	SGS	T74LS113	
	Signetics	74LS113	
	TI	**SN74LS113A**	**871**
DM74LS114	Fairchild	74LS114	
	Hitachi	HD74LS114	
	Motorola	74LS114A	
		SN74LS114A	
	Raytheon	74LS114	
	TI	SN74LS114A	
DM74LS12	Hitachi	HD74LS12	
	Motorola	SN74LS12	
	Raytheon	74LS12	
	Signetics	74LS12	
	TI	**SN74LS12**	**837**
DM74LS122	Hitachi	HD74LS122	
	Motorola	SN74LS122	
	Raytheon	74LS122	
	TI	**SN74LS122**	**873**
DM74LS123	Hitachi	HD74LS123	
	Motorola	SN74LS123	
	Raytheon	74LS123	
	TI	**SN74LS123**	**874**
DM74LS125	Fairchild	74LS125A	
	Motorola	SN74LS125A	
	Raytheon	74LS125	
	SGS	T74LS125	
	Signetics	74LS125A	
	TI	**SN74LS125A**	**875**
DM74LS126	Fairchild	74LS126	
	Motorola	SN74LS126A	
	Raytheon	74LS126	
	SGS	T74LS126	
	Signetics	74LS126A	
	TI	**SN74LS126A**	**875**
DM74LS13	Fairchild	74LS13	
	Hitachi	HD74LS13	
	Motorola	SN74LS13	
	Raytheon	74LS13	
	Signetics	74LS13	
	TI	**SN74LS13**	**837**
DM74LS132	Fairchild	74LS132	
	Hitachi	HD74LS132	
	Motorola	SN74LS132	
	Raytheon	74LS132	
	SGS	T74LS132	
	Signetics	74LS132	
	TI	SN74LS132	
DM74LS136	Fairchild	74LS136	
	Hitachi	HD74LS136	
	Motorola	SN74LS136	
	Raytheon	74LS136	
	SGS	T74LS136	
	Signetics	74LS136	
	TI	**SN74LS136**	**878**
DM74LS138	Fairchild	74LS138	
	Hitachi	HD74LS138	
	Motorola	SN74LS138	
	Raytheon	74LS138	
	SGS	T74LS138	
	Signetics	74LS138	
	TI	**SN74LS138**	**880**
DM74LS139	Fairchild	74LS139	
	Hitachi	HD74LS139	
	Motorola	SN74LS139	
	Raytheon	74LS139	
	SGS	T74LS139	
	Signetics	74LS139	
	TI	**SN74LS139**	**880**
DM74LS14	Fairchild	74LS14	
	Hitachi	HD74LS14	
	Motorola	SN74LS14	
	Raytheon	74LS14	
	Signetics	74LS14	
	TI	**SN74LS14**	**837**
DM74LS15	Fairchild	74LS15	
	Hitachi	HD74LS15	
	Motorola	SN74LS15	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

ALTERNATE SOURCE DIRECTORY

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DM74LS15	Raytheon	74LS15	
	SGS	T74LS15	
	TI	**SN74LS15**	**838**
DM74LS151	Fairchild	74LS151	
	Hitachi	HD74LS151	
		HD74LS151A	
	Motorola	SN74LS151	
	Raytheon	74LS151	
	SGS	T74LS151	
	Signetics	74LS151	
	TI	**SN74LS151**	**884**
DM74LS153	Fairchild	74LS153	
	Hitachi	HD74LS153	
	Motorola	SN74LS153	
	Raytheon	74LS153	
	SGS	T74LS153	
	Signetics	74LS153	
	TI	**SN74LS153**	**884**
DM74LS154	Signetics	74LS154	
DM74LS155	Fairchild	74LS155	
	Hitachi	HD74LS155	
	Motorola	SN74LS155	
	Raytheon	74LS155	
	Signetics	74LS155	
	TI	**SN74LS155**	**886**
DM74LS156	Fairchild	74LS156	
	Hitachi	HD74LS156	
	Motorola	SN74LS156	
	Raytheon	74LS156	
	SGS	T74LS156	
	Signetics	74LS156	
	TI	**SN74LS156**	**886**
DM74LS157	Fairchild	74LS157	
	Hitachi	HD74LS157	
	Motorola	SN74LS157	
	Raytheon	74LS157	
	SGS	T74LS157	
	Signetics	74LS157	
	TI	**SN74LS157**	**887**
DM74LS158	Fairchild	74LS158	
	Hitachi	HD74LS158	
	Motorola	SN74LS158	
	Raytheon	74LS158	
	SGS	T74LS158	
	Signetics	74LS158	
	TI	**SN74LS158**	**887**
DM74LS160	Fairchild	74LS160	
	Hitachi	HD74LS160A	
	Motorola	SN74LS160A	
	Raytheon	74LS160	
	Signetics	74LS160	
		74LS160A	
	TI	**SN74LS160A**	**889**
DM74LS161	AMD	SN74LS161	
	Fairchild	74LS161A	
	Hitachi	HD74LS161A	
	Motorola	SN74LS161A	
	NEC-Electron	μPB74LS161	
	Raytheon	74LS161	
	Signetics	74LS161A	
	TI	**SN74LS161A**	**889**
DM74LS162	Fairchild	74LS162	
	Hitachi	HD74LS162A	
	Motorola	SN74LS162A	
	Raytheon	74LS162	
	SGS	T74LS162	
	Signetics	74LS162A	
	TI	SN74LS162A	
DM74LS163	Fairchild	74LS163	
	Hitachi	HD74LS163	
		HD74LS163A	
	Motorola	SN74LS163A	
	Raytheon	74LS163	
	SGS	T74LS163	
	Signetics	74LS163A	
	TI	**SN74LS163A**	**890**
DM74LS164	Fairchild	74LS164	
	Hitachi	HD74LS164	
	Motorola	SN74LS164A	
	Raytheon	74LS164	
	SGS	T74LS164	
	Signetics	74LS164	
		74LS164A	
	TI	**SN74LS164**	**891**
DM74LS168	Fairchild	74LS168	
	Hitachi	HD74LS168	
	Motorola	SN74LS168	
	Signetics	74LS168A	
	TI	SN74LS168	
DM74LS169	Fairchild	74LS169	
	Hitachi	HD74LS169	
	Motorola	SN74LS169	
	Signetics	74LS169A	
DM74LS170	Fairchild	74LS170	
	Motorola	SN74LS170	
	Raytheon	74LS170	
	SGS	T74LS170	
	Signetics	74LS170	
	TI	**SN74LS170**	**893**
DM74LS173	Fairchild	74LS173	
	Motorola	SN74LS173A	
	Signetics	74LS173	
	TI	**SN74LS173A**	**894**
DM74LS174	Fairchild	74LS174	
	Hitachi	HD74LS174	
	Motorola	SN74LS174	
	Raytheon	74LS174	
	SGS	T74LS174	
	Signetics	74LS174	
	TI	**SN74LS174**	**895**
DM74LS189	Fairchild	74LS189	
	Motorola	SN74LS189	
DM74LS190	Fairchild	74LS190	
	Hitachi	HD74LS190	
	Motorola	SN74LS190	
	Raytheon	74LS190	
	SGS	T74LS190	
	TI	**SN74LS190**	**901**
DM74LS191	Fairchild	74LS191	
	Hitachi	HD74LS191	
	Motorola	SN74LS191	
	Raytheon	74LS191	
	SGS	T74LS191	
	Signetics	74LS191	
	TI	**SN74LS191**	**901**
DM74LS192	Fairchild	74LS192	
	Hitachi	HD74LS192	
	Motorola	SN74LS192	
	Raytheon	74LS192	
	SGS	T74LS192	
	Signetics	74LS192	
	TI	**SN74LS192**	**902**
DM74LS193	Fairchild	74LS193	
	Hitachi	HD74LS193	
	Motorola	SN74LS193	
	Raytheon	74LS193	
	SGS	T74LS193	
	Signetics	74LS193	
	TI	**SN74LS193**	**902**
DM74LS194	Fairchild	74LS194A	
	Hitachi	HD74LS194A	
	Motorola	SN74LS194A	
	SGS	T74LS194A	
	Signetics	74LS194A	
	TI	**SN74LS194A**	**902**
DM74LS195	Fairchild	74LS195A	
	Hitachi	HD74LS195A	
	Motorola	SN74LS195A	
	Raytheon	74LS195A	
	SGS	T74LS195A	
	Signetics	74LS195A	
	TI	**SN74LS195A**	**903**
DM74LS196	Fairchild	74LS196	
	Hitachi	HD74LS196	
	Motorola	SN74LS196	
	Raytheon	74LS196	
	Signetics	N82S80	
	TI	**SN74LS196**	**903**
DM74LS197	Fairchild	74LS197	
	Hitachi	HD74LS197	
	Motorola	SN74LS197	
	Raytheon	74LS197	
	Signetics	74LS197	
	TI	**SN74LS197**	**904**
DM74LS20	Fairchild	74LS20	
	Hitachi	HD74LS20	
	Motorola	SN74LS20	
	Raytheon	74LS20	
	SGS	T74LS20	
	Signetics	74LS20	
	TI	**SN74LS20**	**839**
DM74LS21	Fairchild	74LS21	
	Hitachi	HD74LS21	
	Motorola	SN74LS21	
	Raytheon	74LS21	
	SGS	T74LS21	
	Signetics	74LS21	
	TI	**SN74LS21**	**840**
DM74LS22	Fairchild	74LS22	
	Hitachi	HD74LS22	
	Motorola	SN74LS22	
DM74LS22	Raytheon	74LS22	
	SGS	T74LS22	
	TI	**SN74LS22**	**840**
DM74LS221	Fairchild	74LS221	
	Hitachi	HD74LS221	
	Motorola	SN74LS221	
	Raytheon	74LS221	
	TI	**SN74LS221**	**906**
DM74LS247	Fairchild	74LS247	
	Hitachi	HD74LS247	
	Motorola	SN74LS247	
	TI	**SN74LS247**	**913**
DM74LS248	Fairchild	74LS248	
	Hitachi	HD74LS248	
	Motorola	SN74LS248	
	SGS	T74LS248	
	TI	**SN74LS248**	**914**
DM74LS249	Fairchild	74LS249	
	Hitachi	HD74LS249	
	Motorola	SN74LS249	
	SGS	T74LS249	
	TI	**SN74LS249**	**914**
DM74LS251	Fairchild	74LS251	
	Hitachi	HD74LS251	
	Motorola	SN74LS251	
	Raytheon	74LS251	
	SGS	T74LS251	
	Signetics	74LS251	
	TI	**SN74LS251**	**915**
DM74LS253	Fairchild	74LS253	
	Hitachi	HD74LS253	
	Motorola	SN74LS253	
	National	DM8214	
	Raytheon	74LS253	
	SGS	T74LS253	
	Signetics	74LS253	
	TI	SN74LS253	
DM74LS257	Fairchild	74LS257A	
	Hitachi	HD74LS257	
	Motorola	SN74LS257A	
	Raytheon	74LS257	
	SGS	T74LS257	
	Signetics	74LS257	
		74LS257A	
	TI	SN74LS257	
DM74LS258	Fairchild	74LS258A	
	Hitachi	HD74LS258	
	Motorola	SN74LS258A	
	Raytheon	74LS258	
	SGS	T74LS258	
	Signetics	74LS258	
	TI	SN74LS258	
DM74LS26	Fairchild	74LS26	
	Hitachi	HD74LS26	
	Motorola	SN74LS26	
	Raytheon	74LS26	
	SGS	T74LS26	
	Signetics	74LS26	
	TI	**SN74LS26**	**841**
DM74LS266	Fairchild	74LS266	
	Motorola	SN74LS266	
	Raytheon	74LS266	
		RC8242	
	SGS	T74LS266	
	Signetics	74LS266	
		N8242	
	TI	**SN74LS266**	**918**
DM74LS27	Fairchild	74LS27	
	Hitachi	HD74LS27	
	Motorola	SN74LS27	
	Raytheon	74LS27	
	SGS	T74LS27	
	Signetics	74LS27	
	TI	**SN74LS27**	**842**
DM74LS279	Fairchild	74LS279	
	Hitachi	HD74LS279	
	Motorola	SN74LS279	
	Raytheon	74LS279	
	Signetics	74LS279	
	TI	**SN74LS279**	**921**
DM74LS283	Fairchild	74LS283	
	Hitachi	HD74LS283	
		HD74LS283A	
	Motorola	SN74LS283	
	Raytheon	74LS283	
	SGS	T74LS283	
	Signetics	74LS283	
	TI	**SN74LS283**	**922**
DM74LS289	Fairchild	74LS289	
	TI	SN74LS289	
DM74LS290	Fairchild	74LS290	
DM74LS290	Hitachi	HD74LS290	
	Motorola	SN74LS290	
	Raytheon	74LS290	
	SGS	T74LS290	
	Signetics	74LS290	
	TI	**SN74LS290**	**924**
DM74LS293	Fairchild	74LS293	
	Hitachi	HD74LS293	
	Motorola	SN74LS293	
	SGS	T74LS293	
	Signetics	74LS293	
	TI	**SN74LS293**	**925**
DM74LS30	Fairchild	74LS30	
	Hitachi	HD74LS30	
	Motorola	SN74LS30	
	Raytheon	74LS30	
	SGS	T74LS30	
	Signetics	74LS30	
	TI	**SN74LS30**	**842**
DM74LS32	Fairchild	54LS32	
		74LS32	
	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	**732**
		SN54LS32	
		SN74LS32	
	National	DM54ALS32	
		DM54LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN54LS32**	**843**
		SN74LS32	**843**
DM74LS352	Fairchild	74LS352	
	Motorola	SN74LS352	
	SGS	T74LS352	
	TI	**SN74LS352**	**932**
DM74LS353	Fairchild	74LS353	
	Motorola	DM74LS353	
		SN74LS353	
	SGS	T74LS353	
	TI	**SN74LS353**	**933**
DM74LS365	Fairchild	74LS365A	
	Motorola	SN74LS365A	
	Raytheon	74LS365	
	SGS	T74LS365A	
	Signetics	74LS365	
		74LS365A	
	TI	**SN74LS365A**	**935**
DM74LS366	Fairchild	74LS366A	
	Motorola	SN74LS366A	
	Raytheon	74LS366	
	SGS	T74LS366A	
	Signetics	74LS366A	
	TI	**SN74LS366A**	**935**
DM74LS367	Fairchild	74LS367A	
	Hitachi	HD74LS367	
		HD74LS367A	
	Motorola	SN74LS367A	
	Raytheon	74LS367	
	SGS	T74LS367A	
	Signetics	74LS367	
		74LS367A	
	TI	**SN74LS367A**	**936**
DM74LS368	Fairchild	74LS368A	
	Hitachi	HD74LS368	
	Motorola	SN73LS368A	
		SN74LS368A	
	Raytheon	74LS368	
	SGS	T74LS3	
	Signetics	74LS368	
		74LS368A	
	TI	**SN74LS368A**	**936**
DM74LS37	Fairchild	74LS37	
	Hitachi	HD74LS37	
	Motorola	SN74LS37	
	Raytheon	74LS37	
	SGS	T74LS37	
	Signetics	74LS37	
	TI	**SN74LS37**	**844**
DM74LS374	AMD	SN74LS374	
	Fairchild	74LS374	
	MMI	74LS374	
	Motorola	SN74LS374	
	Raytheon	74LS374	
	SGS	T74LS374	
	Signetics	74LS374	
	TI	**SN74LS374**	**938**
DM74LS38	Fairchild	74LS38	
	Hitachi	HD74LS38	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DM74LS38	Motorola	SN74LS38	
	Raytheon	74LS38	
	SGS	T74LS38	
	Signetics	74LS38	
	TI	**SN74LS38**	**844**
DM74LS386	Hitachi	HD74LS386	
	Motorola	SN74LS386	
	Raytheon	74LS386	
	TI	**SN74LS386**	**942**
DM74LS395	Fairchild	74LS395	
	Motorola	SN74LS395A	
	Raytheon	74LS395A	
	Signetics	74LS395	
	TI	**SN74LS395A**	**943**
DM74LS40	Fairchild	74LS40	
	Hitachi	HD74LS40	
	Motorola	SN74LS40	
	Raytheon	74LS40	
	SGS	T74LS40	
	Signetics	74LS40	
	TI	**SN74LS40**	**845**
DM74LS42	Fairchild	74LS42	
	Hitachi	HD74LS42	
	Motorola	SN74LS42	
	Raytheon	74LS42	
	SGS	T74LS42	
	Signetics	74LS42	
	TI	**SN74LS42**	**845**
DM74LS47	Fairchild	54LS47	
		74LS47	
	Hitachi	HD74LS47	
	Motorola	SN54LS47	
		SN74LS47	
	National	DM54LS47	
	SGS	T74LS47	
	TI	**SN54LS47**	**847**
		SN74LS47	**847**
DM74LS48	Fairchild	74LS48	
	Hitachi	HD74LS48	
	Motorola	SN74LS48	
	SGS	T74LS48	
	Signetics	74LS48	
	TI	**SN74LS48**	**847**
DM74LS49	Fairchild	74LS49	
	Hitachi	HD74LS49	
	Motorola	SN74LS49	
	SGS	T74LS49	
	TI	**SN74LS49**	**847**
DM74LS51	Fairchild	74LS51	
	Hitachi	HD74LS51	
	Motorola	SN74LS51	
	Raytheon	74LS51	
	SGS	T74LS51	
	Signetics	74LS51	
	TI	**SN74LS51**	**848**
DM74LS54	Fairchild	74LS54	
	Hitachi	HD74LS54	
	Motorola	SN74LS54	
	Raytheon	74LS54	
	SGS	T74LS54	
	Signetics	74LS54	
	TI	**SN74LS54**	**850**
DM74LS55	Fairchild	74LS55	
	Hitachi	HD74LS55	
	Motorola	SN74LS55	
	Raytheon	74LS55	
	SGS	T74LS55	
	TI	**SN74LS55**	**851**
DM74LS670	Fairchild	74LS670	
	Motorola	SN74LS670	
	Raytheon	74LS670	
	SGS	T74LS670	
	Signetics	74LS670	
	TI	**SN74LS670**	**990**
DM74LS73	Hitachi	HD74LS73	
	Motorola	SN74LS73A	
	Raytheon	74LS73	
	Signetics	74LS73	
	TI	**SN74LS73A**	**856**
DM74LS74	Fairchild	74LS74	
	Hitachi	HD74LS74	
		HD74LS74A	
	Motorola	SN74LS74A	
	Raytheon	74LS74	
	SGS	T74LS74	
	Signetics	74LS74	
	TI	**SN74LS74A**	**857**
DM74LS75	Hitachi	HD74LS75	
DM74LS75	Motorola	SN74LS75	
	Raytheon	74LS75	
	Signetics	74LS75	
	TI	**SN74LS75**	**858**
DM74LS76	Hitachi	HD74LS76	
	Motorola	SN74LS76A	
	Raytheon	74LS76	
	Signetics	74LS76	
	TI	**SN74LS76A**	**858**
DM74LS77	Raytheon	54LS77	
		74LS77	
DM74LS78	Hitachi	HD74LS78	
	Motorola	SN74LS78A	
	Raytheon	74LS78	
	TI	**SN74LS78A**	**859**
DM74LS83A	Fairchild	74LS83A	
	Hitachi	HD74LS183A	
		HD74LS83A	
	Motorola	SN74LS83A	
	Raytheon	74LS83	
		74LS83A	
	Signetics	74LS83	
		74LS83A	
	TI	**SN74LS83A**	**861**
DM74LS85	Fairchild	74LS85	
	Hitachi	HD74LS85	
	Motorola	SN74LS85	
	Raytheon	74LS85	
	Signetics	74LS85	
	TI	**SN74LS85**	**862**
DM74LS86	Fairchild	74LS86	
	Hitachi	HD74LS86	
	Motorola	SN74LS86	
	Raytheon	74LS86	
	SGS	T74LS86	
	Signetics	74LS86	
	TI	**SN74LS86**	**862**
DM74LS90	Fairchild	74LS90	
	Motorola	SN74LS90	
	Raytheon	74LS90	
	SGS	T74LS90	
	Signetics	74LS90	
	TI	**SN74LS90**	**864**
DM74LS92	Fairchild	74LS92	
	Hitachi	HD74LS92	
	Motorola	SN74LS92	
	Raytheon	74LS92	
	SGS	T74LS92	
	Signetics	74LS92	
	TI	**SN74LS92**	**864**
DM74LS93	Fairchild	74LS93	
	Hitachi	HD74LS93	
	Motorola	SN74LS93	
	Raytheon	74LS93	
	SGS	T74LS93	
	Signetics	74LS93	
	TI	**SN74LS93**	**865**
DM74LS95B	Fairchild	74LS95B	
	Hitachi	HD74LS95B	
	Motorola	SN74LS95B	
	Raytheon	74LS95B	
	SGS	T74LS95B	
	Signetics	74LS95B	
	TI	**SN74LS95B**	**866**
DM74S00	Fairchild	74S00	
	Hitachi	HD74S00	
	Signetics	74S00	
	TI	**SN74S00**	**833**
DM74S02	Fairchild	74S02	
	Hitachi	HD74S02	
	Signetics	74S02	
	TI	**SN74S02**	**833**
		SN74S32	**843**
DM74S03	Fairchild	74S03	
	Hitachi	HD74S03	
	Signetics	74S03	
	TI	**SN74S03**	**834**
DM74S04	Fairchild	74S04	
	Hitachi	HD74S04	
	Signetics	74S04	
	TI	**SN74S04**	**834**
DM74S05	Fairchild	74S05	
	Hitachi	HD74S05	
	Signetics	74S05	
	TI	**SN74S05**	**834**
DM74S10	Fairchild	74S10	
	Hitachi	HD74S10	
	Signetics	74S10	
	TI	**SN74S10**	**836**
DM74S11	Fairchild	74S11	
	Hitachi	HD74S11	
DM74S11	Signetics	74S11	
	TI	**SN74S11**	**836**
DM74S112	Fairchild	74S112	
	Hitachi	HD74S112	
	Motorola	SN74S112	
	Signetics	74S112	
	TI	**SN74S112**	**871**
DM74S113	Fairchild	74S113	
	Hitachi	HD74S113	
	Signetics	74S113	
	TI	**SN74S113**	**871**
DM74S114	Hitachi	HD74S114	
	TI	**SN74S114**	**872**
DM74S133	Fairchild	74S133	
	Hitachi	HD74S133	
	Signetics	74S133	
	TI	**SN74S133**	**877**
DM74S134	Hitachi	HD74S134	
	Signetics	74S134	
	TI	**SN74S134**	**877**
DM74S135	Fairchild	74S135	
	Hitachi	HD74S135	
	Signetics	74S135	
	TI	**SN74S135**	**878**
DM74S138	AMD	SN74S138	
	Fairchild	74S138	
	Signetics	74S138	
	TI	**SN74S138**	**880**
DM74S139	AMD	SN74S139	
	Fairchild	74S139	
	Signetics	74S139	
	TI	**SN74S139**	**880**
DM74S140	Fairchild	74S140	
	Hitachi	HD74S140	
	Signetics	74S140	
	TI	**SN74S140**	**881**
DM74S15	Fairchild	74S15	
	Hitachi	HD74S15	
	TI	**SN74S15**	**838**
DM74S151	AMD	SN74S151	
	Fairchild	74S151	
	Hitachi	HD74S151	
	Signetics	74S151	
	TI	**SN74S151**	**884**
DM74S153	AMD	SN74S153	
	Fairchild	74S153	
	Hitachi	HD74S153	
	Signetics	74S153	
	TI	**SN74S153**	**884**
DM74S157	AMD	SN74S157	
	Fairchild	74S157	
	Hitachi	HD74S157	
	Signetics	74S157	
	TI	**SN74S157**	**887**
DM74S158	AMD	SN74S158	
	Fairchild	74S158	
	Hitachi	HD74S158	
	Signetics	74S158	
	TI	**SN74S158**	**887**
DM74S174	AMD	SN74S174	
	Fairchild	74S174	
	Hitachi	HD74S174	
	Signetics	74S174	
	TI	**SN74S174**	**895**
DM74S175	AMD	SN74S175	
	Fairchild	74S175	
	Hitachi	HD74S175	
	Signetics	74S175	
	TI	**SN74S175**	**895**
DM74S182	Fairchild	74S182	
	Hitachi	HD74S182	
	MMI	74S182	
	Signetics	74S182	
	TI	**SN74S182**	**898**
DM74S188	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		6330-1	**3826**
		63LS080	
	National	DM54S188	
		DM59S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
DM74S189	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
DM74S195	AMD	SN74S195	
	Fairchild	74S195	
		93S00C	
	Signetics	74S195	
	TI	**SN74S195**	**903**
DM74S20	Fairchild	74S20	
	Hitachi	HD74S20	
	Signetics	74S20	
	TI	**SN74S20**	**839**
DM74S200	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
DM74S206	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
	National	N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
DM74S22	Fairchild	74S22	
	Hitachi	HD74S22	
	TI	**SN74S22**	**840**
DM74S251	AMD	SN74S251	
	Hitachi	HD74S251	
	Signetics	74S251	
	TI	**SN74S251**	**915**
DM74S253	AMD	SN74S253	
	Fairchild	74S253	
	Signetics	74S253	
DM74S257	AMD	SN54S257	
		SN74S257	
	Fairchild	74S257	
	Hitachi	HD74S257	
	National	DM7123	
		DM8123	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DM74S257	Signetics	54S257	
		74S257	
	TI	SN54S257	916
		SN74S257	916
DM74S280	Hitachi	HD74S280	
	Signetics	74S280	
	TI	SN74S280	921
DM74S281	TI	SN74S281	922
DM74S287	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
		HM7611-2	3696
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	3826
	National	DM54S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
	TI	TBP24S10	440,3967
DM74S288	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	3826
		63LS081	
	National	DM54S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	TBP18S030	440,3965
		TBP18S030M	440,3965
DM74S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
DM74S289	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	440,863
		SN74S289	
DM74S30	Fairchild	74S30	
	TI	SN74S30	842
DM74S387	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	3696
	Intel	M3601	
	MMI	5300-1	
		6300-1	3826
	National	DM54S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
	TI	TBP24SA10	440,3967
		TBP24SA10M	440,3967
DM74S40	Fairchild	74S40	
	Hitachi	HD74S40	
	Signetics	74S40	
	TI	SN74S40	845
DM74S472	AMD	AM27S29	
	Fujitsu	MB7124	
		MBM7124	
	Harris	HM7649	
	MMI	5349-1	
		6349-1	3826
	Motorola	MCM7649	
	National	DM54S472	
	Raytheon	29621	
	Signetics	N82S147	
		S82S147	
	TI	DM54S472	
		TBP28S42	440,3975
		TBP28S42M	440,3975
DM74S473	AMD	AM27S28	
	Fujitsu	MB7123	
		MB7124	
		MC7124	
	Harris	HM7648	
	MMI	5348	
		6348	
	National	DM54S473	
	Raytheon	29620	
	Signetics	N82S146	
		S82S146	
	TI	TBP28SA42	440,3976
DM74S474	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	3826
	Motorola	MCM7641	
	National	DM54S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	TBP28S46	440,3976
		TBP28S46M	440,3976
DM74S475	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
DM74S475	MMI	5340-1	
		6340-1	3826
	National	DM54S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	TBP28SA46	440
DM74S51	Fairchild	74S51	
	Hitachi	HD74S51	
	Signetics	74S51	
	TI	SN74S51	848
DM74S570	AMD	AM27S12	
	Fairchild	93436	
	Harris	HM7620	
	Intel	M3602	
	MMI	5305	
		6305	
	National	DM54S570	
	Raytheon	29610	
	Signetics	N82S130	
		S82S130	
DM74S571	AMD	AM27S13	
	Fairchild	93446	
	Harris	HM7621	
	Intel	M3622	
	MMI	5306	
		6306	
	National	DM54S571	
	Raytheon	29611	
	Signetics	N82S131	
		S82S131	
DM74S572	AMD	AM27S32	
	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642	
		HM7642-2	3705
	Intel	M3605	
	MMI	5352-1	
		6352	
	National	DM54S572	
	Raytheon	29640	
	Signetics	N82S136	
		S82S136	
	TI	TBP24SA41	440,3968
		TBP24SA41M	440,3968
DM74S573	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	3705
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	3836
		6353-1	3826
		63S1641	3826,3836
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	TBP24S41	440,3968
		TBP24S41M	440,3968
		TBP28S41	
		TBP28S41M	
DM74S65	Fairchild	74S65	
	Hitachi	HD74S65	
	TI	SN74S65	853
DM74S74	Fairchild	74S74	
	Hitachi	HD74S74	
	Signetics	74S74	
	TI	SN74S74	857
DM74S86	Fairchild	74S86	
	Hitachi	HD74S86	
	Signetics	74S86	
	TI	SN74S86	862
DM75491	Fairchild	75491	
	Motorola	MC75491	
	National	DS75491	
	TI	SN75491	
DM75492	Fairchild	75492	
	Motorola	MC75492	
	National	DS75492	
	TI	SN75492	
DM7551	Fairchild	54173	
	National	DM54173	
	Raytheon	RM8T10	
	TI	SN54173	894
DM7560	Fairchild	54192	
	National	DM54192	
	TI	SN54192	902
DM7563	Fairchild	54193	
	National	DM54193	
	TI	SN54193	902
DM7570	Fairchild	54164	
	National	DM54164	
	Signetics	54164	
	TI	SN54164	891
DM7577	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		6330-1	3826
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
DM7578	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	3826
		63LS081	
	National	DM54S288	
		DM74S288	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	TBP18S030	440,3965
		TBP18S030M	440,3965
DM7588	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		6330-1	3826
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DM7589	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
DM7590	Fairchild	54165	
	National	DM54165	
	Signetics	54165	
	TI	**SN54165**	**891**
DM7599	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
DM75L60	**TI**	**SN54L192**	**902**
DM75L63	**TI**	**SN54L193**	**902**
DM76L70	National	DM54L164	
	TI	**SN54L164**	**891**
DM76L97	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
		HM7611-2	**3696**
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	**3826**
DM76L97	National	DM54S287	
		DM74S287	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
	TI	**TBP24S10**	**440,3967**
DM77S180	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
DM77S181	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
DM77S184	AMD	AM27S184	
	Fujitsu	MB7127	
	Harris	HM7684	
	MMI	53100	
		63100	
	Motorola	MCM7684	
	National	DM87S184	
	Raytheon	29650	
	Signetics	N82S184	
	TI	**TBP24SA81**	**440,3969**
DM77S185	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	**440,3968**
		TBP24S81M	**440,3968**
DM77S190	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	
	National	DM87S190	
	Raytheon	29680	
		29683	
	Signetics	82S190	
		N82S190	
		S82S190	
	Supertex	MM82S190	
DM77S191	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	**440,3979**
DM77S295	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**
	National	DM54S475	
		DM74S475	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	**TBP28SA46**	**440**
DM77S474	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	**3826**
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	**TBP28S46**	**440,3976**
		TBP28S46M	**440,3976**
DM77S475	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	**TBP28SA46**	**440**
DM7800	TI	SN55180	
DM7875A	**TI**	**SN54284**	**923**
DM7875B	**TI**	**SN54285**	**923**
DM8093	Fairchild	74125	
	Hitachi	HD74125	
	National	DM74125	
	Signetics	74125	
	TI	**SN74125**	**875**
		SN74425	**946**
DM8094	Fairchild	74126	
	Hitachi	HD74126	
	National	DM74126	
	Signetics	74126	
	TI	**SN74126**	**875**
		SN74426	**946**
DM8095	Motorola	MC6885	
		MC8T95	
	Signetics	N8T95	
	TI	SN74365	
DM8096	Motorola	MC6886	
		MC8T96	
	Signetics	N8T96	
	TI	SN74366	
DM8097	Motorola	MC6887	
		MC8T97	
	Signetics	N8T97	
	TI	SN74367	
DM8098	Motorola	MC6888	
		MC8T98	
	National	DM7098	
		DS8674	
	Signetics	N8T98	
		S8T98	
	TI	SN54368	
		SN74368	
DM8121	National	DM74251	
	TI	**SN74251**	**915**
DM8123	AMD	SN54S257	
		SN74S257	
	Fairchild	74S257	
	Hitachi	HD74S257	
	National	DM7123	
		DM74S257	
	Signetics	54S257	
		74S257	
	TI	**SN54S257**	**916**
		SN74S257	**916**
DM8160	Fairchild	93S46	
		93S47	
	National	DM7160	
DM8214	Fairchild	74LS253	
	Hitachi	HD74LS253	
	Motorola	SN74LS253	
	National	DM74LS253	
	Raytheon	74LS253	
	SGS	T74LS253	
	Signetics	74LS253	
	TI	SN74LS253	
DM8280	Fairchild	74176	
		96176	
	National	DM74176	
	Raytheon	RC8280	
	Signetics	74176	
		N8280	
	TI	**SN74176**	**896**
DM8281	Fairchild	74177	
	National	DM74177	
	Raytheon	RC8281	
	Signetics	74177	
		N8281	
	TI	**SN74177**	**896**
DM8290	Fairchild	74196	
	National	DM74196	
	Raytheon	RC8290	
	Signetics	74196	
	TI	**SN74196**	**903**
DM8291	Fairchild	74197	
	National	DM74197	
	Raytheon	RC8291	
	Signetics	74197	
	TI	**SN74197**	**904**
DM8301	Fairchild	9031	
		9301	
	National	DM9301	
	Raytheon	RC8252	
		RM8252	
	Signetics	N8252	
		S8252	
	TI	SN29301	
		SN39301	
DM8309	Fairchild	9309	
	National	DM9309	
	TI	SN29309	
		SN39309	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DM8311	Fairchild	9311	
	Hitachi	HD74154	
	National	DM54154	
		DM7213	
		DM74154	
		DM9311	
	Raytheon	RC9311	
		RM9311	
	Signetics	54154	
		74154	
	TI	SN29311	
		SN39311	
		SN54154	**885**
		SN74154	**885**
DM8312	Fairchild	9312	
	National	DM9312	
	Raytheon	RC8230	
		RC9312	
		RM8230	
		RM9312	
	Signetics	N8230	
	TI	SN29312	
		SN39312	
DM8318	Fairchild	9318	
	Hitachi	HD74148	
	National	DM54148	
		DM74148	
		DM9318	
	Signetics	54148	
		74148	
		N82148	
	TI	**SN54148**	**883**
		SN74148	**883**
DM8322	Fairchild	74157	
		9322	
	Hitachi	HD74157	
	National	DM74157	
		DM9322	
	Raytheon	RC9322	
		RM9322	
	Signetics	74157	
	TI	SN29322	
		SN29602	
		SN39322	
		SN74157	**887**
DM8334	Fairchild	9334	
	National	DM9334	
	TI	SN29334	
		SN39334	
		SN54259	**917**
		SN74259	**917**
DM8551	Fairchild	74173	
	National	DM74173	
	Raytheon	RC8T10	
	Signetics	8T10	
		N8T10	
	TI	**SN74173**	**894**
DM8560	Fairchild	74192	
		9360	
	National	DM74192	
	Raytheon	RC9360	
		RM9360	
	Signetics	74192	
	TI	**SN54192**	**902**
		SN74192	**902**
DM8563	Fairchild	74193	
	National	DM74193	
	Signetics	74193	
	TI	SN74129	
		SN74193	**902**
DM8570	AMD	74164	
	Fairchild	74164	
	Hitachi	HD74164	
	National	DM74164	
		DM8579	
	Signetics	74164	
	TI	**SN74164**	**891**
DM8577	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		6330-1	**3826**
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM7588	
	Signetics	N82S23	
		S82S23	
DM8577	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
DM8578	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	**3826**
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	**TBP18S030**	**440,3965**
		TBP18S030M	**440,3965**
DM8579	AMD	74164	
	Fairchild	74164	
	Hitachi	HD74164	
	National	DM74164	
		DM8570	
	Signetics	74164	
	TI	**SN74164**	**891**
DM8589	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
DM8590	Fairchild	74165	
	National	DM74165	
	Signetics	74165	
	TI	**SN74165**	**891**
DM8599	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
DM8599	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
DM85L60	National	DM74L192	
DM85L63	National	DM74L193	
DM85S28	MMI	6281-1	
DM85S29	MMI	6280-1	
DM8601	Fairchild	74122	
		9601	
	National	DM9601	
	Raytheon	RF8601	
		RF9601	
	Signetics	8T22	
		N8T22	
		S8T22	
	TI	**SN74122**	**873**
DM8602	Fairchild	9602	
	National	DM9602	
	Raytheon	RF8602	
		RF9602	
	TI	SN39602	
DM86L70	National	DM74L164	
DM86L97	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
		HM7611-2	**3696**
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	**3826**
	National	DM54S287	
		DM74S287	
		DM76L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
	TI	**TBP24S10**	**440,3967**
DM87S180	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
DM87S181	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29623	
DM87S181	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
DM87S184	AMD	AM27S184	
	Fujitsu	MB7127	
	Harris	HM7684	
	MMI	53100	
		63100	
	Motorola	MCM7684	
	National	DM77S184	
	Raytheon	29650	
	Signetics	N82S184	
	TI	**TBP24SA81**	**440,3969**
DM87S185	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	**440,3968**
		TBP24S81M	**440,3968**
DM87S186	Harris	HM7686	
	Motorola	MCM7686	
DM87S187	Harris	HM7687	
	Motorola	MCM7687	
DM87S190	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	
	National	DM77S190	
	Raytheon	29680	
		29683	
	Signetics	82S190	
		N82S190	
		S82S190	
	Supertex	MM82S190	
DM87S191	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	**440,3979**
DM87S228	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DM87S228	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
DM87S229	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
DM87S29	MMI	5281-1	
DM87S295	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	**TBP28SA46**	**440**
DM87S474	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	**3826**
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	**TBP28S46**	**440,3976**
		TBP28S46M	**440,3976**
DM87S475	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**
DM87S475	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	**TBP28SA46**	**440**
DM87SR81	AMD	AM27S37	
DM8810	Fairchild	7426	
	Hitachi	HD7426	
	National	DM7426	
	Signetics	7426	
	TI	**SN7426**	**841**
DM8842	Fairchild	7442	
	Hitachi	HD7442	
	National	DM7442	
	Signetics	7442	
	TI	SN7442	
		SN7442A	**845**
DM8848	Fairchild	5448	
		7448	
	National	DM5448	
		DM7448	
	Signetics	N8T54	
	TI	**SN5448**	**847**
		SN5448A	
		SN7448	**847**
		SN7448A	
DM8875A	**TI**	**SN74284**	**923**
DM8875B	**TI**	**SN74285**	**923**
◆DM8893	National	DS75493	
	TI	SN75493	
◆DM8894	National	DS75494	
	TI	SN75494	
DM9004C	Fairchild	7420	
		9004	
	Hitachi	HD7420	
	National	DM7420	
	Signetics	7420	
	TI	**SN7420**	**839**
	Toshiba	TC7420	
DM9016C	Fairchild	5404	
		9016	
	National	DM5404	
	TI	**SN5404**	**834**
DM9093	Fairchild	9093	
	Motorola	MC853	
		MC953	
	Raytheon	RC993	
		RM993	
	TI	SN158093	
		SN159093	
DM9094	Fairchild	9094	
	Motorola	MC856	
		MC956	
	Raytheon	RC994	
		RM9094	
		RM994	
	TI	SN158094	
		SN159094	
DM9097	Fairchild	9097	
	Motorola	MC855	
		MC955	
	Raytheon	RC997	
		RM997	
	TI	SN158097	
		SN159097	
DM930	Fairchild	930	
		9930	
	Motorola	MC830	
		MC930	
	Raytheon	RC930	
		RM930	
DM9301	Fairchild	9031	
		9301	
	National	DM8301	
	Raytheon	RC8252	
		RM8252	
	Signetics	N8252	
		S8252	
	TI	SN29301	
		SN39301	
DM9309	Fairchild	9309	
	National	DM8309	
	TI	SN29309	
		SN39309	
DM9311	Fairchild	9311	
	Hitachi	HD74154	
DM9311	National	DM54154	
		DM7213	
		DM74154	
		DM8311	
	Raytheon	RC9311	
		RM9311	
	Signetics	54154	
		74154	
	TI	SN29311	
		SN39311	
		SN54154	**885**
		SN74154	**885**
DM9312	Fairchild	9312	
	National	DM8312	
	Raytheon	RC8230	
		RC9312	
		RM8230	
		RM9312	
	Signetics	N8230	
	TI	SN29312	
		SN39312	
DM9316	Fairchild	9316	
	Raytheon	RC9316	
		RM9316	
	TI	SN29316	
		SN39316	
DM9318	Fairchild	9318	
	Hitachi	HD74148	
	National	DM54148	
		DM74148	
		DM8318	
	Signetics	54148	
		74148	
		N82148	
	TI	**SN54148**	**883**
		SN74148	**883**
DM932	Fairchild	932	
		9932	
	Motorola	MC932	
	Raytheon	RC932	
		RM932	
DM9322	Fairchild	74157	
		9322	
	Hitachi	HD74157	
	National	DM74157	
		DM8322	
	Raytheon	RC9322	
		RM9322	
	Signetics	74157	
	TI	SN29322	
		SN29602	
		SN39322	
		SN74157	**887**
DM933	Fairchild	933	
	Motorola	MC933	
	Raytheon	RC933	
		RM933	
DM9334	Fairchild	9334	
	National	DM8334	
	TI	SN29334	
		SN39334	
		SN54259	**917**
		SN74259	**917**
DM935	Fairchild	9135	
	Motorola	MC835	
		MC935	
	Raytheon	RC935	
		RM935	
DM936	Fairchild	936	
	Motorola	MC936	
	Raytheon	RC936	
		RM936	
DM937	Fairchild	937	
	Motorola	MC837	
		MC937	
	Raytheon	RC937	
		RM937	
DM939	Fairchild	939	
DM944	Fairchild	944	
	Motorola	MC944	
	Raytheon	RC944	
		RM944	
DM945	Fairchild	945	
	Motorola	MC945	
	Raytheon	RC945	
		RM945	
DM946	Fairchild	946	
	Motorola	MC946	
	Raytheon	RC946	
		RM946	
DM948	Fairchild	948	
	Motorola	MC948	
DM948	Raytheon	RC948	
		RM948	
DM949	Fairchild	949	
	Motorola	MC949	
	Raytheon	RC949	
		RM949	
DM9567	Fairchild	9157	
	Motorola	MC857	
		MC957	
	National	DM957	
	Raytheon	RC957	
		RM957	
DM957	Fairchild	9157	
	Motorola	MC857	
		MC957	
	National	DM9567	
	Raytheon	RC957	
		RM957	
DM958	Fairchild	9158	
	Motorola	MC858	
		MC958	
	Raytheon	RC958	
		RM958	
DM9601	Fairchild	74122	
		9601	
	National	DM8601	
	Raytheon	RF8601	
		RF9601	
	Signetics	8T22	
		N8T22	
		S8T22	
	TI	**SN74122**	**873**
DM9602	Fairchild	9602	
	National	DM8602	
	Raytheon	RF8602	
		RF9602	
	TI	SN39602	
DM961	Fairchild	961	
	Motorola	MC961	
	National	DM962	
	Raytheon	RC961	
		RM961	
DM962	Fairchild	961	
	Motorola	MC961	
	National	DM961	
	Raytheon	RC961	
		RM961	
DM963	Fairchild	963	
		9963	
	Motorola	MC963	
	Raytheon	RC963	
		RM963	
DMPAL10H8	MMI	PAL10H8	
DMPAL10L8	MMI	PAL10L8	
	Raytheon	PAL10L8	
DMPAL12H10	MMI	PAL12H10	
DMPAL12H6	MMI	PAL12H6	
DMPAL12L10	MMI	PAL12L10	
DMPAL12L6	MMI	PAL12L6	
	Raytheon	PAL12L6	
DMPAL14H4	MMI	PAL14H4	
DMPAL14H8	MMI	PAL14H8	
DMPAL14L4	MMI	PAL14L4	
DMPAL14L8	MMI	PAL14L8	
DMPAL16A4	MMI	PAL16A4	
DMPAL16C1	MMI	PAL16C1	
DMPAL16H2	MMI	PAL16H2	
DMPAL16H6	MMI	PAL16H6	
DMPAL16L2	MMI	PAL16L2	
DMPAL16L8	MMI	PAL16L8	
	TI	FP4ALS16L8	
DMPAL16R4	MMI	PAL16R4	
	TI	FP74ALS16R4	
DMPAL16R6	MMI	PAL16R6	
	TI	FPμ4ALS16R6	
DMPAL16R8	MMI	PAL16R8	
	TI	FP74ALS16R8	
DMPAL16X4	MMI	PAL16X4	
	Raytheon	PAL16X4	
DMPAL18H4	MMI	PAL18H4	
DMPAL20C1	MMI	PAL20C1	
DMPAL20H2	MMI	PAL20H2	
DMPAL20L10	MMI	PAL20L10	
DMPAL20L2	MMI	PAL20L2	
DN74ALS576	**Motorola**	**SN74ALS576**	**732**
	TI	**SN74ALS576**	**965**
DP4201	Intel	4201	
DP8080A	AMD	9080	
		9080A	
		AM9080	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DP8080A	Intel	8080A	
		D8080	
		MD8080	
		P8080	
	National	INS8080A	
	NEC-Micro	μPD8080	
	TI	TMS8080	
		TMS8080A	
DP8212	AMD	3212	
		8212	
	Intel	8212	
	National	INS8212	
	NEC-Micro	μPB8212	
	TI	**SN54S412**	**945**
		SN74S412	**945**
DP8216	AMD	8216	
	Intel	8216	
	National	INS8216	
	NEC-Micro	μPB8216	
DP8224	AMD	8224	
	Intel	8224	
	National	INS8224	
	NEC-Micro	μPB8224	
DP8226	AMD	8226	
	Intel	8226	
	National	INS8226	
	NEC-Micro	μPB8226	
DP8228	AMD	8228	
	Intel	8228	
	National	INS8228	
	NEC-Micro	μPB8228	
	TI	**SN74S428**	**946**
		TIM8228	**3980**
DP8238	AMD	8238	
	Intel	8238	
	National	INS8238	
	NEC-Micro	μPB8238	
	TI	**SN74S438**	**946**
		TIM8238	**3980**
DP8251	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
	National	INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	
◆DP8300	Intel	8300	
◆DP8302	Intel	8302	
DP8303	AMD	DP8303	
DP8304	AMD	8304	
		DP8304	
	Intel	8286	
		8304	
	NEC-Micro	μPB8286	
DP8307	AMD	DP8307	
DS0025	National	MH0025	
DS0026	AMD	MMH0026	
	Motorola	MMH0026	
	National	MH0026	
DS0056	National	MH0056	
DS1488	AMD	MC1488	
	Exar	**XR1488**	**3188**
	Fairchild	μA1488	
	Harris	HA1488	
	Hitachi	HD75188	
	Motorola	**MC1488**	**2753**
	Raytheon	RM1488	
	Signetics	MC1488	
	SiliconG	SG1488	
	TI	MC1488	
		SN75188	
DS1489	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
DS1489A	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
DS1603	National	LM163	
◆DS1604	National	LM163A	
DS1611	National	LM1611	
DS1612	National	LM1612	
DS1613	National	LM1613	
DS1614	National	LM1614	
DS26LS31	AMD	AM26LS31	
	Motorola	**AM26LS31**	**2753**
	TI	AM26LS31	
DS26LS32	TI	AM26LS32	
DS26S10	AMD	AM26S10	
	Fairchild	9640	
	Motorola	DC26S10	
	TI	AM26	
DS26S11	AMD	AM26S11	
	TI	AM26S11	
DS3245	Intel	3245	
	Motorola	MC3245	
DS3486	**Motorola**	**MC3486**	**2753**
	TI	MC3486	
DS3487	Motorola	MC3487	
	National	DS3687	
	TI	MC3487	
DS3611	Sprague	UDN-3611	
DS3612	National	DS3632	
	Sprague	UDN-3612	
DS3613	Sprague	UDN-3613	
DS3614	Sprague	UDN-3614	
DS36147	Motorola	DS36147	
DS36177	Motorola	DS36177	
DS3625	Signetics	N8T25	
DS3632	National	DS3612	
	Sprague	UDN-3612	
DS3650	Motorola	MC3450	
DS3651	Motorola	MC3430	
		MC3441	
DS3652	Motorola	MC3452	
DS3653	Motorola	MC3432	
DS3674	Motorola	MC3460	
DS3687	Motorola	MC3487	
	National	DS3487	
	TI	MC3487	
DS55107	Fairchild	55107	
	Motorola	MC55107	
	National	LM55107A	
	TI	SN55107	
		SN55107B	
DS55108	Fairchild	55108	
	Motorola	MC55108	
	National	LM55108A	
	TI	SN55108	
		SN55108B	
◆DS55109	TI	SN55109A	
◆DS55110	TI	SN55110	
		SN55110A	
DS55121	Signetics	S8T13	
	TI	SN55121	
DS55122	TI	SN55122	
DS5520	National	LM5520	
	SiliconG	SG5520	
	TI	SN5520	
DS5522	Motorola	MC5522	
		MC5523	
	National	LM5522	
	SiliconG	SG5522	
DS5522	TI	SN5522	
DS5524	Fairchild	MC5524	
	Motorola	MC5524	
	National	LM5524	
	Raytheon	RM5524	
	SiliconG	SG5524	
	TI	SN5524	
DS5528	Fairchild	MC5528	
	Motorola	MC5528	
	National	LM5528	
	SiliconG	SG5528	
	TI	SN5528	
DS55325	Fairchild	MC55325	
	Motorola	MC55325	
	National	LM55325	
	Signetics	55325	
	SiliconG	SG55325	
	TI	SN55325	
◆DS5534	Fairchild	MC5534	
	Motorola	MC5534	
	National	LM5534	
	SiliconG	SG5534	
DS55361	TI	SN55361	
DS55365	TI	SN55365	
◆DS5538	Motorola	MC5538	
DS55450	Fairchild	55450	
	Signetics	55450	
	SiliconG	SG55450	
	TI	SN55450	
DS55451	Fairchild	55451	
	Signetics	55451	
	SiliconG	SG55451	
	TI	SN55451	
DS55452	Fairchild	55452	
	Signetics	55452	
	SiliconG	SG55452	
	TI	SN55452	
DS55453	Fairchild	55453	
	National	LM55453	
	Signetics	55453	
	SiliconG	SG55453	
	TI	SN55453	
DS55454	Signetics	55454	
	SiliconG	SG55454	
	TI	SN55454	
DS55460	SiliconG	SG55460	
	TI	SN55460	
DS55461	SiliconG	SG55461	
	TI	SN55461	
DS55462	SiliconG	SG55462	
	TI	SN55462	
DS55463	SiliconG	SG55463	
	TI	SN55463	
DS55464	SiliconG	SG55464	
	TI	SN55464	
DS55493	TI	SN55493	
DS55494	TI	SN55494	
DS75107	Fairchild	75107	
	Motorola	MC75107	
	National	LM75107A	
	TI	SN75107	
		SN75107B	
DS75108	Fairchild	75108	
	Motorola	MC75108	
	National	LM75108A	
	TI	SN75108	
		SN75108B	
◆DS75109	Motorola	MC75109	
	TI	SN75109	
		SN75109A	
◆DS75110	Fairchild	75110	
	Hitachi	HD75110	
	Motorola	MC75110	
	National	LM75110	
	TI	SN75110	
		SN75110A	
DS75121	Motorola	MC8T13	
	National	LM75121	
	Signetics	N8T13	
	TI	N8T13	
		SN75121	
DS75122	Motorola	MC8T14	
	National	LM75122	
	Signetics	N8T14	
	TI	N8T14	
		SN75122	
DS75123	Motorola	MC8T23	
	National	LM75123	
	Signetics	N8T23	
	TI	N8T23	
		SN75123	
DS75124	Motorola	MC8T24	
	National	LM75124	
	Signetics	N8T24	
	TI	N8T24	
		SN75124	
DS75125	**Motorola**	**MC75125**	**2753**
	TI	SN75125	
DS75127	**Motorola**	**MC75127**	**2753**
	TI	SN75127	
DS75128	**Motorola**	**MC75128**	**2753**
	TI	SN75128	
DS75129	**Motorola**	**MC75129**	**2753**
	TI	SN75129	
DS75150	Fairchild	75150	
	TI	SN75150	
DS75154	Fairchild	75154	
	Hitachi	HD75154	
	SiliconG	SG75154	
	TI	SN75154	
DS75160	TI	SN75160	
DS75161	TI	SN75161	
DS75162	TI	SN75162	
DS7520	Fairchild	7520	
	Motorola	MC7520	
	SiliconG	SG7520	
	TI	SN7520	
DS75207	TI	SN75207B	
DS75208	TI	SN75208B	
DS7521	Fairchild	7521	
	Motorola	MC7521	
	National	LM7521	
	SiliconG	SG7521	
	TI	SN7521	
DS7522	Motorola	MC7522	
	SiliconG	SG7522	
	TI	SN7522	
DS7524	Fairchild	75S24	
	Hitachi	HA1902	
	Motorola	MC7524	
	National	75S24	
	Signetics	SN7524	
	SiliconG	SG7524	
	TI	SN75224	
		SN7524	
◆DS7528	Motorola	MC7528	
	Raytheon	RC7528	
	SiliconG	SG7528	
	TI	SN7528	
	Thomson-CSF	SFC2528	
DS75322	TI	SN75322	
DS75324	TI	SN75324	
DS75325	Motorola	MC75325	
	SiliconG	SG75325	
	TI	SN75325	
◆DS7534	Motorola	MC7534	
	SiliconG	SG7534	
DS75361	TI	SN75361	
		SN75361A	
DS75362	TI	SN75362	
DS75364	TI	SN75364	
DS75365	Motorola	MC75365	
	TI	SN75365	
◆DS7538	Fairchild	7538	
	Motorola	MC7538	
	National	LM7538	
	SiliconG	SG7538	
DS75450	Fairchild	75450	
	Motorola	MC75450	
	SiliconG	SG75450	
	TI	SN75450	
DS75451	Fairchild	75451	
	Motorola	MC75451	
	SiliconG	SG75451	
	TI	SN75451	
DS75452	Fairchild	75452	
	Hitachi	HD75452	
	Motorola	MC75452	
	SiliconG	SG75452	
	TI	SN75452	
DS75453	Fairchild	75453	
	Hitachi	HD75453	
	Motorola	MC75453	
	National	LM75453	
	SiliconG	SG75453	
	TI	SN75453	
DS75454	Motorola	MC75454	
	SiliconG	SG75454	
	TI	SN75454	
DS75460	Motorola	MC75460	
	SiliconG	SG75460	
	TI	SN75460	
DS75461	Fairchild	75461	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DS75461	Motorola	MC75401	
		MC75461	
	SiliconG	SG75461	
	TI	SN75461	
DS75462	Fairchild	75462	
	Motorola	MC75402	
		MC75462	
	SiliconG	SG75462	
	TI	SN75462	
DS75463	Motorola	MC75403	
		MC75463	
	SiliconG	SG75463	
	TI	SN75463	
DS75464	Motorola	MC75404	
		MC75464	
	TI	SN75464	
DS75491	Fairchild	75491	
	Motorola	MC75491	
	TI	SN75491	
DS75492	Fairchild	75492	
	Motorola	MC75492	
	TI	SN75492	
DS75493	TI	SN75493	
DS75494	TI	SN75494	
DS7800	TI	SN55180	
◆DS7803	National	MH7803	
DS7820	TI	SN55182	
DS7830	TI	SN55183	
DS7831	TI	DS7831	
DS7832	TI	DS7832	
DS7838	AMD	DS7838	
DS7880	TI	SN55480	
DS8615	Motorola	MC12015	
DS8616	Plessey	SP8793	
DS8617	Motorola	MC12017	
DS8621	Motorola	MC12071	
DS8627	Plessey	SP8656	
DS8628	Plessey	SP8658	
DS8640	Signetics	SP380	
DS8641	Motorola	DS8641	
DS8674	Motorola	MC6888	
		MC8T98	
	National	DM7098	
		DM8098	
	Signetics	N8T98	
		S8T98	
	TI	SN54368	
		SN74368	
DS8800	TI	SN75180	
DS8808	National	MH8808	
DS8820	National	DS8880	
	Signetics	DS8820	
	TI	DS8820	
		SN75182	
		SN75480	
DS8830	Signetics	DS8830	
	TI	DS8830	
		SN75183	
DS8831	TI	DS8831	
DS8832	TI	DS8832	
DS8834	Signetics	N8T34	
DS8836	Signetics	N8T380	
DS8837	Motorola	MC3437	
	Signetics	N8T37	
DS8838	AMD	DS8838	
	Motorola	MC3438	
	Signetics	N8T38	
DS8880	National	DS8820	
	Signetics	DS8820	
	TI	DS8820	
		SN75182	
		SN75480	
DS8889	Motorola	MC3491	
DS8T26A	AMD	N8T26	
		N8T26A	
	Fairchild	μA8T26A	
	Hitachi	HD268T26	
	Motorola	MC6880A	
		MC8T26	
		MC8T26A	
	Signetics	N8T26	
		N8T26A	
	TI	N8T26A	
DS8T28	Fairchild	μA8T28	
IDM2901A	**AMD**	**AM2901A**	**1201**
	Fairchild	29F01	
		F2901A	
IDM29702	AMD	AM29702	
IDM29703	AMD	AM29703	
INS1771	Western	FD1771	
INS2651	Signetics	SCN2651	
	SMC	COM2651	
INS8035	AMD	8035	
		D8035	
		ID8035	
		P8035	
	Fujitsu	MBL8035	
	Intel	8035	
		D8035	
		ID8035	
		P8035	
	NEC-Micro	μPD8035	
		μPD80C35	
	Signetics	SCN8035	
INS8039	AMD	D8039	
		ID8039	
	Fujitsu	MBL8039	
	Intel	8039	
		D8039	
		ID8039	
	NEC-Micro	μPD8039	
	Signetics	SCN8039	
INS8048	AMD	8048	
	Fujitsu	MBL8048	
	Intel	8048	
	NEC-Micro	μPD8048	
		μPD80C48	
	Signetics	SCN8048	
	Toshiba	TMP8048	
INS8049	Fujitsu	MBL8049	
	Intel	8049	
	NEC-Micro	μPD8049	
	Signetics	SCN8049	
INS8060	Signetics	ISP-8A/600	
INS8080A	AMD	9080	
		9080A	
		AM9080	
	Intel	8080A	
		D8080	
		MD8080	
		P8080	
	National	DP8080A	
	NEC-Micro	μPD8080	
	TI	TMS8080	
		TMS8080A	
INS8212	AMD	3212	
		8212	
	Intel	8212	
	National	DP8212	
	NEC-Micro	μPB8212	
	TI	**SN54S412**	**945**
		SN74S412	**945**
INS8214	AMD	8214	
	Intel	8214	
	NEC-Micro	μPB8214	
INS8216	AMD	8216	
	Intel	8216	
	National	DP8216	
	NEC-Micro	μPB8216	
INS8224	AMD	8224	
	Intel	8224	
	National	DP8224	
	NEC-Micro	μPB8224	
INS8226	AMD	8226	
	Intel	8226	
	National	DP8226	
	NEC-Micro	μPB8226	
INS8228	AMD	8228	
	Intel	8228	
	National	DP8228	
	NEC-Micro	μPB8228	
	TI	**SN74S428**	**946**
		TIM8228	**3980**
INS8238	AMD	8238	
	Intel	8238	
	National	DP8238	
	NEC-Micro	μPB8238	
	TI	**SN74S438**	**946**
		TIM8238	**3980**
INS8251	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
INS8251	National	DP8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	
INS8253	AMD	8253	
		D8253	
		ID8253	
		P8253	
	Intel	8253	
		D8253	
		ID8253	
		P82	
	NEC-Micro	μPD8253	
INS8253-5	AMD	8253-5	
		D8253-5	
		P8253-5	
	Intel	8253-5	
		D8253-5	
		P8253-5	
	NEC-Micro	μPD8253-5	
INS8255	AMD	8255A-5	
		9555	
		D8255	
		ID8255	
		P8255	
	Intel	8255A-5	
		D8255	
		ID8255	
		P8255	
	NEC-Micro	8255A	
		μPB8255	
		μPD8225	
		μPD8255	
INS8259	AMD	D8259	
		ID8259	
		MD8259	
		P8259	
	Intel	8259	
		D8259	
		ID8259	
		M8259	
		P8259	
	NEC-Micro	μPD8259	
ISP-8A/600	Signetics	ISP-8A/600	
LF11201	AD	ADG201	
	Harris	HI201	
	MicroPwr	MP201	
	National	**LF13201**	**3318**
	PMI	SW-01	
		SW-201	
	Siliconix	DG201	
LF11202	PMI	SW-02	
	Siliconix	DG202	
LF11508	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
LF11509	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**
LF11509	TeledyneP	4553	
LF12331	PMI	SW04	
LF12332	PMI	SW03	
LF12508	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
LF12509	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**
	TeledyneP	4553	
LF13201	AD	ADG201	
	Harris	HI201	
	MicroPwr	MP201	
	National	**LF11201**	**3318**
	PMI	SW-01	
		SW-201	
	Siliconix	DG201	
LF13202	PMI	SW-02	
	Siliconix	DG202	
LF13331	PMI	SW04	
LF13332	PMI	SW03	
LF13508	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
LF13509	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LF13509	TeledyneP	4553	
LF152	National	LF252	
LF155	AMD	LF155	
	Intersil	LF155	
	Motorola	LF155	
	PMI	PM155	
	Signetics	LF155	
LF156	AMD	LF156	
	Intersil	LF156	
	MicroPwr	OP-16	
	Motorola	LF156	
	PMI	OP-16	
		PM156	
	Signetics	LF156	
LF157	AMD	LF157	
	Intersil	LF157	
	MicroPwr	OP-17	
	Motorola	LF157	
	PMI	OP-17	
		PM157	
LF252	National	LF152	
LF255	AMD	LF255	
	Motorola	LF255	
	PMI	PM255	
LF256	AMD	LF256	
	Motorola	LF256	
	PMI	PM256	
LF257	AMD	LF257	
	Motorola	LF257	
	PMI	PM257	
LF347	Exar	XR074	
	Motorola	MC34004	
	TI	TL074	
		TL084C	
LF355	AMD	LF355	
	Intersil	LF355	
	Motorola	LF355	
	PMI	PM355	
	Signetics	LF355	
LF356	AMD	LF356	
	Intersil	LF356	
	Motorola	LF356	
	PMI	PM356	
	Signetics	LF356	
LF357	AMD	LF357	
	Intersil	LF357	
	Motorola	LF357	
	PMI	PM357	
LF398	Fairchild	μAF398	
	National	LM298	
	PMI	SMP-10	
	Signetics	NE5537	
LH0002	**OEI**	**9910**	**3346**
LH0022	AD	AD506	
	National	LM0052	
LH0032	**OEI**	**9932**	**3346**
	TeledyneP	0032	
LH0042	AD	AD0042	
		AD503	
	Intersil	AD503	
		LH0042	
LH0044	AD	AD510	
		AD517	
		ADOP-07	**3153**
	Burr-Brown	3510	
	Datel	AM-430	
		AM-490-2	
	Fairchild	μA714	
	Harris	HA-2900	
		HA-2905	
		HA-5130	
		HA-5135	
	MicroPwr	MP517	
		MP5505	
		MP5507	
		OP-05	
		OP-07	
	NEC-Electron	μPC725	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TeledyneP	1340	
	TI	OP-07	
LH0062	AD	AD528	
LH0063	**OEI**	**9963**	**3346**
LH2101	AMD	LH2101	
	Intersil	LH2101	
	Raytheon	LH2101	
LH2101	Signetics	LH2101	
LH2108	Intersil	LH2108	
	PMI	PM2108	
LH2108A	Intersil	LH2108A	
	PMI	PM2108A	
LH2110	Intersil	LH2110	
LH2111	AMD	LH2111	
	Intersil	LH2111	
	Raytheon	LH2111	
LH2201	AMD	LH2201	
	Raytheon	LH2201	
LH2208	PMI	PM2208	
LH2208A	Intersil	LH2208A	
	PMI	PM2208A	
LH2211	AMD	LH2211	
LH2301	AMD	LH2301	
	Intersil	LH2301	
LH2308	Intersil	LH2308	
	PMI	PM2308	
	Signetics	LH2308	
LH2308A	Intersil	LH2308A	
	PMI	PM2308A	
LH2310	Intersil	LH2310	
LH2311	AMD	LH2311	
	Intersil	LH2311	
LM0052	AD	AD506	
	National	**LH0022**	**3342**
LM10	MicroEng	MCE-LM10	
◆LM101	AMD	LM101	
	AD	AD101	
	Fairchild	μA101	
	Intersil	AD101	
	Motorola	LM101	
	Raytheon	LM101	
	Signetics	LM101	
	SiliconG	SG101	
	TI	LM101	
	Thomson-CSF	SFC2101	
LM1017	TI	SN29764	
◆LM101A	TI	LM101A	
LM104	Thomson-CSF	SFC2104	
LM105	AMD	LM105	
	Fairchild	μA105	
	Intersil	LM105	
	SiliconG	SG105	
	Thomson-CSF	SFC2105	
LM106	MicroPwr	COMP-01	
		COMP-02	
LM107	AMD	LM107	
	AD	**AD741S**	**3153**
	Intersil	LM107	
	Raytheon	LM107	
	SiliconG	SG107	
	TI	LM107	
		SN55107	
	Thomson-CSF	SFC2107	
LM108	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
LM108A	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
LM108A	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
LM109	Fairchild	μA109	
	Motorola	LM109	
	SiliconG	SG109	
	TI	SN55109	
	Thomson-CSF	SFC2109	
LM11	Motorola	LM11	
LM110	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM210	
		LM310	
	PMI	BUF-01	
		BUF-02	
		BUF-03	
	SiliconG	SG110	
		SG210	
		SG310	
LM111	AMD	LM111	
	AD	AD111	
	Fairchild	μA111	
	Intersil	LM111	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM111	
	PMI	PM111	
	Raytheon	LM111	
	Signetics	LM111	
	SiliconG	SG111	
	TI	LM111	
	Thomson-CSF	SFC2111	
LM112	AMD	LM112	
	Motorola	LM112	
LM113	AD	AD589	
	Datel	VR-8069	
	Ferranti	ZN423	
	Intersil	ICL8069	
	MicroPwr	**MP5010**	**401,3292**
	National	**LM313**	**3304**
	TeledyneS	9491	
		9941	
LM117	MicroEng	MCE-LM117	
	Motorola	**LM117**	**3295**
	SiliconG	SG117	
	TI	LM117	
LM118	AMD	LM118	
	TI	LM118	
LM119	AMD	LM119	
	Signetics	LM119	
LM120-12	Fairchild	μA7912	
		μA79M12	
	Motorola	MC7912	
	National	LM320MP12	
		LM7912	
		LM79M12	
	SiliconG	SG120-12	
		SG320P-12	
		SG7912	
	TI	μA7912	
LM120-15	Fairchild	μA7915	
	Lambda	LμA7915	
	Motorola	MC7915	
	National	LM320-15	
		LM320T15	
		LM7915	
	SiliconG	SG120-15	
		SG320-15	
		SG7915	
LM120-15	TI	μA7915	
LM123	**Motorola**	**LM123**	**3294**
		MC78T05	
	SiliconG	SG123	
	TI	SN55123	
LM124A	AMD	LM124A	
	Motorola	LM124A	
	Raytheon	LM124A	
	RCA	CA124A	
	Signetics	LM124A	
	SiliconG	SG124	
	TI	LM124A	
LM1303	Exar	XR4739	
	Fairchild	μA739	
		μA749	
	Motorola	MC1339	
	Raytheon	RC4739	
	SGS	TBA231	
	TI	SN76131	
		SN76149	
LM1310	Exar	XR1310	
	Hitachi	HA1156	
	RCA	CA1310	
	Sanyo	LA3350	
	Sprague	ULN-2211	
		ULN-3810	
	TI	SN76115	
	Toshiba	TA7157	
LM13600	Exar	XR13600	
	Raytheon	LM13600	
LM137	MicroEng	MCE-LM137	
	Motorola	**LM137**	**3295**
	TI	LM137	
LM139	AMD	LM139	
	Fairchild	μA139	
	Motorola	LM139	
	PMI	CMP-04	
		PM139	
	Raytheon	LM139	
	RCA	CA139	
	Signetics	LM139	
	SiliconG	SG139	
	TI	LM139	
LM1391	Motorola	MC1391	
	RCA	CA1391	
	TI	SN76591	
LM1394	Motorola	MC1394	
	RCA	CA1394	
	TI	SN76594	
LM139A	AMD	LM139A	
	Motorola	LM139A	
	PMI	CMP-04	
		PM139A	
	RCA	CA139A	
	SiliconG	SG139A	
LM140	**Exar**	**XR146**	**3207**
	Raytheon	LM146	
LM140-05	SiliconG	SG140-05	
LM140-12	SiliconG	SG140-12	
LM140-15	SiliconG	SG140-15	
◆LM1408	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
◆LM1408	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
LM1414	Motorola	MC1414	
	TI	TL514	
		TL720	
LM143	Datel	AM-464-2M	
	Harris	**HA-2640**	**3232,3287**
	Motorola	MC1536	
	National	LM1536	
	SiliconG	SG1536	
LM1436	**Datel**	**AM-464-2**	**2622**
	Harris	**HA-2645**	**3232,3287**
	Motorola	MC1436	
		MC1439	
	National	LM343	
	SiliconG	SG1436	
	TeledyneP	1332	
LM1458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
◆LM146	**Exar**	**XR146**	**3207**
	National	LM140	
	Raytheon	LM146	
LM146-2	Raytheon	LM146-2	
LM148	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
◆LM1488	AMD	MC1488	
	Exar	**XR1488**	**3188**
	Fairchild	μA1488	
	Harris	HA1488	
	Hitachi	HD75188	
	Motorola	**MC1488**	**2753**
	National	DS1488	
	Raytheon	RM1488	
	Signetics	MC1488	
	SiliconG	SG1488	
	TI	MC1488	
		SN75188	
◆LM1489	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
LM149	AMD	LM149	
LM1496	Fairchild	μA796	
	Motorola	MC1496	
		MC1596	
	National	LM1596	
	Plessey	SL1496	
		SL1596	
	Signetics	MC1496	
		MC1596	
	SiliconG	SG1496	
		SG1596	
LM150	**Motorola**	**LM150**	**3295**
	SiliconG	SG150	
LM1514	Motorola	MC1514	
	TI	TL514	
LM1536	Datel	AM-464-2M	
	Harris	**HA-2640**	**3232,3287**
	Motorola	MC1536	
	National	LM143	
	SiliconG	SG1536	
LM1558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
LM1558	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
LM158A	Motorola	LM158	
	Raytheon	RM4139	
	RCA	CA158A	
	Signetics	LM158	
	TI	LM158	
LM1596	Fairchild	μA796	
	Motorola	MC1496	
		MC1596	
	National	LM1496	
	Plessey	SL1496	
		SL1596	
	Signetics	MC1496	
		MC1596	
	SiliconG	SG1496	
		SG1596	
LM160	Fairchild	μA760	
	PMI	CMP05	
LM161	PMI	CMP-05	
	Signetics	SE529	
LM1611	National	DS1611	
LM1612	National	DS1612	
LM1613	National	DS1613	
LM1614	National	DS1614	
LM163	National	DS1603	
LM1709	Fairchild	μA709	
	Hitachi	HA1303	
	Motorola	MC1709	
	National	LM709	
	NEC-Electron	μPC255	
		μPC55	
	Raytheon	RC709	
		RM709	
	RCA	CA3038	
	TI	μA709	
	Thomson-CSF	SFC2709	
	Toshiba	TA7502	
LM1800	Motorola	μA758	
	RCA	CA758	
	Signetics	μA758	
	TI	SN76111	
		SN76116	
LM1820	RCA	CA3123	
	TI	SN76635	
LM1827	Sprague	ULN-2224	
LM1829	National	LM3126	
	RCA	CA3126	
LM1848	RCA	CA3172	
LM185	Motorola	LM185	
LM1870	Signetics	LM1870	
LM193A	Fairchild	FC193A	
		μA193	
	Motorola	LM193	
	Signetics	LM193	
	TI	LM193	
LM2002	SGS	TBA2002	
	Sprague	ULN-3701	
LM201	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
LM201A	TI	LM201A	
LM202	AMD	LM202	
	SiliconG	SG202	
LM204	SiliconG	SG204	
	Thomson-CSF	SFC2204	
LM205	AMD	LM205	
	SiliconG	SG205	
	Thomson-CSF	SFC2205	
LM207	AMD	LM207	
	RCA	CA207	
	SiliconG	SG207	
	TI	SN55207	
	Thomson-CSF	SFC2207	
LM208	AMD	LM208	
	AD	**AD208**	**3153**
	Fairchild	μA208	
	MicroPwr	MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM208	
	PMI	OP-08	
		OP05	
		PM208	
	SiliconG	SG208	
	TI	μA714	
LM209	Fairchild	μA209	
	Lambda	LLM209	
	Motorola	LM209	
	SiliconG	SG209	
	Thomson-CSF	SFC2209	
LM210	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM310	
	PMI	BUF-01	
		BUF-02	
		BUF-03	
	SiliconG	SG110	
		SG210	
		SG310	
LM211	AMD	LM211	
	AD	AD211	
	Motorola	LM211	
	PMI	PM211	
	RCA	LM211	
	Signetics	LM211	
	SiliconG	SG211	
	TI	LM211	
	Thomson-CSF	SFC2211	
LM217	MicroEng	MCE-LM217	
	Motorola	**LM217**	**3295**
	SiliconG	SG217	
	TI	LM217	
LM218	AMD	LM218	
		LM318	
	AD	**AD518**	**3155**
	Fairchild	μA318	
	National	LM318	
	NEC-Electron	μPC159	
	TI	LM218	
		LM318	
LM219	AMD	LM219	
	Signetics	LM219	
LM220	Lambda	LLM220	
	SiliconG	SG220	
LM220-12	SiliconG	SG220-12	
LM220-15	SiliconG	SG220-15	
LM220-05	SiliconG	SG220-05	
LM223	Lambda	LLM223	
	Motorola	**LM223**	**3294**
	SiliconG	SG223	
LM224	AMD	LM224	
	Fairchild	μA224	
	Motorola	LM224	
	Raytheon	LM224	
	RCA	CA224	
	Signetics	LM224	
	SiliconG	SG224	
	TI	LM224	
LM237	MicroEng	MCE-LM237	
	TI	LM237	
LM239	AMD	LM239	
	Fairchild	μA239	
	Motorola	LM239	
	PMI	CMP-04	
		PM239	
	Raytheon	LM239	
	RCA	CA239	
	Signetics	LM239	
	SiliconG	SG239	
	TI	LM239	
LM239A	AMD	LM239A	
	Motorola	LM239A	
	PMI	CMP-04	
		PM239A	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LM239A	RCA	CA239A	
	SiliconG	SG239A	
LM246	**Exar**	**XR246**	**3207**
	Raytheon	LM246	
◆LM246-2	Raytheon	LM246-2	
LM248	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
LM249	AMD	LM249	
LM250	**Motorola**	**LM250**	**3295**
	SiliconG	SG250	
LM258A	Motorola	LM258	
	RCA	CA258A	
	Signetics	LM258	
	TI	LM258	
LM285	Motorola	LM285	
LM2900	Hitachi	HA17301	
	Motorola	LM2900	
		MC3301	
	National	LM3301	
	Raytheon	LM2900	
		RC3301	
	TI	LM2900	
LM2901	Fairchild	μA2901	
		μA3302	
	Motorola	LM2901	
		MC3302	
	National	LM3302	
	NEC-Electron	μPC2901	
	PMI	CMP-04	
	Raytheon	LM2901	
		RV3302	
	RCA	CA3302	
	Signetics	LM2901	
		MC3302	
	SiliconG	SG3302	
	TI	LM2901	
		LM3302	
LM2902	Fairchild	μA2902	
	Hitachi	HA17902	
	Motorola	LM2902	
	NEC-Electron	μPC2902	
	Raytheon	LM2902	
	TI	LM2902	
LM2903	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM311**	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
LM2904	Motorola	LM2904	
	RCA	CA2904	
	TI	LM2904	
LM2907	Cherry	CS2907-D14	
LM2917	Cherry	CS2917	
LM293	Fairchild	μA293	
	Motorola	LM293	
	Signetics	LM293	
LM293	TI	LM293	
LM298	Fairchild	μAF398	
	National	LF398	
	PMI	SMP-10	
	Signetics	NE5537	
LM301	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
LM3011	RCA	CA3011	
LM3018	RCA	CA3018	
	Thomson-CSF	SFC2018	
LM3019	RCA	CA3019	
LM301A	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
LM302	AMD	LM302	
	Intersil	LM302	
	SiliconG	SG302	
LM304	NEC-Electron	μPC142	
	SiliconG	SG304	
	Thomson-CSF	SFC2304	
LM3045	Fairchild	μA3045	
	Hitachi	HA1127	
	Plessey	SL3045	
	RCA	CA3045	
	SiliconG	SG3045	
LM3046	Motorola	MC3346	
	Plessey	SL3146	
	RCA	CA3046	
		CA3146	
	SiliconG	SG3046	
		SG3146	
	Sprague	ULN-2046	
LM305	AMD	LM305	
	Fairchild	μA305	
	Intersil	LM305	
	NEC-Electron	μPC141	
	SiliconG	SG305	
	Thomson-CSF	SFC2305	
LM306	AMD	LM306	
	Fairchild	MA306	
	TI	LM306	
LM3064	Motorola	M5140	
		MC1358	
		MC1364	
	RCA	CA3064	
		CA3065	
	Sanyo	LA1365	
	TI	SN76666	
LM3066	RCA	CA3066	
	TI	SN76266	
LM307	AMD	LM307	
	AD	**AD741J**	**3153**
	Intersil	LM307	
	Motorola	LM307	
	Raytheon	LM307	
	RCA	CA307	
	SiliconG	SG307	
	TI	LM307	
	Thomson-CSF	SFC2307	
LM3072	RCA	CA3072	
LM3075	RCA	CA3075	
	TI	SN76675	
LM308	AMD	LM308	
	AD	**AD308**	**3153**
	Burr-Brown	3500	
		3501	
	Fairchild	μA308	
	Intersil	AD308	
		LM308	
	MicroPwr	MP5505	
	Motorola	LM308	
	Raytheon	LM308	
	SiliconG	SG308	
LM3086	Fairchild	μA3086	
	Motorola	MC3386	
	Plessey	SL3046	
		SL3086	
	RCA	CA3046	
		CA3086	
	SiliconG	SG3086	
		SG3821	
		SG3886	
	Sprague	ULN-2046	
		ULN-2086	
LM3089	Hitachi	HA1137	
		LA1230	
	Motorola	MC1389	
	National	CA3089	
	RCA	CA3089	
	Sanyo	LA1230	
		LA3089	
	SGS	TCA3089	
		TDA1200	
	Signetics	CA3089	
	Siliconix	CA3089	
	TI	SN76689	
LM309	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
LM310	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM210	
	PMI	BUF-01	
		BUF-02	
		BUF-03	
	SiliconG	SG110	
		SG210	
		SG310	
LM311	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
LM312	AMD	AMLM112	
		AMLM212	
		AMLM312	
		LM312	
	Motorola	LM312	
	SiliconG	SG3118	
LM3126	National	LM1829	
	RCA	CA3126	
LM313	AD	AD589	
	Datel	VR-8069	
	Ferranti	ZN423	
	Intersil	ICL8069	
	MicroPwr	**MP5010**	**401,3292**
	National	**LM113**	**3304**
	TeledyneS	9491	
		9941	
LM317	Fairchild	μA317	
	MicroEng	MCE-LM317	
	Motorola	**LM317**	**3295**
	SiliconG	SG317	
	TI	LM317	
LM317M	**Motorola**	**LM317M**	**3295**
LM318	AMD	LM218	
		LM318	
	AD	**AD518**	**3155**
	Fairchild	μA318	
	National	LM218	
	NEC-Electron	μPC159	
	TI	LM218	
		LM318	
LM319	AMD	LM319	
	NEC-Electron	μPC319	
	Signetics	LM319	
LM320	Lambda	LLM320	
LM320-15	Fairchild	μA7915	
	Lambda	LμA7915	
	Motorola	MC7915	
	National	LM120-15	
		LM320T15	
		LM7915	
	SiliconG	SG120-15	
		SG320-15	
		SG7915	
	TI	μA7915	
LM320-5	SiliconG	SG320-5	
LM320MP12	Fairchild	μA7912	
		μA79M12	
	Motorola	MC7912	
	National	LM120-12	
		LM7912	
		LM79M12	
	SiliconG	SG120-12	
		SG320P-12	
		SG7912	
	TI	μA7912	
LM320MP5	Fairchild	μA7905	
		μA79M05	
	Lambda	LMC7905	
		LμA7905	
	Motorola	MC7905	
	National	LM7905	
		LM79M05	
	SiliconG	SG120-5	
		SG320-05	
		SG320P-5	
		SG7905	
	TI	μA7905	
LM320T15	Fairchild	μA7915	
	Lambda	LμA7915	
	Motorola	MC7915	
	National	LM120-15	
		LM320-15	
		LM7915	
	SiliconG	SG120-15	
		SG320-15	
		SG7915	
	TI	μA7915	
LM323	Fairchild	SH0323	
		SH323	
		μA78H05	
	Lambda	LAS1405	
		LAS1905	
	Motorola	**LM323**	**3294**
		MC78T05C	
	SiliconG	SG323	
LM324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LM324	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
LM324A	TI	LM324A	
LM3301	Hitachi	HA17301	
	Motorola	LM2900	
		MC3301	
	National	LM2900	
	Raytheon	LM2900	
		RC3301	
	TI	LM2900	
LM3302	Fairchild	μA2901	
		μA3302	
	Motorola	LM2901	
		MC3302	
	National	LM2901	
	NEC-Electron	μPC2901	
	PMI	CMP-04	
	Raytheon	LM2901	
		RV3302	
	RCA	CA3302	
	Signetics	LM2901	
		MC3302	
	SiliconG	SG3302	
	TI	LM2901	
		LM3302	
LM337	MicroEng	MCE-LM337	
	TI	LM337	
LM339	AMD	LM339	
		LM339A	
	Fairchild	μA339	
	Hitachi	HA17901	
	Motorola	LM339	
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
		LM339	
	SiliconG	SG339	
	TI	LM339	
LM340	Lambda	LLM340	
LM340-10	TI	LM340-10	
LM340-15	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340LA-15**	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
LM3401	Motorola	MC3401	
	National	LM3900	
	Raytheon	LM3900	
		RC3401	
	RCA	CA3401	
	TI	LM3900	
LM340LA-12	Fairchild	μA78L12	
	Motorola	MC78L12	
	National	LM78L12	
	NEC-Electron	μPC78L12	
	TI	μA78L12	
LM340LA-15	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
LM340LA-15	**National**	**LM340-15**	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
LM340LA-5	Fairchild	μA78L05	
	Motorola	MC78L05	
	National	LM78L05	
	NEC-Electron	μPC78L05	
	TI	μA78L05	
LM340T-15	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
LM341-12	Fairchild	μA78M12	
	Motorola	MC78M12	
	National	**LM342-12**	**3299**
		LM78M12	
	NEC-Electron	μPC78M12	
	NEC-Micro	μPC78M12	
	Sanyo	L78M12	
LM341-15	Fairchild	μA78M15	
	Motorola	MC78M15	
	National	**LM342-15**	**3299**
		LM78M15	
	NEC-Electron	μPC78M15	
	NEC-Micro	μPC78M15	
	Sanyo	L78M15	
LM341-5	Fairchild	μA78M05	
	Motorola	MC78M05	
	National	LM342-05	
		LM78M05	
	NEC-Electron	μPC78M05	
	NEC-Micro	μPC78M05	
	Sanyo	L78M05	
	TI	μA78M05	
LM342-05	Fairchild	μA78M05	
	Motorola	MC78M05	
	National	**LM341-5**	**3300**
		LM78M05	
	NEC-Electron	μPC78M05	
	NEC-Micro	μPC78M05	
	Sanyo	L78M05	
	TI	μA78M05	
LM342-12	Fairchild	μA78M12	
	Motorola	MC78M12	
	National	**LM341-12**	**3300**
		LM78M12	
	NEC-Electron	μPC78M12	
	NEC-Micro	μPC78M12	
	Sanyo	L78M12	
LM342-15	Fairchild	μA78M15	
	Motorola	MC78M15	
	National	**LM341-15**	**3300**
		LM78M15	
	NEC-Electron	μPC78M15	
	NEC-Micro	μPC78M15	
	Sanyo	L78M15	
LM343	**Datel**	**AM-464-2**	**2622**
	Harris	**HA-2645**	**3232,3287**
	Motorola	MC1436	
		MC1439	
	National	LM1436	
	SiliconG	SG1436	
	TeledyneP	1332	
LM346	**Exar**	**XR346**	**3207**
	Raytheon	LM346	
◆LM346-2	Raytheon	LM346-2	
LM348	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
LM349	AMD	LM349	
LM350	Fairchild	μA78HGA	
	Motorola	**LM350**	**3295**
	SiliconG	SG350	
◆LM351	Fairchild	75453	
	Hitachi	HD75453	
	Motorola	MC75453	
	National	DS75453	
		LM75453	
	SiliconG	SG75453	
	TI	SN75453	
◆LM354	Thomson-CSF	SFC2524	
		SFC2525	
LM358A	Motorola	LM358	
	NEC-Electron	μPC358	
	RCA	CA358A	
		LM358	
	Sanyo	LA6358	
	Signetics	LM358	
		NE532	
	TI	LM358	
LM361	Signetics	NE529	
LM3611	Sprague	UDN-3611	
LM376	Fairchild	μA376	
LM377	TI	SN76177	
LM380	Sprague	ULN-2280	
LM381	Signetics	LM381	
LM382	Signetics	LM382	
LM383	Sprague	ULN-3701	
LM385	Motorola	LM385	
LM387	Signetics	LM387	
LM388	TI	LM388	
LM3900	Motorola	MC3401	
	National	LM3401	
	Raytheon	LM3900	
		RC3401	
	RCA	CA3401	
	TI	LM3900	
LM3911	NEC-Electron	μPC3911	
LM3914	TI	LM3914	
LM3915	TI	LM3915	
LM393	Fairchild	μA393	
	Motorola	LM393	
	Sanyo	LA6393	
	Signetics	LM393	
	TI	LM393	
LM4250	Fairchild	μA776	
	Harris	**HA-2720**	**3236**
	Intersil	ICL8021	
		LM4250	
	Motorola	MC1776	
	SiliconG	SG4250	
	Solitron	UC4250	
LM4500	Motorola	TCA4500	
	Siemens	TCA4500	
LM550	Signetics	SE550	
LM55107A	Fairchild	55107	
	Motorola	MC55107	
	National	DS55107	
	TI	SN55107	
		SN55107B	
LM55108A	Fairchild	55108	
	Motorola	MC55108	
	National	DS55108	
	TI	SN55108	
		SN55108B	
LM5520	SiliconG	SG5520	
	TI	SN5520	
LM5521	SiliconG	SG5521	
LM5522	Motorola	MC5522	
		MC5523	
	SiliconG	SG5522	
	TI	SN5522	
LM5523	SiliconG	SG5523	
LM5524	Fairchild	MC5524	
	Motorola	MC5524	
	Raytheon	RM5524	
	SiliconG	SG5524	
	TI	SN5524	
LM5525	Fairchild	MC5525	
	Motorola	MC5525	
	SiliconG	SG5525	
LM5528	Fairchild	MC5528	
	Motorola	MC5528	
	SiliconG	SG5528	
	TI	SN5528	
LM5529	Fairchild	MC5529	
	Motorola	MC5529	
	SiliconG	SG5529	
LM55325	Fairchild	MC55325	
	Motorola	MC55325	
	National	DS55325	
	Signetics	55325	
	SiliconG	SG55325	
	TI	SN55325	
LM5534	Fairchild	MC5534	
	Motorola	MC5534	
	SiliconG	SG5534	
LM5535	Motorola	MC5535	
	SiliconG	SG5535	
	TI	SN5535	
LM5538	SiliconG	SG5538	
LM5539	Motorola	MC5539	
	SiliconG	SG5539	
LM55450	Fairchild	55450	
	Signetics	55450	
	SiliconG	SG55450	
	TI	SN55450	
LM55451	Fairchild	55451	
	National	DS55451	
	Signetics	55451	
	SiliconG	SG55451	
	TI	SN55451	
LM55452	Fairchild	55452	
	National	DS55452	
	Signetics	55452	
	SiliconG	SG55452	
	TI	SN55452	
LM55453	Fairchild	55453	
	National	DS55453	
	Signetics	55453	
	SiliconG	SG55453	
	TI	SN55453	
LM55454	National	DS55454	
	Signetics	55454	
	SiliconG	SG55454	
	TI	SN55454	
LM555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
LM556	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
LM565	Signetics	NE565	
		SE565	
LM566	Signetics	NE566	
		SE566	
LM567	Exar	XR2567	
		XR567	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LM567	Raytheon	XR2567	
	Signetics	NE567	
		SE567	
LM709	Fairchild	μA709	
	Hitachi	HA1303	
	Motorola	MC1709	
	National	LM1709	
	NEC-Electron	μPC255	
		μPC55	
	Raytheon	RC709	
		RM709	
	RCA	CA3038	
	TI	μA709	
	Thomson-CSF	SFC2709	
	Toshiba	TA7502	
LM710	Fairchild	μA710	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM710	
		MC1710	
	PMI	CMP-01	
		CMP-02	
	Raytheon	RM710	
	SiliconG	SG710	
	TI	μA710	
	Thomson-CSF	SFC2710	
LM711	Fairchild	μA711	
	Motorola	MC1711	
	SiliconG	SG711	
	TI	μA711	
	Thomson-CSF	SFC2711	
LM723	Fairchild	μA723	
	Hitachi	HA17723	
	Intersil	LM723	
	Motorola	**MC1723**	**3295**
	Raytheon	RC723	
		RM723	
	RCA	CA723	
		LM723	
	SGS	L123	
	Signetics	μA723	
	SiliconG	SG723	
	TI	μA723	
	Thomson-CSF	SFC2723	
LM733	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	MC1733	
		NE592	
		SE592	
	Raytheon	RM592	
	Signetics	SE592	
		μA733	
	SiliconG	SG733	
	TI	μA733	
LM741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
LM747	AMD	747	
LM747	Fairchild	μA747	
	Hitachi	HA17747	
	Motorola	MC1747	
	NEC-Electron	μPC251	
	PMI	OP-04	
		PM747	
	Raytheon	RC747	
		RM747	
	RCA	CA747	
	Signetics	μA747	
	SiliconG	SG747	
	TeledyneS	747	
	TI	μA747	
LM748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
LM75107A	Fairchild	75107	
	Motorola	MC75107	
	National	DS75107	
	TI	SN75107	
		SN75107B	
LM75108A	Fairchild	75108	
	Motorola	MC75108	
	National	DS75108	
	TI	SN75108	
		SN75108B	
LM75110	Fairchild	75110	
	Hitachi	HD75110	
	Motorola	MC75110	
	TI	SN75110	
		SN75110A	
LM75121	Motorola	MC8T13	
	National	DS75121	
	Signetics	N8T13	
	TI	N8T13	
		SN75121	
LM75122	Motorola	MC8T14	
	National	DS75122	
	Signetics	N8T14	
	TI	N8T14	
		SN75122	
LM75123	Motorola	MC8T23	
	National	DS75123	
	Signetics	N8T23	
	TI	N8T23	
		SN75123	
LM75124	Motorola	MC8T24	
	National	DS75124	
	Signetics	N8T24	
	TI	N8T24	
		SN75124	
LM7520	Fairchild	7520	
	Motorola	MC7520	
	SiliconG	SG7520	
	TI	SN7520	
LM7521	Fairchild	7521	
	Motorola	MC7521	
	SiliconG	SG7521	
	TI	SN7521	
LM7522	Motorola	MC7522	
	SiliconG	SG7522	
	TI	SN7522	
LM7523	Motorola	MC7523	
	Raytheon	RC7523	
	SiliconG	SG7523	
	TI	SN7523	
LM7524	Fairchild	75S24	
	Hitachi	HA1902	
	Motorola	MC7524	
	National	75S24	
	Signetics	SN7524	
LM7524	SiliconG	SG7524	
	TI	SN75224	
		SN7524	
LM7525	AMD	7525	
	Fairchild	7525	
	Motorola	MC7525	
	SiliconG	SG7525	
◆LM7528	Motorola	MC7528	
	Raytheon	RC7528	
	SiliconG	SG7528	
	TI	SN7528	
	Thomson-CSF	SFC2528	
LM7529	Fairchild	7529	
	Motorola	MC7529	
	Raytheon	RC7529	
	SiliconG	SG7529	
LM75324	National	DS75324	
	TI	SN75324	
LM75325	Motorola	MC75325	
	National	DS75325	
	SiliconG	SG75325	
	TI	SN75325	
◆LM7534	Motorola	MC7534	
	SiliconG	SG7534	
LM7535	Motorola	MC7535	
	SiliconG	SG7535	
LM7538	Fairchild	7538	
	Motorola	MC7538	
	SiliconG	SG7538	
LM7539	Fairchild	7539	
	Motorola	MC7539	
	SiliconG	SG7539	
LM75450	Fairchild	75450	
	Motorola	MC75450	
	National	DS75450	
	SiliconG	SG75450	
	TI	SN75450	
LM75451	Fairchild	75451	
	Motorola	MC75451	
	National	DS75451	
	SiliconG	SG75451	
	TI	SN75451	
LM75452	Fairchild	75452	
	Hitachi	HD75452	
	Motorola	MC75452	
	National	DS75452	
	SiliconG	SG75452	
	TI	SN75452	
LM75453	Fairchild	75453	
	Hitachi	HD75453	
	Motorola	MC75453	
	National	DS75453	
	SiliconG	SG75453	
	TI	SN75453	
LM75454	Motorola	MC75454	
	National	DS75454	
	SiliconG	SG75454	
	TI	SN75454	
LM7805	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
LM7812	Fairchild	μA7812	
	Lambda	LMC7812	
		LμA7812	
	Motorola	**MC7812**	**3294**
	NEC-Electron	μPC7812	
	SGS	L7812	
	SiliconG	SG7812	
	TI	μA7812	
	Toshiba	TA78012	
LM7815	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
LM7815	**National**	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
LM78L05	Fairchild	μA78L05	
	Motorola	MC78L05	
	National	LM340LA-5	
	NEC-Electron	μPC78L05	
	TI	μA78L05	
LM78L12	Fairchild	μA78L12	
	Motorola	MC78L12	
	National	**LM340LA-12**	**3299**
	NEC-Electron	μPC78L12	
	TI	μA78L12	
LM78L15	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
LM78M05	Fairchild	μA78M05	
	Motorola	MC78M05	
	National	**LM341-5**	**3300**
		LM342-05	
	NEC-Electron	μPC78M05	
	NEC-Micro	μPC78M05	
	Sanyo	L78M05	
	TI	μA78M05	
LM78M12	Fairchild	μA78M12	
	Motorola	MC78M12	
	National	**LM341-12**	**3300**
		LM342-12	**3299**
	NEC-Electron	μPC78M12	
	NEC-Micro	μPC78M12	
	Sanyo	L78M12	
LM78M15	Fairchild	μA78M15	
	Motorola	MC78M15	
	National	**LM341-15**	**3300**
		LM342-15	**3299**
	NEC-Electron	μPC78M15	
	NEC-Micro	μPC78M15	
	Sanyo	L78M15	
LM78M18	Motorola	MC78M18	
	Sanyo	L78M18	
LM78M24	Fairchild	μA78M24	
	Motorola	MC78M24	
	Sanyo	L78M24	
	TI	μA78M24	
LM7905	Fairchild	μA7905	
		μA79M05	
	Lambda	LMC7905	
		LμA7905	
	Motorola	MC7905	
	National	LM320MP5	
		LM79M05	
	SiliconG	SG120-5	
		SG320-05	
		SG320P-5	
		SG7905	
	TI	μA7905	
LM7912	Fairchild	μA7912	
		μA79M12	
	Motorola	MC7912	
	National	LM120-12	
		LM320MP12	
		LM79M12	
	SiliconG	SG120-12	
		SG320P-12	
		SG7912	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LM7912	TI	μA7912	
LM7915	Fairchild	μA7915	
	Lambda	LμA7915	
	Motorola	MC7915	
	National	LM120-15	
		LM320-15	
		LM320T15	
	SiliconG	SG120-15	
		SG320-15	
		SG7915	
	TI	μA7915	
LM79M05	Fairchild	μA7905	
		μA79M05	
	Lambda	LMC7905	
		LμA7905	
	Motorola	MC7905	
	National	LM320MP5	
		LM7905	
	SiliconG	SG120-5	
		SG320-05	
		SG320P-5	
		SG7905	
	TI	μA7905	
LM79M12	Fairchild	μA7912	
		μA79M12	
	Motorola	MC7912	
	National	LM120-12	
		LM320MP12	
		LM7912	
	SiliconG	SG120-12	
		SG320P-12	
		SG7912	
	TI	μA7912	
MCA1200	LSILogic	LCA1200	
MCA1300	Motorola	MCA1300	
MCA500	Motorola	MCA500	
MCA600	LSILogic	LCA600	
MH0025	National	DS0025	
MH0026	AMD	MMH0026	
	Motorola	MMH0026	
	National	DS0026	
MH0056	National	DS0056	
MH8808	National	DS8808	
MM1702	AMD	1702A	
MM2102A	AMD	AM9102	
	Fairchild	2102H	
	Panasonic	MN2102	
	SGS	M2102A	
MM2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
MM2141	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
MM2141	National	MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
MM2142	Intel	2142	
MM2147	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
MM2532	**Hitachi**	**HN462532**	**3789**
	Motorola	MCM2532	
	National	NMC2532	
		TDA2530	
		TDA2532	
	Plessey	TDA2530	
	Siemens	TDA2530	
	Signetics	TDA2530	
		TDA2532	
	SiliconG	SG2532	
	TI	TMS2532	
	Universal	UM2532	
MM2708	AMD	2708	
	Fairchild	F2708	
	Hitachi	HN462708	
	Motorola	MC27A08	
		MCM2708	
	NEC-EA	EA2708	
	Panasonic	MN2708	
	Rockwell	2708	
	SGS	M2708	
	TI	TMS2708	
MM2716	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HN462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
MM2732	AMD	2732	
	Fairchild	F2732	
	Hitachi	**HN462732**	**3789**
	Intel	2732	
		2732A	**3819,3822**
		M2732	
	Mitsubishi	M5L2732	
	National	NMC2732	
	NEC-Micro	μPD2732	
	Toshiba	TMM2732	
		TMM324C	
	Universal	UM2732	
MM4104	Fairchild	F4104	
	GTEMicro	G4104	
	Mitel	MD4104	
	Motorola	MC14504	
	RCA	CD40109	
	SGS	HCF40109	
	Signetics	HEF4104	
◆MM450	Intersil	MM450	
◆MM451	Intersil	MM451	
◆MM452	Intersil	MM452	
	Siliconix	SI452	
◆MM455	Intersil	MM455	
	Siliconix	SI455	
MM5066	AMD	5056	
MM52116	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
MM52116	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	RO3-8316	
		RO3-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
MM52132	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	RO3-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
MM52164	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
MM5235	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
MM5257	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
MM5258	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	RO3-8316	
		RO3-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
MM5280	Panasonic	MN1001	
MM5290	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
MM5298	TI	TMS4108-15	
MM5303	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
MM54C04	Fairchild	F4069	
	Hitachi	HD14069	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MM54C04	Motorola	MC14069	
	National	CD4069	
		MM74C04	
	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	
	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
MM54C14	Fairchild	F40014	
	Hitachi	HD14584	
	Motorola	MC14584	
	National	CD40106	
		CD4584	
		MM74C14	
	RCA	CD40106	
	SGS	HCF40106	
	Signetics	HEF40106	
	SSS	SCL4584	
MM54C160	Fairchild	F40160	
	Hitachi	HD14160	
	Motorola	MC14160	
	National	CD40160	
		MM74C160	
	RCA	CD40160	
	SGS	HCF40160	
	Signetics	HEF4060	
	SSS	SCL4160	
	Toshiba	TC40160	
MM54C161	Fairchild	F40161	
	Hitachi	HD14161	
	Motorola	MC14161	
	National	CD40161	
		MM74C161	
	RCA	CD40161	
	SGS	HCF40161	
	Signetics	HEF40161	
	SSS	SCL4161	
	Toshiba	TC40161	
MM54C162	Fairchild	F40162	
	Hitachi	HD14162	
	Motorola	MC14162	
	National	CD40162	
		MM74C162	
	RCA	CD40162	
	SGS	HCF40162	
	Signetics	HEF40162	
	SSS	SCL4162	
	Toshiba	TC40162	
MM54C163	Fairchild	F40163	
	Hitachi	HD14163	
	Motorola	MC14163	
	National	CD40163	
		MM74C163	
	RCA	CD40163	
	SGS	HCF40163	
	Signetics	HEF40163	
	SSS	SCL4163	
	Toshiba	TC40163	
MM54C173	Fairchild	F4076	
	Hitachi	HD14076	
	Motorola	MC14076	
	National	CD4076	
		MM74C173	
	RCA	CD4076	
	SGS	HCF4076	
	Signetics	HEF4076	
	SSS	SCL4076	
	Solitron	CM4076	
	Toshiba	TC4076	
MM54C174	Fairchild	F40174	
	Hitachi	HD14174	
	Motorola	MC14174	
	National	CD40174	
		MM74C174	
	RCA	CD40174	
	SGS	HCF40174	
	Signetics	HEF40174	
	SSS	SCL4174	
	Toshiba	TC40174	
MM54C175	Fairchild	F40175	
	Hitachi	HD14175	
	Motorola	MC14175	
	National	CD40175	
		MM74C175	
MM54C175	Signetics	HEF40175	
	Toshiba	TC40175	
MM54C192	Fairchild	F40192	
	National	MM74C192	
MM54C193	Fairchild	F40193	
	National	CD40193	
		MM74C193	
	RCA	CD40193	
	SGS	HCF40193	
	Signetics	HEF40193	
	SSS	SCL4193	
	Toshiba	TC40193	
MM54GC393	Motorola	MC54HC393	
	RCA	CD54HG393	
	Signetics	PCF54HC393	
MM54HC00	**Motorola**	**MC54HC00**	733
	RCA	**CD54HC00**	740
	Signetics	PCF54HC00	
MM54HC02	Motorola	MC54HC02	
	RCA	**CD54HC02**	740
	Signetics	PCF54HC02	
MM54HC04	Motorola	MC54HC04	
	RCA	**CD54HC04**	740
	Signetics	PCF54HC04	
MM54HC08	Motorola	MC54HC08	
	RCA	**CD54HC08**	740
	Signetics	PCF54HC08	
MM54HC10	Motorola	MC54HC10	
	RCA	**CD54HC10**	740
	Signetics	PCF54HC10	
MM54HC107	Motorola	MC54HC107	
	RCA	**CD54HC107**	739
	Signetics	PCF54HC107	
MM54HC109	Motorola	MC54HC109	
	RCA	**CD54HC109**	739
	Signetics	PCF54HC109	
MM54HC11	Motorola	MC54HC11	
	RCA	**CD54HC11**	740
	Signetics	PCF54HC11	
MM54HC112	Motorola	MC54HC112	
	RCA	**CD54HC112**	739
	Signetics	PCF54HC112	
MM54HC123	Motorola	MC54HC123	
	RCA	CD54HC123	
	Signetics	PCF54HC123	
MM54HC132	Motorola	MC54HC132	
	RCA	CD54HC132	
	Signetics	PCF54HC132	
MM54HC133	Motorola	MC54HC133	
	RCA	**CD54HC133**	740
	Signetics	PCF54HC133	
MM54HC138	Motorola	MC54HC138	
	RCA	**CD54HC138**	739
	Signetics	PCF54HC138	
MM54HC139	Motorola	MC54HC139	
	RCA	**CD54HC139**	739
	Signetics	PCF54HC139	
MM54HC14	Motorola	MC54HC14	
	RCA	**CD54HC14**	740
	Signetics	PCF54HC14	
MM54HC147	Motorola	MC54HC147	
	RCA	**CD54HC147**	739
	Signetics	PC54HC147	
MM54HC151	Motorola	MC54HC151	
	RCA	**CD54HC151**	740
	Signetics	PCF54HC151	
MM54HC153	Motorola	MC54HC153	
	RCA	**CD54HC153**	740
	Signetics	PCF54HC153	
MM54HC154	Motorola	MC54HC154	
	RCA	**CD54HC154**	739
	Signetics	PCF54HC154	
MM54HC158	Motorola	MC54HC158	
	RCA	CD54HC158	
	Signetics	PCF54HC158	
MM54HC160	Motorola	MC54HC160	
	RCA	**CD54HC160**	739
	Signetics	PCF54HC160	
MM54HC161	Motorola	MC54HC161	
	RCA	**CD54HC161**	739
	Signetics	PCF54HC161	
MM54HC162	Motorola	MC54HC162	
	RCA	**CD54HC162**	739
	Signetics	PCF54HC162	
MM54HC163	Motorola	MC54HC163	
	RCA	**CD54HC163**	739
	Signetics	PCF54HC163	
MM54HC164	Motorola	MC54HC164	
	RCA	**CD54HC164**	740
	Signetics	PCF54HC164	
MM54HC165	Motorola	MC54HC165	
MM54HC165	**RCA**	**CD54HC165**	740
	Signetics	PCF54HC165	
MM54HC173	Motorola	MC54HC173	
	RCA	**CD54HC173**	739
	Signetics	PCF54HC173	
MM54HC174	Motorola	MC54HC174	
	RCA	**CD54HC174**	739
	Signetics	PCF54HC174	
MM54HC175	Motorola	MC54HC175	
	RCA	**CD54HC175**	739
	Signetics	PCF54HC175	
MM54HC192	Motorola	MC54HC192	
	RCA	**CD54HC192**	739
	Signetics	PCF54HC192	
MM54HC193	Motorola	MC54HC193	
	RCA	**CD54HC193**	739
	Signetics	PCF54HC193	
MM54HC194	Motorola	MC54HC194	
	RCA	**CD54HC194**	740
	Signetics	PCF54HC194	
MM54HC195	Motorola	MC54HC195	
	RCA	**CD54HC195**	740
	Signetics	PCF54HC195	
MM54HC20	Motorola	MC54HC20	
	RCA	**CD54HC20**	740
	Signetics	PCF54HC20	
MM54HC221	Motorola	MC54HC221	
	RCA	**CD54HC221**	740
	Signetics	PCF54HC221	
MM54HC240	Motorola	MC54HC240	
	RCA	**CD54HC240**	740
	Signetics	PCF54HC240	
MM54HC241	Motorola	MC54HC241	
	RCA	**CD54HC241**	740
	Signetics	PCF54HC241	
MM54HC242	Motorola	MC54HC242	
	RCA	**CD54HC242**	739
	Signetics	PCF54HC242	
MM54HC243	Motorola	MC54HC243	
	RCA	**CD54HC243**	739
	Signetics	PCF54HC243	
MM54HC244	Motorola	MC54HC244	
	RCA	**CD54HC244**	740
	Signetics	PCF54HC244	
MM54HC245	Motorola	MC54HC245	
	RCA	**CD54HC245**	739
	Signetics	PCF54HC245	
MM54HC251	Motorola	MC54HC251	
	RCA	**CD54HC251**	740
	Signetics	PCF54HC251	
MM54HC253	Motorola	MC54HC253	
	RCA	CD54HC253	
	Signetics	PCF54HC253	
MM54HC257	Motorola	MC54HC257	
	RCA	**CD54HC257**	740
	Signetics	PCF54HC257	
MM54HC259	Motorola	MC54HC259	
	RCA	**CD54HC259**	739
	Signetics	PCF54HC259	
MM54HC266	Motorola	MC54HC266	
	RCA	**CD54HC266**	740
	Signetics	PCF54HC266	
MM54HC27	Motorola	MC54HC27	
	RCA	**CD54HC27**	740
	Signetics	PCF54HC27	
MM54HC280	Motorola	MC54HC280	
	RCA	**CD54HC280**	739
	Signetics	PCF54HC280	
MM54HC299	Motorola	MC54HC299	
	RCA	CD54HC299	
	Signetics	PCF54HC299	
MM54HC30	Motorola	MC54HC30	
	RCA	**CD54HC30**	740
	Signetics	PCF54HC30	
MM54HC32	Motorola	MC54HC32	
	RCA	**CD54HC32**	740
	Signetics	PCF54HC32	
MM54HC354	Motorola	MC54HC354	
	RCA	**CD54HC354**	740
	Signetics	PCF54HC354	
MM54HC356	Motorola	MC54HC356	
	RCA	**CD54HC356**	740
	Signetics	PCF54HC356	
MM54HC365	Motorola	MC54HC365	
	RCA	**CD54HC365**	740
	Signetics	PCF54HC365	
MM54HC366	Motorola	MC54HC366	
	RCA	**CD54HC366**	740
	Signetics	PCF54HC366	
MM54HC367	Motorola	MC54HC367	
	RCA	**CD54HC367**	740
	Signetics	PCF54HC367	
MM54HC368	Motorola	MC54HC368	
	RCA	**CD54HC368**	740
	Signetics	PCF54HC368	
MM54HC373	Motorola	MC54HC373	
	RCA	**CD54HC373**	739
	Signetics	PCF54HC373	
MM54HC374	Motorola	MC54HC374	
	RCA	**CD54HC374**	739
	Signetics	PCF54HC374	
MM54HC390	Motorola	MC54HC390	
		MC74HC365	
	National	MM74HC365	
	RCA	**CD54HC390**	739
		CD74HC365	740
	SPI	**SP74HC365**	771
	Signetics	PCF54HC390	
MM54HC4002	Motorola	MC54HC4002	
	RCA	**CD54HC4002**	740
	Signetics	PCF54HC4002	
MM54HC4020	Motorola	MC54HC4020	
	RCA	**CD54HC4020**	739
	Signetics	PCF54HC4020	
MM54HC4040	Motorola	MC54HC4040	
	RCA	**CD54HC4040**	739
	Signetics	PCF54HC4040	
MM54HC4049	Motorola	MC54HC4049	
	RCA	CD54HC4049	
	Signetics	PCF54HC4049	
MM54HC4050	Motorola	MC54HC4050	
	RCA	**CD54HC4050**	740
	Signetics	PCF54HC4050	
MM54HC4060	Motorola	MC54HC4060	
	RCA	**CD54HC4060**	739
	Signetics	PCF54HC4060	
MM54HC42	Motorola	MC54HC42	
	RCA	**CD54HC42**	739
	Signetics	PCF54HC42	
MM54HC4511	Motorola	MC54HC4511	
	RCA	**CD54HC4511**	739
	Signetics	PCF54HC4511	
MM54HC4514	Motorola	MC54HC4514	
	RCA	**CD54HC4514**	739
	Signetics	PCF54HC4514	
MM54HC4538	Motorola	MC54HC4538	
	RCA	**CD54HC4538**	740
	Signetics	PCF54HC4538	
MM54HC533	Motorola	MC54HC533	
	RCA	**CD54HC533**	739
	Signetics	PCF54HC533	
MM54HC534	Motorola	MC54HC534	
	RCA	**CD54HC534**	739
	Signetics	PCF54HC534	
MM54HC563	**RCA**	**CD54HC563**	739
	Signetics	PCF54HC563	
MM54HC564	**RCA**	**CD54HC564**	739
	Signetics	PCF54HC564	
MM54HC573	Motorola	MC54HC573	
	RCA	**CD54HC573**	739
	Signetics	PCF54HC573	
MM54HC574	Motorola	MC54HC574	
	RCA	**CD54HC574**	739
	Signetics	PCF54HC574	
MM54HC640	Motorola	MC54HC640	
	RCA	**CD54HC640**	739
	Signetics	PCF54HC640	
MM54HC643	Motorola	MC54HC643	
	RCA	**CD54HC643**	739
	Signetics	PCF54HC643	
MM54HC645	Motorola	MC54HC645	
	RCA	**CD54HC645**	739
	Signetics	PCF54HC645	
MM54HC646	Motorola	MC54HC646	
	RCA	**CD54HC646**	739
	Signetics	PCF54HC646	
MM54HC648	Motorola	MC54HC648	
	RCA	**CD54HC648**	739
	Signetics	PCF54HC648	
MM54HC688	Motorola	MC54HC688	
	RCA	**CD54HC688**	739
	Signetics	PCF54HC688	
MM54HC73	Motorola	MC54HC73	
	RCA	**CD54HC73**	739
	Signetics	PCF54HC73	
MM54HC74	Motorola	MC54HC74	
	RCA	**CD54HC74**	739
	Signetics	PCF54HC74	
MM54HC75	Motorola	MC54HC75	
	RCA	CD54HC75	
	Signetics	PCF54HC75	
MM54HC76	Motorola	MC54HC76	
	RCA	**CD54HC76**	739
	Signetics	PCF54HC76	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MM54HC85	Motorola	MC54HC85	
	RCA	**CD54HC85**	**739**
	Signetics	PCF54HC85	
MM54HC86	Motorola	MC54HC86	
	RCA	**CD54HC86**	**740**
	Signetics	PCF54HC86	
MM54S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
◆MM55104	Motorola	MC145104	
◆MM55106	Motorola	MC145106	
◆MM55114	Motorola	MC145104	
◆MM55116	Motorola	MC145106	
◆MM552	Siliconix	SI552	
◆MM555	Siliconix	SI555	
MM5837	AMI	S2688	
MM74C00	Fairchild	F4011	
	Hitachi	HD14011	
	Motorola	MC14011	
	National	CD4011	
	OKI	MSM4011	
	RCA	CD4011	
	Sanyo	LC4011	
	SGS	HCF4011	
	Signetics	HEF4011	
	SSS	SCL4011	
	Solitron	CM4011	
	Toshiba	TC4011	
MM74C02	Fairchild	F4001	
	Hitachi	HD14001	
	Motorola	MC14001	
	National	CD4001	
	OKI	MSM4001	
	RCA	CD4001	
	Sanyo	LC4001B	
	SGS	HCF4001	
	Signetics	HEF4001	
	SSS	SCL4001	
	Solitron	CM4001	
	Toshiba	TC4001	
MM74C04	Fairchild	F4069	
MM74C04	Hitachi	HD14069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	
	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
MM74C08	Fairchild	F4081	
	Hitachi	HD14081	
	Motorola	MC14081	
	National	CD4081	
	OKI	MSM4081	
	RCA	CD4081	
	Sanyo	LC4081	
	SGS	HCF4081	
	Signetics	HEF4081	
	SSS	SCL4081	
	Solitron	CM4081	
	Toshiba	TC4081	
MM74C10	Fairchild	F4023	
	Hitachi	HD14023	
	Motorola	MC14023	
	National	CD4023	
	RCA	CD4023	
	SGS	HCF4023	
	Signetics	HEF4023	
	SSS	SCL4023	
	Solitron	CM4023	
	Toshiba	TC4023	
MM74C14	Fairchild	F40014	
	Hitachi	HD14584	
	Motorola	MC14584	
	National	CD40106	
		CD4584	
		MM54C14	
	RCA	CD40106	
	SGS	HCF40106	
	Signetics	HEF40106	
	SSS	SCL4584	
MM74C160	Fairchild	F40160	
	Hitachi	HD14160	
	Motorola	MC14160	
	National	CD40160	
		MM54C160	
	RCA	CD40160	
	SGS	HCF40160	
	Signetics	HEF4060	
	SSS	SCL4160	
	Toshiba	TC40160	
MM74C161	Fairchild	F40161	
	Hitachi	HD14161	
	Motorola	MC14161	
	National	CD40161	
		MM54C161	
	RCA	CD40161	
	SGS	HCF40161	
	Signetics	HEF40161	
	SSS	SCL4161	
	Toshiba	TC40161	
MM74C162	Fairchild	F40162	
	Hitachi	HD14162	
	Motorola	MC14162	
	National	CD40162	
		MM54C162	
	RCA	CD40162	
	SGS	HCF40162	
	Signetics	HEF40162	
	SSS	SCL4162	
	Toshiba	TC40162	
MM74C163	Fairchild	F40163	
	Hitachi	HD14163	
	Motorola	MC14163	
	National	CD40163	
		MM54C163	
	RCA	CD40163	
	SGS	HCF40163	
	Signetics	HEF40163	
	SSS	SCL4163	
	Toshiba	TC40163	
MM74C164	Fairchild	F4015	
	Hitachi	HD14015	
	Motorola	MC14015	
	National	CD4015	
	OKI	MSM4015	
MM74C164	RCA	CD4015	
	Sanyo	LC4015	
	SGS	HCF4015	
	Signetics	HEF4015	
	SSS	SCL4015	
	Solitron	CM4015	
	Toshiba	TC4015	
MM74C173	Fairchild	F4076	
	Hitachi	HD14076	
	Motorola	MC14076	
	National	CD4076	
		MM54C173	
	RCA	CD4076	
	SGS	HCF4076	
	Signetics	HEF4076	
	SSS	SCL4076	
	Solitron	CM4076	
	Toshiba	TC4076	
MM74C174	Fairchild	F40174	
	Hitachi	HD14174	
	Motorola	MC14174	
	National	CD40174	
		MM54C174	
	RCA	CD40174	
	SGS	HCF40174	
	Signetics	HEF40174	
	SSS	SCL4174	
	Toshiba	TC40174	
MM74C175	Fairchild	F40175	
	Hitachi	HD14175	
	Motorola	MC14175	
	National	CD40175	
		MM54C175	
	Signetics	HEF40175	
	Toshiba	TC40175	
MM74C192	Fairchild	F40192	
	National	MM54C192	
MM74C193	Fairchild	F40193	
	National	CD40193	
		MM54C193	
	RCA	CD40193	
	SGS	HCF40193	
	Signetics	HEF40193	
	SSS	SCL4193	
	Toshiba	TC40193	
MM74C195	Fairchild	F40195	
	National	CD40195	
MM74C221	Fairchild	F4528	
	Hitachi	HD14528	
	Motorola	MC14528	
	National	CD4528	
	RCA	CD4098	
	SGS	HCF4098	
	Signetics	HEF4528	
	SSS	SCL4528	
	Toshiba	TC4528	
MM74C32	Fairchild	F4071	
	Hitachi	HD14071	
	Motorola	MC14071	
	National	CD4071	
	OKI	MSM4071	
	RCA	CD4071	
	Sanyo	LC4071	
	SGS	HCF4071	
	Signetics	HEF4071	
	SSS	SCL4071	
	Solitron	CM4071	
	Toshiba	TC4071	
MM74C42	Fairchild	F4028	
	Hitachi	HD14028	
	Motorola	MC14028	
	National	CD4028	
	OKI	MSM4028	
	Sanyo	LC4028	
	SGS	HCF4028	
	Signetics	HEF4028	
	SSS	SCL4028	
	Solitron	CM4028	
	Toshiba	TC4028	
MM74C74	Fairchild	F4013	
	Hitachi	HD14013	
	Motorola	MC14013	
	National	CD4013	
	OKI	MSM4013	
	RCA	CD4013	
	Sanyo	LC4013	
	SGS	HCF4013	
	Signetics	HEF4013	
	SSS	SCL4013	
	Solitron	CM4013	
	Toshiba	TC4013	
MM74C76	Fairchild	F4027	
MM74C76	Hitachi	HD14027	
	Motorola	MC14027	
	National	CD4027	
	OKI	MSM4027	
	RCA	CD4027	
	Sanyo	LC4027	
	SGS	HCF4027	
	Signetics	HEF4027	
	SSS	SCL4027	
	Solitron	CM4027	
MM74C83	Fairchild	F4008	
	Hitachi	HD14008	
	Motorola	MC14008	
	National	CD4008	
	RCA	CD4008	
	SGS	HCF4008	
	Signetics	HEF4008	
	SSS	SCL4008	
	Solitron	CM4008	
	Toshiba	TC4008	
MM74C85	Fairchild	F40085	
	Hitachi	HD14585	
	Motorola	MC14585	
	RCA	CD4585	
	Signetics	HEF4585	
	SSS	SCL4585	
	Toshiba	TC4585	
MM74C86	Fairchild	F4070	
	Hitachi	HD14070	
	Motorola	MC14070	
	National	CD4070	
	RCA	CD4070	
	SGS	HCF4070	
	Signetics	HEF4070	
	SSS	SCL4070	
	Solitron	CM4070	
MM74C89	Fairchild	F40089	
MM74C920	**Harris**	**HM6551**	**669,1333,3758**
	Intersil	IM6551	
	National	NMC6551	
	NEC-Micro	μPD5101	
	RCA	MWS5101	
MM74C929	AMI	S6508	
	Fairchild	4736B	
	Harris	**HM6508**	**669,1333,3754**
	Intel	2125A	
	Motorola	MCM2125	
	National	NMC6508	
	NEC-Micro	μPD443	
	SSS	SCM21C02	
	Toshiba	TC5508	
MM74C930	Harris	6518	
		HM6518	**669,1333,3756**
	Intersil	IM6518-1	
MM74HC00	**Motorola**	**MC74HC00**	**733**
	RCA	**CD74HC00**	**740**
	SPI	**SP74HC00**	**766**
	Signetics	PCF74HC00	
	Toshiba	TC40H000	
MM74HC02	Motorola	MC74HC02	
	RCA	**CD74HC02**	**740**
	SPI	**SP74HC02**	**766**
	Signetics	PCF74HC02	
	Toshiba	TC40H002	
MM74HC04	Motorola	MC74HC04	
	RCA	**CD74HC04**	**740**
	SPI	**SP74HC04**	**766**
	Toshiba	TC40H004	
MM74HC08	Motorola	MC74HC08	
	RCA	**CD74HC08**	**740**
	Signetics	PCF74HC08	
MM74HC10	Motorola	MC74HC10	
		MC74HC10	
	RCA	CD74H10	
		CD74HC10	**740**
	SPI	**SP74HC10**	**766**
	Signetics	PCF74HC10	
	Toshiba	TC40H010	
MM74HC107	Motorola	MC74HC107	
	RCA	**CD74HC107**	**739**
	SPI	**SP74HC107**	**768**
	Signetics	PCF74HC107	
	Toshiba	TC40H107	
MM74HC109	Motorola	MC74HC109	
		MC74HC109	
	RCA	**CD74HC109**	**739**
	SPI	**SP74HC109**	**768**
	Signetics	PCF74HC109	
MM74HC11	Motorola	MC74HC11	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MM74HC11	**RCA**	**CD74HC11**	**740**
	SPI	**SP74HC11**	**766**
	Signetics	PCF74HC11	
	Toshiba	TC40H011	
MM74HC112	Motorola	MC74HC112	
	RCA	**CD74HC112**	**739**
	SPI	SP74HC112N	
	Signetics	PCF74HC112	
MM74HC123	Motorola	MC74HC123	
	RCA	CD74HC123	
	Signetics	PCF74HC123	
MM74HC132	Motorola	MC74HC132	
	RCA	CD74HC132	
	Signetics	PCF74HC132	
MM74HC133	Motorola	MC74HC133	
	RCA	**CD74HC133**	**740**
	Signetics	PCF74HC133	
MM74HC138	Motorola	MC74HC138	
	RCA	**CD74HC138**	**739**
	SPI	SP74HC138	
	Signetics	PCF74HC138	
MM74HC139	Motorola	MC74HC139	
	RCA	**CD74HC139**	**739**
	SPI	**SP74HC139**	**769**
	Signetics	PCF74HC139	
	Toshiba	TC40H139	
MM74HC14	Motorola	MC74HC14	
	RCA	**CD74HC14**	**740**
	SPI	**SP74HC14**	**766**
	Signetics	PCF74HC14	
MM74HC147	Motorola	MC74HC147	
	RCA	**CD74HC147**	**739**
	SPI	**SP74HC147**	**769**
	Signetics	PCF74HC147	
MM74HC151	Motorola	MC74HC151	
	RCA	**CD74HC151**	**740**
	Signetics	PCF74HC151	
MM74HC153	Motorola	MC74HC153	
	RCA	**CD74HC153**	**740**
	SPI	**SP74HC153**	**769**
	Signetics	PCF74HC153	
	Toshiba	TC40H153	
MM74HC154	Motorola	MC74HC154	
	RCA	**CD74HC154**	**739**
	Signetics	PCF74HC154	
MM74HC157	Motorola	MC74HC157	
	RCA	CD74HC157	
	SPI	**SP74HC157**	**769**
	Signetics	PCF74HC157	
	Toshiba	TC40H157	
MM74HC158	Motorola	MC74HC158	
	RCA	CD74HC158	
	SPI	**SP74HC158**	**769**
	Signetics	PCF74HC158	
	Toshiba	TC40H158	
MM74HC160	Motorola	MC74HC160	
	RCA	**CD74HC160**	**739**
	Signetics	PCF74HC160	
MM74HC161	Motorola	MC74HC161	
	RCA	**CD74HC161**	**739**
	SPI	**SP74HC161**	**770**
	Signetics	PCF74HC161	
MM74HC162	Motorola	MC74HC162	
	RCA	**CD74HC162**	**739**
	SPI	**SP74HC162**	**770**
	Signetics	PCF74HC162	
MM74HC163	Motorola	MC74HC163	
	RCA	**CD74HC163**	**739**
	SPI	**SP74HC163**	**770**
	Signetics	PCF74HC163	
MM74HC164	Motorola	MC74HC164	
	RCA	**CD74HC164**	**740**
	Signetics	PCF74HC164	
MM74HC165	Motorola	MC74HC165	
	RCA	**CD74HC165**	**740**
	Signetics	PCF74HC165	
MM74HC173	Motorola	MC74HC173	
	RCA	**CD74HC173**	**739**
	Signetics	PCF74HC173	
MM74HC174	Motorola	MC74HC174	
	RCA	**CD74HC174**	**739**
	SPI	**SP74HC174**	**770**
	Signetics	PCF74HC174	
	Toshiba	TC40H174	
MM74HC175	Motorola	MC74HC175	
	RCA	**CD74HC175**	**739**
	SPI	**SP74HC175**	**770**
	Signetics	PCF74HC175	
	Toshiba	TC40H175	
MM74HC192	Motorola	MC74HC192	
	RCA	**CD74HC192**	**739**
	SPI	**SP74HC192**	**770**
	Signetics	PCF74HC192	
	Toshiba	TC40H192	
MM74HC193	Motorola	MC74HC193	
	RCA	**CD74HC193**	**739**
	SPI	**SP74HC193**	**770**
	Signetics	PCF74HC193	
	Toshiba	TC40H193	
MM74HC194	Motorola	MC74HC194	
	RCA	**CD74HC194**	**740**
	Signetics	PCF74HC194	
MM74HC195	Motorola	MC74HC195	
	RCA	**CD74HC195**	**740**
	Signetics	PCF74HC195	
MM74HC20	Motorola	MC74HC20	
	RCA	**CD74HC20**	**740**
	SPI	**SP74HC20**	**766**
	Signetics	PCF74HC20	
	Toshiba	TC40H020	
MM74HC221	Motorola	MC74HC221	
	RCA	**CD74HC221**	**740**
	Signetics	PCF74HC221	
MM74HC240	Motorola	MC74HC240	
	RCA	**CD74HC240**	**740**
	SPI	**SP74HC240**	**770**
	Signetics	PCF74HC240	
	Toshiba	TC40H240	
MM74HC241	Motorola	MC74HC241	
	RCA	**CD74HC241**	**740**
	Signetics	PCF74HC241	
MM74HC242	Motorola	MC74HC242	
	RCA	**CD74HC242**	**739**
		SGN	
MM74HC243	Motorola	MC74HC243	
	RCA	**CD74HC243**	**739**
	Signetics	PCF74HC243	
MM74HC244	Motorola	MC74HC244	
	RCA	**CD74HC244**	**740**
	Signetics	PCF74HC244	
MM74HC245	Motorola	MC74HC245	
	RCA	**CD74HC245**	**739**
	Signetics	PCF74HC245	
MM74HC251	Motorola	MC74HC251	
	RCA	**CD74HC251**	**740**
	Signetics	PCF74HC251	
MM74HC253	Motorola	MC74HC253	
	RCA	CD74HC253	
	SPI	**SP74HC253**	**771**
	Signetics	PCF74HC253	
MM74HC257	Motorola	MC74HC257	
	RCA	**CD74HC257**	**740**
	SPI	**SP74HC257**	**771**
	Signetics	PCF74HC257	
MM74HC259	Motorola	MC74HC259	
	RCA	**CD74HC259**	**739**
	Signetics	PCF74HC259	
MM74HC266	Motorola	MC74HC266	
	RCA	**CD74HC266**	**740**
	SPI	**SP74HC266**	**771**
	Signetics	PCF74HC266	
MM74HC27	Motorola	MC74HC27	
	RCA	**CD74HC27**	**740**
	SPI	**SP74HC27**	**766**
	Signetics	PCF74HC27	
	Toshiba	TC40H027	
MM74HC280	Motorola	MC74HC280	
	RCA	**CD74HC280**	**739**
	SPI	**SP74HC280**	**771**
	Signetics	PCF74HC280	
MM74HC299	Motorola	MC74HC299	
	RCA	CD74HC299	
	Signetics	PCF74HC299	
MM74HC30	Motorola	MC74HC30	
	RCA	**CD74HC30**	**740**
	Signetics	PCF74HC30	
MM74HC32	Motorola	MC74HC32	
	RCA	**CD74HC32**	**740**
	SPI	**SP74HC32**	**767**
	Signetics	PCF74HC32	
	Toshiba	TC40H032	
MM74HC354	Motorola	MC74HC354	
	RCA	**CD74HC354**	**740**
	Signetics	PCF74HC354	
MM74HC356	Motorola	MC74HC356	
	RCA	**CD74HC356**	**740**
	Signetics	PCF73HC356	
MM74HC365	Motorola	MC54HC390	
		MC74HC365	
MM74HC365	National	MM54HC390	
	RCA	**CD54HC390**	**739**
		CD74HC365	**740**
	SPI	**SP74HC365**	**771**
	Signetics	PCF54HC390	
MM74HC366	Motorola	MC74HC366	
	RCA	**CD74HC366**	**740**
	Signetics	PCF74HC366	
MM74HC367	Motorola	MC74HC367	
	RCA	**CD74HC367**	**740**
	Signetics	PCF74HC367	
MM74HC368	Motorola	MC74HC368	
	RCA	**CD74HC368**	**740**
	Signetics	PCF74HC368	
MM74HC373	Motorola	MC74HC373	
	RCA	**CD74HC373**	**739**
	Signetics	PCF74HC373	
MM74HC374	Motorola	MC74HC374	
	RCA	**CD74HC374**	**739**
	Signetics	PCF74HC374	
MM74HC390	Motorola	MC74HC390	
	RCA	**CD74HC390**	**739**
	Signetics	PCF74HC390	
MM74HC393	Motorola	MC74HC393	
	RCA	**CD74HC393**	**739**
	Signetics	PCF74HC393	
MM74HC4002	Motorola	MC74HC4002	
	RCA	**CD74HC4002**	**740**
	Signetics	PCF74HC4002	
MM74HC4017	Motorola	MC74HC4017	
	RCA	**CD74HC4017**	**739**
	Signetics	PCF74HC4017	
MM74HC4020	Motorola	MC74HC4020	
	RCA	**CD74HC4020**	**739**
	Signetics	PCF74HC4020	
MM74HC4040	Motorola	MC74HC4040	
	RCA	**CD74HC4040**	**739**
	Signetics	PCF74HC4040	
MM74HC4049	Motorola	MC74HC4049	
	RCA	CD74HC4049	
	Signetics	PCF74HC4049	
MM74HC4050	Motorola	MC74HC4050	
	RCA	**CD74HC4050**	**740**
	Signetics	PCF74HC4050	
MM74HC4060	Motorola	MC74HC4060	
	RCA	**CD74HC4060**	**739**
	Signetics	PCF74HC4060	
MM74HC42	Motorola	MC74HC42	
	RCA	**CD74HC42**	**739**
	SPI	**SP74HC42**	**767**
	Signetics	PCF74HC42	
MM74HC4511	Motorola	MC74HC4511	
	RCA	**CD74HC4511**	**739**
	Signetics	PCF74HC4511	
MM74HC4514	Motorola	MC74HC4514	
	RCA	**CD74HC4514**	**739**
	Signetics	PCF74HC4514	
MM74HC4538	Motorola	MC74HC4538	
	RCA	**CD74HC4538**	**740**
	Signetics	PCF74HC4538	
MM74HC533	Motorola	MC74HC533	
	RCA	**CD74HC533**	**739**
	Signetics	PCF74HC533	
MM74HC534	Motorola	MC74HC534	
	RCA	**CD74HC534**	**739**
	Signetics	PCF74HC534	
MM74HC563	**RCA**	**CD74HC563**	**739**
	Signetics	PCF74HC563	
MM74HC564	**RCA**	**CD74HC564**	**739**
	Signetics	PCF74HC564	
MM74HC573	Motorola	MC74HC573	
	RCA	**CD74HC573**	**739**
	Signetics	PCF74HC573	
MM74HC574	Motorola	MC74HC574	
	RCA	**CD74HC574**	**739**
	Signetics	PCF74HC574	
MM74HC640	Motorola	MC74HC640	
	RCA	**CD74HC640**	**739**
	Signetics	PCF74HC640	
MM74HC643	Motorola	MC74HC643	
	RCA	**CD74HC643**	**739**
	Signetics	PCF74HC643	
MM74HC645	Motorola	MC74HC645	
	RCA	**CD74HC645**	**739**
	Signetics	PCF74HC645	
MM74HC646	Motorola	MC74HC646	
	RCA	**CD74HC646**	**739**
	Signetics	PCF74HC646	
MM74HC648	Motorola	MC74HC648	
	RCA	**CD74HC648**	**739**
	Signetics	PCF74HC648	
MM74HC688	Motorola	MC74HC688	
	RCA	**CD74HC688**	**739**
	Signetics	PCF74HC688	
MM74HC73	Motorola	MC74HC73	
	RCA	**CD74HC73**	**739**
	SPI	**SP74HC73**	**767**
	Signetics	PCF74HC73	
MM74HC74	Motorola	MC74HC74	
	RCA	**CD74HC74**	**739**
	SPI	SD74HC74	
	Signetics	PCF74HC74	
	Toshiba	TC40H074	
MM74HC75	Motorola	MC74HC75	
	RCA	CD74HC75	
	Signetics	PCF74HC75	
MM74HC76	Motorola	MC74HC76	
	RCA	**CD74HC76**	**739**
	SPI	**SP74HC76**	**767**
	Signetics	PCF74HC76	
	Toshiba	TC40H076	
MM74HC85	Motorola	MC74HC85	
	RCA	**CD74HC85**	**739**
	Signetics	PCF74HC85	
MM74HC86	Motorola	MC74HC86	
	RCA	**CD74HC86**	**740**
	SPI	SP74HC86N	
	Signetics	PCF74HC86	
MM74S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
MM80C97	Fairchild	F40097	
	Hitachi	HD14503	
	Motorola	MC14503	
	National	CD4503	
	RCA	CD4503	
	Signetics	HEF40097	
MM80C98	Fairchild	F40098	
	Signetics	HEF40098	
MM8629	Plessey	SP8629	
N82S117	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
N82S117	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
N82S17	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
NMC2141	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
NMC2142A	Intel	2142-2	
NMC2147H	Fujitsu	2147	
	Universal	2147	
NMC2148	AMD	9148	
		AM9148	
	Fairchild	**93475**	**3615,3646**
	Fujitsu	MBM2148	
		MBM2149	
	Hitachi	**HM6148**	**3789**
	Intel	2148H	
		2149H	
	Synertek	SY2148	
		SY2149	
NMC2532	**Hitachi**	**HN462532**	**3789**
	Motorola	MCM2532	
	National	MM2532	
		TDA2530	
		TDA2532	
	Plessey	TDA2530	
	Siemens	TDA2530	
	Signetics	TDA2530	
		TDA2532	
	SiliconG	SG2532	
	TI	TMS2532	
	Universal	UM2532	
NMC2564	TI	TMS2564	
NMC2732	AMD	2732	
	Fairchild	F2732	
	Hitachi	**HN462732**	**3789**
	Intel	2732	
		2732A	**3819,3822**
		M2732	
NMC2732	Mitsubishi	M5L2732	
	National	MM2732	
	NEC-Micro	μPD2732	
	Toshiba	TMM2732	
		TMM324C	
	Universal	UM2732	
NMC2764	Fujitsu	MBM2764	
	Hitachi	HN462764	
		HN482764	**3789**
	Intel	**2764**	**3820,3822**
		M2764	
	Intersil	2764	
	Mostek	MK2764	
	NEC-Micro	μPD2764	
	SEEQ	5133	
	Toshiba	TMM2764	
NMC2816	GI	ER5816	
		ER5916	
	Intel	**2816**	**3824**
	NCR	NCR2161	
NMC4164	Fairchild	F64K	
	Fujitsu	MB8264	
		MB8265	
	Hitachi	HM4864	
	Intel	2164	
	Motorola	MCM6664	
		MCM6665	
	NEC-Micro	μPD4164	
	TI	TMS4164	
	Toshiba	TMM4164	
NMC5257A	AMD	AM9044E	
NMC5295	AMD	AM4516	
	Fujitsu	MB8118	
	Hitachi	HM4816	
		HM4816A	
	Intel	2118	
	Intersil	IM7118	
	Mostek	4516	
		MK4516	
	NEC-Micro	2118	
	TI	TMS4516	
NMC6132	Zilog	Z6132	
NMC6503	Harris	HM6503	
NMC6504	Fujitsu	MB8404	
	Intersil	IM6504	
	RCA	CDM5104	
NMC6508	AMI	S6508	
	Fairchild	4736B	
	Harris	**HM6508**	**669,1333,3754**
	Intel	2125A	
	Motorola	MCM2125	
	National	MM74C929	
	NEC-Micro	μPD443	
	SSS	SCM21C02	
	Toshiba	TC5508	
NMC6514	Fujitsu	MB8414	
	Harris	HM6514	
	Hitachi	**HM4334**	**3789**
	Intersil	IM6514	
	MicroPwr	MP6514	
	Mitsubishi	M58981	
	NEC-Micro	μPD444/6514	
		μPD6514	
	OKI	**MSM5115**	**3873**
	RCA	MWS5114	
		MWS5514	
	Toshiba	TC5514	
NMC6551	**Harris**	**HM6551**	**669,1333,3758**
	Intersil	IM6551	
	National	MM74C920	
	NEC-Micro	μPD5101	
	RCA	MWS5101	
NS16008	Fairchild	F16008	
NS16016	Fairchild	F16016	
NS16032	**Fairchild**	**F16032**	**1298**
NS16081	Fairchild	F16081	
NS16082	Fairchild	F16082	
NS16105	Fairchild	F16105	
NS16201	Fairchild	F16201	
NS16202	Fairchild	F16202	
NS16203	Fairchild	F16203	
NS16413	Fairchild	F16413	
NS16425	Fairchild	F16425	
NS16456	**Fairchild**	**F16456**	**1302**
NS16488	**Fairchild**	**F16488**	**1303**
NS16802	Fairchild	F16802	
NS80CX48	Intel	8748	
	NEC-Micro	μPD8748	
S2128	**AMI**	**S23128**	**3610**
	NEC-EA	μPD2/83128	
S2128	**Signetics**	**23128-30**	**3901**
S82S117	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
S82S17	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
SE556	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
SG75464	SiliconG	SG75464	
	TI	SN75464	
SM54251	National	DM7121	
	TI	**SN54251**	**915**
SN54S475	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	**TBP28SA46**	**440**
SN74S475	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
SN74S475	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
	TI	**TBP28SA46**	**440**
TBA120	Plessey	TBA120	
	Siemens	TBA120	
	Signetics	TBA120	
	Telefunken	TBA120	
TBA440	Plessey	TBA440	
	Siemens	TBA440	
TBA530	Plessey	TBA530	
	Signetics	TBA530	
	Telefunken	TBA530	
TBA540	Plessey	TBA540	
	Signetics	TBA540	
	Telefunken	TBA540	
TBA560	Plessey	TBA560	
	Signetics	TBA560	
	Telefunken	TBA560	
TBA920	Plessey	TBA920	
	Signetics	TBA920	
TBA950	ITT	TBA950	
	Plessey	TBA950	
TBA990	Plessey	TBA990	
	Signetics	TBA990	
	Telefunken	TBA990	
TDA2522	Plessey	TDA2522	
	Siemens	TDA2522	
	Signetics	TDA2522	
TDA2523	Plessey	TDA2523	
	Signetics	TDA2523	
TDA2530	**Hitachi**	**HN462532**	**3789**
	Motorola	MCM2532	
	National	MM2532	
		NMC2532	
		TDA2532	
	Plessey	TDA2530	
	Siemens	TDA2530	
	Signetics	TDA2530	
		TDA2532	
	SiliconG	SG2532	
	TI	TMS2532	
	Universal	UM2532	
TDA2532	**Hitachi**	**HN462532**	**3789**
	Motorola	MCM2532	
	National	MM2532	
		NMC2532	
		TDA2530	
	Plessey	TDA2530	
	Siemens	TDA2530	
	Signetics	TDA2530	
		TDA2532	
	SiliconG	SG2532	
	TI	TMS2532	
	Universal	UM2532	
TDA2540	Plessey	TDA2540	
	Signetics	TDA2540	
TDA2541	Plessey	TDA2541	
	Signetics	TDA2541	
TDA2560	Plessey	TDA2560	
	Siemens	TDA2560	
	Signetics	TDA2560	
TDA2591	Plessey	TDA2591	
	Signetics	TDA2591	
	Telefunken	TDA2591	
TDA2593	Plessey	TDA2593	
	Signetics	TDA2593	
	Telefunken	TDA2593	
TDA440	Plessey	TDA440	
	SGS	TDA440	
	Telefunken	TDA440	
TP3020	Intel	ID2910	
TP3021	Intel	ID2911	
TP3040	Intel	ID2912	
TP5087	AMI	S2859	
	GI	AY-5-9559	
	Mitel	MT5087	
	Mostek	MK5087	
	Plessey	MV5087	
TP5089	AMI	S25089	
	Mitel	MT5089	
	Mostek	MK5089	
	Plessey	MV5089	
TP5092	Mitel	MT5092	
	Mostek	MK5092	
TP5094	Mostek	MK5094	
TP50981	Mostek	MK50981	
TP50982	Mostek	MK50982	
TP5116	Fairchild	5116	
	Mostek	MK5116	
	SGS	M5116	
TP5156	Fairchild	5156	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

ALTERNATE SOURCE DIRECTORY

© IC MASTER 1983

National Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
TP5156	Mostek	MK5156	
	SGS	M5156	

NCR Corp., Microelectronics Div.

Manufacturer Device	Replacement Source	Device	IC Master Page
5210	**Xicor**	**X2210**	**3998**
5212	**Xicor**	**X2212**	**3998**
NCR1400	GI	ER1400	
	Mitsubishi	M5G1400	
	Nitron	NC1400	
NCR2051	GI	ER2051	
	Nitron	NC7051	
NCR2055	GI	ER2055	
	Nitron	NC7055	
NCR2161	GI	ER5816	
		ER5916	
	Intel	**2816**	**3824**
	National	NMC2816	
NCR2168	**GI**	**ER5716**	**3683**
	Hitachi	**HM48016**	**3789**
	Motorola	MCM2816	
NCR2811	GI	ER2055	
		ER2810	
	Nitron	NC7810	
NCR3400	GI	ER3400	
	Hughes	HNVM3704	
	Nitron	NC7451	
NCR52001	Xicor	X2001	
NCR52002	Xicor	X2002	
NCR52004	Xicor	X2004	
NCR52210	**Xicor**	**X2210**	**3998**
NCR52801	**Motorola**	**MCM2801**	**3839,3847**
NCR7033	Nitron	NC7033	

NEC-Electron Division

Manufacturer Device	Replacement Source	Device	IC Master Page
μPB10142	TI	SN10102	
μPB10148	Hitachi	HD10148	
	Motorola	**MCM10148**	**3839**
	Signetics	10148	
	TI	SN10148	
μPB10161	Fairchild	F10161	
	Hitachi	HD10161	
	Motorola	MC10161	
	Signetics	10161	
μPB2089	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	

Manufacturer Device	Replacement Source	Device	IC Master Page
μPB2089	NEC-Electron	μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
μPB2200	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
μPB2289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	

Manufacturer Device	Replacement Source	Device	IC Master Page
μPB2289	NEC-Electron	μPB2089	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
μPB74LS05	Fairchild	74LS05	
	Hitachi	HD74LS05	
	Motorola	SN74LS05	
	National	DM74LS05	
	Raytheon	74LS05	
	SGS	T74LS05	
	Signetics	74LS05	
	TI	**SN74LS05**	**834**
μPB74LS161	AMD	SN74LS161	
	Fairchild	74LS161A	
	Hitachi	HD74LS161A	
	Motorola	SN74LS161A	
	National	DM74LS161	
	Raytheon	74LS161	
	Signetics	74LS161A	
	TI	**SN74LS161A**	**889**
μPC141	AMD	LM305	
	Fairchild	μA305	
	Intersil	LM305	
	National	LM305	
	SiliconG	SG305	
	Thomson-CSF	SFC2305	
μPC142	National	LM304	
	SiliconG	SG304	
	Thomson-CSF	SFC2304	
μPC1458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	

Manufacturer Device	Replacement Source	Device	IC Master Page
μPC151	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
μPC154	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
μPC1555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
μPC156	**MicroPwr**	**MP5508**	**401,3292**
		OP-05	
		OP08	
	National	LM108	
	PMI	OP-08	
	Raytheon	LM108	
	SiliconG	SG108	
	TI	μA714	
μPC157	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

NEC-Electron Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
μPC157	NEC-Electron	μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
μPC159	AMD	LM218	
		LM318	
	AD	**AD518**	**3155**
	Fairchild	μA318	
	National	LM218	
		LM318	
	TI	LM218	
		LM318	
μPC251	AMD	747	
	Fairchild	μA747	
	Hitachi	HA17747	
	Motorola	MC1747	
	National	LM747	
	PMI	OP-04	
		PM747	
	Raytheon	RC747	
		RM747	
	RCA	CA747	
	Signetics	μA747	
	SiliconG	SG747	
	TeledyneS	747	
	TI	μA747	
μPC255	Fairchild	μA709	
	Hitachi	HA1303	
	Motorola	MC1709	
	National	LM1709	
		LM709	
	NEC-Electron	μPC55	
	Raytheon	RC709	
		RM709	
	RCA	CA3038	
	TI	μA709	
	Thomson-CSF	SFC2709	
	Toshiba	TA7502	
μPC271	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
μPC2901	Fairchild	μA2901	
		μA3302	
	Motorola	LM2901	
		MC3302	
	National	LM2901	
		LM3302	
	PMI	CMP-04	
	Raytheon	LM2901	
		RV3302	
	RCA	CA3302	
	Signetics	LM2901	
		MC3302	
	SiliconG	SG3302	
	TI	LM2901	
		LM3302	
μPC2902	Fairchild	μA2902	
	Hitachi	HA17902	
	Motorola	LM2902	
	National	LM2902	
	Raytheon	LM2902	
	TI	LM2902	
μPC301	AD	AD301	
	Fairchild	LM301	
		μA301A	
μPC301	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
μPC311	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
μPC319	AMD	LM319	
	National	**LM319**	**3317**
	Signetics	LM319	
μPC324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
μPC339	AMD	LM339	
		LM339A	
	Fairchild	μA339	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
		LM339	
	SiliconG	SG339	
	TI	LM339	
μPC358	Motorola	LM358	
	National	LM358A	
	RCA	CA358A	
		LM358	
	Sanyo	LA6358	
	Signetics	LM358	
		NE532	
	TI	LM358	
μPC3911	National	LM3911	
μPC4558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
μPC4558	**Harris**	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
μPC4741	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
μPC51	Motorola	MC1712	
μPC55	Fairchild	μA709	
	Hitachi	HA1303	
	Motorola	MC1709	
	National	LM1709	
		LM709	
	NEC-Electron	μPC255	
	Raytheon	RC709	
		RM709	
	RCA	CA3038	
	TI	μA709	
	Thomson-CSF	SFC2709	
	Toshiba	TA7502	
μPC603	PMI	DAC-01C	
μPC610	PMI	DAC-02C	
μPC624	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
μPC624	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
μPC725	AD	AD510	
		AD517	
		ADOP-07	**3153**
	Burr-Brown	3510	
	Datel	AM-430	
		AM-490-2	
	Fairchild	μA714	
	Harris	HA-2900	
		HA-2905	
		HA-5130	
		HA-5135	
	MicroPwr	MP517	
		MP5505	
		MP5507	
		OP-05	
		OP-07	
	National	**LH0044**	**3342**
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TeledyneP	1340	
	TI	OP-07	
μPC741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
μPC7805	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
μPC7808	Fairchild	μA7808	
	Lambda	LMC7808	
		LμA7808	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

NEC-Electron Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
μPC7808	**Motorola**	**MC7808**	**3294**
	SiliconG	SG340-8	
		SG7808	
	TI	LM340-8	
		μA7808	
μPC7812	Fairchild	μA7812	
	Lambda	LMC7812	
		LμA7812	
	Motorola	**MC7812**	**3294**
	National	LM7812	
	SGS	L7812	
	SiliconG	SG7812	
	TI	μA7812	
	Toshiba	TA78012	
μPC7815	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
μPC7818	Fairchild	μA7818	
	Lambda	LMC7818	
	SiliconG	SG340-18	
		SG7818	
	TI	LM340-18	
		μA7818	
μPC7824	Fairchild	μA7824	
	Lambda	LMC7824	
		LμA7824	
	Motorola	MC7824	
	SGS	L7824	
	SiliconG	SG7824	
	TI	LM340-24	
		μA7824	
μPC78L05	Fairchild	μA78L05	
	Motorola	MC78L05	
	National	LM340LA-5	
		LM78L05	
	TI	μA78L05	
μPC78L08	Motorola	MC78L08	
	TI	μA78L08	
μPC78L12	Fairchild	μA78L12	
	Motorola	MC78L12	
	National	**LM340LA-12**	**3299**
		LM78L12	
	TI	μA78L12	
μPC78L15	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
μPC78M05	Fairchild	μA78M05	
	Motorola	MC78M05	
	National	**LM341-5**	**3300**
		LM342-05	
		LM78M05	
	NEC-Micro	μPC78M05	
	Sanyo	L78M05	
	TI	μA78M05	
μPC78M08	Fairchild	μA78M08	
	Motorola	MC78M08	
	NEC-Micro	μPC78M08	
μPC78M08	Sanyo	L78M08	
	TI	μA78M08	
μPC78M12	Fairchild	μA78M12	
	Motorola	MC78M12	
	National	**LM341-12**	**3300**
		LM342-12	**3299**
		LM78M12	
	NEC-Micro	μPC78M12	
	Sanyo	L78M12	
μPC78M15	Fairchild	μA78M15	
	Motorola	MC78M15	
	National	**LM341-15**	**3300**
		LM342-15	**3299**
		LM78M15	
	NEC-Micro	μPC78M15	
	Sanyo	L78M15	
μPD23128	Signetics	23128	

NEC-Electronic Arrays Division

Manufacturer Device	Replacement Source	Device	IC Master Page
8332	AMD	AM9233	
	AMI	**S2333**	**3608**
	CSG	MPS2333	
	Fairchild	F3533	
	GI	R03-9333	
	Intel	2332	
	NEC-EA	EA8333	
	RCA	CDM5332	
	Signetics	2332	
	Synertek	**SY2333**	**3950**
	Toshiba	TM2332	
	Universal	UM2333-45	
◇EA2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
EA2316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
EA2708	AMD	2708	
	Fairchild	F2708	
EA2708	Hitachi	HN462708	
	Motorola	MC27A08	
		MCM2708	
	National	MM2708	
	Panasonic	MN2708	
	Rockwell	2708	
	SGS	M2708	
	TI	TMS2708	
◇EA2716	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HN462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
EA8308	AMD	8308	
		9208	
	Motorola	**MCM68A308**	**3840**
	NEC-Micro	μPD2308	
EA8316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
EA8332	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
EA8333	AMD	AM9233	
	AMI	**S2333**	**3608**
	CSG	MPS2333	
	Fairchild	F3533	
	GI	R03-9333	
	Intel	2332	
	NEC-EA	8332	
	RCA	CDM5332	
	Signetics	2332	
	Synertek	**SY2333**	**3950**
	Toshiba	TM2332	
	Universal	UM2333-45	
EA8364	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
EA8364	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
LA8364	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
UPD2/8364-30	AMD	AM9264	
	AMI	S4264	
	GTEMicro	2364-3	
	Mostek	MK36000-5	
	Signetics	**2664A-30**	**3907**
	Synertek	SY2364-3	
	Toshiba	TMM2364	
	Weitek	SC8164	
μPD2/83128	**AMI**	**S23128**	**3610**
	National	S2128	
	Signetics	**23128-30**	**3901**
μPD2/83256	Mostek	MK38000	
	Toshiba	TMM23256	
IPD2/8364-20	AMD	AM92640	
	AMI	S68B364	
	Fairchild	F-3564-25	
	Mostek	MK36000-4	
	Motorola	MCM67365-25	
	Signetics	2064-20	
	Synertek	SY2364-2	
IPD2/8364-35	AMD	AMD264	

NEC-Microcomputer Division

Manufacturer Device	Replacement Source	Device	IC Master Page
2118	AMD	AM4516	
	Fujitsu	MB8118	
	Hitachi	HM4816	
		HM4816A	
	Intel	2118	
	Intersil	IM7118	
	Mostek	4516	
		MK4516	
	National	NMC5295	
	TI	TMS4516	
8156-2	Intel	8156-2	
8255A	AMD	8255A-5	
		9555	
		D8255	
		ID8255	
		P8255	
	Intel	8255A-5	
		D8255	
		ID8255	
		P8255	
	National	INS8255	
	NEC-Micro	μPB8255	
		μPD8225	
		μPD8255	
PD8212	AMD	D8212	
	Intel	D8212	

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

NEC-Microcomputer Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
PD8216	AMD	D8216	
	Intel	D8216	
PD8224	AMD	D8224	
	Intel	D8224	
PD8226	AMD	D8226	
	Intel	D8226	
PD8228	AMD	D8228	
	Intel	D8228	
PD8286	AMD	D8286	
	Intel	D8286	
PD8287	AMD	D8287	
	Intel	D8287	
UPA2001	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
UPA2002	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
µPB408	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
µPB426	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
µPB426	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	
			3826,3836
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	
			440,3968
		TBP24S41M	
			440,3968
		TBP28S41	
		TBP28S41M	
µPB8212	AMD	3212	
		8212	
	Intel	8212	
	National	DP8212	
		INS8212	
	TI	**SN54S412**	**945**
		SN74S412	**945**
µPB8214	AMD	8214	
	Intel	8214	
	National	INS8214	
µPB8216	AMD	8216	
	Intel	8216	
	National	DP8216	
		INS8216	
µPB8224	AMD	8224	
	Intel	8224	
	National	DP8224	
		INS8224	
µPB8226	AMD	8226	
	Intel	8226	
	National	DP8226	
		INS8226	
µPB8228	AMD	8228	
	Intel	8228	
	National	DP8228	
		INS8228	
	TI	**SN74S428**	**946**
		TIM8228	**3980**
µPB8237-5	Intel	8237-5	
µPB8238	AMD	8238	
	Intel	8238	
	National	DP8238	
		INS8238	
	TI	**SN74S438**	**946**
		TIM8238	**3980**
µPB8251	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	µPD8251	
		µPD8251A	
	SMC	COM8251A	
	Western	TR1983	
µPB8255	AMD	8255A-5	
		9555	
		D8255	
		ID8255	
		P8255	
	Intel	8255A-5	
		D8255	
		ID8255	
		P8255	
	National	INS8255	
	NEC-Micro	8255A	
		µPD8225	
		µPD8255	
µPB8282	Intel	8282	
µPB8283	Intel	8283	
µPB8284	Intel	8284	
µPB8286	AMD	8304	
		DP8304	
	Intel	8286	
		8304	
	National	DP8304	
µPB8287	Intel	8287	
µPB8288	Intel	8288	
µPC324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	µA324	
		µA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	µPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
µPC339	AMD	LM339	
		LM339A	
	Fairchild	µA339	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	µPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
		LM339	
	SiliconG	SG339	
	TI	LM339	
µPC78M05	Fairchild	µA78M05	
	Motorola	MC78M05	
	National	**LM341-5**	**3300**
		LM342-05	
		LM78M05	
	NEC-Electron	µPC78M05	
	Sanyo	L78M05	
	TI	µA78M05	
µPC78M08	Fairchild	µA78M08	
	Motorola	MC78M08	
	NEC-Electron	µPC78M08	
	Sanyo	L78M08	
	TI	µA78M08	
µPC78M12	Fairchild	µA78M12	
	Motorola	MC78M12	
	National	**LM341-12**	**3300**
		LM342-12	**3299**
		LM78M12	
	NEC-Electron	µPC78M12	
	Sanyo	L78M12	
µPC78M15	Fairchild	µA78M15	
	Motorola	MC78M15	
	National	**LM341-15**	**3300**
		LM342-15	**3299**
		LM78M15	
	NEC-Electron	µPC78M15	
	Sanyo	L78M15	
µPD2101	AMD	2101A	
		91L01	
	Intel	8101A	
	Synertek	SY2101	
µPD2102	Intel	8102A	
	SGS	M330	
µPD2111	AMD	2111A	
		91L11	
	Intel	8111	
	Synertek	SY2111	
µPD2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
µPD2114	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
µPD2147	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
µPD2167	**Hitachi**	**HM6167**	**3789**
	IMS	1400	
	IDT	IDT6167	
	Intel	2167	
µPD2308	AMD	8308	
		9208	
	Motorola	**MCM68A308**	**3840**
	NEC-EA	EA8308	
µPD2316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
µPD2332	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
µPD2364	AMD	9264	
		9265	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

NEC-Microcomputer Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
μPD2364	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
μPD2716	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HN462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
μPD2732	AMD	2732	
	Fairchild	F2732	
	Hitachi	**HN462732**	**3789**
	Intel	2732	
		2732A	**3819,3822**
		M2732	
	Mitsubishi	M5L2732	
	National	MM2732	
		NMC2732	
	Toshiba	TMM2732	
		TMM324C	
	Universal	UM2732	
μPD2764	Fujitsu	MBM2764	
	Hitachi	HN462764	
		HN482764	**3789**
	Intel	**2764**	**3820,3822**
		M2764	
	Intersil	2764	
	Mostek	MK2764	
	National	NMC2764	
	SEEQ	5133	
	Toshiba	TMM2764	
μPD4104	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
μPD4104-3	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
μPD4104-3	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
μPD416	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
μPD4164	Fairchild	F64K	
	Fujitsu	MB8264	
		MB8265	
	Hitachi	HM4864	
	Intel	2164	
	Motorola	MCM6664	
		MCM6665	
	National	NMC4164	
	TI	TMS4164	
	Toshiba	TMM4164	
μPD443	AMI	S6508	
	Fairchild	4736B	
	Harris	**HM6508**	**669,1333,3754**
	Intel	2125A	
	Motorola	MCM2125	
	National	MM74C929	
		NMC6508	
	SSS	SCM21C02	
	Toshiba	TC5508	
μPD444/6514	Fujitsu	MB8414	
	Harris	HM6514	
	Hitachi	**HM4334**	**3789**
	Intersil	IM6514	
	MicroPwr	MP6514	
	Mitsubishi	M58981	
	National	NMC6514	
	NEC-Micro	μPD6514	
	OKI	**MSM5115**	**3873**
	RCA	MWS5114	
		MWS5514	
	Toshiba	TC5514	
μPD445	Toshiba	TC5047	
μPD446	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
μPD447	Hitachi	HM6117	
	MicroPwr	MP6117	
μPD4511	Fairchild	F4511	
	Hitachi	HD14511	
	Mitel	MD4511	
	MMI	4511	
	Motorola	MC14511	
	National	CD4511	
	RCA	CD4511	
	SGS	HCF4511	
μPD4511	Signetics	HEF4511	
	SSS	SCL4511	
	Solitron	CM4511	
	Toshiba	TC4511	
μPD5101	**Harris**	**HM6551**	**669,1333,3758**
	Intersil	IM6551	
	National	MM74C920	
		NMC6551	
	RCA	MWS5101	
μPD6514	Fujitsu	MB8414	
	Harris	HM6514	
	Hitachi	**HM4334**	**3789**
	Intersil	IM6514	
	MicroPwr	MP6514	
	Mitsubishi	M58981	
	National	NMC6514	
	NEC-Micro	μPD444/6514	
	OKI	**MSM5115**	**3873**
	RCA	MWS5114	
		MWS5514	
	Toshiba	TC5514	
μPD7201	Intel	8272	
		8274	
	NEC-Micro	μPD765	
μPD765	Intel	8272	
		8274	
	NEC-Micro	μPD7201	
μPD780	Mostek	MK3880	
	SGS	Z80	
		Z80-CPU	
		Z80CPUB	
	Zilog	**Z80**	**1581**
		Z80-CPU	
μPD7800	Intel	7800	
μPD7801	Intel	7801	
μPD8021	Intel	8021	
	Signetics	8021	
μPD8022	Intel	8022	
μPD8035	AMD	8035	
		D8035	
		ID8035	
		P8035	
	Fujitsu	MBL8035	
	Intel	8035	
		D8035	
		ID8035	
		P8035	
	National	INS8035	
	NEC-Micro	μPD80C35	
	Signetics	SCN8035	
μPD8039	AMD	D8039	
		ID8039	
	Fujitsu	MBL8039	
	Intel	8039	
		D8039	
		ID8039	
	National	INS8039	
	Signetics	SCN8039	
μPD8041A	AMD	8041	
		D8041	
		P8041	
	Intel	8041A	
		D8041	
		P8041	
μPD8048	AMD	8048	
	Fujitsu	MBL8048	
	Intel	8048	
	National	INS8048	
	NEC-Micro	μPD80C48	
	Signetics	SCN8048	
	Toshiba	TMP8048	
μPD8049	Fujitsu	MBL8049	
	Intel	8049	
	National	INS8049	
	Signetics	SCN8049	
μPD8080	AMD	9080	
		9080A	
		AM9080	
	Intel	8080A	
		D8080	
		MD8080	
		P8080	
	National	DP8080A	
		INS8080A	
	TI	TMS8080	
		TMS8080A	
μPD8085	AMD	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	Intel	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	Toshiba	TMP8085A	
μPD8086	AMD	D8086	
		ID8086	
		MD8086	
	Intel	8086	
		D8086	
		ID8086	
		MD8086	
μPD80C35	AMD	8035	
		D8035	
		ID8035	
		P8035	
	Fujitsu	MBL8035	
	Intel	8035	
		D8035	
		ID8035	
		P8035	
	National	INS8035	
	NEC-Micro	μPD8035	
	Signetics	SCN8035	
μPD80C48	AMD	8048	
	Fujitsu	MBL8048	
	Intel	8048	
	National	INS8048	
	NEC-Micro	μPD8048	
	Signetics	SCN8048	
	Toshiba	TMP8048	
μPD8155	AMD	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	Intel	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	Toshiba	TMP8155	
μPD8156	AMD	8156	
		D8156	
		ID8156	
		P8156	
	Intel	8156	
		D8156	
		ID8156	
		P8156	
μPD8225	AMD	8255A-5	
		9555	
		D8255	
		ID8255	
		P8255	
	Intel	8255A-5	
		D8255	
		ID8255	
		P8255	
	National	INS8255	
	NEC-Micro	8255A	
		μPB8255	
		μPD8255	
μPD8243	AMD	8243	
	Fujitsu	MB8243	
	Intel	8243	
	Signetics	8243	
μPD8251	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251A	
	SMC	COM8251A	
	Western	TR1983	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

NEC-Microcomputer Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
μPD8251A	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
	SMC	COM8251A	
	Western	TR1983	
μPD8253	AMD	8253	
		D8253	
		ID8253	
		P8253	
	Intel	8253	
		D8253	
		ID8253	
		P82	
	National	INS8253	
μPD8253-5	AMD	8253-5	
		D8253-5	
		P8253-5	
	Intel	8253-5	
		D8253-5	
		P8253-5	
	National	INS8253-5	
μPD8255	AMD	8255A-5	
		9555	
		D8255	
		ID8255	
		P8255	
	Intel	8255A-5	
		D8255	
		ID8255	
		P8255	
	National	INS8255	
	NEC-Micro	8255A	
		μPB8255	
		μPD8225	
μPD8257	AMD	8257	
	Intel	8257	
μPD8259	AMD	D8259	
		ID8259	
		MD8259	
		P8259	
	Intel	8259	
		D8259	
		ID8259	
		M8259	
		P8259	
	National	INS8259	
μPD8279-5	AMD	8279-5	
		D8279-5	
		P8279-5	
	Intel	8279	
		8279-5	
		D8279-5	
		P8279-5	
μPD8355	AMD	8355	
	Intel	8355	
	Toshiba	TMP8355	
μPD8741A	Intel	8741A	
μPD8748	Intel	8748	
	National	**NS80CX48**	**1448**
μPD8755	Intel	8755	
μPD8755A	Intel	8755A	
	Toshiba	TMP8755	

Nitron

Manufacturer Device	Replacement Source	Device	IC Master Page
NC1400	GI	ER1400	
	Mitsubishi	M5G1400	
	NCR	NCR1400	
NC2000	Rockwell	CRC8000	
NC2030	Rockwell	CRC8030	
NC2257	Motorola	MC2257	
NC2259	Motorola	MC2259	
NC2260	Motorola	MC2260	
NC2320	GTEMicro	G4320	
	ITT	DF320	
	Mitel	MT4320	
	Siliconix	DF320	
NC2322	ITT	DF322	
	Mitel	MT4322	
NC5050	MasterLogic	ML50	
	MicroEng	**MGC50**	**4437**
	Monosil	ML50	
NC5100	Exar	XRCMA	
	Interdesign	**MCA**	**4433**
	MasterLogic	ML100	
	MicroEng	**MGC110A**	**4437**
	Monosil	ML100	
NC5150	Exar	XRCMB	
	Interdesign	**MCB**	**4433**
	MasterLogic	ML150	
	MicroEng	**MGC160B**	**4437**
	Monosil	ML150	
NC5200	Exar	XRMC	
	Interdesign	**MCC**	**4433**
	MasterLogic	ML200	
	MicroEng	**MGC210C**	**4437**
	Monosil	ML200	
NC5350	Exar	XRCMD	
	Interdesign	**MCD**	**4433**
	MasterLogic	ML350	
	MicroEng	**MGC350D**	**4437**
	Monosil	ML350	
NC5500	MasterLogic	ML500	
	MicroEng	**MGC500**	**4437**
	Monosil	ML500	
NC5600	MasterLogic	ML600	
	MicroEng	**MGC600**	**4437**
	Monosil	ML600	
NC7033	NCR	NCR7033	
NC7051	GI	ER2051	
	NCR	NCR2051	
NC7055	GI	ER2055	
	NCR	NCR2055	
NC7451	GI	ER3400	
	Hughes	HNVM3704	
	NCR	NCR3400	
NC7810	GI	ER2055	
		ER2810	
	NCR	NCR2811	
NC8000	Holt	HI8000	
NC91200	Universal	HCM1200	
NC9360	Universal	HCM360	
NC9540	Universal	HCM540	
NC9720	Universal	HCM720	
NC9960	Universal	HCM960	

OKI Semiconductor

Manufacturer Device	Replacement Source	Device	IC Master Page
MSM2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
MSM2128	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
MSM2128	**OKI**	**MSM5128**	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
MSM2716	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HN462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	Panasonic	MN2716	
	SGS	M2716	
	TI	TMS2516	
MSM3870	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
MSM4001	Fairchild	F4001	
	Hitachi	HD14001	
	Motorola	MC14001	
	National	CD4001	
		MM74C02	
	RCA	CD4001	
	Sanyo	LC4001B	
	SGS	HCF4001	
	Signetics	HEF4001	
	SSS	SCL4001	
	Solitron	CM4001	
	Toshiba	TC4001	
MSM4011	Fairchild	F4011	
	Hitachi	HD14011	
	Motorola	MC14011	
	National	CD4011	
		MM74C00	
	RCA	CD4011	
	Sanyo	LC4011	
	SGS	HCF4011	
	Signetics	HEF4011	
	SSS	SCL4011	
	Solitron	CM4011	
	Toshiba	TC4011	
MSM4013	Fairchild	F4013	
	Hitachi	HD14013	
	Motorola	MC14013	
	National	CD4013	
		MM74C74	
	RCA	CD4013	
	Sanyo	LC4013	
	SGS	HCF4013	
	Signetics	HEF4013	
	SSS	SCL4013	
	Solitron	CM4013	
	Toshiba	TC4013	
MSM4015	Fairchild	F4015	
	Hitachi	HD14015	
	Motorola	MC14015	
	National	CD4015	
		MM74C164	
	RCA	CD4015	
	Sanyo	LC4015	
MSM4015	SGS	HCF4015	
	Signetics	HEF4015	
	SSS	SCL4015	
	Solitron	CM4015	
	Toshiba	TC4015	
MSM4019	Fairchild	F4019	
	National	CD4019	
	RCA	CD4019	
	Sanyo	LC4019	
	SGS	HCF4019	
	Signetics	HEF4019	
	SSS	SCL4019	
	Solitron	CM4019	
	Toshiba	TC4019	
MSM4027	Fairchild	F4027	
	Hitachi	HD14027	
	Motorola	MC14027	
	National	CD4027	
		MM74C76	
	RCA	CD4027	
	Sanyo	LC4027	
	SGS	HCF4027	
	Signetics	HEF4027	
	SSS	SCL4027	
	Solitron	CM4027	
MSM4028	Fairchild	F4028	
	Hitachi	HD14028	
	Motorola	MC14028	
	National	CD4028	
		MM74C42	
	Sanyo	LC4028	
	SGS	HCF4028	
	Signetics	HEF4028	
	SSS	SCL4028	
	Solitron	CM4028	
	Toshiba	TC4028	
MSM4049	Fairchild	F4049	
	Hitachi	HD14049	
	Motorola	MC14049	
	National	CD4049	
	RCA	CD4009	
		CD4049	
	Sanyo	LC4049	
	SGS	HCF4049	
	Signetics	HEF4049	
	SSS	SCL4049	
	Solitron	CM4049	
	Toshiba	TC4049	
MSM4069	Fairchild	F4069	
	Hitachi	HD14069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
		MM74C04	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	
	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
MSM4071	Fairchild	F4071	
	Hitachi	HD14071	
	Motorola	MC14071	
	National	CD4071	
		MM74C32	
	RCA	CD4071	
	Sanyo	LC4071	
	SGS	HCF4071	
	Signetics	HEF4071	
	SSS	SCL4071	
	Solitron	CM4071	
	Toshiba	TC4071	
MSM4081	Fairchild	F4081	
	Hitachi	HD14081	
	Motorola	MC14081	
	National	CD4081	
		MM74C08	
	RCA	CD4081	
	Sanyo	LC4081	
	SGS	HCF4081	
	Signetics	HEF4081	
	SSS	SCL4081	
	Solitron	CM4081	
	Toshiba	TC4081	
MSM4093	Fairchild	F4093	
	Hitachi	HD14093	
	Motorola	MC14093	
	National	CD4093	
	RCA	CD4093	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
OKI Semiconductor (Cont'd)			
MSM4093	Sanyo	LC4093	
	SGS	HCF4093	
	Signetics	HEF4093	
	SSS	SCL4093	
	Toshiba	TC4093	
MSM4520	Fairchild	F4520	
	Hitachi	HD14520	
	Motorola	MC14520	
	National	CD4520	
	RCA	CD4520	
	Sanyo	LC4520	
	SGS	HCF4520	
	Signetics	HEF4520	
	SSS	SCL4520	
	Solitron	CM4520	
	Toshiba	TC4520	
MSM4538	Motorola	MC14538	
	National	CD4538	
	Signetics	HEF4538	
MSM4XXX	Fairchild	34XXX	
		F4XXX	
	Hitachi	HD14XXX	
	Motorola	MC14XXX	
	National	CD4XXX	
	SGS	HCF4XXX	
	SSS	SCL4XXX	
	Solitron	CM4XXX	
	TI	TP4000 series	
	Toshiba	TC4XXX	
MSM5115	Fujitsu	MB8414	
	Harris	HM6514	
	Hitachi	**HM4334**	**3789**
	Intersil	IM6514	
	MicroPwr	MP6514	
	Mitsubishi	M58981	
	National	NMC6514	
	NEC-Micro	μPD444/6514	
		μPD6514	
	RCA	MWS5114	
		MWS5514	
	Toshiba	TC5514	
MSM5128	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
Optical Electronics Inc.			
9910	**National**	**LH0002**	**3342**
9932	**National**	**LH0032**	**3342**
	TeledyneP	0032	
9963	**National**	**LH0063**	**3342**
AH0605	Burr-Brown	OPA605	
Panasonic			
AN5310	Signetics	TDA3570	
MN1001	National	MM5280	
MN2102	AMD	AM9102	
	Fairchild	2102H	
	National	MM2102A	
	SGS	M2102A	
MN2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
MN2114	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
MN2708	AMD	2708	
	Fairchild	F2708	
	Hitachi	HN462708	
	Motorola	MC27A08	
		MCM2708	
	National	MM2708	
	NEC-EA	EA2708	
	Rockwell	2708	
	SGS	M2708	
	TI	TMS2708	
MN2716	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HN462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	SGS	M2716	
	TI	TMS2516	
MN4116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
OM200	Signetics	OM200	
Philips			
TAA263	Cherry	CS263	
TAA560	Cherry	CS560	
Plessey Semiconductors			
MP2812	AMD	TMS2812	
MP3812	AMD	AM2812	
MV5087	AMI	S2859	
	GI	AY-5-9559	
	Mitel	MT5087	
	Mostek	MK5087	
	National	TP5087	
MV5089	AMI	S25089	
	Mitel	MT5089	
	Mostek	MK5089	
	National	TP5089	
MV74SC137	GTEMicro	G74SC137	
	Mitel	**MD74SC137**	**697**
	SPI	SP74SC137	
MV74SC138	GTEMicro	G74SC138	
	Mitel	**MD74SC138**	**697**
	RCA	CDP1873	
	SPI	SP74SC138	
MV74SC139	GTEMicro	G74SC139	
	Mitel	**MD74SC139**	**697**
MV74SC139	SPI	SP74SC139	
MV74SC240	GTEMicro	G74SC240	
	Mitel	**MD74SC240**	**702**
	SPI	**SP74SC240**	**761**
MV74SC241	GTEMicro	G74SC241	
	Mitel	**MD74SC241**	**702**
	SPI	**SP74SC241**	**761**
MV74SC244	GTEMicro	G74SC244	
	Mitel	**MD74SC244**	**702**
	SPI	**SP74SC244**	**761**
MV74SC245	Fairchild	74LS245	
	GTEMicro	G74SC245	
	Mitel	**MD74SC245**	**702,706**
	Motorola	SN74LS245	
	SPI	**SP74SC245**	**761**
	Signetics	**74LS245**	**779**
		N8T245	
	TI	**SN74LS245**	**913**
MV74SC373	GTEMicro	G74SC373	
	Mitel	74SC373	
		MD74SC373	**710**
	SPI	**SP74SC373**	**761**
MV74SC374	GTEMicro	G74SC374	
	Mitel	**MD74SC374**	**710**
	SPI	**SP74SC374**	**761**
MV8865	GTEMicro	G8865	
	Mitel	MT8865	
	Mostek	MK8865	
MV8912	GTEMicro	G8912	
	Intel	2912	
	Mostek	MK5912	
		MK8912	
PIC1650A	**GI**	**PIC1650A**	**1319**
PIC1655A	**GI**	**PIC1655A**	**1319**
PIC1656	**GI**	**PIC1656**	**1319**
SL1496	Fairchild	μA796	
	Motorola	MC1496	
		MC1596	
	National	LM1496	
		LM1596	
	Plessey	SL1596	
	Signetics	MC1496	
		MC1596	
	SiliconG	SG1496	
		SG1596	
SL1596	Fairchild	μA796	
	Motorola	MC1496	
		MC1596	
	National	LM1496	
		LM1596	
	Plessey	SL1496	
	Signetics	MC1496	
		MC1596	
	SiliconG	SG1496	
		SG1596	
SL3045	Fairchild	μA3045	
	Hitachi	HA1127	
	National	LM3045	
	RCA	CA3045	
	SiliconG	SG3045	
SL3046	Fairchild	μA3086	
	Motorola	MC3386	
	National	LM3086	
	Plessey	SL3086	
	RCA	CA3046	
		CA3086	
	SiliconG	SG3086	
		SG3821	
		SG3886	
	Sprague	ULN-2046	
		ULN-2086	
SL3081	RCA	CA3081	
	Signetics	CA3081	
	SiliconG	SG3081	
	Sprague	ULN-2081	
SL3082	RCA	CA3082	
	Signetics	CA3082	
	SiliconG	SG3082	
	Sprague	ULN-2082	
SL3083	Plessey	SL3183	
	RCA	CA3083	
		CA3183	
	Signetics	CA3083	
		CA3183	
	SiliconG	SG3083	
		SG3183	
	Sprague	ULN-2083	
SL3086	Fairchild	μA3086	
	Motorola	MC3336	
	National	LM3086	
SL3086	Plessey	SL3046	
	RCA	CA3046	
		CA3086	
	SiliconG	SG3086	
		SG3821	
		SG3886	
	Sprague	ULN-2046	
		ULN-2086	
SL3127	RCA	CA3127	
SL3145	RCA	CA3045	
	Sprague	ULS-2045	
SL3146	Motorola	MC3346	
	National	LM3046	
	RCA	CA3046	
		CA3146	
	SiliconG	SG3046	
		SG3146	
	Sprague	ULN-2046	
SL3183	Plessey	SL3083	
	RCA	CA3083	
		CA3183	
	Signetics	CA3083	
		CA3183	
	SiliconG	SG3083	
		SG3183	
	Sprague	ULN-2083	
SL748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
SP1648	Motorola	MC1648	
SP1650	Motorola	MC1650	
SP1651	Motorola	MC1651	
SP1658	Fairchild	11C58	
	Motorola	MC1658	
SP1660	Motorola	MC1660	
SP1662	Motorola	MC1662	
SP1664	Motorola	MC1664	
SP1666	Motorola	MC1666	
SP1668	Motorola	MC1668	
SP1670	Fairchild	11C70	
	Motorola	MC1670	
SP1671	Motorola	MC1671	
SP1672	Motorola	MC1672	
SP1674	Motorola	MC1674	
SP1692	Motorola	MC1692	
SP4040	Siemens	SDA4040	
SP4551	Siemens	SDA4041	
SP8610	Fairchild	11C05	
	Motorola	MC1699	
	Plessey	SP8616	
SP8611	**RCA**	**CA3199**	**3364**
SP8616	Fairchild	11C05	
	Motorola	MC1699	
	Plessey	SP8610	
SP8629	National	MM8629	
SP8640	Fairchild	95H90	
	Plessey	SP8647	
SP8647	Fairchild	95H90	
	Plessey	SP8640	
SP8656	National	DS8627	
SP8658	National	DS8628	
SP8680	Fairchild	11C90	
	Plessey	SP8685	
SP8685	Fairchild	11C90	
	Plessey	SP8680	
SP8740	Fairchild	11C91	
SP8793	**National**	**DS8616**	**2771**
SP9685	AMD	AM9685	
SP9687	AMD	AM9687	
TAB1042	Exar	XR4202	
TBA120	**National**	**TBA120**	**3325,3327**

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Plessey Semiconductors (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
TBA120	Siemens	TBA120	
	Signetics	TBA120	
	Telefunken	TBA120	
TBA440	National	TBA440	
	Siemens	TBA440	
TBA520	Signetics	TBA520	
TBA530	National	TBA530	
	Signetics	TBA530	
	Telefunken	TBA530	
TBA540	National	TBA540	
	Signetics	TBA540	
	Telefunken	TBA540	
TBA550	Signetics	TBA550	
TBA560	National	TBA560	
	Signetics	TBA560	
	Telefunken	TBA560	
TBA750	Signetics	TBA750	
TBA800	Fairchild	TBA800	
	SGS	TBA800	
	Thomson-CSF	TBA800	
TBA920	National	TBA920	
	Signetics	TBA920	
TBA950	ITT	TBA950	
	National	TBA950	
TBA990	National	TBA990	
	Signetics	TBA990	
	Telefunken	TBA990	
TCA800	Signetics	TCA800	
TDA1085	Motorola	TDA1085	
TDA1085A	Motorola	TDA1085A	
TDA2522	National	TDA2522	
	Siemens	TDA2522	
	Signetics	TDA2522	
TDA2523	National	TDA2523	
	Signetics	TDA2523	
TDA2530	**Hitachi**	**HN462532**	**3789**
	Motorola	MCM2532	
	National	MM2532	
		NMC2532	
		TDA2530	
		TDA2532	
	Siemens	TDA2530	
	Signetics	TDA2530	
		TDA2532	
	SiliconG	SG2532	
	TI	TMS2532	
	Universal	UM2532	
TDA2540	National	TDA2540	
	Signetics	TDA2540	
TDA2541	National	TDA2541	
	Signetics	TDA2541	
TDA2560	National	TDA2560	
	Siemens	TDA2560	
	Signetics	TDA2560	
TDA2590	Signetics	TDA2590	
TDA2591	National	TDA2591	
	Signetics	TDA2591	
	Telefunken	TDA2591	
TDA2593	National	TDA2593	
	Signetics	TDA2593	
	Telefunken	TDA2593	
TDA440	National	TDA440	
	SGS	TDA440	
	Telefunken	TDA440	

Precision Monolithics Inc.

Manufacturer Device	Replacement Source	Device	IC Master Page
BUF-01	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM210	
		LM310	
	PMI	BUF-02	
		BUF-03	
	SiliconG	SG110	
		SG210	
		SG310	
BUF-02	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM210	
		LM310	
BUF-02	PMI	BUF-01	
		BUF-03	
	SiliconG	SG110	
		SG210	
		SG310	
BUF-03	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM210	
		LM310	
	PMI	BUF-01	
		BUF-02	
	SiliconG	SG110	
		SG210	
		SG310	
CMP-01	MicroPwr	COMP-01	
		COMP-02	
	PMI	CMP-02	
CMP-02	MicroPwr	COMP-01	
		COMP-02	
	PMI	CMP-01	
CMP-05	**National**	**LM161**	**3317**
	Signetics	SE529	
CMP05	Fairchild	μA760	
	National	**LM160**	**3317**
DAC-01	MicroPwr	DAC01	
		MP5520	
	PMI	DAC01	
DAC-01C	NEC-Electron	μPC603	
DAC-02C	NEC-Electron	μPC610	
DAC-08	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC-09	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	

Manufacturer Device	Replacement Source	Device	IC Master Page
DAC-09	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC-10	Datel	DAC-IC10B	
DAC-100	MicroPwr	DAC-100	
DAC-1408	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC-1508	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	

Manufacturer Device	Replacement Source	Device	IC Master Page
◆DAC-76	AMD	AM6070	
◆DAC-86	AMD	AM6072	
◆DAC-87	AMD	AM6073	
DAC01	MicroPwr	DAC01	
		MP5520	
	PMI	DAC-01	
◆DAC100	MicroPwr	MP5560	
DAC12	AMD	AM6012	
	AD	AD562	
	Burr-Brown	DAC862	
	Datel	DAC-562	
		DAC-681	
		DAC-681C	
	Harris	HI562	
		HI562-5	
	MicroPwr	**MP562**	**401,2749**
	MicroEng	MCE-6012	
	Motorola	**AD562**	**2759**
	Signetics	**AM6012**	**3383**
		DAC-312	
	TeledyneP	4068	
DAC1408	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DAC1508	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Precision Monolithics Inc. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DAC1508	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
DMX-88	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
MUX-08	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
MUX-16	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
		MX-1606	**2622**
	Fairchild	F4067	
	Harris	HI1840	
		HI506	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	
	Motorola	MC14067	
	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
MUX-24	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
		LF13509	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**
	TeledyneP	4553	
MUX-28	AD	AD7507	
	Burr-Brown	MPC8D	
	Datel	**MXD-807**	**2622**
		MXD-807	**2622**
	Harris	HI507	
		HI507A	
	Intersil	IH6216	
	MicroPwr	MP7507	
MUX-28	Siliconix	DG507	
		DG507A	**2802**
	TeledyneP	4551	
MUX-88	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
OP-02	AMD	SSS741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	PMI	SSS741	
OP-05	**AD**	**ADOP-07**	**3153**
	MicroPwr	MP5505	
		MP5507	
		OP-05	
		OP-07	
	PMI	OP-07	
	Raytheon	OP-07	
	TI	OP-07	
OP-05A	**RCA**	**CA3493**	**3351**
OP-06	MicroPwr	OP-05	
	PMI	OP-05	
		OP-07	
		OP-08	
OP-07	**AD**	**ADOP-07**	**3153**
	MicroPwr	MP5505	
		MP5507	
		OP-05	
		OP-07	
	PMI	OP-05	
	Raytheon	OP-07	
	TI	OP-07	
OP-08	MicroPwr	OP-05	
	PMI	OP-05	
		OP-06	
		OP-07	
OP-09	Exar	XR4136	
		XR4136M	
	Fairchild	μA4136	
	MicroPwr	MP5509	
	PMI	PM4136	
	Raytheon	RC4136	
		RM4136	
	SiliconG	SG4136	
		SG4136C	
	TI	RC4136	
		RM4136	
OP-10	MicroPwr	MP5510	
		OP-10	
OP-11	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
OP-14	RCA	SSS1458	
		SSS1558	
OP-15	MicroPwr	OP-15	
OP-16	MicroPwr	OP-16	
OP-17	MicroPwr	OP-17	
OP-19	Intersil	ICL741HS	
OP-25	Exar	XR072	
	Fairchild	μAF772	
	TI	TL072	
OP-27	Datel	AM-427	
	Raytheon	OP-27	
OP01	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
OP05	AMD	LM208	
	AD	**AD208**	**3153**
	Fairchild	μA208	
	MicroPwr	MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM208	
	National	LM208	
	PMI	OP-08	
		PM208	
	SiliconG	SG208	
	TI	μA714	
OP12	**MicroPwr**	**MP5524**	**401,3292**
		OP24	
	PMI	OP24	
OP24	**MicroPwr**	**MP5524**	**401,3292**
		OP24	
	PMI	OP12	
OP27	**MicroPwr**	**MP5527**	**401,3292**
		OP27	
OP34	**MicroPwr**	**MP5534**	**401,3292**
		OP34	
OP37	**MicroPwr**	**MP5537**	**401,3292**
		OP37	
PM108	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
PM111	AMD	LM111	
	AD	AD111	
	Fairchild	μA111	
	Intersil	LM111	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM111	
	National	**LM111**	**3317**
	Raytheon	LM111	
	Signetics	LM111	
	SiliconG	SG111	
	TI	LM111	
	Thomson-CSF	SFC2111	
PM139	AMD	LM139	
	Fairchild	μA139	
	Motorola	LM139	
	National	**LM139**	**3317**
	PMI	CMP-04	
	Raytheon	LM139	
	RCA	CA139	
	Signetics	LM139	
	SiliconG	SG139	
	TI	LM139	
PM139A	AMD	LM139A	
	Motorola	LM139A	
	National	**LM139A**	**3317**
	PMI	CMP-04	
	RCA	CA139A	
	SiliconG	SG139A	
PM1458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
PM155	AMD	LF155	
	Intersil	LF155	
	Motorola	LF155	
	National	**LF155**	**3309**
	Signetics	LF155	
PM1558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

ABBREVIATIONS OF COMPANY NAMES

Action Ins	Action Instruments
AD	Analog Devices
ADT	Advanced Digital Technology
Adapt Sci	Adaptive Science Corp.
Advent	Advent Products, Inc.
Alphatron	Alphatron
AMA	American Automation
AMD	Advanced Micro Devices
AMI	American Microsystems, Inc.
Amperex	Amperex Electronic Corp.
Analogic	Analogic
Analog Sys	Analog Systems
APC	Applied Micro Circuits
Apex	Apex Microtechnology
APM	Applied Microsystems Corp.
Appl Sys	Applied Systems Corp.
APT	Applied Microtechnology
Aptek	Aptek Microsystems
Array Tech	Array Technology
AWI	Analog West
Bedford	Bedford Computer Systems Inc.
Burr-Brown	Burr-Brown Research
CAE	Computer Aided Engineering
Cal Devices	California Devices
Cent Data	Central Data Corp.
Cermetek	Cermetek
CGRS	CGRS Microtech Inc.
Cherry	Cherry Semiconductor
CIC	Custom Integrated Circuits
Citel	Citel, Inc.
Comlinear	Comlinear Corporation
CMA	Custom MOS Arrays
Comark	Comark Corp.
Comdial	Comdial Semiconductor
Comp Auto	Computer Automation
Compas	Compas Microsystems
Cont Logic	Control Logic Inc.
Control Sys	Control Systems Microsystems Div.
CreMicro	Creative Micro Systems
Cromemco	Cromemco, Inc.
CSG	Commodore Semiconductor Group
Cubit	Cubit Inc.
Curtis	Curtis Electro Devices, Inc.
Cybernetic	Cybernetic Micro Systems
Cybersys	Cybersystems
Cybertek	Cybertek Inc.
Data General	Data General
Data I/O	Data I/O
Data Trans	Data Translation
Datel	Datel-Intersil
Datricon	Datricon Corporation
DDC	Data Devices Corporation
DEC	Digital Equipment Corporation
Delco	Delco Electronics
DGM	Digital Microsystems
Digelec	Digelec Corp.
Digitek	Digitek, Inc.
Dionics	Dionics Inc.
Dist Comp	Distributed Computer Systems
Divers Tech	Diversified Technology
E-HI	E-H International, Inc.
Elind	Elind Elettronica Industriale
EL Instr	E & L Instruments
EMM	EMM
Emulogic	Emulogic Inc.
Epson	Epson America, Inc.
ETI Micro	ETI Micro
Exar	Exar Integrated Systems
Fairchild	Fairchild
Ferranti	Ferranti Electric
Fujitsu A	Fujitsu America
Fujitsu	Fujitsu Microelectronics, Inc.
GI	General Instrument
GMS	General Microsystems
GTE Micro	GTE Microcircuits
Harris	Harris Semiconductor
Heurikon	Heurikon Corp.
Hilevel	Hilevel Technology, Inc.
Hitachi	Hitachi America, Ltd.
Holt	Holt Inc.
HP	Hewlett-Packard
Hughes	Hughes Aircraft, Solid State Products
Hybrid Sys	Hybrid Systems
Hycom	Hycom Incorporated
IDT	Integrated Device Technology
IMI	International Microcircuits, Inc.
IMP	International Microelectronic Products
IMS	Industrial Micro-systems Inc.
Inconix	Inconix Corporation
Ind Tech	Inductive Technology
Inmos	Inmos
IntCirEng	Integrated Circuit Engineering
IntCirSys	Integrated Circuit Systems
IntCompSys	Integrated Computer Systems
IntCyber	International Cybernetics
Int Micro	International Microsystems
Int Tech	Integrated Technology Corp.
Intech/FMI	Intech/Function Modules Inc.
Intel	Intel
Interdesign	Interdesign
Intersil	Intersil
Intronics	Intronics
IPI	Integrated Photomatrix Inc.
ITT	ITT Semiconductors
Kinetic Sys	Kinetic Systems
Kontron	Kontron Electronics
Lambda	Lambda Semiconductor
Laserdyne	Laserdyne
LSI Comp	LSI Computer Systems
LSI Logic	LSI Logic Corporation
Master Logic	Master Logic Corporation
Matrix	Matrix Corp.
Matrox	Matrox Electronic Systems
MCC	Microcomputer Control
Micrel	Micrel
Micro Eng	Micro Circuit Engineering
Micro Innov	Micro Innovators
Micropac	Micropac Industries
Micro Net	Micro Networks
Micro Pwr	Micro Power Systems
Micro Sci	Micro Sciences Corp.
Micro Tech	Microcircuits Technology
Micro-Link	Micro-Link Corporation
Micron	Micron Technology
MilerTron	MilerTronics
Miller	Miller Technology
Mitel	Mitel Semiconductor
Mitsubishi	Mitsubishi Electronics
MMI	Monolithic Memories, Inc.
Monosil	Monosil
MonSys	Monolithic Systems Corp.
Mostek	Mostek
Motorola	Motorola Semiconductor
MRC	MRC Systems
Murray	Murray Consulting
National	National Semiconductor
NCR	NCR Corp., Microelectronics Division
NEC-EA	NEC/Electronic Arrays Division
NEC Electron	NEC/Electron Division
NEC Micro	NEC/Microcomputer Division
Nitron	Nitron
Nortek	Nortek
OAE	Oliver Advanced Engineering
Octagon	Octagon Systems Corp.
OEI	Optical Electronics Inc.
Ohio Sci	Ohio Scientific
OKI	OKI Semiconductor
Omnibyte	Omnibyte Corp.
Oscar	I. S. Oscar Assoc.
Panasonic	Panasonic
PC/M	Pacific/Cyber Metrix
Percom	Percom Data Co.
Phoenix	Phoenix Digital Corp.
Pico Design	Pico Design
Polycore	Polycore Electronics
Plessey	Plessy Semiconductors
PMI	Precision Monolithics, Inc.
PragDes	Pragmatic Design Inc.
PREMA	PREMA GmbH
Pro-Log	Pro-Log Corp.
Quay	Quay Corp.
Raytheon	Raytheon Semiconductor
RCA	RCA Solid State Division
RCI Data	RCI Data
RELMS	Relational Memory Systems
Reticon	Reticon
RIFA	RFIA
Rockwell	Rockwell, Microelectronic Devices
RTC	Riehl Time Corporation
Sanken	Sanken Electric
Sanyo	Sanyo
SEEQ	SEEQ Technology, Inc.
Semi Proc	Semi Processes
Siemens	Siemens
Signetics	Signetics
SGS	SGS-ATES Semiconductor
Sharp	Sharp
Silicon G	Silicon General
Siliconix	Siliconix
Silicon Sys	Silicon Systems Inc.
Siltronics	Siltronics
SMC	Standard Microsystems Corp.
Solarise	Solarise Enterprises
Solitron	Solitron Devices
Sprague	Sprague Electric Company
SSM	Solid State Micro Technology for Music
SSS	Solid State Scientific
Stag	Stag Microsystems
Struc. Des.	Structured Design inc.
Stynetic	Stynetic Systems
Sunrise	Sunrise Electronics
Sunshine	Sunshine Semiconductor
Supertex	Supertex Inc.
Symtek	Symtek Corp.
Synapse	Synapse Corp.
Synertek	Synertek
Sys Innov	Systems Innovations
Tau Zero	Tau Zero Inc.
Tektronix	Tektronix
Telaris	(See Laserdyne)
Teledyne C	Teledyne Crystalonics
Teledyne P	Teledyne Philbrick
Teledyne S	Teledyne Semiconductor
Telefunken	Telefunken
Telephonics	Telephonics LSI
Telmos	Telmos
Teltone	Teltone Corporation
TI	Texas Instruments
Thomson-CSF	Thompson-CSF Components Corp.
TMX	TMX
Topanga	Topanga Data Systems
Toshiba	Toshiba America
Trans-Data	Trans-Data
TRW	TRW-LSI Products
Unitrode	Unitrode
Universal	Universal Semiconductor, Inc.
Vantage	Vantage Data Products
VTI	VLSI Technology, Inc.
Votrax	Votrax
Weitek	Weitek Corporation
Western	Western Digital
Wintek	Wintek Corp.
Xicor	Xicor, Inc.
Xycom	Xycom
Zendex	Zendex Corp.
Zilog	Zilog
Zymos	Zymos Corporation

© IC MASTER 1983

Authorized IC Master International Distributors

ARGENTINA, COLOMBIA, ECUADOR, VENEZUELA, MEXICO, PERU
Intectra
2629 Terminal Blvd.
Mt. View, CA 94043
Tel. (415) 967-8818

AUSTRALIA
A J Distributors Pty Ltd.
P.O. Box 71
Prospect, S. Australia 5082
Tel. 269-1244
Telex (790) 82635

AUSTRIA
LBG GmbH
Tichtelgasse 10/2/12
A-1120 Vienna, Austria
Tel. (0222) 83 41 01
Telex (847) 134106

BELGIUM
J. P. Le Maire
Rampe Gaulouise Ia
1020 Bruxelles, Belgium
Tel. 02 478 4847
Telex (846) 24610

BRAZIL
Filcres Importacao
Rua Auroraigs
CEP 01209
Caixa Postal 18767
Sao Paulo, Brazil
Tel. (011) 223 7388
Telex 113298

CYPRUS
MOR Electronics Ltd.
P.O. Box 4155
Ramat Gan 52141, Israel

DENMARK
Advanced Electronik
55, Mariendalsvej
DK2000, Copenhagen F, Denmark
Tel. 01 194433
Telex (855) 22431

ENGLAND
Paterson/Steadman & Partner
4 Gold Street
Saffron Walden, Essex CB10 IEP
England
Tel. 27067
Telex 81653

J. B. Tratsart Ltd.
Dogmersfield Nr. Baskingstoke
Hampshire RG27 8SU, England
Tel. 02514 3334
Telex (851) 8814136

FRANCE
Conseilet Promotion
1 Rue Damiens
92100 Boulogne, France
Tel. 621-30-77
Telex 250030F

OFFILIB
48 Rue Gay-Lussac
75240 Paris, Cedex 05, France
Tel. 329-2132
Telex: None

HOLLAND
Manudax-Nederland B. V.
54732G Heeswijk (N.B.)
Meerstraat 7, Holland PB25
Tel. 04139 2901
Telex (844) 50175

HONG KONG
Conmos Products, Ltd.
Haynein Bldg., 11th Floor
1 Tai Yip Street
Keun Tong, Kowloon
Tel. 3-684572
Telex 85448

INDIA, MALAYSIA, SINGAPORE, THAILAND
Radio & Craft Publications
4794/23 Bharat Ram Road
Daryanganj, New Delhi 2, India
Tel. 277147
Telex: None

ISRAEL
STG International Ltd.
10 Huberman Street
P.O. Box 1276
61012 Tel-Aviv, Israel
Tel. 248231
Telex 342229

ITALY
Gruppo Editoriale Jackson
Technoclub
Direzione Redacione e
Amministrazione
Via Rosellini 12
20124 Milano, Italy
Tel. 688-0951

JAPAN
Asahi Glass Company, Ltd.
Electronic Components Group
1-2 Marunouchi 2-chome
Chiyoda-ku, Tokyo 100, Japan
Tel. (03) 218-5813
Telex TK4616

JAPAN (Continued)
Overseas Data Service Co., Ltd.
Shugetsu Building, No. 12-7
Kita-Aoyama 3-chome
Minato-ku, Tokyo 107, Japan
Tel. (03) 400-7090
Telex (781) J26487

Tokyo International
Communications, Inc.
Miyajima Blvd.
28 Yoyogi 1-chome, Shibuya-ku
Tokyo 151, Japan
Tel. 379-2561
Telex: 33106

NORWAY, FINLAND, SWEDEN
Ingenioerforlaget A/S
Kronprinsens Gate 17
Boxs 2476 Solli
Oslo 2, Norway
Tel. (02) 11-51-70
Telex 72400Y

SOUTH AFRICA
Suntronika PTY Ltd.
P.O. Box 46268 Orange Grove
Johannesburg 2119, South Africa
Tel. 725-1210

SPAIN
Sagitron
Castello 25, 2, °
Madrid 1, Spain
Tel. 402 6085
Telex (831) 43819

SWITZERLAND
W. Stolz AG
Taefernstrasse 15
CH-5404 Baden-Daettwil
Switzerland
Tel. 056 840151
Telex (845) 54070Z

TAIWAN
Alfred M. L. Pien
IBS Publications Ltd.
P.O. Box 55-879
Taipei, Taiwan

TURKEY
EEMPA Elektronik
Tersane Cad. Kuthan 38/408
TR/Kara Koy, Istanbul
Turkey
Tel. (11) 49-6249
Telex 24429

WEST GERMANY
Astronic GmbH
Winzererstrasse 47d
8000 Munich 40
West Germany
Tel. (089) 309031
Telex (841) 5216187

Precision Monolithics Inc. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
PM1558	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
PM156	AMD	LF156	
	Intersil	LF156	
	MicroPwr	OP-16	
	Motorola	LF156	
	National	**LF156**	**3309**
	PMI	OP-16	
	Signetics	LF156	
PM157	AMD	LF157	
	Intersil	LF157	
	MicroPwr	OP-17	
	Motorola	LF157	
	National	**LF157**	**3309**
	PMI	OP-17	
PM208	AMD	LM208	
	AD	**AD208**	**3153**
	Fairchild	μA208	
	MicroPwr	MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM208	
	National	LM208	
	PMI	OP-08	
		OP05	
	SiliconG	SG208	
	TI	μA714	
PM2108	Intersil	LH2108	
	National	**LH2108**	**3342**
PM2108A	Intersil	LH2108A	
	National	**LH2108A**	**3342**
PM211	AMD	LM211	
	AD	AD211	
	Motorola	LM211	
	National	**LM211**	**3317**
	RCA	LM211	
	Signetics	LM211	
	SiliconG	SG211	
	TI	LM211	
	Thomson-CSF	SFC2211	
PM2208	**National**	**LH2208**	**3342**
PM2208A	Intersil	LH2208A	
	National	**LH2208A**	**3342**
PM2308	Intersil	LH2308	
	National	**LH2308**	**3342**
	Signetics	LH2308	
PM2308A	Intersil	LH2308A	
	National	**LH2308A**	**3342**
PM239	AMD	LM239	
	Fairchild	μA239	
	Motorola	LM239	
	National	**LM239**	**3317**
	PMI	CMP-04	
	Raytheon	LM239	
	RCA	CA239	
PM239	Signetics	LM239	
	SiliconG	SG239	
	TI	LM239	
PM239A	AMD	LM239A	
	Motorola	LM239A	
	National	**LM239A**	**3317**
	PMI	CMP-04	
	RCA	CA239A	
	SiliconG	SG239A	
PM255	AMD	LF255	
	Motorola	LF255	
	National	**LF255**	**3309**
PM256	AMD	LF256	
	Motorola	LF256	
	National	**LF256**	**3309**
PM257	AMD	LF257	
	Motorola	LF257	
	National	**LF257**	**3309**
PM311	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
PM339A	AMD	LM339	
		LM339A	
	Fairchild	μA339	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
		LM339	
	SiliconG	SG339	
	TI	LM339	
PM355	AMD	LF355	
	Intersil	LF355	
	Motorola	LF355	
	National	**LF355**	**3309**
	Signetics	LF355	
PM356	AMD	LF356	
	Intersil	LF356	
	Motorola	LF356	
	National	**LF356**	**3309**
	Signetics	LF356	
PM357	AMD	LF357	
	Intersil	LF357	
	Motorola	LF357	
	National	**LF357**	**3309**
PM4136	Exar	XR4136	
		XR4136M	
	Fairchild	μA4136	
	MicroPwr	MP5509	
	PMI	OP-09	
	Raytheon	RC4136	
		RM4136	
	SiliconG	SG4136	
		SG4136C	
	TI	RC4136	
		RM4136	
PM725	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
PM725	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
PM741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
PM747	AMD	747	
	Fairchild	μA747	
	Hitachi	HA17747	
	Motorola	MC1747	
	National	LM747	
	NEC-Electron	μPC251	
	PMI	OP-04	
	Raytheon	RC747	
		RM747	
	RCA	CA747	
	Signetics	μA747	
	SiliconG	SG747	
	TeledyneS	747	
	TI	μA747	
REF-01	HybridSys	HSREF01	
	MicroPwr	**MP5532**	**401,3292**
		REF-01	
	Motorola	**MC1404-10**	**2761**
		MC1504-10	**2761**
	TeledyneS	9496	
REF-01AZ	Motorola	MC1500AU10	
REF-01EZ	Motorola	MC1400AU10	
REF-02	**MicroPwr**	**MP5531**	**401,3292**
		REF-02	
	TeledyneS	9495	
REF-02AZ	Motorola	MC1500AU5	
REF-02EZ	Motorola	MC1400AU5	
REF01	PMI	REF-01	
SMP-10	AD	AD583	
	Datel	**SHM-IC-1**	**2622**
	Harris	**HA-2425**	**3214,3287**
	PMI	SMP-11	
	TeledyneP	4856	
SMP-11	AD	AD583	
	Datel	**SHM-IC-1**	**2622**
	Harris	**HA-2425**	**3214,3287**
	PMI	SMP-10	
	TeledyneP	4856	
SSS741	AMD	SSS741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	PMI	OP-02	
SW-01	AD	ADG201	
SW-01	Harris	HI201	
	MicroPwr	MP201	
	National	**LF11201**	**3318**
		LF13201	**3318**
	PMI	SW-201	
	Siliconix	DG201	
SW-02	**National**	**LF13202**	**3318**
	Siliconix	DG202	
SW-05	AD	ADG200	
	Harris	HI200	
	Intersil	IH200	
	MicroPwr	MP200	
		MP7513	
	Siliconix	DG200	
SW-201	AD	ADG201	
	Harris	HI201	
	MicroPwr	MP201	
	National	**LF11201**	**3318**
		LF13201	**3318**
	PMI	SW-01	
	Siliconix	DG201	
SW03	**National**	**LF13332**	**3318**
SW04	**National**	**LF13331**	**3318**
SW7510	AD	AD7510	
	MicroPwr	MP7510	
SW7511	AD	AD7511	
	MicroPwr	MP7511	

Raytheon Semiconductor

29610	AMD	AM27S12	
	Fairchild	93436	
	Harris	HM7620	
	Intel	M3602	
	MMI	5305	
		6305	
	National	DM54S570	
		DM74S570	
	Signetics	N82S130	
		S82S130	
29611	AMD	AM27S13	
	Fairchild	93446	
	Harris	HM7621	
	Intel	M3622	
	MMI	5306	
		6306	
	National	DM54S571	
		DM74S571	
	Signetics	N82S131	
		S82S131	
29620	AMD	AM27S28	
	Fujitsu	MB7123	
		MB7124	
		MC7124	
	Harris	HM7648	
	MMI	5348	
		6348	
	National	DM54S473	
		DM74S473	
	Signetics	N82S146	
		S82S146	
	TI	**TBP28SA42**	**440,3976**
29621	AMD	AM27S29	
	Fujitsu	MB7124	
		MBM7124	
	Harris	HM7649	
	MMI	5349-1	
		6349-1	**3826**
	Motorola	MCM7649	
	National	DM54S472	
		DM74S472	
	Signetics	N82S147	
		S82S147	
	TI	DM54S472	
		TBP28S42	**440,3975**
		TBP28S42M	**440,3975**
29624	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Raytheon Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
29624	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Signetics	N82S140	
		S82S140	
	TI	**TBP28SA46**	**440**
29625	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	**3826**
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Signetics	N82S141	
		S82S141	
	TI	**TBP28S46**	**440,3976**
		TBP28S46M	**440,3976**
29630	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
29631	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
29631A	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**

Manufacturer Device	Replacement Source	Device	IC Master Page
29631A	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
29631AM	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
29633	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	

Manufacturer Device	Replacement Source	Device	IC Master Page
29633	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
29635	Harris	HM7608	
	Signetics	N82S2708	
		S82S2708	
	TI	**TBP28S2708**	**3930**
29640	AMD	AM27S32	
	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642	
		HM7642-2	**3705**
	Intel	M3605	
	MMI	5352-1	
		6352	
	National	DM54S572	
		DM74S572	
	Signetics	N82S136	
		S82S136	
	TI	**TBP24SA41**	**440,3968**
		TBP24SA41M	**440,3968**
29641	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
29643	AMD	AM27PS41	
29650	AMD	AM27S184	
	Fujitsu	MB7127	
	Harris	HM7684	
	MMI	53100	
		63100	
	Motorola	MCM7684	
	National	DM77S184	
		DM87S184	
	Signetics	N82S184	
	TI	**TBP24SA81**	**440,3969**
29651	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	**TBP24S81**	**440,3968**
		TBP24S81M	**440,3968**
29651A	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	**440,3968**
		TBP24S81M	**440,3968**
29651AM	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	**440,3968**
		TBP24S81M	**440,3968**
29653	AMD	AM27PS185	
29660	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	**3696**
	Intel	M3601	
	MMI	5300-1	
		6300-1	**3826**
	National	DM54S387	
		DM74S387	
	Signetics	N82S126	
		S82S126	
	TI	**TBP24SA10**	**440,3967**
		TBP24SA10M	**440,3967**
29661	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
		HM7611-2	**3696**
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	**3826**
	National	DM54S287	
		DM74S287	
		DM76L97	
		DM86L97	
	Signetics	N82S129	
		S82S129	
	TI	**TBP24S10**	**440,3967**
29680	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Raytheon Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
29680	National	DM77S190	
		DM87S190	
	Raytheon	29683	
	Signetics	82S190	
		N82S190	
		S82S190	
	Supertex	MM82S190	
29681	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	**440.3979**
29681A	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	**440.3979**
29683	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	
	National	DM77S190	
		DM87S190	
	Raytheon	29680	
	Signetics	82S190	
		N82S190	
		S82S190	
	Supertex	MM82S190	
54LS00	Fairchild	54LS00	
	Motorola	SN54LS00	
	National	DM54LS00	
	Signetics	54LS00	
	TI	**SN54LS00**	**833**
54LS01	Fairchild	54LS01	
	Motorola	SN54LS01	
	National	DM54LS01	
	TI	**SN54LS01**	**833**
54LS02	Fairchild	54LS02	
	Motorola	SN54LS02	
	National	DM54LS02	
	Signetics	54LS02	
	TI	**SN54LS02**	**833**
54LS03	Fairchild	54LS03	
	Motorola	SN54LS03	
	National	DM54LS03	
	TI	**SN54LS03**	**834**
54LS04	Fairchild	54LS04	
	Motorola	SN54LS04	
	National	DM54LS04	
	Signetics	54LS04	
	TI	**SN54LS04**	**834**
54LS05	Fairchild	54LS05	
	Motorola	SN54LS05	
	National	DM54LS05	
	TI	**SN54LS05**	**834**
54LS08	Fairchild	54LS08	
	Motorola	SN54LS08	
	National	DM54LS08	
	Signetics	54LS08	
	TI	**SN54LS08**	**835**
54LS09	Fairchild	54LS09	
	Motorola	SN54LS09	
	National	DM54LS09	
	TI	**SN54LS09**	**836**
54LS10	Fairchild	54LS10	
	Motorola	SN54LS10	
	National	DM54LS10	
	Signetics	54LS10	
	TI	**SN54LS10**	**836**
54LS107	Motorola	SN54LS107A	
	National	DM54LS107	
	Signetics	54LS107	
	TI	**SN54LS107A**	**869**
54LS109	Fairchild	54LS109	
	Motorola	SN54LS109A	
	National	DM54LS109	
		DM54LS109A	
	Signetics	54LS109	
	TI	SN54LS109	
		SN54LS109A	**870**
54LS11	Fairchild	54LS11	
	Motorola	SN54LS11	
	National	DM54LS11	
	TI	**SN54LS11**	**836**
54LS112	Fairchild	54LS112	
	Motorola	SN54LS112A	
	National	DM54LS112	
	Signetics	54LS112	
	TI	SN54LS112	
		SN54LS112A	**871**
54LS113	Fairchild	54LS113	
	Motorola	SN54LS113A	
	National	DM54LS113	
	Signetics	54LS113	
	TI	SN54LS113	
		SN54LS113A	**871**
54LS114	Fairchild	54LS114	
	Motorola	SN54LS114A	
	National	DM54LS114	
		DM54LS114A	
	TI	SN54LS114	
		SN54LS114A	
54LS12	Motorola	SN54LS12	
	National	DM54LS12	
	TI	**SN54LS12**	**837**
54LS122	Motorola	SN54LS122	
	National	DM54LS122	
	TI	**SN54LS122**	**873**
54LS123	Motorola	SN54LS123	
	National	DM54LS123	
	TI	**SN54LS123**	**874**
54LS125	Motorola	SN54LS125A	
	National	DM54LS125	
	Signetics	54LS125A	
	TI	**SN54LS125A**	**875**
54LS126	Fairchild	54LS126	
		SN54LS126	
	Motorola	SN54LS126A	
	National	DM54LS126	
	Signetics	54LS126A	
	TI	SN54LS126	
		SN54LS126A	
54LS13	Fairchild	54LS13	
	Motorola	SN54LS13	
	National	DM54LS13	
	TI	**SN54LS13**	**837**
		SN54S13	
54LS132	Motorola	SN54LS132	
	National	DM54LS132	
	Signetics	54LS132	
	TI	**SN54LS132**	**877**
54LS136	Fairchild	54LS136	
	Motorola	SN54LS136	
	National	DM54LS136	
	Signetics	54LS136	
	TI	**SN54LS136**	**878**
54LS138	AMD	SN54LS138	
	Fairchild	54LS138	
	Motorola	SN54LS138	
	National	DM54LS138	
	Signetics	54LS138	
	TI	**SN54LS138**	**880**
54LS139	AMD	SN54LS139	
	Fairchild	54LS139	
	Motorola	SN54LS139	
	National	DM54LS139	
	Signetics	54LS139	
	TI	**SN54LS139**	**880**
54LS14	Fairchild	54LS14	
	Motorola	SN54LS14	
	National	DM54LS14	
	Signetics	54LS14	
	TI	**SN54LS14**	**837**
54LS15	Fairchild	54LS15	
	Motorola	SN54LS15	
	National	DM54LS15	
	TI	**SN54LS15**	**838**
54LS151	AMD	SN54LS151	
	Fairchild	54LS151	
	Motorola	SN54LS151	
	National	DM54LS151	
	Signetics	54LS151	
	TI	**SN54LS151**	**884**
54LS152	Fairchild	54LS152	
	TI	**SN54LS152**	**884**
54LS153	AMD	SN54LS153	
	Fairchild	54LS153	
	Motorola	SN54LS153	
	National	DM54LS153	
	Signetics	54LS153	
	TI	**SN54LS153**	**884**
54LS155	Fairchild	54LS155	
	Motorola	SN54LS155	
	National	DM54LS155	
	Raytheon	74LS155	
	TI	**SN54LS155**	**886**
54LS156	Fairchild	54LS156	
	Motorola	SN54LS156	
	National	DM54LS156	
	TI	**SN54LS156**	**886**
54LS157	AMD	SN54LS157	
	Fairchild	54LS157	
	Motorola	SN54LS157	
	National	DM54LS157	
	Signetics	54LS157	
	TI	**SN54LS157**	**887**
54LS158	AMD	SN54LS158	
	Fairchild	54LS158	
	Motorola	SN54LS158	
	National	DM54LS158	
	Signetics	54LS158	
	TI	**SN54LS158**	**887**
54LS160	AMD	SN54LS160A	
		SN74S160	**1227**
	Fairchild	93S10	
	Motorola	SN54LS160A	
	National	DM54LS160	
	Signetics	54LS160	
		54LS160A	
	TI	**SN54LS160A**	**889**
54LS161	AMD	SN54LS161A	
	Fairchild	54LS161A	
	Motorola	SN54LS161A	
	National	DM54LS161A	
	Signetics	54LS161A	
	TI	SN54LS161	
		SN54LS161A	**889**
54LS162	AMD	SN54LS162A	
	Motorola	SN54LS162A	
	National	DM54LS162A	
	Signetics	54LS162A	
	TI	SN54LS162	
		SN54LS162A	**890**
54LS163	AMD	SN54LS163A	
	Motorola	SN54LS163A	
	National	DM54LS163	
		DM54LS163A	
	Signetics	54LS163A	
	TI	54LS163A	
		SN54LS163	
		SN54LS163A	
54LS164	AMD	SN54LS164	
	Fairchild	54LS164	
	Motorola	SN54LS164	
		SN54LS164A	
	National	DM54LS164	
		DM54LS164A	
	Signetics	54LS164	
	TI	**SN54LS164**	**891**
		SN54LS164A	
54LS170	Fairchild	54LS170	
	Motorola	SN54LS170	
	National	DM54LS170	
	TI	**SN54LS170**	**893**
54LS174	AMD	SN54LS174	
	Fairchild	54LS174	
	Motorola	SN54LS174	
	National	DM54LS174	
	Signetics	54LS174	
	TI	**SN54LS174**	**895**
54LS175	AMD	SN54LS175	
	Fairchild	54LS175	
	Motorola	SN54LS175	
	National	DM54LS175	
	Signetics	54LS175	
	TI	**SN54LS175**	**895**
54LS181	AMD	SN54LS181	
	Fairchild	54LS181	
	Motorola	SN54LS181	
	Signetics	54LS181	
	TI	**SN54LS181**	**897**
54LS190	AMD	SN54LS190	
	Motorola	SN54LS190	
	National	DM54LS190	
	Signetics	54LS190	
	TI	**SN54LS190**	**901**
54LS191	AMD	SN54LS191	
	Motorola	SN54LS191	
	National	DM54LS191	
	Signetics	54LS191	
	TI	**SN54LS191**	**901**
54LS192	AMD	SN54LS192	
	Fairchild	54LS192	
	Motorola	SN54LS192	
	National	DM54LS192	
	Signetics	54LS192	
	TI	**SN54LS192**	**902**
54LS193	AMD	SN54LS193	
	Fairchild	54LS193	
	Motorola	SN54LS193	
	National	DM54LS193	
	Signetics	54LS193	
	TI	**SN54LS193**	**902**
54LS195A	AMD	SN54LS195A	
	Fairchild	54LS195A	
	Motorola	SN54LS195A	
	Signetics	54LS195A	
	TI	**SN54LS195A**	**903**
54LS196	Motorola	SN54LS196	
	National	DM54LS196	
	TI	**SN54LS196**	**903**
54LS197	Motorola	SN54LS197	
	National	DM54LS197	
	Signetics	54LS197	
	TI	**SN54LS197**	**904**
54LS20	Fairchild	54LS20	
	Motorola	SN54LS20	
	National	DM54LS20	
	Signetics	54LS20	
	TI	**SN54LS20**	**839**
54LS21	Fairchild	54LS21	
	Motorola	SN54LS21	
	National	DM54LS21	
	TI	**SN54LS21**	**840**
54LS22	Fairchild	54LS22	
	Motorola	SN54LS22	
	National	DM54LS22	
	TI	**SN54LS22**	**840**
54LS221	Motorola	SN54LS221	
	National	DM54LS221	
	Signetics	54LS221	
	TI	**SN54LS221**	**906**
54LS240	AMD	SN54LS240	
	Fairchild	54LS240	
	MMI	54LS240	
	Motorola	SN54LS240	
	TI	**SN54LS240**	**910**
54LS241	AMD	SN54LS241	
	Fairchild	54LS241	
	MMI	54LS241	
	Motorola	SN54LS241	
	TI	**SN54LS241**	**911**
54LS242	AMD	SN54LS242	
	Motorola	SN54LS242	
	TI	**SN54LS242**	**911**
54LS243	AMD	SN54LS243	
	Motorola	SN54LS243	
	TI	**SN54LS243**	**912**
54LS244	AMD	SN54LS244	
	Fairchild	54LS244	
	MMI	54LS244	
	Motorola	SN54LS244	
	TI	**SN54LS244**	**912**
54LS251	AMD	SN54LS251	
	Fairchild	54LS251	
	Motorola	SN54LS251	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Raytheon Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
54LS251	Signetics	54LS251	
	TI	**SN54LS251**	915
54LS253	AMD	SN54LS253	
	Fairchild	54LS253	
	Motorola	SN54LS253	
	National	DM54LS253	
		DM7214	
	Signetics	54LS253	
	TI	SN54LS253	
54LS255	Fairchild	54LS255	
54LS257	AMD	SN54LS257	
	Motorola	SN54LS257A	
	National	DM54LS257	
	Signetics	54LS257	
	TI	SN54LS257	
		SN54LS257A	916
54LS258	AMD	SN54LS258	
	Fairchild	54LS258A	
	Motorola	SN54LS258A	
	National	DM54LS258	
	Signetics	54LS258	
	TI	SN54LS258	
		SN54LS258A	917
54LS26	Fairchild	54LS26	
	Motorola	SN54LS26	
	National	DM54LS26	
	TI	**SN54LS26**	841
54LS261	TI	**SN54LS261**	918
54LS266	Fairchild	54LS266	
		9386	
	Motorola	SN54LS266	
	National	DM54LS266	
	Signetics	54LS266	
	TI	**SN54LS266**	918
54LS27	Fairchild	54LS27	
	Motorola	SN54LS27	
	National	DM54LS27	
	TI	**SN54LS27**	842
54LS273	AMD	**SN54LS273**	1227
	Fairchild	54LS273	
	Motorola	SN54LS273	
	TI	**SN54LS273**	919
54LS279	Fairchild	54LS279	
	Motorola	SN54LS279	
	National	DM54LS279	
	Signetics	54LS279	
	TI	**SN54LS279**	921
54LS28	Fairchild	54LS28	
	Motorola	SN54LS28	
	Signetics	54LS194A	
		54LS28	
	TI	**SN54LS28**	842
54LS283	Fairchild	54LS283	
	Motorola	SN54LS283	
	National	DM54LS283	
	Signetics	54LS283	
	TI	**SN54LS283**	922
54LS290	Motorola	SN54LS290	
	National	DM54LS290	
	Signetics	54LS290	
	TI	**SN54LS290**	924
54LS293	Fairchild	54LS293	
	Motorola	SN54LS293	
	National	DM54LS293	
	Signetics	54LS293	
	TI	**SN54LS293**	925
54LS295A	Motorola	SN54LS295A	
	TI	**SN54LS295B**	925
54LS298	AMD	SN54LS298	
	Fairchild	54LS298	
	Motorola	SN54LS298	
	TI	**SN54LS298**	926
54LS299	AMD	**SN54LS299**	1227
	Fairchild	54LS299	
	MMI	54LS299	
	Motorola	SN54LS299	
	TI	**SN54LS299**	927
54LS30	Fairchild	54LS30	
	Motorola	SN54LS30	
	National	DM54LS30	
	Signetics	54LS30	
	TI	**SN54LS30**	842
54LS32	Fairchild	54LS32	
		74LS32	
	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	732
		SN54LS32	
		SN74LS32	
54LS32	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN54LS32**	843
		SN74LS32	843
54LS322	AMD	SN54LS322	
	Motorola	SN54LS322	
	Raytheon	54LS322A	
	TI	SN54LS322	
		SN54LS322A	930
54LS322A	AMD	SN54LS322	
	Motorola	SN54LS322	
	Raytheon	54LS322	
	TI	SN54LS322	
		SN54LS322A	930
54LS323	AMD	SN54LS323	
		SN74LS323	
	Fairchild	54LS323	
		74LS323	
	Motorola	SN54LS323	
		SN74LS323	
	Raytheon	74LS323	
	TI	**SN54LS323**	930
		SN54LS323A	
		SN74LS323	930
54LS33	Fairchild	54LS33	
	Motorola	SN54LS33	
	TI	**SN54LS33**	843
54LS365	Fairchild	54LS365A	
	Motorola	SN54LS365A	
	Signetics	54LS365	
		54LS365A	
	TI	SN54LS265A	
		SN54LS365A	935
54LS366	Fairchild	54LS366A	
	Motorola	SN54LS366A	
	National	DM54LS366	
	Signetics	54LS366A	
	TI	**SN54LS366A**	935
54LS367	Fairchild	54LS367A	
	Motorola	SN54LS367A	
	National	DM54LS367	
	Signetics	54LS367	
		54LS367A	
	TI	**SN54LS367A**	936
54LS368	Fairchild	54LS368A	
	Motorola	SN54LS368A	
	National	DM54LS368	
	Signetics	54LS368	
		54LS368A	
	TI	SN54L368A	
		SN54LS368A	936
54LS37	Fairchild	54LS37	
	Motorola	SN54LS37	
	National	DM54LS37	
	Signetics	54LS37	
	TI	**SN54LS37**	844
54LS373	AMD	**SN54LS373**	1227
	MMI	54LS373	
	Motorola	SN54LS373	
	Signetics	**54LS373**	783
	TI	**SN54LS373**	937
54LS374	AMD	**SN54LS374**	1227
	MMI	54LS374	
	Motorola	SN54LS374	
	National	DM54LS374	
	TI	**SN54LS374**	938
54LS375	Fairchild	54LS375	
	Motorola	SN54LS375	
	Signetics	54LS375	
	TI	**SN54LS375**	938
54LS377	AMD	**SN54LS377**	1227
	Fairchild	54LS377	
	Motorola	SN54LS377	
	TI	**SN54LS377**	939
54LS38	Fairchild	54LS38	
	Motorola	SN54LS38	
	National	DM54LS38	
	TI	**SN54LS38**	844
54LS384	AMD	SN54LS384	
	Motorola	SN54LS384	
	TI	**SN54LS384**	941
54LS385	AMD	SN54LS385	
	Motorola	SN54LS385	
	TI	**SN54LS385**	942
54LS386	Motorola	SN54LS386	
	National	DM54LS386	
	Raytheon	RM8241	
54LS386	Signetics	S82S41	
	TI	54LS386	
		SN54LS386	942
54LS395A	Motorola	SN54LS395A	
	National	DM54LS395	
	Signetics	54LS395	
	TI	SN54LS395	
		SN54LS395A	943
54LS40	Fairchild	54LS40	
	Motorola	SN54LS40	
	National	DM54LS40	
	TI	**SN54LS40**	845
54LS42	Fairchild	54LS42	
	Motorola	SN54LS42	
	National	DM54LS42	
	Signetics	54LS42	
	TI	**SN54LS42**	845
54LS51	Fairchild	54LS51	
	Motorola	SN54LS51	
	National	DM54LS51	
	Signetics	54LS51	
	TI	**SN54LS51**	848
54LS54	Fairchild	54LS54	
	Motorola	SN54LS54	
	National	DM54LS54	
	TI	**SN54LS54**	850
54LS55	Fairchild	54LS55	
	Motorola	SN54LS55	
	National	DM54LS55	
	TI	54LS55	
		SN54LS55	851
54LS670	Fairchild	54LS670	
	Motorola	54LS670	
		SN54LS670	
	National	DM54LS670	
	Signetics	54LS670	
	TI	**SN54LS670**	990
54LS73	Motorola	SN54LS73A	
	National	DM54LS73	
	Signetics	54LS73	
	TI	SN54LS73	
		SN54LS73A	856
54LS74	Fairchild	54LS74	
	Motorola	SN54LS74A	
	National	DM54LS74	
		DM54LS74A	
	Signetics	54LS74	
	TI	SN54LS74	
		SN54LS74A	857
54LS75	Motorola	SN54LS75	
	National	DM54LS75	
	Signetics	54LS75	
	TI	**SN54LS75**	858
54LS76	Motorola	SN54LS76A	
	National	DM54LS76	
	Signetics	54LS76	
	TI	SN54LS76	
		SN54LS76A	858
54LS77	National	DM74LS77	
	Raytheon	74LS77	
54LS78	Motorola	SN54LS78A	
	National	DM54LS78	
	TI	SN54LS78	
		SN54LS78A	859
54LS83A	Fairchild	54LS83A	
	Motorola	SN542S83A	
		SN54LS83A	
	National	DM54LS83A	
	Signetics	54LS83	
		54LS83A	
	TI	**SN54LS83A**	861
54LS85	Fairchild	54LS85	
	Motorola	SN54LS85	
	National	DM54LS85	
	Signetics	54LS85	
	TI	SN54LS85	
54LS86	Motorola	SN54LS86	
	National	DM54LS86	
	Signetics	54LS86	
	TI	**SN54LS86**	862
54LS90	Motorola	SN54LS90	
	National	DM54LS90	
	Signetics	54LS90	
	TI	**SN54LS90**	864
54LS91	Motorola	SN54LS91	
	TI	**SN54LS91**	864
54LS92	Motorola	SN54LS92	
	National	DM54LS92	
	Signetics	54LS92	
	TI	**SN54LS92**	864
54LS93	Fairchild	54LS93	
	Motorola	SN54LS93	
54LS93	National	DM54LS93	
	Signetics	54LS93	
	TI	**SN54LS93**	865
54LS95B	Fairchild	54LS95B	
	Motorola	SN54LS95B	
	National	DM54LS95B	
	Signetics	54LS95B	
	TI	**SN54LS95B**	866
54S240	AMD	SN54S240	
	MMI	54S240	
		SN54S240	715
	TI	**SN54S240**	910
54S241	AMD	SN54S241	
	MMI	54S241	
		SN54S241	715
	TI	**SN54S241**	911
54S244	AMD	SN54S244	
	MMI	54S244	
		SN54S244	715
	TI	**SN54S244**	912
67401	AMD	3341	
	Fairchild	3341	
	MMI	67401	
74LS00	Fairchild	74LS00	
	Hitachi	HD74LS00	
	Motorola	SN74LS00	
	National	DM74LS00	
	SGS	T74LS00	
	Signetics	74LS00	
	TI	**SN74LS00**	833
74LS01	Fairchild	HD74LS01	
	Hitachi	HD74LS01	
	Motorola	SN74LS01	
	National	DM74LS01	
	Signetics	74LS01	
	TI	**SN74LS01**	833
74LS02	Fairchild	74LS02	
	Hitachi	HD74LS02	
	Motorola	SN74LS02	
	National	DM74LS02	
	SGS	T74LS02	
	Signetics	74LS02	
	TI	**SN74LS02**	833
74LS03	Fairchild	74LS03	
	Hitachi	HD74LS03	
	Motorola	SN74LS03	
	National	DM74LS03	
	SGS	T74LS03	
	TI	**SN74LS03**	834
74LS04	Fairchild	74LS04	
	Hitachi	HD74LS04	
	Motorola	SN74LS04	
	National	DM74LS04	
	SGS	T74LS04	
	Signetics	74LS04	
	TI	**SN74LS04**	834
74LS05	Fairchild	74LS05	
	Hitachi	HD74LS05	
	Motorola	SN74LS05	
	National	DM74LS05	
	NEC-Electron	μPB74LS05	
	SGS	T74LS05	
	Signetics	74LS05	
	TI	**SN74LS05**	834
74LS08	Fairchild	74LS08	
	Hitachi	HD74LS08	
	Motorola	SN74LS08	
	National	DM74LS08	
	SGS	T74LS08	
	Signetics	74LS08	
		SN74LS08	
	TI	**SN74LS08**	835
74LS09	Fairchild	74LS09	
	Hitachi	HD74LS09	
	Motorola	SN74LS09	
	National	DM74LS09	
	SGS	T74LS09	
	TI	**SN74LS09**	836
74LS10	Fairchild	74LS10	
	Hitachi	HD74LS10	
	Motorola	SN74LS10	
	National	DM74LS10	
	SGS	T74LS10	
	Signetics	74LS10	
	TI	**SN74LS10**	836
74LS107	Hitachi	HD74LS107	
	Motorola	SN74LS107A	
	National	DM74LS107	
	Signetics	74LS107	
	TI	**SN74LS107A**	869
74LS109	Fairchild	74LS109	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Raytheon Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
74LS109	Hitachi	HD74LS109	
	Motorola	SN74LS109	
		SN74LS109A	
	National	DM74LS109	
	Signetics	74LS109	
	TI	**SN74LS109A**	**870**
		SN74S109A	
74LS11	Fairchild	74LS11	
	Hitachi	HD74LS11	
	Motorola	SN74LS11	
	National	DM74LS11	
	SGS	T74LS11	
	Signetics	74LS11	
	TI	**SN74LS11**	**836**
74LS112	Fairchild	74LS112	
	Hitachi	HD74LS112	
	Motorola	SN74LS112A	
	National	DM74LS112	
	SGS	T74LS112	
	Signetics	74LS112	
	TI	**SN74LS112A**	**871**
74LS113	Fairchild	74LS113	
	Hitachi	HD74LS113	
	Motorola	SN74LS113A	
	National	DM74LS113	
	SGS	T74LS113	
	Signetics	74LS113	
	TI	**SN74LS113A**	**871**
74LS114	Fairchild	74LS114	
	Hitachi	HD74LS114	
	Motorola	74LS114A	
		SN74LS114A	
	National	DM74LS114	
	TI	SN74LS114A	
74LS12	Hitachi	HD74LS12	
	Motorola	SN74LS12	
	National	DM74LS12	
	Signetics	74LS12	
	TI	**SN74LS12**	**837**
74LS122	Hitachi	HD74LS122	
	Motorola	SN74LS122	
	National	DM74LS122	
	TI	**SN74LS122**	**873**
74LS123	Hitachi	HD74LS123	
	Motorola	SN74LS123	
	National	DM74LS123	
	TI	**SN74LS123**	**874**
74LS125	Fairchild	74LS125A	
	Motorola	SN74LS125A	
	National	DM74LS125	
	SGS	T74LS125	
	Signetics	74LS125A	
	TI	**SN74LS125A**	**875**
74LS126	Fairchild	74LS126	
	Motorola	SN74LS126A	
	National	DM74LS126	
	SGS	T74LS126	
	Signetics	74LS126A	
	TI	**SN74LS126A**	**875**
74LS13	Fairchild	74LS13	
	Hitachi	HD74LS13	
	Motorola	SN74LS13	
	National	DM74LS13	
	Signetics	74LS13	
	TI	**SN74LS13**	**837**
74LS132	Fairchild	74LS132	
	Hitachi	HD74LS132	
	Motorola	SN74LS132	
	National	DM74LS132	
	SGS	T74LS132	
	Signetics	74LS132	
	TI	SN74LS132	
74LS136	Fairchild	74LS136	
	Hitachi	HD74LS136	
	Motorola	SN74LS136	
	National	DM74LS136	
	SGS	T74LS136	
	Signetics	74LS136	
	TI	**SN74LS136**	**878**
74LS138	Fairchild	74LS138	
	Hitachi	HD74LS138	
	Motorola	SN74LS138	
	National	DM74LS138	
	SGS	T74LS138	
	Signetics	74LS138	
	TI	**SN74LS138**	**880**
74LS139	Fairchild	74LS139	
	Hitachi	HD74LS139	
74LS139	Motorola	SN74LS139	
	National	DM74LS139	
	SGS	T74LS139	
	Signetics	74LS139	
	TI	**SN74LS139**	**880**
74LS14	Fairchild	74LS14	
	Hitachi	HD74LS14	
	Motorola	SN74LS14	
	National	DM74LS14	
	Signetics	74LS14	
	TI	**SN74LS14**	**837**
74LS15	Fairchild	74LS15	
	Hitachi	HD74LS15	
	Motorola	SN74LS15	
	National	DM74LS15	
	SGS	T74LS15	
	TI	**SN74LS15**	**838**
74LS151	Fairchild	74LS151	
	Hitachi	HD74LS151	
		HD74LS151A	
	Motorola	SN74LS151	
	National	DM74LS151	
	SGS	T74LS151	
	Signetics	74LS151	
	TI	**SN74LS151**	**884**
74LS152	Signetics	74LS152	
74LS153	Fairchild	74LS153	
	Hitachi	HD74LS153	
	Motorola	SN74LS153	
	National	DM74LS153	
	SGS	T74LS153	
	Signetics	74LS153	
	TI	**SN74LS153**	**884**
74LS155	Fairchild	74LS155	
	Hitachi	HD74LS155	
	Motorola	SN74LS155	
	National	DM74LS155	
	Signetics	74LS155	
	TI	**SN74LS155**	**886**
74LS156	Fairchild	74LS156	
	Hitachi	HD74LS156	
	Motorola	SN74LS156	
	National	DM74LS156	
	SGS	T74LS156	
	Signetics	74LS156	
	TI	**SN74LS156**	**886**
74LS157	Fairchild	74LS157	
	Hitachi	HD74LS157	
	Motorola	SN74LS157	
	National	DM74LS157	
	SGS	T74LS157	
	Signetics	74LS157	
	TI	**SN74LS157**	**887**
74LS158	Fairchild	74LS158	
	Hitachi	HD74LS158	
	Motorola	SN74LS158	
	National	DM74LS158	
	SGS	T74LS158	
	Signetics	74LS158	
	TI	**SN74LS158**	**887**
74LS160	Fairchild	74LS160	
	Hitachi	HD74LS160A	
	Motorola	SN74LS160A	
	National	DM74LS160	
	Signetics	74LS160	
		74LS160A	
	TI	**SN74LS160A**	**889**
74LS161	AMD	SN74LS161	
	Fairchild	74LS161A	
	Hitachi	HD74LS161A	
	Motorola	SN74LS161A	
	National	DM74LS161	
	NEC-Electron	μPB74LS161	
	Signetics	74LS161A	
	TI	**SN74LS161A**	**889**
74LS162	Fairchild	74LS162	
	Hitachi	HD74LS162A	
	Motorola	SN74LS162A	
	National	DM74LS162	
	SGS	T74LS162	
	Signetics	74LS162A	
	TI	SN74LS162A	
74LS163	Fairchild	74LS163	
	Hitachi	HD74LS163	
		HD74LS163A	
	Motorola	SN74LS163A	
	National	DM74LS163	
	SGS	T74LS163	
	Signetics	74LS163A	
	TI	**SN74LS163A**	**890**
74LS164	Fairchild	74LS164	
74LS164	Hitachi	HD74LS164	
	Motorola	SN74LS164A	
	National	DM74LS164	
	SGS	T74LS164	
	Signetics	74LS164	
		74LS164A	
	TI	**SN74LS164**	**891**
74LS170	Fairchild	74LS170	
	Motorola	SN74LS170	
	National	DM74LS170	
	SGS	T74LS170	
	Signetics	74LS170	
	TI	**SN74LS170**	**893**
74LS174	Fairchild	74LS174	
	Hitachi	HD74LS174	
	Motorola	SN74LS174	
	National	DM74LS174	
	SGS	T74LS174	
	Signetics	74LS174	
	TI	**SN74LS174**	**895**
74LS175	Fairchild	74LS175	
	Hitachi	HD74LS175	
	Motorola	SN74LS175	
	SGS	T74LS175	
	Signetics	74LS175	
	TI	**SN74LS175**	**895**
74LS181	Fairchild	74LS181	
	Hitachi	HD74LS181	
	Motorola	SN74LS181	
	SGS	T74LS181	
	Signetics	74LS181	
	TI	**SN74LS181**	**897**
74LS190	Fairchild	74LS190	
	Hitachi	HD74LS190	
	Motorola	SN74LS190	
	National	DM74LS190	
	SGS	T74LS190	
	TI	**SN74LS190**	**901**
74LS191	Fairchild	74LS191	
	Hitachi	HD74LS191	
	Motorola	SN74LS191	
	National	DM74LS191	
	SGS	T74LS191	
	Signetics	74LS191	
	TI	**SN74LS191**	**901**
74LS192	Fairchild	74LS192	
	Hitachi	HD74LS192	
	Motorola	SN74LS192	
	National	DM74LS192	
	SGS	T74LS192	
	Signetics	74LS192	
	TI	**SN74LS192**	**902**
74LS193	Fairchild	74LS193	
	Hitachi	HD74LS193	
	Motorola	SN74LS193	
	National	DM74LS193	
	SGS	T74LS193	
	Signetics	74LS193	
	TI	**SN74LS193**	**902**
74LS195A	Fairchild	74LS195A	
	Hitachi	HD74LS195A	
	Motorola	SN74LS195A	
	National	DM74LS195	
	SGS	T74LS195A	
	Signetics	74LS195A	
	TI	**SN74LS195A**	**903**
74LS196	Fairchild	74LS196	
	Hitachi	HD74LS196	
	Motorola	SN74LS196	
	National	DM74LS196	
	Signetics	N82S80	
	TI	**SN74LS196**	**903**
74LS197	Fairchild	74LS197	
	Hitachi	HD74LS197	
	Motorola	SN74LS197	
	National	DM74LS197	
	Signetics	74LS197	
	TI	**SN74LS197**	**904**
74LS20	Fairchild	74LS20	
	Hitachi	HD74LS20	
	Motorola	SN74LS20	
	National	DM74LS20	
	SGS	T74LS20	
	Signetics	74LS20	
	TI	**SN74LS20**	**839**
74LS21	Fairchild	74LS21	
	Hitachi	HD74LS21	
	Motorola	SN74LS21	
	National	DM74LS21	
	SGS	T74LS21	
	Signetics	74LS21	
	TI	**SN74LS21**	**840**
74LS22	Fairchild	74LS22	
	Hitachi	HD74LS22	
	Motorola	SN74LS22	
	National	DM74LS22	
	SGS	T74LS22	
	TI	**SN74LS22**	**840**
74LS221	Fairchild	74LS221	
	Hitachi	HD74LS221	
	Motorola	SN74LS221	
	National	DM74LS221	
	TI	**SN74LS221**	**906**
74LS240	AMD	SN74LS240	
	Fairchild	74LS240	
	Hitachi	HD74LS240	
	MMI	74LS240	
	Motorola	SN74LS240	
	Signetics	74LS240	
	TI	**SN74LS240**	**910**
74LS241	AMD	SN74LS241	
	Fairchild	74LS241	
	Hitachi	HD74LS241	
	MMI	74LS241	
	Motorola	SN74LS241	
	Signetics	74LS241	
	TI	**SN74LS241**	**911**
74LS242	AMD	SN74LS242	
	Fairchild	74LS242A	
	Motorola	SN74LS242	
	Signetics	74LS242	
	TI	**SN74LS242**	**911**
74LS243	AMD	SN74LS243	
	Fairchild	74LS243A	
	Motorola	SN74LS243	
	Signetics	74LS243	
	TI	**SN74LS243**	**912**
74LS244	AMD	SN74LS244	
	Fairchild	74LS244	
	Hitachi	HD74LS244	
	MMI	74LS244	
	Motorola	SN74LS244	
	Signetics	74LS244	
	TI	**SN74LS244**	**912**
74LS251	Fairchild	74LS251	
	Hitachi	HD74LS251	
	Motorola	SN74LS251	
	National	DM74LS251	
	SGS	T74LS251	
	Signetics	74LS251	
	TI	**SN74LS251**	**915**
74LS253	Fairchild	74LS253	
	Hitachi	HD74LS253	
	Motorola	SN74LS253	
	National	DM74LS253	
		DM8214	
	SGS	T74LS253	
	Signetics	74LS253	
	TI	SN74LS253	
74LS255	Fairchild	74LS255	
74LS257	Fairchild	74LS257A	
	Hitachi	HD74LS257	
	Motorola	SN74LS257A	
	National	DM74LS257	
	SGS	T74LS257	
	Signetics	74LS257	
		74LS257A	
	TI	SN74LS257	
74LS258	Fairchild	74LS258A	
	Hitachi	HD74LS258	
	Motorola	SN74LS258A	
	National	DM74LS258	
	SGS	T74LS258	
	Signetics	74LS258	
	TI	SN74LS258	
74LS26	Fairchild	74LS26	
	Hitachi	HD74LS26	
	Motorola	SN74LS26	
	National	DM74LS26	
	SGS	T74LS26	
	Signetics	74LS26	
	TI	**SN74LS26**	**841**
74LS261	**TI**	**SN74LS261**	**918**
74LS266	Fairchild	74LS266	
	Motorola	SN74LS266	
	National	DM74LS266	
	Raytheon	RC8242	
	SGS	T74LS266	
	Signetics	74LS266	
		N8242	
	TI	**SN74LS266**	**918**
74LS27	Fairchild	74LS27	
	Hitachi	HD74LS27	
	Motorola	SN74LS27	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Raytheon Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
74LS27	National	DM74LS27	
	SGS	T74LS27	
	Signetics	74LS27	
	TI	**SN74LS27**	**842**
74LS273	**AMD**	**SN74LS273**	**1227**
	Fairchild	74LS273	
	Motorola	SN74LS273	
	SGS	T74LS273	
	Signetics	74LS273	
	TI	**SN74LS273**	**919**
74LS279	Fairchild	74LS279	
	Hitachi	HD74LS279	
	Motorola	SN74LS279	
	National	DM74LS279	
	Signetics	74LS279	
	TI	**SN74LS279**	**921**
74LS28	Fairchild	74LS28	
	Motorola	SN74LS28	
	SGS	T74LS28	
	TI	**SN74LS28**	**842**
74LS283	Fairchild	74LS283	
	Hitachi	HD74LS283	
		HD74LS283A	
	Motorola	SN74LS283	
	National	DM74LS283	
	SGS	T74LS283	
	Signetics	74LS283	
	TI	**SN74LS283**	**922**
74LS290	Fairchild	74LS290	
	Hitachi	HD74LS290	
	Motorola	SN74LS290	
	National	DM74LS290	
	SGS	T74LS290	
	Signetics	74LS290	
	TI	**SN74LS290**	**924**
74LS295A	Fairchild	74LS295A	
	Motorola	SN74LS295A	
	Signetics	74LS295A	
		74LS295B	
	TI	**SN74LS295B**	**925**
74LS298	Fairchild	74LS298	
	Hitachi	HD74LS298	
	Motorola	SN74LS298	
	SGS	T74LS298	
	Signetics	74LS298	
	TI	**SN74LS298**	**926**
74LS299	**AMD**	**SN74LS299**	**1227**
	Fairchild	74LS299	
	Hitachi	HD74LS299	
	Motorola	SN74LS299	
	SGS	T74LS299	
	TI	**SN74LS299**	**927**
74LS30	Fairchild	74LS30	
	Hitachi	HD74LS30	
	Motorola	SN74LS30	
	National	DM74LS30	
	SGS	T74LS30	
	Signetics	74LS30	
	TI	**SN74LS30**	**842**
74LS32	Fairchild	54LS32	
		74LS32	
	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	**732**
		SN54LS32	
		SN74LS32	
	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN54LS32**	**843**
		SN74LS32	**843**
74LS322	AMD	SN74LS322	
	Fairchild	74LS322	
	Motorola	SN74LS322	
	Raytheon	74LS322A	
	TI	**SN74LS322A**	**930**
74LS322A	AMD	SN74LS322	
	Fairchild	74LS322	
	Motorola	SN74LS322	
	Raytheon	74LS322	
	TI	**SN74LS322A**	**930**
74LS323	AMD	SN54LS323	
		SN74LS323	
	Fairchild	54LS323	
		74LS323	
74LS323	Motorola	SN54LS323	
		SN74LS323	
	Raytheon	54LS323	
	TI	**SN54LS323**	**930**
		SN54LS323A	
		SN74LS323	**930**
74LS33	Fairchild	74LS33	
	Motorola	SN74LS33	
	Signetics	74LS33	
	TI	**SN74LS33**	**843**
74LS365	Fairchild	74LS365A	
	Motorola	SN74LS365A	
	National	DM74LS365	
	SGS	T74LS365A	
	Signetics	74LS365	
		74LS365A	
	TI	**SN74LS365A**	**935**
74LS366	Fairchild	74LS366A	
	Motorola	SN74LS366A	
	National	DM74LS366	
	SGS	T74LS366A	
	Signetics	74LS366A	
	TI	**SN74LS366A**	**935**
74LS367	Fairchild	74LS367A	
	Hitachi	HD74LS367	
		HD74LS367A	
	Motorola	SN74LS367A	
	National	DM74LS367	
	SGS	T74LS367A	
	Signetics	74LS367	
		74LS367A	
	TI	**SN74LS367A**	**936**
74LS368	Fairchild	74LS368A	
	Hitachi	HD74LS368	
	Motorola	SN73LS368A	
		SN74LS368A	
	National	DM74LS368	
	SGS	T74LS3	
	Signetics	74LS368	
		74LS368A	
	TI	**SN74LS368A**	**936**
74LS37	Fairchild	74LS37	
	Hitachi	HD74LS37	
	Motorola	SN74LS37	
	National	DM74LS37	
	SGS	T74LS37	
	Signetics	74LS37	
	TI	**SN74LS37**	**844**
74LS373	**AMD**	**SN74LS373**	**1227**
	Fairchild	74LS373	
	MMI	74LS373	
	Motorola	SN74LS373	
	SGS	T74LS373	
	Signetics	**74LS373**	**783**
	TI	**SN74LS373**	**937**
74LS374	AMD	SN74LS374	
	Fairchild	74LS374	
	MMI	74LS374	
	Motorola	SN74LS374	
	National	DM74LS374	
	SGS	T74LS374	
	Signetics	74LS374	
	TI	**SN74LS374**	**938**
74LS375	Fairchild	74LS375	
	Motorola	SN74LS375	
	Signetics	74LS375	
	TI	**SN74LS375**	**938**
74LS377	**AMD**	**SN74LS377**	**1227**
	Fairchild	74LS377	
	Motorola	SN74LS377	
	SGS	T74LS377	
	Signetics	74LS377	
	TI	**SN74LS377**	**939**
74LS38	Fairchild	74LS38	
	Hitachi	HD74LS38	
	Motorola	SN74LS38	
	National	DM74LS38	
	SGS	T74LS38	
	Signetics	74LS38	
	TI	**SN74LS38**	**844**
74LS384	AMD	SN74LS384	
	Motorola	SN74LS384	
	TI	**SN74LS384**	**941**
74LS385	AMD	SN74LS385	
	Motorola	SN74LS385	
	TI	**SN74LS385**	**942**
74LS386	Hitachi	HD74LS386	
	Motorola	SN74LS386	
	National	DM74LS386	
	TI	**SN74LS386**	**942**
74LS395A	Fairchild	74LS395	
	Motorola	SN74LS395A	
74LS395A	National	DM74LS395	
	Signetics	74LS395	
	TI	**SN74LS395A**	**943**
74LS40	Fairchild	74LS40	
	Hitachi	HD74LS40	
	Motorola	SN74LS40	
	National	DM74LS40	
	SGS	T74LS40	
	Signetics	74LS40	
	TI	**SN74LS40**	**845**
74LS42	Fairchild	74LS42	
	Hitachi	HD74LS42	
	Motorola	SN74LS42	
	National	DM74LS42	
	SGS	T74LS42	
	Signetics	74LS42	
	TI	**SN74LS42**	**845**
74LS51	Fairchild	74LS51	
	Hitachi	HD74LS51	
	Motorola	SN74LS51	
	National	DM74LS51	
	SGS	T74LS51	
	Signetics	74LS51	
	TI	**SN74LS51**	**848**
74LS54	Fairchild	74LS54	
	Hitachi	HD74LS54	
	Motorola	SN74LS54	
	National	DM74LS54	
	SGS	T74LS54	
	Signetics	74LS54	
	TI	**SN74LS54**	**850**
74LS55	Fairchild	74LS55	
	Hitachi	HD74LS55	
	Motorola	SN74LS55	
	National	DM74LS55	
	SGS	T74LS55	
	TI	**SN74LS55**	**851**
74LS670	Fairchild	74LS670	
	Motorola	SN74LS670	
	National	DM74LS670	
	SGS	T74LS670	
	Signetics	74LS670	
	TI	**SN74LS670**	**990**
74LS73	Hitachi	HD74LS73	
	Motorola	SN74LS73A	
	National	DM74LS73	
	Signetics	74LS73	
	TI	**SN74LS73A**	**856**
74LS74	Fairchild	74LS74	
	Hitachi	HD74LS74	
		HD74LS74A	
	Motorola	SN74LS74A	
	National	DM74LS74	
	SGS	T74LS74	
	Signetics	74LS74	
	TI	**SN74LS74A**	**857**
74LS75	Hitachi	HD74LS75	
	Motorola	SN74LS75	
	National	DM74LS75	
	Signetics	74LS75	
	TI	**SN74LS75**	**858**
74LS76	Hitachi	HD74LS76	
	Motorola	SN74LS76A	
	National	DM74LS76	
	Signetics	74LS76	
	TI	**SN74LS76A**	**858**
74LS77	National	DM74LS77	
	Raytheon	54LS77	
74LS78	Hitachi	HD74LS78	
	Motorola	SN74LS78A	
	National	DM74LS78	
	TI	**SN74LS78A**	**859**
74LS83	Fairchild	74LS83A	
	Hitachi	HD74LS183A	
		HD74LS83A	
	Motorola	SN74LS83A	
	National	DM74LS83A	
	Raytheon	74LS83A	
	Signetics	74LS83	
		74LS83A	
	TI	**SN74LS83A**	**861**
74LS83A	Fairchild	74LS83A	
	Hitachi	HD74LS183A	
		HD74LS83A	
	Motorola	SN74LS83A	
	National	DM74LS83A	
	Raytheon	74LS83	
	Signetics	74LS83	
		74LS83A	
	TI	**SN74LS83A**	**861**
74LS85	Fairchild	74LS85	
74LS85	Hitachi	HD74LS85	
	Motorola	SN74LS85	
	National	DM74LS85	
	Signetics	74LS85	
	TI	**SN74LS85**	**862**
74LS86	Fairchild	74LS86	
	Hitachi	HD74LS86	
	Motorola	SN74LS86	
	National	DM74LS86	
	SGS	T74LS86	
	Signetics	74LS86	
	TI	**SN74LS86**	**862**
74LS90	Fairchild	74LS90	
	Motorola	SN74LS90	
	National	DM74LS90	
	SGS	T74LS90	
	Signetics	74LS90	
	TI	**SN74LS90**	**864**
74LS91	Hitachi	HD74LS91	
	Motorola	SN74LS91	
	TI	**SN74LS91**	**864**
74LS92	Fairchild	74LS92	
	Hitachi	HD74LS92	
	Motorola	SN74LS92	
	National	DM74LS92	
	SGS	T74LS92	
	Signetics	74LS92	
	TI	**SN74LS92**	**864**
74LS93	Fairchild	74LS93	
	Hitachi	HD74LS93	
	Motorola	SN74LS93	
	National	DM74LS93	
	SGS	T74LS93	
	Signetics	74LS93	
	TI	**SN74LS93**	**865**
74LS95B	Fairchild	74LS95B	
	Hitachi	HD74LS95B	
	Motorola	SN74LS95B	
	National	DM74LS95B	
	SGS	T74LS95B	
	Signetics	74LS95B	
	TI	**SN74LS95B**	**866**
AM2901A	**AMD**	**AM2901A**	**1201**
	Fairchild	29F01	
		F2901A	
	National	IDM2901A	
AM2902	AMD	AM2902	
◆AM2909	AMD	AM2909	
◆AM2911	AMD	AM2911	
◆AM2915A	AMD	AM2915A	
◆AM2916A	AMD	AM2916A	
◆AM2917A	AMD	AM2917A	
◆AM2918	AMD	AM2918	
DAC-08	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
HA4741	AMD	LM148	
		LM248	
		LM348	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Raytheon Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HA4741	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
LH2101	AMD	LH2101	
	Intersil	LH2101	
	National	LH2101	
	Signetics	LH2101	
LH2111	AMD	LH2111	
	Intersil	LH2111	
	National	**LH2111**	**3317**
LH2201	AMD	LH2201	
	National	LH2201	
◆LH2211	AMD	LH2211	
	National	**LH2211**	**3317**
◆LH2301	AMD	LH2301	
	Intersil	LH2301	
	National	LH2301	
◆LH2311	AMD	LH2311	
	Intersil	LH2311	
	National	LH2311	
LM101	AMD	LM101	
	AD	AD101	
	Fairchild	μA101	
	Intersil	AD101	
	Motorola	LM101	
	Signetics	LM101	
	SiliconG	SG101	
	TI	LM101	
	Thomson-CSF	SFC2101	
LM107	AMD	LM107	
	AD	**AD741S**	**3153**
	Intersil	LM107	
	National	LM107	
	SiliconG	SG107	
	TI	LM107	
		SN55107	
	Thomson-CSF	SFC2107	
LM108	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
LM111	AMD	LM111	
	AD	AD111	
	Fairchild	μA111	
	Intersil	LM111	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM111	
	National	**LM111**	**3317**
	PMI	PM111	
	Signetics	LM111	
LM111	SiliconG	SG111	
	TI	LM111	
	Thomson-CSF	SFC2111	
LM118	AMD	LM118	
	National	LM118	
	TI	LM118	
LM124A	AMD	LM124A	
	Motorola	LM124A	
	National	LM124A	
	RCA	CA124A	
	Signetics	LM124A	
	SiliconG	SG124	
	TI	LM124A	
◆LM129	**National**	**LM129**	**3304**
LM13600	Exar	XR13600	
	National	**LM13600**	**3326**
LM139	AMD	LM139	
	Fairchild	μA139	
	Motorola	LM139	
	National	**LM139**	**3317**
	PMI	CMP-04	
		PM139	
	RCA	CA139	
	Signetics	LM139	
	SiliconG	SG139	
	TI	LM139	
LM146	**Exar**	**XR146**	**3207**
	National	LM140	
LM146-2	National	LM146-2	
LM148	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
◆LM149	AMD	LM149	
	National	LM149	
◆LM201	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
◆LM205	AMD	LM205	
	National	LM205	
	SiliconG	SG205	
	Thomson-CSF	SFC2205	
◆LM207	AMD	LM207	
	National	LM207	
	RCA	CA207	
	SiliconG	SG207	
	TI	SN55207	
	Thomson-CSF	SFC2207	
LM208	AMD	LM208	
	AD	**AD208**	**3153**
	Fairchild	μA208	
	MicroPwr	MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
LM208	Motorola	LM208	
	National	LM208	
	PMI	OP-08	
		OP05	
		PM208	
	SiliconG	SG208	
	TI	μA714	
◆LM211	AMD	LM211	
	AD	AD211	
	Motorola	LM211	
	National	**LM211**	**3317**
	PMI	PM211	
	RCA	LM211	
	Signetics	LM211	
	SiliconG	SG211	
	TI	LM211	
	Thomson-CSF	SFC2211	
LM218	AMD	LM218	
		LM318	
	AD	**AD518**	**3155**
	Fairchild	μA318	
	National	LM218	
		LM318	
	NEC-Electron	μPC159	
	TI	LM218	
		LM318	
LM224	AMD	LM224	
	Fairchild	μA224	
	Motorola	LM224	
	National	LM224	
	RCA	CA224	
	Signetics	LM224	
	SiliconG	SG224	
	TI	LM224	
LM239	AMD	LM239	
	Fairchild	μA239	
	Motorola	LM239	
	National	**LM239**	**3317**
	PMI	CMP-04	
		PM239	
	RCA	CA239	
	Signetics	LM239	
	SiliconG	SG239	
	TI	LM239	
LM246	**Exar**	**XR246**	**3207**
	National	LM246	
◆LM249	AMD	LM249	
	National	LM249	
LM2900	Hitachi	HA17301	
	Motorola	LM2900	
		MC3301	
	National	LM2900	
		LM3301	
	Raytheon	RC3301	
	TI	LM2900	
LM2901	Fairchild	μA2901	
		μA3302	
	Motorola	LM2901	
		MC3302	
	National	LM2901	
		LM3302	
	NEC-Electron	μPC2901	
	PMI	CMP-04	
	Raytheon	RV3302	
	RCA	CA3302	
	Signetics	LM2901	
		MC3302	
	SiliconG	SG3302	
	TI	LM2901	
		LM3302	
LM2902	Fairchild	μA2902	
	Hitachi	HA17902	
	Motorola	LM2902	
	National	LM2902	
	NEC-Electron	μPC2902	
	TI	LM2902	
LM301	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
LM301	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
LM307	AMD	LM307	
	AD	**AD741J**	**3153**
	Intersil	LM307	
	Motorola	LM307	
	National	LM307	
	RCA	CA307	
	SiliconG	SG307	
	TI	LM307	
	Thomson-CSF	SFC2307	
LM308	AMD	LM308	
	AD	**AD308**	**3153**
	Burr-Brown	3500	
		3501	
	Fairchild	μA308	
	Intersil	AD308	
		LM308	
	MicroPwr	MP5505	
	Motorola	LM308	
	National	LM308	
	SiliconG	SG308	
LM311	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
LM318	AMD	LM218	
		LM318	
	AD	**AD518**	**3155**
	Fairchild	μA318	
	National	LM218	
		LM318	
	NEC-Electron	μPC159	
	TI	LM218	
		LM318	
LM324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
◆LM329	**National**	**LM329**	**3304**
LM339	AMD	LM339	
		LM339A	
	Fairchild	μA339	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	RCA	CA339	
		CA339A	
		LM339	
	SiliconG	SG339	
	TI	LM339	
LM346	**Exar**	**XR346**	**3207**
	National	LM346	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Raytheon Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LM348	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
◆LM349	AMD	LM349	
	National	LM349	
LM3900	Motorola	MC3401	
	National	LM3401	
		LM3900	
	Raytheon	RC3401	
	RCA	CA3401	
	TI	LM3900	
OP-07	**AD**	**ADOP-07**	**3153**
	MicroPwr	MP5505	
		MP5507	
		OP-05	
		OP-07	
	PMI	OP-05	
		OP-07	
	TI	OP-07	
OP-27	Datel	AM-427	
	PMI	OP-27	
◆PAL10H8	MMI	PAL10H8	
	National	DMPAL10H8	
PAL10L8	MMI	PAL10L8	
	National	DMPAL10L8	
◆PAL12H6	MMI	PAL12H6	
	National	DMPAL12H6	
PAL12L6	MMI	PAL12L6	
	National	DMPAL12L6	
◆PAL14H4	MMI	PAL14H4	
	National	DMPAL14H4	
◆PAL14L4	MMI	PAL14L4	
	National	DMPAL14L4	
◆PAL16A4	MMI	PAL16A4	
	National	DMPAL16A4	
◆PAL16C1	MMI	PAL16C1	
	National	DMPAL16C1	
◆PAL16H2	MMI	PAL16H2	
	National	DMPAL16H2	
◆PAL16L2	MMI	PAL16L2	
	National	DMPAL16L2	
◆PAL16L8	MMI	PAL16L8	
	National	DMPAL16L8	
	TI	FP4ALS16L8	
◆PAL16R4	MMI	PAL16R4	
	National	DMPAL16R4	
	TI	FP74ALS16R4	
◆PAL16R6	MMI	PAL16R6	
	National	DMPAL16R6	
	TI	FPμ4ALS16R6	
◆PAL16R8	MMI	PAL16R8	
	National	DMPAL16R8	
	TI	FP74ALS16R8	
PAL16X4	MMI	PAL16X4	
	National	DMPAL16X4	
◆RC1437	Motorola	MC1437	
RC1458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
RC1458	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
RC1558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
RC3078	**RCA**	**CA3078**	**3354**
RC3301	Hitachi	HA17301	
	Motorola	LM2900	
		MC3301	
	National	LM2900	
		LM3301	
	Raytheon	LM2900	
	TI	LM2900	
RC3401	Motorola	MC3401	
	National	LM3401	
		LM3900	
RC3401	Raytheon	LM3900	
	RCA	CA3401	
	TI	LM3900	
RC3403	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo-Signetics	LA6324	
		LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
RC3503	**Exar**	**XR3503**	**3207**
	Motorola	MC3503	
	Raytheon	RM3503	
		RM4137	
	Signetics	MC3503	
	SiliconG	SG3503	
	TI	MC3503	
RC4136	Exar	XR4136	
		XR4136M	
	Fairchild	μA4136	
	MicroPwr	MP5509	
	PMI	OP-09	
		PM4136	
	Raytheon	RM4136	
	SiliconG	SG4136	
		SG4136C	
	TI	RC4136	
		RM4136	
RC4137	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
RC4151	**Exar**	**XR4151**	**3193**
	Raytheon	RM4151	
		RV4151	
	TI	XR4151	
RC4152	TI	XR4152	
RC4156	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RM4156	
	TI	LM148	
		LM248	
		XR4156	
RC4194	Exar	XR4194	
	MicroEng	MCE-4194	
	Raytheon	RM4194	
	SiliconG	SG4194	
RC4195	Exar	XR1468	
		XR4195	
RC4195	**Motorola**	**MC1468**	**3296**
	SiliconG	SG1468	
		SG2501A	
		SG3501A	
		SG4501	
RC4444	Motorola	MC3416	
RC4531	Signetics	NE531	
RC4558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
RC4739	Exar	XR4739	
	Fairchild	μA739	
		μA749	
	Motorola	MC1339	
	National	**LM1303**	**3325**
	SGS	TBA231	
	TI	SN76131	
		SN76149	
RC5534	Datel	AM-453-2C	
		AM-453-2M	
	Exar	**XR5534**	**3209**
	Raytheon	RM5534	
	Signetics	NE5534	
		NE5534A	
		SE5534	
		SE5534A	
	TI	NE5534	
		NE5534A	
RC555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
RC556	AMD	LM555	
		LM556	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Raytheon Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
RC556	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
RC592	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	MC1733	
		NE592	
		SE592	
	SiliconG	SG733	
	TI	μA733	
RC709	Fairchild	μA709	
	Hitachi	HA1303	
	Motorola	MC1709	
	National	LM1709	
		LM709	
	NEC-Electron	μPC255	
		μPC55	
	Raytheon	RM709	
	RCA	CA3038	
	TI	μA709	
	Thomson-CSF	SFC2709	
	Toshiba	TA7502	
◆RC710	Fairchild	μA710	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM710	
		MC1710	
	National	**LM710**	**3317**
	PMI	CMP-01	
		CMP-02	
	Raytheon	RM710	
	SiliconG	SG710	
	TI	μA710	
	Thomson-CSF	SFC2710	
RC723	Fairchild	μA723	
	Hitachi	HA17723	
	Intersil	LM723	
	Motorola	**MC1723**	**3295**
	National	LM723	
	Raytheon	RM723	
	RCA	CA723	
		LM723	
	SGS	L123	
	Signetics	μA723	
	SiliconG	SG723	
	TI	μA723	
	Thomson-CSF	SFC2723	
RC725	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RM725	
RC725	**RCA**	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
RC733	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		μA733	
	SiliconG	SG733	
	TI	μA733	
RC741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
RC747	AMD	747	
	Fairchild	μA747	
	Hitachi	HA17747	
	Motorola	MC1747	
	National	LM747	
	NEC-Electron	μPC251	
	PMI	OP-04	
		PM747	
	Raytheon	RM747	
	RCA	CA747	
	Signetics	μA747	
	SiliconG	SG747	
	TeledyneS	747	
	TI	μA747	
RC7523	Motorola	MC7523	
	National	LM7523	
	SiliconG	SG7523	
	TI	SN7523	
RC7528	Motorola	MC7528	
	SiliconG	SG7528	
	TI	SN7528	
	Thomson-CSF	SFC2528	
RC7529	Fairchild	7529	
	Motorola	MC7529	
	National	LM7529	
	SiliconG	SG7529	
RC8202	Signetics	N8202	
RC8225	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
RC8225	Signetics	54S189	
		74S189	
	TI	SN54S189	
		SN74S189	
RC8230	Fairchild	9312	
	National	DM8312	
		DM9312	
	Raytheon	RC9312	
		RM8230	
		RM9312	
	Signetics	N8230	
	TI	SN29312	
		SN39312	
RC8233	Signetics	N8233	
RC8234	Signetics	N8234	
RC8242	Fairchild	74LS266	
	Motorola	SN74LS266	
	National	DM74LS266	
	Raytheon	74LS266	
	SGS	T74LS266	
	Signetics	74LS266	
		N8242	
	TI	**SN74LS266**	**918**
RC8243	Signetics	N8243	
RC8250	Signetics	N8250	
RC8252	Fairchild	9031	
		9301	
	National	DM8301	
		DM9301	
	Raytheon	RM8252	
	Signetics	N8252	
		S8252	
	TI	SN29301	
		SN39301	
RC8262	Signetics	N8262	
RC8266	Signetics	N8266	
RC8270	**TI**	**SN74178**	**896**
RC8271	Fairchild	74179	
	Signetics	N8271	
	TI	**SN74179**	**897**
RC8273	Signetics	N8273	
RC8274	Signetics	N8274	
RC8277	Fairchild	9328	
	Signetics	N8277	
RC8280	Fairchild	74176	
		96176	
	National	DM74176	
		DM8280	
	Signetics	74176	
		N8280	
	TI	**SN74176**	**896**
RC8281	Fairchild	74177	
	National	DM74177	
		DM8281	
	Signetics	74177	
		N8281	
	TI	**SN74177**	**896**
RC8290	Fairchild	74196	
	National	DM74196	
		DM8290	
	Signetics	74196	
	TI	**SN74196**	**903**
RC8291	Fairchild	74197	
	National	DM74197	
		DM8291	
	Signetics	74197	
	TI	**SN74197**	**904**
RC8T09	Signetics	8T09	
		N8T09	
RC8T10	Fairchild	74173	
	National	DM74173	
		DM8551	
	Signetics	8T10	
		N8T10	
	TI	**SN74173**	**894**
RC8T20	Signetics	8T20	
RC930	Fairchild	930	
		9930	
	Motorola	MC830	
		MC930	
	National	DM930	
	Raytheon	RM930	
RC9304	Fairchild	9304	
	Raytheon	RM9304	
RC9308	Fairchild	9308	
	Raytheon	RM9308	
	TI	SN29308	
		SN39308	
		SN74116	**872**
RC9311	Fairchild	9311	
	Hitachi	HD74154	
RC9311	National	DM54154	
		DM7213	
		DM74154	
		DM8311	
		DM9311	
	Raytheon	RM9311	
	Signetics	54154	
		74154	
	TI	SN29311	
		SN39311	
		SN54154	**885**
		SN74154	**885**
RC9312	Fairchild	9312	
	National	DM8312	
		DM9312	
	Raytheon	RC8230	
		RM8230	
		RM9312	
	Signetics	N8230	
	TI	SN29312	
		SN39312	
RC9316	Fairchild	9316	
	National	DM9316	
	Raytheon	RM9316	
	TI	SN29316	
		SN39316	
RC932	Fairchild	932	
		9932	
	Motorola	MC932	
	National	DM932	
	Raytheon	RM932	
RC9322	Fairchild	74157	
		9322	
	Hitachi	HD74157	
	National	DM74157	
		DM8322	
		DM9322	
	Raytheon	RM9322	
	Signetics	74157	
	TI	SN29322	
		SN29602	
		SN39322	
		SN74157	**887**
RC933	Fairchild	933	
	Motorola	MC933	
	National	DM933	
	Raytheon	RM933	
RC934	Motorola	MC934	
	Raytheon	RM934	
	TI	SN15834	
		SN15934	
RC9341	Fairchild	54181	
		9341	
	Hitachi	HD74181	
	National	DM54181	
		DM74181	
	Raytheon	RM9341	
	Signetics	54181	
		74181	
	TI	**SN54181**	**897**
		SN74181	**897**
RC935	Fairchild	9135	
	Motorola	MC835	
		MC935	
	National	DM935	
	Raytheon	RM935	
RC936	Fairchild	936	
	Motorola	MC936	
	National	DM936	
	Raytheon	RM936	
RC9360	Fairchild	74192	
		9360	
	National	DM74192	
		DM8560	
	Raytheon	RM9360	
	Signetics	74192	
	TI	**SN54192**	**902**
		SN74192	**902**
RC937	Fairchild	937	
	Motorola	MC837	
		MC937	
	National	DM937	
	Raytheon	RM937	
RC941	Motorola	MC841	
RC944	Fairchild	944	
	Motorola	MC944	
	National	DM944	
	Raytheon	RM944	
RC945	Fairchild	945	
	Motorola	MC945	
	National	DM945	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Raytheon Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
RC945	Raytheon	RM945	
RC946	Fairchild	946	
	Motorola	MC946	
	National	DM946	
	Raytheon	RM946	
RC948	Fairchild	948	
	Motorola	MC948	
	National	DM948	
	Raytheon	RM948	
RC949	Fairchild	949	
	Motorola	MC949	
	National	DM949	
	Raytheon	RM949	
RC950	Fairchild	950	
	Motorola	MC950	
	Raytheon	RM950	
RC951	Fairchild	951	
		9951	
	Motorola	MC851	
		MC852	
		MC951	
	Raytheon	RM951	
	TI	SN15851	
		SN15951	
RC957	Fairchild	9157	
	Motorola	MC857	
		MC957	
	National	DM9567	
		DM957	
	Raytheon	RM957	
RC958	Fairchild	9158	
	Motorola	MC858	
		MC958	
	National	DM958	
	Raytheon	RM958	
RC961	Fairchild	961	
	Motorola	MC961	
	National	DM961	
		DM962	
	Raytheon	RM961	
RC962	Fairchild	962	
	Motorola	MC962	
	National	DM962	
	Raytheon	RM962	
RC963	Fairchild	963	
		9963	
	Motorola	MC963	
	National	DM963	
	Raytheon	RM963	
RC993	Fairchild	9093	
	Motorola	MC853	
		MC953	
	National	DM9093	
	Raytheon	RM993	
	TI	SN158093	
		SN159093	
RC994	Fairchild	9094	
	Motorola	MC856	
		MC956	
	National	DM9094	
	Raytheon	RM9094	
		RM994	
	TI	SN158094	
		SN159094	
RC997	Fairchild	9097	
	Motorola	MC855	
		MC955	
	National	DM9097	
	Raytheon	RM997	
	TI	SN158097	
		SN159097	
RF8601	Fairchild	74122	
		9601	
	National	DM8601	
		DM9601	
	Raytheon	RF9601	
	Signetics	8T22	
		N8T22	
		S8T22	
	TI	**SN74122**	**873**
RF8602	Fairchild	9602	
	National	DM8602	
		DM9602	
	Raytheon	RF9602	
	TI	SN39602	
RF9601	Fairchild	74122	
		9601	
	National	DM8601	
		DM9601	
RF9601	Raytheon	RF8601	
	Signetics	8T22	
		N8T22	
		S8T22	
	TI	**SN74122**	**873**
RF9602	Fairchild	9602	
	National	DM8602	
		DM9602	
	Raytheon	RF8602	
	TI	SN39602	
RM1488	AMD	MC1488	
	Exar	**XR1488**	**3188**
	Fairchild	μA1488	
	Harris	HA1488	
	Hitachi	HD75188	
	Motorola	**MC1488**	**2753**
	National	DS1488	
	Signetics	MC1488	
	SiliconG	SG1488	
	TI	MC1488	
		SN75188	
RM1537	Motorola	MC1537	
RM1558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
RM3403	Exar	XR3403M	
RM3503	**Exar**	**XR3503**	**3207**
	Motorola	MC3503	
	Raytheon	RC3503	
		RM4137	
	Signetics	MC3503	
	SiliconG	SG3503	
	TI	MC3503	
RM4136	Exar	XR4136	
		XR4136M	
	Fairchild	μA4136	
	MicroPwr	MP5509	
	PMI	OP-09	
		PM4136	
	Raytheon	RC4136	
	SiliconG	SG4136	
		SG4136C	
	TI	RC4136	
		RM4136	
RM4137	**Exar**	**XR3503**	**3207**
	Motorola	MC3503	
	Raytheon	RC3503	
		RM3503	
RM4137	Signetics	MC3503	
	SiliconG	SG3503	
	TI	MC3503	
RM4139	Motorola	LM158	
	National	LM158A	
	RCA	CA158A	
	Signetics	LM158	
	TI	LM158	
RM4151	**Exar**	**XR4151**	**3193**
	Raytheon	RC4151	
		RV4151	
	TI	XR4151	
RM4152	TI	XR4152	
RM4156	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
	TI	LM148	
		LM248	
		XR4156	
RM4194	Exar	XR4194	
	MicroEng	MCE-4194	
	Raytheon	RC4194	
	SiliconG	SG4194	
RM4195	Exar	XR1568	
	Motorola	**MC1568**	**3296**
	SiliconG	SG1501A	
		SG1568	
RM4558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
RM5524	Fairchild	MC5524	
	Motorola	MC5524	
	National	LM5524	
	SiliconG	SG5524	
RM5524	TI	SN5524	
RM5534	Datel	AM-453-2C	
		AM-453-2M	
	Exar	**XR5534**	**3209**
	Raytheon	RC5534	
	Signetics	NE5534	
		NE5534A	
		SE5534	
		SE5534A	
	TI	NE5534	
		NE5534A	
RM555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
RM556	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
RM592	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Signetics	SE592	
		μA733	
	SiliconG	SG733	
	TI	μA733	
RM709	Fairchild	μA709	
	Hitachi	HA1303	
	Motorola	MC1709	
	National	LM1709	
		LM709	
	NEC-Electron	μPC255	
		μPC55	
	Raytheon	RC709	
	RCA	CA3038	
	TI	μA709	
	Thomson-CSF	SFC2709	
	Toshiba	TA7502	
RM710	Fairchild	μA710	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM710	
		MC1710	
	National	**LM710**	**3317**
	PMI	CMP-01	
		CMP-02	
	SiliconG	SG710	
	TI	μA710	
	Thomson-CSF	SFC2710	
RM723	Fairchild	μA723	
	Hitachi	HA17723	
	Intersil	LM723	
	Motorola	**MC1723**	**3295**
	National	LM723	
	Raytheon	RC723	
	RCA	CA723	
		LM723	
	SGS	L123	
	Signetics	μA723	
	SiliconG	SG723	
	TI	μA723	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Raytheon Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
RM723	Thomson-CSF	SFC2723	
RM725	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
RM741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
RM747	AMD	747	
	Fairchild	μA747	
	Hitachi	HA17747	
	Motorola	MC1747	
	National	LM747	
	NEC-Electron	μPC251	
	PMI	OP-04	
		PM747	
	Raytheon	RC747	
	RCA	CA747	
	Signetics	μA747	
	SiliconG	SG747	
	TeledyneS	747	
	TI	μA747	
RM748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	RCA	CA201	
		CA748	
		LM748	
RM748	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
RM8202	Signetics	S8202	
RM8230	Fairchild	9312	
	National	DM8312	
		DM9312	
	Raytheon	RC8230	
		RC9312	
		RM9312	
	Signetics	N8230	
	TI	SN29312	
		SN39312	
RM8231	Signetics	S8231	
RM8241	Motorola	SN54LS386	
	National	DM54LS386	
	Raytheon	54LS386	
	Signetics	S82S41	
	TI	54LS386	
		SN54LS386	**942**
RM8250	Signetics	S8250	
RM8252	Fairchild	9031	
		9301	
	National	DM8301	
		DM9301	
	Raytheon	RC8252	
	Signetics	N8252	
		S8252	
	TI	SN29301	
		SN39301	
RM8262	Signetics	S8262	
RM8266	Signetics	S8266	
RM8270	Fairchild	54178	
	Signetics	S8270	
	TI	**SN54178**	**896**
RM8271	Fairchild	54179	
	Signetics	S8271	
	TI	**SN54179**	**897**
RM8277	Signetics	S8277	
RM8280	Fairchild	54176	
	National	DM54176	
	Signetics	54176	
		S8280	
	TI	**SN54176**	**896**
RM8281	Fairchild	54177	
	National	DM54177	
		DM7281	
	Signetics	54177	
		S7281	
		S8281	
	TI	**SN54177**	**896**
RM8T09	Signetics	S8T09	
RM8T10	Fairchild	54173	
	National	DM54173	
		DM7551	
	TI	**SN54173**	**894**
RM9094	Fairchild	9094	
	Motorola	MC856	
		MC956	
	National	DM9094	
	Raytheon	RC994	
		RM994	
	TI	SN158094	
		SN159094	
RM930	Fairchild	930	
		9930	
	Motorola	MC830	
		MC930	
	National	DM930	
	Raytheon	RC930	
RM9304	Fairchild	9304	
	Raytheon	RC9304	
RM9308	Fairchild	9308	
	Raytheon	RC9308	
	TI	SN29308	
		SN39308	
		SN74116	**872**
RM931	TI	SN15931	
RM9310	Fairchild	54160	
		9310	
	National	DM54160	
	Signetics	54160	
	TI	**SN54160**	**889**
RM9311	Fairchild	9311	
RM9311	Hitachi	HD74154	
	National	DM54154	
		DM7213	
		DM74154	
		DM8311	
		DM9311	
	Raytheon	RC9311	
	Signetics	54154	
		74154	
	TI	SN29311	
		SN39311	
		SN54154	**885**
		SN74154	**885**
RM9312	Fairchild	9312	
	National	DM8312	
		DM9312	
	Raytheon	RC8230	
		RC9312	
		RM8230	
	Signetics	N8230	
	TI	SN29312	
		SN39312	
RM9316	Fairchild	9316	
	National	DM9316	
	Raytheon	RC9316	
	TI	SN29316	
		SN39316	
RM932	Fairchild	932	
		9932	
	Motorola	MC932	
	National	DM932	
	Raytheon	RC932	
RM9322	Fairchild	74157	
		9322	
	Hitachi	HD74157	
	National	DM74157	
		DM8322	
		DM9322	
	Raytheon	RC9322	
	Signetics	74157	
	TI	SN29322	
		SN29602	
		SN39322	
		SN74157	**887**
RM933	Fairchild	933	
	Motorola	MC933	
	National	DM933	
	Raytheon	RC933	
RM934	Motorola	MC934	
	Raytheon	RC934	
	TI	SN15834	
		SN15934	
RM9341	Fairchild	54181	
		9341	
	Hitachi	HD74181	
	National	DM54181	
		DM74181	
	Raytheon	RC9341	
	Signetics	54181	
		74181	
	TI	**SN54181**	**897**
		SN74181	**897**
RM9342	Fairchild	54182	
		9342	
	Hitachi	HD74182	
	National	DM54182	
		DM74182	
	TI	**SN54182**	**898**
		SN74182	**898**
RM935	Fairchild	9135	
	Motorola	MC835	
		MC935	
	National	DM935	
	Raytheon	RC935	
RM936	Fairchild	936	
	Motorola	MC936	
	National	DM936	
	Raytheon	RC936	
RM9360	Fairchild	74192	
		9360	
	National	DM74192	
		DM8560	
	Raytheon	RC9360	
	Signetics	74192	
	TI	**SN54192**	**902**
		SN74192	**902**
RM937	Fairchild	937	
	Motorola	MC837	
		MC937	
	National	DM937	
	Raytheon	RC937	
RM941	Motorola	MC941	
RM944	Fairchild	944	
	Motorola	MC944	
	National	DM944	
	Raytheon	RC944	
RM945	Fairchild	945	
	Motorola	MC945	
	National	DM945	
	Raytheon	RC945	
RM946	Fairchild	946	
	Motorola	MC946	
	National	DM946	
	Raytheon	RC946	
RM947	TI	SN15947	
RM948	Fairchild	948	
	Motorola	MC948	
	National	DM948	
	Raytheon	RC948	
RM949	Fairchild	949	
	Motorola	MC949	
	National	DM949	
	Raytheon	RC949	
RM950	Fairchild	950	
	Motorola	MC950	
	Raytheon	RC950	
RM951	Fairchild	951	
		9951	
	Motorola	MC851	
		MC852	
		MC951	
	Raytheon	RC951	
	TI	SN15851	
		SN15951	
RM952	Fairchild	9099	
	Motorola	MC952	
	Raytheon	RM999	
RM957	Fairchild	9157	
	Motorola	MC857	
		MC957	
	National	DM9567	
		DM957	
	Raytheon	RC957	
RM958	Fairchild	9158	
	Motorola	MC858	
		MC958	
	National	DM958	
	Raytheon	RC958	
RM961	Fairchild	961	
	Motorola	MC961	
	National	DM961	
		DM962	
	Raytheon	RC961	
RM962	Fairchild	962	
	Motorola	MC962	
	National	DM962	
	Raytheon	RC962	
RM963	Fairchild	963	
		9963	
	Motorola	MC963	
	National	DM963	
	Raytheon	RC963	
RM993	Fairchild	9093	
	Motorola	MC853	
		MC953	
	National	DM9093	
	Raytheon	RC993	
	TI	SN158093	
		SN159093	
RM994	Fairchild	9094	
	Motorola	MC856	
		MC956	
	National	DM9094	
	Raytheon	RC994	
		RM9094	
	TI	SN158094	
		SN159094	
RM997	Fairchild	9097	
	Motorola	MC855	
		MC955	
	National	DM9097	
	Raytheon	RC997	
	TI	SN158097	
		SN159097	
RM999	Fairchild	9099	
	Motorola	MC952	
	Raytheon	RM952	
RV3302	Fairchild	μA2901	
		μA3302	
	Motorola	LM2901	
		MC3302	
	National	LM2901	
		LM3302	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

ALTERNATE SOURCE DIRECTORY

© IC MASTER 1983

Raytheon Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
RV3302	NEC-Electron	μPC2901	
	PMI	CMP-04	
	Raytheon	LM2901	
	RCA	CA3302	
	Signetics	LM2901	
		MC3302	
	SiliconG	SG3302	
	TI	LM2901	
		LM3302	
RV4151	**Exar**	**XR4151**	**3193**
	Raytheon	RC4151	
		RM4151	
	TI	XR4151	
RV4152	TI	XR4152	
RV4156	TI	XR4156	
SP3724	Fairchild	FQ3724	
	Motorola	MQ3724	
	RCA	CA3724	
SP3725	Fairchild	FQ3725	
	Motorola	MQ3725	
	National	DH3725	
	RCA	CA3725	
XR2207	**Exar**	**XR2207**	**3198**
XR2211	**Exar**	**XR2211**	**3195**
XR2567	Exar	XR2567	
		XR567	
	National	LM567	
	Signetics	NE567	
		SE567	

RCA Solid State Division

Manufacturer Device	Replacement Source	Device	IC Master Page
CA080	TI	TL080	
CA081	Fairchild	μAF771	
	TI	TL081	
CA082	**Exar**	**XR082**	**3206**
	TI	TL082	
CA083	**Exar**	**XR083**	**3206**
	TI	TL083	
CA084	**Exar**	**XR084**	**3206**
	Fairchild	μAF774	
	TI	TL084	
◆CA101	AMD	LM101	
	AD	AD101	
	Fairchild	μA101	
	Intersil	AD101	
	Motorola	LM101	
	Raytheon	LM101	
	Signetics	LM101	
	SiliconG	SG101	
	TI	LM101	
	Thomson-CSF	SFC2101	
◆CA107	AMD	LM107	
	AD	**AD741S**	**3153**
	Intersil	LM107	
	National	LM107	
	Raytheon	LM107	
	SiliconG	SG107	
	TI	LM107	
		SN55107	
	Thomson-CSF	SFC2107	
CA108	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
CA108	SiliconG	SG108	
	TI	μA714	
◆CA111	AMD	LM111	
	AD	AD111	
	Fairchild	μA111	
	Intersil	LM111	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM111	
	National	**LM111**	**3317**
	PMI	PM111	
	Raytheon	LM111	
	Signetics	LM111	
	SiliconG	SG111	
	TI	LM111	
	Thomson-CSF	SFC2111	
CA1190	Fairchild	TDA1194	
	Hitachi	HA1364	
	SGS	TDA1190	
		TDA1190Z	
		TDA3190	
	Sprague	ULN-2290	
CA124A	AMD	LM124A	
	Motorola	LM124A	
	National	LM124A	
	Raytheon	LM124A	
	Signetics	LM124A	
	SiliconG	SG124	
	TI	LM124A	
CA1310	Exar	XR1310	
	Hitachi	HA1156	
	National	**LM1310**	**3325,3328**
	Sanyo	LA3350	
	Sprague	ULN-2211	
		ULN-3810	
	TI	SN76115	
	Toshiba	TA7157	
CA1352	Fairchild	ULN-2136	
	Motorola	MC1352	
		MC1357	
	RCA	CA2111	
		CA3014	
	Sanyo	LA1352	
	Sprague	ULN-2111	
		ULN-2136	
	TI	SN76642	
		SN76643	
		SN76650	
		SN76669	
CA139	AMD	LM139	
	Fairchild	μA139	
	Motorola	LM139	
	National	**LM139**	**3317**
	PMI	CMP-04	
		PM139	
	Raytheon	LM139	
	Signetics	LM139	
	SiliconG	SG139	
	TI	LM139	
CA1391	Motorola	MC1391	
	National	LM1391	
	TI	SN76591	
CA1394	Motorola	MC1394	
	National	LM1394	
	TI	SN76594	
CA1398	Motorola	MC1398	
	TI	SN76298	
CA139A	AMD	LM139A	
	Motorola	LM139A	
	National	**LM139A**	**3317**
	PMI	CMP-04	
		PM139A	
	SiliconG	SG139A	
CA1458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
CA1458	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
CA158A	Motorola	LM158	
	National	LM158A	
	Raytheon	RM4139	
	Signetics	LM158	
	TI	LM158	
CA2002	Sprague	ULN-3701	
CA2004	SGS	TDA2004	
CA201	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
CA201	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
CA207	AMD	LM207	
	National	LM207	
	SiliconG	SG207	
	TI	SN55207	
	Thomson-CSF	SFC2207	
CA208	AMD	LM208	
	AD	**AD208**	**3153**
	Fairchild	μA208	
	MicroPwr	MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM208	
	National	LM208	
	PMI	OP-08	
		OP05	
		PM208	
	SiliconG	SG208	
	TI	μA714	
◆CA211	AMD	LM211	
	AD	AD211	
	Motorola	LM211	
	National	**LM211**	**3317**
	PMI	PM211	
	RCA	LM211	
	Signetics	LM211	
	SiliconG	SG211	
	TI	LM211	
	Thomson-CSF	SFC2211	
CA2111	Fairchild	ULN-2136	
	Motorola	MC1352	
		MC1357	
	RCA	CA1352	
		CA3014	
	Sanyo	LA1352	
	Sprague	ULN-2111	
		ULN-2136	
	TI	SN76642	
		SN76643	
		SN76650	
		SN76669	
CA224	AMD	LM224	
	Fairchild	μA224	
	Motorola	LM224	
	National	LM224	
	Raytheon	LM224	
	Signetics	LM224	
	SiliconG	SG224	
	TI	LM224	
CA239	AMD	LM239	
	Fairchild	μA239	
	Motorola	LM239	
	National	**LM239**	**3317**
	PMI	CMP-04	
		PM239	
	Raytheon	LM239	
	Signetics	LM239	
	SiliconG	SG239	
	TI	LM239	
CA239A	AMD	LM239A	
	Motorola	LM239A	
	National	**LM239A**	**3317**
	PMI	CMP-04	
		PM239A	
	SiliconG	SG239A	
CA2524	**Exar**	**XR2524**	**3190,3209**
	Signetics	SG2524	
	SiliconG	SG2524	
	TI	SG2524	
CA258A	Motorola	LM258	
	National	LM258A	
	Signetics	LM258	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

RCA Solid State Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
CA258A	TI	LM258	
CA2904	Motorola	LM2904	
	National	LM2904	
	TI	LM2904	
CA3001	Hitachi	HA1110	
	SiliconG	SG3001	
CA301	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
CA3011	Motorola	MC1590	
	RCA	CA3012	
CA3012	Motorola	MC1590	
	RCA	CA3011	
CA3013	Motorola	MC1355	
CA3014	Fairchild	ULN-2136	
	Motorola	MC1352	
		MC1357	
	RCA	CA1352	
		CA2111	
	Sanyo	LA1352	
	Sprague	ULN-2111	
		ULN-2136	
	TI	SN76642	
		SN76643	
		SN76650	
		SN76669	
CA3018	National	LM3018	
	Thomson-CSF	SFC2018	
CA3019	National	LM3019	
CA3026	Motorola	CA3054	
	RCA	CA3054	
	SiliconG	SG3822	
	Sprague	ULN-2054	
	Thomson-CSF	SFC2054	
CA3036	Thomson-CSF	SFC2036	
CA3038	Fairchild	μA709	
	Hitachi	HA1303	
	Motorola	MC1709	
	National	LM1709	
		LM709	
	NEC-Electron	μPC255	
		μPC55	
	Raytheon	RC709	
		RM709	
	TI	μA709	
	Thomson-CSF	SFC2709	
	Toshiba	TA7502	
CA3045	Fairchild	μA3045	
	Hitachi	HA1127	
	National	LM3045	
	Plessey	SL3045	
	SiliconG	SG3045	
CA3046	Fairchild	μA3086	
	Motorola	MC3386	
	National	LM3086	
	Plessey	SL3046	
		SL3086	
	RCA	CA3086	
	SiliconG	SG3086	
		SG3821	
		SG3886	
	Sprague	ULN-2046	
		ULN-2086	
CA3054	Motorola	CA3054	
	RCA	CA3026	
	SiliconG	SG3822	
	Sprague	ULN-2054	
	Thomson-CSF	SFC2054	
CA3056	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
CA3056	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
CA3058	SiliconG	SG3058	
CA3059	Motorola	CA3059	
	SiliconG	SG3059	
CA3064	Motorola	M5140	
		MC1358	
		MC1364	
	National	LM3064	
	RCA	CA3065	
	Sanyo	LA1365	
	TI	SN76666	
CA3065	Motorola	M5140	
		MC1358	
		MC1364	
	National	LM3064	
	RCA	CA3064	
	Sanyo	LA1365	
	TI	SN76666	
CA3066	National	LM3066	
	TI	SN76266	
CA3067	TI	SN76267	
CA307	AMD	LM307	
	AD	**AD741J**	**3153**
	Intersil	LM307	
	Motorola	LM307	
	National	LM307	
	Raytheon	LM307	
	SiliconG	SG307	
	TI	LM307	
	Thomson-CSF	SFC2307	
CA3070	TI	SN76242	
CA3071	TI	SN76243	
		SN76246	
CA3072	National	LM3072	
CA3075	**National**	**LM3075**	**3325,3327**
	TI	SN76675	
CA3076	TI	SN76676	
CA3078	Raytheon	RC3078	
CA3079	Motorola	CA3079	
	SiliconG	SG3079	
CA3081	Plessey	SL3081	
	Signetics	CA3081	
	SiliconG	SG3081	
	Sprague	ULN-2081	
CA3082	Plessey	SL3082	
	Signetics	CA3082	
	SiliconG	SG3082	
	Sprague	ULN-2082	
CA3083	Plessey	SL3083	
		SL3183	
	RCA	CA3183	
	Signetics	CA3083	
		CA3183	
	SiliconG	SG3083	
		SG3183	
	Sprague	ULN-2083	
CA3086	Fairchild	μA3086	
	Motorola	MC3386	
	National	LM3086	
	Plessey	SL3046	
		SL3086	
	RCA	CA3046	
	SiliconG	SG3086	
		SG3821	
		SG3886	
	Sprague	ULN-2046	
		ULN-2086	
CA3089	Hitachi	HA1137	
		LA1230	
	Motorola	MC1389	
	National	CA3089	
		LM3089	**3325,3327**
	Sanyo	LA1230	
		LA3089	
	SGS	TCA3089	
		TDA1200	
	Signetics	CA3089	
	Siliconix	CA3089	
	TI	SN76689	
CA311	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
CA3123	National	LM1820	
	TI	SN76635	
CA3126	National	LM1829	
		LM3126	
CA3127	Plessey	SL3127	
CA3135	Sprague	ULN-2261	
CA3139	Motorola	CA3139	
CA3146	Motorola	MC3346	
	National	LM3046	
	Plessey	SL3146	
	RCA	CA3046	
	SiliconG	SG3046	
		SG3146	
	Sprague	ULN-2046	
CA3162	AD	AD2020	
CA3172	National	LM1848	
CA3183	Plessey	SL3083	
		SL3183	
	RCA	CA3083	
	Signetics	CA3083	
		CA3183	
	SiliconG	SG3083	
		SG3183	
	Sprague	ULN-2083	
CA3189	SGS	TCA3189	
	Signetics	CA3189	
	Sprague	ULN-3889	
CA3199	Plessey	SP8611	
CA3217	Hitachi	HA1148	
CA324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
CA3300	Datel	ADC-883	
CA3302	Fairchild	μA2901	
		μA3302	
	Motorola	LM2901	
		MC3302	
	National	LM2901	
		LM3302	
	NEC-Electron	μPC2901	
	PMI	CMP-04	
CA3302	Raytheon	LM2901	
		RV3302	
	Signetics	LM2901	
		MC3302	
	SiliconG	SG3302	
	TI	LM2901	
		LM3302	
CA339	AMD	LM339	
		LM339A	
	Fairchild	μA339	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339A	
		LM339	
	SiliconG	SG339	
	TI	LM339	
CA339A	AMD	LM339	
		LM339A	
	Fairchild	μA339	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		LM339	
	SiliconG	SG339	
	TI	LM339	
CA3401	Motorola	MC3401	
	National	LM3401	
		LM3900	
	Raytheon	LM3900	
		RC3401	
	TI	LM3900	
CA3493	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	Signetics	LM108	
	SiliconG	SG108	
	TI	μA714	
CA3524	**Exar**	**XR3524**	**3190**
	Signetics	SG3524	
	SiliconG	SG3524	
	TI	SG3524	
CA355	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

RCA Solid State Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
CA355	SiliconG	SG555	
	TI	NE555	
		SE555	
CA358A	Motorola	LM358	
	National	LM358A	
	NEC-Electron	μPC358	
	RCA	LM358	
	Sanyo	LA6358	
	Signetics	LM358	
		NE532	
	TI	LM358	
CA3724	Fairchild	FQ3724	
	Motorola	MQ3724	
	Raytheon	SP3724	
CA3725	Fairchild	FQ3725	
	Motorola	MQ3725	
	National	DH3725	
	Raytheon	SP3725	
CA555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
CA723	Fairchild	μA723	
	Hitachi	HA17723	
	Intersil	LM723	
	Motorola	**MC1723**	**3295**
	National	LM723	
	Raytheon	RC723	
		RM723	
	RCA	LM723	
	SGS	L123	
	Signetics	μA723	
	SiliconG	SG723	
	TI	μA723	
	Thomson-CSF	SFC2723	
CA741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
CA747	AMD	747	
	Fairchild	μA747	
	Hitachi	HA17747	
	Motorola	MC1747	
	National	LM747	
	NEC-Electron	μPC251	
	PMI	OP-04	
		PM747	
	Raytheon	RC747	
		RM747	
CA747	Signetics	μA747	
	SiliconG	SG747	
	TeledyneS	747	
	TI	μA747	
CA748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
CA758	Motorola	μA758	
	National	**LM1800**	**3325,3328**
	Signetics	μA758	
	TI	SN76111	
		SN76116	
CA7607	Toshiba	TA7607	
CA7611	Toshiba	TA7611	
CA810	Fairchild	TBA810	
	SGS	TBA810	
	Signetics	TBA810	
CD0438	**AMI**	**S4521**	**2610**
	Hughes	HLCD0438	
CD22100	Motorola	MC1452100	
	SGS	M22100	
CD22404	**Motorola**	**MC14404**	**3298**
CD22413	Motorola	MC14413	
CD22414	Motorola	MC14414	
CD22416	**Motorola**	**MC14416**	**3298**
CD22419	**Motorola**	**MC14419**	**3298**
CD4000	Motorola	MC14000	
	National	CD4000	
	SGS	HCF4000	
	Signetics	HEF400	
	SSS	SCL4000	
	Solitron	CM4000	
CD4001	Fairchild	F4001	
	Hitachi	HD14001	
	Motorola	MC14001	
	National	CD4001	
		MM74C02	
	OKI	MSM4001	
	Sanyo	LC4001B	
	SGS	HCF4001	
	Signetics	HEF4001	
	SSS	SCL4001	
	Solitron	CM4001	
	Toshiba	TC4001	
CD4002	Fairchild	F4002	
	Hitachi	HD14002	
	Motorola	MC14002	
	National	CD4002	
	SGS	HCF4002	
	Signetics	HEF4002	
	SSS	SCL4002	
	Solitron	CM4002	
	TI	TP4002	
	Toshiba	TC4002	
CD4006	Fairchild	F4006	
	Hitachi	HD14006	
	Motorola	MC14006	
	National	CD4006	
	SGS	HCF4006	
	SSS	SCL4006	
	Solitron	CM4006	
	Toshiba	TC4006	
CD4007	Fairchild	F4007	
	Hitachi	HD14007	
	Motorola	MC14007	
	National	CD4007	
	SGS	HCF4007	
	Signetics	HEF4007	
	SSS	SCL4007	
	Solitron	CM4007	
	Toshiba	TC4007	
CD4008	Fairchild	F4008	
	Hitachi	HD14008	
	Motorola	MC14008	
	National	CD4008	
		MM74C83	
	SGS	HCF4008	
	Signetics	HEF4008	
	SSS	SCL4008	
	Solitron	CM4008	
	Toshiba	TC4008	
CD4009	Fairchild	F4049	
	Hitachi	HD14049	
	Motorola	MC14049	
	National	CD4049	
	OKI	MSM4049	
	RCA	CD4049	
	Sanyo	LC4049	
	SGS	HCF4049	
	Signetics	HEF4049	
	SSS	SCL4049	
	Solitron	CM4049	
	Toshiba	TC4049	
CD4010	Fairchild	F4050	
	Hitachi	HD14050	
	Motorola	MC14050	
	National	CD4050	
	RCA	CD4050	
	SGS	HCF4050	
	Signetics	HEF4050	
	SSS	SCL4050	
	Solitron	CM4050	
	Toshiba	TC4050	
CD40100	SGS	HCF40100	
CD40101	Fairchild	F4531	
	Hitachi	HD14531	
	Motorola	MC14531	
	SGS	HCF40101	
	Signetics	HEF4531	
	SSS	SCL4531	
	Toshiba	TC4531	
CD40102	SGS	HCF40102	
CD40103	SGS	HCF40103	
CD40105	SGS	HCF40105	
CD40106	Fairchild	F40014	
	Hitachi	HD14584	
	Motorola	MC14584	
	National	CD40106	
		CD4584	
		MM54C14	
		MM74C14	
	SGS	HCF40106	
	Signetics	HEF40106	
	SSS	SCL4584	
CD40107	SGS	HCF40107	
	Toshiba	TC40107	
CD40108	Hitachi	HD14580	
	Motorola	MC14580	
CD40109	Fairchild	F4104	
	GTEMicro	G4104	
	Mitel	MD4104	
	Motorola	MC14504	
	National	MM4104	
	SGS	HCF40109	
	Signetics	HEF4104	
CD4011	Fairchild	F4011	
	Hitachi	HD14011	
	Motorola	MC14011	
	National	CD4011	
		MM74C00	
	OKI	MSM4011	
	Sanyo	LC4011	
	SGS	HCF4011	
	Signetics	HEF4011	
	SSS	SCL4011	
	Solitron	CM4011	
	Toshiba	TC4011	
CD4012	Fairchild	F4012	
	Hitachi	HD14012	
	Motorola	MC14012	
	National	CD4012	
	SGS	HCF4012	
	Signetics	HEF4012	
	SSS	SCL4012	
	Solitron	CM4012	
	Toshiba	TC4012	
CD4013	Fairchild	F4013	
	Hitachi	HD14013	
	Motorola	MC14013	
	National	CD4013	
		MM74C74	
	OKI	MSM4013	
	Sanyo	LC4013	
CD4013	SGS	HCF4013	
	Signetics	HEF4013	
	SSS	SCL4013	
	Solitron	CM4013	
	Toshiba	TC4013	
CD4014	Fairchild	F4014	
	Hitachi	HD14014	
	Motorola	MC14014	
	National	CD4014	
	SGS	HCF4014	
	Signetics	HEF4014	
	SSS	SCL4014	
	Solitron	CM4014	
	Toshiba	TC4014	
CD4015	Fairchild	F4015	
	Hitachi	HD14015	
	Motorola	MC14015	
	National	CD4015	
		MM74C164	
	OKI	MSM4015	
	Sanyo	LC4015	
	SGS	HCF4015	
	Signetics	HEF4015	
	SSS	SCL4015	
	Solitron	CM4015	
	Toshiba	TC4015	
CD4016	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
CD40160	Fairchild	F40160	
	Hitachi	HD14160	
	Motorola	MC14160	
	National	CD40160	
		MM54C160	
		MM74C160	
	SGS	HCF40160	
	Signetics	HEF4060	
	SSS	SCL4160	
	Toshiba	TC40160	
CD40161	Fairchild	F40161	
	Hitachi	HD14161	
	Motorola	MC14161	
	National	CD40161	
		MM54C161	
		MM74C161	
	SGS	HCF40161	
	Signetics	HEF40161	
	SSS	SCL4161	
	Toshiba	TC40161	
CD40162	Fairchild	F40162	
	Hitachi	HD14162	
	Motorola	MC14162	
	National	CD40162	
		MM54C162	
		MM74C162	
	SGS	HCF40162	
	Signetics	HEF40162	
	SSS	SCL4162	
	Toshiba	TC40162	
CD40163	Fairchild	F40163	
	Hitachi	HD14163	
	Motorola	MC14163	
	National	CD40163	
		MM54C163	
		MM74C163	
	SGS	HCF40163	
	Signetics	HEF40163	
	SSS	SCL4163	
	Toshiba	TC40163	
CD4017	Fairchild	F4017	
	Hitachi	HD14017	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

RCA Solid State Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
CD4017	Motorola	MC14017	
	National	CD4017	
	SGS	HCF4017	
	Signetics	HEF4017	
	SSS	SCL4017	
	Solitron	CM4017	
	Toshiba	TC4017	
CD40174	Fairchild	F40174	
	Hitachi	HD14174	
	Motorola	MC14174	
	National	CD40174	
		MM54C174	
		MM74C174	
	SGS	HCF40174	
	Signetics	HEF40174	
	SSS	SCL4174	
	Toshiba	TC40174	
CD40175	Motorola	MC40175	
CD4018	Fairchild	F4018	
	Hitachi	HD14018	
	Motorola	MC14018	
	National	CD4018	
	SGS	HCF4018	
	Signetics	HEF4018	
	SSS	SCL4018	
	Solitron	CM4018	
	Toshiba	TC4018	
CD40181	Hitachi	HD14581	
	Motorola	MC14581	
	RCA	CD4057	
	SGS	HCF40181	
	SSS	SCL4581	
CD40182	Fairchild	F4582	
	Hitachi	HD14582	
	Motorola	MC14582	
	SGS	HCF40182	
	SSS	SCL4582	
CD4019	Fairchild	F4019	
	National	CD4019	
	OKI	MSM4019	
	Sanyo	LC4019	
	SGS	HCF4019	
	Signetics	HEF4019	
	SSS	SCL4019	
	Solitron	CM4019	
	Toshiba	TC4019	
CD40192	Fairchild	F4029	
	Motorola	MC14029	
	National	CD40192	
		CD4029	
	RCA	CD4029	
	SGS	HCF40192	
		HCF4029	
	Signetics	HEF40192	
	SSS	SCL4029	
		SCL4192	
	Solitron	CM4029	
	Toshiba	TC40192	
		TC4029	
CD40193	Fairchild	F40193	
	National	CD40193	
		MM54C193	
		MM74C193	
	SGS	HCF40193	
	Signetics	HEF40193	
	SSS	SCL4193	
	Toshiba	TC40193	
CD40194	Fairchild	F40194	
	Hitachi	HD14194	
	Motorola	MC14194	
	SGS	HCF40194	
	Signetics	HEF40194	
CD4020	Fairchild	F4020	
	Hitachi	HD14020	
	Motorola	MC14020	
	National	CD4020	
	SGS	HCF4020	
	Signetics	HEF4020	
	SSS	SCL4020	
	Solitron	CM4020	
	Toshiba	TC4020	
CD40208	SGS	HCF40208	
CD4021	Fairchild	F4021	
	Hitachi	HD14021	
	Motorola	MC14021	
	National	CD4021	
	SGS	HCF4021	
	Signetics	HEF4021	
	SSS	SCL4021	
CD4021	Solitron	CM4021	
	Toshiba	TC4021	
CD4022	Fairchild	F4022	
	Hitachi	HD14022	
	Motorola	MC14022	
	National	CD4022	
	SGS	HCF4022	
	Signetics	HEF4022	
	SSS	SCL4022	
	Solitron	CM4022	
	Toshiba	TC4022	
CD4023	Fairchild	F4023	
	Hitachi	HD14023	
	Motorola	MC14023	
	National	CD4023	
		MM74C10	
	SGS	HCF4023	
	Signetics	HEF4023	
	SSS	SCL4023	
	Solitron	CM4023	
	Toshiba	TC4023	
CD4024	Fairchild	F4024	
	Hitachi	HD14024	
	Motorola	MC14024	
	National	CD4024	
	SGS	HCF4024	
	Signetics	HEF4024	
	SSS	SCL4024	
	Solitron	CM4024	
	Toshiba	TC4024	
CD4025	Fairchild	F4025	
	Hitachi	HD14025	
	Motorola	MC14025	
	National	CD4025	
	SGS	HCF4025	
	Signetics	HEF4025	
	SSS	SCL4025	
	Solitron	CM4025	
	Toshiba	TC4025	
CD40257	SGS	HCF40257	
CD4026	SGS	HCF4026	
	SSS	SCL4026	
	Solitron	CM4026	
CD4027	Fairchild	F4027	
	Hitachi	HD14027	
	Motorola	MC14027	
	National	CD4027	
		MM74C76	
	OKI	MSM4027	
	Sanyo	LC4027	
	SGS	HCF4027	
	Signetics	HEF4027	
	SSS	SCL4027	
	Solitron	CM4027	
CD4029	Fairchild	F4029	
	Motorola	MC14029	
	National	CD40192	
		CD4029	
	RCA	CD40192	
	SGS	HCF40192	
		HCF4029	
	Signetics	HEF40192	
	SSS	SCL4029	
		SCL4192	
	Solitron	CM4029	
	Toshiba	TC40192	
		TC4029	
CD4030	Fairchild	F4030	
	National	CD4030	
	SGS	HCF4030	
	Signetics	HEF4030	
	SSS	SCL4030	
	Solitron	CM4030	
	Toshiba	TC4030	
CD4031	Fairchild	F4031	
	National	CD4031	
	SGS	HCF4031	
	Signetics	HEF4731	
CD4032	Hitachi	HD14032	
	Motorola	MC14032	
	SGS	HCF4032	
	Solitron	CM4032	
	Toshiba	TC4032	
CD4033	SGS	HCF4033	
	SSS	SCL4033	
	Solitron	CM4033	
CD4034	Fairchild	F4034	
	Hitachi	HD14034	
	Motorola	MC14034	
	National	CD4034	
	SGS	HCF4034	
CD4034	SSS	SCL4034	
	Solitron	CM4034	
	Toshiba	TC4034	
CD4035	Fairchild	F4035	
	Hitachi	HD14035	
	Motorola	MC14035	
	National	CD4035	
	SGS	HCF4035	
	Signetics	HEF4035	
	SSS	SCL4035	
	Solitron	CM4035	
	Toshiba	TC4035	
CD4036	Solitron	CM4036	
	Toshiba	TC4036	
CD4037	Solitron	CM4037	
CD4038	Hitachi	HD14038	
	Motorola	MC14038	
	SGS	HCF4038	
	Solitron	CM4038	
	Toshiba	TC4038	
CD4039	Solitron	CM4039	
	Toshiba	TC4039	
CD4040	Fairchild	F4040	
	Hitachi	HD14040	
	Motorola	MC14040	
	National	CD4040	
	SGS	HCF4040	
	Signetics	HEF4040	
	SSS	SCL4040	
	Solitron	CM4040	
	Toshiba	TC4040	
CD4041	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
CD4042	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
CD4043	Hitachi	HD14043	
	Motorola	MC14043	
	National	CD4043	
	SGS	HCF4043	
	Signetics	HEF4043	
	SSS	SCL4043	
	Solitron	CM4043	
	Toshiba	TC4043	
CD4044	Fairchild	F4044	
	Hitachi	HD14044	
	Motorola	MC14044	
	National	CD4044	
	SGS	HCF4044	
	Signetics	HEF4044	
	SSS	SCL4044	
	Solitron	CM4044	
	Toshiba	TC4044	
CD4045	Fairchild	F4521	
	Motorola	MC14521	
	SGS	HCF4045	
	Signetics	HEF4521	
	SSS	SCL4445	
	Solitron	CM4045	
	Toshiba	TC4521	
CD4046	Fairchild	F4046	
	Hitachi	HD14046	
	Motorola	MC14046	
	National	CD4046	
	SGS	HCF4046	
CD4046	SSS	SCL4046	
	Solitron	CM4046	
CD4047	Fairchild	F4047	
	National	CD4047	
	SGS	HCF4047	
	Signetics	HEF4042	
		HEF4047	
	SSS	SCL4047	
	Solitron	CM4047	
	Toshiba	TC4047	
CD4048	National	CD4048	
	SGS	HCF4048	
	SSS	SCL4402	
	Solitron	CM4048	
CD4049	Fairchild	F4049	
	Hitachi	HD14049	
	Motorola	MC14049	
	National	CD4049	
	OKI	MSM4049	
	RCA	CD4009	
	Sanyo	LC4049	
	SGS	HCF4049	
	Signetics	HEF4049	
	SSS	SCL4049	
	Solitron	CM4049	
	Toshiba	TC4049	
CD4050	Fairchild	F4050	
	Hitachi	HD14050	
	Motorola	MC14050	
	National	CD4050	
	RCA	CD4010	
	SGS	HCF4050	
	Signetics	HEF4050	
	SSS	SCL4050	
	Solitron	CM4050	
	Toshiba	TC4050	
CD4051	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
CD4052	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**
	TeledyneP	4553	
CD4053	Fairchild	F4053	
	Motorola	MC14053	
	National	CD4053	
	SGS	HCF4052	
	Signetics	HEF4053	
	SSS	SCL4053	
	Solitron	CM4053	
	Toshiba	TC4053B	
CD4054	SGS	HCF4054	
	Toshiba	TC4054	
CD4055	Fairchild	F4543	
	Hitachi	HD14543	
	Motorola	MC14543	
	National	CD4543	
	RCA	CD4056	
		CD4543	
	Signetics	HEF4543	
	Toshiba	TC4543	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

RCA Solid State Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
CD4056	Fairchild	F4543	
	Hitachi	HD14543	
	Motorola	MC14543	
	National	CD4543	
	RCA	CD4055	
		CD4543	
	Signetics	HEF4543	
	Toshiba	TC4543	
CD4057	Hitachi	HD14581	
	Motorola	MC14581	
	RCA	CD40181	
	SGS	HCF40181	
	SSS	SCL4581	
CD4059	Hitachi	HD14560	
	Motorola	MC14569	
	Signetics	HEF4059	
CD4060	Motorola	MC14060	
	National	CD4060	
	SGS	HCF4060	
	Signetics	HEF4060	
	SSS	SCL4060	
CD4063	SGS	HCF4063	
	Toshiba	TC4063	
CD4066	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
CD4067	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	MV-1606	2622
		MX-1606	2622
	Fairchild	F4067	
	Harris	HI1840	
		HI506	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	
	Motorola	MC14067	
	PMI	MUX-16	
	SGS	HCF4067	
	Signetics	HEF4067	
	Siliconix	DG506	
CD4068	Fairchild	F4068	
	Hitachi	HD14068	
	Motorola	MC14068	
	SGS	HCF4068	
	Signetics	HEF4068	
	SSS	SCL4068	
		SCL4412	
	Solitron	CM4068	
	TI	UCN4810	
	Toshiba	TC4068	
CD4069	Fairchild	F4069	
	Hitachi	HD14069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
		MM74C04	
	OKI	MSM4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	
	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
CD4070	Fairchild	F4070	
	Hitachi	HD14070	
CD4070	Motorola	MC14070	
	National	CD4070	
		MM74C86	
	SGS	HCF4070	
	Signetics	HEF4070	
	SSS	SCL4070	
	Solitron	CM4070	
CD4071	Fairchild	F4071	
	Hitachi	HD14071	
	Motorola	MC14071	
	National	CD4071	
		MM74C32	
	OKI	MSM4071	
	Sanyo	LC4071	
	SGS	HCF4071	
	Signetics	HEF4071	
	SSS	SCL4071	
	Solitron	CM4071	
	Toshiba	TC4071	
CD4072	Fairchild	F4072	
	Hitachi	HD14072	
	Motorola	MC14072	
	National	CD4072	
	SGS	HCF4072	
	Signetics	HEF4072	
	SSS	SCL4072	
	Toshiba	TC4072	
CD4073	Fairchild	F4073	
	Hitachi	HD14073	
	Motorola	MC14073	
	National	CD4073	
	SGS	HCF4073	
	Signetics	HEF4073	
	SSS	SCL4073	
	Solitron	CM4073	
	Toshiba	TC4073	
CD4075	Fairchild	F4075	
	Hitachi	HD14075	
	Motorola	MC14075	
	National	CD4075	
	SGS	HCF4075	
	Signetics	HEF4075	
	SSS	SCL4075	
	Solitron	CM4075	
	Toshiba	TC4075	
CD4076	Fairchild	F4076	
	Hitachi	HD14076	
	Motorola	MC14076	
	National	CD4076	
		MM54C173	
		MM74C173	
	SGS	HCF4076	
	Signetics	HEF4076	
	SSS	SCL4076	
	Solitron	CM4076	
	Toshiba	TC4076	
CD4077	Fairchild	F4077	
	Hitachi	HD14077	
	Motorola	MC14077	
	National	CD4077	
	SGS	HCF4077	
	Signetics	HEF4077	
	SSS	SCL4077	
	Solitron	CM4077	
CD4078	Fairchild	F4078	
	Hitachi	HD14078	
	Motorola	MC14078	
	SGS	HCF4078	
	Signetics	HEF4078	
	SSS	SCL4078	
	Solitron	CM4078	
	Toshiba	TC4078	
CD4081	Fairchild	F4081	
	Hitachi	HD14081	
	Motorola	MC14081	
	National	CD4081	
		MM74C08	
	OKI	MSM4081	
	Sanyo	LC4081	
	SGS	HCF4081	
	Signetics	HEF4081	
	SSS	SCL4081	
	Solitron	CM4081	
	Toshiba	TC4081	
CD4082	Fairchild	F4082	
	Hitachi	HD14082	
	Motorola	MC14082	
	National	CD4082	
	SGS	HCF4082	
	Signetics	HEF4082	
	SSS	SCL4082	
CD4082	Toshiba	TC4082	
CD4085	Fairchild	F4085	
	National	CD4085	
	SGS	HCF4085	
	Signetics	HEF4085	
	SSS	SCL4085	
	Toshiba	TC4085	
CD4086	Fairchild	F4086	
	SGS	HCF4086	
	Signetics	HEF4086	
	SSS	SCL4086	
	Toshiba	TC4086	
CD4089	National	CD4089	
	SGS	HCF4089	
CD4093	Fairchild	F4093	
	Hitachi	HD14093	
	Motorola	MC14093	
	National	CD4093	
	OKI	MSM4093	
	Sanyo	LC4093	
	SGS	HCF4093	
	Signetics	HEF4093	
	SSS	SCL4093	
	Toshiba	TC4093	
CD4094	Hitachi	HD14094	
	Motorola	MC14094	
	SGS	HCF4094	
	Signetics	HEF4094	
	SSS	SCL4094	
	Toshiba	TC4094	
CD4095	SGS	HCF4095	
CD4096	SGS	HCF4096	
CD4097	Fairchild	F4097	
	Motorola	MC14097	
	SGS	HCF4097	
CD4098	Fairchild	F4528	
	Hitachi	HD14528	
	Motorola	MC14528	
	National	CD4528	
		MM74C221	
	SGS	HCF4098	
	Signetics	HEF4528	
	SSS	SCL4528	
	Toshiba	TC4528	
CD4099	Hitachi	HD14099	
	Motorola	MC14099	
	National	CD4099	
	SGS	HCF4099	
	SSS	SCL4099	
	Toshiba	TC4099	
CD4502	Hitachi	HD14502	
	Motorola	MC14502	
	SGS	HCF4502	
	Signetics	HEF4502	
	SSS	SCL4502	
CD4503	Fairchild	F40097	
	Hitachi	HD14503	
	Motorola	MC14503	
	National	CD4503	
		MM80C97	
	Signetics	HEF40097	
CD4508	Hitachi	HD14508	
		HD74147	
	Motorola	MC14508	
	National	DM74147	
	SGS	HCF4508	
	Signetics	74147	
		HEF4508	
		N82147	
	SSS	SCL4508	
	Solitron	CM4508	
	TI	SN74147	882
	Toshiba	TC4508	
CD4510	Fairchild	F4510	
	Hitachi	HD14510	
	Motorola	MC14510	
	National	CD4510	
	SGS	HCF4510	
	Signetics	HEF4510	
	SSS	SCL4510	
	Solitron	CM4510	
	Toshiba	TC4510	
CD4511	Fairchild	F4511	
	Hitachi	HD14511	
	Mitel	MD4511	
	MMI	4511	
	Motorola	MC14511	
	National	CD4511	
	NEC-Micro	μPD4511	
	SGS	HCF4511	
	Signetics	HEF4511	
CD4511	SSS	SCL4511	
	Solitron	CM4511	
	Toshiba	TC4511	
CD4512	Fairchild	F4512	
	Hitachi	HD14512	
	Motorola	MC14512	
	National	CD4512	
	SGS	HCF4512	
	SSS	SCL4512	
	Toshiba	TC4512	
CD4514	Fairchild	F4514	
	Hitachi	HD14514	
	Motorola	MC14514	
	National	CD4514	
	SGS	HCF4514	
	Signetics	HEF4514	
	SSS	SCL4514	
	Solitron	CM4514	
	Toshiba	TC4514	
CD4515	Fairchild	F4515	
	Hitachi	HD14515	
	Motorola	MC14515	
	National	CD4515	
	SGS	HCF4515	
	Signetics	HEF4515	
	SSS	SCL4515	
	Solitron	CM4515	
	Toshiba	TC4515	
CD4516	Fairchild	F4516	
	Hitachi	HD14516	
	Motorola	MC14516	
	National	CD4516	
	SGS	HCF4516	
	Signetics	HEF4516	
	SSS	SCL4516	
	Solitron	CM4516	
	Toshiba	TC4516	
CD4517	Hitachi	HD14517	
	Motorola	MC14517	
	Signetics	HEF4517	
	SSS	SCL4517	
CD4518	Fairchild	F4518	
	Hitachi	HD14518	
	Motorola	MC14518	
	National	CD4518	
	SGS	HCF4518	
	Signetics	HEF4518	
	SSS	SCL4518	
	Solitron	CM4518	
	Toshiba	TC4518	
CD4519	Hitachi	HD14519	
		HD4519	
	Motorola	MC14519	
	National	CD4519	
	Signetics	HEF4519	
CD4520	Fairchild	F4520	
	Hitachi	HD14520	
	Motorola	MC14520	
	National	CD4520	
	OKI	MSM4520	
	Sanyo	LC4520	
	SGS	HCF4520	
	Signetics	HEF4520	
	SSS	SCL4520	
	Solitron	CM4520	
	Toshiba	TC4520	
CD4522	Fairchild	F4522	
	Hitachi	HD14522	
	Motorola	MC14522	
	National	CD4522	
	Signetics	HEF4522	
	SSS	SCL4522	
	Toshiba	TC4522	
CD4527	Fairchild	F4527	
	Hitachi	HD14527	
	Motorola	MC14527	
	National	CD4527	
	SGS	HCF4527	
	Signetics	HEF4527	
	SSS	SCL4527	
	Toshiba	TC4527	
		TR4527	
CD4532	Fairchild	F4532	
	Hitachi	HD14532	
	Motorola	MC14532	
	SGS	HCF4532	
	Signetics	HEF4532	
	SSS	SCL4532	
	Toshiba	TC4532	
CD4536	Motorola	MC14536	
CD4541B	Motorola	MC14541B	
	Signetics	HEF4591	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

RCA Solid State Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
CD4543	Fairchild	F4543	
	Hitachi	HD14543	
	Motorola	MC14543	
	National	CD4543	
	RCA	CD4055	
		CD4056	
	Signetics	HEF4543	
	Toshiba	TC4543	
CD4543B	Motorola	MC14543B	
CD4555	Fairchild	F4555	
	Hitachi	HD14555	
	Motorola	MC14555	
	SGS	HCF4555	
	Signetics	HEF4555	
	SSS	SCL4555	
	Toshiba	TC4555	
CD4556	Fairchild	F4556	
	Motorola	MC14556	
	SGS	HCF4556	
	Signetics	HEF4556	
	SSS	SCL4556	
	Toshiba	TC4556	
CD4585	Fairchild	F40085	
	Hitachi	HD14585	
	Motorola	MC14585	
	National	MM74C85	
	Signetics	HEF4585	
	SSS	SCL4585	
	Toshiba	TC4585	
CD4724	Fairchild	F4724	
CD4XXX	TI	TP4000 Series	
CD54HC00	**Motorola**	**MC54HC00**	**733**
	National	MM54HC00	
	Signetics	PCF54HC00	
CD54HC02	Motorola	MC54HC02	
	National	MM54HC02	
	Signetics	PCF54HC02	
CD54HC04	Motorola	MC54HC04	
	National	MM54HC04	
	Signetics	PCF54HC04	
CD54HC08	Motorola	MC54HC08	
	National	MM54HC08	
	Signetics	PCF54HC08	
CD54HC10	Motorola	MC54HC10	
	National	MM54HC10	
	Signetics	PCF54HC10	
CD54HC107	Motorola	MC54HC107	
	National	MM54HC107	
	Signetics	PCF54HC107	
CD54HC109	Motorola	MC54HC109	
	National	MM54HC109	
	Signetics	PCF54HC109	
CD54HC11	Motorola	MC54HC11	
	National	MM54HC11	
	Signetics	PCF54HC11	
CD54HC112	Motorola	MC54HC112	
	National	MM54HC112	
	Signetics	PCF54HC112	
CD54HC123	Motorola	MC54HC123	
	National	MM54HC123	
	Signetics	PCF54HC123	
CD54HC132	Motorola	MC54HC132	
	National	MM54HC132	
	Signetics	PCF54HC132	
CD54HC133	Motorola	MC54HC133	
	National	MM54HC133	
	Signetics	PCF54HC133	
CD54HC138	Motorola	MC54HC138	
	National	MM54HC138	
	Signetics	PCF54HC138	
CD54HC139	Motorola	MC54HC139	
	National	MM54HC139	
	Signetics	PCF54HC139	
CD54HC14	Motorola	MC54HC14	
	National	MM54HC14	
	Signetics	PCF54HC14	
CD54HC147	Motorola	MC54HC147	
	National	MM54HC147	
	Signetics	PC54HC147	
CD54HC151	Motorola	MC54HC151	
	National	MM54HC151	
	Signetics	PCF54HC151	
CD54HC153	Motorola	MC54HC153	
	National	MM54HC153	
	Signetics	PCF54HC153	
CD54HC154	Motorola	MC54HC154	
	National	MM54HC154	
	Signetics	PCF54HC154	
CD54HC157	Motorola	MC54HC157	
	Signetics	PCF54HC157	
CD54HC158	Motorola	MC54HC158	
	National	MM54HC158	
	Signetics	PCF54HC158	
CD54HC160	Motorola	MC54HC160	
	National	MM54HC160	
	Signetics	PCF54HC160	
CD54HC161	Motorola	MC54HC161	
	National	MM54HC161	
	Signetics	PCF54HC161	
CD54HC162	Motorola	MC54HC162	
	National	MM54HC162	
	Signetics	PCF54HC162	
CD54HC163	Motorola	MC54HC163	
	National	MM54HC163	
	Signetics	PCF54HC163	
CD54HC164	Motorola	MC54HC164	
	National	MM54HC164	
	Signetics	PCF54HC164	
CD54HC165	Motorola	MC54HC165	
	National	MM54HC165	
	Signetics	PCF54HC165	
CD54HC166	Signetics	PCF54HC166	
CD54HC173	Motorola	MC54HC173	
	National	MM54HC173	
	Signetics	PCF54HC173	
CD54HC174	Motorola	MC54HC174	
	National	MM54HC174	
	Signetics	PCF54HC174	
CD54HC175	Motorola	MC54HC175	
	National	MM54HC175	
	Signetics	PCF54HC175	
CD54HC191	Signetics	PCF54HC191	
CD54HC192	Motorola	MC54HC192	
	National	MM54HC192	
	Signetics	PCF54HC192	
CD54HC193	Motorola	MC54HC193	
	National	MM54HC193	
	Signetics	PCF54HC193	
CD54HC194	Motorola	MC54HC194	
	National	MM54HC194	
	Signetics	PCF54HC194	
CD54HC195	Motorola	MC54HC195	
	National	MM54HC195	
	Signetics	PCF54HC195	
CD54HC20	Motorola	MC54HC20	
	National	MM54HC20	
	Signetics	PCF54HC20	
CD54HC221	Motorola	MC54HC221	
	National	MM54HC221	
	Signetics	PCF54HC221	
CD54HC238	Signetics	PCF54HC238	
CD54HC240	Motorola	MC54HC240	
	National	MM54HC240	
	Signetics	PCF54HC240	
CD54HC241	Motorola	MC54HC241	
	National	MM54HC241	
	Signetics	PCF54HC241	
CD54HC242	Motorola	MC54HC242	
	National	MM54HC242	
	Signetics	PCF54HC242	
CD54HC243	Motorola	MC54HC243	
	National	MM54HC243	
	Signetics	PCF54HC243	
CD54HC244	Motorola	MC54HC244	
	National	MM54HC244	
	Signetics	PCF54HC244	
CD54HC245	Motorola	MC54HC245	
	National	MM54HC245	
	Signetics	PCF54HC245	
CD54HC251	Motorola	MC54HC251	
	National	MM54HC251	
	Signetics	PCF54HC251	
CD54HC253	Motorola	MC54HC253	
	National	MM54HC253	
	Signetics	PCF54HC253	
CD54HC257	Motorola	MC54HC257	
	National	MM54HC257	
	Signetics	PCF54HC257	
CD54HC259	Motorola	MC54HC259	
	National	MM54HC259	
	Signetics	PCF54HC259	
CD54HC266	Motorola	MC54HC266	
	National	MM54HC266	
	Signetics	PCF54HC266	
CD54HC27	Motorola	MC54HC27	
	National	MM54HC27	
	Signetics	PCF54HC27	
CD54HC273	Motorola	MC54HC273	
	Signetics	PCF54HC273	
CD54HC280	Motorola	MC54HC280	
CD54HC280	National	MM54HC280	
	Signetics	PCF54HC280	
CD54HC297	Signetics	PCF54HC297	
CD54HC299	Motorola	MC54HC299	
	National	MM54HC299	
	Signetics	PCF54HC299	
CD54HC30	Motorola	MC54HC30	
	National	MM54HC30	
	Signetics	PCF54HC30	
CD54HC32	Motorola	MC54HC32	
	National	MM54HC32	
	Signetics	PCF54HC32	
CD54HC354	Motorola	MC54HC354	
	National	MM54HC354	
	Signetics	PCF54HC354	
CD54HC356	Motorola	MC54HC356	
	National	MM54HC356	
	Signetics	PCF54HC356	
CD54HC365	Motorola	MC54HC365	
	National	MM54HC365	
	Signetics	PCF54HC365	
CD54HC366	Motorola	MC54HC366	
	National	MM54HC366	
	Signetics	PCF54HC366	
CD54HC367	Motorola	MC54HC367	
	National	MM54HC367	
	Signetics	PCF54HC367	
CD54HC368	Motorola	MC54HC368	
	National	MM54HC368	
	Signetics	PCF54HC368	
CD54HC373	Motorola	MC54HC373	
	National	MM54HC373	
	Signetics	PCF54HC373	
CD54HC374	Motorola	MC54HC374	
	National	MM54HC374	
	Signetics	PCF54HC374	
CD54HC377	Signetics	PCF54HC377	
CD54HC384	Signetics	PCF54HC384	
CD54HC390	Motorola	MC54HC390	
		MC74HC365	
	National	MM54HC390	
		MM74HC365	
	RCA	**CD74HC365**	**740**
	SPI	**SP74HC365**	**771**
	Signetics	PCF54HC390	
CD54HC4002	Motorola	MC54HC4002	
	National	MM54HC4002	
	Signetics	PCF54HC4002	
CD54HC40104	Signetics	PCF54HC40104	
CD54HC40105	Signetics	PCF54HC40105	
CD54HC4017	Motorola	MC54HC4017	
	Signetics	PCF54HC4017	
CD54HC4020	Motorola	MC54HC4020	
	National	MM54HC4020	
	Signetics	PCF54HC4020	
CD54HC4024	Motorola	MC54HC4024	
	Signetics	PCF54HC4024	
CD54HC4040	Motorola	MC54HC4040	
	National	MM54HC4040	
	Signetics	PCF54HC4040	
CD54HC4049	Motorola	MC54HC4049	
	National	MM54HC4049	
	Signetics	PCF54HC4049	
CD54HC4050	Motorola	MC54HC4050	
	National	MM54HC4050	
	Signetics	PCF54HC4050	
CD54HC4051	Motorola	MC54HC4051	
	Signetics	PCF54HC4051	
CD54HC4052	Motorola	MC54HC4052	
	Signetics	PCF54HC4052	
CD54HC4053	Motorola	MC54HC4053	
	Signetics	PCF54HC4053	
CD54HC4060	Motorola	MC54HC4060	
	National	MM54HC4060	
	Signetics	PCF54HC4060	
CD54HC42	Motorola	MC54HC42	
	National	MM54HC42	
	Signetics	PCF54HC42	
CD54HC4511	Motorola	MC54HC4511	
	National	MM54HC4511	
	Signetics	PCF54HC4511	
CD54HC4514	Motorola	MC54HC4514	
	National	MM54HC4514	
	Signetics	PCF54HC4514	
CD54HC4520	Signetics	PCF54HC4520	
CD54HC4538	Motorola	MC54HC4538	
	National	MM54HC4538	
	Signetics	PCF54HC4538	
CD54HC533	Motorola	MC54HC533	
	National	MM54HC533	
	Signetics	PCF54HC533	
CD54HC534	Motorola	MC54HC534	
CD54HC534	National	MM54HC534	
	Signetics	PCF54HC534	
CD54HC541	Signetics	PCF54HC541	
CD54HC563	National	MM54HC563	
	Signetics	PCF54HC563	
CD54HC564	National	MM54HC564	
	Signetics	PCF54HC564	
CD54HC573	Motorola	MC54HC573	
	National	MM54HC573	
	Signetics	PCF54HC573	
CD54HC574	Motorola	MC54HC574	
	National	MM54HC574	
	Signetics	PCF54HC574	
CD54HC640	Motorola	MC54HC640	
	National	MM54HC640	
	Signetics	PCF54HC640	
CD54HC643	Motorola	MC54HC643	
	National	MM54HC643	
	Signetics	PCF54HC643	
CD54HC645	Motorola	MC54HC645	
	National	MM54HC645	
	Signetics	PCF54HC645	
CD54HC646	Motorola	MC54HC646	
	National	MM54HC646	
	Signetics	PCF54HC646	
CD54HC648	Motorola	MC54HC648	
	National	MM54HC648	
	Signetics	PCF54HC648	
CD54HC670	Signetics	PCF54HC670	
CD54HC688	Motorola	MC54HC688	
	National	MM54HC688	
	Signetics	PCF54HC688	
CD54HC73	Motorola	MC54HC73	
	National	MM54HC73	
	Signetics	PCF54HC73	
CD54HC74	Motorola	MC54HC74	
	National	MM54HC74	
	Signetics	PCF54HC74	
CD54HC75	Motorola	MC54HC75	
	National	MM54HC75	
	Signetics	PCF54HC75	
CD54HC76	Motorola	MC54HC76	
	National	MM54HC76	
	Signetics	PCF54HC76	
CD54HC85	Motorola	MC54HC85	
	National	MM54HC85	
	Signetics	PCF54HC85	
CD54HC86	Motorola	MC54HC86	
	National	MM54HC86	
	Signetics	PCF54HC86	
CD54HCT00	Signetics	PCF54HCT00	
CD54HCT02	Signetics	PCF54HCT02	
CD54HCT04	Signetics	PCF54HCT04	
CD54HCT08	Signetics	PCF54HCT08	
CD54HCT10	Signetics	PCF54HCT10	
CD54HCT107	Signetics	PCF54HCT107	
CD54HCT109	Signetics	PCF54HCT109	
CD54HCT11	Signetics	PCF54HCT11	
CD54HCT112	Signetics	PCF54HCT112	
CD54HCT123	Signetics	PCF54HCT123	
CD54HCT132	Signetics	PCF54HCT132	
CD54HCT133	Signetics	PCF54HCT133	
CD54HCT138	Signetics	PCF54HCT138	
CD54HCT139	Signetics	PCF54HCT139	
CD54HCT14	Signetics	PCF54HCT14	
CD54HCT147	Signetics	PCF54HCT147	
CD54HCT151	Signetics	PCF54HCT151	
CD54HCT153	Signetics	PCF54HCT153	
CD54HCT154	Signetics	PCF54HCT154	
CD54HCT157	Signetics	PCF54HCT157	
CD54HCT158	Signetics	PCF54HCT158	
CD54HCT160	Signetics	PCF54HCT160	
CD54HCT161	Signetics	PCF54HCT161	
CD54HCT162	Signetics	PCF54HCT162	
CD54HCT163	Signetics	PCF54HCT163	
CD54HCT164	Signetics	PCF54HCT164	
CD54HCT165	Signetics	PCF54HCT165	
CD54HCT166	Signetics	PCF54HCT166	
CD54HCT173	Signetics	PCF54HCT173	
CD54HCT174	Signetics	PCF54HCT174	
CD54HCT175	Signetics	PCF54HCT175	
CD54HCT191	Signetics	PCF54HCT191	
CD54HCT192	Signetics	PCF54HCT192	
CD54HCT193	Signetics	PCF54HCT193	
CD54HCT194	Signetics	PCF54HCT194	
CD54HCT195	Signetics	PCF54HCT195	
CD54HCT20	Signetics	PCF54HCT20	
CD54HCT221	Signetics	PCF54HCT221	
CD54HCT238	Signetics	PCF54HCT238	
CD54HCT240	Signetics	PCF54HCT240	
CD54HCT241	Signetics	PCF54HCT241	
CD54HCT242	Signetics	PCF54HCT242	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

RCA Solid State Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
CD54HCT243	Signetics	PCF54HCT243	
CD54HCT244	Signetics	PCF54HCT244	
CD54HCT245	Signetics	PCF54HCT245	
CD54HCT251	Signetics	PCF54HCT251	
CD54HCT253	Signetics	PCF54HCT253	
CD54HCT257	Signetics	PCF54HCT257	
CD54HCT259	Signetics	PCF54HCT259	
CD54HCT266	Signetics	PCF54HCT266	
CD54HCT27	Signetics	PCF54HCT	
CD54HCT273	Signetics	PCF54HCT273	
CD54HCT280	Signetics	PCF54HCT280	
CD54HCT297	Signetics	PCF54HCT297	
CD54HCT299	Signetics	PCF54HCT299	
CD54HCT30	Signetics	PCF54HCT30	
CD54HCT32	Signetics	PCF54HCT32	
CD54HCT354	Signetics	PCF54HCT354	
CD54HCT356	Signetics	PCF54HCT356	
CD54HCT365	Signetics	PCF54HCT365	
CD54HCT366	Signetics	PCF54HCT366	
CD54HCT367	Signetics	PCF54HCT367	
CD54HCT368	Signetics	PCF54HCT368	
CD54HCT373	Signetics	PCF54HCT373	
CD54HCT374	Signetics	PCF54HCT374	
CD54HCT377	Signetics	PCF54HCT377	
CD54HCT384	Signetics	PCF54HCT384	
CD54HCT390	Signetics	PCF54HCT390	
CD54HCT393	Signetics	PCF54HCT393	
CD54HCT4002	Signetics	PCF54HCT4002	
CD54HCT40104	Signetics	PCF54HCT40104	
CD54HCT40105	Signetics	PCF54HCT40105	
CD54HCT4017	Signetics	PCF54HCT4017	
CD54HCT4020	Signetics	PCF54HCT4020	
CD54HCT4024	Signetics	PCF54HCT4024	
CD54HCT4040	Signetics	PCF54HCT4040	
CD54HCT4049	Signetics	PCF54HCT4049	
CD54HCT4050	Signetics	PCF54HCT4050	
CD54HCT4051	Signetics	PCF54HCT4051	
CD54HCT4052	Signetics	PCF54HCT4052	
CD54HCT4053	Signetics	PCF54HCT4053	
CD54HCT4060	Signetics	PCF54HCT4060	
CD54HCT42	Signetics	PCF54HCT42	
CD54HCT4511	Signetics	PCF54HCT4511	
CD54HCT4514	Signetics	PCF54HCT4514	
CD54HCT4520	Signetics	PCF54HCT4520	
CD54HCT4538	Signetics	PCF54HCT4538	
CD54HCT533	Signetics	PCF54HCT533	
CD54HCT534	Signetics	PCF54HCT534	
CD54HCT540	Signetics	PCF54HCT540	
CD54HCT541	Signetics	PCF54HCT541	
CD54HCT563	Signetics	PCF54HCT563	
CD54HCT564	Signetics	PCF54HCT564	
CD54HCT573	Signetics	PCF54HCT573	
CD54HCT574	Signetics	PCF54HCT574	
CD54HCT640	Signetics	PCF54HCT640	
CD54HCT643	Signetics	PCF54HCT643	
CD54HCT645	Signetics	PCF54HCT645	
CD54HCT646	Signetics	PCF54HCT646	
CD54HCT648	Signetics	PCF54HCT648	
CD54HCT670	Signetics	PCF54HCT670	
CD54HCT688	Signetics	PCF54HCT688	
CD54HCT73	Signetics	PCF54HCT73	
CD54HCT74	Signetics	PCF54HCT74	
CD54HCT75	Signetics	PCF54HCT75	
CD54HCT76	Signetics	PCF54HCT76	
CD54HCT85	Signetics	PCF54HCT85	
CD54HCT86	Signetics	PCF54HCT86	
CD54HCU04	Signetics	PCF54HCU04	
CD54HG393	Motorola	MC54HC393	
	National	MM54GC393	
	Signetics	PCF54HC393	
CD55HC540	Signetics	PCF54HC540	
CD74H10	Motorola	MC74HC10	
		MC74HC10	
	National	MM74HC10	
	RCA	**CD74HC10**	**740**
	SPI	**SP74HC10**	**766**
	Signetics	PCF74HC10	
	Toshiba	TC40H010	
CD74HC00	**Motorola**	**MC74HC00**	**733**
	National	MM74HC00	
	SPI	**SP74HC00**	**766**
	Signetics	PCF74HC00	
	Toshiba	TC40H000	
CD74HC02	Motorola	MC74HC02	
	National	MM74HC02	
	SPI	**SP74HC02**	**766**
	Signetics	PCF74HC02	
	Toshiba	TC40H002	
CD74HC04	Motorola	MC74HC04	
CD74HC04	National	MM74HC04	
	SPI	**SP74HC04**	**766**
	Toshiba	TC40H004	
CD74HC08	Motorola	MC74HC08	
	National	MM74HC08	
	Signetics	PCF74HC08	
CD74HC10	Motorola	MC74HC10	
		MC74HC10	
	National	MM74HC10	
	RCA	CD74H10	
	SPI	**SP74HC10**	**766**
	Signetics	PCF74HC10	
	Toshiba	TC40H010	
CD74HC107	Motorola	MC74HC107	
	National	MM74HC107	
	SPI	**SP74HC107**	**768**
	Signetics	PCF74HC107	
	Toshiba	TC40H107	
CD74HC109	Motorola	MC74HC109	
		MC74HC109	
	National	MM74HC109	
	SPI	**SP74HC109**	**768**
	Signetics	PCF74HC109	
CD74HC11	Motorola	MC74HC11	
	National	MM74HC11	
	SPI	**SP74HC11**	**766**
	Signetics	PCF74HC11	
	Toshiba	TC40H011	
CD74HC112	Motorola	MC74HC112	
	National	MM74HC112	
	SPI	SP74HC112N	
	Signetics	PCF74HC112	
CD74HC123	Motorola	MC74HC123	
	National	MM74HC123	
	Signetics	PCF74HC123	
CD74HC132	Motorola	MC74HC132	
	National	MM74HC132	
	Signetics	PCF74HC132	
CD74HC133	Motorola	MC74HC133	
	National	MM74HC133	
	Signetics	PCF74HC133	
CD74HC138	Motorola	MC74HC138	
	National	MM74HC138	
	SPI	SP74HC138	
	Signetics	PCF74HC138	
CD74HC139	Motorola	MC74HC139	
	National	MM74HC139	
	SPI	**SP74HC139**	**769**
	Signetics	PCF74HC139	
	Toshiba	TC40H139	
CD74HC14	Motorola	MC74HC14	
	National	MM74HC14	
	SPI	**SP74HC14**	**766**
	Signetics	PCF74HC14	
CD74HC147	Motorola	MC74HC147	
	National	MM74HC147	
	SPI	**SP74HC147**	**769**
	Signetics	PCF74HC147	
CD74HC151	Motorola	MC74HC151	
	National	MM74HC151	
	Signetics	PCF74HC151	
CD74HC153	Motorola	MC74HC153	
	National	MM74HC153	
	SPI	**SP74HC153**	**769**
	Signetics	PCF74HC153	
	Toshiba	TC40H153	
CD74HC154	Motorola	MC74HC154	
	National	MM74HC154	
	Signetics	PCF74HC154	
CD74HC157	Motorola	MC74HC157	
	National	MM74HC157	
	SPI	**SP74HC157**	**769**
	Signetics	PCF74HC157	
	Toshiba	TC40H157	
CD74HC158	Motorola	MC74HC158	
	National	MM74HC158	
	SPI	**SP74HC158**	**769**
	Signetics	PCF74HC158	
	Toshiba	TC40H158	
CD74HC160	Motorola	MC74HC160	
	National	MM74HC160	
	Signetics	PCF74HC160	
CD74HC161	Motorola	MC74HC161	
	National	MM74HC161	
	SPI	**SP74HC161**	**770**
	Signetics	PCF74HC161	
CD74HC162	Motorola	MC74HC162	
	National	MM74HC162	
	SPI	**SP74HC162**	**770**
	Signetics	PCF74HC162	
CD74HC163	Motorola	MC74HC163	
CD74HC163	National	MM74HC163	
	SPI	**SP74HC163**	**770**
	Signetics	PCF74HC163	
CD74HC164	Motorola	MC74HC164	
	National	MM74HC164	
	Signetics	PCF74HC164	
CD74HC165	Motorola	MC74HC165	
	National	MM74HC165	
	Signetics	PCF74HC165	
CD74HC166	Signetics	PCF74HC166	
CD74HC173	Motorola	MC74HC173	
	National	MM74HC173	
	Signetics	PCF74HC173	
CD74HC174	Motorola	MC74HC174	
	National	MM74HC174	
	SPI	**SP74HC174**	**770**
	Signetics	PCF74HC174	
	Toshiba	TC40H174	
CD74HC175	Motorola	MC74HC175	
	National	MM74HC175	
	SPI	**SP74HC175**	**770**
	Signetics	PCF74HC175	
	Toshiba	TC40H175	
CD74HC191	Signetics	PCF74HC191	
CD74HC192	Motorola	MC74HC192	
	National	MM74HC192	
	SPI	**SP74HC192**	**770**
	Signetics	PCF74HC192	
	Toshiba	TC40H192	
CD74HC193	Motorola	MC74HC193	
	National	MM74HC193	
	SPI	**SP74HC193**	**770**
	Signetics	PCF74HC193	
	Toshiba	TC40H193	
CD74HC194	Motorola	MC74HC194	
	National	MM74HC194	
	Signetics	PCF74HC194	
CD74HC195	Motorola	MC74HC195	
	National	MM74HC195	
	Signetics	PCF74HC195	
CD74HC20	Motorola	MC74HC20	
	National	MM74HC20	
	SPI	**SP74HC20**	**766**
	Signetics	PCF74HC20	
	Toshiba	TC40H020	
CD74HC221	Motorola	MC74HC221	
	National	MM74HC221	
	Signetics	PCF74HC221	
CD74HC238	Signetics	PCF74HC238	
CD74HC240	Motorola	MC74HC240	
	National	MM74HC240	
	SPI	**SP74HC240**	**770**
	Signetics	PCF74HC240	
	Toshiba	TC40H240	
CD74HC241	Motorola	MC74HC241	
	National	MM74HC241	
	Signetics	PCF74HC241	
CD74HC242	Motorola	MC74HC242	
	National	MM74HC242	
	RCA	SGN	
CD74HC243	Motorola	MC74HC243	
	National	MM74HC243	
	Signetics	PCF74HC243	
CD74HC244	Motorola	MC74HC244	
	National	MM74HC244	
	Signetics	PCF74HC244	
CD74HC245	Motorola	MC74HC245	
	National	MM74HC245	
	Signetics	PCF74HC245	
CD74HC251	Motorola	MC74HC251	
	National	MM74HC251	
	Signetics	PCF74HC251	
CD74HC253	Motorola	MC74HC253	
	National	MM74HC253	
	SPI	**SP74HC253**	**771**
	Signetics	PCF74HC253	
CD74HC257	Motorola	MC74HC257	
	National	MM74HC257	
	SPI	**SP74HC257**	**771**
	Signetics	PCF74HC257	
CD74HC259	Motorola	MC74HC259	
	National	MM74HC259	
	Signetics	PCF74HC259	
CD74HC266	Motorola	MC74HC266	
	National	MM74HC266	
	SPI	**SP74HC266**	**771**
	Signetics	PCF74HC266	
CD74HC27	Motorola	MC74HC27	
	National	MM74HC27	
	SPI	**SP74HC27**	**766**
	Signetics	PCF74HC27	
	Toshiba	TC40H027	
CD74HC273	Motorola	MC74HC273	
CD74HC273	Signetics	PCF74HC273	
CD74HC280	Motorola	MC74HC280	
	National	MM74HC280	
	SPI	**SP74HC280**	**771**
	Signetics	PCF74HC280	
CD74HC297	Signetics	PCF74HC297	
CD74HC299	Motorola	MC74HC299	
	National	MM74HC299	
	Signetics	PCF74HC299	
CD74HC30	Motorola	MC74HC30	
	National	MM74HC30	
	Signetics	PCF74HC30	
CD74HC32	Motorola	MC74HC32	
	National	MM74HC32	
	SPI	**SP74HC32**	**767**
	Signetics	PCF74HC32	
	Toshiba	TC40H032	
CD74HC354	Motorola	MC74HC354	
	National	MM74HC354	
	Signetics	PCF74HC354	
CD74HC356	Motorola	MC74HC356	
	National	MM74HC356	
	Signetics	PCF73HC356	
CD74HC365	Motorola	MC54HC390	
		MC74HC365	
	National	MM54HC390	
		MM74HC365	
	RCA	**CD54HC390**	**739**
	SPI	**SP74HC365**	**771**
	Signetics	PCF54HC390	
CD74HC366	Motorola	MC74HC366	
	National	MM74HC366	
	Signetics	PCF74HC366	
CD74HC367	Motorola	MC74HC367	
	National	MM74HC367	
	Signetics	PCF74HC367	
CD74HC368	Motorola	MC74HC368	
	National	MM74HC368	
	Signetics	PCF74HC368	
CD74HC373	Motorola	MC74HC373	
	National	MM74HC373	
	Signetics	PCF74HC373	
CD74HC374	Motorola	MC74HC374	
	National	MM74HC374	
	Signetics	PCF74HC374	
CD74HC377	Signetics	PCF74HC377	
CD74HC384	Signetics	PCF74HC384	
CD74HC390	Motorola	MC74HC390	
	National	MM74HC390	
	Signetics	PCF74HC390	
CD74HC393	Motorola	MC74HC393	
	National	MM74HC393	
	Signetics	PCF74HC393	
CD74HC4002	Motorola	MC74HC4002	
	National	MM74HC4002	
	Signetics	PCF74HC4002	
CD74HC40104	Signetics	PCF74HC40104	
CD74HC40105	Signetics	PCF74HC40105	
CD74HC4017	Motorola	MC74HC4017	
	National	MM74HC4017	
	Signetics	PCF74HC4017	
CD74HC4020	Motorola	MC74HC4020	
	National	MM74HC4020	
	Signetics	PCF74HC4020	
CD74HC4024	Motorola	MC74HC4024	
	Signetics	PCF74HC4024	
CD74HC4040	Motorola	MC74HC4040	
	National	MM74HC4040	
	Signetics	PCF74HC4040	
CD74HC4049	Motorola	MC74HC4049	
	National	MM74HC4049	
	Signetics	PCF74HC4049	
CD74HC4050	Motorola	MC74HC4050	
	National	MM74HC4050	
	Signetics	PCF74HC4050	
CD74HC4051	Motorola	MC74HC4051	
	Signetics	PCF74HC4051	
CD74HC4052	Motorola	MC74HC4052	
	Signetics	PCF74HC4052	
CD74HC4053	Motorola	MC74HC4053	
	Signetics	PCF74HC4053	
CD74HC4060	Motorola	MC74HC4060	
	National	MM74HC4060	
	Signetics	PCF74HC4060	
CD74HC42	Motorola	MC74HC42	
	National	MM74HC42	
	SPI	**SP74HC42**	**767**
	Signetics	PCF74HC42	
CD74HC4511	Motorola	MC74HC4511	
	National	MM74HC4511	
	Signetics	PCF74HC4511	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

RCA Solid State Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
CD74HC4514	Motorola	MC74HC4514	
	National	MM74HC4514	
	Signetics	PCF74HC4514	
CD74HC4520	Signetics	PCF74HC4520	
CD74HC4538	Motorola	MC74HC4538	
	National	MM74HC4538	
	Signetics	PCF74HC4538	
CD74HC533	Motorola	MC74HC533	
	National	MM74HC533	
	Signetics	PCF74HC533	
CD74HC534	Motorola	MC74HC534	
	National	MM74HC534	
	Signetics	PCF74HC534	
CD74HC540	Signetics	PCF74HC540	
CD74HC541	Signetics	PCF74HC541	
CD74HC563	National	MM74HC563	
	Signetics	PCF74HC563	
CD74HC564	National	MM74HC564	
	Signetics	PCF74HC564	
CD74HC573	Motorola	MC74HC573	
	National	MM74HC573	
	Signetics	PCF74HC573	
CD74HC574	Motorola	MC74HC574	
	National	MM74HC574	
	Signetics	PCF74HC574	
CD74HC640	Motorola	MC74HC640	
	National	MM74HC640	
	Signetics	PCF74HC640	
CD74HC643	Motorola	MC74HC643	
	National	MM74HC643	
	Signetics	PCF74HC643	
CD74HC645	Motorola	MC74HC645	
	National	MM74HC645	
	Signetics	PCF74HC645	
CD74HC646	Motorola	MC74HC646	
	National	MM74HC646	
	Signetics	PCF74HC646	
CD74HC648	Motorola	MC74HC648	
	National	MM74HC648	
	Signetics	PCF74HC648	
CD74HC670	Signetics	PCF74HC670	
CD74HC688	Motorola	MC74HC688	
	National	MM74HC688	
	Signetics	PCF74HC688	
CD74HC73	Motorola	MC74HC73	
	National	MM74HC73	
	SPI	**SP74HC73**	**767**
	Signetics	PCF74HC73	
CD74HC74	Motorola	MC74HC74	
	National	MM74HC74	
	SPI	SD74HC74	
	Signetics	PCF74HC74	
	Toshiba	TC40H074	
CD74HC75	Motorola	MC74HC75	
	National	MM74HC75	
	Signetics	PCF74HC75	
CD74HC76	Motorola	MC74HC76	
	National	MM74HC76	
	SPI	**SP74HC76**	**767**
	Signetics	PCF74HC76	
	Toshiba	TC40H076	
CD74HC85	Motorola	MC74HC85	
	National	MM74HC85	
	Signetics	PCF74HC85	
CD74HC86	Motorola	MC74HC86	
	National	MM74HC86	
	SPI	SP74HC86N	
	Signetics	PCF74HC86	
CD74HCT00	Signetics	PCF74HCT00	
CD74HCT02	Signetics	PCF74HCT02	
CD74HCT08	Signetics	PCF74HCT08	
CD74HCT10	Signetics	PCF74HCT10	
CD74HCT107	Signetics	PCF74HCT107	
CD74HCT109	Signetics	PCF74HCT109	
CD74HCT11	Signetics	PCF74HCT11	
CD74HCT112	Signetics	PCF74HCT112	
CD74HCT123	Signetics	PCF74HCT123	
CD74HCT132	Signetics	PCF74HCT132	
CD74HCT133	Signetics	PCF74HCT133	
CD74HCT138	Signetics	PCF74HCT138	
CD74HCT139	Signetics	PCF74HCT139	
CD74HCT14	Signetics	PCF74HCT14	
CD74HCT147	Signetics	PCF74HCT147	
CD74HCT151	Signetics	PCF74HCT151	
CD74HCT153	Signetics	PCF74HCT153	
CD74HCT154	Signetics	PCF74HCT154	
CD74HCT157	Signetics	PCF74HCT157	
CD74HCT158	Signetics	PCF74HCT158	
CD74HCT160	Signetics	PCF74HCT160	
CD74HCT161	Signetics	PCF74HCT161	
CD74HCT162	Signetics	PCF74HCT162	
CD74HCT163	Signetics	PCF74HCT163	
CD74HCT164	Signetics	PCF74HCT164	
CD74HCT165	Signetics	PCF74HCT165	
CD74HCT166	Signetics	PCF74HCT166	
CD74HCT173	Signetics	PCF74HCT173	
CD74HCT174	Signetics	PCF74HCT174	
CD74HCT175	Signetics	PCF74HCT175	
CD74HCT191	Signetics	PCF74HCT191	
CD74HCT192	Signetics	PCF74HCT192	
CD74HCT193	Signetics	PCF74HCT193	
CD74HCT194	Signetics	PCF74HCT194	
CD74HCT195	Signetics	PCF74HCT195	
CD74HCT20	Signetics	PCF74HCT20	
CD74HCT221	Signetics	PCF74HCT221	
CD74HCT238	Signetics	PCF74HCT238	
CD74HCT240	Signetics	PCF74HCT240	
CD74HCT241	Signetics	PCF74HCT241	
CD74HCT242	Signetics	PCF74HCT242	
CD74HCT243	Signetics	PCF74HCT243	
CD74HCT244	Signetics	PCF74HCT244	
CD74HCT245	Signetics	PCF74HCT245	
CD74HCT251	Signetics	PCF74HCT251	
CD74HCT253	Signetics	PCF74HCT253	
CD74HCT257	Signetics	PCF74HCT257	
CD74HCT259	Signetics	PCF74HCT259	
CD74HCT266	Signetics	PCF74HCT266	
CD74HCT27	Signetics	PCF74HCT27	
CD74HCT273	Signetics	PCF74HCT273	
CD74HCT280	Signetics	PCF74HCT280	
CD74HCT297	Signetics	PCF74HCT297	
CD74HCT299	Signetics	PCF74HCT299	
CD74HCT30	Signetics	PCF74HCT30	
CD74HCT32	Signetics	PCF74HCT32	
CD74HCT354	Signetics	PCF74HCT354	
CD74HCT356	Signetics	PCF74HCT356	
CD74HCT365	Signetics	PCF74HCT365	
CD74HCT366	Signetics	PCF74HCT366	
CD74HCT367	Signetics	PCF74HCT367	
CD74HCT368	Signetics	PCF74HCT368	
CD74HCT373	Signetics	PCF74HCT373	
CD74HCT374	Signetics	PCF74HCT374	
CD74HCT377	Signetics	PCF74HCT377	
CD74HCT384	Signetics	PCF74HCT384	
CD74HCT390	Signetics	PCF74HCT390	
CD74HCT393	Signetics	PCF74HCT393	
CD74HCT4002	Signetics	PCF74HCT4002	
CD74HCT40104	Signetics	PCF74HCT40104	
CD74HCT40105	Signetics	PCF74HCT40105	
CD74HCT4017	Signetics	PCF74HCT4017	
CD74HCT4020	Signetics	PCF74HCT4020	
CD74HCT4024	Signetics	PCF74HCT4024	
CD74HCT4040	Signetics	PCF74HCT4040	
CD74HCT4049	Signetics	PCF74HCT4049	
CD74HCT4050	Signetics	PCF74HCT4050	
CD74HCT4051	Signetics	PCF74HCT4051	
CD74HCT4052	Signetics	PCF74HCT4052	
CD74HCT4053	Signetics	PCF74HCT4053	
CD74HCT4060	Signetics	PCF74HCT4060	
CD74HCT42	Signetics	PCF74HCT42	
CD74HCT4511	Signetics	PCF74HCT4511	
CD74HCT4514	Signetics	PCF74HCT4514	
CD74HCT4538	Signetics	PCF74HCT4538	
CD74HCT533	Signetics	PCF74HCT533	
CD74HCT534	Signetics	PCF74HCT534	
CD74HCT540	Signetics	PCF74HCT540	
CD74HCT541	Signetics	PCF74HCT541	
CD74HCT563	Signetics	PCF74HCT563	
CD74HCT564	Signetics	PCF74HCT564	
CD74HCT573	Signetics	PCF74HCT573	
CD74HCT574	Signetics	PCF74HCT574	
CD74HCT640	Signetics	PCF74HCT640	
CD74HCT643	Signetics	PCF74HCT643	
CD74HCT645	Signetics	PCF74HCT645	
CD74HCT646	Signetics	PCF74HCT646	
CD74HCT648	Signetics	PCF74HCT648	
CD74HCT670	Signetics	PCF74HCT670	
CD74HCT688	Signetics	PCF74HCT688	
CD74HCT73	Signetics	PCF74HCT73	
CD74HCT74	Signetics	PCF74HCT74	
CD74HCT75	Signetics	PCF74HCT75	
CD74HCT76	Signetics	PCF74HCT76	
CD74HCT85	Signetics	PCF74HCT85	
CD74HCT86	Signetics	PCF74HCT86	
CDM5104	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
CDM5104	**Hitachi**	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	TI	TMS4044	
	Zilog	6104	
		Z6104	
CDM5332	AMD	AM9233	
	AMI	**S2333**	**3608**
	CSG	MPS2333	
	Fairchild	F3533	
	GI	R03-9333	
	Intel	2332	
	NEC-EA	8332	
		EA8333	
	Signetics	2332	
	Synertek	**SY2333**	**3950**
	Toshiba	TM2332	
	Universal	UM2333-45	
CDM5333	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
CDM6116	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
CDP1802	Hughes	HCMP1802A	
CDP1824	Hughes	HCMP1824	
CDP1831	Hughes	HCMP1831	
CDP1832	Hughes	HCMP1832	
CDP1833	Hughes	HCMP1833	
CDP1834	Hughes	HCMP1834	
CDP1851	Hughes	HCMP1851	
CDP1852	Hughes	HCMP1852	
CDP1853	Hughes	HCMP1853	
CDP1854	Hughes	HCMP1854	
CDP1855	Hughes	HCMP1855	
CDP1856	Hughes	HCMP1856	
CDP1857	Hughes	HCMP1857	
CDP1858	Hughes	HCMP1858	
CDP1859	Hughes	HCMP1859	
CDP1861	Hughes	HCMP1861	
CDP1873	GTEMicro	G74SC138	
	Mitel	**MD74SC138**	**697**
	Plessey	MV74SC138	
	SPI	SP74SC138	
CDP6402	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
CDP6402	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
◆C04028	Fairchild	F4028	
	Hitachi	HD14028	
	Motorola	MC14028	
	National	CD4028	
		MM74C42	
	OKI	MSM4028	
	Sanyo	LC4028	
	SGS	HCF4028	
	Signetics	HEF4028	
	SSS	SCL4028	
	Solitron	CM4028	
	Toshiba	TC4028	
LM1458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
LM1558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

RCA Solid State Division (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LM1558	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
LM211	AMD	LM211	
	AD	AD211	
	Motorola	LM211	
	National	**LM211**	**3317**
	PMI	PM211	
	Signetics	LM211	
	SiliconG	SG211	
	TI	LM211	
	Thomson-CSF	SFC2211	
LM301	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
LM311	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
LM324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
	Sanyo	LA6324	
LM324	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
LM339	AMD	LM339	
		LM339A	
	Fairchild	μA339	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
	SiliconG	SG339	
	TI	LM339	
LM358	Motorola	LM358	
	National	LM358A	
	NEC-Electron	μPC358	
	RCA	CA358A	
	Sanyo	LA6358	
	Signetics	LM358	
		NE532	
	TI	LM358	
LM723	Fairchild	μA723	
	Hitachi	HA17723	
	Intersil	LM723	
	Motorola	**MC1723**	**3295**
	National	LM723	
	Raytheon	RC723	
		RM723	
	RCA	CA723	
	SGS	L123	
	Signetics	μA723	
	SiliconG	SG723	
	TI	μA723	
	Thomson-CSF	SFC2723	
LM748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
MWS5101	**Harris**	**HM6551**	**669,1333,3758**
	Intersil	IM6551	
	National	MM74C920	
		NMC6551	
	NEC-Micro	μPD5101	
MWS5114	Fujitsu	MB8414	
	Harris	HM6514	
	Hitachi	**HM4334**	**3789**
	Intersil	IM6514	
	MicroPwr	MP6514	
	Mitsubishi	M58981	
	National	NMC6514	
	NEC-Micro	μPD444/6514	
		μPD6514	
	OKI	**MSM5115**	**3873**
	RCA	MWS5514	
	Toshiba	TC5514	
MWS5514	Fujitsu	MB8414	
	Harris	HM6514	
	Hitachi	**HM4334**	**3789**
	Intersil	IM6514	
	MicroPwr	MP6514	
	Mitsubishi	M58981	
	National	NMC6514	
	NEC-Micro	μPD444/6514	
		μPD6514	
MWS5514	**OKI**	**MSM5115**	**3873**
	RCA	MWS5114	
	Toshiba	TC5514	
RC4558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
SGN	Motorola	MC74HC242	
	National	MM74HC242	
	RCA	**CD74HC242**	**739**
SSS1458	PMI	OP-14	
	RCA	SSS1558	
SSS1558	PMI	OP-14	
	RCA	SSS1458	

RIFA

Manufacturer Device	Replacement Source	Device	IC Master Page
PBD352301	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
PBD352303	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
PBD352303	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
PBD352304	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
PBD352311	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
PBD352314	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
PBD353801	Sprague	ULN-2801	
PBD353802	Sprague	ULN-2804	
PBD353803	Sprague	ULN-2803	
PBD353804	Sprague	ULN-2802	

Rockwell Electronic Devices

Manufacturer Device	Replacement Source	Device	IC Master Page
2708	AMD	2708	
	Fairchild	F2708	
	Hitachi	HN462708	
	Motorola	MC27A08	
		MCM2708	
	National	MM2708	
	NEC-EA	EA2708	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Rockwell Electronic Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
2708	Panasonic	MN2708	
	SGS	M2708	
	TI	TMS2708	
CRC8000	Nitron	NC2000	
CRC8030	Nitron	NC2030	
R2316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
R2332	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
R2364	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
R6500/1	CSG	MPS6500/1	
	Synertek	SY6500/1	
R6502	CSG	MPS6502	
	Synertek	SY6502	
R6503	CSG	MPS6503	
	Synertek	SY6503	
R6504	CSG	MPS6504	
	Synertek	SY6504	
R6505	CSG	MPS6505	
	Synertek	SY6505	
R6506	CSG	MPS6506	
	Synertek	SY6506	
R6507	CSG	MPS6507	
	Synertek	SY6507	
R6512	CSG	MPS6512	
	Synertek	SY6512	
R6514	CSG	MPS6514	
	Synertek	SY6514	
R6515	CSG	MPS6515	
	Synertek	SY6515	
R6520	CSG	MPS6520	
	Synertek	**SY6520**	**1527**
R6522	CSG	MPS6522	
	Synertek	**SY6522**	**1529**
R6530	**Synertek**	**SY6530**	**1530**
R6532	CSG	MPS6532	
	Synertek	**SY6532**	**1531**
R6545	CSG	MPS6545	
	Hitachi	**HD6845**	**1345**
		HD68A45	**1345**
		HD68B45	**1345**
	Motorola	**MC6845**	**1351**
	Synertek	SY6545	
R6551	**AMI**	**S6551**	**1249**
	CSG	MP6551	
		MPS6551	
	Synertek	**SY6551**	**1536**
R68000	Hitachi	HD68000	
	Mostek	MK68000	
	Motorola	MC68000	
	Signetics	**SCN68000**	**1524**
R8118	CSG	MPS4118	
	Mostek	MK4118A	
		MK4801A	

Sanyo Semiconductor

L78M05	Fairchild	μA78M05	
	Motorola	MC78M05	
	National	**LM341-5**	**3300**
		LM342-05	
		LM78M05	
	NEC-Electron	μPC78M05	
	NEC-Micro	μPC78M05	
	TI	μA78M05	
L78M06	Fairchild	μA78M06	
	Motorola	MC78M06	
	TI	μA78M06	
L78M08	Fairchild	μA78M08	
	Motorola	MC78M08	
	NEC-Electron	μPC78M08	
	NEC-Micro	μPC78M08	
	TI	μA78M08	
L78M12	Fairchild	μA78M12	
	Motorola	MC78M12	
	National	**LM341-12**	**3300**
		LM342-12	**3299**
		LM78M12	
	NEC-Electron	μPC78M12	
	NEC-Micro	μPC78M12	
L78M15	Fairchild	μA78M15	
	Motorola	MC78M15	
	National	**LM341-15**	**3300**
		LM342-15	**3299**
		LM78M15	
	NEC-Electron	μPC78M15	
	NEC-Micro	μPC78M15	
L78M18	Motorola	MC78M18	
L78M24	Fairchild	μA78M24	
	Motorola	MC78M24	
	TI	μA78M24	
LA1230	Hitachi	HA1137	
		LA1230	
	Motorola	MC1389	
	National	CA3089	
		LM3089	**3325,3327**
	RCA	CA3089	
	Sanyo	LA3089	
	SGS	TCA3089	
		TDA1200	
	Signetics	CA3089	
	Siliconix	CA3089	
	TI	SN76689	
LA1240	Hitachi	HA1197	
LA1352	Fairchild	ULN-2136	
	Motorola	MC1352	
		MC1357	
	RCA	CA1352	
		CA2111	
		CA3014	
	Sprague	ULN-2111	
		ULN-2136	
LA1352	TI	SN76642	
		SN76643	
		SN76650	
		SN76669	
LA1365	Motorola	M5140	
		MC1358	
		MC1364	
	National	LM3064	
	RCA	CA3064	
		CA3065	
	TI	SN76666	
LA1369	Sprague	ULN-2224	
LA3089	Hitachi	HA1137	
		LA1230	
	Motorola	MC1389	
	National	CA3089	
		LM3089	**3325,3327**
	RCA	CA3089	
	Sanyo	LA1230	
	SGS	TCA3089	
		TDA1200	
	Signetics	CA3089	
	Siliconix	CA3089	
	TI	SN76689	
LA3350	Exar	XR1310	
	Hitachi	HA1156	
	National	**LM1310**	**3325,3328**
	RCA	CA1310	
	Sprague	ULN-2211	
		ULN-3810	
	TI	SN76115	
	Toshiba	TA7157	
LA6324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
LA6358	Motorola	LM358	
	National	LM358A	
	NEC-Electron	μPC358	
	RCA	CA358A	
		LM358	
	Signetics	LM358	
		NE532	
	TI	LM358	
LA6393	Fairchild	μA393	
	Motorola	LM393	
	National	**LM393**	**3317**
	Signetics	LM393	
	TI	LM393	
LA6458A	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
LA6458A	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
LB1231	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
LB1232	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
LB1233	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Sanyo Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LB1234	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
LB1290	Dionics	DI514	
	Exar	**XR6118**	**3205**
	SiliconG	SG6118	
	Sprague	**UDN-6118**	**2843**
		ULN-6118	
LB1293	**Sprague**	**UDN-6126**	**2843**
LB8555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
LC4001B	Fairchild	F4001	
	Hitachi	HD14001	
	Motorola	MC14001	
	National	CD4001	
		MM74C02	
	OKI	MSM4001	
	RCA	CD4001	
	SGS	HCF4001	
	Signetics	HEF4001	
	SSS	SCL4001	
	Solitron	CM4001	
	Toshiba	TC4001	
LC4011	Fairchild	F4011	
	Hitachi	HD14011	
	Motorola	MC14011	
	National	CD4011	
		MM74C00	
	OKI	MSM4011	
	RCA	CD4011	
	SGS	HCF4011	
	Signetics	HEF4011	
	SSS	SCL4011	
	Solitron	CM4011	
	Toshiba	TC4011	
LC4013	Fairchild	F4013	
	Hitachi	HD14013	
	Motorola	MC14013	
	National	CD4013	
		MM74C74	
	OKI	MSM4013	
	RCA	CD4013	
	SGS	HCF4013	
	Signetics	HEF4013	
	SSS	SCL4013	
	Solitron	CM4013	
LC4013	Toshiba	TC4013	
LC4015	Fairchild	F4015	
	Hitachi	HD14015	
	Motorola	MC14015	
	National	CD4015	
		MM74C164	
	OKI	MSM4015	
	RCA	CD4015	
	SGS	HCF4015	
	Signetics	HEF4015	
	SSS	SCL4015	
	Solitron	CM4015	
	Toshiba	TC4015	
LC4016	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
LC4019	Fairchild	F4019	
	National	CD4019	
	OKI	MSM4019	
	RCA	CD4019	
	SGS	HCF4019	
	Signetics	HEF4019	
	SSS	SCL4019	
	Solitron	CM4019	
	Toshiba	TC4019	
LC4027	Fairchild	F4027	
	Hitachi	HD14027	
	Motorola	MC14027	
	National	CD4027	
		MM74C76	
	OKI	MSM4027	
	RCA	CD4027	
	SGS	HCF4027	
	Signetics	HEF4027	
	SSS	SCL4027	
	Solitron	CM4027	
LC4028	Fairchild	F4028	
	Hitachi	HD14028	
	Motorola	MC14028	
	National	CD4028	
		MM74C42	
	OKI	MSM4028	
	SGS	HCF4028	
	Signetics	HEF4028	
	SSS	SCL4028	
	Solitron	CM4028	
	Toshiba	TC4028	
LC4049	Fairchild	F4049	
	Hitachi	HD14049	
	Motorola	MC14049	
	National	CD4049	
	OKI	MSM4049	
	RCA	CD4009	
		CD4049	
	SGS	HCF4049	
	Signetics	HEF4049	
	SSS	SCL4049	
	Solitron	CM4049	
	Toshiba	TC4049	
LC4066	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
LC4066	Sanyo	LC4016	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
LC4069	Fairchild	F4069	
	Hitachi	HD14069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
		MM74C04	
	OKI	MSM4069	
	RCA	CD4069	
	SGS	HC4069	
		HCF4069	
	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
LC4071	Fairchild	F4071	
	Hitachi	HD14071	
	Motorola	MC14071	
	National	CD4071	
		MM74C32	
	OKI	MSM4071	
	RCA	CD4071	
	SGS	HCF4071	
	Signetics	HEF4071	
	SSS	SCL4071	
	Solitron	CM4071	
	Toshiba	TC4071	
LC4081	Fairchild	F4081	
	Hitachi	HD14081	
	Motorola	MC14081	
	National	CD4081	
		MM74C08	
	OKI	MSM4081	
	RCA	CD4081	
	SGS	HCF4081	
	Signetics	HEF4081	
	SSS	SCL4081	
	Solitron	CM4081	
	Toshiba	TC4081	
LC4093	Fairchild	F4093	
	Hitachi	HD14093	
	Motorola	MC14093	
	National	CD4093	
	OKI	MSM4093	
	RCA	CD4093	
	SGS	HCF4093	
	Signetics	HEF4093	
	SSS	SCL4093	
	Toshiba	TC4093	
LC4520	Fairchild	F4520	
	Hitachi	HD14520	
	Motorola	MC14520	
	National	CD4520	
	OKI	MSM4520	
	RCA	CD4520	
	SGS	HCF4520	
	Signetics	HEF4520	
	SSS	SCL4520	
	Solitron	CM4520	
	Toshiba	TC4520	

SEEQ Technology, Inc.

Manufacturer Device	Replacement Source	Device	IC Master Page
5123	**Xicor**	**X2816**	**3999**
5133	Fujitsu	MBM2764	
	Hitachi	HN462764	
		HN482764	**3789**
	Intel	**2764**	**3820,3822**
		M2764	
	Intersil	2764	
	Mostek	MK2764	
	National	NMC2764	
	NEC-Micro	μPD2764	
	Toshiba	TMM2764	
5143	Fujitsu	27128	
	Intel	**27128**	**3821**

Semi Processes Inc.

Manufacturer Device	Replacement Source	Device	IC Master Page
SD5000	Signetics	SD5000	
	Siliconix	SI5000	
SD5001	Signetics	SD5001	
	Siliconix	SI5001	
SD5002	Signetics	SD5002	
	Siliconix	SI5002	
SD5200	Signetics	SD5200	
	Siliconix	SI5200	
SD74HC74	Motorola	MC74HC74	
	National	MM74HC74	
	RCA	**CD74HC74**	**739**
	Signetics	PCF74HC74	
	Toshiba	TC40H074	
SP54SC137	**Mitel**	**MD54SC137**	**697**
SP54SC138	**Mitel**	**MD54SC138**	**697**
SP54SC139	**Mitel**	**MD54SC139**	**697**
SP54SC238	**Mitel**	**MD54SC238**	**697**
SP54SC239	**Mitel**	**MD54SC239**	**697**
SP54SC240	**Mitel**	**MD54SC240**	**702**
SP54SC241	**Mitel**	**MD54SC241**	**702**
SP54SC244	**Mitel**	**MD54SC244**	**702**
SP54SC245	**Mitel**	**MD54SC245**	**706**
SP54SC373	**Mitel**	**MD54SC373**	**710**
SP54SC374	**Mitel**	**MD54SC374**	**710**
SP54SC540	**Mitel**	**MD54SC540**	**702**
SP54SC541	**Mitel**	**MD54SC541**	**702**
SP54SC573	**Mitel**	**MD54SC573**	**710**
SP54SC574	**Mitel**	**MD54SC574**	**710**
SP7003	MasterLogic	ML7003	
SP7005	MasterLogic	ML7005	
SP7010	MasterLogic	ML7010	
SP7015	MasterLogic	ML7015	
SP7020	MasterLogic	ML7020	
SP74HC00	**Motorola**	**MC74HC00**	**733**
	National	MM74HC00	
	RCA	**CD74HC00**	**740**
	Signetics	PCF74HC00	
	Toshiba	TC40H000	
SP74HC02	Motorola	MC74HC02	
	National	MM74HC02	
	RCA	**CD74HC02**	**740**
	Signetics	PCF74HC02	
	Toshiba	TC40H002	
SP74HC04	Motorola	MC74HC04	
	National	MM74HC04	
	RCA	**CD74HC04**	**740**
	Toshiba	TC40H004	
SP74HC10	Motorola	MC74HC10	
		MC74HC10	
	National	MM74HC10	
	RCA	CD74H10	
		CD74HC10	**740**
	Signetics	PCF74HC10	
	Toshiba	TC40H010	
SP74HC107	Motorola	MC74HC107	
	National	MM74HC107	
	RCA	**CD74HC107**	**739**
	Signetics	PCF74HC107	
	Toshiba	TC40H107	
SP74HC109	Motorola	MC74HC109	
		MC74HC109	
	National	MM74HC109	
	RCA	**CD74HC109**	**739**
	Signetics	PCF74HC109	
SP74HC11	Motorola	MC74HC11	
	National	MM74HC11	
	RCA	**CD74HC11**	**740**
	Signetics	PCF74HC11	
	Toshiba	TC40H011	
SP74HC112N	Motorola	MC74HC112	
	National	MM74HC112	
	RCA	**CD74HC112**	**739**
	Signetics	PCF74HC112	
SP74HC138	Motorola	MC74HC138	
	National	MM74HC138	
	RCA	**CD74HC138**	**739**
	Signetics	PCF74HC138	
SP74HC139	Motorola	MC74HC139	
	National	MM74HC139	
	RCA	**CD74HC139**	**739**
	Signetics	PCF74HC139	
	Toshiba	TC40H139	
SP74HC14	Motorola	MC74HC14	
	National	MM74HC14	
	RCA	**CD74HC14**	**740**
	Signetics	PCF74HC14	
SP74HC147	Motorola	MC74HC147	
	National	MM74HC147	
	RCA	**CD74HC147**	**739**

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Semi Processes Inc. (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SP74HC147	Signetics	PCF74HC147	
SP74HC153	Motorola	MC74HC153	
	National	MM74HC153	
	RCA	**CD74HC153**	**740**
	Signetics	PCF74HC153	
	Toshiba	TC40H153	
SP74HC157	Motorola	MC74HC157	
	National	MM74HC157	
	RCA	CD74HC157	
	Signetics	PCF74HC157	
	Toshiba	TC40H157	
SP74HC158	Motorola	MC74HC158	
	National	MM74HC158	
	RCA	CD74HC158	
	Signetics	PCF74HC158	
	Toshiba	TC40H158	
SP74HC161	Motorola	MC74HC161	
	National	MM74HC161	
	RCA	**CD74HC161**	**739**
	Signetics	PCF74HC161	
SP74HC162	Motorola	MC74HC162	
	National	MM74HC162	
	RCA	**CD74HC162**	**739**
	Signetics	PCF74HC162	
SP74HC163	Motorola	MC74HC163	
	National	MM74HC163	
	RCA	**CD74HC163**	**739**
	Signetics	PCF74HC163	
SP74HC174	Motorola	MC74HC174	
	National	MM74HC174	
	RCA	**CD74HC174**	**739**
	Signetics	PCF74HC174	
	Toshiba	TC40H174	
SP74HC175	Motorola	MC74HC175	
	National	MM74HC175	
	RCA	**CD74HC175**	**739**
	Signetics	PCF74HC175	
	Toshiba	TC40H175	
SP74HC192	Motorola	MC74HC192	
	National	MM74HC192	
	RCA	**CD74HC192**	**739**
	Signetics	PCF74HC192	
	Toshiba	TC40H192	
SP74HC193	Motorola	MC74HC193	
	National	MM74HC193	
	RCA	**CD74HC193**	**739**
	Signetics	PCF74HC193	
	Toshiba	TC40H193	
SP74HC20	Motorola	MC74HC20	
	National	MM74HC20	
	RCA	**CD74HC20**	**740**
	Signetics	PCF74HC20	
	Toshiba	TC40H020	
SP74HC240	Motorola	MC74HC240	
	National	MM74HC240	
	RCA	**CD74HC240**	**740**
	Signetics	PCF74HC240	
	Toshiba	TC40H240	
SP74HC253	Motorola	MC74HC253	
	National	MM74HC253	
	RCA	CD74HC253	
	Signetics	PCF74HC253	
SP74HC257	Motorola	MC74HC257	
	National	MM74HC257	
	RCA	**CD74HC257**	**740**
	Signetics	PCF74HC257	
SP74HC266	Motorola	MC74HC266	
	National	MM74HC266	
	RCA	**CD74HC266**	**740**
	Signetics	PCF74HC266	
SP74HC27	Motorola	MC74HC27	
	National	MM74HC27	
	RCA	**CD74HC27**	**740**
	Signetics	PCF74HC27	
	Toshiba	TC40H027	
SP74HC280	Motorola	MC74HC280	
	National	MM74HC280	
	RCA	**CD74HC280**	**739**
	Signetics	PCF74HC280	
SP74HC32	Motorola	MC74HC32	
	National	MM74HC32	
	RCA	**CD74HC32**	**740**
	Signetics	PCF74HC32	
	Toshiba	TC40H032	
SP74HC365	Motorola	MC54HC390	
		MC74HC365	
	National	MM54HC390	
		MM74HC365	
	RCA	**CD54HC390**	**739**
		CD74HC365	**740**
SP74HC365	Signetics	PCF54HC390	
SP74HC42	Motorola	MC74HC42	
	National	MM74HC42	
	RCA	**CD74HC42**	**739**
	Signetics	PCF74HC42	
SP74HC73	Motorola	MC74HC73	
	National	MM74HC73	
	RCA	**CD74HC73**	**739**
	Signetics	PCF74HC73	
SP74HC76	Motorola	MC74HC76	
	National	MM74HC76	
	RCA	**CD74HC76**	**739**
	Signetics	PCF74HC76	
	Toshiba	TC40H076	
SP74HC86N	Motorola	MC74HC86	
	National	MM74HC86	
	RCA	**CD74HC86**	**740**
	Signetics	PCF74HC86	
SP74SC137	GTEMicro	G74SC137	
	Mitel	**MD74SC137**	**697**
	Plessey	MV74SC137	
SP74SC138	GTEMicro	G74SC138	
	Mitel	**MD74SC138**	**697**
	Plessey	MV74SC138	
	RCA	CDP1873	
SP74SC139	GTEMicro	G74SC139	
	Mitel	**MD74SC139**	**697**
	Plessey	MV74SC139	
SP74SC238	GTEMicro	G74SC238	
	Mitel	**MD74SC238**	**697**
SP74SC239	GTEMicro	G74SC239	
	Mitel	**MD74SC239**	**697**
SP74SC240	GTEMicro	G74SC240	
	Mitel	**MD74SC240**	**702**
	Plessey	MV74SC240	
SP74SC241	GTEMicro	G74SC241	
	Mitel	**MD74SC241**	**702**
	Plessey	MV74SC241	
SP74SC244	GTEMicro	G74SC244	
	Mitel	**MD74SC244**	**702**
	Plessey	MV74SC244	
SP74SC245	Fairchild	74LS245	
	GTEMicro	G74SC245	
	Mitel	**MD74SC245**	**702,706**
	Motorola	SN74LS245	
	Plessey	MV74SC245	
	Signetics	**74LS245**	**779**
		N8T245	
	TI	**SN74LS245**	**913**
SP74SC373	GTEMicro	G74SC373	
	Mitel	74SC373	
		MD74SC373	**710**
	Plessey	MV74SC373	
SP74SC374	GTEMicro	G74SC374	
	Mitel	**MD74SC374**	**710**
	Plessey	MV74SC374	
SP74SC540	GTEMicro	G74SC540	
	Mitel	**MD74SC540**	**702**
SP74SC541	GTEMicro	G74SC541	
	Mitel	**MD74SC541**	**702**
SP74SC573	GTEMicro	G74SC573	
	Mitel	**MD74SC573**	**710**
SP74SC574	GTEMicro	G74SC574	
	Mitel	**MD74SC574**	**710**

SGS-ATES Semiconductor

Manufacturer Device	Replacement Source	Device	IC Master Page
HC4069	Fairchild	F4069	
	Hitachi	HD14069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
		MM74C04	
	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HCF4069	
	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
HCF4000	Motorola	MC14000	
	National	CD4000	
	RCA	CD4000	
	Signetics	HEF400	
	SSS	SCL4000	
	Solitron	CM4000	
HCF4001	Fairchild	F4001	
	Hitachi	HD14001	
HCF4001	Motorola	MC14001	
	National	CD4001	
		MM74C02	
	OKI	MSM4001	
	RCA	CD4001	
	Sanyo	LC4001B	
	Signetics	HEF4001	
	SSS	SCL4001	
	Solitron	CM4001	
	Toshiba	TC4001	
HCF4002	Fairchild	F4002	
	Hitachi	HD14002	
	Motorola	MC14002	
	National	CD4002	
	RCA	CD4002	
	Signetics	HEF4002	
	SSS	SCL4002	
	Solitron	CM4002	
	TI	TP4002	
	Toshiba	TC4002	
HCF4006	Fairchild	F4006	
	Hitachi	HD14006	
	Motorola	MC14006	
	National	CD4006	
	RCA	CD4006	
	SSS	SCL4006	
	Solitron	CM4006	
	Toshiba	TC4006	
HCF4007	Fairchild	F4007	
	Hitachi	HD14007	
	Motorola	MC14007	
	National	CD4007	
	RCA	CD4007	
	Signetics	HEF4007	
	SSS	SCL4007	
	Solitron	CM4007	
	Toshiba	TC4007	
HCF4008	Fairchild	F4008	
	Hitachi	HD14008	
	Motorola	MC14008	
	National	CD4008	
		MM74C83	
	RCA	CD4008	
	Signetics	HEF4008	
	SSS	SCL4008	
	Solitron	CM4008	
	Toshiba	TC4008	
HCF4009	Hitachi	HD14009	
	National	CD4009	
	RCA	CD4009	
	SSS	SCL4009	
	Solitron	CM4009	
	Toshiba	TC4009	
HCF4010	Hitachi	HD14010	
	National	CD4010	
	RCA	CD4010	
	SSS	SCL4010	
	Solitron	CM4010	
	Toshiba	TC4010	
HCF40100	RCA	CD40100	
HCF40101	Fairchild	F4531	
	Hitachi	HD14531	
	Motorola	MC14531	
	RCA	CD40101	
	Signetics	HEF4531	
	SSS	SCL4531	
	Toshiba	TC4531	
HCF40102	RCA	CD40102	
HCF40103	RCA	CD40103	
HCF40105	RCA	CD40105	
HCF40106	Fairchild	F40014	
	Hitachi	HD14584	
	Motorola	MC14584	
	National	CD40106	
		CD4584	
		MM54C14	
		MM74C14	
	RCA	CD40106	
	Signetics	HEF40106	
	SSS	SCL4584	
HCF40107	RCA	CD40107	
	Toshiba	TC40107	
HCF40109	Fairchild	F4104	
	GTEMicro	G4104	
	Mitel	MD4104	
	Motorola	MC14504	
	National	MM4104	
	RCA	CD40109	
	Signetics	HEF4104	
HCF4011	Fairchild	F4011	
	Hitachi	HD14011	
HCF4011	Motorola	MC14011	
	National	CD4011	
		MM74C00	
	OKI	MSM4011	
	RCA	CD4011	
	Sanyo	LC4011	
	Signetics	HEF4011	
	SSS	SCL4011	
	Solitron	CM4011	
	Toshiba	TC4011	
HCF4012	Fairchild	F4012	
	Hitachi	HD14012	
	Motorola	MC14012	
	National	CD4012	
	RCA	CD4012	
	Signetics	HEF4012	
	SSS	SCL4012	
	Solitron	CM4012	
	Toshiba	TC4012	
HCF4013	Fairchild	F4013	
	Hitachi	HD14013	
	Motorola	MC14013	
	National	CD4013	
		MM74C74	
	OKI	MSM4013	
	RCA	CD4013	
	Sanyo	LC4013	
	Signetics	HEF4013	
	SSS	SCL4013	
	Solitron	CM4013	
	Toshiba	TC4013	
HCF4014	Fairchild	F4014	
	Hitachi	HD14014	
	Motorola	MC14014	
	National	CD4014	
	RCA	CD4014	
	Signetics	HEF4014	
	SSS	SCL4014	
	Solitron	CM4014	
	Toshiba	TC4014	
HCF4015	Fairchild	F4015	
	Hitachi	HD14015	
	Motorola	MC14015	
	National	CD4015	
		MM74C164	
	OKI	MSM4015	
	RCA	CD4015	
	Sanyo	LC4015	
	Signetics	HEF4015	
	SSS	SCL4015	
	Solitron	CM4015	
	Toshiba	TC4015	
HCF4016	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
HCF40160	Fairchild	F40160	
	Hitachi	HD14160	
	Motorola	MC14160	
	National	CD40160	
		MM54C160	
		MM74C160	
	RCA	CD40160	
	Signetics	HEF4060	
	SSS	SCL4160	
	Toshiba	TC40160	
HCF40161	Fairchild	F40161	
	Hitachi	HD14161	
	Motorola	MC14161	
	National	CD40161	
		MM54C161	
		MM74C161	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

SGS-ATES Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HCF40161	RCA	CD40161	
	Signetics	HEF40161	
	SSS	SCL4161	
	Toshiba	TC40161	
HCF40162	Fairchild	F40162	
	Hitachi	HD14162	
	Motorola	MC14162	
	National	CD40162	
		MM54C162	
		MM74C162	
	RCA	CD40162	
	Signetics	HEF40162	
	SSS	SCL4162	
	Toshiba	TC40162	
HCF40163	Fairchild	F40163	
	Hitachi	HD14163	
	Motorola	MC14163	
	National	CD40163	
		MM54C163	
		MM74C163	
	RCA	CD40163	
	Signetics	HEF40163	
	SSS	SCL4163	
	Toshiba	TC40163	
HCF4017	Fairchild	F4017	
	Hitachi	HD14017	
	Motorola	MC14017	
	National	CD4017	
	RCA	CD4017	
	Signetics	HEF4017	
	SSS	SCL4017	
	Solitron	CM4017	
	Toshiba	TC4017	
HCF40174	Fairchild	F40174	
	Hitachi	HD14174	
	Motorola	MC14174	
	National	CD40174	
		MM54C174	
		MM74C174	
	RCA	CD40174	
	Signetics	HEF40174	
	SSS	SCL4174	
	Toshiba	TC40174	
HCF4018	Fairchild	F4018	
	Hitachi	HD14018	
	Motorola	MC14018	
	National	CD4018	
	RCA	CD4018	
	Signetics	HEF4018	
	SSS	SCL4018	
	Solitron	CM4018	
	Toshiba	TC4018	
HCF40181	Hitachi	HD14581	
	Motorola	MC14581	
	RCA	CD40181	
		CD4057	
	SSS	SCL4581	
HCF40182	Fairchild	F4582	
	Hitachi	HD14582	
	Motorola	MC14582	
	RCA	CD40182	
	SSS	SCL4582	
HCF4019	Fairchild	F4019	
	National	CD4019	
	OKI	MSM4019	
	RCA	CD4019	
	Sanyo	LC4019	
	Signetics	HEF4019	
	SSS	SCL4019	
	Solitron	CM4019	
	Toshiba	TC4019	
HCF40192	Fairchild	F4029	
	Motorola	MC14029	
	National	CD40192	
		CD4029	
	RCA	CD40192	
		CD4029	
	SGS	HCF4029	
	Signetics	HEF40192	
	SSS	SCL4029	
		SCL4192	
	Solitron	CM4029	
	Toshiba	TC40192	
		TC4029	
HCF40193	Fairchild	F40193	
	National	CD40193	
		MM54C193	
		MM74C193	
HCF40193	RCA	CD40193	
	Signetics	HEF40193	
	SSS	SCL4193	
	Toshiba	TC40193	
HCF40194	Fairchild	F40194	
	Hitachi	HD14194	
	Motorola	MC14194	
	RCA	CD40194	
	Signetics	HEF40194	
HCF4020	Fairchild	F4020	
	Hitachi	HD14020	
	Motorola	MC14020	
	National	CD4020	
	RCA	CD4020	
	Signetics	HEF4020	
	SSS	SCL4020	
	Solitron	CM4020	
	Toshiba	TC4020	
HCF40208	RCA	CD40208	
HCF4021	Fairchild	F4021	
	Hitachi	HD14021	
	Motorola	MC14021	
	National	CD4021	
	RCA	CD4021	
	Signetics	HEF4021	
	SSS	SCL4021	
	Solitron	CM4021	
	Toshiba	TC4021	
HCF4022	Fairchild	F4022	
	Hitachi	HD14022	
	Motorola	MC14022	
	National	CD4022	
	RCA	CD4022	
	Signetics	HEF4022	
	SSS	SCL4022	
	Solitron	CM4022	
	Toshiba	TC4022	
HCF4023	Fairchild	F4023	
	Hitachi	HD14023	
	Motorola	MC14023	
	National	CD4023	
		MM74C10	
	RCA	CD4023	
	Signetics	HEF4023	
	SSS	SCL4023	
	Solitron	CM4023	
	Toshiba	TC4023	
HCF4024	Fairchild	F4024	
	Hitachi	HD14024	
	Motorola	MC14024	
	National	CD4024	
	RCA	CD4024	
	Signetics	HEF4024	
	SSS	SCL4024	
	Solitron	CM4024	
	Toshiba	TC4024	
HCF4025	Fairchild	F4025	
	Hitachi	HD14025	
	Motorola	MC14025	
	National	CD4025	
	RCA	CD4025	
	Signetics	HEF4025	
	SSS	SCL4025	
	Solitron	CM4025	
	Toshiba	TC4025	
HCF40257	RCA	CD40257	
HCF4026	RCA	CD4026	
	SSS	SCL4026	
	Solitron	CM4026	
HCF4027	Fairchild	F4027	
	Hitachi	HD14027	
	Motorola	MC14027	
	National	CD4027	
		MM74C76	
	OKI	MSM4027	
	RCA	CD4027	
	Sanyo	LC4027	
	Signetics	HEF4027	
	SSS	SCL4027	
	Solitron	CM4027	
HCF4028	Fairchild	F4028	
	Hitachi	HD14028	
	Motorola	MC14028	
	National	CD4028	
		MM74C42	
	OKI	MSM4028	
	Sanyo	LC4028	
	Signetics	HEF4028	
	SSS	SCL4028	
	Solitron	CM4028	
	Toshiba	TC4028	
HCF4029	Fairchild	F4029	
	Motorola	MC14029	
	National	CD40192	
		CD4029	
	RCA	CD40192	
		CD4029	
	SGS	HCF40192	
	Signetics	HEF40192	
	SSS	SCL4029	
		SCL4192	
	Solitron	CM4029	
	Toshiba	TC40192	
		TC4029	
HCF4030	Fairchild	F4030	
	National	CD4030	
	RCA	CD4030	
	Signetics	HEF4030	
	SSS	SCL4030	
	Solitron	CM4030	
	Toshiba	TC4030	
HCF4031	Fairchild	F4031	
	National	CD4031	
	RCA	CD4031	
	Signetics	HEF4731	
HCF4032	Hitachi	HD14032	
	Motorola	MC14032	
	RCA	CD4032	
	Solitron	CM4032	
	Toshiba	TC4032	
HCF4033	RCA	CD4033	
	SSS	SCL4033	
	Solitron	CM4033	
HCF4034	Fairchild	F4034	
	Hitachi	HD14034	
	Motorola	MC14034	
	National	CD4034	
	RCA	CD4034	
	SSS	SCL4034	
	Solitron	CM4034	
	Toshiba	TC4034	
HCF4035	Fairchild	F4035	
	Hitachi	HD14035	
	Motorola	MC14035	
	National	CD4035	
	RCA	CD4035	
	Signetics	HEF4035	
	SSS	SCL4035	
	Solitron	CM4035	
	Toshiba	TC4035	
HCF4038	Hitachi	HD14038	
	Motorola	MC14038	
	RCA	CD4038	
	Solitron	CM4038	
	Toshiba	TC4038	
HCF4040	Fairchild	F4040	
	Hitachi	HD14040	
	Motorola	MC14040	
	National	CD4040	
	RCA	CD4040	
	Signetics	HEF4040	
	SSS	SCL4040	
	Solitron	CM4040	
	Toshiba	TC4040	
HCF4041	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
HCF4042	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
HCF4042	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
HCF4043	Hitachi	HD14043	
	Motorola	MC14043	
	National	CD4043	
	RCA	CD4043	
	Signetics	HEF4043	
	SSS	SCL4043	
	Solitron	CM4043	
	Toshiba	TC4043	
HCF4044	Fairchild	F4044	
	Hitachi	HD14044	
	Motorola	MC14044	
	National	CD4044	
	RCA	CD4044	
	Signetics	HEF4044	
	SSS	SCL4044	
	Solitron	CM4044	
	Toshiba	TC4044	
HCF4045	Fairchild	F4521	
	Motorola	MC14521	
	RCA	CD4045	
	Signetics	HEF4521	
	SSS	SCL4445	
	Solitron	CM4045	
	Toshiba	TC4521	
HCF4046	Fairchild	F4046	
	Hitachi	HD14046	
	Motorola	MC14046	
	National	CD4046	
	RCA	CD4046	
	SSS	SCL4046	
	Solitron	CM4046	
HCF4047	Fairchild	F4047	
	National	CD4047	
	RCA	CD4047	
	Signetics	HEF4042	
		HEF4047	
	SSS	SCL4047	
	Solitron	CM4047	
	Toshiba	TC4047	
HCF4048	National	CD4048	
	RCA	CD4048	
	SSS	SCL4402	
	Solitron	CM4048	
HCF4049	Fairchild	F4049	
	Hitachi	HD14049	
	Motorola	MC14049	
	National	CD4049	
	OKI	MSM4049	
	RCA	CD4009	
		CD4049	
	Sanyo	LC4049	
	Signetics	HEF4049	
	SSS	SCL4049	
	Solitron	CM4049	
	Toshiba	TC4049	
HCF4050	Fairchild	F4050	
	Hitachi	HD14050	
	Motorola	MC14050	
	National	CD4050	
	RCA	CD4010	
		CD4050	
	Signetics	HEF4050	
	SSS	SCL4050	
	Solitron	CM4050	
	Toshiba	TC4050	
HCF4051	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	MX-808	2622
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	LF11508	3318
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	2804
	TeledyneP	4554	
HCF4052	Burr-Brown	MPC4D	

◊ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

SGS-ATES Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HCF4052	**Datel**	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**
	TeledyneP	4553	
HCF4054	RCA	CD4054	
	Toshiba	TC4054	
HCF4055	Mitel	MD4055	
	RCA	CD4055	
	Toshiba	TC4055	
HCF4056	Mitel	MD4056	
	RCA	CD4056	
	Toshiba	TC4056	
HCF4060	Motorola	MC14060	
	National	CD4060	
	RCA	CD4060	
	Signetics	HEF4060	
	SSS	SCL4060	
HCF4063	RCA	CD4063	
	Toshiba	TC4063	
HCF4066	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
HCF4067	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
		MX-1606	**2622**
	Fairchild	F4067	
	Harris	HI1840	
		HI506	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	
	Motorola	MC14067	
	PMI	MUX-16	
	RCA	CD4067	
	Signetics	HEF4067	
	Siliconix	DG506	
HCF4068	Fairchild	F4068	
	Hitachi	HD14068	
	Motorola	MC14068	
	RCA	CD4068	
	Signetics	HEF4068	
	SSS	SCL4068	
		SCL4412	
	Solitron	CM4068	
	TI	UCN4810	
	Toshiba	TC4068	
HCF4069	Fairchild	F4069	
	Hitachi	HD14069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
		MM74C04	
	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
HCF4069	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
HCF4070	Fairchild	F4070	
	Hitachi	HD14070	
	Motorola	MC14070	
	National	CD4070	
		MM74C86	
	RCA	CD4070	
	Signetics	HEF4070	
	SSS	SCL4070	
	Solitron	CM4070	
HCF4071	Fairchild	F4071	
	Hitachi	HD14071	
	Motorola	MC14071	
	National	CD4071	
		MM74C32	
	OKI	MSM4071	
	RCA	CD4071	
	Sanyo	LC4071	
	Signetics	HEF4071	
	SSS	SCL4071	
	Solitron	CM4071	
	Toshiba	TC4071	
HCF4072	Fairchild	F4072	
	Hitachi	HD14072	
	Motorola	MC14072	
	National	CD4072	
	RCA	CD4072	
	Signetics	HEF4072	
	SSS	SCL4072	
	Toshiba	TC4072	
HCF4073	Fairchild	F4073	
	Hitachi	HD14073	
	Motorola	MC14073	
	National	CD4073	
	RCA	CD4073	
	Signetics	HEF4073	
	SSS	SCL4073	
	Solitron	CM4073	
	Toshiba	TC4073	
HCF4075	Fairchild	F4075	
	Hitachi	HD14075	
	Motorola	MC14075	
	National	CD4075	
	RCA	CD4075	
	Signetics	HEF4075	
	SSS	SCL4075	
	Solitron	CM4075	
	Toshiba	TC4075	
HCF4076	Fairchild	F4076	
	Hitachi	HD14076	
	Motorola	MC14076	
	National	CD4076	
		MM54C173	
		MM74C173	
	RCA	CD4076	
	Signetics	HEF4076	
	SSS	SCL4076	
	Solitron	CM4076	
	Toshiba	TC4076	
HCF4077	Fairchild	F4077	
	Hitachi	HD14077	
	Motorola	MC14077	
	National	CD4077	
	RCA	CD4077	
	Signetics	HEF4077	
	SSS	SCL4077	
	Solitron	CM4077	
HCF4078	Fairchild	F4078	
	Hitachi	HD14078	
	Motorola	MC14078	
	RCA	CD4078	
	Signetics	HEF4078	
	SSS	SCL4078	
	Solitron	CM4078	
	Toshiba	TC4078	
HCF4081	Fairchild	F4081	
	Hitachi	HD14081	
	Motorola	MC14081	
	National	CD4081	
		MM74C08	
	OKI	MSM4081	
	RCA	CD4081	
	Sanyo	LC4081	
	Signetics	HEF4081	
	SSS	SCL4081	
	Solitron	CM4081	
	Toshiba	TC4081	
HCF4082	Fairchild	F4082	
HCF4082	Hitachi	HD14082	
	Motorola	MC14082	
	National	CD4082	
	RCA	CD4082	
	Signetics	HEF4082	
	SSS	SCL4082	
	Toshiba	TC4082	
HCF4085	Fairchild	F4085	
	National	CD4085	
	RCA	CD4085	
	Signetics	HEF4085	
	SSS	SCL4085	
	Toshiba	TC4085	
HCF4086	Fairchild	F4086	
	RCA	CD4086	
	Signetics	HEF4086	
	SSS	SCL4086	
	Toshiba	TC4086	
HCF4089	National	CD4089	
	RCA	CD4089	
HCF4093	Fairchild	F4093	
	Hitachi	HD14093	
	Motorola	MC14093	
	National	CD4093	
	OKI	MSM4093	
	RCA	CD4093	
	Sanyo	LC4093	
	Signetics	HEF4093	
	SSS	SCL4093	
	Toshiba	TC4093	
HCF4094	Hitachi	HD14094	
	Motorola	MC14094	
	RCA	CD4094	
	Signetics	HEF4094	
	SSS	SCL4094	
	Toshiba	TC4094	
HCF4095	RCA	CD4095	
HCF4096	RCA	CD4096	
HCF4097	Fairchild	F4097	
	Motorola	MC14097	
	RCA	CD4097	
HCF4098	Fairchild	F4528	
	Hitachi	HD14528	
	Motorola	MC14528	
	National	CD4528	
		MM74C221	
	RCA	CD4098	
	Signetics	HEF4528	
	SSS	SCL4528	
	Toshiba	TC4528	
HCF4099	Hitachi	HD14099	
	Motorola	MC14099	
	National	CD4099	
	RCA	CD4099	
	SSS	SCL4099	
	Toshiba	TC4099	
HCF4502	Hitachi	HD14502	
	Motorola	MC14502	
	RCA	CD4502	
	Signetics	HEF4502	
	SSS	SCL4502	
HCF4508	Hitachi	HD14508	
		HD74147	
	Motorola	MC14508	
	National	DM74147	
	RCA	CD4508	
	Signetics	74147	
		HEF4508	
		N82147	
	SSS	SCL4508	
	Solitron	CM4508	
	TI	**SN74147**	**882**
	Toshiba	TC4508	
HCF4510	Fairchild	F4510	
	Hitachi	HD14510	
	Motorola	MC14510	
	National	CD4510	
	RCA	CD4510	
	Signetics	HEF4510	
	SSS	SCL4510	
	Solitron	CM4510	
	Toshiba	TC4510	
HCF4511	Fairchild	F4511	
	Hitachi	HD14511	
	Mitel	MD4511	
	MMI	4511	
	Motorola	MC14511	
	National	CD4511	
	NEC-Micro	μPD4511	
	RCA	CD4511	
	Signetics	HEF4511	
HCF4511	SSS	SCL4511	
	Solitron	CM4511	
	Toshiba	TC4511	
HCF4512	Fairchild	F4512	
	Hitachi	HD14512	
	Motorola	MC14512	
	National	CD4512	
	RCA	CD4512	
	SSS	SCL4512	
	Toshiba	TC4512	
HCF4514	Fairchild	F4514	
	Hitachi	HD14514	
	Motorola	MC14514	
	National	CD4514	
	RCA	CD4514	
	Signetics	HEF4514	
	SSS	SCL4514	
	Solitron	CM4514	
	Toshiba	TC4514	
HCF4515	Fairchild	F4515	
	Hitachi	HD14515	
	Motorola	MC14515	
	National	CD4515	
	RCA	CD4515	
	Signetics	HEF4515	
	SSS	SCL4515	
	Solitron	CM4515	
	Toshiba	TC4515	
HCF4516	Fairchild	F4516	
	Hitachi	HD14516	
	Motorola	MC14516	
	National	CD4516	
	RCA	CD4516	
	Signetics	HEF4516	
	SSS	SCL4516	
	Solitron	CM4516	
	Toshiba	TC4516	
HCF4518	Fairchild	F4518	
	Hitachi	HD14518	
	Motorola	MC14518	
	National	CD4518	
	RCA	CD4518	
	Signetics	HEF4518	
	SSS	SCL4518	
	Solitron	CM4518	
	Toshiba	TC4518	
HCF4520	Fairchild	F4520	
	Hitachi	HD14520	
	Motorola	MC14520	
	National	CD4520	
	OKI	MSM4520	
	RCA	CD4520	
	Sanyo	LC4520	
	Signetics	HEF4520	
	SSS	SCL4520	
	Solitron	CM4520	
	Toshiba	TC4520	
HCF4527	Fairchild	F4527	
	Hitachi	HD14527	
	Motorola	MC14527	
	National	CD4527	
	RCA	CD4527	
	Signetics	HEF4527	
	SSS	SCL4527	
	Toshiba	TC4527	
		TR4527	
HCF4532	Fairchild	F4532	
	Hitachi	HD14532	
	Motorola	MC14532	
	RCA	CD4532	
	Signetics	HEF4532	
	SSS	SCL4532	
	Toshiba	TC4532	
HCF4555	Fairchild	F4555	
	Hitachi	HD14555	
	Motorola	MC14555	
	RCA	CD4555	
	Signetics	HEF4555	
	SSS	SCL4555	
	Toshiba	TC4555	
HCF4556	Fairchild	F4556	
	Motorola	MC14556	
	RCA	CD4556	
	Signetics	HEF4556	
	SSS	SCL4556	
	Toshiba	TC4556	
HCF4XXX	Fairchild	34XXX	
		F4XXX	
	Hitachi	HD14XXX	
	Motorola	MC14XXX	
	National	CD4XXX	
	OKI	MSM4XXX	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

SGS-ATES Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HCF4XXX	SSS	SCL4XXX	
	Solitron	CM4XXX	
	TI	TP4000 series	
	Toshiba	TC4XXX	
L123	Fairchild	μA723	
	Hitachi	HA17723	
	Intersil	LM723	
	Motorola	**MC1723**	**3295**
	National	LM723	
	Raytheon	RC723	
		RM723	
	RCA	CA723	
		LM723	
	Signetics	μA723	
	SiliconG	SG723	
	TI	μA723	
	Thomson-CSF	SFC2723	
L201	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
L202	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
L203	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
L601	Sprague	ULN-2821	
L602	Sprague	ULN-2822	
L603	Sprague	ULN-2823	
L604	Sprague	ULN-2824	
L7805	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
L7810	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
L7812	Fairchild	μA7812	
	Lambda	LMC7812	
		LμA7812	
	Motorola	**MC7812**	**3294**
	National	LM7812	
	NEC-Electron	μPC7812	
	SiliconG	SG7812	
	TI	μA7812	
	Toshiba	TA78012	
L7815	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
L7815	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
L7818	**Motorola**	**MC7818**	**3294**
L7824	Fairchild	μA7824	
	Lambda	LMC7824	
		LμA7824	
	Motorola	MC7824	
	NEC-Electron	μPC7824	
	SiliconG	SG7824	
	TI	LM340-24	
		μA7824	
M2102	Intel	2102	
M2102A	AMD	AM9102	
	Fairchild	2102H	
	National	MM2102A	
	Panasonic	MN2102	
M22100	Motorola	MC1452100	
	RCA	**CD22100**	**749,753**
M2316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
M2708	AMD	2708	
	Fairchild	F2708	
	Hitachi	HN462708	
	Motorola	MC27A08	
		MCM2708	
	National	MM2708	
	NEC-EA	EA2708	
	Panasonic	MN2708	
	Rockwell	2708	
	TI	TMS2708	
M2716	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HN462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	TI	TMS2516	
M330	Intel	8102A	
	NEC-Micro	μPD2102	
M36000	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
M36000	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
M3870	Fairchild	3870	
	Mostek	MK3870	
	SMC	MPU3870	
M3872	**Fairchild**	**F3872**	**1254**
	Motorola	MC14006	
	RCA	CD4006	
	Signetics	HEF4006	
M4027	Fairchild	M4027	
	Mostek	MK4027	
M4116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
M5116	Fairchild	5116	
	Mostek	MK5116	
	National	**TP5116**	**3337**
M5156	Fairchild	5156	
	Mostek	MK5156	
	National	**TP5156**	**3337**
T74LS00	Fairchild	74LS00	
	Hitachi	HD74LS00	
	Motorola	SN74LS00	
	National	DM74LS00	
	Raytheon	74LS00	
	Signetics	74LS00	
	TI	**SN74LS00**	**833**
T74LS02	Fairchild	74LS02	
	Hitachi	HD74LS02	
	Motorola	SN74LS02	
	National	DM74LS02	
	Raytheon	74LS02	
	Signetics	74LS02	
	TI	**SN74LS02**	**833**
T74LS03	Fairchild	74LS03	
	Hitachi	HD74LS03	
	Motorola	SN74LS03	
	National	DM74LS03	
	Raytheon	74LS03	
	TI	**SN74LS03**	**834**
T74LS04	Fairchild	74LS04	
	Hitachi	HD74LS04	
	Motorola	SN74LS04	
	National	DM74LS04	
	Raytheon	74LS04	
	Signetics	74LS04	
	TI	**SN74LS04**	**834**
T74LS05	Fairchild	74LS05	
	Hitachi	HD74LS05	
	Motorola	SN74LS05	
	National	DM74LS05	
	NEC-Electron	μPB74LS05	
	Raytheon	74LS05	
	Signetics	74LS05	
	TI	**SN74LS05**	**834**
T74LS08	Fairchild	74LS08	
	Hitachi	HD74LS08	
	Motorola	SN74LS08	
	National	DM74LS08	
	Raytheon	74LS08	
	Signetics	74LS08	
		SN74LS08	
	TI	**SN74LS08**	**835**
T74LS09	Fairchild	74LS09	
	Hitachi	HD74LS09	
	Motorola	SN74LS09	
	National	DM74LS09	
	Raytheon	74LS09	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

SGS-ATES Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
T74LS09	**TI**	**SN74LS09**	**836**
T74LS10	Fairchild	74LS10	
	Hitachi	HD74LS10	
	Motorola	SN74LS10	
	National	DM74LS10	
	Raytheon	74LS10	
	Signetics	74LS10	
	TI	**SN74LS10**	**836**
T74LS109	TI	SN74LS109	
T74LS11	Fairchild	74LS11	
	Hitachi	HD74LS11	
	Motorola	SN74LS11	
	National	DM74LS11	
	Raytheon	74LS11	
	Signetics	74LS11	
	TI	**SN74LS11**	**836**
T74LS112	Fairchild	74LS112	
	Hitachi	HD74LS112	
	Motorola	SN74LS112A	
	National	DM74LS112	
	Raytheon	74LS112	
	Signetics	74LS112	
	TI	**SN74LS112A**	**871**
T74LS113	Fairchild	74LS113	
	Hitachi	HD74LS113	
	Motorola	SN74LS113A	
	National	DM74LS113	
	Raytheon	74LS113	
	Signetics	74LS113	
	TI	**SN74LS113A**	**871**
T74LS114	TI	SN74LS114	
T74LS125	Fairchild	74LS125A	
	Motorola	SN74LS125A	
	National	DM74LS125	
	Raytheon	74LS125	
	Signetics	74LS125A	
	TI	**SN74LS125A**	**875**
T74LS126	Fairchild	74LS126	
	Motorola	SN74LS126A	
	National	DM74LS126	
	Raytheon	74LS126	
	Signetics	74LS126A	
	TI	**SN74LS126A**	**875**
T74LS132	Fairchild	74LS132	
	Hitachi	HD74LS132	
	Motorola	SN74LS132	
	National	DM74LS132	
	Raytheon	74LS132	
	Signetics	74LS132	
	TI	SN74LS132	
T74LS136	Fairchild	74LS136	
	Hitachi	HD74LS136	
	Motorola	SN74LS136	
	National	DM74LS136	
	Raytheon	74LS136	
	Signetics	74LS136	
	TI	**SN74LS136**	**878**
T74LS138	Fairchild	74LS138	
	Hitachi	HD74LS138	
	Motorola	SN74LS138	
	National	DM74LS138	
	Raytheon	74LS138	
	Signetics	74LS138	
	TI	**SN74LS138**	**880**
T74LS139	Fairchild	74LS139	
	Hitachi	HD74LS139	
	Motorola	SN74LS139	
	National	DM74LS139	
	Raytheon	74LS139	
	Signetics	74LS139	
	TI	**SN74LS139**	**880**
T74LS15	Fairchild	74LS15	
	Hitachi	HD74LS15	
	Motorola	SN74LS15	
	National	DM74LS15	
	Raytheon	74LS15	
	TI	**SN74LS15**	**838**
T74LS151	Fairchild	74LS151	
	Hitachi	HD74LS151	
		HD74LS151A	
	Motorola	SN74LS151	
	National	DM74LS151	
	Raytheon	74LS151	
	Signetics	74LS151	
	TI	**SN74LS151**	**884**
T74LS152	TI	SN74LS152	
T74LS153	Fairchild	74LS153	
	Hitachi	HD74LS153	
T74LS153	Motorola	SN74LS153	
	National	DM74LS153	
	Raytheon	74LS153	
	Signetics	74LS153	
	TI	**SN74LS153**	**884**
T74LS156	Fairchild	74LS156	
	Hitachi	HD74LS156	
	Motorola	SN74LS156	
	National	DM74LS156	
	Raytheon	74LS156	
	Signetics	74LS156	
	TI	**SN74LS156**	**886**
T74LS157	Fairchild	74LS157	
	Hitachi	HD74LS157	
	Motorola	SN74LS157	
	National	DM74LS157	
	Raytheon	74LS157	
	Signetics	74LS157	
	TI	**SN74LS157**	**887**
T74LS158	Fairchild	74LS158	
	Hitachi	HD74LS158	
	Motorola	SN74LS158	
	National	DM74LS158	
	Raytheon	74LS158	
	Signetics	74LS158	
	TI	**SN74LS158**	**887**
T74LS160	TI	SN74LS160	
T74LS161	TI	SN74LS161	
T74LS162	Fairchild	74LS162	
	Hitachi	HD74LS162A	
	Motorola	SN74LS162A	
	National	DM74LS162	
	Raytheon	74LS162	
	Signetics	74LS162A	
	TI	SN74LS162A	
T74LS163	Fairchild	74LS163	
	Hitachi	HD74LS163	
		HD74LS163A	
	Motorola	SN74LS163A	
	National	DM74LS163	
	Raytheon	74LS163	
	Signetics	74LS163A	
	TI	**SN74LS163A**	**890**
T74LS164	Fairchild	74LS164	
	Hitachi	HD74LS164	
	Motorola	SN74LS164A	
	National	DM74LS164	
	Raytheon	74LS164	
	Signetics	74LS164	
		74LS164A	
	TI	**SN74LS164**	**891**
T74LS165	Fairchild	74LS165	
	Motorola	SN74LS165	
	TI	**SN74LS165**	**891**
T74LS170	Fairchild	74LS170	
	Motorola	SN74LS170	
	National	DM74LS170	
	Raytheon	74LS170	
	Signetics	74LS170	
	TI	**SN74LS170**	**893**
T74LS173	TI	SN74LS173	
T74LS174	Fairchild	74LS174	
	Hitachi	HD74LS174	
	Motorola	SN74LS174	
	National	DM74LS174	
	Raytheon	74LS174	
	Signetics	74LS174	
	TI	**SN74LS174**	**895**
T74LS175	Fairchild	74LS175	
	Hitachi	HD74LS175	
	Motorola	SN74LS175	
	Raytheon	74LS175	
	Signetics	74LS175	
	TI	**SN74LS175**	**895**
T74LS181	Fairchild	74LS181	
	Hitachi	HD74LS181	
	Motorola	SN74LS181	
	Raytheon	74LS181	
	Signetics	74LS181	
	TI	**SN74LS181**	**897**
T74LS190	Fairchild	74LS190	
	Hitachi	HD74LS190	
	Motorola	SN74LS190	
	National	DM74LS190	
	Raytheon	74LS190	
	TI	**SN74LS190**	**901**
T74LS191	Fairchild	74LS191	
	Hitachi	HD74LS191	
	Motorola	SN74LS191	
	National	DM74LS191	
	Raytheon	74LS191	
	Signetics	74LS191	
T74LS191	**TI**	**SN74LS191**	**901**
T74LS192	Fairchild	74LS192	
	Hitachi	HD74LS192	
	Motorola	SN74LS192	
	National	DM74LS192	
	Raytheon	74LS192	
	Signetics	74LS192	
	TI	**SN74LS192**	**902**
T74LS193	Fairchild	74LS193	
	Hitachi	HD74LS193	
	Motorola	SN74LS193	
	National	DM74LS193	
	Raytheon	74LS193	
	Signetics	74LS193	
	TI	**SN74LS193**	**902**
T74LS194A	Fairchild	74LS194A	
	Hitachi	HD74LS194A	
	Motorola	SN74LS194A	
	National	DM74LS194	
	Signetics	74LS194A	
	TI	**SN74LS194A**	**902**
T74LS195A	Fairchild	74LS195A	
	Hitachi	HD74LS195A	
	Motorola	SN74LS195A	
	National	DM74LS195	
	Raytheon	74LS195A	
	Signetics	74LS195A	
	TI	**SN74LS195A**	**903**
T74LS20	Fairchild	74LS20	
	Hitachi	HD74LS20	
	Motorola	SN74LS20	
	National	DM74LS20	
	Raytheon	74LS20	
	Signetics	74LS20	
	TI	**SN74LS20**	**839**
T74LS21	Fairchild	74LS21	
	Hitachi	HD74LS21	
	Motorola	SN74LS21	
	National	DM74LS21	
	Raytheon	74LS21	
	Signetics	74LS21	
	TI	**SN74LS21**	**840**
T74LS22	Fairchild	74LS22	
	Hitachi	HD74LS22	
	Motorola	SN74LS22	
	National	DM74LS22	
	Raytheon	74LS22	
	TI	**SN74LS22**	**840**
T74LS247	Fairchild	74F521	
	Signetics	74F521	
T74LS248	Fairchild	74LS248	
	Hitachi	HD74LS248	
	Motorola	SN74LS248	
	National	DM74LS248	
	TI	**SN74LS248**	**914**
T74LS249	Fairchild	74LS249	
	Hitachi	HD74LS249	
	Motorola	SN74LS249	
	National	DM74LS249	
	TI	**SN74LS249**	**914**
T74LS251	Fairchild	74LS251	
	Hitachi	HD74LS251	
	Motorola	SN74LS251	
	National	DM74LS251	
	Raytheon	74LS251	
	Signetics	74LS251	
	TI	**SN74LS251**	**915**
T74LS253	Fairchild	74LS253	
	Hitachi	HD74LS253	
	Motorola	SN74LS253	
	National	DM74LS253	
		DM8214	
	Raytheon	74LS253	
	Signetics	74LS253	
	TI	SN74LS253	
T74LS256	TI	SN74LS256	
T74LS257	Fairchild	74LS257A	
	Hitachi	HD74LS257	
	Motorola	SN74LS257A	
	National	DM74LS257	
	Raytheon	74LS257	
	Signetics	74LS257	
		74LS257A	
	TI	SN74LS257	
T74LS258	Fairchild	74LS258A	
	Hitachi	HD74LS258	
	Motorola	SN74LS258A	
	National	DM74LS258	
	Raytheon	74LS258	
	Signetics	74LS258	
	TI	SN74LS258	
T74LS259	Fairchild	74LS259	
	Motorola	SN74LS259	
	Signetics	74LS259	
	TI	**SN74LS259**	**917**
T74LS26	Fairchild	74LS26	
	Hitachi	HD74LS26	
	Motorola	SN74LS26	
	National	DM74LS26	
	Raytheon	74LS26	
	Signetics	74LS26	
	TI	**SN74LS26**	**841**
T74LS260	TI	SN74LS260	
T74LS266	Fairchild	74LS266	
	Motorola	SN74LS266	
	National	DM74LS266	
	Raytheon	74LS266	
		RC8242	
	Signetics	74LS266	
		N8242	
	TI	**SN74LS266**	**918**
T74LS27	Fairchild	74LS27	
	Hitachi	HD74LS27	
	Motorola	SN74LS27	
	National	DM74LS27	
	Raytheon	74LS27	
	Signetics	74LS27	
	TI	**SN74LS27**	**842**
T74LS273	**AMD**	**SN74LS273**	**1227**
	Fairchild	74LS273	
	Motorola	SN74LS273	
	Raytheon	74LS273	
	Signetics	74LS273	
	TI	**SN74LS273**	**919**
T74LS28	Fairchild	74LS28	
	Motorola	SN74LS28	
	Raytheon	74LS28	
	TI	**SN74LS28**	**842**
T74LS283	Fairchild	74LS283	
	Hitachi	HD74LS283	
		HD74LS283A	
	Motorola	SN74LS283	
	National	DM74LS283	
	Raytheon	74LS283	
	Signetics	74LS283	
	TI	**SN74LS283**	**922**
T74LS290	Fairchild	74LS290	
	Hitachi	HD74LS290	
	Motorola	SN74LS290	
	National	DM74LS290	
	Raytheon	74LS290	
	Signetics	74LS290	
	TI	**SN74LS290**	**924**
T74LS292	**TI**	**SN74LS292**	**924**
T74LS293	Fairchild	74LS293	
	Hitachi	HD74LS293	
	Motorola	SN74LS293	
	National	DM74LS293	
	Signetics	74LS293	
	TI	**SN74LS293**	**925**
T74LS295A	TI	SN74LS295A	
T74LS298	Fairchild	74LS298	
	Hitachi	HD74LS298	
	Motorola	SN74LS298	
	Raytheon	74LS298	
	Signetics	74LS298	
	TI	**SN74LS298**	**926**
T74LS299	**AMD**	**SN74LS299**	**1227**
	Fairchild	74LS299	
	Hitachi	HD74LS299	
	Motorola	SN74LS299	
	Raytheon	74LS299	
	TI	**SN74LS299**	**927**
T74LS3	Fairchild	74LS368A	
	Hitachi	HD74LS368	
	Motorola	SN73LS368A	
		SN74LS368A	
	National	DM74LS368	
	Raytheon	74LS368	
	Signetics	74LS368	
		74LS368A	
	TI	**SN74LS368A**	**936**
T74LS30	Fairchild	74LS30	
	Hitachi	HD74LS30	
	Motorola	SN74LS30	
	National	DM74LS30	
	Raytheon	74LS30	
	Signetics	74LS30	
	TI	**SN74LS30**	**842**
T74LS32	Fairchild	54LS32	
		74LS32	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

SGS-ATES Semiconductor (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
T74LS32	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	**732**
		SN54LS32	
		SN74LS32	
	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN54LS32**	**843**
		SN74LS32	**843**
T74LS352	Fairchild	74LS352	
	Motorola	SN74LS352	
	National	DM74LS352	
	TI	**SN74LS352**	**932**
T74LS353	Fairchild	74LS353	
	Motorola	DM74LS353	
		SN74LS353	
	National	DM74LS353	
	TI	**SN74LS353**	**933**
T74LS365A	Fairchild	74LS365A	
	Motorola	SN74LS365A	
	National	DM74LS365	
	Raytheon	74LS365	
	Signetics	74LS365	
		74LS365A	
	TI	**SN74LS365A**	**935**
T74LS366A	Fairchild	74LS366A	
	Motorola	SN74LS366A	
	National	DM74LS366	
	Raytheon	74LS366	
	Signetics	74LS366A	
	TI	**SN74LS366A**	**935**
T74LS367A	Fairchild	74LS367A	
	Hitachi	HD74LS367	
		HD74LS367A	
	Motorola	SN74LS367A	
	National	DM74LS367	
	Raytheon	74LS367	
	Signetics	74LS367	
		74LS367A	
	TI	**SN74LS367A**	**936**
T74LS37	Fairchild	74LS37	
	Hitachi	HD74LS37	
	Motorola	SN74LS37	
	National	DM74LS37	
	Raytheon	74LS37	
	Signetics	74LS37	
	TI	**SN74LS37**	**844**
T74LS373	**AMD**	**SN74LS373**	**1227**
	Fairchild	74LS373	
	MMI	74LS373	
	Motorola	SN74LS373	
	Raytheon	74LS373	
	Signetics	**74LS373**	**783**
	TI	**SN74LS373**	**937**
T74LS374	AMD	SN74LS374	
	Fairchild	74LS374	
	MMI	74LS374	
	Motorola	SN74LS374	
	National	DM74LS374	
	Raytheon	74LS374	
	Signetics	74LS374	
	TI	**SN74LS374**	**938**
T74LS377	**AMD**	**SN74LS377**	**1227**
	Fairchild	74LS377	
	Motorola	SN74LS377	
	Raytheon	74LS377	
	Signetics	74LS377	
	TI	**SN74LS377**	**939**
T74LS378	AMD	SN74LS378	
	Fairchild	74LS378	
	Motorola	SN74LS378	
	Signetics	74LS378	
		SN74LS378	
	TI	**SN74LS378**	**939**
T74LS379	AMD	SN74LS379	
	Fairchild	74LS379	
	Motorola	SN74LS379	
	TI	**SN74LS379**	**940**
T74LS38	Fairchild	74LS38	
	Hitachi	HD74LS38	
	Motorola	SN74LS38	
	National	DM74LS38	
	Raytheon	74LS38	
	Signetics	74LS38	
	TI	**SN74LS38**	**844**
T74LS390	Fairchild	74LS390	
	Motorola	SN74LS390	
	TI	**SN74LS390**	**943**
T74LS393	Fairchild	74LS393	
	Motorola	SN74LS393	
	Signetics	74LS393	
	TI	**SN74LS393**	**943**
T74LS395	TI	SN74LS395	
T74LS40	Fairchild	74LS40	
	Hitachi	HD74LS40	
	Motorola	SN74LS40	
	National	DM74LS40	
	Raytheon	74LS40	
	Signetics	74LS40	
	TI	**SN74LS40**	**845**
T74LS42	Fairchild	74LS42	
	Hitachi	HD74LS42	
	Motorola	SN74LS42	
	National	DM74LS42	
	Raytheon	74LS42	
	Signetics	74LS42	
	TI	**SN74LS42**	**845**
T74LS47	Fairchild	54LS47	
		74LS47	
	Hitachi	HD74LS47	
	Motorola	SN54LS47	
		SN74LS47	
	National	DM54LS47	
		DM74LS47	
	TI	**SN54LS47**	**847**
		SN74LS47	**847**
T74LS48	Fairchild	74LS48	
	Hitachi	HD74LS48	
	Motorola	SN74LS48	
	National	DM74LS48	
	Signetics	74LS48	
	TI	**SN74LS48**	**847**
T74LS49	Fairchild	74LS49	
	Hitachi	HD74LS49	
	Motorola	SN74LS49	
	National	DM74LS49	
	TI	**SN74LS49**	**847**
T74LS490	Fairchild	74LS490	
	Motorola	SN74LS490	
	Signetics	74LS490	
	TI	**SN74LS490**	**955**
T74LS51	Fairchild	74LS51	
	Hitachi	HD74LS51	
	Motorola	SN74LS51	
	National	DM74LS51	
	Raytheon	74LS51	
	Signetics	74LS51	
	TI	**SN74LS51**	**848**
T74LS54	Fairchild	74LS54	
	Hitachi	HD74LS54	
	Motorola	SN74LS54	
	National	DM74LS54	
	Raytheon	74LS54	
	Signetics	74LS54	
	TI	**SN74LS54**	**850**
T74LS55	Fairchild	74LS55	
	Hitachi	HD74LS55	
	Motorola	SN74LS55	
	National	DM74LS55	
	Raytheon	74LS55	
	TI	**SN74LS55**	**851**
T74LS670	Fairchild	74LS670	
	Motorola	SN74LS670	
	National	DM74LS670	
	Raytheon	74LS670	
	Signetics	74LS670	
	TI	**SN74LS670**	**990**
T74LS74	Fairchild	74LS74	
	Hitachi	HD74LS74	
		HD74LS74A	
	Motorola	SN74LS74A	
	National	DM74LS74	
	Raytheon	74LS74	
	Signetics	74LS74	
	TI	**SN74LS74A**	**857**
T74LS86	Fairchild	74LS86	
	Hitachi	HD74LS86	
	Motorola	SN74LS86	
	National	DM74LS86	
	Raytheon	74LS86	
	Signetics	74LS86	
	TI	**SN74LS86**	**862**
T74LS90	Fairchild	74LS90	
	Motorola	SN74LS90	
	National	DM74LS90	
	Raytheon	74LS90	
T74LS90	Signetics	74LS90	
	TI	**SN74LS90**	**864**
T74LS92	Fairchild	74LS92	
	Hitachi	HD74LS92	
	Motorola	SN74LS92	
	National	DM74LS92	
	Raytheon	74LS92	
	Signetics	74LS92	
	TI	**SN74LS92**	**864**
T74LS93	Fairchild	74LS93	
	Hitachi	HD74LS93	
	Motorola	SN74LS93	
	National	DM74LS93	
	Raytheon	74LS93	
	Signetics	74LS93	
	TI	**SN74LS93**	**865**
T74LS95B	Fairchild	74LS95B	
	Hitachi	HD74LS95B	
	Motorola	SN74LS95B	
	National	DM74LS95B	
	Raytheon	74LS95B	
	Signetics	74LS95B	
	TI	**SN74LS95B**	**866**
TBA2002	**National**	**LM2002**	**3326**
	Sprague	ULN-3701	
TBA231	Exar	XR4739	
	Fairchild	μA739	
		μA749	
	Motorola	MC1339	
	National	**LM1303**	**3325**
	Raytheon	RC4739	
	TI	SN76131	
		SN76149	
TBA800	Fairchild	TBA800	
	Plessey	TBA800	
	Thomson-CSF	TBA800	
TBA810	Fairchild	TBA810	
	RCA	CA810	
	Signetics	TBA810	
TBA820	TI	SN76001	
	Thomson-CSF	TBA820	
TBA830	Thomson-CSF	TBA830	
TCA3089	Hitachi	HA1137	
		LA1230	
	Motorola	MC1389	
	National	CA3089	
		LM3089	**3325,3327**
	RCA	CA3089	
	Sanyo	LA1230	
		LA3089	
	SGS	TDA1200	
	Signetics	CA3089	
	Siliconix	CA3089	
	TI	SN76689	
TCA3189	RCA	CA3189	
	Signetics	CA3189	
	Sprague	ULN-3889	
TCA830	Telefunken	TCA830	
TCA840	Telefunken	TCA840	
TCA900	Thomson-CSF	TCA900	
TDA1190	Fairchild	TDA1194	
	Hitachi	HA1364	
	RCA	CA1190	
	SGS	TDA1190Z	
		TDA3190	
	Sprague	ULN-2290	
TDA1190Z	Fairchild	TDA1194	
	Hitachi	HA1364	
	RCA	CA1190	
	SGS	TDA1190	
		TDA3190	
	Sprague	ULN-2290	
TDA1200	Hitachi	HA1137	
		LA1230	
	Motorola	MC1389	
	National	CA3089	
		LM3089	**3325,3327**
	RCA	CA3089	
	Sanyo	LA1230	
		LA3089	
	SGS	TCA3089	
	Signetics	CA3089	
	Siliconix	CA3089	
	TI	SN76689	
TDA2002	Fairchild	TDA2002	
	Sprague	ULN-3701	
TDA2003	Fairchild	TDA2003	
TDA2004	RCA	CA2004	
TDA2140	Telefunken	TDA2140	
TDA2151	Telefunken	TDA2151	
TDA2161	Telefunken	TDA2161	
TDA3190	Fairchild	TDA1194	
TDA3190	Hitachi	HA1364	
	RCA	CA1190	
	SGS	TDA1190	
		TDA1190Z	
	Sprague	ULN-2290	
TDA440	National	TDA440	
	Plessey	TDA440	
	Telefunken	TDA440	
TDA4420	Telefunken	TDA4420	
TDA4421	Telefunken	TDA4421	
Z8	Synertek	Z8	
	Zilog	Z8	
Z80	Mostek	MK3880	
	NEC-Micro	μPD780	
	SGS	Z80-CPU	
		Z80CPUB	
	Zilog	**Z80**	**1581**
		Z80-CPU	
Z80-CPU	Mostek	MK3880	
	NEC-Micro	μPD780	
	SGS	Z80	
		Z80CPUB	
	Zilog	**Z80**	**1581**
		Z80-CPU	
Z80-CTC	Mostek	MK3882	
	SGS	Z80CPUB	
	Zilog	**Z80-CTC**	**1581**
Z80-PI	Mostek	MK3881	
	SGS	Z80CPUB	
	Zilog	**Z80-PIO**	**1581**
Z80-SIO	Mostek	MK3884	
		MK3885	
		MK3887	
	SGS	Z80CPUB	
	Zilog	**Z80-SIO**	**1581**
Z8000	**Zilog**	**Z8000**	**1581,1601**
Z8001	AMD	AMZ8001	
	Zilog	**Z8001**	**1587**
Z8002	AMD	AMZ8002	
	Zilog	**Z8002**	**1587**
Z8010	AMD	AMZ8010	
	Zilog	Z8010	
Z8036	Zilog	Z8036	
Z8038	Zilog	Z8038	
Z8060	Zilog	Z8060	
Z8090	Zilog	Z8090	
Z80CPUB	Mostek	MK3880	
	NEC-Micro	μPD780	
	SGS	Z80	
		Z80-CPU	
	Zilog	**Z80**	**1581**
		Z80-CPU	
Z80DART	Zilog	Z80DART	
Z8400	Zilog	Z8400	
Z8410	**Zilog**	**Z8410**	**1585**
Z8420	**Zilog**	**Z8420**	**1585**
Z8430	**Zilog**	**Z8430**	**1585**
Z8440	**Zilog**	**Z8440**	**1586**
Z8441	Zilog	Z8441	
Z8442	Zilog	Z8442	
Z8449	Zilog	Z8449	
Z8470	**Zilog**	**Z8470**	**1586**
Z8601	**Synertek**	**Z8601**	**1540**
	Zilog	**Z8601**	**1596**
Z8602	**Synertek**	**Z8602**	**1541**
	Zilog	Z8602	
Z8611	**Synertek**	**Z8611**	**1543**
	Zilog	**Z8611**	**1597**
Z8612	**Synertek**	**Z8612**	**1544**
	Zilog	**Z8612**	**1597**

Siemens

GXB10415	AMD	AM10415	
	Fairchild	**F10415**	**3615,3618**
	Hitachi	**HM2110**	**3789**
		HM2112	**3789**
	Motorola	**MCM10146**	**3839**
	National	DM10415	
	Signetics	10146	
HYB4116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Siemens (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HYB4116	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
SAB1791	**Fujitsu**	**MB8876**	**1308**
	SMC	FDC1791	
	Western	FD1791	
SAB1793	**Fujitsu**	**MB8877**	**1308**
	SMC	FDC1793	
	Western	FD1793	
SAB1795	SMC	FDC1795	
	Western	FD1795	
SAB1797	SMC	FDC1797	
	Western	FD1797	
SDA4040	Plessey	SP4040	
SDA4041	Plessey	SP4551	
TBA120	**National**	**TBA120**	**3325,3327**
	Plessey	TBA120	
	Signetics	TBA120	
	Telefunken	TBA120	
TBA1441	Signetics	TBA1441	
TBA440	National	TBA440	
	Plessey	TBA440	
TCA440	Signetics	TCA440	
TCA4500	Motorola	TCA4500	
	National	LM4500	
TDA2522	National	TDA2522	
	Plessey	TDA2522	
	Signetics	TDA2522	
TDA2530	**Hitachi**	**HN462532**	**3789**
	Motorola	MCM2532	
	National	MM2532	
		NMC2532	
		TDA2530	
		TDA2532	
	Plessey	TDA2530	
	Signetics	TDA2530	
		TDA2532	
	SiliconG	SG2532	
	TI	TMS2532	
	Universal	UM2532	
TDA2560	National	TDA2560	
	Plessey	TDA2560	
	Signetics	TDA2560	
μAA170	TI	μAA170	
μAA171	TI	μAA171	

Signetics

Manufacturer Device	Replacement Source	Device	IC Master Page
100101	**Fairchild**	**F100101**	**658**
100102	**Fairchild**	**F100102**	**658**
100107	**Fairchild**	**F100107**	**658**
100114	**Fairchild**	**F100114**	**658**
100117	**Fairchild**	**F100117**	**658**
100118	**Fairchild**	**F100118**	**658**
100122	**Fairchild**	**F100122**	**658**
100149	Motorola	100416	
100155	**Fairchild**	**F100155**	**658**
100158	**Fairchild**	**F100158**	**658**
100160	**Fairchild**	**F100160**	**658**
100163	**Fairchild**	**F100163**	**658**
100166	**Fairchild**	**F100166**	**658**
100171	**Fairchild**	**F100171**	**658**
100415	AMD	AM100415	
	Fairchild	100415	
10100	Fairchild	F10100	
	Motorola	MC10100	
10101	Fairchild	F10101	
	Hitachi	HD10101	
	Motorola	MC10101	
1010130	Fairchild	F10130	
	Hitachi	HD10130	
	Motorola	MC10130	
	Signetics	10130	
10102	Fairchild	F10102	
	Hitachi	HD10102	
	Motorola	MC10102	
10103	Fairchild	F10103	
	Motorola	MC10103	
10104	Fairchild	F10104	
	Hitachi	HD10104	
	Motorola	MC10104	
10105	Fairchild	F10105	
10105	Hitachi	HD10105	
	Motorola	MC10105	
10106	Fairchild	F10106	
	Hitachi	HD10106	
	Motorola	MC10106	
10107	Fairchild	F10107	
	Hitachi	HD10107	
	Motorola	MC10107	
10109	Fairchild	F10109	
	Hitachi	HD10109	
	Motorola	MC10109	
10110	Fairchild	F10110	
	Hitachi	HD10110	
	Motorola	MC10110	
10111	Fairchild	F10111	
	Hitachi	HD10111	
	Motorola	MC10111	
10113	Fairchild	F10113	
	Motorola	MC10113	
10114	Fairchild	F10114	
	Motorola	MC10114	
10115	Fairchild	F10115	
	Motorola	MC10115	
10116	Fairchild	F10116	
	Hitachi	HD10116	
	Motorola	MC10116	
	National	DM10116	
10117	Fairchild	F10117	
	Hitachi	HD10117	
	Motorola	MC10117	
10118	Fairchild	F10118	
	Hitachi	HD10118	
	Motorola	MC10118	
10119	Fairchild	F10119	
	Hitachi	HD10119	
	Motorola	MC10119	
10121	Fairchild	F10121	
	Hitachi	HD10121	
	Motorola	MC10121	
10123	Fairchild	F10123	
	Motorola	MC10123	
10124	Fairchild	F10124	
	Hitachi	HD10124	
	Motorola	MC10124	
10125	Fairchild	F10125	
	Hitachi	HD10125	
	Motorola	MC10125	
10128	Motorola	MC10128	
10129	Motorola	MC10129	
10130	Fairchild	F10130	
	Hitachi	HD10130	
	Motorola	MC10130	
	Signetics	1010130	
10131	Fairchild	F10131	
	Hitachi	HD10131	
	Motorola	MC10131	
10132	Fairchild	F10132	
	Hitachi	HD10132	
	Motorola	MC10132	
10133	Fairchild	F10133	
	Hitachi	HD10133	
	Motorola	MC10133	
10134	Fairchild	F10134	
	Hitachi	HD10134	
	Motorola	MC10134	
10135	Fairchild	F10135	
	Motorola	MC10135	
10136	Fairchild	F10136	
	Hitachi	HD10136	
	Motorola	MC10136	
10137	Fairchild	F10137	
	Motorola	MC10137	
10138	Motorola	MC10138	
10139	Motorola	MCM10139	
10140	TI	SN10140	
10141	Fairchild	F10141	
	Motorola	MC10141	
10144	Fairchild	F10144	
	Motorola	**MCM10144**	**3839**
	TI	SN10144	
10146	AMD	AM10415	
	Fairchild	**F10415**	**3615,3618**
	Hitachi	**HM2110**	**3789**
		HM2112	**3789**
	Motorola	**MCM10146**	**3839**
	National	DM10415	
	Siemens	GXB10415	
10148	Hitachi	HD10148	
	Motorola	**MCM10148**	**3839**
	NEC-Electron	μPB10148	
	TI	SN10148	
10149	Fairchild	F10416	
10149	Motorola	MCM10149	
	Signetics	N10149	
10158	Fairchild	F10158	
	Motorola	MC10158	
10159	Fairchild	F10159	
	Motorola	MC10159	
10160	Fairchild	F10160	
	Hitachi	HD10160	
	Motorola	MC10160	
10161	Fairchild	F10161	
	Hitachi	HD10161	
	Motorola	MC10161	
	NEC-Electron	μPB10161	
10162	Fairchild	F10162	
	Hitachi	HD10162	
	Motorola	MC10162	
10164	Fairchild	F10164	
	Hitachi	HD10164	
	Motorola	MC10164	
	TI	SN10164	
10165	Fairchild	F10165	
	Hitachi	HD10165	
	Motorola	MC10165	
10170	Motorola	MC10170	
10171	Fairchild	F10171	
	Motorola	MC10171	
10172	Fairchild	F10172	
	Motorola	MC10172	
10173	Fairchild	F10173	
	Motorola	MC10173	
10174	Fairchild	F10174	
	Hitachi	HD10174	
	Motorola	MC10174	
	TI	SN10174	
10175	Fairchild	F10175	
	Hitachi	HD10175	
	Motorola	MC10175	
	TI	SN10175	
10176	Fairchild	F10176	
	Motorola	MC10176	
10178	Fairchild	F10178	
	Motorola	MC10178	
10179	Fairchild	F10179	
	Hitachi	HD10179	
	Motorola	MC10179	
10180	Fairchild	F10180	
	Hitachi	HD10180	
	Motorola	MC10180	
10181	Fairchild	F10181	
	Hitachi	HD10181	
	Motorola	MC10181	
10186	Fairchild	F10186	
	Motorola	MC10186	
10188	Motorola	MC10188	
10189	Motorola	MC10189	
10190	Motorola	MC10190	
10191	Motorola	MC10191	
10192	Fairchild	F10192	
	Motorola	MC10192	
10195	Motorola	MC10195	
10210	Fairchild	F10210	
	Motorola	MC10210	
10211	Fairchild	F10211	
	Motorola	MC10211	
10212	Fairchild	F10212	
	Motorola	MC10212	
10216	Fairchild	F10216	
	Motorola	MC10216	
10231	Fairchild	F10231	
	Motorola	MC10231	
10470	AMD	AM10470	
	Fairchild	**F10470**	**3615,3621**
	Fujitsu	**MBM10470**	**3681**
	Hitachi	**HM10470**	**3789**
	Motorola	MCM10470	
	National	**DM10470**	**3855**
2064-20	AMD	AM92640	
	AMI	S68B364	
	Fairchild	F-3564-25	
	Mostek	MK36000-4	
	Motorola	MCM67365-25	
	NEC-EA	μPD2/8364-20	
	Synertek	SY2364-2	
23128	NEC-Electron	μPD23128	
23128-30	**AMI**	**S23128**	**3610**
	National	S2128	
	NEC-EA	μPD2/83128	
2332	AMD	AM9233	
	AMI	**S2333**	**3608**
	CSG	MPS2333	
	Fairchild	F3533	
	GI	R03-9333	
2332	Intel	2332	
	NEC-EA	8332	
		EA8333	
	RCA	CDM5332	
	Synertek	**SY2333**	**3950**
	Toshiba	TM2332	
	Universal	UM2333-45	
2364	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
2364-20	**AMI**	**S2364**	**3609**
	GI	R03-9367	
	Mostek	MK37000	
	Synertek	**SY2365**	**3951**
		SY2365-2	**3951**
◆2616	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
◆2632	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
◆2664	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
◆2664	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
2664A	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
2664A-30	AMD	AM9264	
	AMI	S4264	
	GTEMicro	2364-3	
	Mostek	MK36000-5	
	NEC-EA	UPD2/8364-30	
	Synertek	SY2364-3	
	Toshiba	TMM2364	
	Weitek	SC8164	
2681	Motorola	MC2681	
2682	Motorola	MC2682	
2690	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
2960	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
	Signetics	2690	

Manufacturer Device	Replacement Source	Device	IC Master Page
2960	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
3001	Intel	3001	
	Signetics	N3001	
3002	Intel	3002	
	Signetics	N3002	
3101	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
3101A	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	

Manufacturer Device	Replacement Source	Device	IC Master Page
3101A	Signetics	3101	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
5400	Fairchild	5400	
	National	DM5400	
	TI	**SN5400**	**833**
◆5401	Fairchild	5401	
	National	DM5401	
	TI	**SN5401**	**833**
◆5402	Fairchild	5402	
	National	DM5402	
	TI	**SN5402**	**833**
◆5403	Fairchild	5403	
	National	DM5403	
	TI	**SN5403**	**834**
◆5404	Fairchild	5404	
		9016	
	National	DM5404	
		DM9016C	
	TI	**SN5404**	**834**
◆5405	Fairchild	5405	
	National	DM5405	
	TI	**SN5405**	**834**
◆5406	Fairchild	5406	
	National	DM5406	
	TI	**SN5406**	**835**
◆5407	Fairchild	5407	
	National	DM5407	
	TI	**SN5407**	**835**
◆5408	Fairchild	5408	
	National	DM5408	
	TI	**SN5408**	**835**
◆5409	Fairchild	5409	
	National	DM5409	
	TI	**SN5409**	**836**
◆5410	Fairchild	5410	
	National	DM5410	
	TI	**SN5410**	**836**
◆54100	**TI**	**SN54100**	**867**
◆54107	Fairchild	54107	
	Motorola	MC54107	
	National	DM54107	
	TI	**SN54107**	**869**
54109	National	DM54109	
	TI	**SN54109**	**870**
5411	Fairchild	5411	
	National	DM5411	
	TI	SN5411	
54116	**TI**	**SN54116**	**872**
◆5412	Fairchild	5412	
	TI	**SN5412**	**837**
54121	Fairchild	54121	
		9603	
	National	DM54121	
	TI	**SN54121**	**873**
54123	Fairchild	54123	
	National	DM54123	
	TI	**SN54123**	**874**
◆54125	Fairchild	54125	
	National	DM54125	
		DM7093	
	TI	**SN54125**	**875**
		SN54425	**946**
54126	Fairchild	54126	
	National	DM54126	
		DM7094	
	TI	**SN54126**	**875**
		SN54426	**946**
◆54128	**TI**	**SN54128**	**876**
◆5413	Fairchild	5413	
	National	DM5413	
	TI	**SN5413**	**837**
54132	Fairchild	54132	
	National	DM54132	
	TI	**SN54132**	**877**
5414	Fairchild	5414	

Manufacturer Device	Replacement Source	Device	IC Master Page
5414	National	DM5414	
	TI	**SN5414**	**837**
54141	Fairchild	9315	
	National	DM54141	
	TI	SN54141	
◆54145	Fairchild	54145	
	National	DM54145	
	TI	**SN54145**	**882**
54147	National	DM54147	
	TI	**SN54147**	**882**
54148	Fairchild	9318	
	Hitachi	HD74148	
	National	DM54148	
		DM74148	
		DM8318	
		DM9318	
	Signetics	74148	
		N82148	
	TI	**SN54148**	**883**
		SN74148	**883**
◆54150	Fairchild	54150	
	National	DM54150	
	TI	**SN54150**	**883**
54151	Fairchild	54151A	
	National	DM54151	
	TI	SN54151	
		SN54151A	**884**
◆54152	Fairchild	54152A	
	TI	**SN54152A**	**884**
54153	Fairchild	54153	
	National	DM54153	
	TI	**SN54153**	**884**
54154	Fairchild	9311	
	Hitachi	HD74154	
	National	DM54154	
		DM7213	
		DM74154	
		DM8311	
		DM9311	
	Raytheon	RC9311	
		RM9311	
	Signetics	74154	
	TI	SN29311	
		SN39311	
		SN54154	**885**
		SN74154	**885**
◆54155	Fairchild	54155	
	National	DM54155	
	TI	**SN54155**	**886**
◆54156	Fairchild	54156	
	National	DM54156	
	TI	**SN54156**	**886**
54157	Fairchild	54157	
	National	DM54157	
	TI	**SN54157**	**887**
◆5416	Fairchild	5416	
	National	DM5416	
	TI	**SN5416**	**838**
54160	Fairchild	54160	
		9310	
	National	DM54160	
	Raytheon	RM9310	
	TI	**SN54160**	**889**
54161	Fairchild	54161	
	National	DM54161	
	TI	**SN54161**	**889**
◆54162	Fairchild	54162	
	National	DM54162	
	TI	**SN54162**	**890**
54163	Fairchild	54163	
	National	DM54163	
	TI	**SN54163**	**890**
54164	Fairchild	54164	
	National	DM54164	
		DM7570	
	TI	**SN54164**	**891**
54165	Fairchild	54165	
	National	DM54165	
		DM7590	
	TI	**SN54165**	**891**
54166	Fairchild	54166	
	National	DM54166	
	TI	**SN54166**	**891**
◆5417	Fairchild	5417	
	National	DM5417	
	TI	**SN5417**	**838**
◆54170	Fairchild	54170	
	National	DM54170	
	TI	**SN54170**	**893**
54174	Fairchild	54174	
	National	DM54174	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
54174	TI	**SN54174**	**895**
54175	Fairchild	54175	
	National	DM54175	
	TI	**SN54175**	**895**
54176	Fairchild	54176	
	National	DM54176	
	Raytheon	RM8280	
	Signetics	S8280	
	TI	**SN54176**	**896**
54177	Fairchild	54177	
	National	DM54177	
		DM7281	
	Raytheon	RM8281	
	Signetics	S7281	
		S8281	
	TI	**SN54177**	**896**
54180	Fairchild	54180	
	National	DM54180	
	TI	**SN54180**	**897**
54181	Fairchild	54181	
		9341	
	Hitachi	HD74181	
	National	DM54181	
		DM74181	
	Raytheon	RC9341	
		RM9341	
	Signetics	74181	
	TI	**SN54181**	**897**
		SN74181	**897**
◇54182	Fairchild	54182	
		9342	
	Hitachi	HD74182	
	National	DM54182	
		DM74182	
	Raytheon	RM9342	
	TI	**SN54182**	**898**
		SN74182	**898**
54190	Fairchild	54190	
	National	DM54190	
	TI	**SN54190**	**901**
54191	Fairchild	54191	
	National	DM54191	
	TI	**SN54191**	**901**
◇54192	Fairchild	54192	
	National	DM54192	
		DM7560	
	TI	**SN54192**	**902**
◇54193	Fairchild	54193	
	National	DM54193	
		DM7563	
	TI	**SN54193**	**902**
54194	National	DM54194	
	TI	**SN54194**	**902**
◇54195	Fairchild	54195	
		9300	
	National	DM54195	
	TI	**SN54195**	**903**
54196	Fairchild	54196	
	National	DM54196	
	TI	**SN54196**	**903**
◇54198	Fairchild	54198	
	National	DM54198	
	TI	**SN54198**	**904**
◇54199	Fairchild	54199	
	National	DM54199	
	TI	**SN54199**	**905**
5420	Fairchild	5420	
	National	DM5420	
	TI	**SN5420**	**839**
◆5421	Fairchild	5421	
5426	National	DM5426	
	TI	**SN5426**	**841**
54279	Fairchild	54279	
	TI	**SN54279**	**921**
◇54298	Fairchild	54298	
	TI	**SN54298**	**926**
◆5430	Fairchild	5430	
	National	DM5430	
	TI	**SN5430**	**842**
5432	Fairchild	5432	
	National	DM5432	
	TI	**SN5432**	**843**
◇5437	Fairchild	5437	
	National	DM5437	
	TI	**SN5437**	**844**
◇5438	Fairchild	5438	
	National	DM5438	
	TI	**SN5438**	**844**
◇5440	Fairchild	5440	
◇5440	National	DM5440	
	TI	**SN5440**	**845**
5442	Fairchild	5442A	
	National	DM5442	
	TI	SN5442	
5443	Fairchild	5443A	
	TI	SN5443	
◇5444	Fairchild	5444A	
	TI	SN5444	
		SN5444A	**846**
◇5445	Fairchild	5445	
	National	DM5445	
	TI	**SN5445**	**846**
		SN5445A	
5446	Fairchild	5446A	
		9317B	
		9317C	
	National	DM5446	
		DM5447	
	TI	SN5446	
		SN5446A	**847**
5447	Fairchild	5447A	
	National	DM5447	
	TI	SN5447	
		SN5447A	**847**
◇5448	Fairchild	5448	
		7448	
	National	DM5448	
		DM7448	
		DM8848	
	Signetics	N8T54	
	TI	**SN5448**	**847**
		SN5448A	
		SN7448	**847**
		SN7448A	
◇5450	Fairchild	5450	
	National	DM5450	
	TI	**SN5450**	**848**
◇5451	Fairchild	5451	
	National	DM5451	
	TI	**SN5451**	**848**
◇5453	Fairchild	5453	
	National	DM5453	
	TI	**SN5453**	**849**
◇5454	Fairchild	5454	
	National	DM5454	
	TI	**SN5454**	**850**
◇5460	Fairchild	5460	
	National	DM5460	
	TI	**SN5460**	**852**
◇5470	Fairchild	5470	
	National	DM5470	
	TI	**SN5470**	**855**
◇5472	Fairchild	5472	
	National	DM5472	
	TI	**SN5472**	**856**
5473	Fairchild	5473	
	National	DM5473	
	TI	**SN5473**	**856**
5474	Fairchild	5474	
	National	DM5474	
	TI	**SN5474**	**857**
5475	Fairchild	5475	
	National	DM5475	
	TI	**SN5475**	**858**
5476	Fairchild	5476	
	National	DM5476	
	TI	**SN5476**	**858**
5477	Fairchild	5477	
	TI	**SN5477**	**859**
◆5480	Fairchild	5480	
	TI	**SN5480**	**860**
5483A	Fairchild	5483A	
	TI	**SN5483A**	**861**
5485	Fairchild	5485	
	National	DM5485	
	TI	**SN5485**	**862**
5486	Fairchild	5486	
	National	DM5486	
	TI	**SN5486**	**862**
◇5490	Fairchild	5490	
	National	DM5490	
	TI	SN5490	
		SN5490A	**864**
5491	Fairchild	5491A	
	National	DM5491	
	TI	SN5491	
		SN5491A	**864**
◇5492	Fairchild	5492	
	National	DM5492	
	TI	SN5492	
		SN5492A	**864**
5493	Fairchild	5493A	
	National	DM5493	
	TI	SN5493	
		SN5493A	**865**
◇5494	Fairchild	5494	
	TI	**SN5494**	**865**
		SN5494A	
◇5495	Fairchild	5495A	
	National	DM5495	
	TI	SN5495	
		SN5495A	**866**
5496	Fairchild	5496	
	National	DM5496	
	TI	**SN5496**	**866**
54F00	Fairchild	54F00	
	Motorola	**MC54F00**	**731**
54F02	Fairchild	54F02	
	Motorola	**MC54F02**	**731**
54F04	Fairchild	54F04	
	Motorola	**MC54F04**	**731**
54F08	Fairchild	54F08	
	Motorola	**MC54F08**	**731**
54F10	Fairchild	54F10	
	Motorola	**MC54F10**	**731**
54F109	Fairchild	54F109	
	Motorola	**MC54F109**	**731**
54F11	Fairchild	54F11	
	Motorola	**MC54F11**	**731**
54F138	Fairchild	54F138	
	Motorola	**MC54F138**	**731**
54F139	Fairchild	54F139	
	Motorola	**MC54F139**	**731**
54F20	Fairchild	54F20	
	Motorola	**MC54F20**	**731**
54F240	Fairchild	**54F240**	**630**
	Motorola	**MC54F240**	**731**
54F241	Fairchild	**54F241**	**630**
	Motorola	**MC54F241**	**731**
54F242	Fairchild	54F242	
	Motorola	**MC54F242**	**731**
54F243	Fairchild	54F243	
	Motorola	**MC54F243**	**731**
54F244	Fairchild	**54F244**	**630**
	Motorola	**MC54F244**	**731**
54F32	Fairchild	54F32	
	Motorola	**MC54F32**	**731**
54F333	Fairchild	54F333	
	Motorola	MC54F333	
54F373	Fairchild	**54F373**	**632**
	Motorola	**MC54F373**	**731**
54F374	Fairchild	**54F374**	**634**
	Motorola	**MC54F374**	**731**
54F534	Fairchild	54F534	
	Motorola	**MC54F534**	**731**
54F74	Fairchild	54F74	
	Motorola	**MC54F74**	**731**
◇54H00	Fairchild	54H00	
	National	DM54H00	
	TI	SN54H00	
◇54H01	Fairchild	54H01	
	National	DM54H01	
	TI	**SN54H01**	**833**
◇54H04	Fairchild	54H04	
	National	DM54H04	
	TI	**SN54H04**	**834**
◇54H05	Fairchild	54H05	
	National	DM54H05	
	TI	**SN54H05**	**834**
◇54H08	Fairchild	54H08	
	National	DM54H08	
◇54H10	Fairchild	54H10	
	National	DM54H10	
	TI	**SN54H10**	**836**
◇54H101	Fairchild	54H101	
	TI	**SN54H101**	**868**
◇54H102	Fairchild	54H102	
	TI	**SN54H102**	**868**
◇54H103	Fairchild	54H103	
	National	DM54H103	
	TI	**SN54H103**	**868**
◇54H106	Fairchild	54H106	
	National	DM54H106	
	TI	**SN54H106**	**869**
◇54H108	Fairchild	54H108	
	National	DM54H108	
	TI	**SN54H108**	**870**
◇54H11	Fairchild	54H11	
	Motorola	3106	
	National	DM54H11	
	TI	**SN54H11**	**836**
◇54H20	Fairchild	54H20	
◇54H20	National	DM54H20	
	TI	**SN54H20**	**839**
◇54H21	Fairchild	54H21	
	National	DM54H21	
	TI	**SN54H21**	**840**
◇54H22	Fairchild	54H22	
	National	DM54H22	
	TI	**SN54H22**	**840**
◇54H30	Fairchild	54H30	
	National	DM54H30	
	TI	**SN54H30**	**842**
◇54H40	Fairchild	54H40	
	National	DM54H40	
	TI	**SN54H40**	**845**
◇54H50	Fairchild	54H50	
	National	DM54H50	
	TI	**SN54H50**	**848**
◇54H51	Fairchild	54H51	
	National	DM54H51	
	TI	**SN54H51**	**848,849**
◇54H52	Fairchild	54H52	
	National	DM54H52	
	TI	SN54H52	
◇54H53	Fairchild	54H53	
	National	DM54H53	
	RCA	CD4029	
	Signetics	HEF4029	
	TI	**SN54H53**	**849**
◇54H54	Fairchild	54H54	
	National	DM54H54	
	TI	**SN54H54**	**850**
◇54H55	Fairchild	54H55	
	National	DM54H55	
	TI	**SN54H55**	**851**
◇54H60	Fairchild	54H60	
	National	DM54H60	
	TI	**SN54H60**	**852**
◇54H61	Fairchild	54H61	
	National	DM54H61	
	TI	**SN54H61**	**852**
◇54H62	Fairchild	54H62	
	National	DM54H62	
	TI	**SN54H62**	**853**
◇54H71	Fairchild	54H71	
	National	DM54H71	
	TI	**SN54H71**	**855**
◆54H72	Fairchild	54H72	
	National	DM54H72	
	TI	**SN54H72**	**856**
◇54H73	Fairchild	54H72	
	National	DM54H72	
	TI	**SN54H72**	**856**
◇54H74	Fairchild	54H74	
	National	DM54H74	
	TI	**SN54H74**	**857**
◇54H76	Fairchild	54H76	
	National	DM54H76	
	TI	**SN54H76**	**858**
54LS00	Fairchild	54LS00	
	Motorola	SN54LS00	
	National	DM54LS00	
	Raytheon	54LS00	
	TI	**SN54LS00**	**833**
◇54LS01	Fairchild	54LS01	
	Motorola	SN54LS01	
	National	DM54LS01	
	Raytheon	54LS01	
	TI	**SN54LS01**	**833**
54LS02	Fairchild	54LS02	
	Motorola	SN54LS02	
	National	DM54LS02	
	Raytheon	54LS02	
	TI	**SN54LS02**	**833**
◇54LS03	Fairchild	54LS03	
	Motorola	SN54LS03	
	National	DM54LS03	
	Raytheon	54LS03	
	TI	**SN54LS03**	**834**
54LS04	Fairchild	54LS04	
	Motorola	SN54LS04	
	National	DM54LS04	
	Raytheon	54LS04	
	TI	**SN54LS04**	**834**
◇54LS05	Fairchild	54LS05	
	Motorola	SN54LS05	
	National	DM54LS05	
	Raytheon	54LS05	
	TI	**SN54LS05**	**834**
54LS08	Fairchild	54LS08	
	Motorola	SN54LS08	
	National	DM54LS08	
	Raytheon	54LS08	

◇ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Signetics		**(Cont'd)**	
54LS08	TI	**SN54LS08**	835
◆54LS09	Fairchild	54LS09	
	Motorola	SN54LS09	
	National	DM54LS09	
	Raytheon	54LS09	
	TI	**SN54LS09**	836
54LS10	Fairchild	54LS10	
	Motorola	SN54LS10	
	National	DM54LS10	
	Raytheon	54LS10	
	TI	**SN54LS10**	836
54LS107	Motorola	SN54LS107A	
	National	DM54LS107	
	Raytheon	54LS107	
	TI	**SN54LS107A**	869
54LS109	Fairchild	54LS109	
	Motorola	SN54LS109A	
	National	DM54LS109	
		DM54LS109A	
	Raytheon	54LS109	
	TI	SN54LS109	
		SN54LS109A	870
◆54LS11	Fairchild	54LS11	
	Motorola	SN54LS11	
	National	DM54LS11	
	Raytheon	54LS11	
	TI	**SN54LS11**	836
54LS112	Fairchild	54LS112	
	Motorola	SN54LS112A	
	National	DM54LS112	
	Raytheon	54LS112	
	TI	SN54LS112	
		SN54LS112A	871
54LS113	Fairchild	54LS113	
	Motorola	SN54LS113A	
	National	DM54LS113	
	Raytheon	54LS113	
	TI	SN54LS113	
		SN54LS113A	871
◆54LS114	Fairchild	54LS114	
	Motorola	SN54LS114A	
	National	DM54LS114	
		DM54LS114A	
	Raytheon	54LS114	
	TI	SN54LS114	
		SN54LS114A	
◆54LS12	Motorola	SN54LS12	
	National	DM54LS12	
	Raytheon	54LS12	
	TI	**SN54LS12**	837
54LS125A	Motorola	SN54LS125A	
	National	DM54LS125	
	Raytheon	54LS125	
	TI	**SN54LS125A**	875
54LS126A	Fairchild	54LS126	
		SN54LS126	
	Motorola	SN54LS126A	
	National	DM54LS126	
	Raytheon	54LS126	
	TI	SN54LS126	
		SN54LS126A	
◆54LS13	Fairchild	54LS13	
	Motorola	SN54LS13	
	National	DM54LS13	
	Raytheon	54LS13	
	TI	**SN54LS13**	837
		SN54S13	
54LS132	Motorola	SN54LS132	
	National	DM54LS132	
	Raytheon	54LS132	
	TI	**SN54LS132**	877
54LS136	Fairchild	54LS136	
	Motorola	SN54LS136	
	National	DM54LS136	
	Raytheon	54LS136	
	TI	**SN54LS136**	878
54LS138	AMD	SN54LS138	
	Fairchild	54LS138	
	Motorola	SN54LS138	
	National	DM54LS138	
	Raytheon	54LS138	
	TI	**SN54LS138**	880
54LS139	AMD	SN54LS139	
	Fairchild	54LS139	
	Motorola	SN54LS139	
	National	DM54LS139	
	Raytheon	54LS139	
	TI	**SN54LS139**	880
54LS14	Fairchild	54LS14	
54LS14	Motorola	SN54LS14	
	National	DM54LS14	
	Raytheon	54LS14	
	TI	**SN54LS14**	837
◆54LS15	Fairchild	54LS15	
	Motorola	SN54LS15	
	National	DM54LS15	
	Raytheon	54LS15	
	TI	**SN54LS15**	838
54LS151	AMD	SN54LS151	
	Fairchild	54LS151	
	Motorola	SN54LS151	
	National	DM54LS151	
	Raytheon	54LS151	
	TI	**SN54LS151**	884
54LS153	AMD	SN54LS153	
	Fairchild	54LS153	
	Motorola	SN54LS153	
	National	DM54LS153	
	Raytheon	54LS153	
	TI	**SN54LS153**	884
54LS154	National	DM54LS154	
54LS157	AMD	SN54LS157	
	Fairchild	54LS157	
	Motorola	SN54LS157	
	National	DM54LS157	
	Raytheon	54LS157	
	TI	**SN54LS157**	887
54LS158	AMD	SN54LS158	
	Fairchild	54LS158	
	Motorola	SN54LS158	
	National	DM54LS158	
	Raytheon	54LS158	
	TI	**SN54LS158**	887
54LS160	AMD	SN54LS160A	
		SN74S160	1227
	Fairchild	93S10	
	Motorola	SN54LS160A	
	National	DM54LS160	
	Raytheon	54LS160	
	Signetics	54LS160A	
	TI	**SN54LS160A**	889
54LS160A	AMD	SN54LS160A	
		SN74S160	1227
	Fairchild	93S10	
	Motorola	SN54LS160A	
	National	DM54LS160	
	Raytheon	54LS160	
	Signetics	54LS160A	
	TI	**SN54LS160A**	889
54LS161A	AMD	SN54LS161A	
	Fairchild	54LS161A	
	Motorola	SN54LS161A	
	National	DM54LS161A	
	Raytheon	54LS161	
	TI	SN54LS161	
		SN54LS161A	889
54LS162A	AMD	SN54LS162A	
	Motorola	SN54LS162A	
	National	DM54LS162A	
	Raytheon	54LS162	
	TI	SN54LS162	
		SN54LS162A	890
54LS163A	AMD	SN54LS163A	
	Motorola	SN54LS163A	
	National	DM54LS163	
		DM54LS163A	
	Raytheon	54LS163	
	TI	54LS163A	
		SN54LS163	
		SN54LS163A	
54LS164	AMD	SN54LS164	
	Fairchild	54LS164	
	Motorola	SN54LS164	
		SN54LS164A	
	National	DM54LS164	
		DM54LS164A	
	Raytheon	54LS164	
	TI	**SN54LS164**	891
		SN54LS164A	
◆54LS170	Fairchild	54LS170	
	Motorola	SN54LS170	
	National	DM54LS170	
	Raytheon	54LS170	
	TI	**SN54LS170**	893
54LS173	Fairchild	54LS173	
	Motorola	SN54LS173A	
	National	DM54LS173	
	TI	**SN54LS173A**	894
54LS174	AMD	SN54LS174	
	Fairchild	54LS174	
	Motorola	SN54LS174	
54LS174	National	DM54LS174	
	Raytheon	54LS174	
	TI	**SN54LS174**	895
54LS175	AMD	SN54LS175	
	Fairchild	54LS175	
	Motorola	SN54LS175	
	National	DM54LS175	
	Raytheon	54LS175	
	TI	**SN54LS175**	895
54LS181	AMD	SN54LS181	
	Fairchild	54LS181	
	Motorola	SN54LS181	
	Raytheon	54LS181	
	TI	**SN54LS181**	897
54LS190	AMD	SN54LS190	
	Motorola	SN54LS190	
	National	DM54LS190	
	Raytheon	54LS190	
	TI	**SN54LS190**	901
54LS191	AMD	SN54LS191	
	Motorola	SN54LS191	
	National	DM54LS191	
	Raytheon	54LS191	
	TI	**SN54LS191**	901
54LS192	AMD	SN54LS192	
	Fairchild	54LS192	
	Motorola	SN54LS192	
	National	DM54LS192	
	Raytheon	54LS192	
	TI	**SN54LS192**	902
54LS193	AMD	SN54LS193	
	Fairchild	54LS193	
	Motorola	SN54LS193	
	National	DM54LS193	
	Raytheon	54LS193	
	TI	**SN54LS193**	902
54LS194A	Fairchild	54LS28	
	Motorola	SN54LS28	
	Raytheon	54LS28	
	Signetics	54LS28	
	TI	**SN54LS28**	842
54LS195A	AMD	SN54LS195A	
	Fairchild	54LS195A	
	Motorola	SN54LS195A	
	Raytheon	54LS195A	
	TI	**SN54LS195A**	903
◆54LS196	Motorola	SN54LS196	
	National	DM54LS196	
	Raytheon	54LS196	
	TI	**SN54LS196**	903
54LS197	Motorola	SN54LS197	
	National	DM54LS197	
	Raytheon	54LS197	
	TI	**SN54LS197**	904
54LS20	Fairchild	54LS20	
	Motorola	SN54LS20	
	National	DM54LS20	
	Raytheon	54LS20	
	TI	**SN54LS20**	839
◆54LS21	Fairchild	54LS21	
	Motorola	SN54LS21	
	National	DM54LS21	
	Raytheon	54LS21	
	TI	**SN54LS21**	840
◆54LS22	Fairchild	54LS22	
	Motorola	SN54LS22	
	National	DM54LS22	
	Raytheon	54LS22	
	TI	**SN54LS22**	840
54LS221	Motorola	SN54LS221	
	National	DM54LS221	
	Raytheon	54LS221	
	TI	**SN54LS221**	906
54LS248	Fairchild	54LS248	
	Motorola	SN54LS248	
	National	DM54LS248	
	TI	**SN54LS248**	914
54LS251	AMD	SN54LS251	
	Fairchild	54LS251	
	Motorola	SN54LS251	
	Raytheon	54LS251	
	TI	**SN54LS251**	915
54LS253	AMD	SN54LS253	
	Fairchild	54LS253	
	Motorola	SN54LS253	
	National	DM54LS253	
		DM7214	
	Raytheon	54LS253	
	TI	SN54LS253	
54LS257	AMD	SN54LS257	
	Motorola	SN54LS257A	
54LS257	National	DM54LS257	
	Raytheon	54LS257	
	TI	SN54LS257	
		SN54LS257A	916
54LS258	AMD	SN54LS258	
	Fairchild	54LS258A	
	Motorola	SN54LS258A	
	National	DM54LS258	
	Raytheon	54LS258	
	TI	SN54LS258	
		SN54LS258A	917
◆54LS26	Fairchild	54LS26	
	Motorola	SN54LS26	
	National	DM54LS26	
	Raytheon	54LS26	
	TI	**SN54LS26**	841
54LS260A	Fairchild	54LS260	
	Motorola	SN54LS260A	
◆54LS261	Raytheon	54LS261	
	TI	**SN54LS261**	918
54LS266	Fairchild	54LS266	
		9386	
	Motorola	SN54LS266	
	National	DM54LS266	
	Raytheon	54LS266	
	TI	**SN54LS266**	918
◆54LS27	Fairchild	54LS27	
	Motorola	SN54LS27	
	National	DM54LS27	
	Raytheon	54LS27	
	TI	**SN54LS27**	842
54LS279	Fairchild	54LS279	
	Motorola	SN54LS279	
	National	DM54LS279	
	Raytheon	54LS279	
	TI	**SN54LS279**	921
54LS28	Fairchild	54LS28	
	Motorola	SN54LS28	
	Raytheon	54LS28	
	Signetics	54LS194A	
	TI	**SN54LS28**	842
54LS283	Fairchild	54LS283	
	Motorola	SN54LS283	
	National	DM54LS283	
	Raytheon	54LS283	
	TI	**SN54LS283**	922
54LS290	Motorola	SN54LS290	
	National	DM54LS290	
	Raytheon	54LS290	
	TI	**SN54LS290**	924
54LS293	Fairchild	54LS293	
	Motorola	SN54LS293	
	National	DM54LS293	
	Raytheon	54LS293	
	TI	**SN54LS293**	925
54LS30	Fairchild	54LS30	
	Motorola	SN54LS30	
	National	DM54LS30	
	Raytheon	54LS30	
	TI	**SN54LS30**	842
54LS32	Fairchild	54LS32	
		74LS32	
	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	732
		SN54LS32	
		SN74LS32	
	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	74LS32	
	TI	**SN54LS32**	843
		SN74LS32	843
◆54LS33	Fairchild	54LS33	
	Motorola	SN54LS33	
	Raytheon	54LS33	
	TI	**SN54LS33**	843
54LS365	Fairchild	54LS365A	
	Motorola	SN54LS365A	
	Raytheon	54LS365	
	Signetics	54LS365A	
	TI	SN54LS265A	
		SN54LS365A	935
54LS365A	Fairchild	54LS365A	
	Motorola	SN54LS365A	
	Raytheon	54LS365	
	Signetics	54LS365	
	TI	SN54LS265A	
		SN54LS365A	935

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
54LS366A	Fairchild	54LS366A	
	Motorola	SN54LS366A	
	National	DM54LS366	
	Raytheon	54LS366	
	TI	**SN54LS366A**	**935**
54LS367	Fairchild	54LS367A	
	Motorola	SN54LS367A	
	National	DM54LS367	
	Raytheon	54LS367	
	Signetics	54LS367A	
	TI	**SN54LS367A**	**936**
54LS367A	Fairchild	54LS367A	
	Motorola	SN54LS367A	
	National	DM54LS367	
	Raytheon	54LS367	
	Signetics	54LS367	
	TI	**SN54LS367A**	**936**
54LS368	Fairchild	54LS368A	
	Motorola	SN54LS368A	
	National	DM54LS368	
	Raytheon	54LS368	
	Signetics	54LS368A	
	TI	SN54LS368A	
		SN54LS368A	**936**
54LS368A	Fairchild	54LS368A	
	Motorola	SN54LS368A	
	National	DM54LS368	
	Raytheon	54LS368	
	Signetics	54LS368	
	TI	SN54LS368A	
		SN54LS368A	**936**
54LS37	Fairchild	54LS37	
	Motorola	SN54LS37	
	National	DM54LS37	
	Raytheon	54LS37	
	TI	**SN54LS37**	**844**
54LS373	**AMD**	**SN54LS373**	**1227**
	MMI	54LS373	
	Motorola	SN54LS373	
	Raytheon	54LS373	
	TI	**SN54LS373**	**937**
54LS375	Fairchild	54LS375	
	Motorola	SN54LS375	
	Raytheon	54LS375	
	TI	**SN54LS375**	**938**
◆54LS38	Fairchild	54LS38	
	Motorola	SN54LS38	
	National	DM54LS38	
	Raytheon	54LS38	
	TI	**SN54LS38**	**844**
◆54LS386	Motorola	SN54LS386	
	National	DM54LS386	
	Raytheon	54LS386	
		RM8241	
	Signetics	S82S41	
	TI	54LS386	
		SN54LS386	**942**
54LS395	Motorola	SN54LS395A	
	National	DM54LS395	
	Raytheon	54LS395A	
	TI	SN54LS395	
		SN54LS395A	**943**
◆54LS40	Fairchild	54LS40	
	Motorola	SN54LS40	
	National	DM54LS40	
	Raytheon	54LS40	
	TI	**SN54LS40**	**845**
54LS42	Fairchild	54LS42	
	Motorola	SN54LS42	
	National	DM54LS42	
	Raytheon	54LS42	
	TI	**SN54LS42**	**845**
54LS51	Fairchild	54LS51	
	Motorola	SN54LS51	
	National	DM54LS51	
	Raytheon	54LS51	
	TI	**SN54LS51**	**848**
◆54LS54	Fairchild	54LS54	
	Motorola	SN54LS54	
	National	DM54LS54	
	Raytheon	54LS54	
	TI	**SN54LS54**	**850**
◆54LS55	Fairchild	54LS55	
	Motorola	SN54LS55	
	National	DM54LS55	
	Raytheon	54LS55	
	TI	54LS55	
		SN54LS55	**851**
54LS670	Fairchild	54LS670	
	Motorola	54LS670	
		SN54LS670	
	National	DM54LS670	
	Raytheon	54LS670	
	TI	**SN54LS670**	**990**
54LS73	Motorola	SN54LS73A	
	National	DM54LS73	
	Raytheon	54LS73	
	TI	SN54LS73	
		SN54LS73A	**856**
54LS74	Fairchild	54LS74	
	Motorola	SN54LS74A	
	National	DM54LS74	
		DM54LS74A	
	Raytheon	54LS74	
	TI	SN54LS74	
		SN54LS74A	**857**
54LS75	Motorola	SN54LS75	
	National	DM54LS75	
	Raytheon	54LS75	
	TI	**SN54LS75**	**858**
54LS76	Motorola	SN54LS76A	
	National	DM54LS76	
	Raytheon	54LS76	
	TI	SN54LS76	
		SN54LS76A	**858**
◆54LS78	Motorola	SN54LS78A	
	National	DM54LS78	
	Raytheon	54LS78	
	TI	SN54LS78	
		SN54LS78A	**859**
54LS83	Fairchild	54LS83A	
	Motorola	SN542S83A	
		SN54LS83A	
	National	DM54LS83A	
	Raytheon	54LS83A	
	Signetics	54LS83A	
	TI	**SN54LS83A**	**861**
54LS83A	Fairchild	54LS83A	
	Motorola	SN542S83A	
		SN54LS83A	
	National	DM54LS83A	
	Raytheon	54LS83A	
	Signetics	54LS83	
	TI	**SN54LS83A**	**861**
54LS85	Fairchild	54LS85	
	Motorola	SN54LS85	
	National	DM54LS85	
	Raytheon	54LS85	
	TI	SN54LS85	
54LS86	Motorola	SN54LS86	
	National	DM54LS86	
	Raytheon	54LS86	
	TI	**SN54LS86**	**862**
54LS89	Motorola	SN54LS89	
54LS90	Motorola	SN54LS90	
	National	DM54LS90	
	Raytheon	54LS90	
	TI	**SN54LS90**	**864**
54LS92	Motorola	SN54LS92	
	National	DM54LS92	
	Raytheon	54LS92	
	TI	**SN54LS92**	**864**
54LS93	Fairchild	54LS93	
	Motorola	SN54LS93	
	National	DM54LS93	
	Raytheon	54LS93	
	TI	**SN54LS93**	**865**
54LS95B	Fairchild	54LS95B	
	Motorola	SN54LS95B	
	National	DM54LS95B	
	Raytheon	54LS95B	
	TI	**SN54LS95B**	**866**
54LS96	**TI**	**SN54LS96**	**866**
54S00	Fairchild	54S00	
	TI	**SN54S00**	**833**
54S02	Fairchild	54S02	
	TI	**SN54S02**	**833**
54S04	**TI**	**SN54S04**	**834**
◆54S05	Fairchild	54S05A	
	TI	**SN54S05**	**834**
54S08	Fairchild	54S08	
	TI	**SN54S08**	**835**
◆54S09	Fairchild	54S09	
	TI	**SN54S09**	**836**
54S11	Fairchild	54S11	
	TI	**SN54S11**	**836**
54S139	AMD	SN54S139	
	Fairchild	54S139	
	TI	**SN54S139**	**880**
54S140	Fairchild	54S140	
54S140	National	DM54S140	
	TI	**SN54S140**	**881**
◆54S15	Fairchild	54S15	
	TI	**SN54S15**	**838**
54S151	AMD	SN54S151	
	Fairchild	54S151	
	TI	**SN54S151**	**884**
54S153	AMD	SN54S153	
	Fairchild	54S153	
	TI	**SN54S153**	**884**
54S157	AMD	SN54S157	
	Fairchild	54S157	
	TI	**SN54S157**	**887**
54S158	AMD	SN54S158	
	Fairchild	54S158	
	TI	**SN54S158**	**887**
54S181	AMD	SN54S181	
	Fairchild	93S41M	
	TI	**SN54S181**	**897**
54S189	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	74S189	
	TI	SN54S189	
		SN74S189	
54S200	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
54S201	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
◆54S22	Fairchild	54S22	
	National	DM54S22	
	TI	**SN54S22**	**840**
54S251	AMD	SN54S251	
	TI	**SN54S251**	**915**
54S253	AMD	SN54S253	
	Fairchild	54S253	
54S257	AMD	SN54S257	
		SN74S257	
	Fairchild	74S257	
	Hitachi	HD74S257	
	National	DM7123	
		DM74S257	
		DM8123	
	Signetics	74S257	
	TI	**SN54S257**	**916**
		SN74S257	**916**
54S258	AMD	SN54S258	
	Fairchild	54S258	
	TI	**SN54S258**	**917**
54S260	Fairchild	54S260	
	TI	**SN54S260**	**918**
54S301	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
◆54S32	Fairchild	54S32	
	TI	**SN54S32**	**843**
54S37	**TI**	**SN54S37**	**844**
54S85	**TI**	**SN54S85**	**862**
54S86	Fairchild	54S86	
	TI	**SN54S86**	**862**
55325	Fairchild	MC55325	
	Motorola	MC55325	
	National	DS55325	
		LM55325	
	SiliconG	SG55325	
	TI	SN55325	
55450	Fairchild	55450	
	SiliconG	SG55450	
	TI	SN55450	
55451	Fairchild	55451	
	National	DS55451	
	SiliconG	SG55451	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
55451	TI	SN55451	
55452	Fairchild	55452	
	National	DS55452	
	SiliconG	SG55452	
	TI	SN55452	
55453	Fairchild	55453	
	National	DS55453	
		LM55453	
	SiliconG	SG55453	
	TI	SN55453	
55454	National	DS55454	
	SiliconG	SG55454	
	TI	SN55454	
◆68451	**Motorola**	**MC68451**	**1358**
68682	Motorola	MC68682	
7400	Fairchild	7400	
	Hitachi	HD7400	
	National	DM7400	
	TI	**SN7400**	**833**
	Toshiba	TC7400	
7402	Fairchild	7402	
	Hitachi	HD7402	
	National	DM7402	
	TI	**SN7402**	**833**
7403	Fairchild	7403	
	Hitachi	HD7403	
	National	DM7403	
	TI	**SN7403**	**834**
7404	Fairchild	7404	
	Hitachi	HD7404	
	National	DM7404	
	TI	**SN7404**	**834**
	Toshiba	TC7404	
7405	Fairchild	7405	
	Hitachi	HD7405	
	National	DM7405	
	TI	**SN7405**	**834**
7406	Fairchild	7406	
	Hitachi	HD7406	
	National	DM7406	
	TI	**SN7406**	**835**
7407	Fairchild	7407	
	Hitachi	HD7407	
	National	DM7407	
	TI	**SN7407**	**835**
7408	Fairchild	7408	
	Hitachi	HD7408	
	National	DM7408	
	TI	**SN7408**	**835**
7410	Fairchild	7410	
	Hitachi	HD7410	
	National	DM7410	
	TI	**SN7410**	**836**
	Toshiba	TC7410	
74107	Fairchild	74107	
	Hitachi	HD74107	
	National	DM74107	
	TI	**SN74107**	**869**
74109	National	DM74109	
	TI	**SN74109**	**870**
7411	Fairchild	7411	
	Hitachi	HD7411	
	National	DM7411	
74116	**TI**	**SN74116**	**872**
74121	Fairchild	74121	
	Hitachi	HD74121	
	National	DM74121	
	TI	**SN74121**	**873**
74123	Fairchild	74123	
	National	DM74123	
	TI	**SN74123**	**874**
74125	Fairchild	74125	
	Hitachi	HD74125	
	National	DM74125	
		DM8093	
	TI	**SN74125**	**875**
		SN74425	**946**
74126	Fairchild	74126	
	Hitachi	HD74126	
	National	DM74126	
		DM8094	
	TI	**SN74126**	**875**
		SN74426	**946**
74128	**TI**	**SN74128**	**876**
7413	Fairchild	7413	
	Hitachi	HD7413	
	National	DM7413	
	TI	**SN7413**	**837**
74132	Fairchild	74132	
	Hitachi	HD74132	
	National	DM74132	
	TI	**SN74132**	**877**
7414	Fairchild	7414	
	Hitachi	HD7414	
	National	DM7414	
	TI	**SN7414**	**837**
74141	Fairchild	74141	
		93141	
	Hitachi	HD74141	
		HD7441	
	National	DM74141	
		DM7441	
	Signetics	7441	
	TI	**SN74141**	**881**
74145	Fairchild	74145	
	Hitachi	HD74145	
	National	DM74145	
	TI	**SN74145**	**882**
74147	Hitachi	HD14508	
		HD74147	
	Motorola	MC14508	
	National	DM74147	
	RCA	CD4508	
	SGS	HCF4508	
	Signetics	HEF4508	
		N82147	
	SSS	SCL4508	
	Solitron	CM4508	
	TI	**SN74147**	**882**
	Toshiba	TC4508	
74148	Fairchild	9318	
	Hitachi	HD74148	
	National	DM54148	
		DM74148	
		DM8318	
		DM9318	
	Signetics	54148	
		N82148	
	TI	**SN54148**	**883**
		SN74148	**883**
74150	Fairchild	74150	
	Hitachi	HD74150	
	National	DM74150	
	TI	**SN74150**	**883**
74151	Fairchild	74151	
	Hitachi	HD74151	
	National	DM74151	
	TI	SN74151	
		SN74151A	**884**
74153	Fairchild	74153	
	Hitachi	HD74153	
	National	DM74153	
	TI	**SN74153**	**884**
74154	Fairchild	9311	
	Hitachi	HD74154	
	National	DM54154	
		DM7213	
		DM74154	
		DM8311	
		DM9311	
	Raytheon	RC9311	
		RM9311	
	Signetics	54154	
	TI	SN29311	
		SN39311	
		SN54154	**885**
		SN74154	**885**
74155	Fairchild	74155	
	National	DM74155	
	TI	**SN74155**	**886**
74156	Fairchild	74156	
	Hitachi	HD74156	
	National	DM74156	
	TI	**SN74156**	**886**
74157	Fairchild	74157	
		9322	
	Hitachi	HD74157	
	National	DM74157	
		DM8322	
		DM9322	
	Raytheon	RC9322	
		RM9322	
	TI	SN29322	
		SN29602	
		SN39322	
		SN74157	**887**
7416	Fairchild	7416	
	Hitachi	HD7416	
	National	DM7416	
	TI	**SN7416**	**838**
74160	Fairchild	74160	
	Hitachi	HD74160	
	National	DM74160	
	TI	**SN74160**	**889**
74161	Fairchild	74161	
	Hitachi	HD74161	
	National	DM74161	
	TI	**SN74161**	**889**
74163	Fairchild	74163	
	Hitachi	HD74163	
	National	DM74163	
	TI	**SN74163**	**890**
74164	AMD	74164	
	Fairchild	74164	
	Hitachi	HD74164	
	National	DM74164	
		DM8570	
		DM8579	
	TI	**SN74164**	**891**
74165	Fairchild	74165	
	National	DM74165	
		DM8590	
	TI	**SN74165**	**891**
74166	Fairchild	74166	
	Hitachi	HD74166	
	National	DM74166	
	TI	**SN74166**	**891**
7417	Fairchild	7417	
	Hitachi	HD7417	
	National	DM7417	
	TI	**SN7417**	**838**
74170	Fairchild	74170	
	Hitachi	HD74170	
	National	DM74170	
	TI	**SN74170**	**893**
74172	**TI**	**SN74172**	**894**
74174	Fairchild	74174	
	Hitachi	HD74174	
	National	DM74174	
	TI	**SN74174**	**895**
74175	Fairchild	74175	
	Hitachi	HD74175	
	National	DM74175	
	TI	**SN74175**	**895**
74176	Fairchild	74176	
		96176	
	National	DM74176	
		DM8280	
	Raytheon	RC8280	
	Signetics	N8280	
	TI	**SN74176**	**896**
74177	Fairchild	74177	
	National	DM74177	
		DM8281	
	Raytheon	RC8281	
	Signetics	N8281	
	TI	**SN74177**	**896**
74180	Fairchild	74180	
	Hitachi	HD74180	
	National	DM74180	
	TI	**SN74180**	**897**
74181	Fairchild	54181	
		9341	
	Hitachi	HD74181	
	National	DM54181	
		DM74181	
	Raytheon	RC9341	
		RM9341	
	Signetics	54181	
	TI	**SN54181**	**897**
		SN74181	**897**
74190	Fairchild	74190	
	Hitachi	HD74190	
	National	DM74190	
	TI	**SN74190**	**901**
74191	Fairchild	74191	
	Hitachi	HD74191	
	National	DM74191	
	TI	**SN74191**	**901**
74192	Fairchild	74192	
		9360	
	National	DM74192	
		DM8560	
	Raytheon	RC9360	
		RM9360	
	TI	**SN54192**	**902**
		SN74192	**902**
74193	Fairchild	74193	
	National	DM74193	
		DM8563	
	TI	SN74129	
		SN74193	**902**
74194	Fairchild	74194	
	Hitachi	HD74194	
	National	DM74194	
	TI	**SN74194**	**902**
74195	Fairchild	74195	
	National	DM74195	
	TI	**SN74195**	**903**
74196	Fairchild	74196	
	National	DM74196	
		DM8290	
	Raytheon	RC8290	
	TI	**SN74196**	**903**
74197	Fairchild	74197	
	National	DM74197	
		DM8291	
	Raytheon	RC8291	
	TI	**SN74197**	**904**
74198	Fairchild	74198	
	Hitachi	HD74198	
	National	DM74198	
	TI	**SN74198**	**904**
74199	Fairchild	74199	
	National	DM74199	
	TI	**SN74199**	**905**
7420	Fairchild	7420	
		9004	
	Hitachi	HD7420	
	National	DM7420	
		DM9004C	
	TI	**SN7420**	**839**
	Toshiba	TC7420	
74200	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
7421	Fairchild	7421	
74221	**TI**	**SN74221**	**906**
7426	Fairchild	7426	
	Hitachi	HD7426	
	National	DM7426	
		DM8810	
	TI	**SN7426**	**841**
7427	Fairchild	7427	
	Hitachi	HD7427	
	National	DM7427	
	TI	**SN7427**	**842**
74279	Fairchild	74279	
	TI	**SN74279**	**921**
7428	**TI**	**SN7428**	**842**
74298	Fairchild	74298	
	TI	**SN74298**	**926**
7430	Fairchild	7430	
	Hitachi	HD7430	
	National	DM7430	
	TI	**SN7430**	**842**
7432	Fairchild	7432	
	Hitachi	HD7432	
	National	DM7432	
	TI	**SN7432**	**843**
7433	**TI**	**SN7433**	**843**
74365A	**TI**	**SN74365A**	**935**
		SN74366A	**935**
74367A	**TI**	**SN74367A**	**936**
74368A	**TI**	**SN74368A**	**936**
7437	Fairchild	7437	
	Hitachi	HD7437	
	National	DM7437	
	TI	**SN7437**	**844**
7438	Fairchild	7438	
	Hitachi	HD7438	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
7438	National	DM7438	
	TI	**SN7438**	**844**
7439	Fairchild	7439	
7440	Fairchild	7440	
	Hitachi	HD7440	
	National	DM7440	
	TI	**SN7440**	**845**
7441	Fairchild	74141	
		93141	
	Hitachi	HD74141	
		HD7441	
	National	DM74141	
		DM7441	
	Signetics	74141	
	TI	**SN74141**	**881**
7442	Fairchild	7442	
	Hitachi	HD7442	
	National	DM7442	
		DM8842	
	TI	SN7442	
		SN7442A	**845**
7445	Fairchild	7445	
	Hitachi	HD7445	
	National	DM7445	
	TI	**SN7445**	**846**
7450	Fairchild	7450	
	Hitachi	HD7450	
	National	DM7450	
	TI	**SN7450**	**848**
7451	Fairchild	7451	
	Hitachi	HD7451	
	National	DM7451	
	TI	**SN7451**	**848**
7473	Fairchild	7473	
	Hitachi	HD7473	
	National	DM7473	
	TI	**SN7473**	**856**
7474	Fairchild	7474	
	Hitachi	HD7474	
	National	DM7474	
	TI	**SN7474**	**857**
7475	Fairchild	7475	
	Hitachi	HD7475	
	National	DM7475	
	TI	**SN7475**	**858**
7476	Fairchild	7476	
	Hitachi	HD7476	
	National	DM7476	
	TI	**SN7476**	**858**
7477	TI	SN7477	
7483	Fairchild	7483	
	Hitachi	HD7483	
	National	DM7483	
	TI	SN7483	
		SN7483A	**861**
7485	Fairchild	7485	
	Hitachi	HD7485	
	National	DM7485	
	TI	**SN7485**	**862**
7486	Fairchild	7486	
	Hitachi	HD7486	
	National	DM7486	
	TI	**SN7486**	**862**
7488	Fairchild	7488	
	Motorola	MC4002	
	National	DM7488	
	Signetics	N8224	
	TI	SN7488	
		SN7488A	**863**
7489	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
7489	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
7490	Fairchild	7490	
	Hitachi	HD7490	
	National	DM7490	
	TI	SN7490	
		SN7490A	**864**
7491	Fairchild	7491	
	Hitachi	HD7491	
	National	DM7491	
	TI	SN7491	
		SN7491A	**864**
7492	Fairchild	7492	
	Hitachi	HD7492	
	National	DM7492	
	TI	SN7492	
		SN7492A	**864**
7493	Fairchild	7493	
	Hitachi	HD7493	
	National	DM7493	
	TI	SN7493	
		SN7493A	**865**
7494	Fairchild	7494	
	Hitachi	HD7494	
	TI	**SN7494**	**865**
7495	Fairchild	7495	
	Hitachi	HD7495	
	National	DM7495	
	TI	SN7495	
		SN7495A	**866**
7496	Fairchild	7496	
	Hitachi	HD7496	
	National	DM7496	
	TI	**SN7496**	**866**
74F00	Fairchild	74F00	
	Motorola	**MC74F00**	**731**
74F02	Fairchild	74F02	
	Motorola	**MC74F02**	**731**
74F04	Fairchild	74F04	
	Motorola	**MC74F04**	**731**
74F08	Fairchild	74F08	
	Motorola	**MC74F08**	**731**
74F10	Fairchild	74F10	
	Motorola	**MC74F10**	**731**
74F109	Fairchild	74F109	
	Motorola	**MC74F109**	**731**
74F11	Fairchild	74F11	
	Motorola	**MC74F11**	**731**
74F138	Fairchild	74F138	
	Motorola	**MC74F138**	**731**
74F139	Fairchild	74F139	
	Motorola	**MC74F139**	**731**
74F157	Fairchild	74F157	
74F158	Fairchild	74F158	
74F20	Fairchild	74F20	
	Motorola	**MC74F20**	**731**
74F240	**Fairchild**	**74F240**	**630**
	Motorola	**MC74F240**	**731**
74F241	**Fairchild**	**74F241**	**630**
	Motorola	**MC74F241**	**731**
74F242	Fairchild	74F242	
	Motorola	**MC74F242**	**731**
74F243	Fairchild	74F243	
	Motorola	**MC74F243**	**731**
74F244	**Fairchild**	**74F244**	**630**
	Motorola	**MC74F244**	**731**
74F257	Fairchild	74F257	
74F258	Fairchild	74F258	
74F32	Fairchild	74F32	
	Motorola	**MC74F32**	**731**
74F373	**Fairchild**	**74F373**	**632**
	Motorola	**MC74F373**	**731**
74F374	**Fairchild**	**74F374**	**634**
	Motorola	**MC74F374**	**731**
74F521	Fairchild	74F521	
	SGS	T74LS247	
74F533	Fairchild	74F533	
	Motorola	**MC74F533**	**731**
74F534	Fairchild	74F534	
	Motorola	**MC74F534**	**731**
74F74	Fairchild	74F74	
	Motorola	**MC74F74**	**731**
74F86	Fairchild	74F86	
74H101	Fairchild	74H101	
	TI	**SN74H101**	**868**
74LS00	Fairchild	74LS00	
	Hitachi	HD74LS00	
	Motorola	SN74LS00	
	National	DM74LS00	
	Raytheon	74LS00	
	SGS	T74LS00	
	TI	**SN74LS00**	**833**
74LS01	Fairchild	HD74LS01	
	Hitachi	HD74LS01	
	Motorola	SN74LS01	
	National	DM74LS01	
	Raytheon	74LS01	
	TI	**SN74LS01**	**833**
74LS02	Fairchild	74LS02	
	Hitachi	HD74LS02	
	Motorola	SN74LS02	
	National	DM74LS02	
	Raytheon	74LS02	
	SGS	T74LS02	
	TI	**SN74LS02**	**833**
74LS04	Fairchild	74LS04	
	Hitachi	HD74LS04	
	Motorola	SN74LS04	
	National	DM74LS04	
	Raytheon	74LS04	
	SGS	T74LS04	
	TI	**SN74LS04**	**834**
74LS05	Fairchild	74LS05	
	Hitachi	HD74LS05	
	Motorola	SN74LS05	
	National	DM74LS05	
	NEC-Electron	μPB74LS05	
	Raytheon	74LS05	
	SGS	T74LS05	
	TI	**SN74LS05**	**834**
74LS08	Fairchild	74LS08	
	Hitachi	HD74LS08	
	Motorola	SN74LS08	
	National	DM74LS08	
	Raytheon	74LS08	
	SGS	T74LS08	
	Signetics	SN74LS08	
	TI	**SN74LS08**	**835**
74LS10	Fairchild	74LS10	
	Hitachi	HD74LS10	
	Motorola	SN74LS10	
	National	DM74LS10	
	Raytheon	74LS10	
	SGS	T74LS10	
	TI	**SN74LS10**	**836**
74LS107	Hitachi	HD74LS107	
	Motorola	SN74LS107A	
	National	DM74LS107	
	Raytheon	74LS107	
	TI	**SN74LS107A**	**869**
74LS109	Fairchild	74LS109	
	Hitachi	HD74LS109	
	Motorola	SN74LS109	
		SN74LS109A	
	National	DM74LS109	
	Raytheon	74LS109	
	TI	**SN74LS109A**	**870**
		SN74S109A	
74LS11	Fairchild	74LS11	
	Hitachi	HD74LS11	
	Motorola	SN74LS11	
	National	DM74LS11	
	Raytheon	74LS11	
	SGS	T74LS11	
74LS11	**TI**	**SN74LS11**	**836**
74LS112	Fairchild	74LS112	
	Hitachi	HD74LS112	
	Motorola	SN74LS112A	
	National	DM74LS112	
	Raytheon	74LS112	
	SGS	T74LS112	
	TI	**SN74LS112A**	**871**
74LS113	Fairchild	74LS113	
	Hitachi	HD74LS113	
	Motorola	SN74LS113A	
	National	DM74LS113	
	Raytheon	74LS113	
	SGS	T74LS113	
	TI	**SN74LS113A**	**871**
74LS12	Hitachi	HD74LS12	
	Motorola	SN74LS12	
	National	DM74LS12	
	Raytheon	74LS12	
	TI	**SN74LS12**	**837**
74LS125A	Fairchild	74LS125A	
	Motorola	SN74LS125A	
	National	DM74LS125	
	Raytheon	74LS125	
	SGS	T74LS125	
	TI	**SN74LS125A**	**875**
74LS126A	Fairchild	74LS126	
	Motorola	SN74LS126A	
	National	DM74LS126	
	Raytheon	74LS126	
	SGS	T74LS126	
	TI	**SN74LS126A**	**875**
74LS13	Fairchild	74LS13	
	Hitachi	HD74LS13	
	Motorola	SN74LS13	
	National	DM74LS13	
	Raytheon	74LS13	
	TI	**SN74LS13**	**837**
74LS132	Fairchild	74LS132	
	Hitachi	HD74LS132	
	Motorola	SN74LS132	
	National	DM74LS132	
	Raytheon	74LS132	
	SGS	T74LS132	
	TI	SN74LS132	
74LS136	Fairchild	74LS136	
	Hitachi	HD74LS136	
	Motorola	SN74LS136	
	National	DM74LS136	
	Raytheon	74LS136	
	SGS	T74LS136	
	TI	**SN74LS136**	**878**
74LS138	Fairchild	74LS138	
	Hitachi	HD74LS138	
	Motorola	SN74LS138	
	National	DM74LS138	
	Raytheon	74LS138	
	SGS	T74LS138	
	TI	**SN74LS138**	**880**
74LS139	Fairchild	74LS139	
	Hitachi	HD74LS139	
	Motorola	SN74LS139	
	National	DM74LS139	
	Raytheon	74LS139	
	SGS	T74LS139	
	TI	**SN74LS139**	**880**
74LS14	Fairchild	74LS14	
	Hitachi	HD74LS14	
	Motorola	SN74LS14	
	National	DM74LS14	
	Raytheon	74LS14	
	TI	**SN74LS14**	**837**
74LS151	Fairchild	74LS151	
	Hitachi	HD74LS151	
		HD74LS151A	
	Motorola	SN74LS151	
	National	DM74LS151	
	Raytheon	74LS151	
	SGS	T74LS151	
	TI	**SN74LS151**	**884**
74LS152	Raytheon	74LS152	
74LS153	Fairchild	74LS153	
	Hitachi	HD74LS153	
	Motorola	SN74LS153	
	National	DM74LS153	
	Raytheon	74LS153	
	SGS	T74LS153	
	TI	**SN74LS153**	**884**
74LS154	National	DM74LS154	
74LS155	Fairchild	74LS155	
	Hitachi	HD74LS155	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
74LS155	Motorola	SN74LS155	
	National	DM74LS155	
	Raytheon	74LS155	
	TI	**SN74LS155**	**886**
74LS156	Fairchild	74LS156	
	Hitachi	HD74LS156	
	Motorola	SN74LS156	
	National	DM74LS156	
	Raytheon	74LS156	
	SGS	T74LS156	
	TI	**SN74LS156**	**886**
74LS157	Fairchild	74LS157	
	Hitachi	HD74LS157	
	Motorola	SN74LS157	
	National	DM74LS157	
	Raytheon	74LS157	
	SGS	T74LS157	
	TI	**SN74LS157**	**887**
74LS158	Fairchild	74LS158	
	Hitachi	HD74LS158	
	Motorola	SN74LS158	
	National	DM74LS158	
	Raytheon	74LS158	
	SGS	T74LS158	
	TI	**SN74LS158**	**887**
74LS160	Fairchild	74LS160	
	Hitachi	HD74LS160A	
	Motorola	SN74LS160A	
	National	DM74LS160	
	Raytheon	74LS160	
	Signetics	74LS160A	
	TI	**SN74LS160A**	**889**
74LS160A	Fairchild	74LS160	
	Hitachi	HD74LS160A	
	Motorola	SN74LS160A	
	National	DM74LS160	
	Raytheon	74LS160	
	Signetics	74LS160	
	TI	**SN74LS160A**	**889**
74LS161A	AMD	SN74LS161	
	Fairchild	74LS161A	
	Hitachi	HD74LS161A	
	Motorola	SN74LS161A	
	National	DM74LS161	
	NEC-Electron	μPB74LS161	
	Raytheon	74LS161	
	TI	**SN74LS161A**	**889**
74LS162A	Fairchild	74LS162	
	Hitachi	HD74LS162A	
	Motorola	SN74LS162A	
	National	DM74LS162	
	Raytheon	74LS162	
	SGS	T74LS162	
	TI	SN74LS162A	
74LS163A	Fairchild	74LS163	
	Hitachi	HD74LS163	
		HD74LS163A	
	Motorola	SN74LS163A	
	National	DM74LS163	
	Raytheon	74LS163	
	SGS	T74LS163	
	TI	**SN74LS163A**	**890**
74LS164	Fairchild	74LS164	
	Hitachi	HD74LS164	
	Motorola	SN74LS164A	
	National	DM74LS164	
	Raytheon	74LS164	
	SGS	T74LS164	
	Signetics	74LS164A	
	TI	**SN74LS164**	**891**
74LS164A	Fairchild	74LS164	
	Hitachi	HD74LS164	
	Motorola	SN74LS164A	
	National	DM74LS164	
	Raytheon	74LS164	
	SGS	T74LS164	
	Signetics	74LS164	
	TI	**SN74LS164**	**891**
74LS168A	Fairchild	74LS168	
	Hitachi	HD74LS168	
	Motorola	SN74LS168	
	National	DM74LS168	
	TI	SN74LS168	
74LS169A	Fairchild	74LS169	
	Hitachi	HD74LS169	
	Motorola	SN74LS169	
	National	DM74LS169	
74LS170	Fairchild	74LS170	
	Motorola	SN74LS170	
74LS170	National	DM74LS170	
	Raytheon	74LS170	
	SGS	T74LS170	
	TI	**SN74LS170**	**893**
74LS173	Fairchild	74LS173	
	Motorola	SN74LS173A	
	National	DM74LS173	
	TI	**SN74LS173A**	**894**
74LS174	Fairchild	74LS174	
	Hitachi	HD74LS174	
	Motorola	SN74LS174	
	National	DM74LS174	
	Raytheon	74LS174	
	SGS	T74LS174	
	TI	**SN74LS174**	**895**
74LS175	Fairchild	74LS175	
	Hitachi	HD74LS175	
	Motorola	SN74LS175	
	Raytheon	74LS175	
	SGS	T74LS175	
	TI	**SN74LS175**	**895**
74LS181	Fairchild	74LS181	
	Hitachi	HD74LS181	
	Motorola	SN74LS181	
	Raytheon	74LS181	
	SGS	T74LS181	
	TI	**SN74LS181**	**897**
74LS191	Fairchild	74LS191	
	Hitachi	HD74LS191	
	Motorola	SN74LS191	
	National	DM74LS191	
	Raytheon	74LS191	
	SGS	T74LS191	
	TI	**SN74LS191**	**901**
74LS192	Fairchild	74LS192	
	Hitachi	HD74LS192	
	Motorola	SN74LS192	
	National	DM74LS192	
	Raytheon	74LS192	
	SGS	T74LS192	
	TI	**SN74LS192**	**902**
74LS193	Fairchild	74LS193	
	Hitachi	HD74LS193	
	Motorola	SN74LS193	
	National	DM74LS193	
	Raytheon	74LS193	
	SGS	T74LS193	
	TI	**SN74LS193**	**902**
74LS194A	Fairchild	74LS194A	
	Hitachi	HD74LS194A	
	Motorola	SN74LS194A	
	National	DM74LS194	
	SGS	T74LS194A	
	TI	**SN74LS194A**	**902**
74LS195A	Fairchild	74LS195A	
	Hitachi	HD74LS195A	
	Motorola	SN74LS195A	
	National	DM74LS195	
	Raytheon	74LS195A	
	SGS	T74LS195A	
	TI	**SN74LS195A**	**903**
74LS197	Fairchild	74LS197	
	Hitachi	HD74LS197	
	Motorola	SN74LS197	
	National	DM74LS197	
	Raytheon	74LS197	
	TI	**SN74LS197**	**904**
74LS20	Fairchild	74LS20	
	Hitachi	HD74LS20	
	Motorola	SN74LS20	
	National	DM74LS20	
	Raytheon	74LS20	
	SGS	T74LS20	
	TI	**SN74LS20**	**839**
74LS21	Fairchild	74LS21	
	Hitachi	HD74LS21	
	Motorola	SN74LS21	
	National	DM74LS21	
	Raytheon	74LS21	
	SGS	T74LS21	
	TI	**SN74LS21**	**840**
74LS240	AMD	SN74LS240	
	Fairchild	74LS240	
	Hitachi	HD74LS240	
	MMI	74LS240	
	Motorola	SN74LS240	
	Raytheon	74LS240	
	TI	**SN74LS240**	**910**
74LS241	AMD	SN74LS241	
	Fairchild	74LS241	
	Hitachi	HD74LS241	
	MMI	74LS241	
74LS241	Motorola	SN74LS241	
	Raytheon	74LS241	
	TI	**SN74LS241**	**911**
74LS242	AMD	SN74LS242	
	Fairchild	74LS242A	
	Motorola	SN74LS242	
	Raytheon	74LS242	
	TI	**SN74LS242**	**911**
74LS243	AMD	SN74LS243	
	Fairchild	74LS243A	
	Motorola	SN74LS243	
	Raytheon	74LS243	
	TI	**SN74LS243**	**912**
74LS244	AMD	SN74LS244	
	Fairchild	74LS244	
	Hitachi	HD74LS244	
	MMI	74LS244	
	Motorola	SN74LS244	
	Raytheon	74LS244	
	TI	**SN74LS244**	**912**
74LS245	Fairchild	74LS245	
	GTEMicro	G74SC245	
	Mitel	**MD74SC245**	
			702,706
	Motorola	SN74LS245	
	Plessey	MV74SC245	
	SPI	**SP74SC245**	**761**
	Signetics	N8T245	
	TI	**SN74LS245**	**913**
74LS251	Fairchild	74LS251	
	Hitachi	HD74LS251	
	Motorola	SN74LS251	
	National	DM74LS251	
	Raytheon	74LS251	
	SGS	T74LS251	
	TI	**SN74LS251**	**915**
74LS253	Fairchild	74LS253	
	Hitachi	HD74LS253	
	Motorola	SN74LS253	
	National	DM74LS253	
		DM8214	
	Raytheon	74LS253	
	SGS	T74LS253	
	TI	SN74LS253	
74LS256	Fairchild	74LS256	
	Motorola	SN74LS256	
74LS257	Fairchild	74LS257A	
	Hitachi	HD74LS257	
	Motorola	SN74LS257A	
	National	DM74LS257	
	Raytheon	74LS257	
	SGS	T74LS257	
	Signetics	74LS257A	
	TI	SN74LS257	
74LS257A	Fairchild	74LS257A	
	Hitachi	HD74LS257	
	Motorola	SN74LS257A	
	National	DM74LS257	
	Raytheon	74LS257	
	SGS	T74LS257	
	Signetics	74LS257	
	TI	SN74LS257	
74LS258	Fairchild	74LS258A	
	Hitachi	HD74LS258	
	Motorola	SN74LS258A	
	National	DM74LS258	
	Raytheon	74LS258	
	SGS	T74LS258	
	TI	SN74LS258	
74LS259	Fairchild	74LS259	
	Motorola	SN74LS259	
	SGS	T74LS259	
	TI	**SN74LS259**	**917**
74LS26	Fairchild	74LS26	
	Hitachi	HD74LS26	
	Motorola	SN74LS26	
	National	DM74LS26	
	Raytheon	74LS26	
	SGS	T74LS26	
	TI	**SN74LS26**	**841**
74LS260	Fairchild	74LS260	
	Motorola	SN74LS260	
74LS266	Fairchild	74LS266	
	Motorola	SN74LS266	
	National	DM74LS266	
	Raytheon	74LS266	
		RC8242	
	SGS	T74LS266	
	Signetics	N8242	
	TI	**SN74LS266**	**918**
74LS27	Fairchild	74LS27	
74LS27	Hitachi	HD74LS27	
	Motorola	SN74LS27	
	National	DM74LS27	
	Raytheon	74LS27	
	SGS	T74LS27	
	TI	**SN74LS27**	**842**
74LS273	**AMD**	**SN74LS273**	**1227**
	Fairchild	74LS273	
	Motorola	SN74LS273	
	Raytheon	74LS273	
	SGS	T74LS273	
	TI	**SN74LS273**	**919**
74LS279	Fairchild	74LS279	
	Hitachi	HD74LS279	
	Motorola	SN74LS279	
	National	DM74LS279	
	Raytheon	74LS279	
	TI	**SN74LS279**	**921**
74LS283	Fairchild	74LS283	
	Hitachi	HD74LS283	
		HD74LS283A	
	Motorola	SN74LS283	
	National	DM74LS283	
	Raytheon	74LS283	
	SGS	T74LS283	
	TI	**SN74LS283**	**922**
74LS290	Fairchild	74LS290	
	Hitachi	HD74LS290	
	Motorola	SN74LS290	
	National	DM74LS290	
	Raytheon	74LS290	
	SGS	T74LS290	
	TI	**SN74LS290**	**924**
74LS293	Fairchild	74LS293	
	Hitachi	HD74LS293	
	Motorola	SN74LS293	
	National	DM74LS293	
	SGS	T74LS293	
	TI	**SN74LS293**	**925**
74LS295A	Fairchild	74LS295A	
	Motorola	SN74LS295A	
	Raytheon	74LS295A	
	Signetics	74LS295B	
	TI	**SN74LS295B**	**925**
74LS295B	Fairchild	74LS295A	
	Motorola	SN74LS295A	
	Raytheon	74LS295A	
	Signetics	74LS295A	
	TI	**SN74LS295B**	**925**
74LS298	Fairchild	74LS298	
	Hitachi	HD74LS298	
	Motorola	SN74LS298	
	Raytheon	74LS298	
	SGS	T74LS298	
	TI	**SN74LS298**	**926**
74LS30	Fairchild	74LS30	
	Hitachi	HD74LS30	
	Motorola	SN74LS30	
	National	DM74LS30	
	Raytheon	74LS30	
	SGS	T74LS30	
	TI	**SN74LS30**	**842**
74LS32	Fairchild	54LS32	
		74LS32	
	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	**732**
		SN54LS32	
		SN74LS32	
	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
	TI	**SN54LS32**	**843**
		SN74LS32	**843**
74LS33	Fairchild	74LS33	
	Motorola	SN74LS33	
	Raytheon	74LS33	
	TI	**SN74LS33**	**843**
74LS365	Fairchild	74LS365A	
	Motorola	SN74LS365A	
	National	DM74LS365	
	Raytheon	74LS365	
	SGS	T74LS365A	
	Signetics	74LS365A	
	TI	**SN74LS365A**	**935**
74LS365A	Fairchild	74LS365A	
	Motorola	SN74LS365A	
	National	DM74LS365	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

© IC MASTER 1983

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
74LS365A	Raytheon	74LS365	
	SGS	T74LS365A	
	Signetics	74LS365	
	TI	**SN74LS365A**	**935**
74LS366A	Fairchild	74LS366A	
	Motorola	SN74LS366A	
	National	DM74LS366	
	Raytheon	74LS366	
	SGS	T74LS366A	
	TI	**SN74LS366A**	**935**
74LS367	Fairchild	74LS367A	
	Hitachi	HD74LS367	
		HD74LS367A	
	Motorola	SN74LS367A	
	National	DM74LS367	
	Raytheon	74LS367	
	SGS	T74LS367A	
	Signetics	74LS367A	
	TI	**SN74LS367A**	**936**
74LS367A	Fairchild	74LS367A	
	Hitachi	HD74LS367	
		HD74LS367A	
	Motorola	SN74LS367A	
	National	DM74LS367	
	Raytheon	74LS367	
	SGS	T74LS367A	
	Signetics	74LS367	
	TI	**SN74LS367A**	**936**
74LS368	Fairchild	74LS368A	
	Hitachi	HD74LS368	
	Motorola	SN73LS368A	
		SN74LS368A	
	National	DM74LS368	
	Raytheon	74LS368	
	SGS	T74LS3	
	Signetics	74LS368A	
	TI	**SN74LS368A**	**936**
74LS368A	Fairchild	74LS368A	
	Hitachi	HD74LS368	
	Motorola	SN73LS368A	
		SN74LS368A	
	National	DM74LS368	
	Raytheon	74LS368	
	SGS	T74LS3	
	Signetics	74LS368	
	TI	**SN74LS368A**	**936**
74LS37	Fairchild	74LS37	
	Hitachi	HD74LS37	
	Motorola	SN74LS37	
	National	DM74LS37	
	Raytheon	74LS37	
	SGS	T74LS37	
	TI	**SN74LS37**	**844**
74LS373	**AMD**	**SN74LS373**	**1227**
	Fairchild	74LS373	
	MMI	74LS373	
	Motorola	SN74LS373	
	Raytheon	74LS373	
	SGS	T74LS373	
	TI	**SN74LS373**	**937**
74LS374	AMD	SN74LS374	
	Fairchild	74LS374	
	MMI	74LS374	
	Motorola	SN74LS374	
	National	DM74LS374	
	Raytheon	74LS374	
	SGS	T74LS374	
	TI	**SN74LS374**	**938**
74LS375	Fairchild	74LS375	
	Motorola	SN74LS375	
	Raytheon	74LS375	
	TI	**SN74LS375**	**938**
74LS377	**AMD**	**SN74LS377**	**1227**
	Fairchild	74LS377	
	Motorola	SN74LS377	
	Raytheon	74LS377	
	SGS	T74LS377	
	TI	**SN74LS377**	**939**
74LS378	AMD	SN74LS378	
	Fairchild	74LS378	
	Motorola	SN74LS378	
	SGS	T74LS378	
	Signetics	SN74LS378	
	TI	**SN74LS378**	**939**
74LS38	Fairchild	74LS38	
	Hitachi	HD74LS38	
	Motorola	SN74LS38	
	National	DM74LS38	
	Raytheon	74LS38	
74LS38	SGS	T74LS38	
	TI	**SN74LS38**	**844**
74LS393	Fairchild	74LS393	
	Motorola	SN74LS393	
	SGS	T74LS393	
	TI	**SN74LS393**	**943**
74LS395	Fairchild	74LS395	
	Motorola	SN74LS395A	
	National	DM74LS395	
	Raytheon	74LS395A	
	TI	**SN74LS395A**	**943**
74LS40	Fairchild	74LS40	
	Hitachi	HD74LS40	
	Motorola	SN74LS40	
	National	DM74LS40	
	Raytheon	74LS40	
	SGS	T74LS40	
	TI	**SN74LS40**	**845**
74LS42	Fairchild	74LS42	
	Hitachi	HD74LS42	
	Motorola	SN74LS42	
	National	DM74LS42	
	Raytheon	74LS42	
	SGS	T74LS42	
	TI	**SN74LS42**	**845**
74LS48	Fairchild	74LS48	
	Hitachi	HD74LS48	
	Motorola	SN74LS48	
	National	DM74LS48	
	SGS	T74LS48	
	TI	**SN74LS48**	**847**
74LS490	Fairchild	74LS490	
	Motorola	SN74LS490	
	SGS	T74LS490	
	TI	**SN74LS490**	**955**
74LS51	Fairchild	74LS51	
	Hitachi	HD74LS51	
	Motorola	SN74LS51	
	National	DM74LS51	
	Raytheon	74LS51	
	SGS	T74LS51	
	TI	**SN74LS51**	**848**
74LS54	Fairchild	74LS54	
	Hitachi	HD74LS54	
	Motorola	SN74LS54	
	National	DM74LS54	
	Raytheon	74LS54	
	SGS	T74LS54	
	TI	**SN74LS54**	**850**
74LS540	Fairchild	74LS540	
	Motorola	SN74LS540	
	TI	**SN74LS540**	**960**
74LS541	Fairchild	74LS541	
	Motorola	SN74LS541	
	TI	**SN74LS541**	**960**
74LS568	AMD	AM74LS568	
74LS569	AMD	AM74LS569	
74LS640	Motorola	SN74LS640	
	Signetics	8T125	
		N8T125	
	TI	**SN74LS640**	**984**
74LS641	Motorola	SN74LS641	
	TI	**SN74LS641**	**984**
74LS642	Motorola	SN74LS642	
	TI	**SN74LS642**	**984**
74LS645	Motorola	SN74LS645	
	TI	**SN74LS645**	**984**
74LS670	Fairchild	74LS670	
	Motorola	SN74LS670	
	National	DM74LS670	
	Raytheon	74LS670	
	SGS	T74LS670	
	TI	**SN74LS670**	**990**
74LS73	Hitachi	HD74LS73	
	Motorola	SN74LS73A	
	National	DM74LS73	
	Raytheon	74LS73	
	TI	**SN74LS73A**	**856**
74LS74	Fairchild	74LS74	
	Hitachi	HD74LS74	
		HD74LS74A	
	Motorola	SN74LS74A	
	National	DM74LS74	
	Raytheon	74LS74	
	SGS	T74LS74	
	TI	**SN74LS74A**	**857**
74LS75	Hitachi	HD74LS75	
	Motorola	SN74LS75	
	National	DM74LS75	
	Raytheon	74LS75	
	TI	**SN74LS75**	**858**
74LS76	Hitachi	HD74LS76	
	Motorola	SN74LS76A	
	National	DM74LS76	
	Raytheon	74LS76	
	TI	**SN74LS76A**	**858**
74LS83	Fairchild	74LS83A	
	Hitachi	HD74LS183A	
		HD74LS83A	
	Motorola	SN74LS83A	
	National	DM74LS83A	
	Raytheon	74LS83	
		74LS83A	
	Signetics	74LS83A	
	TI	**SN74LS83A**	**861**
74LS83A	Fairchild	74LS83A	
	Hitachi	HD74LS183A	
		HD74LS83A	
	Motorola	SN74LS83A	
	National	DM74LS83A	
	Raytheon	74LS83	
		74LS83A	
	Signetics	74LS83	
	TI	**SN74LS83A**	**861**
74LS85	Fairchild	74LS85	
	Hitachi	HD74LS85	
	Motorola	SN74LS85	
	National	DM74LS85	
	Raytheon	74LS85	
	TI	**SN74LS85**	**862**
74LS86	Fairchild	74LS86	
	Hitachi	HD74LS86	
	Motorola	SN74LS86	
	National	DM74LS86	
	Raytheon	74LS86	
	SGS	T74LS86	
	TI	**SN74LS86**	**862**
74LS89	Motorola	SN74LS89	
74LS90	Fairchild	74LS90	
	Motorola	SN74LS90	
	National	DM74LS90	
	Raytheon	74LS90	
	SGS	T74LS90	
	TI	**SN74LS90**	**864**
74LS92	Fairchild	74LS92	
	Hitachi	HD74LS92	
	Motorola	SN74LS92	
	National	DM74LS92	
	Raytheon	74LS92	
	SGS	T74LS92	
	TI	**SN74LS92**	**864**
74LS93	Fairchild	74LS93	
	Hitachi	HD74LS93	
	Motorola	SN74LS93	
	National	DM74LS93	
	Raytheon	74LS93	
	SGS	T74LS93	
	TI	**SN74LS93**	**865**
74LS95B	Fairchild	74LS95B	
	Hitachi	HD74LS95B	
	Motorola	SN74LS95B	
	National	DM74LS95B	
	Raytheon	74LS95B	
	SGS	T74LS95B	
	TI	**SN74LS95B**	**866**
74LS96	**TI**	**SN74LS96**	**866**
74S00	Fairchild	74S00	
	Hitachi	HD74S00	
	National	DM74S00	
	TI	**SN74S00**	**833**
74S02	Fairchild	74S02	
	Hitachi	HD74S02	
	National	DM74S02	
	TI	**SN74S02**	**833**
		SN74S32	**843**
74S03	Fairchild	74S03	
	Hitachi	HD74S03	
	National	DM74S03	
	TI	**SN74S03**	**834**
74S04	Fairchild	74S04	
	Hitachi	HD74S04	
	National	DM74S04	
	TI	**SN74S04**	**834**
74S05	Fairchild	74S05	
	Hitachi	HD74S05	
	National	DM74S05	
	TI	**SN74S05**	**834**
74S08	Fairchild	74S08	
	TI	**SN74S08**	**835**
74S10	Fairchild	74S10	
	Hitachi	HD74S10	
	National	DM74S10	
	TI	**SN74S10**	**836**
74S11	Fairchild	74S11	
	Hitachi	HD74S11	
	National	DM74S11	
	TI	**SN74S11**	**836**
74S112	Fairchild	74S112	
	Hitachi	HD74S112	
	Motorola	SN74S112	
	National	DM74S112	
	TI	**SN74S112**	**871**
74S113	Fairchild	74S113	
	Hitachi	HD74S113	
	National	DM74S113	
	TI	**SN74S113**	**871**
74S133	Fairchild	74S133	
	Hitachi	HD74S133	
	National	DM74S133	
	TI	**SN74S133**	**877**
74S134	Hitachi	HD74S134	
	National	DM74S134	
	TI	**SN74S134**	**877**
74S135	Fairchild	74S135	
	Hitachi	HD74S135	
	National	DM74S135	
	TI	**SN74S135**	**878**
74S138	AMD	SN74S138	
	Fairchild	74S138	
	National	DM74S138	
	TI	**SN74S138**	**880**
74S139	AMD	SN74S139	
	Fairchild	74S139	
	National	DM74S139	
	TI	**SN74S139**	**880**
74S140	Fairchild	74S140	
	Hitachi	HD74S140	
	National	DM74S140	
	TI	**SN74S140**	**881**
74S151	AMD	SN74S151	
	Fairchild	74S151	
	Hitachi	HD74S151	
	National	DM74S151	
	TI	**SN74S151**	**884**
74S153	AMD	SN74S153	
	Fairchild	74S153	
	Hitachi	HD74S153	
	National	DM74S153	
	TI	**SN74S153**	**884**
74S157	AMD	SN74S157	
	Fairchild	74S157	
	Hitachi	HD74S157	
	National	DM74S157	
	TI	**SN74S157**	**887**
74S158	AMD	SN74S158	
	Fairchild	74S158	
	Hitachi	HD74S158	
	National	DM74S158	
	TI	**SN74S158**	**887**
74S168	**TI**	**SN74S168**	**892**
74S169	**TI**	**SN74S169**	**892**
74S174	AMD	SN74S174	
	Fairchild	74S174	
	Hitachi	HD74S174	
	National	DM74S174	
	TI	**SN74S174**	**895**
74S175	AMD	SN74S175	
	Fairchild	74S175	
	Hitachi	HD74S175	
	National	DM74S175	
	TI	**SN74S175**	**895**
74S181	AMD	SN74S181	
	Fairchild	93S41C	
	Hitachi	HD74S181	
	TI	SN74S181	
74S182	Fairchild	74S182	
	Hitachi	HD74S182	
	MMI	74S182	
	National	DM74S182	
	TI	**SN74S182**	**898**
74S189	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
74S189	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
	TI	SN54S189	
		SN74S189	
74S194	AMD	SN74S194	
	Fairchild	74S194	
	TI	**SN74S194**	**902**
74S195	AMD	SN74S195	
	Fairchild	74S195	
		93S00C	
	National	DM74S195	
	TI	**SN74S195**	**903**
74S196	**TI**	**SN74S196**	**903**
74S197	**TI**	**SN74S197**	**904**
74S20	Fairchild	74S20	
	Hitachi	HD74S20	
	National	DM74S20	
	TI	**SN74S20**	**839**
74S240	AMD	SN74S240	
	MMI	74S240	
		SN74S240	**715**
	TI	**SN74S240**	**910**
74S241	AMD	SN74S241	
	MMI	74S241	
		SN74S241	**715**
	TI	**SN74S241**	**911**
74S244	AMD	AM74S244	
74S251	AMD	SN74S251	
	Hitachi	HD74S251	
	National	DM74S251	
	TI	**SN74S251**	**915**
74S253	AMD	SN74S253	
	Fairchild	74S253	
	National	DM74S253	
74S257	AMD	SN54S257	
		SN74S257	
	Fairchild	74S257	
	Hitachi	HD74S257	
	National	DM7123	
		DM74S257	
		DM8123	
	Signetics	54S257	
	TI	**SN54S257**	**916**
		SN74S257	**916**
74S258	AMD	SN74S258	
	Fairchild	74S258	
	Hitachi	HD74S258	
	TI	**SN74S258**	**917**
74S280	Hitachi	HD74S280	
	National	DM74S280	
	TI	**SN74S280**	**921**
74S301	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
74S32	Fairchild	74S32	
74S37	**TI**	**SN74S37**	**844**
74S373	MMI	74S373	
		SN74S373	**715**
	TI	**SN74S373**	**937**
74S374	MMI	74S374	
		SN74S374	**715**
	TI	**SN74S374**	**938**
74S40	Fairchild	74S40	
	Hitachi	HD74S40	
	National	DM74S40	
	TI	**SN74S40**	**845**
74S51	Fairchild	74S51	
74S51	Hitachi	HD74S51	
	National	DM74S51	
	TI	**SN74S51**	**848**
74S534	AMD	AM74S534	
74S74	Fairchild	74S74	
	Hitachi	HD74S74	
	National	DM74S74	
	TI	**SN74S74**	**857**
74S85	**TI**	**SN74S85**	**862**
74S86	Fairchild	74S86	
	Hitachi	HD74S86	
	National	DM74S86	
	TI	**SN74S86**	**862**
8021	Intel	8021	
	NEC-Micro	μPD8021	
8243	AMD	8243	
	Fujitsu	MB8243	
	Intel	8243	
	NEC-Micro	μPD8243	
825181	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
82HS137	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
82HS181	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
82HS185	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	**440,3968**
		TBP24S81M	**440,3968**
82S10	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
82S123	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	**3826**
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
82S123	**TI**	**TBP18S030**	**440,3965**
		TBP18S030M	**440,3965**
82S130	Fairchild	93436	
82S131	AMD	AM27S13	
	Fairchild	93446	
	Fujitsu	MB7053	
	Harris	HM7621	
	Intel	3622	
	MMI	6306	
	Motorola	MCM7621	
	National	DM74S571	
	TI	SN74S571	
82S137	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
82S17	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
82S190	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	
	National	DM77S190	
		DM87S190	
	Raytheon	29680	
		29683	
	Signetics	N82S190	
		S82S190	
	Supertex	MM82S190	
82S191	AMD	AM27S191	
	Fairchild	93511	
		93Z511	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
82S191	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	**440,3979**
82S212	Fairchild	93479	
	Signetics	N82S212	
		S82S212	
82S25	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
82S291	MMI	5275-1	
	Signetics	87S290	
82S321	AMD	AM27S43	
	Fujitsu	MB7142	
	Intel	3632	
	Signetics	N82S321	
		S82S321	
87S290	MMI	5275-1	
	Signetics	82S291	
8T09	Raytheon	RC8T09	
	Signetics	N8T09	
8T10	Fairchild	74173	
	National	DM74173	
		DM8551	
	Raytheon	RC8T10	
	Signetics	N8T10	
	TI	**SN74173**	**894**
8T125	Motorola	SN74LS640	
8T125	Signetics	74LS640	
		N8T125	
	TI	**SN74LS640**	**984**
8T20	Raytheon	RC8T20	
8T22	Fairchild	74122	
		9601	
	National	DM8601	
		DM9601	
	Raytheon	RF8601	
		RF9601	
	Signetics	N8T22	
		S8T22	
	TI	**SN74122**	**873**
9401	Fairchild	9401	
		F9401	
	Motorola	MC8503	
9403	Fairchild	9403	
		F9403	
AM6012	AMD	AM6012	
	AD	AD562	
	Burr-Brown	DAC862	
	Datel	DAC-562	
		DAC-681	
		DAC-681C	
	Harris	HI562	
		HI562-5	
	MicroPwr	**MP562**	**401,2749**
	MicroEng	MCE-6012	
	Motorola	**AD562**	**2759**
	PMI	DAC12	
	Signetics	DAC-312	
	TeledyneP	4068	
CA3081	Plessey	SL3081	
	RCA	CA3081	
	SiliconG	SG3081	
	Sprague	ULN-2081	
CA3082	Plessey	SL3082	
	RCA	CA3082	
	SiliconG	SG3082	
	Sprague	ULN-2082	
CA3083	Plessey	SL3083	
		SL3183	
	RCA	CA3083	
		CA3183	
	Signetics	CA3183	
	SiliconG	SG3083	
		SG3183	
	Sprague	ULN-2083	
CA3089	Hitachi	HA1137	
		LA1230	
	Motorola	MC1389	
	National	CA3089	
		LM3089	**3325,3327**
	RCA	CA3089	
	Sanyo	LA1230	
		LA3089	
	SGS	TCA3089	
		TDA1200	
	Siliconix	CA3089	
	TI	SN76689	
CA3183	Plessey	SL3083	
		SL3183	
	RCA	CA3083	
		CA3183	
	Signetics	CA3083	
	SiliconG	SG3083	
		SG3183	
	Sprague	ULN-2083	
CA3189	RCA	CA3189	
	SGS	TCA3189	
	Sprague	ULN-3889	
DAC-312	AMD	AM6012	
	AD	AD562	
	Burr-Brown	DAC862	
	Datel	DAC-562	
		DAC-681	
		DAC-681C	
	Harris	HI562	
		HI562-5	
	MicroPwr	**MP562**	**401,2749**
	MicroEng	MCE-6012	
	Motorola	**AD562**	**2759**
	PMI	DAC12	
	Signetics	**AM6012**	**3383**
	TeledyneP	4068	
DS8820	National	DS8820	
		DS8880	
	TI	DS8820	
		SN75182	
		SN75480	
DS8830	National	DS8830	
	TI	DS8830	
		SN75183	
◆DS8880	National	DS8820	
		DS8880	
	Signetics	DS8820	
	TI	DS8820	
		SN75182	
		SN75480	
HEF400	Motorola	MC14000	
	National	CD4000	
	RCA	CD4000	
	SGS	HCF4000	
	SSS	SCL4000	
	Solitron	CM4000	
HEF4001	Fairchild	F4001	
	Hitachi	HD14001	
	Motorola	MC14001	
	National	CD4001	
		MM74C02	
	OKI	MSM4001	
	RCA	CD4001	
	Sanyo	LC4001B	
	SGS	HCF4001	
	SSS	SCL4001	
	Solitron	CM4001	
	Toshiba	TC4001	
HEF4002	Fairchild	F4002	
	Hitachi	HD14002	
	Motorola	MC14002	
	National	CD4002	
	RCA	CD4002	
	SGS	HCF4002	
	SSS	SCL4002	
	Solitron	CM4002	
	TI	TP4002	
	Toshiba	TC4002	
HEF4006	**Fairchild**	**F3872**	**1254**
	Motorola	MC14006	
	RCA	CD4006	
	SGS	M3872	
HEF4007	Fairchild	F4007	
	Hitachi	HD14007	
	Motorola	MC14007	
	National	CD4007	
	RCA	CD4007	
	SGS	HCF4007	
	SSS	SCL4007	
	Solitron	CM4007	
	Toshiba	TC4007	
HEF4008	Fairchild	F4008	
	Hitachi	HD14008	
	Motorola	MC14008	
	National	CD4008	
		MM74C83	
	RCA	CD4008	
	SGS	HCF4008	
	SSS	SCL4008	
	Solitron	CM4008	
	Toshiba	TC4008	
HEF40097	Fairchild	F40097	
	Hitachi	HD14503	
	Motorola	MC14503	
	National	CD4503	
		MM80C97	
	RCA	CD4503	
HEF40098	Fairchild	F40098	
	National	MM80C98	
HEF40106	Fairchild	F40014	
	Hitachi	HD14584	
	Motorola	MC14584	
	National	CD40106	
		CD4584	
		MM54C14	
		MM74C14	
	RCA	CD40106	
	SGS	HCF40106	
	SSS	SCL4584	
HEF4011	Fairchild	F4011	
	Hitachi	HD14011	
	Motorola	MC14011	
	National	CD4011	
		MM74C00	
	OKI	MSM4011	
	RCA	CD4011	
	Sanyo	LC4011	
	SGS	HCF4011	
	SSS	SCL4011	
	Solitron	CM4011	
	Toshiba	TC4011	
HEF4012	Fairchild	F4012	
HEF4012	Hitachi	HD14012	
	Motorola	MC14012	
	National	CD4012	
	RCA	CD4012	
	SGS	HCF4012	
	SSS	SCL4012	
	Solitron	CM4012	
	Toshiba	TC4012	
HEF4013	Fairchild	F4013	
	Hitachi	HD14013	
	Motorola	MC14013	
	National	CD4013	
		MM74C74	
	OKI	MSM4013	
	RCA	CD4013	
	Sanyo	LC4013	
	SGS	HCF4013	
	SSS	SCL4013	
	Solitron	CM4013	
	Toshiba	TC4013	
HEF4014	Fairchild	F4014	
	Hitachi	HD14014	
	Motorola	MC14014	
	National	CD4014	
	RCA	CD4014	
	SGS	HCF4014	
	SSS	SCL4014	
	Solitron	CM4014	
	Toshiba	TC4014	
HEF4015	Fairchild	F4015	
	Hitachi	HD14015	
	Motorola	MC14015	
	National	CD4015	
		MM74C164	
	OKI	MSM4015	
	RCA	CD4015	
	Sanyo	LC4015	
	SGS	HCF4015	
	SSS	SCL4015	
	Solitron	CM4015	
	Toshiba	TC4015	
HEF4016	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
HEF40161	Fairchild	F40161	
	Hitachi	HD14161	
	Motorola	MC14161	
	National	CD40161	
		MM54C161	
		MM74C161	
	RCA	CD40161	
	SGS	HCF40161	
	SSS	SCL4161	
	Toshiba	TC40161	
HEF40162	Fairchild	F40162	
	Hitachi	HD14162	
	Motorola	MC14162	
	National	CD40162	
		MM54C162	
		MM74C162	
	RCA	CD40162	
	SGS	HCF40162	
	SSS	SCL4162	
	Toshiba	TC40162	
HEF40163	Fairchild	F40163	
	Hitachi	HD14163	
	Motorola	MC14163	
	National	CD40163	
		MM54C163	
		MM74C163	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HEF40163	RCA	CD40163	
	SGS	HCF40163	
	SSS	SCL4163	
	Toshiba	TC40163	
HEF4017	Fairchild	F4017	
	Hitachi	HD14017	
	Motorola	MC14017	
	National	CD4017	
	RCA	CD4017	
	SGS	HCF4017	
	SSS	SCL4017	
	Solitron	CM4017	
	Toshiba	TC4017	
HEF40174	Fairchild	F40174	
	Hitachi	HD14174	
	Motorola	MC14174	
	National	CD40174	
		MM54C174	
		MM74C174	
	RCA	CD40174	
	SGS	HCF40174	
	SSS	SCL4174	
	Toshiba	TC40174	
HEF40175	Fairchild	F40175	
	Hitachi	HD14175	
	Motorola	MC14175	
	National	CD40175	
		MM54C175	
		MM74C175	
	Toshiba	TC40175	
HEF4018	Fairchild	F4018	
	Hitachi	HD14018	
	Motorola	MC14018	
	National	CD4018	
	RCA	CD4018	
	SGS	HCF4018	
	SSS	SCL4018	
	Solitron	CM4018	
	Toshiba	TC4018	
HEF4019	Fairchild	F4019	
	National	CD4019	
	OKI	MSM4019	
	RCA	CD4019	
	Sanyo	LC4019	
	SGS	HCF4019	
	SSS	SCL4019	
	Solitron	CM4019	
	Toshiba	TC4019	
HEF40192	Fairchild	F4029	
	Motorola	MC14029	
	National	CD40192	
		CD4029	
	RCA	CD40192	
		CD4029	
	SGS	HCF40192	
		HCF4029	
	SSS	SCL4029	
		SCL4192	
	Solitron	CM4029	
	Toshiba	TC40192	
		TC4029	
HEF40193	Fairchild	F40193	
	National	CD40193	
		MM54C193	
		MM74C193	
	RCA	CD40193	
	SGS	HCF40193	
	SSS	SCL4193	
	Toshiba	TC40193	
HEF40194	Fairchild	F40194	
	Hitachi	HD14194	
	Motorola	MC14194	
	RCA	CD40194	
	SGS	HCF40194	
HEF4020	Fairchild	F4020	
	Hitachi	HD14020	
	Motorola	MC14020	
	National	CD4020	
	RCA	CD4020	
	SGS	HCF4020	
	SSS	SCL4020	
	Solitron	CM4020	
	Toshiba	TC4020	
HEF4021	Fairchild	F4021	
	Hitachi	HD14021	
	Motorola	MC14021	
	National	CD4021	
	RCA	CD4021	
	SGS	HCF4021	
HEF4021	SSS	SCL4021	
	Solitron	CM4021	
	Toshiba	TC4021	
HEF4022	Fairchild	F4022	
	Hitachi	HD14022	
	Motorola	MC14022	
	National	CD4022	
	RCA	CD4022	
	SGS	HCF4022	
	SSS	SCL4022	
	Solitron	CM4022	
	Toshiba	TC4022	
HEF4023	Fairchild	F4023	
	Hitachi	HD14023	
	Motorola	MC14023	
	National	CD4023	
		MM74C10	
	RCA	CD4023	
	SGS	HCF4023	
	SSS	SCL4023	
	Solitron	CM4023	
	Toshiba	TC4023	
HEF4024	Fairchild	F4024	
	Hitachi	HD14024	
	Motorola	MC14024	
	National	CD4024	
	RCA	CD4024	
	SGS	HCF4024	
	SSS	SCL4024	
	Solitron	CM4024	
	Toshiba	TC4024	
HEF4025	Fairchild	F4025	
	Hitachi	HD14025	
	Motorola	MC14025	
	National	CD4025	
	RCA	CD4025	
	SGS	HCF4025	
	SSS	SCL4025	
	Solitron	CM4025	
	Toshiba	TC4025	
HEF4027	Fairchild	F4027	
	Hitachi	HD14027	
	Motorola	MC14027	
	National	CD4027	
		MM74C76	
	OKI	MSM4027	
	RCA	CD4027	
	Sanyo	LC4027	
	SGS	HCF4027	
	SSS	SCL4027	
	Solitron	CM4027	
HEF4028	Fairchild	F4028	
	Hitachi	HD14028	
	Motorola	MC14028	
	National	CD4028	
		MM74C42	
	OKI	MSM4028	
	Sanyo	LC4028	
	SGS	HCF4028	
	SSS	SCL4028	
	Solitron	CM4028	
	Toshiba	TC4028	
HEF4029	Fairchild	54H53	
	National	DM54H53	
	RCA	CD4029	
	TI	**SN54H53**	**849**
HEF4030	Fairchild	F4030	
	National	CD4030	
	RCA	CD4030	
	SGS	HCF4030	
	SSS	SCL4030	
	Solitron	CM4030	
	Toshiba	TC4030	
HEF4035	Fairchild	F4035	
	Hitachi	HD14035	
	Motorola	MC14035	
	National	CD4035	
	RCA	CD4035	
	SGS	HCF4035	
	SSS	SCL4035	
	Solitron	CM4035	
	Toshiba	TC4035	
HEF4040	Fairchild	F4040	
	Hitachi	HD14040	
	Motorola	MC14040	
	National	CD4040	
	RCA	CD4040	
	SGS	HCF4040	
	SSS	SCL4040	
	Solitron	CM4040	
HEF4040	Toshiba	TC4040	
HEF4041	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
HEF4042	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
HEF4043	Hitachi	HD14043	
	Motorola	MC14043	
	National	CD4043	
	RCA	CD4043	
	SGS	HCF4043	
	SSS	SCL4043	
	Solitron	CM4043	
	Toshiba	TC4043	
HEF4044	Fairchild	F4044	
	Hitachi	HD14044	
	Motorola	MC14044	
	National	CD4044	
	RCA	CD4044	
	SGS	HCF4044	
	SSS	SCL4044	
	Solitron	CM4044	
	Toshiba	TC4044	
HEF4046	Fairchild	F4051	
	Motorola	MC14051	
	National	CD4051	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	SSS	SCL4051	
	Solitron	CM4051	
	Toshiba	TC4051	
HEF4047	Fairchild	F4047	
	National	CD4047	
	RCA	CD4047	
	SGS	HCF4047	
	Signetics	HEF4042	
	SSS	SCL4047	
	Solitron	CM4047	
	Toshiba	TC4047	
HEF4049	Fairchild	F4049	
	Hitachi	HD14049	
	Motorola	MC14049	
	National	CD4049	
	OKI	MSM4049	
	RCA	CD4009	
		CD4049	
	Sanyo	LC4049	
	SGS	HCF4049	
	SSS	SCL4049	
	Solitron	CM4049	
	Toshiba	TC4049	
HEF4050	Fairchild	F4050	
	Hitachi	HD14050	
	Motorola	MC14050	
	National	CD4050	
	RCA	CD4010	
		CD4050	
	SGS	HCF4050	
	SSS	SCL4050	
	Solitron	CM4050	
	Toshiba	TC4050	
HEF4051	AD	AD7501	
	Burr-Brown	MPC8S	
HEF4051	**Datel**	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Siliconix	DG508	
		DG508A	**2804**
	TeledyneP	4554	
HEF4052	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Siliconix	DG509	
		DG509A	**2804**
	TeledyneP	4553	
HEF4053	Fairchild	F4053	
	Motorola	MC14053	
	National	CD4053	
	RCA	CD4053	
	SGS	HCF4052	
	SSS	SCL4053	
	Solitron	CM4053	
	Toshiba	TC4053B	
HEF4059	Hitachi	HD14569	
	Motorola	MC14569	
	RCA	CD4059	
HEF4060	Fairchild	F40160	
	Hitachi	HD14160	
	Motorola	MC14160	
	National	CD40160	
		MM54C160	
		MM74C160	
	RCA	CD40160	
	SGS	HCF40160	
	SSS	SCL4160	
	Toshiba	TC40160	
HEF4066	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
HEF4067	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
		MX-1606	**2622**
	Fairchild	F4067	
	Harris	HI1840	
		HI506	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
HEF4067	Motorola	MC14067	
	PMI	MUX-16	
	RCA	CD4067	
	SGS	HCF4067	
	Siliconix	DG506	
HEF4068	Fairchild	F4068	
	Hitachi	HD14068	
	Motorola	MC14068	
	RCA	CD4068	
	SGS	HCF4068	
	SSS	SCL4068	
		SCL4412	
	Solitron	CM4068	
	TI	UCN4810	
	Toshiba	TC4068	
HEF4069	Fairchild	F4069	
	Hitachi	HD14069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
		MM74C04	
	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
HEF4070	Fairchild	F4070	
	Hitachi	HD14070	
	Motorola	MC14070	
	National	CD4070	
		MM74C86	
	RCA	CD4070	
	SGS	HCF4070	
	SSS	SCL4070	
	Solitron	CM4070	
HEF4071	Fairchild	F4071	
	Hitachi	HD14071	
	Motorola	MC14071	
	National	CD4071	
		MM74C32	
	OKI	MSM4071	
	RCA	CD4071	
	Sanyo	LC4071	
	SGS	HCF4071	
	SSS	SCL4071	
	Solitron	CM4071	
	Toshiba	TC4071	
HEF4072	Fairchild	F4072	
	Hitachi	HD14072	
	Motorola	MC14072	
	National	CD4072	
	RCA	CD4072	
	SGS	HCF4072	
	SSS	SCL4072	
	Toshiba	TC4072	
HEF4073	Fairchild	F4073	
	Hitachi	HD14073	
	Motorola	MC14073	
	National	CD4073	
	RCA	CD4073	
	SGS	HCF4073	
	SSS	SCL4073	
	Solitron	CM4073	
	Toshiba	TC4073	
HEF4075	Fairchild	F4075	
	Hitachi	HD14075	
	Motorola	MC14075	
	National	CD4075	
	RCA	CD4075	
	SGS	HCF4075	
	SSS	SCL4075	
	Solitron	CM4075	
	Toshiba	TC4075	
HEF4076	Fairchild	F4076	
	Hitachi	HD14076	
	Motorola	MC14076	
	National	CD4076	
		MM54C173	
		MM74C173	
	RCA	CD4076	
	SGS	HCF4076	
	SSS	SCL4076	
	Solitron	CM4076	
	Toshiba	TC4076	
HEF4077	Fairchild	F4077	
HEF4077	Hitachi	HD14077	
	Motorola	MC14077	
	National	CD4077	
	RCA	CD4077	
	SGS	HCF4077	
	SSS	SCL4077	
	Solitron	CM4077	
HEF4078	Fairchild	F4078	
	Hitachi	HD14078	
	Motorola	MC14078	
	RCA	CD4078	
	SGS	HCF4078	
	SSS	SCL4078	
	Solitron	CM4078	
	Toshiba	TC4078	
HEF4081	Fairchild	F4081	
	Hitachi	HD14081	
	Motorola	MC14081	
	National	CD4081	
		MM74C08	
	OKI	MSM4081	
	RCA	CD4081	
	Sanyo	LC4081	
	SGS	HCF4081	
	SSS	SCL4081	
	Solitron	CM4081	
	Toshiba	TC4081	
HEF4082	Fairchild	F4082	
	Hitachi	HD14082	
	Motorola	MC14082	
	National	CD4082	
	RCA	CD4082	
	SGS	HCF4082	
	SSS	SCL4082	
	Toshiba	TC4082	
HEF4085	Fairchild	F4085	
	National	CD4085	
	RCA	CD4085	
	SGS	HCF4085	
	SSS	SCL4085	
	Toshiba	TC4085	
HEF4086	Fairchild	F4086	
	RCA	CD4086	
	SGS	HCF4086	
	SSS	SCL4086	
	Toshiba	TC4086	
HEF4093	Fairchild	F4093	
	Hitachi	HD14093	
	Motorola	MC14093	
	National	CD4093	
	OKI	MSM4093	
	RCA	CD4093	
	Sanyo	LC4093	
	SGS	HCF4093	
	SSS	SCL4093	
	Toshiba	TC4093	
HEF4094	Hitachi	HD14094	
	Motorola	MC14094	
	RCA	CD4094	
	SGS	HCF4094	
	SSS	SCL4094	
	Toshiba	TC4094	
HEF4104	Fairchild	F4104	
	GTEMicro	G4104	
	Mitel	MD4104	
	Motorola	MC14504	
	National	MM4104	
	RCA	CD40109	
	SGS	HCF40109	
HEF4502	Hitachi	HD14502	
	Motorola	MC14502	
	RCA	CD4502	
	SGS	HCF4502	
	SSS	SCL4502	
HEF4505	Motorola	MC14505	
HEF4508	Hitachi	HD14508	
		HD74147	
	Motorola	MC14508	
	National	DM74147	
	RCA	CD4508	
	SGS	HCF4508	
	Signetics	74147	
		N82147	
	SSS	SCL4508	
	Solitron	CM4508	
	TI	**SN74147**	**882**
	Toshiba	TC4508	
HEF4510	Fairchild	F4510	
	Hitachi	HD14510	
	Motorola	MC14510	
	National	CD4510	
HEF4510	RCA	CD4510	
	SGS	HCF4510	
	SSS	SCL4510	
	Solitron	CM4510	
	Toshiba	TC4510	
HEF4511	Fairchild	F4511	
	Hitachi	HD14511	
	Mitel	MD4511	
	MMI	4511	
	Motorola	MC14511	
	National	CD4511	
	NEC-Micro	μPD4511	
	RCA	CD4511	
	SGS	HCF4511	
	SSS	SCL4511	
	Solitron	CM4511	
	Toshiba	TC4511	
HEF4514	Fairchild	F4514	
	Hitachi	HD14514	
	Motorola	MC14514	
	National	CD4514	
	RCA	CD4514	
	SGS	HCF4514	
	SSS	SCL4514	
	Solitron	CM4514	
	Toshiba	TC4514	
HEF4515	Fairchild	F4515	
	Hitachi	HD14515	
	Motorola	MC14515	
	National	CD4515	
	RCA	CD4515	
	SGS	HCF4515	
	SSS	SCL4515	
	Solitron	CM4515	
	Toshiba	TC4515	
HEF4516	Fairchild	F4516	
	Hitachi	HD14516	
	Motorola	MC14516	
	National	CD4516	
	RCA	CD4516	
	SGS	HCF4516	
	SSS	SCL4516	
	Solitron	CM4516	
	Toshiba	TC4516	
HEF4517	Hitachi	HD14517	
	Motorola	MC14517	
	RCA	CD4517	
	SSS	SCL4517	
HEF4518	Fairchild	F4518	
	Hitachi	HD14518	
	Motorola	MC14518	
	National	CD4518	
	RCA	CD4518	
	SGS	HCF4518	
	SSS	SCL4518	
	Solitron	CM4518	
	Toshiba	TC4518	
HEF4519	Hitachi	HD14519	
		HD4519	
	Motorola	MC14519	
	National	CD4519	
	RCA	CD4519	
HEF4520	Fairchild	F4520	
	Hitachi	HD14520	
	Motorola	MC14520	
	National	CD4520	
	OKI	MSM4520	
	RCA	CD4520	
	Sanyo	LC4520	
	SGS	HCF4520	
	SSS	SCL4520	
	Solitron	CM4520	
	Toshiba	TC4520	
HEF4521	Fairchild	F4521	
	Motorola	MC14521	
	RCA	CD4045	
	SGS	HCF4045	
	SSS	SCL4445	
	Solitron	CM4045	
	Toshiba	TC4521	
HEF4522	Fairchild	F4522	
	Hitachi	HD14522	
	Motorola	MC14522	
	National	CD4522	
	RCA	CD4522	
	SSS	SCL4522	
	Toshiba	TC4522	
HEF4526	Fairchild	F4526	
	Hitachi	HD14526	
	Motorola	MC14526	
	National	CD4526	
HEF4526	SSS	SCL4526	
	Toshiba	TC4526	
HEF4527	Fairchild	F4527	
	Hitachi	HD14527	
	Motorola	MC14527	
	National	CD4527	
	RCA	CD4527	
	SGS	HCF4527	
	SSS	SCL4527	
	Toshiba	TC4527	
		TR4527	
HEF4528	Fairchild	F4528	
	Hitachi	HD14528	
	Motorola	MC14528	
	National	CD4528	
		MM74C221	
	RCA	CD4098	
	SGS	HCF4098	
	SSS	SCL4528	
	Toshiba	TC4528	
HEF4531	Fairchild	F4531	
	Hitachi	HD14531	
	Motorola	MC14531	
	RCA	CD40101	
	SGS	HCF40101	
	SSS	SCL4531	
	Toshiba	TC4531	
HEF4532	Fairchild	F4532	
	Hitachi	HD14532	
	Motorola	MC14532	
	RCA	CD4532	
	SGS	HCF4532	
	SSS	SCL4532	
	Toshiba	TC4532	
HEF4534	Hitachi	HD14534	
	Motorola	MC14534	
HEF4538	Motorola	MC14538	
	National	CD4538	
	OKI	MSM4538	
HEF4539	Fairchild	F4539	
	Hitachi	HD14539	
	Motorola	MC14539	
	Toshiba	TC4539	
HEF4543	Fairchild	F4543	
	Hitachi	HD14543	
	Motorola	MC14543	
	National	CD4543	
	RCA	CD4055	
		CD4056	
		CD4543	
	Toshiba	TC4543	
HEF4555	Fairchild	F4555	
	Hitachi	HD14555	
	Motorola	MC14555	
	RCA	CD4555	
	SGS	HCF4555	
	SSS	SCL4555	
	Toshiba	TC4555	
HEF4556	Fairchild	F4556	
	Motorola	MC14556	
	RCA	CD4556	
	SGS	HCF4556	
	SSS	SCL4556	
	Toshiba	TC4556	
HEF4557	Fairchild	F4557	
	Hitachi	HD14557	
	Motorola	MC14557	
HEF4585	Fairchild	F40085	
	Hitachi	HD14585	
	Motorola	MC14585	
	National	MM74C85	
	RCA	CD4585	
	SSS	SCL4585	
	Toshiba	TC4585	
HEF4591	Motorola	MC14541B	
	RCA	CD4541B	
HEF4720	Fairchild	F4720	
HEF4724	Fairchild	F4727	
HEF4731	Fairchild	F4031	
	National	CD4031	
	RCA	CD4031	
	SGS	HCF4031	
INS2652	National	2652	
ISP-8A/600	National	ISP-8A/600	
LF155	AMD	LF155	
	Intersil	LF155	
	Motorola	LF155	
	National	**LF155**	**3309**
	PMI	PM155	
LF156	AMD	LF156	
	Intersil	LF156	
	MicroPwr	OP-16	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LF156	Motorola	LF156	
	National	**LF156**	**3309**
	PMI	OP-16	
		PM156	
LF355	AMD	LF355	
	Intersil	LF355	
	Motorola	LF355	
	National	**LF355**	**3309**
	PMI	PM355	
LF356	AMD	LF356	
	Intersil	LF356	
	Motorola	LF356	
	National	**LF356**	**3309**
	PMI	PM356	
LH2101	AMD	LH2101	
	Intersil	LH2101	
	National	LH2101	
	Raytheon	LH2101	
LH2308	Intersil	LH2308	
	National	**LH2308**	**3342**
	PMI	PM2308	
LM101	AMD	LM101	
	AD	AD101	
	Fairchild	μA101	
	Intersil	AD101	
	Motorola	LM101	
	Raytheon	LM101	
	SiliconG	SG101	
	TI	LM101	
	Thomson-CSF	SFC2101	
LM108	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	SiliconG	SG108	
	TI	μA714	
LM111	AMD	LM111	
	AD	AD111	
	Fairchild	μA111	
	Intersil	LM111	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM111	
	National	**LM111**	**3317**
	PMI	PM111	
	Raytheon	LM111	
	SiliconG	SG111	
	TI	LM111	
	Thomson-CSF	SFC2111	
LM119	AMD	LM119	
	National	**LM119**	**3317**
LM124A	AMD	LM124A	
	Motorola	LM124A	
	National	LM124A	
	Raytheon	LM124A	
	RCA	CA124A	
	SiliconG	SG124	
	TI	LM124A	
LM139	AMD	LM139	
	Fairchild	μA139	
	Motorola	LM139	
	National	**LM139**	**3317**
	PMI	CMP-04	
		PM139	
	Raytheon	LM139	
	RCA	CA139	
LM139	SiliconG	SG139	
	TI	LM139	
LM158	Motorola	LM158	
	National	LM158A	
	Raytheon	RM4139	
	RCA	CA158A	
	TI	LM158	
LM1870	**National**	**LM1870**	**3325,3328**
◆LM1880	National	LM1880	
LM193	Fairchild	FC193A	
		μA193	
	Motorola	LM193	
	National	**LM193A**	**3317**
	TI	LM193	
LM201	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
◆LM207	AMD	LM207	
	National	LM207	
	RCA	CA207	
	SiliconG	SG207	
	TI	SN55207	
	Thomson-CSF	SFC2207	
LM208	AMD	LM208	
	AD	**AD208**	**3153**
	Fairchild	μA208	
	MicroPwr	MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM208	
	National	LM208	
	PMI	OP-08	
		OP05	
		PM208	
	SiliconG	SG208	
	TI	μA714	
LM211	AMD	LM211	
	AD	AD211	
	Motorola	LM211	
	National	**LM211**	**3317**
	PMI	PM211	
	RCA	LM211	
	SiliconG	SG211	
	TI	LM211	
	Thomson-CSF	SFC2211	
LM219	AMD	LM219	
	National	**LM219**	**3317**
LM224	AMD	LM224	
	Fairchild	μA224	
	Motorola	LM224	
	National	LM224	
	Raytheon	LM224	
	RCA	CA224	
	SiliconG	SG224	
	TI	LM224	
LM239	AMD	LM239	
	Fairchild	μA239	
	Motorola	LM239	
	National	**LM239**	**3317**
	PMI	CMP-04	
		PM239	
	Raytheon	LM239	
	RCA	CA239	
	SiliconG	SG239	
	TI	LM239	
LM258	Motorola	LM258	
	National	LM258A	
	RCA	CA258A	
	TI	LM258	
LM2901	Fairchild	μA2901	
		μA3302	
	Motorola	LM2901	
		MC3302	
	National	LM2901	
		LM3302	
	NEC-Electron	μPC2901	
	PMI	CMP-04	
	Raytheon	LM2901	
		RV3302	
	RCA	CA3302	
	Signetics	MC3302	
	SiliconG	SG3302	
	TI	LM2901	
		LM3302	
LM2902	Fairchild	μA2902	
	Hitachi	HA17902	
	Motorola	LM2902	
	National	LM2902	
	NEC-Electron	μPC2902	
	Raytheon	LM2902	
	TI	LM2902	
LM2903	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
LM2904	Motorola	LM2904	
	National	LM2904	
	RCA	CA2904	
	TI	LM2904	
LM293	Fairchild	μA293	
	Motorola	LM293	
	National	**LM293**	**3317**
	TI	LM293	
LM301	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
LM311	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
LM319	AMD	LM319	
	National	**LM319**	**3317**
LM319	NEC-Electron	μPC319	
LM324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
LM358	Motorola	LM358	
	National	LM358A	
	NEC-Electron	μPC358	
	RCA	CA358A	
		LM358	
	Sanyo	LA6358	
	Signetics	NE532	
	TI	LM358	
LM381	**National**	**LM381**	**3325,3328**
LM382	**National**	**LM382**	**3325,3327**
LM387	**National**	**LM387**	**3325,3327**
LM393	Fairchild	μA393	
	Motorola	LM393	
	National	**LM393**	**3317**
	Sanyo	LA6393	
	TI	LM393	
MC1408	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1508	
		SE5008	
		SE5009	
MC1456	**Datel**	**AM-460-2**	**2622**
	Harris	**HA-2605**	**3226,3287**
	Intersil	HA-2602	
		HA-2605	
		HA2605	
	Motorola	MC1456	
	SiliconG	SG1456	
	TI	MC1456	
MC1458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
MC1458	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
MC1488	AMD	MC1488	
	Exar	**XR1488**	**3188**
	Fairchild	μA1488	
	Harris	HA1488	
	Hitachi	HD75188	
	Motorola	**MC1488**	**2753**
	National	DS1488	
	Raytheon	RM1488	
	SiliconG	SG1488	
	TI	MC1488	
		SN75188	
MC1489	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
MC1489A	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
MC1496	Fairchild	μA796	
	Motorola	MC1496	
		MC1596	
	National	LM1496	
		LM1596	
	Plessey	SL1496	
		SL1596	
	Signetics	MC1596	
	SiliconG	SG1496	
		SG1596	
MC1508	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		SE5008	
		SE5009	
MC1556	**Harris**	**HA-2600**	**3226,3287**
	Intersil	HA2600	
	Motorola	MC1556	
	SiliconG	SG1556	
	TeledyneP	1326	
	TI	MC1556	
MC1558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
MC1596	Fairchild	μA796	
	Motorola	MC1496	
		MC1596	
MC1596	National	LM1496	
		LM1596	
	Plessey	SL1496	
		SL1596	
	Signetics	MC1496	
	SiliconG	SG1496	
		SG1596	
MC3302	Fairchild	μA2901	
		μA3302	
	Motorola	LM2901	
		MC3302	
	National	LM2901	
		LM3302	
	NEC-Electron	μPC2901	
	PMI	CMP-04	
	Raytheon	LM2901	
		RV3302	
	RCA	CA3302	
	Signetics	LM2901	
	SiliconG	SG3302	
	TI	LM2901	
		LM3302	
MC3303	Fairchild	μA3303	
	Motorola	MC3303	
	TI	MC3303	
MC3403	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
MC3410	**Motorola**	**MC3410**	**2759**
MC3503	**Exar**	**XR3503**	**3207**
	Motorola	MC3503	
	Raytheon	RC3503	
		RM3503	
		RM4137	
	SiliconG	SG3503	
	TI	MC3503	
MC3510	Datel	DAC-IC10BM	
	Motorola	**MC3510**	**2759**
	Signetics	**NE5410**	**3413**
		SE5410	**3413**
N10145	Fairchild	F10145A	
	Motorola	**MCM10145**	**3839**
N10149	Fairchild	F10416	
	Motorola	MCM10149	
	Signetics	10149	
◆N2901A	**AMD**	**AM2901A**	**1201**
	Fairchild	29F01	
		F2901A	
	National	IDM2901A	
N3001	Intel	3001	
	Signetics	3001	
N3002	Intel	3002	
	Signetics	3002	
N3101	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
N3101	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
N4066	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
N54S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
N54S289	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
N74S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
N8202	Raytheon	RC8202	
N8204	MMI	6246-1	
N8205	MMI	6247-1	
N82147	Hitachi	HD14508	
		HD74147	
	Motorola	MC14508	
	National	DM74147	
	RCA	CD4508	
	SGS	HCF4508	
	Signetics	74147	
		HEF4508	
	SSS	SCL4508	
	Solitron	CM4508	
	TI	**SN74147**	**882**
	Toshiba	TC4508	
N82148	Fairchild	9318	
	Hitachi	HD74148	
	National	DM54148	
		DM74148	
		DM8318	
		DM9318	
N82148	Signetics	54148	
		74148	
	TI	**SN54148**	**883**
		SN74148	**883**
N8224	Fairchild	7488	
	Motorola	MC4002	
	National	DM7488	
	Signetics	7488	
	TI	SN7488	
		SN7488A	**863**
N8225	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
N8230	Fairchild	9312	
	National	DM8312	
		DM9312	
	Raytheon	RC8230	
		RC9312	
		RM8230	
		RM9312	
	TI	SN29312	
		SN39312	
N8233	Raytheon	RC8233	
N8234	Raytheon	RC8234	
N8242	Fairchild	74LS266	
	Motorola	SN74LS266	
	National	DM74LS266	
	Raytheon	74LS266	
		RC8242	
	SGS	T74LS266	
	Signetics	74LS266	
	TI	**SN74LS266**	**918**
N8243	Raytheon	RC8243	
N8250	Raytheon	RC8250	
N8252	Fairchild	9031	
		9301	
	National	DM8301	
		DM9301	
	Raytheon	RC8252	
		RM8252	
	Signetics	S8252	
	TI	SN29301	
		SN39301	
N8255	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
N8262	Raytheon	RC8262	
N8266	Raytheon	RC8266	
N8271	Fairchild	74179	
	Raytheon	RC8271	
	TI	**SN74179**	**897**
N8273	Raytheon	RC8273	
N8274	Raytheon	RC8274	
N8277	Fairchild	9328	
	Raytheon	RC8277	
N8280	Fairchild	74176	
		96176	
	National	DM74176	
		DM8280	
	Raytheon	RC8280	
	Signetics	74176	
	TI	**SN74176**	**896**
N8281	Fairchild	74177	
	National	DM74177	
		DM8281	
	Raytheon	RC8281	
	Signetics	74177	
	TI	**SN74177**	**896**
N82HS195	AMD	27S41	
N82LS181	Fairchild	93L451	
	Signetics	S82LS181	
	TI	**TBP28L86**	**440,3972**
N82S09	Fairchild	93419	
	Signetics	S82S09	
N82S10	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
N82S100	Fairchild	93459	
	Signetics	S82S100	
N82S101	Fairchild	93458	
	Signetics	S82S101	
N82S110	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		S82S10	
		S82S110	
	TI	SN54S314	
		SN74S314	
N82S115	AMD	AM27S15	
	Harris	HM7647R	
	Signetics	S82S115	
N82S116	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
N82S123	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	**3826**
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	**TBP18S030**	**440,3965**
		TBP18S030M	**440,3965**
N82S126	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	**3696**
	Intel	M3601	
	MMI	5300-1	
		6300-1	**3826**
	National	DM54S387	
		DM74S387	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
N82S126	Raytheon	29660	
	Signetics	S82S126	
	TI	**TBP24SA10**	**440,3967**
		TBP24SA10M	**440,3967**
N82S129	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
		HM7611-2	**3696**
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	**3826**
	National	DM54S287	
		DM74S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	S82S129	
	TI	**TBP24S10**	**440,3967**
N82S130	AMD	AM27S12	
	Fairchild	93436	
	Harris	HM7620	
	Intel	M3602	
	MMI	5305	
		6305	
	National	DM54S570	
		DM74S570	
	Raytheon	29610	
	Signetics	S82S130	
N82S131	AMD	AM27S13	
	Fairchild	93446	
	Harris	HM7621	
	Intel	M3622	
	MMI	5306	
		6306	
	National	DM54S571	
		DM74S571	
	Raytheon	29611	
	Signetics	S82S131	
N82S136	AMD	AM27S32	
	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642	
		HM7642-2	**3705**
	Intel	M3605	
	MMI	5352-1	
		6352	
	National	DM54S572	
		DM74S572	
	Raytheon	29640	
	Signetics	S82S136	
	TI	**TBP24SA41**	**440,3968**
		TBP24SA41M	**440,3968**
N82S137	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		S82HS137	
		S82S137	
N82S137	**TI**	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
N82S140	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	S82S140	
	TI	**TBP28SA46**	**440**
N82S141	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	**3826**
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	S82S141	
	TI	**TBP28S46**	**440,3976**
		TBP28S46M	**440,3976**
N82S146	AMD	AM27S28	
	Fujitsu	MB7123	
		MB7124	
		MC7124	
	Harris	HM7648	
	MMI	5348	
		6348	
	National	DM54S473	
		DM74S473	
	Raytheon	29620	
	Signetics	S82S146	
	TI	**TBP28SA42**	**440,3976**
N82S147	AMD	AM27S29	
	Fujitsu	MB7124	
		MBM7124	
	Harris	HM7649	
	MMI	5349-1	
		6349-1	**3826**
	Motorola	MCM7649	
	National	DM54S472	
		DM74S472	
	Raytheon	29621	
	Signetics	S82S147	
	TI	DM54S472	
		TBP28S42	**440,3975**
		TBP28S42M	**440,3975**
N82S16	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		S82S116	
		S82S16	
N82S16	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
N82S180	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	S82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
N82S181	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
N82S184	AMD	AM27S184	
	Fujitsu	MB7127	
	Harris	HM7684	
	MMI	53100	
		63100	
	Motorola	MCM7684	
	National	DM77S184	
		DM87S184	
	Raytheon	29650	
	TI	**TBP24SA81**	**440,3969**
N82S185	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	**440,3968**
		TBP24S81M	**440,3968**
N82S190	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	
	National	DM77S190	
		DM87S190	
	Raytheon	29680	
		29683	
	Signetics	82S190	
		S82S190	
	Supertex	MM82S190	
N82S191	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	**TBP28S166**	**440,3979**
N82S212	Fairchild	93479	
	Signetics	82S212	
		S82S212	
N82S23	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		6330-1	**3826**
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
N82S25	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Manufacturer Device	Replacement Source	Device	IC Master Page
Signetics		**(Cont'd)**	
N82S25	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
N82S2708	Harris	HM7608	
	Raytheon	29635	
	Signetics	S82S2708	
	TI	**TBP28S2708**	**3980**
N82S321	AMD	AM27S43	
	Fujitsu	MB7142	
	Intel	3632	
	Signetics	82S321	
		S82S321	
N82S707	Motorola	MCM82707	
N82S708	Motorola	MCM82708	
N82S80	Fairchild	74LS196	
	Hitachi	HD74LS196	
	Motorola	SN74LS196	
	National	DM74LS196	
	Raytheon	74LS196	
	TI	**SN74LS196**	**903**
N8T09	Raytheon	RC8T09	
	Signetics	8T09	
N8T10	Fairchild	74173	
	National	DM74173	
		DM8551	
	Raytheon	RC8T10	
	Signetics	8T10	
	TI	**SN74173**	**894**
N8T125	Motorola	SN74LS640	
	Signetics	74LS640	
		8T125	
	TI	**SN74LS640**	**984**
N8T13	Motorola	MC8T13	
	National	DS75121	
		LM75121	
	TI	N8T13	
		SN75121	
N8T14	Motorola	MC8T14	
	National	DS75122	
		LM75122	
	TI	N8T14	
		SN75122	
N8T22	Fairchild	74122	
		9601	
	National	DM8601	
		DM9601	
	Raytheon	RF8601	
		RF9601	
	Signetics	8T22	
		S8T22	
	TI	**SN74122**	**873**
N8T23	Motorola	MC8T23	
	National	DS75123	
		LM75123	
	TI	N8T23	
		SN75123	
N8T24	Motorola	MC8T24	
	National	DS75124	
		LM75124	
	TI	N8T24	
		SN75124	
N8T245	Fairchild	74LS245	
	GTEMicro	G74SC245	
	Mitel	**MD74SC245**	**702,706**
	Motorola	SN74LS245	
	Plessey	MV74SC245	
	SPI	**SP74SC245**	**761**
	Signetics	**74LS245**	**779**
	TI	**SN74LS245**	**913**
N8T25	National	DS3625	
N8T26	AMD	N8T26	
		N8T26A	
	Fairchild	μA8T26A	
	Hitachi	HD268T26	
N8T26	Motorola	MC6880A	
		MC8T26	
		MC8T26A	
	National	DS8T26A	
	Signetics	N8T26A	
	TI	N8T26A	
N8T26A	AMD	N8T26	
		N8T26A	
	Fairchild	μA8T26A	
	Hitachi	HD268T26	
	Motorola	MC6880A	
		MC8T26	
		MC8T26A	
	National	DS8T26A	
	Signetics	N8T26	
	TI	N8T26A	
N8T28	AMD	N8T28	
	Motorola	MC8T28	
N8T34	National	DS8834	
N8T3404	Intel	3404	
N8T37	Motorola	MC3437	
	National	DS8837	
N8T38	AMD	DS8838	
	Motorola	MC3438	
	National	DS8838	
N8T380	National	DS8836	
N8T54	Fairchild	5448	
		7448	
	National	DM5448	
		DM7448	
		DM8848	
	TI	**SN5448**	**847**
		SN5448A	
		SN7448	**847**
		SN7448A	
N8T74	Fairchild	9374	
N8T95	Motorola	MC6885	
		MC8T95	
	National	DM8095	
	TI	SN74365	
N8T96	Motorola	MC6886	
		MC8T96	
	National	DM8096	
	TI	SN74366	
N8T97	Motorola	MC6887	
		MC8T97	
	National	DM8097	
	TI	SN74367	
N8T98	Motorola	MC6888	
		MC8T98	
	National	DM7098	
		DM8098	
		DS8674	
	Signetics	S8T98	
	TI	SN54368	
		SN74368	
NE3403	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
		MC3403	
NE4558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
NE4558	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
◇NE5007	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-03	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
◇NE5008	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
◇NE5008	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
◇NE5009	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-03	**3164**
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	**2621**
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	**3320**
		DAC0801	
		DAC0802	**3320**
		DAC0806	
		DAC0807	
		DAC0808	**3320**
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
		SE5009	
NE5018	AMD	AM6081	
	Datel	DAC-UP8B	
	Signetics	NE5019	
		NE5118	
		NE5119	
NE5019	AMD	AM6081	
	Datel	DAC-UP8B	
	Signetics	NE5018	
		NE5118	
		NE5119	
NE5020	Datel	DAC-UP10	
NE5118	AMD	AM6081	
	Datel	DAC-UP8B	
	Signetics	NE5018	
		NE5019	
		NE5119	
NE5119	AMD	AM6081	
	Datel	DAC-UP8B	
	Signetics	NE5018	
		NE5019	
		NE5118	
NE529	**National**	**LM361**	**3317**
NE531	Raytheon	RC4531	
NE532	Motorola	LM358	
	National	LM358A	
	NEC-Electron	μPC358	
	RCA	CA358A	
		LM358	
	Sanyo	LA6358	
	Signetics	LM358	
	TI	LM358	
NE536	Intersil	LM740	
	Signetics	μA740	
NE5410	Datel	DAC-IC10BM	

◇ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
NE5410	**Motorola**	**MC3510**	**2759**
	Signetics	MC3510	
		SE5410	**3413**
◆NE5501	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
◆NE5502	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
◆NE5503	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
◆NE5504	Sprague	ULN-2024	
	TI	SN75469	
NE5532	**Exar**	**XR5532**	**3208**
	Signetics	NE5532A	
		SE5532	
		SE5532A	
	TI	NE5532	
		NE5532A	
NE5532A	**Exar**	**XR5532**	**3208**
	Signetics	NE5532	
		SE5532	
		SE5532A	
	TI	NE5532	
		NE5532A	
NE5533	**Exar**	**XR5533**	**3208**
	Signetics	NE5533A	
		SE5533	
		SE5533A	
	TI	NE5533	
NE5533A	**Exar**	**XR5533**	**3208**
	Signetics	NE5533	
		SE5533	
		SE5533A	
	TI	NE5533	
NE5534	Datel	AM-453-2C	
		AM-453-2M	
	Exar	**XR5534**	**3209**
	Raytheon	RC5534	
		RM5534	
	Signetics	NE5534A	
		SE5534	
		SE5534A	
	TI	NE5534	
		NE5534A	
NE5534A	Datel	AM-453-2C	
		AM-453-2M	
	Exar	**XR5534**	**3209**
	Raytheon	RC5534	
		RM5534	
	Signetics	NE5534	
		SE5534	
		SE5534A	
	TI	NE5534	
		NE5534A	
NE5537	Fairchild	μAF398	
	National	LF398	
		LM298	
	PMI	SMP-10	
NE555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	SE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
NE556	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
NE5560	Ferranti	ZN1060	
	Signetics	**SE5560**	**3402**
	Sprague	ULN-8160	
		ULS-8160	
NE558	Exar	XR558	
	Signetics	SE558	
◆NE5601	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
◆NE5601	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
NE56202	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
NE565	National	LM565	
	Signetics	SE565	
NE566	National	LM566	
	Signetics	SE566	
NE567	Exar	XR2567	
		XR567	
	National	LM567	
	Raytheon	XR2567	
	Signetics	SE567	
OM200	Panasonic	OM200	
PC54HC147	Motorola	MC54HC147	
	National	MM54HC147	
	RCA	**CD54HC147**	**739**
PCF54HC00	**Motorola**	**MC54HC00**	**733**
	National	MM54HC00	
	RCA	**CD54HC00**	**740**
PCF54HC02	Motorola	MC54HC02	
	National	MM54HC02	
	RCA	**CD54HC02**	**740**
PCF54HC04	Motorola	MC54HC04	
	National	MM54HC04	
	RCA	**CD54HC04**	**740**
PCF54HC08	Motorola	MC54HC08	
	National	MM54HC08	
	RCA	**CD54HC08**	**740**
PCF54HC10	Motorola	MC54HC10	
	National	MM54HC10	
	RCA	**CD54HC10**	**740**
PCF54HC107	Motorola	MC54HC107	
	National	MM54HC107	
	RCA	**CD54HC107**	**739**
PCF54HC109	Motorola	MC54HC109	
	National	MM54HC109	
	RCA	**CD54HC109**	**739**
PCF54HC11	Motorola	MC54HC11	
	National	MM54HC11	
	RCA	**CD54HC11**	**740**
PCF54HC112	Motorola	MC54HC112	
	National	MM54HC112	
	RCA	**CD54HC112**	**739**
PCF54HC123	Motorola	MC54HC123	
	National	MM54HC123	
	RCA	CD54HC123	
PCF54HC132	Motorola	MC54HC132	
	National	MM54HC132	
	RCA	CD54HC132	
PCF54HC133	Motorola	MC54HC133	
	National	MM54HC133	
	RCA	**CD54HC133**	**740**
PCF54HC138	Motorola	MC54HC138	
	National	MM54HC138	
	RCA	**CD54HC138**	**739**
PCF54HC139	Motorola	MC54HC139	
	National	MM54HC139	
	RCA	**CD54HC139**	**739**
PCF54HC14	Motorola	MC54HC14	
	National	MM54HC14	
	RCA	**CD54HC14**	**740**
PCF54HC151	Motorola	MC54HC151	
	National	MM54HC151	
	RCA	**CD54HC151**	**740**
PCF54HC153	Motorola	MC54HC153	
	National	MM54HC153	
	RCA	**CD54HC153**	**740**
PCF54HC154	Motorola	MC54HC154	
	National	MM54HC154	
	RCA	**CD54HC154**	**739**
PCF54HC157	Motorola	MC54HC157	
PCF54HC158	Motorola	MC54HC158	
	National	MM54HC158	
	RCA	CD54HC158	
PCF54HC160	Motorola	MC54HC160	
	National	MM54HC160	
	RCA	**CD54HC160**	**739**
PCF54HC161	Motorola	MC54HC161	
	National	MM54HC161	
	RCA	**CD54HC161**	**739**
PCF54HC162	Motorola	MC54HC162	
	National	MM54HC162	
	RCA	**CD54HC162**	**739**
PCF54HC163	Motorola	MC54HC163	
	National	MM54HC163	
	RCA	**CD54HC163**	**739**
PCF54HC164	Motorola	MC54HC164	
	National	MM54HC164	
	RCA	**CD54HC164**	**740**
PCF54HC165	Motorola	MC54HC165	
	National	MM54HC165	
	RCA	**CD54HC165**	**740**
PCF54HC166	RCA	CD54HC166	
PCF54HC173	Motorola	MC54HC173	
	National	MM54HC173	
	RCA	**CD54HC173**	**739**
PCF54HC174	Motorola	MC54HC174	
	National	MM54HC174	
	RCA	**CD54HC174**	**739**
PCF54HC175	Motorola	MC54HC175	
	National	MM54HC175	
	RCA	**CD54HC175**	**739**
PCF54HC191	**RCA**	**CD54HC191**	**739**
PCF54HC192	Motorola	MC54HC192	
	National	MM54HC192	
	RCA	**CD54HC192**	**739**
PCF54HC193	Motorola	MC54HC193	
	National	MM54HC193	
	RCA	**CD54HC193**	**739**
PCF54HC194	Motorola	MC54HC194	
	National	MM54HC194	
	RCA	**CD54HC194**	**740**
PCF54HC195	Motorola	MC54HC195	
	National	MM54HC195	
	RCA	**CD54HC195**	**740**
PCF54HC20	Motorola	MC54HC20	
	National	MM54HC20	
	RCA	**CD54HC20**	**740**
PCF54HC221	Motorola	MC54HC221	
	National	MM54HC221	
	RCA	**CD54HC221**	**740**
PCF54HC238	RCA	CD54HC238	
PCF54HC240	Motorola	MC54HC240	
	National	MM54HC240	
	RCA	**CD54HC240**	**740**
PCF54HC241	Motorola	MC54HC241	
	National	MM54HC241	
	RCA	**CD54HC241**	**740**
PCF54HC242	Motorola	MC54HC242	
	National	MM54HC242	
	RCA	**CD54HC242**	**739**
PCF54HC243	Motorola	MC54HC243	
	National	MM54HC243	
	RCA	**CD54HC243**	**739**
PCF54HC244	Motorola	MC54HC244	
	National	MM54HC244	
	RCA	**CD54HC244**	**740**
PCF54HC245	Motorola	MC54HC245	
	National	MM54HC245	
	RCA	**CD54HC245**	**739**
PCF54HC251	Motorola	MC54HC251	
	National	MM54HC251	
	RCA	**CD54HC251**	**740**
PCF54HC253	Motorola	MC54HC253	
	National	MM54HC253	
	RCA	CD54HC253	
PCF54HC257	Motorola	MC54HC257	
	National	MM54HC257	
	RCA	**CD54HC257**	**740**
PCF54HC259	Motorola	MC54HC259	
	National	MM54HC259	
	RCA	**CD54HC259**	**739**
PCF54HC266	Motorola	MC54HC266	
	National	MM54HC266	
	RCA	**CD54HC266**	**740**
PCF54HC27	Motorola	MC54HC27	
	National	MM54HC27	
	RCA	**CD54HC27**	**740**
PCF54HC273	Motorola	MC54HC273	
	RCA	CD54HC273	
PCF54HC280	Motorola	MC54HC280	
	National	MM54HC280	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
PCF54HC280	**RCA**	**CD54HC280**	**739**
PCF54HC297	RCA	CD54HC297	
PCF54HC299	Motorola	MC54HC299	
	National	MM54HC299	
	RCA	CD54HC299	
PCF54HC30	Motorola	MC54HC30	
	National	MM54HC30	
	RCA	**CD54HC30**	**740**
PCF54HC32	Motorola	MC54HC32	
	National	MM54HC32	
	RCA	**CD54HC32**	**740**
PCF54HC354	Motorola	MC54HC354	
	National	MM54HC354	
	RCA	**CD54HC354**	**740**
PCF54HC356	Motorola	MC54HC356	
	National	MM54HC356	
	RCA	**CD54HC356**	**740**
PCF54HC365	Motorola	MC54HC365	
	National	MM54HC365	
	RCA	**CD54HC365**	**740**
PCF54HC366	Motorola	MC54HC366	
	National	MM54HC366	
	RCA	**CD54HC366**	**740**
PCF54HC367	Motorola	MC54HC367	
	National	MM54HC367	
	RCA	**CD54HC367**	**740**
PCF54HC368	Motorola	MC54HC368	
	National	MM54HC368	
	RCA	**CD54HC368**	**740**
PCF54HC373	Motorola	MC54HC373	
	National	MM54HC373	
	RCA	**CD54HC373**	**739**
PCF54HC374	Motorola	MC54HC374	
	National	MM54HC374	
	RCA	**CD54HC374**	**739**
PCF54HC377	RCA	CD54HC377	
PCF54HC384	**RCA**	**CD54HC384**	**739**
PCF54HC390	Motorola	MC54HC390	
		MC74HC365	
	National	MM54HC390	
		MM74HC365	
	RCA	**CD54HC390**	**739**
		CD74HC365	**740**
	SPI	**SP74HC365**	**771**
PCF54HC393	Motorola	MC54HC393	
	National	MM54GC393	
	RCA	CD54HG393	
PCF54HC4002	Motorola	MC54HC4002	
	National	MM54HC4002	
	RCA	**CD54HC4002**	**740**
PCF54HC40104	RCA	CD54HC40104	
PCF54HC40105	RCA	CD54HC40105	
PCF54HC4017	Motorola	MC54HC4017	
	RCA	**CD54HC4017**	**739**
PCF54HC4020	Motorola	MC54HC4020	
	National	MM54HC4020	
	RCA	**CD54HC4020**	**739**
PCF54HC4024	Motorola	MC54HC4024	
	RCA	**CD54HC4024**	**739**
PCF54HC4040	Motorola	MC54HC4040	
	National	MM54HC4040	
	RCA	**CD54HC4040**	**739**
PCF54HC4049	Motorola	MC54HC4049	
	National	MM54HC4049	
	RCA	CD54HC4049	
PCF54HC4050	Motorola	MC54HC4050	
	National	MM54HC4050	
	RCA	**CD54HC4050**	**740**
PCF54HC4051	Motorola	MC54HC4051	
	RCA	CD54HC4051	
PCF54HC4052	Motorola	MC54HC4052	
	RCA	CD54HC4052	
PCF54HC4053	Motorola	MC54HC4053	
	RCA	CD54HC4053	
PCF54HC4060	Motorola	MC54HC4060	
	National	MM54HC4060	
	RCA	**CD54HC4060**	**739**
PCF54HC42	Motorola	MC54HC42	
	National	MM54HC42	
	RCA	**CD54HC42**	**739**
PCF54HC4511	Motorola	MC54HC4511	
	National	MM54HC4511	
	RCA	**CD54HC4511**	**739**
PCF54HC4514	Motorola	MC54HC4514	
	National	MM54HC4514	
	RCA	**CD54HC4514**	**739**
PCF54HC4520	**RCA**	**CD54HC4520**	**739**
PCF54HC4538	Motorola	MC54HC4538	
	National	MM54HC4538	
PCF54HC4538	**RCA**	**CD54HC4538**	**740**
PCF54HC533	Motorola	MC54HC533	
	National	MM54HC533	
	RCA	**CD54HC533**	**739**
PCF54HC534	Motorola	MC54HC534	
	National	MM54HC534	
	RCA	**CD54HC534**	**739**
PCF54HC540	RCA	CD55HC540	
PCF54HC541	**RCA**	**CD54HC541**	**740**
PCF54HC563	National	MM54HC563	
	RCA	**CD54HC563**	**739**
PCF54HC564	National	MM54HC564	
	RCA	**CD54HC564**	**739**
PCF54HC573	Motorola	MC54HC573	
	National	MM54HC573	
	RCA	**CD54HC573**	**739**
PCF54HC574	Motorola	MC54HC574	
	National	MM54HC574	
	RCA	**CD54HC574**	**739**
PCF54HC640	Motorola	MC54HC640	
	National	MM54HC640	
	RCA	**CD54HC640**	**739**
PCF54HC643	Motorola	MC54HC643	
	National	MM54HC643	
	RCA	**CD54HC643**	**739**
PCF54HC645	Motorola	MC54HC645	
	National	MM54HC645	
	RCA	**CD54HC645**	**739**
PCF54HC646	Motorola	MC54HC646	
	National	MM54HC646	
	RCA	**CD54HC646**	**739**
PCF54HC648	Motorola	MC54HC648	
	National	MM54HC648	
	RCA	**CD54HC648**	**739**
PCF54HC670	RCA	CD54HC670	
PCF54HC688	Motorola	MC54HC688	
	National	MM54HC688	
	RCA	**CD54HC688**	**739**
PCF54HC73	Motorola	MC54HC73	
	National	MM54HC73	
	RCA	**CD54HC73**	**739**
PCF54HC74	Motorola	MC54HC74	
	National	MM54HC74	
	RCA	**CD54HC74**	**739**
PCF54HC75	Motorola	MC54HC75	
	National	MM54HC75	
	RCA	CD54HC75	
PCF54HC76	Motorola	MC54HC76	
	National	MM54HC76	
	RCA	**CD54HC76**	**739**
PCF54HC85	Motorola	MC54HC85	
	National	MM54HC85	
	RCA	**CD54HC85**	**739**
PCF54HC86	Motorola	MC54HC86	
	National	MM54HC86	
	RCA	**CD54HC86**	**740**
PCF54HCT	RCA	CD54HCT27	
PCF54HCT00	RCA	CD54HCT00	
PCF54HCT02	RCA	CD54HCT02	
PCF54HCT04	RCA	CD54HCT04	
PCF54HCT08	RCA	CD54HCT08	
PCF54HCT10	RCA	CD54HCT10	
PCF54HCT107	RCA	CD54HCT107	
PCF54HCT109	RCA	CD54HCT109	
PCF54HCT11	RCA	CD54HCT11	
PCF54HCT112	RCA	CD54HCT112	
PCF54HCT123	RCA	CD54HCT123	
PCF54HCT132	RCA	CD54HCT132	
PCF54HCT133	RCA	CD54HCT133	
PCF54HCT138	RCA	CD54HCT138	
PCF54HCT139	RCA	CD54HCT139	
PCF54HCT14	RCA	CD54HCT14	
PCF54HCT147	RCA	CD54HCT147	
PCF54HCT151	RCA	CD54HCT151	
PCF54HCT153	RCA	CD54HCT153	
PCF54HCT154	RCA	CD54HCT154	
PCF54HCT157	RCA	CD54HCT157	
PCF54HCT158	RCA	CD54HCT158	
PCF54HCT160	RCA	CD54HCT160	
PCF54HCT161	RCA	CD54HCT161	
PCF54HCT162	RCA	CD54HCT162	
PCF54HCT163	RCA	CD54HCT163	
PCF54HCT164	RCA	CD54HCT164	
PCF54HCT165	RCA	CD54HCT165	
PCF54HCT166	RCA	CD54HCT166	
PCF54HCT173	RCA	CD54HCT173	
PCF54HCT174	RCA	CD54HCT174	
PCF54HCT175	RCA	CD54HCT175	
PCF54HCT191	RCA	CD54HCT191	
PCF54HCT192	RCA	CD54HCT192	
PCF54HCT193	RCA	CD54HCT193	
PCF54HCT194	RCA	CD54HCT194	
PCF54HCT195	RCA	CD54HCT195	
PCF54HCT20	RCA	CD54HCT20	
PCF54HCT221	RCA	CD54HCT221	
PCF54HCT238	RCA	CD54HCT238	
PCF54HCT240	RCA	CD54HCT240	
PCF54HCT241	RCA	CD54HCT241	
PCF54HCT242	RCA	CD54HCT242	
PCF54HCT243	RCA	CD54HCT243	
PCF54HCT244	RCA	CD54HCT244	
PCF54HCT245	RCA	CD54HCT245	
PCF54HCT251	RCA	CD54HCT251	
PCF54HCT253	RCA	CD54HCT253	
PCF54HCT257	RCA	CD54HCT257	
PCF54HCT259	RCA	CD54HCT259	
PCF54HCT266	RCA	CD54HCT266	
PCF54HCT273	RCA	CD54HCT273	
PCF54HCT280	RCA	CD54HCT280	
PCF54HCT297	RCA	CD54HCT297	
PCF54HCT299	RCA	CD54HCT299	
PCF54HCT30	RCA	CD54HCT30	
PCF54HCT32	RCA	CD54HCT32	
PCF54HCT354	RCA	CD54HCT354	
PCF54HCT356	RCA	CD54HCT356	
PCF54HCT365	RCA	CD54HCT365	
PCF54HCT366	RCA	CD54HCT366	
PCF54HCT367	RCA	CD54HCT367	
PCF54HCT368	RCA	CD54HCT368	
PCF54HCT373	RCA	CD54HCT373	
PCF54HCT374	RCA	CD54HCT374	
PCF54HCT377	RCA	CD54HCT377	
PCF54HCT384	RCA	CD54HCT384	
PCF54HCT390	RCA	CD54HCT390	
PCF54HCT393	RCA	CD54HCT393	
PCF54HCT4002	RCA	CD54HCT4002	
PCF54HCT40104	RCA	CD54HCT40104	
PCF54HCT40105	RCA	CD54HCT40105	
PCF54HCT4017	RCA	CD54HCT4017	
PCF54HCT4020	RCA	CD54HCT4020	
PCF54HCT4024	RCA	CD54HCT4024	
PCF54HCT4040	RCA	CD54HCT4040	
PCF54HCT4049	RCA	CD54HCT4049	
PCF54HCT4050	RCA	CD54HCT4050	
PCF54HCT4051	RCA	CD54HCT4051	
PCF54HCT4052	RCA	CD54HCT4052	
PCF54HCT4053	RCA	CD54HCT4053	
PCF54HCT4060	RCA	CD54HCT4060	
PCF54HCT42	RCA	CD54HCT42	
PCF54HCT4511	RCA	CD54HCT4511	
PCF54HCT4514	RCA	CD54HCT4514	
PCF54HCT4520	RCA	CD54HCT4520	
PCF54HCT4538	RCA	CD54HCT4538	
PCF54HCT533	RCA	CD54HCT533	
PCF54HCT534	RCA	CD54HCT534	
PCF54HCT540	RCA	CD54HCT540	
PCF54HCT541	RCA	CD54HCT541	
PCF54HCT563	RCA	CD54HCT563	
PCF54HCT564	RCA	CD54HCT564	
PCF54HCT573	RCA	CD54HCT573	
PCF54HCT574	RCA	CD54HCT574	
PCF54HCT640	RCA	CD54HCT640	
PCF54HCT643	RCA	CD54HCT643	
PCF54HCT645	RCA	CD54HCT645	
PCF54HCT646	RCA	CD54HCT646	
PCF54HCT648	RCA	CD54HCT648	
PCF54HCT670	RCA	CD54HCT670	
PCF54HCT688	RCA	CD54HCT688	
PCF54HCT73	RCA	CD54HCT73	
PCF54HCT74	RCA	CD54HCT74	
PCF54HCT75	RCA	CD54HCT75	
PCF54HCT76	RCA	CD54HCT76	
PCF54HCT85	RCA	CD54HCT85	
PCF54HCT86	RCA	CD54HCT86	
PCF54HCU04	RCA	CD54HCU04	
PCF73HC356	Motorola	MC74HC356	
	National	MM74HC356	
	RCA	**CD74HC356**	**740**
PCF74HC00	**Motorola**	**MC74HC00**	**733**
	National	MM74HC00	
	RCA	**CD74HC00**	**740**
	SPI	**SP74HC00**	**766**
	Toshiba	TC40H000	
PCF74HC02	Motorola	MC74HC02	
	National	MM74HC02	
	RCA	**CD74HC02**	**740**
	SPI	**SP74HC02**	**766**
	Toshiba	TC40H002	
PCF74HC08	Motorola	MC74HC08	
	National	MM74HC08	
PCF74HC08	**RCA**	**CD74HC08**	**740**
PCF74HC10	Motorola	MC74HC10	
		MC74HC10	
	National	MM74HC10	
	RCA	CD74H10	
		CD74HC10	**740**
	SPI	**SP74HC10**	**766**
	Toshiba	TC40H010	
PCF74HC107	Motorola	MC74HC107	
	National	MM74HC107	
	RCA	**CD74HC107**	**739**
	SPI	**SP74HC107**	**768**
	Toshiba	TC40H107	
PCF74HC109	Motorola	MC74HC109	
		MC74HC109	
	National	MM74HC109	
	RCA	**CD74HC109**	**739**
	SPI	**SP74HC109**	**768**
PCF74HC11	Motorola	MC74HC11	
	National	MM74HC11	
	RCA	**CD74HC11**	**740**
	SPI	**SP74HC11**	**766**
	Toshiba	TC40H011	
PCF74HC112	Motorola	MC74HC112	
	National	MM74HC112	
	RCA	**CD74HC112**	**739**
	SPI	SP74HC112N	
PCF74HC123	Motorola	MC74HC123	
	National	MM74HC123	
	RCA	CD74HC123	
PCF74HC132	Motorola	MC74HC132	
	National	MM74HC132	
	RCA	CD74HC132	
PCF74HC133	Motorola	MC74HC133	
	National	MM74HC133	
	RCA	**CD74HC133**	**740**
PCF74HC138	Motorola	MC74HC138	
	National	MM74HC138	
	RCA	**CD74HC138**	**739**
	SPI	SP74HC138	
PCF74HC139	Motorola	MC74HC139	
	National	MM74HC139	
	RCA	**CD74HC139**	**739**
	SPI	**SP74HC139**	**769**
	Toshiba	TC40H139	
PCF74HC14	Motorola	MC74HC14	
	National	MM74HC14	
	RCA	**CD74HC14**	**740**
	SPI	**SP74HC14**	**766**
PCF74HC147	Motorola	MC74HC147	
	National	MM74HC147	
	RCA	**CD74HC147**	**739**
	SPI	**SP74HC147**	**769**
PCF74HC151	Motorola	MC74HC151	
	National	MM74HC151	
	RCA	**CD74HC151**	**740**
PCF74HC153	Motorola	MC74HC153	
	National	MM74HC153	
	RCA	**CD74HC153**	**740**
	SPI	**SP74HC153**	**769**
	Toshiba	TC40H153	
PCF74HC154	Motorola	MC74HC154	
	National	MM74HC154	
	RCA	**CD74HC154**	**739**
PCF74HC157	Motorola	MC74HC157	
	National	MM74HC157	
	RCA	CD74HC157	
	SPI	**SP74HC157**	**769**
	Toshiba	TC40H157	
PCF74HC158	Motorola	MC74HC158	
	National	MM74HC158	
	RCA	CD74HC158	
	SPI	**SP74HC158**	**769**
	Toshiba	TC40H158	
PCF74HC160	Motorola	MC74HC160	
	National	MM74HC160	
	RCA	**CD74HC160**	**739**
PCF74HC161	Motorola	MC74HC161	
	National	MM74HC161	
	RCA	**CD74HC161**	**739**
	SPI	**SP74HC161**	**770**
PCF74HC162	Motorola	MC74HC162	
	National	MM74HC162	
	RCA	**CD74HC162**	**739**
	SPI	**SP74HC162**	**770**
PCF74HC163	Motorola	MC74HC163	
	National	MM74HC163	
	RCA	**CD74HC163**	**739**
	SPI	**SP74HC163**	**770**
PCF74HC164	Motorola	MC74HC164	
	National	MM74HC164	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
PCF74HC164	**RCA**	**CD74HC164**	740
PCF74HC165	Motorola	MC74HC165	
	National	MM74HC165	
	RCA	**CD74HC165**	740
PCF74HC166	RCA	CD74HC166	
PCF74HC173	Motorola	MC74HC173	
	National	MM74HC173	
	RCA	**CD74HC173**	739
PCF74HC174	Motorola	MC74HC174	
	National	MM74HC174	
	RCA	**CD74HC174**	739
	SPI	**SP74HC174**	770
	Toshiba	TC40H174	
PCF74HC175	Motorola	MC74HC175	
	National	MM74HC175	
	RCA	**CD74HC175**	739
	SPI	**SP74HC175**	770
	Toshiba	TC40H175	
PCF74HC191	**RCA**	**CD74HC191**	739
PCF74HC192	Motorola	MC74HC192	
	National	MM74HC192	
	RCA	**CD74HC192**	739
	SPI	**SP74HC192**	770
	Toshiba	TC40H192	
PCF74HC193	Motorola	MC74HC193	
	National	MM74HC193	
	RCA	**CD74HC193**	739
	SPI	**SP74HC193**	770
	Toshiba	TC40H193	
PCF74HC194	Motorola	MC74HC194	
	National	MM74HC194	
	RCA	**CD74HC194**	740
PCF74HC195	Motorola	MC74HC195	
	National	MM74HC195	
	RCA	**CD74HC195**	740
PCF74HC20	Motorola	MC74HC20	
	National	MM74HC20	
	RCA	**CD74HC20**	740
	SPI	**SP74HC20**	766
	Toshiba	TC40H020	
PCF74HC221	Motorola	MC74HC221	
	National	MM74HC221	
	RCA	**CD74HC221**	740
PCF74HC238	RCA	CD74HC238	
PCF74HC240	Motorola	MC74HC240	
	National	MM74HC240	
	RCA	**CD74HC240**	740
	SPI	**SP74HC240**	770
	Toshiba	TC40H240	
PCF74HC241	Motorola	MC74HC241	
	National	MM74HC241	
	RCA	**CD74HC241**	740
PCF74HC243	Motorola	MC74HC243	
	National	MM74HC243	
	RCA	**CD74HC243**	739
PCF74HC244	Motorola	MC74HC244	
	National	MM74HC244	
	RCA	**CD74HC244**	740
PCF74HC245	Motorola	MC74HC245	
	National	MM74HC245	
	RCA	**CD74HC245**	739
PCF74HC251	Motorola	MC74HC251	
	National	MM74HC251	
	RCA	**CD74HC251**	740
PCF74HC253	Motorola	MC74HC253	
	National	MM74HC253	
	RCA	CD74HC253	
	SPI	**SP74HC253**	771
PCF74HC257	Motorola	MC74HC257	
	National	MM74HC257	
	RCA	**CD74HC257**	740
	SPI	**SP74HC257**	771
PCF74HC259	Motorola	MC74HC259	
	National	MM74HC259	
	RCA	**CD74HC259**	739
PCF74HC266	Motorola	MC74HC266	
	National	MM74HC266	
	RCA	**CD74HC266**	740
	SPI	**SP74HC266**	771
PCF74HC27	Motorola	MC74HC27	
	National	MM74HC27	
	RCA	**CD74HC27**	740
	SPI	**SP74HC27**	766
	Toshiba	TC40H027	
PCF74HC273	Motorola	MC74HC273	
	RCA	CD74HC273	
PCF74HC280	Motorola	MC74HC280	
	National	MM74HC280	
	RCA	**CD74HC280**	739
PCF74HC280	**SPI**	**SP74HC280**	771
PCF74HC297	RCA	CD74HC297	
PCF74HC299	Motorola	MC74HC299	
	National	MM74HC299	
	RCA	CD74HC299	
PCF74HC30	Motorola	MC74HC30	
	National	MM74HC30	
	RCA	**CD74HC30**	740
PCF74HC32	Motorola	MC74HC32	
	National	MM74HC32	
	RCA	**CD74HC32**	740
	SPI	**SP74HC32**	767
	Toshiba	TC40H032	
PCF74HC354	Motorola	MC74HC354	
	National	MM74HC354	
	RCA	**CD74HC354**	740
PCF74HC366	Motorola	MC74HC366	
	National	MM74HC366	
	RCA	**CD74HC366**	740
PCF74HC367	Motorola	MC74HC367	
	National	MM74HC367	
	RCA	**CD74HC367**	740
PCF74HC368	Motorola	MC74HC368	
	National	MM74HC368	
	RCA	**CD74HC368**	740
PCF74HC373	Motorola	MC74HC373	
	National	MM74HC373	
	RCA	**CD74HC373**	739
PCF74HC374	Motorola	MC74HC374	
	National	MM74HC374	
	RCA	**CD74HC374**	739
PCF74HC377	RCA	CD74HC377	
PCF74HC384	**RCA**	**CD74HC384**	739
PCF74HC390	Motorola	MC74HC390	
	National	MM74HC390	
	RCA	**CD74HC390**	739
PCF74HC393	Motorola	MC74HC393	
	National	MM74HC393	
	RCA	**CD74HC393**	739
PCF74HC4002	Motorola	MC74HC4002	
	National	MM74HC4002	
	RCA	**CD74HC4002**	740
PCF74HC40104	RCA	CD74HC40104	
PCF74HC40105	RCA	CD74HC40105	
PCF74HC4017	Motorola	MC74HC4017	
	National	MM74HC4017	
	RCA	**CD74HC4017**	739
PCF74HC4020	Motorola	MC74HC4020	
	National	MM74HC4020	
	RCA	**CD74HC4020**	739
PCF74HC4024	Motorola	MC74HC4024	
	RCA	**CD74HC4024**	739
PCF74HC4040	Motorola	MC74HC4040	
	National	MM74HC4040	
	RCA	**CD74HC4040**	739
PCF74HC4049	Motorola	MC74HC4049	
	National	MM74HC4049	
	RCA	CD74HC4049	
PCF74HC4050	Motorola	MC74HC4050	
	National	MM74HC4050	
	RCA	**CD74HC4050**	740
PCF74HC4051	Motorola	MC74HC4051	
	RCA	CD74HC4051	
PCF74HC4052	Motorola	MC74HC4052	
	RCA	CD74HC4052	
PCF74HC4053	Motorola	MC74HC4053	
	RCA	CD74HC4053	
PCF74HC4060	Motorola	MC74HC4060	
	National	MM74HC4060	
	RCA	**CD74HC4060**	739
PCF74HC42	Motorola	MC74HC42	
	National	MM74HC42	
	RCA	**CD74HC42**	739
	SPI	**SP74HC42**	767
PCF74HC4511	Motorola	MC74HC4511	
	National	MM74HC4511	
	RCA	**CD74HC4511**	739
PCF74HC4514	Motorola	MC74HC4514	
	National	MM74HC4514	
	RCA	**CD74HC4514**	739
PCF74HC4520	**RCA**	**CD74HC4520**	739
PCF74HC4538	Motorola	MC74HC4538	
	National	MM74HC4538	
	RCA	**CD74HC4538**	740
PCF74HC533	Motorola	MC74HC533	
	National	MM74HC533	
	RCA	**CD74HC533**	739
PCF74HC534	Motorola	MC74HC534	
	National	MM74HC534	
	RCA	**CD74HC534**	739
PCF74HC540	**RCA**	**CD74HC540**	740
PCF74HC541	**RCA**	**CD74HC541**	740
PCF74HC563	National	MM74HC563	
	RCA	**CD74HC563**	739
PCF74HC564	National	MM74HC564	
	RCA	**CD74HC564**	739
PCF74HC573	Motorola	MC74HC573	
	National	MM74HC573	
	RCA	**CD74HC573**	739
PCF74HC574	Motorola	MC74HC574	
	National	MM74HC574	
	RCA	**CD74HC574**	739
PCF74HC640	Motorola	MC74HC640	
	National	MM74HC640	
	RCA	**CD74HC640**	739
PCF74HC643	Motorola	MC74HC643	
	National	MM74HC643	
	RCA	**CD74HC643**	739
PCF74HC645	Motorola	MC74HC645	
	National	MM74HC645	
	RCA	**CD74HC645**	739
PCF74HC646	Motorola	MC74HC646	
	National	MM74HC646	
	RCA	**CD74HC646**	739
PCF74HC648	Motorola	MC74HC648	
	National	MM74HC648	
	RCA	**CD74HC648**	739
PCF74HC670	RCA	CD74HC670	
PCF74HC688	Motorola	MC74HC688	
	National	MM74HC688	
	RCA	**CD74HC688**	739
PCF74HC73	Motorola	MC74HC73	
	National	MM74HC73	
	RCA	**CD74HC73**	739
	SPI	**SP74HC73**	767
PCF74HC74	Motorola	MC74HC74	
	National	MM74HC74	
	RCA	**CD74HC74**	739
	SPI	SD74HC74	
	Toshiba	TC40H074	
PCF74HC75	Motorola	MC74HC75	
	National	MM74HC75	
	RCA	CD74HC75	
PCF74HC76	Motorola	MC74HC76	
	National	MM74HC76	
	RCA	**CD74HC76**	739
	SPI	**SP74HC76**	767
	Toshiba	TC40H076	
PCF74HC85	Motorola	MC74HC85	
	National	MM74HC85	
	RCA	**CD74HC85**	739
PCF74HC86	Motorola	MC74HC86	
	National	MM74HC86	
	RCA	**CD74HC86**	740
	SPI	SP74HC86N	
PCF74HCT00	RCA	CD74HCT00	
PCF74HCT02	RCA	CD74HCT02	
PCF74HCT08	RCA	CD74HCT08	
PCF74HCT10	RCA	CD74HCT10	
PCF74HCT107	RCA	CD74HCT107	
PCF74HCT109	RCA	CD74HCT109	
PCF74HCT11	RCA	CD74HCT11	
PCF74HCT112	RCA	CD74HCT112	
PCF74HCT123	RCA	CD74HCT123	
PCF74HCT132	RCA	CD74HCT132	
PCF74HCT133	RCA	CD74HCT133	
PCF74HCT138	RCA	CD74HCT138	
PCF74HCT139	RCA	CD74HCT139	
PCF74HCT14	RCA	CD74HCT14	
PCF74HCT147	RCA	CD74HCT147	
PCF74HCT151	RCA	CD74HCT151	
PCF74HCT153	RCA	CD74HCT153	
PCF74HCT154	RCA	CD74HCT154	
PCF74HCT157	RCA	CD74HCT157	
PCF74HCT158	RCA	CD74HCT158	
PCF74HCT160	RCA	CD74HCT160	
PCF74HCT161	RCA	CD74HCT161	
PCF74HCT162	RCA	CD74HCT162	
PCF74HCT163	RCA	CD74HCT163	
PCF74HCT164	RCA	CD74HCT164	
PCF74HCT165	RCA	CD74HCT165	
PCF74HCT166	RCA	CD74HCT166	
PCF74HCT173	RCA	CD74HCT173	
PCF74HCT174	RCA	CD74HCT174	
PCF74HCT175	RCA	CD74HCT175	
PCF74HCT191	RCA	CD74HCT191	
PCF74HCT192	RCA	CD74HCT192	
PCF74HCT193	RCA	CD74HCT193	
PCF74HCT194	RCA	CD74HCT194	
PCF74HCT195	RCA	CD74HCT195	
PCF74HCT20	RCA	CD74HCT20	
PCF74HCT221	RCA	CD74HCT221	
PCF74HCT238	RCA	CD74HCT238	
PCF74HCT240	RCA	CD74HCT240	
PCF74HCT241	RCA	CD74HCT241	
PCF74HCT242	RCA	CD74HCT242	
PCF74HCT243	RCA	CD74HCT243	
PCF74HCT244	RCA	CD74HCT244	
PCF74HCT245	RCA	CD74HCT245	
PCF74HCT251	RCA	CD74HCT251	
PCF74HCT253	RCA	CD74HCT253	
PCF74HCT257	RCA	CD74HCT257	
PCF74HCT259	RCA	CD74HCT259	
PCF74HCT266	RCA	CD74HCT266	
PCF74HCT27	RCA	CD74HCT27	
PCF74HCT273	RCA	CD74HCT273	
PCF74HCT280	RCA	CD74HCT280	
PCF74HCT297	RCA	CD74HCT297	
PCF74HCT299	RCA	CD74HCT299	
PCF74HCT30	RCA	CD74HCT30	
PCF74HCT32	RCA	CD74HCT32	
PCF74HCT354	RCA	CD74HCT354	
PCF74HCT356	RCA	CD74HCT356	
PCF74HCT365	RCA	CD74HCT365	
PCF74HCT366	RCA	CD74HCT366	
PCF74HCT367	RCA	CD74HCT367	
PCF74HCT368	RCA	CD74HCT368	
PCF74HCT373	RCA	CD74HCT373	
PCF74HCT374	RCA	CD74HCT374	
PCF74HCT377	RCA	CD74HCT377	
PCF74HCT384	RCA	CD74HCT384	
PCF74HCT390	RCA	CD74HCT390	
PCF74HCT393	RCA	CD74HCT393	
PCF74HCT4002	RCA	CD74HCT4002	
PCF74HCT40104	RCA	CD74HCT40104	
PCF74HCT40105	RCA	CD74HCT40105	
PCF74HCT4017	RCA	CD74HCT4017	
PCF74HCT4020	RCA	CD74HCT4020	
PCF74HCT4024	RCA	CD74HCT4024	
PCF74HCT4040	RCA	CD74HCT4040	
PCF74HCT4049	RCA	CD74HCT4049	
PCF74HCT4050	RCA	CD74HCT4050	
PCF74HCT4051	RCA	CD74HCT4051	
PCF74HCT4052	RCA	CD74HCT4052	
PCF74HCT4053	RCA	CD74HCT4053	
PCF74HCT4060	RCA	CD74HCT4060	
PCF74HCT42	RCA	CD74HCT42	
PCF74HCT4511	RCA	CD74HCT4511	
PCF74HCT4514	RCA	CD74HCT4514	
PCF74HCT4538	RCA	CD74HCT4538	
PCF74HCT533	RCA	CD74HCT533	
PCF74HCT534	RCA	CD74HCT534	
PCF74HCT540	RCA	CD74HCT540	
PCF74HCT541	RCA	CD74HCT541	
PCF74HCT563	RCA	CD74HCT563	
PCF74HCT564	RCA	CD74HCT564	
PCF74HCT573	RCA	CD74HCT573	
PCF74HCT574	RCA	CD74HCT574	
PCF74HCT640	RCA	CD74HCT640	
PCF74HCT643	RCA	CD74HCT643	
PCF74HCT645	RCA	CD74HCT645	
PCF74HCT646	RCA	CD74HCT646	
PCF74HCT648	RCA	CD74HCT648	
PCF74HCT670	RCA	CD74HCT670	
PCF74HCT688	RCA	CD74HCT688	
PCF74HCT73	RCA	CD74HCT73	
PCF74HCT74	RCA	CD74HCT74	
PCF74HCT75	RCA	CD74HCT75	
PCF74HCT76	RCA	CD74HCT76	
PCF74HCT85	RCA	CD74HCT85	
PCF74HCT86	RCA	CD74HCT86	
S3101	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

ALTERNATE SOURCE DIRECTORY

© IC MASTER 1983

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
S3101	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
◆S54S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
S7281	Fairchild	54177	
	National	DM54177	
		DM7281	
	Raytheon	RM8281	
	Signetics	54177	
		S8281	
S7281	TI	**SN54177**	**896**
S74S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
◆S8200	Raytheon	RM8200	
◆S8201	Raytheon	RM8201	
S8202	Raytheon	RM8202	
◆S8203	Raytheon	RM8203	
◆S82147	National	DM54147	
	Signetics	54147	
	TI	**SN54147**	**882**
◆S82148	Fairchild	9318	
	Hitachi	HD74148	
	National	DM54148	
		DM74148	
		DM8318	
		DM9318	
	Signetics	54148	
		74148	
		N82148	
	TI	**SN54148**	**883**
		SN74148	**883**
S8224	Fairchild	5488	
	National	DM5488	
	TI	SN5488	
		SN5488A	
S8225	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
S8225	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
		SN74S289	
◆S8230	Fairchild	9312	
	National	DM8312	
		DM9312	
	Raytheon	RC8230	
		RC9312	
		RM8230	
		RM9312	
	Signetics	N8230	
	TI	SN29312	
		SN39312	
S8231	Raytheon	RM8231	
◆S8241	Motorola	SN54LS386	
	National	DM54LS386	
	Raytheon	54LS386	
		RM8241	
	Signetics	S82S41	
	TI	54LS386	
		SN54LS386	**942**
◆S8242	Raytheon	RM8242	
S8250	Raytheon	RM8250	
◆S8251	Raytheon	RM8251	
S8252	Fairchild	9031	
		9301	
	National	DM8301	
		DM9301	
	Raytheon	RC8252	
		RM8252	
	Signetics	N8252	
	TI	SN29301	
		SN39301	
◆S8260	Raytheon	RM8260	
◆S8261	Raytheon	RM8261	
S8262	Raytheon	RM8262	
◆S8263	Raytheon	RM8263	
◆S8264	Raytheon	RM8264	
S8266	Raytheon	RM8266	
◆S8267	Raytheon	RM8267	
◆S8269	National	DM7200	
S8270	Fairchild	54178	
	Raytheon	RM8270	
	TI	**SN54178**	**896**
S8271	Fairchild	54179	
	Raytheon	RM8271	
	TI	**SN54179**	**897**
S8277	Raytheon	RM8277	
S8280	Fairchild	54176	
	National	DM54176	
	Raytheon	RM8280	
	Signetics	54176	
	TI	**SN54176**	**896**
S8281	Fairchild	54177	
	National	DM54177	
		DM7281	
	Raytheon	RM8281	
	Signetics	54177	
		S7281	
	TI	**SN54177**	**896**
◆S8288	National	DM7288	
S82HS137	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
S82HS181	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
S82HS185	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82S185	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
S82HS185	TI	SN54S454	
		SN74S454	
		TBP24S81	**440,3968**
		TBP24S81M	**440,3968**
S82LS181	Fairchild	93L451	
	Signetics	N82LS181	
	TI	**TBP28L86**	**440,3972**
S82S09	Fairchild	93419	
	Signetics	N82S09	
S82S10	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S110	
	TI	SN54S314	
		SN74S314	
S82S100	Fairchild	93459	
	Signetics	N82S100	
S82S101	Fairchild	93458	
	Signetics	N82S101	
S82S110	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
	TI	SN54S314	
		SN74S314	
S82S115	AMD	AM27S15	
	Harris	HM7647R	
	Signetics	N82S115	
S82S116	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
S82S123	AMD	AM27LS19	
		AM27S19	
S82S123	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	**3826**
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	**TBP18S030**	**440,3965**
		TBP18S030M	**440,3965**
S82S126	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	**3696**
	Intel	M3601	
	MMI	5300-1	
		6300-1	**3826**
	National	DM54S387	
		DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
	TI	**TBP24SA10**	**440,3967**
		TBP24SA10M	**440,3967**
S82S129	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
		HM7611-2	**3696**
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	**3826**
	National	DM54S287	
		DM74S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
	TI	**TBP24S10**	**440,3967**
S82S130	AMD	AM27S12	
	Fairchild	93436	
	Harris	HM7620	
	Intel	M3602	
	MMI	5305	
		6305	
	National	DM54S570	
		DM74S570	
	Raytheon	29610	
	Signetics	N82S130	
S82S131	AMD	AM27S13	
	Fairchild	93446	
	Harris	HM7621	
	Intel	M3622	
	MMI	5306	
		6306	
	National	DM54S571	
		DM74S571	
	Raytheon	29611	
	Signetics	N82S131	
S82S136	AMD	AM27S32	
	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642	
		HM7642-2	**3705**
	Intel	M3605	
	MMI	5352-1	
		6352	
	National	DM54S572	
		DM74S572	
	Raytheon	29640	
	Signetics	N82S136	
	TI	**TBP24SA41**	**440,3968**
		TBP24SA41M	**440,3968**
S82S137	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
S82S137	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
		TBP28S41M	
S82S140	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
	TI	**TBP28SA46**	**440**
S82S141	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	**3826**
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
	TI	**TBP28S46**	**440,3976**
		TBP28S46M	**440,3976**
S82S146	AMD	AM27S28	
	Fujitsu	MB7123	
		MB7124	
		MC7124	
	Harris	HM7648	
	MMI	5348	
		6348	
	National	DM54S473	
		DM74S473	
	Raytheon	29620	
	Signetics	N82S146	
	TI	**TBP28SA42**	**440,3976**
S82S147	AMD	AM27S29	
	Fujitsu	MB7124	
		MBM7124	
	Harris	HM7649	
	MMI	5349-1	
		6349-1	**3826**
	Motorola	MCM7649	
	National	DM54S472	
		DM74S472	
	Raytheon	29621	
	Signetics	N82S147	
S82S147	TI	DM54S472	
		TBP28S42	**440,3975**
		TBP28S42M	**440,3975**
S82S16	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
S82S180	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
	TI	TBP28SA86	
		TBP28SA86M	**3978**
S82S181	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
	Supertex	SM82S181	
	TI	TBP28S86	
		TBP28S86M	
◆S82S184	AMD	AM27S184	
	Fujitsu	MB7127	
	Harris	HM7684	
	MMI	53100	
		63100	
	Motorola	MCM7684	
	National	DM77S184	
		DM87S184	
	Raytheon	29650	
	Signetics	N82S184	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Signetics (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
◆S82S184	TI	TBP24SA81	440,3969
S82S185	AMD	AM27S185	
	Fujitsu	MB7128	3679
	Harris	HM7685	
		HM7685-2	3714
	MMI	53101	
		63101	
		63S841	3826,3833
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	440,3968
		TBP24S81M	440,3968
S82S190	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	
	National	DM77S190	
		DM87S190	
	Raytheon	29680	
		29683	
	Signetics	82S190	
		N82S190	
	Supertex	MM82S190	
S82S191	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
	Supertex	MM82S191	
		SM82S191	
	TI	TBP28S166	440,3979
S82S212	Fairchild	93479	
	Signetics	82S212	
		N82S212	
S82S23	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		6330-1	3826
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
S82S25	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
	TI	SN5489	
		SN54S289	
		SN7489	440,863
		SN74S289	
S82S2708	Harris	HM7608	
	Raytheon	29635	
	Signetics	N82S2708	
	TI	TBP28S2708	3980
S82S30	Fairchild	93S12	
S82S321	AMD	AM27S43	
	Fujitsu	MB7142	
	Intel	3632	
	Signetics	82S321	
		N82S321	
S82S41	Motorola	SN54LS386	
	National	DM54LS386	
	Raytheon	54LS386	
		RM8241	
	TI	54LS386	
		SN54LS386	942
S82S62	Fairchild	93S62	
◆S82S707	Motorola	MCM82707	
	Signetics	N82S707	
◆S82S708	Motorola	MCM82708	
	Signetics	N82S708	
◆S8471	Motorola	SN54LS12	
	National	DM54LS12	
	Raytheon	54LS12	
	TI	SN54LS12	837
◆S8H16	Fairchild	54H20	
	National	DM54H20	
	TI	SN54H20	839
◆S8H70	Fairchild	54H10	
	National	DM54H10	
	TI	SN54H10	836
◆S8H80	Fairchild	54H00	
	National	DM54H00	
	TI	SN54H00	
◆S8H90	Fairchild	54H04	
	National	DM54H04	
	TI	SN54H04	834
S8T09	Raytheon	RM8T09	
◆S8T10	Fairchild	54173	
	National	DM54173	
		DM7551	
◆S8T10	Raytheon	RM8T10	
	TI	SN54173	894
S8T13	National	DS55121	
	TI	SN55121	
◆S8T14	National	DS55122	
	TI	SN55122	
S8T22	Fairchild	74122	
		9601	
	National	DM8601	
		DM9601	
	Raytheon	RF8601	
		RF9601	
	Signetics	8T22	
		N8T22	
	TI	SN74122	873
S8T26	AMD	S8T26	
S8T28	AMD	S8T28	
S8T95	National	DM7095	
	TI	SN54365	
◆S8T96	National	DM7096	
	TI	SN54366	
S8T97	National	DM7097	
	TI	SN54367	
S8T98	Motorola	MC6888	
		MC8T98	
	National	DM7098	
		DM8098	
		DS8674	
	Signetics	N8T98	
	TI	SN54368	
		SN74368	
SCN2651	National	INS2651	
	SMC	COM2651	
SCN2652	AMI	S6852	
	Fairchild	F6852	1281
	Hitachi	HD6852	1345
		HD68A52	1345
	Motorola	MC2652	1359
		MC6852	1351
		MC68652	1359
	SSS	SND5025	
	SMC	COM5025	
SCN2653	Motorola	MC2653	1360
		MC68653	1360
SCN2661	Motorola	MC2661	
		MC68661	
	SMC	COM2661	
	Synertek	2661	
SCN68000	Hitachi	HD68000	
	Mostek	MK68000	
	Motorola	MC68000	
	Rockwell	R68000	
SCN68120	Motorola	MC68120	1352,1357,1730
SCN68230	Motorola	MC68230	
SCN68681	Motorola	MC68681	1360
SCN8035	AMD	8035	
		D8035	
		ID8035	
		P8035	
	Fujitsu	MBL8035	
	Intel	8035	
		D8035	
		ID8035	
		P8035	
	National	INS8035	
	NEC-Micro	μPD8035	
		μPD80C35	
SCN8039	AMD	D8039	
		ID8039	
	Fujitsu	MBL8039	
	Intel	8039	
		D8039	
		ID8039	
	National	INS8039	
	NEC-Micro	μPD8039	
SCN8048	AMD	8048	
	Fujitsu	MBL8048	
	Intel	8048	
	National	INS8048	
	NEC-Micro	μPD8048	
		μPD80C48	
	Toshiba	TMP8048	
SCN8049	Fujitsu	MBL8049	
	Intel	8049	
	National	INS8049	
	NEC-Micro	μPD8049	
SD5000	SPI	SD5000	
	Siliconix	SI5000	
SD5001	SPI	SD5001	
	Siliconix	SI5001	
SD5002	SPI	SD5002	
SD5002	Siliconix	SI5002	
SD5200	SPI	SD5200	
	Siliconix	SI5200	
SE5008	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	3164
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	2621
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	3320
		DAC0801	
		DAC0802	3320
		DAC0806	
		DAC0807	
		DAC0808	3320
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5009	
SE5009	AMD	1408	
		1508	
		AM1508	
		SSS1408	
	AD	AD1408	
		ADDAC-08	3164
	Datel	DAC-08B	
		DAC-I8BC	
		DAC-IC8B	
		DAC-IC8BC	2621
		DAC-IC8BM	
	Fairchild	DAC-08	
		MA0802M	
		μA0801	
		μA0802	
	Motorola	DAC-08	
		MC1408	
		MC1508	
	National	DAC-0800	
		DAC0800	3320
		DAC0801	
		DAC0802	3320
		DAC0806	
		DAC0807	
		DAC0808	3320
	NEC-Electron	μPC624	
	PMI	DAC-08	
		DAC-09	
		DAC-1408	
		DAC-1508	
		DAC1408	
		DAC1508	
	Raytheon	DAC-08	
	Signetics	MC1408	
		MC1508	
		SE5008	
SE5019	AMD	AM6080	
	Signetics	SE5118	
		SE5119	
SE5118	AMD	AM6080	
	Signetics	SE5019	
		SE5119	
SE5119	AMD	AM6080	
	Signetics	SE5019	
		SE5118	
SE529	National	LM161	3317
	PMI	CMP-05	
◆SE531	Raytheon	RM4531	
SE5410	Datel	DAC-IC10BM	
	Motorola	MC3510	2759
	Signetics	MC3510	
		NE5410	3413

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Manufacturer Device	Replacement Source	Device	IC Master Page
Signetics		**(Cont'd)**	
SE550	National	LM550	
SE5532	**Exar**	**XR5532**	**3208**
	Signetics	NE5532	
		NE5532A	
		SE5532A	
	TI	NE5532	
		NE5532A	
SE5532A	**Exar**	**XR5532**	**3208**
	Signetics	NE5532	
		NE5532A	
		SE5532	
	TI	NE5532	
		NE5532A	
SE5533	**Exar**	**XR5533**	**3208**
	Signetics	NE5533	
		NE5533A	
		SE5533A	
	TI	NE5533	
SE5533A	**Exar**	**XR5533**	**3208**
	Signetics	NE5533	
		NE5533A	
		SE5533	
	TI	NE5533	
SE5534	Datel	AM-453-2C	
		AM-453-2M	
	Exar	**XR5534**	**3209**
	Raytheon	RC5534	
		RM5534	
	Signetics	NE5534	
		NE5534A	
		SE5534A	
	TI	NE5534	
		NE5534A	
SE5534A	Datel	AM-453-2C	
		AM-453-2M	
	Exar	**XR5534**	**3209**
	Raytheon	RC5534	
		RM5534	
	Signetics	NE5534	
		NE5534A	
		SE5534	
	TI	NE5534	
		NE5534A	
SE554A	TI	SE5534	
		SE5534A	
SE555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
	SiliconG	SG555	
	TI	NE555	
		SE555	
SE556	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
SE5560	Ferranti	ZN1060	
	Signetics	**NE5560**	**3402**
	Sprague	ULN-8160	
		ULS-8160	
SE5561	Sprague	ULS-8161	
SE558	Exar	XR558	
	Signetics	NE558	
SE565	National	LM565	
	Signetics	NE565	
SE566	National	LM566	
	Signetics	NE566	
SE567	Exar	XR2567	
		XR567	
SE567	National	LM567	
	Raytheon	XR2567	
	Signetics	NE567	
SE592	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	μA733	
	SiliconG	SG733	
	TI	μA733	
SG1524	**Exar**	**XR1524**	**3190**
	RCA	**CA1524**	**3368**
	SiliconG	SG1524	
	TI	SG1524	
SG2524	**Exar**	**XR2524**	**3190,3209**
	RCA	**CA2524**	**3368**
	SiliconG	SG2524	
	TI	SG2524	
SG3524	**Exar**	**XR3524**	**3190**
	RCA	**CA3524**	**3368**
	SiliconG	SG3524	
	TI	SG3524	
SN74LS08	Fairchild	74LS08	
	Hitachi	HD74LS08	
	Motorola	SN74LS08	
	National	DM74LS08	
	Raytheon	74LS08	
	SGS	T74LS08	
	Signetics	74LS08	
	TI	**SN74LS08**	**835**
SN74LS378	AMD	SN74LS378	
	Fairchild	74LS378	
	Motorola	SN74LS378	
	SGS	T74LS378	
	Signetics	74LS378	
	TI	**SN74LS378**	**939**
SN7524	Fairchild	75S24	
	Hitachi	HA1902	
	Motorola	MC7524	
	National	75S24	
	SiliconG	SG7524	
	TI	SN75224	
		SN7524	
SP380	National	DS8640	
SU536	Intersil	SU536	
TBA120	**National**	**TBA120**	**3325,3327**
	Plessey	TBA120	
	Siemens	TBA120	
	Telefunken	TBA120	
TBA1441	Siemens	TBA1441	
TBA396	Motorola	TBA396	
TBA520	Plessey	TBA520	
TBA530	National	TBA530	
	Plessey	TBA530	
	Telefunken	TBA530	
TBA540	National	TBA540	
	Plessey	TBA540	
	Telefunken	TBA540	
TBA550	Plessey	TBA550	
TBA560	National	TBA560	
	Plessey	TBA560	
	Telefunken	TBA560	
TBA750	Plessey	TBA750	
TBA810	Fairchild	TBA810	
	RCA	CA810	
	SGS	TBA810	
TBA920	National	TBA920	
	Plessey	TBA920	
TBA990	National	TBA990	
	Plessey	TBA990	
	Telefunken	TBA990	
TCA440	Siemens	TCA440	
TCA800	Plessey	TCA800	
TDA2522	National	TDA2522	
	Plessey	TDA2522	
	Siemens	TDA2522	
TDA2523	National	TDA2523	
	Plessey	TDA2523	
TDA2530	**Hitachi**	**HN462532**	**3789**
	Motorola	MCM2532	
	National	MM2532	
		NMC2532	
		TDA2530	
		TDA2532	
TDA2530	Plessey	TDA2530	
	Siemens	TDA2530	
	Signetics	TDA2532	
	SiliconG	SG2532	
	TI	TMS2532	
	Universal	UM2532	
TDA2532	**Hitachi**	**HN462532**	**3789**
	Motorola	MCM2532	
	National	MM2532	
		NMC2532	
		TDA2530	
		TDA2532	
	Plessey	TDA2530	
	Siemens	TDA2530	
	Signetics	TDA2530	
	SiliconG	SG2532	
	TI	TMS2532	
	Universal	UM2532	
TDA2540	National	TDA2540	
	Plessey	TDA2540	
TDA2541	National	TDA2541	
	Plessey	TDA2541	
TDA2560	National	TDA2560	
	Plessey	TDA2560	
	Siemens	TDA2560	
TDA2590	Plessey	TDA2590	
TDA2591	National	TDA2591	
	Plessey	TDA2591	
	Telefunken	TDA2591	
TDA2593	National	TDA2593	
	Plessey	TDA2593	
	Telefunken	TDA2593	
TDA2600	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	TI	SBP8316	
	Toshiba	TMM331A	
TDA3570	Panasonic	AN5310	
ULN-6128	**Exar**	**XR6128**	**3205**
	Sprague	**UDN-6128**	**2843**
ULN2001	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
ULN2003	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
ULN2003	**Motorola**	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
ULN2004	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
μA723	Fairchild	μA723	
	Hitachi	HA17723	
	Intersil	LM723	
	Motorola	**MC1723**	**3295**
	National	LM723	
	Raytheon	RC723	
		RM723	
	RCA	CA723	
		LM723	
	SGS	L123	
	SiliconG	SG723	
	TI	μA723	
	Thomson-CSF	SFC2723	
μA733	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
	SiliconG	SG733	
	TI	μA733	
μA740	Intersil	LM740	
	Signetics	NE536	
μA741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Manufacturer Device	Replacement Source	Device	IC Master Page
Signetics (Cont'd)			
μA741	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
μA747	AMD	747	
	Fairchild	μA747	
	Hitachi	HA17747	
	Motorola	MC1747	
	National	LM747	
	NEC-Electron	μPC251	
	PMI	OP-04	
		PM747	
	Raytheon	RC747	
		RM747	
	RCA	CA747	
	SiliconG	SG747	
	TeledyneS	747	
	TI	μA747	
μA748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
μA758	Motorola	μA758	
	National	**LM1800**	**3325,3328**
	RCA	CA758	
	TI	SN76111	
		SN76116	
Silicon General			
SG101	AMD	LM101	
	AD	AD101	
	Fairchild	μA101	
	Intersil	AD101	
	Motorola	LM101	
	Raytheon	LM101	
	Signetics	LM101	
	TI	LM101	
	Thomson-CSF	SFC2101	
SG105	AMD	LM105	
	Fairchild	μA105	
	Intersil	LM105	
	National	LM105	
	Thomson-CSF	SFC2105	
SG107	AMD	LM107	
	AD	**AD741S**	**3153**
	Intersil	LM107	
	National	LM107	
	Raytheon	LM107	
	TI	LM107	
		SN55107	
	Thomson-CSF	SFC2107	
SG108	AMD	LM108	
SG108	**AD**	**AD108**	**3153**
	Fairchild	μA108	
		μA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	μPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	TI	μA714	
SG109	Fairchild	μA109	
	Motorola	LM109	
	National	LM109	
	TI	SN55109	
	Thomson-CSF	SFC2109	
SG110	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM210	
		LM310	
	PMI	BUF-01	
		BUF-02	
		BUF-03	
	SiliconG	SG210	
		SG310	
SG111	AMD	LM111	
	AD	AD111	
	Fairchild	μA111	
	Intersil	LM111	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM111	
	National	**LM111**	**3317**
	PMI	PM111	
	Raytheon	LM111	
	Signetics	LM111	
	TI	LM111	
	Thomson-CSF	SFC2111	
SG117	MicroEng	MCE-LM117	
	Motorola	**LM117**	**3295**
	National	**LM117**	**3299**
	TI	LM117	
SG120-12	Fairchild	μA7912	
		μA79M12	
	Motorola	MC7912	
	National	LM120-12	
		LM320MP12	
		LM7912	
		LM79M12	
	SiliconG	SG320P-12	
		SG7912	
	TI	μA7912	
SG120-15	Fairchild	μA7915	
	Lambda	LμA7915	
	Motorola	MC7915	
	National	LM120-15	
		LM320-15	
		LM320T15	
		LM7915	
	SiliconG	SG320-15	
		SG7915	
	TI	μA7915	
SG120-5	Fairchild	μA7905	
		μA79M05	
	Lambda	LMC7905	
		LμA7905	
	Motorola	MC7905	
	National	LM320MP5	
		LM7905	
		LM79M05	
SG120-5	SiliconG	SG320-05	
		SG320P-5	
		SG7905	
	TI	μA7905	
SG123	**Motorola**	**LM123**	**3294**
		MC78T05	
	National	**LM123**	**3299**
	TI	SN55123	
SG124	AMD	LM124A	
	Motorola	LM124A	
	National	LM124A	
	Raytheon	LM124A	
	RCA	CA124A	
	Signetics	LM124A	
	TI	LM124A	
SG139	AMD	LM139	
	Fairchild	μA139	
	Motorola	LM139	
	National	**LM139**	**3317**
	PMI	CMP-04	
		PM139	
	Raytheon	LM139	
	RCA	CA139	
	Signetics	LM139	
	TI	LM139	
SG139A	AMD	LM139A	
	Motorola	LM139A	
	National	**LM139A**	**3317**
	PMI	CMP-04	
		PM139A	
	RCA	CA139A	
SG140-05	National	LM140-05	
SG140-12	**National**	**LM140-12**	**3299**
SG140-15	**National**	**LM140-15**	**3299**
SG1403	**AD**	**AD1403**	**3178**
	Motorola	**MC1403**	**2761**
SG1436	**Datel**	**AM-464-2**	**2622**
	Harris	**HA-2645**	**3232,3287**
	Motorola	MC1436	
		MC1439	
	National	LM1436	
		LM343	
	TeledyneP	1332	
SG1456	**Datel**	**AM-460-2**	**2622**
	Harris	**HA-2605**	**3226,3287**
	Intersil	HA-2602	
		HA-2605	
		HA2605	
	Motorola	MC1456	
	Signetics	MC1456	
	TI	MC1456	
SG1458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
SG1458	SiliconG	SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
SG1468	Exar	XR1468	
		XR4195	
	Motorola	**MC1468**	**3296**
	Raytheon	RC4195	
	SiliconG	SG2501A	
		SG3501A	
		SG4501	
SG1488	AMD	MC1488	
	Exar	**XR1488**	**3188**
	Fairchild	μA1488	
	Harris	HA1488	
	Hitachi	HD75188	
	Motorola	**MC1488**	**2753**
	National	DS1488	
	Raytheon	RM1488	
	Signetics	MC1488	
	TI	MC1488	
		SN75188	
SG1489	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
SG1489A	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
	TI	MC1489A	
		SN75189	
		SN75189A	
		SN85189	
SG1495	Motorola	MC1495	
SG1496	Fairchild	μA796	
	Motorola	MC1496	
		MC1596	
	National	LM1496	
		LM1596	
	Plessey	SL1496	
		SL1596	
	Signetics	MC1496	
		MC1596	
	SiliconG	SG1596	
SG150	**Motorola**	**LM150**	**3295**
	National	**LM150**	**3299**
SG1501A	Exar	XR1568	
	Motorola	**MC1568**	**3296**
	Raytheon	RM4195	
	SiliconG	SG1568	
SG1524	**Exar**	**XR1524**	**3190**
	RCA	**CA1524**	**3368**
	Signetics	SG1524	
	TI	SG1524	
SG1525A	Motorola	SG1525A	
	Siliconix	PWM25A	
SG1527A	Motorola	SG1527A	
	Siliconix	PWM27A	
SG1536	Datel	AM-464-2M	
	Harris	**HA-2640**	**3232,3287**
	Motorola	MC1536	
	National	LM143	
		LM1536	
SG1556	**Harris**	**HA-2600**	**3226,3287**
	Intersil	HA2600	
	Motorola	MC1556	
	Signetics	MC1556	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Silicon General (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SG1556	TeledyneP	1326	
	TI	MC1556	
SG1558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
	TI	MC1458	
		MC1558	
		RC4558	
		RM4558	
SG1568	Exar	XR1568	
	Motorola	**MC1568**	**3296**
	Raytheon	RM4195	
	SiliconG	SG1501A	
SG1595	Motorola	MC1595	
SG1596	Fairchild	μA796	
	Motorola	MC1496	
		MC1596	
	National	LM1496	
		LM1596	
	Plessey	SL1496	
		SL1596	
	Signetics	MC1496	
		MC1596	
	SiliconG	SG1496	
SG2001	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
SG2002	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
SG2002	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
SG2003	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
SG2004	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
SG201	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
SG201	SiliconG	SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
SG202	AMD	LM202	
	National	LM202	
SG204	National	LM204	
	Thomson-CSF	SFC2204	
SG205	AMD	LM205	
	National	LM205	
	Thomson-CSF	SFC2205	
SG207	AMD	LM207	
	National	LM207	
	RCA	CA207	
	TI	SN55207	
	Thomson-CSF	SFC2207	
SG208	AMD	LM208	
	AD	**AD208**	**3153**
	Fairchild	μA208	
	MicroPwr	MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM208	
	National	LM208	
	PMI	OP-08	
		OP05	
		PM208	
	TI	μA714	
SG209	Fairchild	μA209	
	Lambda	LLM209	
	Motorola	LM209	
	National	LM209	
	Thomson-CSF	SFC2209	
SG210	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM210	
		LM310	
	PMI	BUF-01	
		BUF-02	
		BUF-03	
	SiliconG	SG110	
		SG310	
SG211	AMD	LM211	
	AD	AD211	
	Motorola	LM211	
	National	**LM211**	**3317**
	PMI	PM211	
	RCA	LM211	
	Signetics	LM211	
	TI	LM211	
	Thomson-CSF	SFC2211	
SG212	AMD	LM212	
	Motorola	LM212	
SG217	MicroEng	MCE-LM217	
	Motorola	**LM217**	**3295**
	National	**LM217**	**3299**
	TI	LM217	
SG220	Lambda	LLM220	
	National	LM220	
SG220-05	National	LM220-05	
SG220-12	National	LM220-12	
SG220-15	National	LM220-15	
SG223	Lambda	LLM223	
	Motorola	**LM223**	**3294**
	National	**LM223**	**3299**
SG224	AMD	LM224	
	Fairchild	μA224	
	Motorola	LM224	
	National	LM224	
	Raytheon	LM224	
	RCA	CA224	
	Signetics	LM224	
	TI	LM224	
SG239	AMD	LM239	
	Fairchild	μA239	
	Motorola	LM239	
	National	**LM239**	**3317**
	PMI	CMP-04	
		PM239	
	Raytheon	LM239	
	RCA	CA239	
	Signetics	LM239	
	TI	LM239	
SG239A	AMD	LM239A	
	Motorola	LM239A	
SG239A	**National**	**LM239A**	**3317**
	PMI	CMP-04	
		PM239A	
	RCA	CA239A	
SG250	**Motorola**	**LM250**	**3295**
	National	**LM250**	**3299**
SG2501A	Exar	XR1468	
		XR4195	
	Motorola	**MC1468**	**3296**
	Raytheon	RC4195	
	SiliconG	SG1468	
		SG3501A	
		SG4501	
SG2524	**Exar**	**XR2524**	**3190,3209**
	RCA	**CA2524**	**3368**
	Signetics	SG2524	
	TI	SG2524	
SG2525A	Motorola	SG2525A	
	Siliconix	PWM25B	
SG2526	**Motorola**	**SG2526**	**3297**
		SG3526	**3297**
	Sprague	ULQ-8126	
SG2527A	Motorola	SG2527A	
	Siliconix	PWM27B	
SG2532	**Hitachi**	**HN462532**	**3789**
	Motorola	MCM2532	
	National	MM2532	
		NMC2532	
		TDA2530	
		TDA2532	
	Plessey	TDA2530	
	Siemens	TDA2530	
	Signetics	TDA2530	
		TDA2532	
	TI	TMS2532	
	Universal	UM2532	
SG300	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
SG3001	Hitachi	HA1110	
	RCA	CA3001	
SG301	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
SG302	AMD	LM302	
	Intersil	LM302	
	National	LM302	
SG304	National	LM304	
	NEC-Electron	μPC142	
	Thomson-CSF	SFC2304	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Silicon General (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SG3045	Fairchild	μA3045	
	Hitachi	HA1127	
	National	LM3045	
	Plessey	SL3045	
	RCA	CA3045	
SG3046	Motorola	MC3346	
	National	LM3046	
	Plessey	SL3146	
	RCA	CA3046	
		CA3146	
	SiliconG	SG3146	
	Sprague	ULN-2046	
SG305	AMD	LM305	
	Fairchild	μA305	
	Intersil	LM305	
	National	LM305	
	NEC-Electron	μPC141	
	Thomson-CSF	SFC2305	
SG3058	RCA	CA3058	
SG3059	Motorola	CA3059	
	RCA	CA3059	
SG307	AMD	LM307	
	AD	**AD741J**	**3153**
	Intersil	LM307	
	Motorola	LM307	
	National	LM307	
	Raytheon	LM307	
	RCA	CA307	
	TI	LM307	
	Thomson-CSF	SFC2307	
SG3079	Motorola	CA3079	
	RCA	CA3079	
SG308	AMD	LM308	
	AD	**AD308**	**3153**
	Burr-Brown	3500	
		3501	
	Fairchild	μA308	
	Intersil	AD308	
		LM308	
	MicroPwr	MP5505	
	Motorola	LM308	
	National	LM308	
	Raytheon	LM308	
SG3081	Plessey	SL3081	
	RCA	CA3081	
	Signetics	CA3081	
	Sprague	ULN-2081	
SG3082	Plessey	SL3082	
	RCA	CA3082	
	Signetics	CA3082	
	Sprague	ULN-2082	
SG3083	Plessey	SL3083	
		SL3183	
	RCA	CA3083	
		CA3183	
	Signetics	CA3083	
		CA3183	
	SiliconG	SG3183	
	Sprague	ULN-2083	
SG3086	Fairchild	μA3086	
	Motorola	MC3386	
	National	LM3086	
	Plessey	SL3046	
		SL3086	
	RCA	CA3046	
		CA3086	
	SiliconG	SG3821	
		SG3886	
	Sprague	ULN-2046	
		ULN-2086	
SG309	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
SG309	Toshiba	TA78005	
SG310	AMD	LM110	
		LM210	
		LM310	
	Intersil	LM110	
		LM310	
	National	LM110	
		LM210	
		LM310	
	PMI	BUF-01	
		BUF-02	
		BUF-03	
	SiliconG	SG110	
		SG210	
SG311	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
		SFC3111	
SG3118	AMD	AMLM112	
		AMLM212	
		AMLM312	
		LM312	
	Motorola	LM312	
	National	LM312	
SG3146	Motorola	MC3346	
	National	LM3046	
	Plessey	SL3146	
	RCA	CA3046	
		CA3146	
	SiliconG	SG3046	
	Sprague	ULN-2046	
SG317	Fairchild	μA317	
	MicroEng	MCE-LM317	
	Motorola	**LM317**	**3295**
	National	**LM317**	**3299**
	TI	LM317	
SG3183	Plessey	SL3083	
		SL3183	
	RCA	CA3083	
		CA3183	
	Signetics	CA3083	
		CA3183	
	SiliconG	SG3083	
	Sprague	ULN-2083	
SG320-05	Fairchild	μA7905	
		μA79M05	
	Lambda	LMC7905	
		LμA7905	
	Motorola	MC7905	
	National	LM320MP5	
		LM7905	
		LM79M05	
	SiliconG	SG120-5	
		SG320P-5	
		SG7905	
	TI	μA7905	
SG320-15	Fairchild	μA7915	
	Lambda	LμA7915	
	Motorola	MC7915	
	National	LM120-15	
		LM320-15	
		LM320T15	
		LM7915	
	SiliconG	SG120-15	
		SG7915	
	TI	μA7915	
SG320-5	National	LM320-5	
SG320P-12	Fairchild	μA7912	
		μA79M12	
	Motorola	MC7912	
	National	LM120-12	
		LM320MP12	
		LM7912	
		LM79M12	
SG320P-12	SiliconG	SG120-12	
		SG7912	
	TI	μA7912	
SG320P-5	Fairchild	μA7905	
		μA79M05	
	Lambda	LMC7905	
		LμA7905	
	Motorola	MC7905	
	National	LM320MP5	
		LM7905	
		LM79M05	
	SiliconG	SG120-5	
		SG320-05	
		SG7905	
	TI	μA7905	
SG323	Fairchild	SH0323	
		SH323	
		μA78H05	
	Lambda	LAS1405	
		LAS1905	
	Motorola	**LM323**	**3294**
		MC78T05C	
	National	**LM323**	**3299**
SG324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	TI	LM324	
		MC3403	
SG3302	Fairchild	μA2901	
		μA3302	
	Motorola	LM2901	
		MC3302	
	National	LM2901	
		LM3302	
	NEC-Electron	μPC2901	
	PMI	CMP-04	
	Raytheon	LM2901	
		RV3302	
	RCA	CA3302	
	Signetics	LM2901	
		MC3302	
	TI	LM2901	
		LM3302	
SG339	AMD	LM339	
		LM339A	
	Fairchild	μA339	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
		LM339	
	TI	LM339	
SG340-05	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
SG340-05	Toshiba	TA78005	
SG340-15	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
SG340-18	Fairchild	μA7818	
	Lambda	LMC7818	
	NEC-Electron	μPC7818	
	SiliconG	SG7818	
	TI	LM340-18	
		μA7818	
SG340-5	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
	TI	μA7805	
	Thomson-CSF	SFC2309	
SG340-6	Fairchild	μA7806	
	Lambda	LMC7806	
		LμA7806	
	Motorola	MC7806	
	SiliconG	SG7806	
	TI	μA7806	
SG340-8	Fairchild	μA7808	
	Lambda	LMC7808	
		LμA7808	
	Motorola	**MC7808**	**3294**
	NEC-Electron	μPC7808	
	SiliconG	SG7808	
	TI	LM340-8	
		μA7808	
SG3423	Motorola	MC3423	
	TI	MC3423	
SG350	Fairchild	μA78HGA	
	Motorola	**LM350**	**3295**
	National	**LM350**	**3299**
SG3501A	Exar	XR1468	
		XR4195	
	Motorola	**MC1468**	**3296**
	Raytheon	RC4195	
	SiliconG	SG1468	
		SG2501A	
		SG4501	
SG3503	**Exar**	**XR3503**	**3207**
	Motorola	MC3503	
	Raytheon	RC3503	
		RM3503	
		RM4137	
	Signetics	MC3503	
	TI	MC3503	
SG3523	Motorola	MC3523	
	TI	MC3523	
SG3524	**Exar**	**XR3524**	**3190**
	RCA	**CA3524**	**3368**
	Signetics	SG3524	
	TI	SG3524	
SG3525	TI	SG3525	
SG3525A	Motorola	SG3525A	
	Siliconix	PWM25C	
	TI	SG3525A	
SG3526	Sprague	ULS-8126	
SG3527	TI	SG3527	
SG3527A	Motorola	SG3527A	
	Siliconix	PWM27C	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Silicon General (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SG3527A	TI	SG3527A	
SG3532	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
SG3821	Fairchild	μA3086	
	Motorola	MC3386	
	National	LM3086	
	Plessey	SL3046	
		SL3086	
	RCA	CA3046	
		CA3086	
	SiliconG	SG3086	
		SG3886	
	Sprague	ULN-2046	
		ULN-2086	
SG3822	Motorola	CA3054	
	RCA	CA3026	
		CA3054	
	Sprague	ULN-2054	
	Thomson-CSF	SFC2054	
SG3851	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
SG3852	Sprague	ULS-2012	
SG3853	Sprague	ULS-2013	
SG3886	Fairchild	μA3086	
	Motorola	MC3386	
	National	LM3086	
	Plessey	SL3046	
		SL3086	
	RCA	CA3046	
		CA3086	
	SiliconG	SG3086	
		SG3821	
	Sprague	ULN-2046	
		ULN-2086	
SG4136	Exar	XR4136	
		XR4136M	
	Fairchild	μA4136	
	MicroPwr	MP5509	
	PMI	OP-09	
		PM4136	
	Raytheon	RC4136	
		RM4136	
	SiliconG	SG4136C	
	TI	RC4136	
		RM4136	
SG4136C	Exar	XR4136	
		XR4136M	
	Fairchild	μA4136	
	MicroPwr	MP5509	
SG4136C	PMI	OP-09	
		PM4136	
	Raytheon	RC4136	
		RM4136	
	SiliconG	SG4136	
	TI	RC4136	
		RM4136	
SG4194	Exar	XR4194	
	MicroEng	MCE-4194	
	Raytheon	RC4194	
		RM4194	
SG4250	Fairchild	μA776	
	Harris	**HA-2720**	**3236**
	Intersil	ICL8021	
		LM4250	
	Motorola	MC1776	
	National	LM4250	
	Solitron	UC4250	
SG4501	Exar	XR1468	
		XR4195	
	Motorola	**MC1468**	**3296**
	Raytheon	RC4195	
	SiliconG	SG1468	
		SG2501A	
		SG3501A	
SG55138	TI	SN55138	
SG55154	TI	SN55154	
SG5520	National	LM5520	
	TI	SN5520	
SG5521	National	LM5521	
SG5522	Motorola	MC5522	
		MC5523	
	National	LM5522	
	TI	SN5522	
SG5523	National	LM5523	
SG55236	TI	SN55236	
SG5524	Fairchild	MC5524	
	Motorola	MC5524	
	National	LM5524	
	Raytheon	RM5524	
	TI	SN5524	
SG5525	Fairchild	MC5525	
	Motorola	MC5525	
	National	LM5525	
SG5526	TI	SN5526	
SG5527	TI	SN5527	
SG5528	Fairchild	MC5528	
	Motorola	MC5528	
	National	LM5528	
	TI	SN5528	
SG5529	Fairchild	MC5529	
	Motorola	MC5529	
	National	LM5529	
SG55325	Fairchild	MC55325	
	Motorola	MC55325	
	National	DS55325	
		LM55325	
	Signetics	55325	
	TI	SN55325	
SG5534	Fairchild	MC5534	
	Motorola	MC5534	
	National	LM5534	
SG5535	Motorola	MC5535	
	National	LM5535	
	TI	SN5535	
SG5536	TI	SN5536	
SG5537	TI	SN5537	
SG5538	National	LM5538	
SG5539	Motorola	MC5539	
	National	LM5539	
SG55450	Fairchild	55450	
	Signetics	55450	
	TI	SN55450	
SG55451	Fairchild	55451	
	National	DS55451	
	Signetics	55451	
	TI	SN55451	
SG55452	Fairchild	55452	
	National	DS55452	
	Signetics	55452	
	TI	SN55452	
SG55453	Fairchild	55453	
	National	DS55453	
		LM55453	
	Signetics	55453	
	TI	SN55453	
SG55454	National	DS55454	
	Signetics	55454	
	TI	SN55454	
SG55460	National	DS55460	
	TI	SN55460	
SG55461	National	DS55461	
SG55461	TI	SN55461	
SG55462	National	DS55462	
	TI	SN55462	
SG55463	National	DS55463	
	TI	SN55463	
SG55464	National	DS55464	
	TI	SN55464	
SG55471	TI	SN55471	
SG55472	TI	SN55472	
SG55473	TI	SN55473	
SG55474	TI	SN55474	
SG555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	TI	NE555	
		SE555	
SG556	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	TI	NE556	
		SE556	
SG6118	Dionics	DI514	
	Exar	**XR6118**	**3205**
	Sanyo	LB1290	
	Sprague	**UDN-6118**	**2843**
		ULN-6118	
SG710	Fairchild	μA710	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM710	
		MC1710	
	National	**LM710**	**3317**
	PMI	CMP-01	
		CMP-02	
	Raytheon	RM710	
	TI	μA710	
	Thomson-CSF	SFC2710	
SG711	Fairchild	μA711	
	Motorola	MC1711	
	National	**LM711**	**3317**
	TI	μA711	
	Thomson-CSF	SFC2711	
SG723	Fairchild	μA723	
	Hitachi	HA17723	
	Intersil	LM723	
	Motorola	**MC1723**	**3295**
	National	LM723	
	Raytheon	RC723	
		RM723	
	RCA	CA723	
		LM723	
	SGS	L123	
	Signetics	μA723	
	TI	μA723	
	Thomson-CSF	SFC2723	
SG733	AMD	AM592	
		NE592	
		SE592	
	Fairchild	μA733	
	Hitachi	HA17733	
	Intersil	μA733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		μA733	
SG733	TI	μA733	
SG741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
SG747	AMD	747	
	Fairchild	μA747	
	Hitachi	HA17747	
	Motorola	MC1747	
	National	LM747	
	NEC-Electron	μPC251	
	PMI	OP-04	
		PM747	
	Raytheon	RC747	
		RM747	
	RCA	CA747	
	Signetics	μA747	
	TeledyneS	747	
	TI	μA747	
SG748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
SG75138	TI	SN75138	
SG75154	Fairchild	75154	
	Hitachi	HD75154	
	National	DS75154	
	TI	SN75154	
SG7520	Fairchild	7520	
	Motorola	MC7520	
	TI	SN7520	
SG7521	Fairchild	7521	
	Motorola	MC7521	
	National	LM7521	
	TI	SN7521	
SG7522	Motorola	MC7522	
	TI	SN7522	
SG7523	Motorola	MC7523	
	National	LM7523	
	Raytheon	RC7523	
	TI	SN7523	
SG75236	TI	SN75236	
SG7524	Fairchild	75S24	
	Hitachi	HA1902	
	Motorola	MC7524	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Silicon General (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SG7524	National	75S24	
	Signetics	SN7524	
	TI	SN75224	
		SN7524	
SG7525	AMD	7525	
	Fairchild	7525	
	Motorola	MC7525	
	National	LM7525	
SG7528	Motorola	MC7528	
	Raytheon	RC7528	
	TI	SN7528	
	Thomson-CSF	SFC2528	
SG7529	Fairchild	7529	
	Motorola	MC7529	
	National	LM7529	
	Raytheon	RC7529	
SG75325	Motorola	MC75325	
	National	DS75325	
	TI	SN75325	
SG7534	Motorola	MC7534	
SG7535	Motorola	MC7535	
	National	LM7535	
SG7538	Fairchild	7538	
	Motorola	MC7538	
	National	LM7538	
SG7539	Fairchild	7539	
	Motorola	MC7539	
	National	LM7539	
SG7541	Fairchild	75471	
	SiliconG	SG75471	
	TI	SN75471	
SG7542	Fairchild	75472	
	SiliconG	SG75472	
	TI	SN75472	
SG7543	TI	SN75473	
SG7544	TI	SN75474	
SG75450	Fairchild	75450	
	Motorola	MC75450	
	National	DS75450	
	TI	SN75450	
SG75451	Fairchild	75451	
	Motorola	MC75451	
	National	DS75451	
	TI	SN75451	
SG75452	Fairchild	75452	
	Hitachi	HD75452	
	Motorola	MC75452	
	National	DS75452	
	TI	SN75452	
SG75453	Fairchild	75453	
	Hitachi	HD75453	
	Motorola	MC75453	
	National	DS75453	
		LM75453	
	TI	SN75453	
SG75454	Motorola	MC75454	
	National	DS75454	
	TI	SN75454	
SG75460	Motorola	MC75460	
	National	DS75460	
	TI	SN75460	
SG75461	Fairchild	75461	
	Motorola	MC75401	
		MC75461	
	National	DS75461	
	TI	SN75461	
SG75462	Fairchild	75462	
	Motorola	MC75402	
		MC75462	
	National	DS75462	
	TI	SN75462	
SG75463	Motorola	MC75403	
		MC75463	
	National	DS75463	
	TI	SN75463	
SG75464	National	SG75464	
	TI	SN75464	
SG75470	TI	SN75470	
SG75471	Fairchild	75471	
	SiliconG	SG7541	
	TI	SN75471	
SG75472	Fairchild	75472	
	SiliconG	SG7542	
	TI	SN75472	
SG777	TI	μA777	
SG7806	Fairchild	μA7806	
	Lambda	LMC7806	
		LμA7806	
	Motorola	MC7806	
	SiliconG	SG340-6	
SG7806	TI	μA7806	
SG7808	Fairchild	μA7808	
	Lambda	LMC7808	
		LμA7808	
	Motorola	**MC7808**	**3294**
	NEC-Electron	μPC7808	
	SiliconG	SG340-8	
	TI	LM340-8	
		μA7808	
SG7812	Fairchild	μA7812	
	Lambda	LMC7812	
		LμA7812	
	Motorola	**MC7812**	**3294**
	National	LM7812	
	NEC-Electron	μPC7812	
	SGS	L7812	
	TI	μA7812	
	Toshiba	TA78012	
SG7815	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
	TI	LM340-15	
		μA7815	
		μA78L15	
	Toshiba	TA78015	
SG7818	Fairchild	μA7818	
	Lambda	LMC7818	
	NEC-Electron	μPC7818	
	SiliconG	SG340-18	
	TI	LM340-18	
		μA7818	
SG7824	Fairchild	μA7824	
	Lambda	LMC7824	
		LμA7824	
	Motorola	MC7824	
	NEC-Electron	μPC7824	
	SGS	L7824	
	TI	LM340-24	
		μA7824	
SG7905	Fairchild	μA7905	
		μA79M05	
	Lambda	LMC7905	
		LμA7905	
	Motorola	MC7905	
	National	LM320MP5	
		LM7905	
		LM79M05	
	SiliconG	SG120-5	
		SG320-05	
		SG320P-5	
	TI	μA7905	
	Fairchild	MC7905	
	Lambda	LMC7905	
	Motorola	MC7905	
SG7908	Fairchild	MC7908	
		μA7908	
		μA79M08	
	Lambda	LMC7908	
		LμA7908	
	Motorola	MC7908	
	TI	μA7908	
		μA79M08	
SG7912	Fairchild	μA7912	
		μA79M12	
	Motorola	MC7912	
	National	LM120-12	
		LM320MP12	
		LM7912	
		LM79M12	
	SiliconG	SG120-12	
		SG320P-12	
	TI	μA7912	
SG7915	Fairchild	μA7915	
	Lambda	LμA7915	
	Motorola	MC7915	
	National	LM120-15	
		LM320-15	
		LM320T15	
		LM7915	
SG7915	SiliconG	SG120-15	
		SG320-15	
	TI	μA7915	

Silicon Systems Inc.

Manufacturer Device	Replacement Source	Device	IC Master Page
104	Fujitsu	MB4111	
105	Fujitsu	MB4112	
SSI201	Aptek	3201	
		ITT3201	
SSI8500	Motorola	MC8500	
SSI8502	Motorola	MC8502	
SSI8520	Motorola	MC8520	

Siliconix

Manufacturer Device	Replacement Source	Device	IC Master Page
CA3089	Hitachi	HA1137	
		LA1230	
	Motorola	MC1389	
	National	CA3089	
		LM3089	**3325,3327**
	RCA	CA3089	
	Sanyo	LA1230	
		LA3089	
	SGS	TCA3089	
		TDA1200	
	Signetics	CA3089	
	TI	SN76689	
D123	Intersil	D123	
D125	Intersil	D125	
	TeledyneC	CDR125	
DF320	GTEMicro	G4320	
	ITT	DF320	
	Mitel	MT4320	
	Nitron	NC2320	
◆DF321	Nitron	NC2321	
◆DF322	ITT	DF322	
	Mitel	MT4322	
	Nitron	NC2322	
◆DF323	Mitel	MT4323	
◆DF411	SSS	SCL25411	
DF412	Intersil	ICL7211	
DG111	Intersil	DG111	
	Siliconix	DGM111	
◆DG116	Intersil	DG116	
DG123	Intersil	DG123	
DG125	Intersil	DG125	
DG126	**National**	**AH0126**	**3344**
DG129	**National**	**AH0129**	**3343**
DG133	**National**	**AH0133**	**3344**
DG134	**National**	**AH0134**	**3344**
DG139	**National**	**AH0139**	**3344**
DG140	**National**	**AH0140**	**3344**
DG141	**National**	**AH0141**	**3344**
DG142	**National**	**AH0142**	**3344**
DG143	**National**	**AH0143**	**3344**
DG144	**National**	**AH0144**	**3344**
DG145	**National**	**AH0145**	**3344**
DG146	**National**	**AH0146**	**3344**
DG151	**National**	**AH0151**	**3344**
DG152	**National**	**AH0152**	**3344**
DG153	**National**	**AH0153**	**3344**
DG154	National	AM0154	
DG161	**National**	**AH0161**	**3344**
DG162	**National**	**AH0162**	**3344**
DG163	National	AM0163	
DG164	National	AM0164	
DG172	Intersil	DG118	
DG180	Intersil	DG180	
DG181	**Harris**	**HI381**	**2635,3288**
		HI5048	
	Intersil	DG181	
		IH5048	
	Siliconix	DG381	
DG182	Intersil	DG182	
	TI	TL182	
DG183	Intersil	DG183	
DG184	**Harris**	**HI384**	**2635,3288**
		HI5049	
	Intersil	DG184	
		IH5049	
	Siliconix	DG384	
DG185	Harris	HI5045	
	Intersil	DG185	
		IH5045	
	Siliconix	DG5045	
	TI	TL185	
DG186	Intersil	DG186	
DG187	Harris	HI-5050	
		HI387	**2635,3288**
		HI5050	
DG187	Intersil	DG187	
		IH5050	
	Siliconix	DG387	
DG188	Harris	HI5042	
	Intersil	DG188	
		IH5042	
	Siliconix	DG5042	
	TI	TL188	
DG189	Intersil	DG189	
DG190	Harris	HI-5051	
	Intersil	DG190	
		IH5051	
DG191	Harris	HI5043	
	Intersil	DG191	
		IH5043	
	Siliconix	DG243	
		DG5043	
DG200	AD	ADG200	
	Harris	HI200	
	Intersil	IH200	
	MicroPwr	MP200	
		MP7513	
	PMI	SW-05	
DG201	AD	ADG201	
	Harris	HI201	
	MicroPwr	MP201	
	National	**LF11201**	**3318**
		LF13201	**3318**
	PMI	SW-01	
		SW-201	
DG201A	PMI	SW-201	
	Siliconix	DG201	
DG202	**National**	**LF13202**	**3318**
	PMI	SW-02	
DG211	Intersil	IH5052	
DG243	Harris	HI5043	
	Intersil	DG191	
		IH5043	
	Siliconix	DG191	
		DG5043	
DG300	**Harris**	**HI300**	**2630,3287**
DG301	**Harris**	**HI301**	**2630,3287**
DG302	**Harris**	**HI302**	**2630,3288**
DG303	**Harris**	**HI303**	**2630,3288**
DG304	**Harris**	**HI304**	**2630,3287**
DG305	**Harris**	**HI305**	**2630,3287**
DG306	**Harris**	**HI306**	**2630,3288**
DG307	**Harris**	**HI307**	**2630,3288**
DG381	**Harris**	**HI381**	**2635,3288**
		HI5048	
	Intersil	DG181	
		IH5048	
	Siliconix	DG181	
DG384	**Harris**	**HI384**	**2635,3288**
		HI5049	
	Intersil	DG184	
		IH5049	
	Siliconix	DG184	
DG387	Harris	HI-5050	
		HI387	**2635,3288**
		HI5050	
	Intersil	DG187	
		IH5050	
	Siliconix	DG187	
DG390	**Harris**	**HI390**	**2635,3288**
DG5040	Harris	HI5040	
	Intersil	IH5040	
DG5041	Harris	HI5041	
	Intersil	IH5041	
DG5042	Harris	HI5042	
	Intersil	DG188	
		IH5042	
	Siliconix	DG188	
	TI	TL188	
DG5043	Harris	HI5043	
	Intersil	DG191	
		IH5043	
	Siliconix	DG191	
		DG243	
DG5044	Harris	HI5044	
	Intersil	IH5044	
DG5045	Harris	HI5045	
	Intersil	DG185	
		IH5045	
	Siliconix	DG185	
	TI	TL185	
DG506	AD	AD7506	
	Burr-Brown	MPC16S	
	Datel	**MV-1606**	**2622**
		MX-1606	**2622**

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Siliconix (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
DG506	Fairchild	F4067	
	Harris	HI1840	
		HI506	
		HI506A	
	Intersil	IH6116	
	MicroPwr	MP7506	
	Motorola	MC14067	
	PMI	MUX-16	
	RCA	CD4067	
	SGS	HCF4067	
	Signetics	HEF4067	
DG507	AD	AD7507	
	Burr-Brown	MPC8D	
	Datel	**MXD-807**	**2622**
		MXD-807	**2622**
	Harris	HI507	
		HI507A	
	Intersil	IH6216	
	MicroPwr	MP7507	
	PMI	MUX-28	
	Siliconix	**DG507A**	**2802**
	TeledyneP	4551	
DG507A	AD	AD7507	
	Burr-Brown	MPC8D	
	Datel	**MXD-807**	**2622**
		MXD-807	**2622**
	Harris	HI507	
		HI507A	
	Intersil	IH6216	
	MicroPwr	MP7507	
	PMI	MUX-28	
	Siliconix	DG507	
	TeledyneP	4551	
DG508	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	**DG508A**	**2804**
	TeledyneP	4554	
DG508A	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	
	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
	TeledyneP	4554	
DG509	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
	TeledyneP	4553	
DGM111	Intersil	DG111	
	Siliconix	DG111	
G115	Intersil	G115	
G116	Intersil	G116	
G117	Intersil	G117	
G118	Intersil	G118	
G119	Intersil	G119	
G123	Intersil	G123	
G125	Intersil	G125	
G126	Intersil	G126	
G127	Intersil	G127	
G128	Intersil	G128	
G129	Intersil	G129	
G130	Intersil	G130	
G131	Intersil	G131	
G132	Intersil	G132	
L144	Siltronics	SL144	
LD111	Motorola	MC1405	
LD131	Intersil	ICL7106	
	MicroPwr	**MP7138**	**401,2749**
	TeledyneS	7106	
		8751	
◆LM101	AMD	LM101	
	AD	AD101	
	Fairchild	μA101	
	Intersil	AD101	
	Motorola	LM101	
	Raytheon	LM101	
	Signetics	LM101	
	SiliconG	SG101	
	TI	LM101	
	Thomson-CSF	SFC2101	
◆LM3909	National	LM3909	
PWM25A	Motorola	SG1525A	
	SiliconG	SG1525A	
PWM25B	Motorola	SG2525A	
	SiliconG	SG2525A	
PWM25C	Motorola	SG3525A	
	SiliconG	SG3525A	
	TI	SG3525A	
PWM27A	Motorola	SG1527A	
	SiliconG	SG1527A	
PWM27B	Motorola	SG2527A	
	SiliconG	SG2527A	
PWM27C	Motorola	SG3527A	
	SiliconG	SG3527A	
	TI	SG3527A	
◆SG4250	Fairchild	μA776	
	Harris	**HA-2720**	**3236**
	Intersil	ICL8021	
		LM4250	
	Motorola	MC1776	
	National	LM4250	
	SiliconG	SG4250	
	Solitron	UC4250	
SG555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
SG555	SiliconG	SG555	
	TI	NE555	
		SE555	
SG556	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
		SE556	
◆SG741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
◆SG748	Intersil	ICL748	
◆SI1525B	Motorola	SG1525A	
	SiliconG	SG1525A	
	Siliconix	PWM25A	
◆SI1527B	Motorola	SG1527A	
	SiliconG	SG1527A	
	Siliconix	PWM27A	
◆SI2525B	Motorola	SG2525A	
	SiliconG	SG2525A	
	Siliconix	PWM25B	
◆SI2527B	Motorola	SG2527A	
	SiliconG	SG2527A	
	Siliconix	PWM27B	
SI3002	Fairchild	SH3002	
SI3527B	Motorola	SG3527A	
	SiliconG	SG3527A	
	Siliconix	PWM27C	
	TI	SG3527A	
SI3535B	Motorola	SG3525A	
	SiliconG	SG3525A	
	Siliconix	PWM25C	
	TI	SG3525A	
SI3705	AMD	AM3705	
SI452	Intersil	MM452	
SI455	Intersil	MM455	
SI5000	SPI	SD5000	
	Signetics	SD5000	
SI5001	SPI	SD5001	
	Signetics	SD5001	
SI5002	SPI	SD5002	
	Signetics	SD5002	
SI5200	SPI	SD5200	
	Signetics	SD5200	

Siltronics

SL144	Siliconix	L144	

Solid State Scientific

SCL4000	Motorola	MC14000	
	National	CD4000	
SCL4000	RCA	CD4000	
	SGS	HCF4000	
	Signetics	HEF400	
	Solitron	CM4000	
SCL4001	Fairchild	F4001	
	Hitachi	HD14001	
	Motorola	MC14001	
	National	CD4001	
		MM74C02	
	OKI	MSM4001	
	RCA	CD4001	
	Sanyo	LC4001B	
	SGS	HCF4001	
	Signetics	HEF4001	
	Solitron	CM4001	
	Toshiba	TC4001	
SCL4002	Fairchild	F4002	
	Hitachi	HD14002	
	Motorola	MC14002	
	National	CD4002	
	RCA	CD4002	
	SGS	HCF4002	
	Signetics	HEF4002	
	Solitron	CM4002	
	TI	TP4002	
	Toshiba	TC4002	
SCL4006	Fairchild	F4006	
	Hitachi	HD14006	
	Motorola	MC14006	
	National	CD4006	
	RCA	CD4006	
	SGS	HCF4006	
	Solitron	CM4006	
	Toshiba	TC4006	
SCL4007	Fairchild	F4007	
	Hitachi	HD14007	
	Motorola	MC14007	
	National	CD4007	
	RCA	CD4007	
	SGS	HCF4007	
	Signetics	HEF4007	
	Solitron	CM4007	
	Toshiba	TC4007	
SCL4008	Fairchild	F4008	
	Hitachi	HD14008	
	Motorola	MC14008	
	National	CD4008	
		MM74C83	
	RCA	CD4008	
	SGS	HCF4008	
	Signetics	HEF4008	
	Solitron	CM4008	
	Toshiba	TC4008	
SCL4009	Hitachi	HD14009	
	National	CD4009	
	RCA	CD4009	
	SGS	HCF4009	
	Solitron	CM4009	
	Toshiba	TC4009	
SCL4010	Hitachi	HD14010	
	National	CD4010	
	RCA	CD4010	
	SGS	HCF4010	
	Solitron	CM4010	
	Toshiba	TC4010	
SCL4011	Fairchild	F4011	
	Hitachi	HD14011	
	Motorola	MC14011	
	National	CD4011	
		MM74C00	
	OKI	MSM4011	
	RCA	CD4011	
	Sanyo	LC4011	
	SGS	HCF4011	
	Signetics	HEF4011	
	Solitron	CM4011	
	Toshiba	TC4011	
SCL4012	Fairchild	F4012	
	Hitachi	HD14012	
	Motorola	MC14012	
	National	CD4012	
	RCA	CD4012	
	SGS	HCF4012	
	Signetics	HEF4012	
	Solitron	CM4012	
	Toshiba	TC4012	
SCL4013	Fairchild	F4013	
	Hitachi	HD14013	
	Motorola	MC14013	
	National	CD4013	
		MM74C74	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Solid State Scientific (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SCL4013	OKI	MSM4013	
	RCA	CD4013	
	Sanyo	LC4013	
	SGS	HCF4013	
	Signetics	HEF4013	
	Solitron	CM4013	
	Toshiba	TC4013	
SCL4014	Fairchild	F4014	
	Hitachi	HD14014	
	Motorola	MC14014	
	National	CD4014	
	RCA	CD4014	
	SGS	HCF4014	
	Signetics	HEF4014	
	Solitron	CM4014	
	Toshiba	TC4014	
SCL4015	Fairchild	F4015	
	Hitachi	HD14015	
	Motorola	MC14015	
	National	CD4015	
		MM74C164	
	OKI	MSM4015	
	RCA	CD4015	
	Sanyo	LC4015	
	SGS	HCF4015	
	Signetics	HEF4015	
	Solitron	CM4015	
	Toshiba	TC4015	
SCL4016	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
SCL4017	Fairchild	F4017	
	Hitachi	HD14017	
	Motorola	MC14017	
	National	CD4017	
	RCA	CD4017	
	SGS	HCF4017	
	Signetics	HEF4017	
	Solitron	CM4017	
	Toshiba	TC4017	
SCL4018	Fairchild	F4018	
	Hitachi	HD14018	
	Motorola	MC14018	
	National	CD4018	
	RCA	CD4018	
	SGS	HCF4018	
	Signetics	HEF4018	
	Solitron	CM4018	
	Toshiba	TC4018	
SCL4019	Fairchild	F4019	
	National	CD4019	
	OKI	MSM4019	
	RCA	CD4019	
	Sanyo	LC4019	
	SGS	HCF4019	
	Signetics	HEF4019	
	Solitron	CM4019	
	Toshiba	TC4019	
SCL4020	Fairchild	F4020	
	Hitachi	HD14020	
	Motorola	MC14020	
	National	CD4020	
	RCA	CD4020	
	SGS	HCF4020	
	Signetics	HEF4020	
	Solitron	CM4020	
	Toshiba	TC4020	
SCL4021	Fairchild	F4021	
	Hitachi	HD14021	
SCL4021	Motorola	MC14021	
	National	CD4021	
	RCA	CD4021	
	SGS	HCF4021	
	Signetics	HEF4021	
	Solitron	CM4021	
	Toshiba	TC4021	
SCL4022	Fairchild	F4022	
	Hitachi	HD14022	
	Motorola	MC14022	
	National	CD4022	
	RCA	CD4022	
	SGS	HCF4022	
	Signetics	HEF4022	
	Solitron	CM4022	
	Toshiba	TC4022	
SCL4023	Fairchild	F4023	
	Hitachi	HD14023	
	Motorola	MC14023	
	National	CD4023	
		MM74C10	
	RCA	CD4023	
	SGS	HCF4023	
	Signetics	HEF4023	
	Solitron	CM4023	
	Toshiba	TC4023	
SCL4024	Fairchild	F4024	
	Hitachi	HD14024	
	Motorola	MC14024	
	National	CD4024	
	RCA	CD4024	
	SGS	HCF4024	
	Signetics	HEF4024	
	Solitron	CM4024	
	Toshiba	TC4024	
SCL4025	Fairchild	F4025	
	Hitachi	HD14025	
	Motorola	MC14025	
	National	CD4025	
	RCA	CD4025	
	SGS	HCF4025	
	Signetics	HEF4025	
	Solitron	CM4025	
	Toshiba	TC4025	
SCL4026	RCA	CD4026	
	SGS	HCF4026	
	Solitron	CM4026	
SCL4027	Fairchild	F4027	
	Hitachi	HD14027	
	Motorola	MC14027	
	National	CD4027	
		MM74C76	
	OKI	MSM4027	
	RCA	CD4027	
	Sanyo	LC4027	
	SGS	HCF4027	
	Signetics	HEF4027	
	Solitron	CM4027	
SCL4028	Fairchild	F4028	
	Hitachi	HD14028	
	Motorola	MC14028	
	National	CD4028	
		MM74C42	
	OKI	MSM4028	
	Sanyo	LC4028	
	SGS	HCF4028	
	Signetics	HEF4028	
	Solitron	CM4028	
	Toshiba	TC4028	
SCL4029	Fairchild	F4029	
	Motorola	MC14029	
	National	CD40192	
		CD4029	
	RCA	CD40192	
		CD4029	
	SGS	HCF40192	
		HCF4029	
	Signetics	HEF40192	
	SSS	SCL4192	
	Solitron	CM4029	
	Toshiba	TC40192	
		TC4029	
SCL4030	Fairchild	F4030	
	National	CD4030	
	RCA	CD4030	
	SGS	HCF4030	
	Signetics	HEF4030	
	Solitron	CM4030	
	Toshiba	TC4030	
SCL4033	RCA	CD4033	
	SGS	HCF4033	
	Solitron	CM4033	
SCL4034	Fairchild	F4034	
	Hitachi	HD14034	
	Motorola	MC14034	
	National	CD4034	
	RCA	CD4034	
	SGS	HCF4034	
	Solitron	CM4034	
	Toshiba	TC4034	
SCL4035	Fairchild	F4035	
	Hitachi	HD14035	
	Motorola	MC14035	
	National	CD4035	
	RCA	CD4035	
	SGS	HCF4035	
	Signetics	HEF4035	
	Solitron	CM4035	
	Toshiba	TC4035	
SCL4040	Fairchild	F4040	
	Hitachi	HD14040	
	Motorola	MC14040	
	National	CD4040	
	RCA	CD4040	
	SGS	HCF4040	
	Signetics	HEF4040	
	Solitron	CM4040	
	Toshiba	TC4040	
SCL4041	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4042	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
SCL4042	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
	Solitron	CM4041	
		CM4042	
	Toshiba	TC4042	
SCL4043	Hitachi	HD14043	
	Motorola	MC14043	
	National	CD4043	
	RCA	CD4043	
	SGS	HCF4043	
	Signetics	HEF4043	
	Solitron	CM4043	
	Toshiba	TC4043	
SCL4044	Fairchild	F4044	
	Hitachi	HD14044	
	Motorola	MC14044	
	National	CD4044	
	RCA	CD4044	
	SGS	HCF4044	
	Signetics	HEF4044	
	Solitron	CM4044	
	Toshiba	TC4044	
SCL4046	Fairchild	F4046	
	Hitachi	HD14046	
	Motorola	MC14046	
	National	CD4046	
	RCA	CD4046	
	SGS	HCF4046	
	Solitron	CM4046	
SCL4047	Fairchild	F4047	
	National	CD4047	
	RCA	CD4047	
	SGS	HCF4047	
	Signetics	HEF4042	
		HEF4047	
	Solitron	CM4047	
	Toshiba	TC4047	
SCL4049	Fairchild	F4049	
	Hitachi	HD14049	
SCL4049	Motorola	MC14049	
	National	CD4049	
	OKI	MSM4049	
	RCA	CD4009	
		CD4049	
	Sanyo	LC4049	
	SGS	HCF4049	
	Signetics	HEF4049	
	Solitron	CM4049	
	Toshiba	TC4049	
SCL4050	Fairchild	F4050	
	Hitachi	HD14050	
	Motorola	MC14050	
	National	CD4050	
	RCA	CD4010	
		CD4050	
	SGS	HCF4050	
	Signetics	HEF4050	
	Solitron	CM4050	
	Toshiba	TC4050	
SCL4051	Fairchild	F4051	
	Motorola	MC14051	
	National	CD4051	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4046	
		HEF4051	
	Solitron	CM4051	
	Toshiba	TC4051	
SCL4052	Fairchild	F4052	
	Hitachi	HD14052	
	Motorola	MC14052	
	National	CD4052	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Solitron	CM4052	
	Toshiba	TC4052	
SCL4053	Fairchild	F4053	
	Motorola	MC14053	
	National	CD4053	
	RCA	CD4053	
	SGS	HCF4052	
	Signetics	HEF4053	
	Solitron	CM4053	
	Toshiba	TC4053B	
SCL4060	Motorola	MC14060	
	National	CD4060	
	RCA	CD4060	
	SGS	HCF4060	
	Signetics	HEF4060	
SCL4066	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
SCL4068	Fairchild	F4068	
	Hitachi	HD14068	
	Motorola	MC14068	
	RCA	CD4068	
	SGS	HCF4068	
	Signetics	HEF4068	
	SSS	SCL4412	
	Solitron	CM4068	
	TI	UCN4810	
	Toshiba	TC4068	
SCL4069	Fairchild	F4069	
	Hitachi	HD14069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
		MM74C04	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Solid State Scientific (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SCL4069	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	
	Signetics	HEF4069	
	SSS	SCL4449	
	Solitron	CM4069	
	Toshiba	TC4069	
SCL4070	Fairchild	F4070	
	Hitachi	HD14070	
	Motorola	MC14070	
	National	CD4070	
		MM74C86	
	RCA	CD4070	
	SGS	HCF4070	
	Signetics	HEF4070	
	Solitron	CM4070	
SCL4071	Fairchild	F4071	
	Hitachi	HD14071	
	Motorola	MC14071	
	National	CD4071	
		MM74C32	
	OKI	MSM4071	
	RCA	CD4071	
	Sanyo	LC4071	
	SGS	HCF4071	
	Signetics	HEF4071	
	Solitron	CM4071	
	Toshiba	TC4071	
SCL4072	Fairchild	F4072	
	Hitachi	HD14072	
	Motorola	MC14072	
	National	CD4072	
	RCA	CD4072	
	SGS	HCF4072	
	Signetics	HEF4072	
	Toshiba	TC4072	
SCL4073	Fairchild	F4073	
	Hitachi	HD14073	
	Motorola	MC14073	
	National	CD4073	
	RCA	CD4073	
	SGS	HCF4073	
	Signetics	HEF4073	
	Solitron	CM4073	
	Toshiba	TC4073	
SCL4075	Fairchild	F4075	
	Hitachi	HD14075	
	Motorola	MC14075	
	National	CD4075	
	RCA	CD4075	
	SGS	HCF4075	
	Signetics	HEF4075	
	Solitron	CM4075	
	Toshiba	TC4075	
SCL4076	Fairchild	F4076	
	Hitachi	HD14076	
	Motorola	MC14076	
	National	CD4076	
		MM54C173	
		MM74C173	
	RCA	CD4076	
	SGS	HCF4076	
	Signetics	HEF4076	
	Solitron	CM4076	
	Toshiba	TC4076	
SCL4077	Fairchild	F4077	
	Hitachi	HD14077	
	Motorola	MC14077	
	National	CD4077	
	RCA	CD4077	
	SGS	HCF4077	
	Signetics	HEF4077	
	Solitron	CM4077	
SCL4078	Fairchild	F4078	
	Hitachi	HD14078	
	Motorola	MC14078	
	RCA	CD4078	
	SGS	HCF4078	
	Signetics	HEF4078	
	Solitron	CM4078	
	Toshiba	TC4078	
SCL4081	Fairchild	F4081	
	Hitachi	HD14081	
	Motorola	MC14081	
	National	CD4081	
		MM74C08	
	OKI	MSM4081	
	RCA	CD4081	
SCL4081	Sanyo	LC4081	
	SGS	HCF4081	
	Signetics	HEF4081	
	Solitron	CM4081	
	Toshiba	TC4081	
SCL4082	Fairchild	F4082	
	Hitachi	HD14082	
	Motorola	MC14082	
	National	CD4082	
	RCA	CD4082	
	SGS	HCF4082	
	Signetics	HEF4082	
	Toshiba	TC4082	
SCL4085	Fairchild	F4085	
	National	CD4085	
	RCA	CD4085	
	SGS	HCF4085	
	Signetics	HEF4085	
	Toshiba	TC4085	
SCL4086	Fairchild	F4086	
	RCA	CD4086	
	SGS	HCF4086	
	Signetics	HEF4086	
	Toshiba	TC4086	
SCL4093	Fairchild	F4093	
	Hitachi	HD14093	
	Motorola	MC14093	
	National	CD4093	
	OKI	MSM4093	
	RCA	CD4093	
	Sanyo	LC4093	
	SGS	HCF4093	
	Signetics	HEF4093	
	Toshiba	TC4093	
SCL4094	Hitachi	HD14094	
	Motorola	MC14094	
	RCA	CD4094	
	SGS	HCF4094	
	Signetics	HEF4094	
	Toshiba	TC4094	
SCL4099	Hitachi	HD14099	
	Motorola	MC14099	
	National	CD4099	
	RCA	CD4099	
	SGS	HCF4099	
	Toshiba	TC4099	
SCL4160	Fairchild	F40160	
	Hitachi	HD14160	
	Motorola	MC14160	
	National	CD40160	
		MM54C160	
		MM74C160	
	RCA	CD40160	
	SGS	HCF40160	
	Signetics	HEF4060	
	Toshiba	TC40160	
SCL4161	Fairchild	F40161	
	Hitachi	HD14161	
	Motorola	MC14161	
	National	CD40161	
		MM54C161	
		MM74C161	
	RCA	CD40161	
	SGS	HCF40161	
	Signetics	HEF40161	
	Toshiba	TC40161	
SCL4162	Fairchild	F40162	
	Hitachi	HD14162	
	Motorola	MC14162	
	National	CD40162	
		MM54C162	
		MM74C162	
	RCA	CD40162	
	SGS	HCF40162	
	Signetics	HEF40162	
	Toshiba	TC40162	
SCL4163	Fairchild	F40163	
	Hitachi	HD14163	
	Motorola	MC14163	
	National	CD40163	
		MM54C163	
		MM74C163	
	RCA	CD40163	
	SGS	HCF40163	
	Signetics	HEF40163	
	Toshiba	TC40163	
SCL4174	Fairchild	F40174	
	Hitachi	HD14174	
	Motorola	MC14174	
	National	CD40174	
		MM54C174	
		MM74C174	
SCL4174	RCA	CD40174	
	SGS	HCF40174	
	Signetics	HEF40174	
	Toshiba	TC40174	
SCL4192	Fairchild	F4029	
	Motorola	MC14029	
	National	CD40192	
		CD4029	
	RCA	CD40192	
		CD4029	
	SGS	HCF40192	
		HCF4029	
	Signetics	HEF40192	
	SSS	SCL4029	
	Solitron	CM4029	
	Toshiba	TC40192	
		TC4029	
SCL4193	Fairchild	F40193	
	National	CD40193	
		MM54C193	
		MM74C193	
	RCA	CD40193	
	SGS	HCF40193	
	Signetics	HEF40193	
	Toshiba	TC40193	
SCL4402	National	CD4048	
	RCA	CD4048	
	SGS	HCF4048	
	Solitron	CM4048	
SCL4412	Fairchild	F4068	
	Hitachi	HD14068	
	Motorola	MC14068	
	RCA	CD4068	
	SGS	HCF4068	
	Signetics	HEF4068	
	SSS	SCL4068	
	Solitron	CM4068	
	TI	UCN4810	
	Toshiba	TC4068	
SCL4445	Fairchild	F4521	
	Motorola	MC14521	
	RCA	CD4045	
	SGS	HCF4045	
	Signetics	HEF4521	
	Solitron	CM4045	
	Toshiba	TC4521	
SCL4449	Fairchild	F4069	
	Hitachi	HD14069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
		MM74C04	
	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	
	Signetics	HEF4069	
	SSS	SCL4069	
	Solitron	CM4069	
	Toshiba	TC4069	
SCL4502	Hitachi	HD14502	
	Motorola	MC14502	
	RCA	CD4502	
	SGS	HCF4502	
	Signetics	HEF4502	
SCL4508	Hitachi	HD14508	
		HD74147	
	Motorola	MC14508	
	National	DM74147	
	RCA	CD4508	
	SGS	HCF4508	
	Signetics	74147	
		HEF4508	
		N82147	
	Solitron	CM4508	
	TI	**SN74147**	**882**
	Toshiba	TC4508	
SCL4510	Fairchild	F4510	
	Hitachi	HD14510	
	Motorola	MC14510	
	National	CD4510	
	RCA	CD4510	
	SGS	HCF4510	
	Signetics	HEF4510	
	Solitron	CM4510	
	Toshiba	TC4510	
SCL4511	Fairchild	F4511	
	Hitachi	HD14511	
	Mitel	MD4511	
	MMI	4511	
SCL4511	Motorola	MC14511	
	National	CD4511	
	NEC-Micro	μPD4511	
	RCA	CD4511	
	SGS	HCF4511	
	Signetics	HEF4511	
	Solitron	CM4511	
	Toshiba	TC4511	
SCL4512	Fairchild	F4512	
	Hitachi	HD14512	
	Motorola	MC14512	
	National	CD4512	
	RCA	CD4512	
	SGS	HCF4512	
	Toshiba	TC4512	
SCL4514	Fairchild	F4514	
	Hitachi	HD14514	
	Motorola	MC14514	
	National	CD4514	
	RCA	CD4514	
	SGS	HCF4514	
	Signetics	HEF4514	
	Solitron	CM4514	
	Toshiba	TC4514	
SCL4515	Fairchild	F4515	
	Hitachi	HD14515	
	Motorola	MC14515	
	National	CD4515	
	RCA	CD4515	
	SGS	HCF4515	
	Signetics	HEF4515	
	Solitron	CM4515	
	Toshiba	TC4515	
SCL4516	Fairchild	F4516	
	Hitachi	HD14516	
	Motorola	MC14516	
	National	CD4516	
	RCA	CD4516	
	SGS	HCF4516	
	Signetics	HEF4516	
	Solitron	CM4516	
	Toshiba	TC4516	
SCL4517	Hitachi	HD14517	
	Motorola	MC14517	
	RCA	CD4517	
	Signetics	HEF4517	
SCL4518	Fairchild	F4518	
	Hitachi	HD14518	
	Motorola	MC14518	
	National	CD4518	
	RCA	CD4518	
	SGS	HCF4518	
	Signetics	HEF4518	
	Solitron	CM4518	
	Toshiba	TC4518	
SCL4520	Fairchild	F4520	
	Hitachi	HD14520	
	Motorola	MC14520	
	National	CD4520	
	OKI	MSM4520	
	RCA	CD4520	
	Sanyo	LC4520	
	SGS	HCF4520	
	Signetics	HEF4520	
	Solitron	CM4520	
	Toshiba	TC4520	
SCL4522	Fairchild	F4522	
	Hitachi	HD14522	
	Motorola	MC14522	
	National	CD4522	
	RCA	CD4522	
	Signetics	HEF4522	
	Toshiba	TC4522	
SCL4526	Fairchild	F4526	
	Hitachi	HD14526	
	Motorola	MC14526	
	National	CD4526	
	Signetics	HEF4526	
	Toshiba	TC4526	
SCL4527	Fairchild	F4527	
	Hitachi	HD14527	
	Motorola	MC14527	
	National	CD4527	
	RCA	CD4527	
	SGS	HCF4527	
	Signetics	HEF4527	
	Toshiba	TC4527	
		TR4527	
SCL4528	Fairchild	F4528	
	Hitachi	HD14528	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Solid State Scientific (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SCL4528	Motorola	MC14528	
	National	CD4528	
		MM74C221	
	RCA	CD4098	
	SGS	HCF4098	
	Signetics	HEF4528	
	Toshiba	TC4528	
SCL4531	Fairchild	F4531	
	Hitachi	HD14531	
	Motorola	MC14531	
	RCA	CD40101	
	SGS	HCF40101	
	Signetics	HEF4531	
	Toshiba	TC4531	
SCL4532	Fairchild	F4532	
	Hitachi	HD14532	
	Motorola	MC14532	
	RCA	CD4532	
	SGS	HCF4532	
	Signetics	HEF4532	
	Toshiba	TC4532	
SCL4555	Fairchild	F4555	
	Hitachi	HD14555	
	Motorola	MC14555	
	RCA	CD4555	
	SGS	HCF4555	
	Signetics	HEF4555	
	Toshiba	TC4555	
SCL4556	Fairchild	F4556	
	Motorola	MC14556	
	RCA	CD4556	
	SGS	HCF4556	
	Signetics	HEF4556	
	Toshiba	TC4556	
SCL4581	Hitachi	HD14581	
	Motorola	MC14581	
	RCA	CD40181	
		CD4057	
	SGS	HCF40181	
SCL4582	Fairchild	F4582	
	Hitachi	HD14582	
	Motorola	MC14582	
	RCA	CD40182	
	SGS	HCF40182	
SCL4584	Fairchild	F40014	
	Hitachi	HD14584	
	Motorola	MC14584	
	National	CD40106	
		CD4584	
		MM54C14	
		MM74C14	
	RCA	CD40106	
	SGS	HCF40106	
	Signetics	HEF40106	
SCL4585	Fairchild	F40085	
	Hitachi	HD14585	
	Motorola	MC14585	
	National	MM74C85	
	RCA	CD4585	
	Signetics	HEF4585	
	Toshiba	TC4585	
SCL4XXX	Fairchild	34XXX	
		F4XXX	
	Hitachi	HD14XXX	
	Motorola	MC14XXX	
	National	CD4XXX	
	OKI	MSM4XXX	
	SGS	HCF4XXX	
	Solitron	CM4XXX	
	TI	TP4000 series	
	Toshiba	TC4XXX	
SCM21C02	AMI	S6508	
	Fairchild	4736B	
	Harris	**HM6508**	
		669.1333.3754	
	Intel	2125A	
	Motorola	MCM2125	
	National	MM74C929	
		NMC6508	
	NEC-Micro	μPD443	
	Toshiba	TC5508	
SND5025	AMI	S6852	
	Fairchild	**F6852**	**1281**
	Hitachi	**HD6852**	**1345**
		HD68A52	**1345**
	Motorola	**MC2652**	**1359**
		MC6852	**1351**
		MC68652	**1359**
	Signetics	SCN2652	
	SMC	COM5025	
SND5027	SMC	CRT5027	
	TI	**TMS9927**	**1554**
SND5037	SMC	CRT5037	

Solitron Devices

Manufacturer Device	Replacement Source	Device	IC Master Page
CM4000	Motorola	MC14000	
	National	CD4000	
	RCA	CD4000	
	SGS	HCF4000	
	Signetics	HEF400	
	SSS	SCL4000	
CM4001	Fairchild	F4001	
	Hitachi	HD14001	
	Motorola	MC14001	
	National	CD4001	
		MM74C02	
	OKI	MSM4001	
	RCA	CD4001	
	Sanyo	LC4001B	
	SGS	HCF4001	
	Signetics	HEF4001	
	SSS	SCL4001	
	Toshiba	TC4001	
CM4002	Fairchild	F4002	
	Hitachi	HD14002	
	Motorola	MC14002	
	National	CD4002	
	RCA	CD4002	
	SGS	HCF4002	
	Signetics	HEF4002	
	SSS	SCL4002	
	TI	TP4002	
	Toshiba	TC4002	
CM4006	Fairchild	F4006	
	Hitachi	HD14006	
	Motorola	MC14006	
	National	CD4006	
	RCA	CD4006	
	SGS	HCF4006	
	SSS	SCL4006	
	Toshiba	TC4006	
CM4007	Fairchild	F4007	
	Hitachi	HD14007	
	Motorola	MC14007	
	National	CD4007	
	RCA	CD4007	
	SGS	HCF4007	
	Signetics	HEF4007	
	SSS	SCL4007	
	Toshiba	TC4007	
CM4008	Fairchild	F4008	
	Hitachi	HD14008	
	Motorola	MC14008	
	National	CD4008	
		MM74C83	
	RCA	CD4008	
	SGS	HCF4008	
	Signetics	HEF4008	
	SSS	SCL4008	
	Toshiba	TC4008	
CM4009	Hitachi	HD14009	
	National	CD4009	
	RCA	CD4009	
	SGS	HCF4009	
	SSS	SCL4009	
	Toshiba	TC4009	
CM4010	Hitachi	HD14010	
	National	CD4010	
	RCA	CD4010	
	SGS	HCF4010	
	SSS	SCL4010	
	Toshiba	TC4010	
CM4011	Fairchild	F4011	
	Hitachi	HD14011	
	Motorola	MC14011	
	National	CD4011	
		MM74C00	
	OKI	MSM4011	
	RCA	CD4011	
	Sanyo	LC4011	
	SGS	HCF4011	
	Signetics	HEF4011	
	SSS	SCL4011	
	Toshiba	TC4011	
CM4012	Fairchild	F4012	
	Hitachi	HD14012	
	Motorola	MC14012	
	National	CD4012	
	RCA	CD4012	
	SGS	HCF4012	
	Signetics	HEF4012	
CM4012	SSS	SCL4012	
	Toshiba	TC4012	
CM4013	Fairchild	F4013	
	Hitachi	HD14013	
	Motorola	MC14013	
	National	CD4013	
		MM74C74	
	OKI	MSM4013	
	RCA	CD4013	
	Sanyo	LC4013	
	SGS	HCF4013	
	Signetics	HEF4013	
	SSS	SCL4013	
	Toshiba	TC4013	
CM4014	Fairchild	F4014	
	Hitachi	HD14014	
	Motorola	MC14014	
	National	CD4014	
	RCA	CD4014	
	SGS	HCF4014	
	Signetics	HEF4014	
	SSS	SCL4014	
	Toshiba	TC4014	
CM4015	Fairchild	F4015	
	Hitachi	HD14015	
	Motorola	MC14015	
	National	CD4015	
		MM74C164	
	OKI	MSM4015	
	RCA	CD4015	
	Sanyo	LC4015	
	SGS	HCF4015	
	Signetics	HEF4015	
	SSS	SCL4015	
	Toshiba	TC4015	
CM4016	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4066	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
CM4017	Fairchild	F4017	
	Hitachi	HD14017	
	Motorola	MC14017	
	National	CD4017	
	RCA	CD4017	
	SGS	HCF4017	
	Signetics	HEF4017	
	SSS	SCL4017	
	Toshiba	TC4017	
CM4018	Fairchild	F4018	
	Hitachi	HD14018	
	Motorola	MC14018	
	National	CD4018	
	RCA	CD4018	
	SGS	HCF4018	
	Signetics	HEF4018	
	SSS	SCL4018	
	Toshiba	TC4018	
CM4019	Fairchild	F4019	
	National	CD4019	
	OKI	MSM4019	
	RCA	CD4019	
	Sanyo	LC4019	
	SGS	HCF4019	
	Signetics	HEF4019	
	SSS	SCL4019	
	Toshiba	TC4019	
CM4020	Fairchild	F4020	
	Hitachi	HD14020	
	Motorola	MC14020	
	National	CD4020	
	RCA	CD4020	
CM4020	SGS	HCF4020	
	Signetics	HEF4020	
	SSS	SCL4020	
	Toshiba	TC4020	
CM4021	Fairchild	F4021	
	Hitachi	HD14021	
	Motorola	MC14021	
	National	CD4021	
	RCA	CD4021	
	SGS	HCF4021	
	Signetics	HEF4021	
	SSS	SCL4021	
	Toshiba	TC4021	
CM4022	Fairchild	F4022	
	Hitachi	HD14022	
	Motorola	MC14022	
	National	CD4022	
	RCA	CD4022	
	SGS	HCF4022	
	Signetics	HEF4022	
	SSS	SCL4022	
	Toshiba	TC4022	
CM4023	Fairchild	F4023	
	Hitachi	HD14023	
	Motorola	MC14023	
	National	CD4023	
		MM74C10	
	RCA	CD4023	
	SGS	HCF4023	
	Signetics	HEF4023	
	SSS	SCL4023	
	Toshiba	TC4023	
CM4024	Fairchild	F4024	
	Hitachi	HD14024	
	Motorola	MC14024	
	National	CD4024	
	RCA	CD4024	
	SGS	HCF4024	
	Signetics	HEF4024	
	SSS	SCL4024	
	Toshiba	TC4024	
CM4025	Fairchild	F4025	
	Hitachi	HD14025	
	Motorola	MC14025	
	National	CD4025	
	RCA	CD4025	
	SGS	HCF4025	
	Signetics	HEF4025	
	SSS	SCL4025	
	Toshiba	TC4025	
CM4026	RCA	CD4026	
	SGS	HCF4026	
	SSS	SCL4026	
CM4027	Fairchild	F4027	
	Hitachi	HD14027	
	Motorola	MC14027	
	National	CD4027	
		MM74C76	
	OKI	MSM4027	
	RCA	CD4027	
	Sanyo	LC4027	
	SGS	HCF4027	
	Signetics	HEF4027	
	SSS	SCL4027	
CM4028	Fairchild	F4028	
	Hitachi	HD14028	
	Motorola	MC14028	
	National	CD4028	
		MM74C42	
	OKI	MSM4028	
	Sanyo	LC4028	
	SGS	HCF4028	
	Signetics	HEF4028	
	SSS	SCL4028	
	Toshiba	TC4028	
CM4029	Fairchild	F4029	
	Motorola	MC14029	
	National	CD40192	
		CD4029	
	RCA	CD40192	
		CD4029	
	SGS	HCF40192	
		HCF4029	
	Signetics	HEF40192	
	SSS	SCL4029	
		SCL4192	
	Toshiba	TC40192	
		TC4029	
CM4030	Fairchild	F4030	
	National	CD4030	
	RCA	CD4030	
	SGS	HCF4030	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Solitron Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
	Signetics	HEF4030	
	SSS	SCL4030	
	Toshiba	TC4030	
CM4032	Hitachi	HD14032	
	Motorola	MC14032	
	RCA	CD4032	
	SGS	HCF4032	
	Toshiba	TC4032	
CM4033	RCA	CD4033	
	SGS	HCF4033	
	SSS	SCL4033	
CM4034	Fairchild	F4034	
	Hitachi	HD14034	
	Motorola	MC14034	
	National	CD4034	
	RCA	CD4034	
	SGS	HCF4034	
	SSS	SCL4034	
	Toshiba	TC4034	
CM4035	Fairchild	F4035	
	Hitachi	HD14035	
	Motorola	MC14035	
	National	CD4035	
	RCA	CD4035	
	SGS	HCF4035	
	Signetics	HEF4035	
	SSS	SCL4035	
	Toshiba	TC4035	
CM4036	RCA	CD4036	
	Toshiba	TC4036	
CM4037	RCA	CD4037	
CM4038	Hitachi	HD14038	
	Motorola	MC14038	
	RCA	CD4038	
	SGS	HCF4038	
	Toshiba	TC4038	
CM4039	RCA	CD4039	
	Toshiba	TC4039	
CM4040	Fairchild	F4040	
	Hitachi	HD14040	
	Motorola	MC14040	
	National	CD4040	
	RCA	CD4040	
	SGS	HCF4040	
	Signetics	HEF4040	
	SSS	SCL4040	
	Toshiba	TC4040	
CM4041	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4042	
	Toshiba	TC4042	
CM4042	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
	Toshiba	TC4042	
CM4043	Hitachi	HD14043	
	Motorola	MC14043	
	National	CD4043	
	RCA	CD4043	
	SGS	HCF4043	
	Signetics	HEF4043	
	SSS	SCL4043	
	Toshiba	TC4043	
CM4044	Fairchild	F4044	
	Hitachi	HD14044	
CM4044	Motorola	MC14044	
	National	CD4044	
	RCA	CD4044	
	SGS	HCF4044	
	Signetics	HEF4044	
	SSS	SCL4044	
	Toshiba	TC4044	
CM4045	Fairchild	F4521	
	Motorola	MC14521	
	RCA	CD4045	
	SGS	HCF4045	
	Signetics	HEF4521	
	SSS	SCL4445	
	Toshiba	TC4521	
CM4046	Fairchild	F4046	
	Hitachi	HD14046	
	Motorola	MC14046	
	National	CD4046	
	RCA	CD4046	
	SGS	HCF4046	
	SSS	SCL4046	
CM4047	Fairchild	F4047	
	National	CD4047	
	RCA	CD4047	
	SGS	HCF4047	
	Signetics	HEF4042	
		HEF4047	
	SSS	SCL4047	
	Toshiba	TC4047	
CM4048	National	CD4048	
	RCA	CD4048	
	SGS	HCF4048	
	SSS	SCL4402	
CM4049	Fairchild	F4049	
	Hitachi	HD14049	
	Motorola	MC14049	
	National	CD4049	
	OKI	MSM4049	
	RCA	CD4009	
		CD4049	
	Sanyo	LC4049	
	SGS	HCF4049	
	Signetics	HEF4049	
	SSS	SCL4049	
	Toshiba	TC4049	
CM4050	Fairchild	F4050	
	Hitachi	HD14050	
	Motorola	MC14050	
	National	CD4050	
	RCA	CD4010	
		CD4050	
	SGS	HCF4050	
	Signetics	HEF4050	
	SSS	SCL4050	
	Toshiba	TC4050	
CM4051	Fairchild	F4051	
	Motorola	MC14051	
	National	CD4051	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4046	
		HEF4051	
	SSS	SCL4051	
	Toshiba	TC4051	
CM4052	Fairchild	F4052	
	Hitachi	HD14052	
	Motorola	MC14052	
	National	CD4052	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	SSS	SCL4052	
	Toshiba	TC4052	
CM4053	Fairchild	F4053	
	Motorola	MC14053	
	National	CD4053	
	RCA	CD4053	
	SGS	HCF4052	
	Signetics	HEF4053	
	SSS	SCL4053	
	Toshiba	TC4053B	
CM4066	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
CM4066	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		HCF4016	
	Toshiba	TC4016	
		TC4066	
CM4068	Fairchild	F4068	
	Hitachi	HD14068	
	Motorola	MC14068	
	RCA	CD4068	
	SGS	HCF4068	
	Signetics	HEF4068	
	SSS	SCL4068	
		SCL4412	
	TI	UCN4810	
	Toshiba	TC4068	
CM4069	Fairchild	F4069	
	Hitachi	HD14069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
		MM74C04	
	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	
	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Toshiba	TC4069	
CM4070	Fairchild	F4070	
	Hitachi	HD14070	
	Motorola	MC14070	
	National	CD4070	
		MM74C86	
	RCA	CD4070	
	SGS	HCF4070	
	Signetics	HEF4070	
	SSS	SCL4070	
CM4071	Fairchild	F4071	
	Hitachi	HD14071	
	Motorola	MC14071	
	National	CD4071	
		MM74C32	
	OKI	MSM4071	
	RCA	CD4071	
	Sanyo	LC4071	
	SGS	HCF4071	
	Signetics	HEF4071	
	SSS	SCL4071	
	Toshiba	TC4071	
CM4073	Fairchild	F4073	
	Hitachi	HD14073	
	Motorola	MC14073	
	National	CD4073	
	RCA	CD4073	
	SGS	HCF4073	
	Signetics	HEF4073	
	SSS	SCL4073	
	Toshiba	TC4073	
CM4075	Fairchild	F4075	
	Hitachi	HD14075	
	Motorola	MC14075	
	National	CD4075	
	RCA	CD4075	
	SGS	HCF4075	
	Signetics	HEF4075	
	SSS	SCL4075	
	Toshiba	TC4075	
CM4076	Fairchild	F4076	
	Hitachi	HD14076	
	Motorola	MC14076	
	National	CD4076	
		MM54C173	
		MM74C173	
	RCA	CD4076	
	SGS	HCF4076	
	Signetics	HEF4076	
	SSS	SCL4076	
	Toshiba	TC4076	
CM4077	Fairchild	F4077	
	Hitachi	HD14077	
	Motorola	MC14077	
CM4077	National	CD4077	
	RCA	CD4077	
	SGS	HCF4077	
	Signetics	HEF4077	
	SSS	SCL4077	
CM4078	Fairchild	F4078	
	Hitachi	HD14078	
	Motorola	MC14078	
	RCA	CD4078	
	SGS	HCF4078	
	Signetics	HEF4078	
	SSS	SCL4078	
	Toshiba	TC4078	
CM4081	Fairchild	F4081	
	Hitachi	HD14081	
	Motorola	MC14081	
	National	CD4081	
		MM74C08	
	OKI	MSM4081	
	RCA	CD4081	
	Sanyo	LC4081	
	SGS	HCF4081	
	Signetics	HEF4081	
	SSS	SCL4081	
	Toshiba	TC4081	
CM4508	Hitachi	HD14508	
		HD74147	
	Motorola	MC14508	
	National	DM74147	
	RCA	CD4508	
	SGS	HCF4508	
	Signetics	74147	
		HEF4508	
		N82147	
	SSS	SCL4508	
	TI	**SN74147**	**882**
	Toshiba	TC4508	
CM4510	Fairchild	F4510	
	Hitachi	HD14510	
	Motorola	MC14510	
	National	CD4510	
	RCA	CD4510	
	SGS	HCF4510	
	Signetics	HEF4510	
	SSS	SCL4510	
	Toshiba	TC4510	
CM4511	Fairchild	F4511	
	Hitachi	HD14511	
	Mitel	MD4511	
	MMI	4511	
	Motorola	MC14511	
	National	CD4511	
	NEC-Micro	μPD4511	
	RCA	CD4511	
	SGS	HCF4511	
	Signetics	HEF4511	
	SSS	SCL4511	
	Toshiba	TC4511	
CM4514	Fairchild	F4514	
	Hitachi	HD14514	
	Motorola	MC14514	
	National	CD4514	
	RCA	CD4514	
	SGS	HCF4514	
	Signetics	HEF4514	
	SSS	SCL4514	
	Toshiba	TC4514	
CM4515	Fairchild	F4515	
	Hitachi	HD14515	
	Motorola	MC14515	
	National	CD4515	
	RCA	CD4515	
	SGS	HCF4515	
	Signetics	HEF4515	
	SSS	SCL4515	
	Toshiba	TC4515	
CM4516	Fairchild	F4516	
	Hitachi	HD14516	
	Motorola	MC14516	
	National	CD4516	
	RCA	CD4516	
	SGS	HCF4516	
	Signetics	HEF4516	
	SSS	SCL4516	
	Toshiba	TC4516	
CM4518	Fairchild	F4518	
	Hitachi	HD14518	
	Motorola	MC14518	
	National	CD4518	
	RCA	CD4518	
	SGS	HCF4518	
	Signetics	HEF4518	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Solitron Devices (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
	SSS	SCL4518	
	Toshiba	TC4518	
CM4520	Fairchild	F4520	
	Hitachi	HD14520	
	Motorola	MC14520	
	National	CD4520	
	OKI	MSM4520	
	RCA	CD4520	
	Sanyo	LC4520	
	SGS	HCF4520	
	Signetics	HEF4520	
	SSS	SCL4520	
	Toshiba	TC4520	
CM4XXX	Fairchild	34XXX	
		F4XXX	
	Hitachi	HD14XXX	
	Motorola	MC14XXX	
	National	CD4XXX	
	OKI	MSM4XXX	
	SGS	HCF4XXX	
	SSS	SCL4XXX	
	TI	TP4000 series	
	Toshiba	TC4XXX	
HCF4016	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
	Toshiba	TC4016	
		TC4066	
UC4250	Fairchild	μA776	
	Harris	**HA-2720**	**3236**
	Intersil	ICL8021	
		LM4250	
	Motorola	MC1776	
	National	LM4250	
	SiliconG	SG4250	
μA2556	Intel	1101	
	Solitron	μA2656	
		μA3556	
		μA3656	
μA2656	Intel	1101	
	Solitron	μA2556	
		μA3556	
		μA3656	
μA3556	Intel	1101	
	Solitron	μA2556	
		μA2656	
		μA3656	
μA3656	Intel	1101	
	Solitron	μA2556	
		μA2656	
		μA3556	

Sprague Electric Company

*UCN-4116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
*UCN-4116	Signetics	2690	
		2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
◆TDA3189	RCA	CD3189	
UCN-4810	**AMI**	**S4534**	**2611**
	TI	UCN4810	
UCN4116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
UCN4810	Fairchild	F4068	
	Hitachi	HD14068	
	Motorola	MC14068	
	RCA	CD4068	
	SGS	HCF4068	
	Signetics	HEF4068	
	SSS	SCL4068	
		SCL4412	
	Solitron	CM4068	
	TI	UCN4810	
	Toshiba	TC4068	
UDN-2841	TI	UDN2841	
UDN-2842	TI	UDN2842	
UDN-2843	TI	UDN2843	
UDN-2844	TI	UDN2844	
UDN-2845	TI	UDN2845	
UDN-2846	TI	UDN2846	
UDN-2981	Mitel	M54563	
UDN-2982	Mitel	M54562	
UDN-3611	National	LM3611	
UDN-3612	National	DS3612	
		DS3632	
UDN-3613	National	DS3613	
UDN-3614	National	DS3614	
UDN-5711	TI	SN75476	
UDN-5712	Motorola	MC1472	
	TI	SN75475	
		SN75477	
UDN-5713	TI	SN75478	
UDN-5714	TI	SN75479	
UDN-6116	Dionics	DI509	
UDN-6118	Dionics	DI514	
	Exar	**XR6118**	**3205**
	Sanyo	LB1290	
	SiliconG	SG6118	
	Sprague	ULN-6118	
UDN-6126	Sanyo	LB1293	
UDN-6128	**Exar**	**XR6128**	**3205**
	Signetics	ULN-6128	
UDN-6164	Dionics	DI507	
UDN-6184	Dionics	DI512	
UDN-7183	Dionics	DI302	
◆UDN-7184	Dionics	DI302	
	Sprague	**UDN-7183**	**2843**
◆UDN-7186	Dionics	DI302	
	Sprague	**UDN-7183**	**2843**
ULN-2001	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
ULN-2001	Sprague	ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
ULN-2002	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
ULN-2003	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
ULN-2004	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
ULN-2005A	TI	ULN2005A	
ULN-2021	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
ULN-2021	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
ULN-2022	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULS-2002	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
ULN-2023	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
ULN-2024	TI	SN75469	
ULN-2046	Fairchild	μA3086	
	Motorola	MC3386	
	National	LM3086	
	Plessey	SL3046	
		SL3086	
	RCA	CA3046	
		CA3086	
	SiliconG	SG3086	
		SG3821	
		SG3886	
	Sprague	ULN-2086	
ULN-2054	Motorola	CA3054	
	RCA	CA3026	
		CA3054	
	SiliconG	SG3822	
	Thomson-CSF	SFC2054	
ULN-2064	TI	ULN2064	
	Toshiba	TD62064	
ULN-2065	TI	ULN2065	
ULN-2066	TI	ULN2066	
ULN-2067	TI	ULN2067	
ULN-2068	**Motorola**	**ULN2068**	**2753**
	TI	ULN2068	
ULN-2069	TI	ULN2069	
ULN-2074	Motorola	ULN2074	
	TI	ULN2074	
	Toshiba	TD62074	
ULN-2075	TI	ULN2075	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Sprague Electric Company (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
ULN-2081	Plessey	SL3081	
	RCA	CA3081	
	Signetics	CA3081	
	SiliconG	SG3081	
ULN-2082	Plessey	SL3082	
	RCA	CA3082	
	Signetics	CA3082	
	SiliconG	SG3082	
ULN-2083	Plessey	SL3083	
		SL3183	
	RCA	CA3083	
		CA3183	
	Signetics	CA3083	
		CA3183	
	SiliconG	SG3083	
		SG3183	
ULN-2086	Fairchild	μA3086	
	Motorola	MC3386	
	National	LM3086	
	Plessey	SL3046	
		SL3086	
	RCA	CA3046	
		CA3086	
	SiliconG	SG3086	
		SG3821	
		SG3886	
	Sprague	ULN-2046	
ULN-2111	Fairchild	ULN-2136	
	Motorola	MC1352	
		MC1357	
	RCA	CA1352	
		CA2111	
		CA3014	
	Sanyo	LA1352	
	Sprague	ULN-2136	
	TI	SN76642	
		SN76643	
		SN76650	
		SN76669	
ULN-2113	Fairchild	ULN-2136	
	Motorola	MC1352	
		MC1357	
	RCA	CA1352	
		CA2111	
		CA3014	
	Sanyo	LA1352	
	Sprague	ULN-2111	
		ULN-2136	
	TI	SN76642	
		SN76643	
		SN76650	
		SN76669	
ULN-2136	Fairchild	ULN-2136	
	Motorola	MC1352	
		MC1357	
	RCA	CA1352	
		CA2111	
		CA3014	
	Sanyo	LA1352	
	Sprague	ULN-2111	
	TI	SN76642	
		SN76643	
		SN76650	
		SN76669	
ULN-2204	Hitachi	HA12402	
	Motorola	MC14094	
	RCA	CD4094	
	Telefunken	TDA1083	
	Toshiba	TA7613	
ULN-2211	Exar	XR1310	
	Hitachi	HA1156	
	National	**LM1310 3325,3328**	
	RCA	CA1310	
	Sanyo	LA3350	
	Sprague	ULN-3810	
	TI	SN76115	
	Toshiba	TA7157	
ULN-2224	Sanyo	LA1369	
ULN-2228	RCA	CA3071	
	TI	SN76243	
		SN76246	
ULN-2242	Motorola	TDA1090	
ULN-2244	Motorola	μA758	
	National	**LM1800 3325,3328**	
	RCA	CA758	
	Signetics	μA758	
	TI	SN76111	
		SN76116	
ULN-2249	Hitachi	HA1199	
ULN-2261	RCA	CA3135	
ULN-2270	Fairchild	UA7327	
ULN-2280	**National**	**LM380**	**3326**
ULN-2289	Hitachi	HA1137	
		LA1230	
	Motorola	MC1389	
	National	CA3089	
		LM3089 3325,3327	
	RCA	CA3089	
	Sanyo	LA1230	
		LA3089	
	SGS	TCA3089	
		TDA1200	
	Signetics	CA3089	
	Siliconix	CA3089	
	TI	SN76689	
ULN-2290	Fairchild	TDA1194	
	Hitachi	HA1364	
	RCA	CA1190	
	SGS	TDA1190	
		TDA1190Z	
		TDA3190	
ULN-2298	Motorola	MC1398	
	RCA	CA1398	
	TI	SN76298	
ULN-2429	Cherry	CS166	
ULN-2801	RIFA	PBD353801	
ULN-2802	RIFA	PBD353804	
ULN-2803	RIFA	PBD353803	
ULN-2804	RIFA	PBD353802	
ULN-2821	SGS	L601	
ULN-2822	SGS	L602	
ULN-2823	SGS	L603	
ULN-2824	SGS	L604	
ULN-3304	Cherry	CS102	
◆ULN-3305	Cherry	CS122	
	Sprague	ULN-3306	
ULN-3306	Cherry	CS122	
ULN-3701	Fairchild	TDA2002	
	SGS	TDA2002	
ULN-3809	Motorola	MC1309	
ULN-3810	Exar	XR1310	
	Hitachi	HA1156	
	National	**LM1310 3325,3328**	
	RCA	CA1310	
	Sanyo	LA3350	
	Sprague	ULN-2211	
	TI	SN76115	
	Toshiba	TA7157	
ULN-3889	RCA	CA3189	
	SGS	TCA3189	
	Signetics	CA3189	
ULN-6118	Dionics	DI514	
	Exar	**XR6118**	**3205**
	Sanyo	LB1290	
	SiliconG	SG6118	
	Sprague	**UDN-6118**	**2843**
ULN-8126	**Motorola**	**SG1526**	**3297**
ULN-8160	Ferranti	ZN1060	
	Signetics	**NE5560**	**3402**
		SE5560	**3402**
	Sprague	ULS-8160	
ULN2005	TI	ULN2005	
ULN2066	Sprague	ULN-2066	
	TI	ULN2066	
ULN2067	Sprague	ULN-2067	
	TI	ULN2067	
ULN2069	Sprague	ULN-2069	
	TI	ULN2069	
ULN2075	Sprague	ULN-2075	
	TI	ULN2075	
◆ULN28XX	Motorola	ULN28XX	
ULQ-8126	**Motorola**	**SG2526**	**3297**
		SG3526	**3297**
	SiliconG	SG2526	
ULS-2001	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
ULS-2001	Sprague	ULN-2001	
		ULN-2021	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
ULS-2002	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
	TI	SN75467	
		ULN2002	
	Toshiba	TD62002	
ULS-2003	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
ULS-2004	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
ULS-2011	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
ULS-2011	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
		TD62101	
ULS-2012	SiliconG	SG3852	
ULS-2013	SiliconG	SG3853	
ULS-2045	Plessey	SL3145	
	RCA	CA3045	
ULS-8126	SiliconG	SG3526	
ULS-8160	Ferranti	ZN1060	
	Signetics	**NE5560**	**3402**
		SE5560	**3402**
	Sprague	ULN-8160	
ULS-8161	Signetics	SE5561	
◆ULX3905	Hitachi	HA1148	
	RCA	CA3217	

Standard Microsystems Corporation

Manufacturer Device	Replacement Source	Device	IC Master Page
COM1671	**Western**	**UC1671**	**2871**
COM2017	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2502H	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
COM2502H	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM8017	
	Western	TR1402	
		TR1602	
		TR1863	
COM2651	National	INS2651	
	Signetics	SCN2651	
COM2661	Motorola	MC2661	
		MC68661	
	Signetics	SCN2661	
	Synertek	2661	
COM5016	Western	BR1941	
COM5025	AMI	S6852	
	Fairchild	**F6852**	**1281**
	Hitachi	**HD6852**	**1345**
		HD68A52	**1345**
	Motorola	**MC2652**	**1359**
		MC6852	**1351**
		MC68652	**1359**
	Signetics	SCN2652	
	SSS	SND5025	
COM8017	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Standard Microsystems Corporation (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
COM8017	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
	Western	TR1402	
		TR1602	
		TR1863	
COM8116	GI	AY-5-8116	
COM8136	GI	AY-5-8136	
COM8251A	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	Western	TR1983	
CRT5027	SSS	SND5027	
	TI	**TMS9927**	**1554**
CRT5037	SSS	SND5037	
FDC1761	Western	FD1761	
FDC1763	Western	FD1763	
FDC1765	Western	FD1765	
FDC1767	Western	FD1767	
FDC1791	**Fujitsu**	**MB8876**	**1308**
	Siemens	SAB1791	
	Western	FD1791	
FDC1792	Western	FD1792	
FDC1793	**Fujitsu**	**MB8877**	**1308**
	Siemens	SAB1793	
	Western	FD1793	
FDC1794	Western	FD1794	
FDC1795	Siemens	SAB1795	
	Western	FD1795	
FDC1797	Siemens	SAB1797	
	Western	FD1797	
MPU3870	Fairchild	3870	
	Mostek	MK3870	
	SGS	M3870	
ROM36000	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	Synertek	SY2364	
	TI	TMS4764	
	Toshiba	TM2364	
ROM4732	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
ROM4732	Rockwell	R2332	
	SiliconG	SG3532	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
SR5015	AMI	S2182	
		S2183	
		S2185	
	Fairchild	3347	

Supertex Inc.

Manufacturer Device	Replacement Source	Device	IC Master Page
CM2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
CM6400	TI	TMS2564	
MM74S188	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		6330-1	**3826**
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	SM74S188	
	TI	TBP18SA030	
		TBPSA030M	
MM74S288	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	**3826**
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	SM74S288	
	TI	**TBP18S030**	**440,3965**
		TBP18S030N	**440,3965**
MM82S190	AMD	AM27PS191	
		AM27PS291	
		AM27S190	
	Fairchild	93510	
		93Z510	
	Fujitsu	MB7137	
		MBM7138	
	Harris	HM76160	
	MMI	631681	
	National	DM77S190	
		DM87S190	
	Raytheon	29680	
		29683	
MM82S190	Signetics	82S190	
		N82S190	
		S82S190	
MM82S191	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	SM82S191	
	TI	**TBP28S166**	**440,3979**
SM74S188	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		6330-1	**3826**
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
	TI	TBP18SA030	
		TBPSA030M	
SM74S288	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	**3826**
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
	TI	**TBP18S030**	**440,3965**
		TBP18S030N	**440,3965**
SM82S181	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
SM82S181	TI	TBP28S86	
		TBP28S86M	
SM82S191	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
	TI	**TBP28S166**	**440,3979**

Synertek

Manufacturer Device	Replacement Source	Device	IC Master Page
◆2316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
2661	Motorola	MC2661	
		MC68661	
	Signetics	SCN2661	
	SMC	COM2661	
SY1791	Western	1791	
SY1793	Western	1793	
SY2101	AMD	2101A	
		91L01	
	Intel	8101A	
	NEC-Micro	μPD2101	
SY2111	AMD	2111A	
		91L11	
	Intel	8111	
	NEC-Micro	μPD2111	
SY2112	AMD	2112	
	TI	TMS4043	
SY2114	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Synertek (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SY2114	**OKI**	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
		TMM314A	
SY2128	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
SY2129	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
	TI	TMS4016	
	Toshiba	TC5516	
		TMM2016	
◆SY2142	Intel	2142	
	National	MM2142	
◆SY2142-2	Intel	2142-2	
	National	NMC2142A	
SY2147	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
SY2148	AMD	9148	
		AM9148	
	Fairchild	**93475**	**3615,3646**
	Fujitsu	MBM2148	
		MBM2149	
	Hitachi	**HM6148**	**3789**
	Intel	2148H	
		2149H	
	National	NMC2148	
	Synertek	SY2149	
SY2149	AMD	9148	
		AM9148	
	Fairchild	**93475**	**3615,3646**
	Fujitsu	MBM2148	
		MBM2149	
	Hitachi	**HM6148**	**3789**
	Intel	2148H	
		2149H	
	National	NMC2148	
	Synertek	SY2148	
◆SY2316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
◆SY2316	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
	Toshiba	TMM331A	
SY2332	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
◆SY2332-3	Universal	UM2332-30	
SY2333	AMD	AM9233	
	AMI	**S2333**	**3608**
	CSG	MPS2333	
	Fairchild	F3533	
	GI	R03-9333	
	Intel	2332	
	NEC-EA	8332	
		EA8333	
	RCA	CDM5332	
	Signetics	2332	
	Toshiba	TM2332	
	Universal	UM2333-45	
◆SY2333-3	Universal	UM2333-30	
SY2364	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	TI	TMS4764	
	Toshiba	TM2364	
SY2364-2	AMD	AM92640	
	AMI	S68B364	
	Fairchild	F-3564-25	
	Mostek	MK36000-4	
	Motorola	MCM67365-25	
	NEC-EA	μPD2/8364-20	
	Signetics	2064-20	
SY2364-3	AMD	AM9264	
	AMI	S4264	
	GTEMicro	2364-3	
	Mostek	MK36000-5	
	NEC-EA	UPD2/8364-30	
	Signetics	**2664A-30**	**3907**
	Toshiba	TMM2364	
	Weitek	SC8164	
SY2365	**AMI**	**S2364**	**3609**
	GI	R03-9367	
	Mostek	MK37000	
	Signetics	**2364-20**	**3899**
	Synertek	**SY2365-2**	**3951**
SY2365-2	**AMI**	**S2364**	**3609**
	GI	R03-9367	
	Mostek	MK37000	
	Signetics	**2364-20**	**3899**
	Synertek	**SY2365**	**3951**
◆SY2401	AMD	2401	
SY6500/1	CSG	MPS6500/1	
	Rockwell	R6500/1	
SY6502	CSG	MPS6502	
	Rockwell	R6502	
SY6503	CSG	MPS6503	
	Rockwell	R6503	
SY6504	CSG	MPS6504	
	Rockwell	R6504	
SY6505	CSG	MPS6505	
	Rockwell	R6505	
SY6506	CSG	MPS6506	
	Rockwell	R6506	
SY6507	CSG	MPS6507	
	Rockwell	R6507	
SY6512	CSG	MPS6512	
	Rockwell	R6512	
SY6514	CSG	MPS6514	
	Rockwell	R6514	
SY6515	CSG	MPS6515	
	Rockwell	R6515	
SY6520	CSG	MPS6520	
	Rockwell	R6520	
SY6521	Motorola	6821	
SY6522	CSG	MPS6522	
	Rockwell	R6522	
SY6530	Rockwell	R6530	
SY6532	CSG	MPS6532	
	Rockwell	R6532	
SY6545	CSG	MPS6545	
	Hitachi	**HD6845**	**1345**
		HD68A45	**1345**
		HD68B45	**1345**
	Motorola	**MC6845**	**1351**
	Rockwell	R6545	
SY6551	**AMI**	**S6551**	**1249**
	CSG	MP6551	
		MPS6551	
	Rockwell	R6551	
SY68045	**AMI**	**S68045**	**1250**
Z8	SGS	Z8	
	Zilog	Z8	
Z8601	SGS	Z8601	
	Zilog	**Z8601**	**1596**
Z8602	SGS	Z8602	
	Zilog	Z8602	
Z8603	**Zilog**	**Z8603**	**1596**
Z8611	SGS	Z8611	
	Zilog	**Z8611**	**1597**
Z8612	SGS	Z8612	
	Zilog	**Z8612**	**1597**
Z8613	**Zilog**	**Z8613**	**1597**
Z8671	**Zilog**	**Z8671**	**1597**
Z8681	**Zilog**	**Z8681**	**1597**

Teledyne Crystalonics

CDR125	Intersil	D125
	Siliconix	D125

Teledyne Philbrick

0032	**National**	**LH0032**	**3342**
	OEI	**9932**	**3346**
1323	Datel	AM-470-2	
		AM-470-2C	**2623**
		AM-470-2M	
	Harris	HA-2700	
		HA-2704	
		HA-2705	
1326	**Harris**	**HA-2600**	**3226,3287**
	Intersil	HA2600	
	Motorola	MC1556	
	Signetics	MC1556	
	SiliconG	SG1556	
	TI	MC1556	
1332	**Datel**	**AM-464-2**	**2622**
	Harris	**HA-2645**	**3232,3287**
	Motorola	MC1436	
		MC1439	
	National	LM1436	
		LM343	
1332	SiliconG	SG1436	
1340	AD	AD510	
		AD517	
		ADOP-07	**3153**
	Burr-Brown	3510	
	Datel	AM-430	
		AM-490-2	
	Fairchild	μA714	
	Harris	HA-2900	
		HA-2905	
		HA-5130	
		HA-5135	
	MicroPwr	MP517	
		MP5505	
		MP5507	
		OP-05	
		OP-07	
	National	**LH0044**	**3342**
	NEC-Electron	μPC725	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
	TI	OP-07	
1430	Datel	AM-500	
3554	Burr-Brown	3554	
4068	AMD	AM6012	
	AD	AD562	
	Burr-Brown	DAC862	
	Datel	DAC-562	
		DAC-681	
		DAC-681C	
	Harris	HI562	
		HI562-5	
	MicroPwr	**MP562**	**401,2749**
	MicroEng	MCE-6012	
	Motorola	**AD562**	**2759**
	PMI	DAC12	
	Signetics	**AM6012**	**3383**
		DAC-312	
4140	**Datel**	**ADC-EK8B**	**2619**
	TeledyneS	8700	
4141	**Datel**	**ADC-EK10B**	**2619**
	TeledyneS	8701	
4142	**Datel**	**ADC-EK12B**	**2619**
	TeledyneS	8702	
4143	Datel	ADC-ET8B	
	TeledyneS	8703	
4144	Datel	ADC-ET10B	
	TeledyneS	8704	
4145	Datel	ADC-ET12B	
	TeledyneS	8705	
4146	Datel	ADC-EK12D	
	TeledyneS	8750	
4551	AD	AD7507	
	Burr-Brown	MPC8D	
	Datel	**MVD-807**	**2622**
		MXD-807	**2622**
	Harris	HI507	
		HI507A	
	Intersil	IH6216	
	MicroPwr	MP7507	
	PMI	MUX-28	
	Siliconix	DG507	
		DG507A	**2802**
4553	Burr-Brown	MPC4D	
	Datel	**MXD-409**	**2622**
	Fairchild	F4052	
	Harris	HI509	
		HI509A	
	Intersil	IH6208	
	MicroPwr	MP7509	
	Motorola	MC14052	
	National	**LF11509**	**3318**
		LF13509	
	PMI	MUX-24	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	Siliconix	DG509	
		DG509A	**2804**
4554	AD	AD7501	
	Burr-Brown	MPC8S	
	Datel	**MX-808**	**2622**
	Fairchild	F4051	
	Harris	HI1818	
		HI508	
		HI508A	
	Hitachi	HD14051	
	Intersil	IH6108	
	MicroPwr	MP7501	
		MP7508	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Teledyne Philbrick (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
4554	Motorola	MC14051	
	National	**LF11508**	**3318**
		LF13508	
	PMI	DMX-88	
		MUX-08	
		MUX-88	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4051	
	Siliconix	DG508	
		DG508A	**2804**
4780	Datel	VFQ-1	
	TeledyneS	9400	
		9400C	
4781	Datel	VFQ-2	
	TeledyneS	9401	
4782	Datel	VFQ-3	
	TeledyneS	9402	
4856	AD	AD583	
	Datel	**SHM-IC-1**	**2622**
	Harris	**HA-2425**	**3214,3287**
	PMI	SMP-10	
		SMP-11	
TDADC84	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TPADC87	
TP4134	Datel	ADC-EH12B	
	DDC	ADC4454	
TP5210	**AD**	**AD5210**	**3174**
	Datel	**ADC-5210**	**2621**
	HybridSys	HS5210	
	DDC	DDC5210	
	MicroNet	MN5210	
TP5211	**Datel**	**ADC-5211**	**2621**
	HybridSys	HS5211	
	DDC	DDC5211	
	MicroNet	MN5211	
TP5212	**Datel**	**ADC-5212**	**2621**
	HybridSys	HS5212	
	DDC	DDC5212	
	MicroNet	MN5212	
TP5213	**Datel**	**ADC-5213**	**2621**
	HybridSys	HS5213	
		MN5214	
	MicroNet	MN5213	
		MN5214	
	TeledyneP	TP5214	
TP5214	**Datel**	**ADC-5213**	**2621**
	HybridSys	HS5213	
		MN5214	
	MicroNet	MN5213	
		MN5214	
	TeledyneP	TP5213	
TP5215	**Datel**	**ADC-5214**	**2621**
	HybridSys	HS5215	
	MicroNet	MN5215	
TPADC85	DDC	DDCADC87	
TPADC87	AD	ADADC84	
		ADADC85	
		ADADC85S	
	Burr-Brown	ADC84	
		ADC85	
TPADC87	Datel	ADC-84	
		ADC-85	
		ADC-87	
		ADC-HX12B	
		ADC-HZ12B	
		ADC-HZ12BGZ	
	HybridSys	ADC581	
		ADC581B	
		HSADC85	
		HSADC85C	**2744**
	DDC	ADH-8585	
		ADH-8586	
		ADH8585-1	
		DDC5240	
		DDCADC85	
		DDCADC87	
	MicroNet	MN5240	
		MNAD787	
		MNADC84	
		MNADC85	
	TeledyneP	TDADC84	

Teledyne Semiconductor

Manufacturer Device	Replacement Source	Device	IC Master Page
14433	Motorola	MC14433	
	TeledyneS	14433A	
14433A	Motorola	MC14433	
	TeledyneS	14433	
7106	Intersil	ICL7106	
	MicroPwr	**MP7138**	**401,2749**
	Siliconix	LD131	
	TeledyneS	8751	
7107	Intersil	ICL7107	
7109	Intersil	1CL7109	
7116	Intersil	ICL7116	
7117	Intersil	ICL7117	
7126	Intersil	ICL7126	
747	AMD	747	
	Fairchild	μA747	
	Hitachi	HA17747	
	Motorola	MC1747	
	National	LM747	
	NEC-Electron	μPC251	
	PMI	OP-04	
		PM747	
	Raytheon	RC747	
		RM747	
	RCA	CA747	
	Signetics	μA747	
	SiliconG	SG747	
	TI	μA747	
7541	AD	AD7541	
	Datel	DAC-7541	
	HybridSys	HS7541	
	Intersil	AD7541	
		ICL7541	
	MicroPwr	**MP7541**	**401,2749**
		MP7621	
8700	**Datel**	**ADC-EK8B**	**2619**
	TeledyneP	4140	
8701	**Datel**	**ADC-EK10B**	**2619**
	TeledyneP	4141	
8702	**Datel**	**ADC-EK12B**	**2619**
	TeledyneP	4142	
8703	Datel	ADC-ET8B	
	TeledyneP	4143	
8704	Datel	ADC-ET10B	
	TeledyneP	4144	
8705	Datel	ADC-ET12B	
	TeledyneP	4145	
8750	Datel	ADC-EK12D	
	TeledyneP	4146	
8751	Intersil	ICL7106	
	MicroPwr	**MP7138**	**401,2749**
	Siliconix	LD131	
	TeledyneS	7106	
9400	Datel	VFQ-1	
	TeledyneP	4780	
	TeledyneS	9400C	
9400C	Datel	VFQ-1	
	TeledyneP	4780	
	TeledyneS	9400	
9401	Datel	VFQ-2	
	TeledyneP	4781	
9402	Datel	VFQ-3	
	TeledyneP	4782	
9491	AD	AD589	
	Datel	VR-8069	
	Ferranti	ZN423	
	Intersil	ICL8069	
9491	**MicroPwr**	**MP5010**	**401,3292**
	National	**LM113**	**3304**
		LM313	**3304**
	TeledyneS	9941	
9495	**MicroPwr**	**MP5531**	**401,3292**
		REF-02	
	PMI	REF-02	
9496	HybridSys	HSREF01	
	MicroPwr	**MP5532**	**401,3292**
		REF-01	
	Motorola	**MC1404-10**	**2761**
		MC1504-10	**2761**
	PMI	REF-01	
9941	AD	AD589	
	Datel	VR-8069	
	Ferranti	ZN423	
	Intersil	ICL8069	
	MicroPwr	**MP5010**	**401,3292**
	National	**LM113**	**3304**
		LM313	**3304**
	TeledyneS	9491	

Telefunken

Manufacturer Device	Replacement Source	Device	IC Master Page
TBA120	**National**	**TBA120**	**3325,3327**
	Plessey	TBA120	
	Siemens	TBA120	
	Signetics	TBA120	
TBA530	National	TBA530	
	Plessey	TBA530	
	Signetics	TBA530	
TBA540	National	TBA540	
	Plessey	TBA540	
	Signetics	TBA540	
TBA560	National	TBA560	
	Plessey	TBA560	
	Signetics	TBA560	
TBA990	National	TBA990	
	Plessey	TBA990	
	Signetics	TBA990	
TCA830	SGS	TCA830	
TCA840	SGS	TCA840	
TDA1083	Hitachi	HA12402	
	Motorola	MC14094	
	RCA	CD4094	
	Sprague	ULN-2204	
	Toshiba	TA7613	
TDA2140	SGS	TDA2140	
TDA2151	SGS	TDA2151	
TDA2161	SGS	TDA2161	
TDA2591	National	TDA2591	
	Plessey	TDA2591	
	Signetics	TDA2591	
TDA2593	National	TDA2593	
	Plessey	TDA2593	
	Signetics	TDA2593	
TDA440	National	TDA440	
	Plessey	TDA440	
	SGS	TDA440	
TDA4420	SGS	TDA4420	
TDA4421	SGS	TDA4421	

Texas Instruments

Manufacturer Device	Replacement Source	Device	IC Master Page
4732	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	TMS4732	
	Toshiba	TMM333	
	Universal	UM2332	
54LS163A	AMD	SN54LS163A	
	Motorola	SN54LS163A	
	National	DM54LS163	
		DM54LS163A	
	Raytheon	54LS163	
	Signetics	54LS163A	
54LS163A	TI	SN54LS163	
		SN54LS163A	
54LS386	Motorola	SN54LS386	
	National	DM54LS386	
	Raytheon	54LS386	
		RM8241	
	Signetics	S82S41	
	TI	**SN54LS386**	**942**
54LS55	Fairchild	54LS55	
	Motorola	SN54LS55	
	National	DM54LS55	
	Raytheon	54LS55	
	TI	**SN54LS55**	**851**
9615	Fairchild	96115	
		9615	
	TI	SN55115	
		SN75115	
9636	Fairchild	9636A	
	Motorola	MC3488	
	TI	9636A	
9636A	Fairchild	9636A	
	Motorola	MC3488	
	TI	9636	
9637	Fairchild	9637A	
	TI	9637A	
9637A	Fairchild	9637A	
	TI	9637	
9643	Fairchild	9643	
ADC0801	Intersil	ADC0801	
	National	ADC0801	
ADC0802	Intersil	ADC0802	
	National	**ADC0802**	**3319**
ADC0803	Datel	ADC-830	
	Intersil	ADC0803	
	National	**ADC0803**	**3319**
ADC0804	Intersil	ADC0804	
	National	ADC0804	
ADC0808	Mostek	MK0808	
	National	**ADC0808**	**3319**
ADC0809	Mostek	MK50809	
	National	**ADC0809**	**3319**
ADC0816	Datel	DAS-952	
	Mostek	MK50816	
	National	**ADC0816**	**3319**
AM26	AMD	AM26S10	
	Fairchild	9640	
	Motorola	DC26S10	
	National	DS26S10	
AM26LS31	AMD	AM26LS31	
	Motorola	**AM26LS31**	**2753**
	National	DS26LS31	
AM26LS32	National	DS26LS32	
AM26S11	AMD	AM26S11	
	National	DS26S11	
DM54S472	AMD	AM27S29	
	Fujitsu	MB7124	
		MBM7124	
	Harris	HM7649	
	MMI	5349-1	
		6349-1	**3826**
	Motorola	MCM7649	
	National	DM54S472	
		DM74S472	
	Raytheon	29621	
	Signetics	N82S147	
		S82S147	
	TI	**TBP28S42**	**440,3975**
		TBP28S42M	**440,3975**
DS7831	National	DS7831	
DS7832	National	DS7832	
DS8820	National	DS8820	
		DS8880	
	Signetics	DS8820	
	TI	SN75182	
		SN75480	
DS8830	National	DS8830	
	Signetics	DS8830	
	TI	SN75183	
DS8831	National	DS8831	
DS8832	National	DS8832	
FP4ALS16L8	MMI	PAL16L8	
	National	DMPAL16L8	
FP74ALS16R4	MMI	PAL16R4	
	National	DMPAL16R4	
FP74ALS16R8	MMI	PAL16R8	
	National	DMPAL16R8	
FP u4ALS16R6	MMI	PAL16R6	
	National	DMPAL16R6	
LL081BC	**Motorola**	**MC34001A**	**3293**

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LM101	AMD	LM101	
	AD	AD101	
	Fairchild	μA101	
	Intersil	AD101	
	Motorola	LM101	
	Raytheon	LM101	
	Signetics	LM101	
	SiliconG	SG101	
	Thomson-CSF	SFC2101	
LM101A	National	LM101A	
LM107	AMD	LM107	
	AD	**AD741S**	**3153**
	Intersil	LM107	
	National	LM107	
	Raytheon	LM107	
	SiliconG	SG107	
	TI	SN55107	
	Thomson-CSF	SFC2107	
LM111	AMD	LM111	
	AD	AD111	
	Fairchild	μA111	
	Intersil	LM111	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM111	
	National	**LM111**	**3317**
	PMI	PM111	
	Raytheon	LM111	
	Signetics	LM111	
	SiliconG	SG111	
	Thomson-CSF	SFC2111	
LM117	MicroEng	MCE-LM117	
	Motorola	**LM117**	**3295**
	National	**LM117**	**3299**
	SiliconG	SG117	
LM118	AMD	LM118	
	National	LM118	
LM124A	AMD	LM124A	
	Motorola	LM124A	
	National	LM124A	
	Raytheon	LM124A	
	RCA	CA124A	
	Signetics	LM124A	
	SiliconG	SG124	
LM137	MicroEng	MCE-LM137	
	Motorola	**LM137**	**3295**
	National	**LM137**	**3301**
LM139	AMD	LM139	
	Fairchild	μA139	
	Motorola	LM139	
	National	**LM139**	**3317**
	PMI	CMP-04	
		PM139	
	Raytheon	LM139	
	RCA	CA139	
	Signetics	LM139	
	SiliconG	SG139	
LM148	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM248	
		XR4156	
LM158	Motorola	LM158	
	National	LM158A	
	Raytheon	RM4139	
	RCA	CA158A	
	Signetics	LM158	
LM193	Fairchild	FC193A	
		μA193	
	Motorola	LM193	
	National	**LM193A**	**3317**
	Signetics	LM193	
LM201	AMD	748	
		LM201	
LM201	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
LM201A	National	LM201A	
LM211	AMD	LM211	
	AD	AD211	
	Motorola	LM211	
	National	**LM211**	**3317**
	PMI	PM211	
	RCA	LM211	
	Signetics	LM211	
	SiliconG	SG211	
	Thomson-CSF	SFC2211	
LM217	MicroEng	MCE-LM217	
	Motorola	**LM217**	**3295**
	National	**LM217**	**3299**
	SiliconG	SG217	
LM218	AMD	LM218	
		LM318	
	AD	**AD518**	**3155**
	Fairchild	μA318	
	National	LM218	
		LM318	
	NEC-Electron	μPC159	
	TI	LM318	
LM224	AMD	LM224	
	Fairchild	μA224	
	Motorola	LM224	
	National	LM224	
	Raytheon	LM224	
	RCA	CA224	
	Signetics	LM224	
	SiliconG	SG224	
LM237	MicroEng	MCE-LM237	
	National	**LM237**	**3301**
LM239	AMD	LM239	
	Fairchild	μA239	
	Motorola	LM239	
	National	**LM239**	**3317**
	PMI	CMP-04	
		PM239	
	Raytheon	LM239	
	RCA	CA239	
	Signetics	LM239	
	SiliconG	SG239	
LM248	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		XR4156	
LM258	Motorola	LM258	
	National	LM258A	
	RCA	CA258A	
	Signetics	LM258	
LM2900	Hitachi	HA17301	
	Motorola	LM2900	
		MC3301	
	National	LM2900	
		LM3301	
LM2900	Raytheon	LM2900	
		RC3301	
LM2901	Fairchild	μA2901	
		μA3302	
	Motorola	LM2901	
		MC3302	
	National	LM2901	
		LM3302	
	NEC-Electron	μPC2901	
	PMI	CMP-04	
	Raytheon	LM2901	
		RV3302	
	RCA	CA3302	
	Signetics	LM2901	
		MC3302	
	SiliconG	SG3302	
	TI	LM3302	
LM2902	Fairchild	μA2902	
	Hitachi	HA17902	
	Motorola	LM2902	
	National	LM2902	
	NEC-Electron	μPC2902	
	Raytheon	LM2902	
LM2903	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
	Thomson-CSF	SFC2311	
		SFC3111	
LM2904	Motorola	LM2904	
	National	LM2904	
	RCA	CA2904	
LM293	Fairchild	μA293	
	Motorola	LM293	
	National	**LM293**	**3317**
	Signetics	LM293	
LM301	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301A	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
LM301A	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
	Thomson-CSF	SFC2301	
	Toshiba	TA7506	
LM306	AMD	LM306	
	Fairchild	MA306	
	National	**LM306**	**3317**
LM307	AMD	LM307	
	AD	**AD741J**	**3153**
	Intersil	LM307	
	Motorola	LM307	
LM307	National	LM307	
	Raytheon	LM307	
	RCA	CA307	
	SiliconG	SG307	
	Thomson-CSF	SFC2307	
LM311	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
	Thomson-CSF	SFC2311	
		SFC3111	
LM317	Fairchild	μA317	
	MicroEng	MCE-LM317	
	Motorola	**LM317**	**3295**
	National	**LM317**	**3299**
	SiliconG	SG317	
LM318	AMD	LM218	
		LM318	
	AD	**AD518**	**3155**
	Fairchild	μA318	
	National	LM218	
		LM318	
	NEC-Electron	μPC159	
	TI	LM218	
LM324	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	MC3403	
LM324A	National	LM324A	
LM3302	Fairchild	μA2901	
		μA3302	
	Motorola	LM2901	
		MC3302	
	National	LM2901	
		LM3302	
	NEC-Electron	μPC2901	
	PMI	CMP-04	
	Raytheon	LM2901	
		RV3302	
	RCA	CA3302	
	Signetics	LM2901	
		MC3302	
	SiliconG	SG3302	
	TI	LM2901	
LM337	MicroEng	MCE-LM337	
	National	**LM337**	**3301**
LM339	AMD	LM339	
		LM339A	
	Fairchild	μA339	
	Hitachi	HA17901	
	Motorola	LM339	
	National	**LM339**	**3317**
	NEC-Electron	μPC339	
	NEC-Micro	μPC339	
	PMI	CMP-04	
		PM339A	
	Raytheon	LM339	
	RCA	CA339	
		CA339A	
		LM339	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
LM339	SiliconG	SG339	
LM340-15	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	μA7815	
		μA78L15	
	Toshiba	TA78015	
LM340-18	Fairchild	μA7818	
	Lambda	LMC7818	
	NEC-Electron	μPC7818	
	SiliconG	SG340-18	
		SG7818	
	TI	μA7818	
LM340-24	Fairchild	μA7824	
	Lambda	LMC7824	
		LμA7824	
	Motorola	MC7824	
	NEC-Electron	μPC7824	
	SGS	L7824	
	SiliconG	SG7824	
	TI	μA7824	
LM340-8	Fairchild	μA7808	
	Lambda	LMC7808	
		LμA7808	
	Motorola	**MC7808**	**3294**
	NEC-Electron	μPC7808	
	SiliconG	SG340-8	
		SG7808	
	TI	μA7808	
LM348	Fairchild	μA348	
	National	LM348	
LM358	Motorola	LM358	
	National	LM358A	
	NEC-Electron	μPC358	
	RCA	CA358A	
		LM358	
	Sanyo	LA6358	
	Signetics	LM358	
		NE532	
LM388	**National**	**LM388**	**3326,3328**
LM3900	Motorola	MC3401	
	National	LM3401	
		LM3900	
	Raytheon	LM3900	
		RC3401	
	RCA	CA3401	
LM393	Fairchild	μA393	
	Motorola	LM393	
	National	**LM393**	**3317**
	Sanyo	LA6393	
	Signetics	LM393	
MC1445	Motorola	MC1445	
MC1456	**Datel**	**AM-460-2**	**2622**
	Harris	**HA-2605**	**3226,3287**
	Intersil	HA-2602	
		HA-2605	
		HA2605	
	Motorola	MC1456	
	Signetics	MC1456	
	SiliconG	SG1456	
MC1458	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1558	
		RC4558	
		RM4558	
MC1488	AMD	MC1488	
	Exar	**XR1488**	**3188**
	Fairchild	μA1488	
	Harris	HA1488	
	Hitachi	HD75188	
	Motorola	**MC1488**	**2753**
	National	DS1488	
	Raytheon	RM1488	
	Signetics	MC1488	
	SiliconG	SG1488	
	TI	SN75188	
MC1489A	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	SN75189	
		SN75189A	
		SN85189	
MC1556	**Harris**	**HA-2600**	**3226,3287**
	Intersil	HA2600	
	Motorola	MC1556	
	Signetics	MC1556	
	SiliconG	SG1556	
	TeledyneP	1326	
MC1558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
MC1558	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		RC4558	
		RM4558	
MC3303	Fairchild	μA3303	
	Motorola	MC3303	
	Signetics	MC3303	
MC3403	AMD	LM324	
	Exar	**XR3403**	**3207**
		XR3403C	
	Fairchild	μA324	
		μA3403	
	Motorola	LM324	
		MC3403	
	National	LM324	
	NEC-Electron	μPC324	
	NEC-Micro	μPC324	
	Raytheon	LM324	
		RC3403	
		RC4137	
	RCA	CA324	
		LM324	
	Sanyo	LA6324	
	Signetics	LM324	
		MC3403	
	SiliconG	SG324	
	TI	LM324	
MC3423	Motorola	MC3423	
	SiliconG	SG3423	
MC3446	Motorola	MC3446	
		MC3446A	**2753**
MC3486	**Motorola**	**MC3486**	**2753**
	National	DS3486	
MC3487	Motorola	MC3487	
	National	DS3487	
		DS3687	
MC3503	**Exar**	**XR3503**	**3207**
	Motorola	MC3503	
	Raytheon	RC3503	
		RM3503	
		RM4137	
	Signetics	MC3503	
	SiliconG	SG3503	
MC3523	Motorola	MC3523	
	SiliconG	SG3523	
N8T13	Motorola	MC8T13	
	National	DS75121	
		LM75121	
	Signetics	N8T13	
	TI	SN75121	
N8T14	Motorola	MC8T14	
	National	DS75122	
		LM75122	
	Signetics	N8T14	
	TI	SN75122	
N8T23	Motorola	MC8T23	
	National	DS75123	
		LM75123	
	Signetics	N8T23	
	TI	SN75123	
N8T24	Motorola	MC8T24	
	National	DS75124	
		LM75124	
	Signetics	N8T24	
	TI	SN75124	
N8T26A	AMD	N8T26	
		N8T26A	
	Fairchild	μA8T26A	
	Hitachi	HD268T26	
	Motorola	MC6880A	
		MC8T26	
		MC8T26A	
N8T26A	National	DS8T26A	
	Signetics	N8T26	
		N8T26A	
NE5532	**Exar**	**XR5532**	**3208**
	Signetics	NE5532	
		NE5532A	
		SE5532	
		SE5532A	
	TI	NE5532A	
NE5532A	**Exar**	**XR5532**	**3208**
	Signetics	NE5532	
		NE5532A	
		SE5532	
		SE5532A	
	TI	NE5532	
NE5533	**Exar**	**XR5533**	**3208**
	Signetics	NE5533	
		NE5533A	
		SE5533	
		SE5533A	
NE5534	Datel	AM-453-2C	
		AM-453-2M	
	Exar	**XR5534**	**3209**
	Raytheon	RC5534	
		RM5534	
	Signetics	NE5534	
		NE5534A	
		SE5534	
		SE5534A	
	TI	NE5534A	
NE5534A	Datel	AM-453-2C	
		AM-453-2M	
	Exar	**XR5534**	**3209**
	Raytheon	RC5534	
		RM5534	
	Signetics	NE5534	
		NE5534A	
		SE5534	
		SE5534A	
	TI	NE5534	
NE555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	SE555	
NE556	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	SE556	
OP-07	**AD**	**ADOP-07**	**3153**
	MicroPwr	MP5505	
		MP5507	
		OP-05	
		OP-07	
	PMI	OP-05	
		OP-07	
	Raytheon	OP-07	
RC4136	Exar	XR4136	
		XR4136M	
	Fairchild	μA4136	
	MicroPwr	MP5509	
	PMI	OP-09	
		PM4136	
	Raytheon	RC4136	
		RM4136	
	SiliconG	SG4136	
		SG4136C	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
RC4136	TI	RM4136	
RC4558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
RM4136	Exar	XR4136	
		XR4136M	
	Fairchild	μA4136	
	MicroPwr	MP5509	
	PMI	OP-09	
		PM4136	
	Raytheon	RC4136	
		RM4136	
	SiliconG	SG4136	
		SG4136C	
	TI	RC4136	
RM4558	AMD	1458	
		1558	
		AM1458	
	Exar	XR1458	
		XR1588	
		XR4558	
	Fairchild	μA1458	
		μA1558	
	Harris	**HA-2650**	**3234,3287**
		HA-2655	**3234,3287**
		HA-2665	
	Hitachi	HA17458	
	Motorola	MC1458	
		MC1558	
		MC4558	
		MC4558C	
		RC1558	
		RC4558	
	National	LM1458	
		LM1558	
	NEC-Electron	μPC1458	
		μPC4558	
	PMI	OP-14	
		PM1458	
		PM1558	
	Raytheon	RC1458	
		RC1558	
		RC4558	
		RM1558	
		RM4558	
RM4558	RCA	CA1458	
		CA1558	
		LM1458	
		LM1558	
		RC4558	
		SSS1458	
		SSS1558	
	Sanyo	LA6458A	
	Signetics	MC1458	
		MC1558	
		NE4558	
	SiliconG	SG1458	
		SG1558	
	TI	MC1458	
		MC1558	
		RC4558	
SBP8316	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	R03-8316	
		R03-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	Toshiba	TMM331A	
SE5534	Signetics	SE554A	
	TI	SE5534A	
SE5534A	Signetics	SE554A	
	TI	SE5534	
SE555	Cherry	CS555	
	Exar	XR555	
		XR555M	
	Fairchild	μA555	
	Hitachi	HA17555	
	Motorola	MC1455	
		MC1555	
	National	LM555	
	NEC-Electron	μPC1555	
	Raytheon	RC555	
		RM555	
	RCA	CA355	
		CA555	
	Sanyo	LB8555	
	Signetics	NE555	
		SE555	
	SiliconG	SG555	
	TI	NE555	
SE556	AMD	LM555	
		LM556	
	Exar	XR556	
		XR556M	
	Fairchild	μA556	
	Motorola	MC3456	
		MC3556	
	National	LM556	
	Raytheon	RC556	
		RM556	
	Signetics	NE556	
		SE556	
	SiliconG	SG556	
	TI	NE556	
SG1524	**Exar**	**XR1524**	**3190**
	RCA	**CA1524**	**3368**
	Signetics	SG1524	
	SiliconG	SG1524	
SG2524	**Exar**	**XR2524**	**3190,3209**
	RCA	**CA2524**	**3368**
	Signetics	SG2524	
	SiliconG	SG2524	
SG3524	**Exar**	**XR3524**	**3190**
	RCA	**CA3524**	**3368**
	Signetics	SG3524	
	SiliconG	SG3524	
SG3525	SiliconG	SG3525	
SG3525A	Motorola	SG3525A	
	SiliconG	SG3525A	
	Siliconix	PWM25C	
SG3527	SiliconG	SG3527	
SG3527A	Motorola	SG3527A	
	SiliconG	SG3527A	
	Siliconix	PWM27C	
SM74LS147	Motorola	SN74LS147	
SN10102	NEC-Electron	μPB10142	
SN10140	Signetics	10140	
SN10144	Fairchild	F10144	
	Motorola	**MCM10144**	**3839**
	Signetics	10144	
SN10147	**Motorola**	**MCM10147**	**3839**
SN10148	Hitachi	HD10148	
	Motorola	**MCM10148**	**3839**
	NEC-Electron	μPB10148	
	Signetics	10148	
SN10164	Fairchild	F10164	
	Hitachi	HD10164	
	Motorola	MC10164	
	Signetics	10164	
SN10174	Fairchild	F10174	
	Hitachi	HD10174	
	Motorola	MC10174	
	Signetics	10174	
SN10175	Fairchild	F10175	
	Hitachi	HD10175	
	Motorola	MC10175	
	Signetics	10175	
SN158093	Fairchild	9093	
	Motorola	MC853	
		MC953	
	National	DM9093	
	Raytheon	RC993	
		RM993	
	TI	SN159093	
SN158094	Fairchild	9094	
	Motorola	MC856	
		MC956	
	National	DM9094	
	Raytheon	RC994	
		RM9094	
		RM994	
	TI	SN159094	
SN158097	Fairchild	9097	
	Motorola	MC855	
		MC955	
	National	DM9097	
	Raytheon	RC997	
		RM997	
	TI	SN159097	
SN15831	Motorola	MC831	
SN15834	Motorola	MC934	
	Raytheon	RC934	
		RM934	
	TI	SN15934	
SN15851	Fairchild	951	
		9951	
	Motorola	MC851	
		MC852	
		MC951	
	Raytheon	RC951	
		RM951	
	TI	SN15951	
SN159093	Fairchild	9093	
	Motorola	MC853	
		MC953	
	National	DM9093	
	Raytheon	RC993	
		RM993	
	TI	SN158093	
SN159094	Fairchild	9094	
	Motorola	MC856	
		MC956	
	National	DM9094	
	Raytheon	RC994	
		RM9094	
		RM994	
	TI	SN158094	
SN159097	Fairchild	9097	
	Motorola	MC855	
		MC955	
	National	DM9097	
	Raytheon	RC997	
		RM997	
	TI	SN158097	
SN15931	Raytheon	RM931	
SN15934	Motorola	MC934	
	Raytheon	RC934	
		RM934	
SN15934	TI	SN15834	
SN15947	Raytheon	RM947	
SN15951	Fairchild	951	
		9951	
	Motorola	MC851	
		MC852	
		MC951	
	Raytheon	RC951	
		RM951	
	TI	SN15851	
SN29001	Fairchild	74H105	
		9001	
	TI	SN39001	
SN29301	Fairchild	9031	
		9301	
	National	DM8301	
		DM9301	
	Raytheon	RC8252	
		RM8252	
	Signetics	N8252	
		S8252	
	TI	SN39301	
SN29308	Fairchild	9308	
	Raytheon	RC9308	
		RM9308	
	TI	SN39308	
		SN74116	**872**
SN29309	Fairchild	9309	
	National	DM8309	
		DM9309	
	TI	SN39309	
SN29311	Fairchild	9311	
	Hitachi	HD74154	
	National	DM54154	
		DM7213	
		DM74154	
		DM8311	
		DM9311	
	Raytheon	RC9311	
		RM9311	
	Signetics	54154	
		74154	
	TI	SN39311	
		SN54154	**885**
		SN74154	**885**
SN29312	Fairchild	9312	
	National	DM8312	
		DM9312	
	Raytheon	RC8230	
		RC9312	
		RM8230	
		RM9312	
	Signetics	N8230	
	TI	SN39312	
SN29316	Fairchild	9316	
	National	DM9316	
	Raytheon	RC9316	
		RM9316	
	TI	SN39316	
SN29322	Fairchild	74157	
		9322	
	Hitachi	HD74157	
	National	DM74157	
		DM8322	
		DM9322	
	Raytheon	RC9322	
		RM9322	
	Signetics	74157	
	TI	SN29602	
		SN39322	
		SN74157	**887**
SN29334	Fairchild	9334	
	National	DM8334	
		DM9334	
	TI	SN39334	
		SN54259	**917**
		SN74259	**917**
SN29602	Fairchild	74157	
		9322	
	Hitachi	HD74157	
	National	DM74157	
		DM8322	
		DM9322	
	Raytheon	RC9322	
		RM9322	
	Signetics	74157	
	TI	SN29322	
		SN39322	
		SN74157	**887**
SN29764	National	LM1017	
SN39001	Fairchild	74H105	
		9001	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN39001	TI	SN29001	
SN39301	Fairchild	9031	
		9301	
	National	DM8301	
		DM9301	
	Raytheon	RC8252	
		RM8252	
	Signetics	N8252	
		S8252	
	TI	SN29301	
SN39308	Fairchild	9308	
	Raytheon	RC9308	
		RM9308	
	TI	SN29308	
		SN74116	**872**
SN39309	Fairchild	9309	
	National	DM8309	
		DM9309	
	TI	SN29309	
SN39311	Fairchild	9311	
	Hitachi	HD74154	
	National	DM54154	
		DM7213	
		DM74154	
		DM8311	
		DM9311	
	Raytheon	RC9311	
		RM9311	
	Signetics	54154	
		74154	
	TI	SN29311	
		SN54154	**885**
		SN74154	**885**
SN39312	Fairchild	9312	
	National	DM8312	
		DM9312	
	Raytheon	RC8230	
		RC9312	
		RM8230	
		RM9312	
	Signetics	N8230	
	TI	SN29312	
SN39316	Fairchild	9316	
	National	DM9316	
	Raytheon	RC9316	
		RM9316	
	TI	SN29316	
SN39322	Fairchild	74157	
		9322	
	Hitachi	HD74157	
	National	DM74157	
		DM8322	
		DM9322	
	Raytheon	RC9322	
		RM9322	
	Signetics	74157	
	TI	SN29322	
		SN29602	
		SN74157	**887**
SN39334	Fairchild	9334	
	National	DM8334	
		DM9334	
	TI	SN29334	
		SN54259	**917**
		SN74259	**917**
SN39602	Fairchild	9602	
	National	DM8602	
		DM9602	
	Raytheon	RF8602	
		RF9602	
SN5400	Fairchild	5400	
	National	DM5400	
	Signetics	5400	
SN5401	Fairchild	5401	
	National	DM5401	
SN5402	Fairchild	5402	
	National	DM5402	
SN5403	Fairchild	5403	
	National	DM5403	
SN5404	Fairchild	5404	
		9016	
	National	DM5404	
		DM9016C	
SN5405	Fairchild	5405	
	National	DM5405	
SN5406	Fairchild	5406	
	National	DM5406	
SN5407	Fairchild	5407	
	National	DM5407	
SN5408	Fairchild	5408	
	National	DM5408	
SN5409	Fairchild	5409	
	National	DM5409	
SN5410	Fairchild	5410	
	National	DM5410	
SN54107	Fairchild	54107	
	Motorola	MC54107	
	National	DM54107	
SN54109	National	DM54109	
	Signetics	54109	
SN5411	Fairchild	5411	
	National	DM5411	
	Signetics	5411	
SN54116	Signetics	54116	
SN5412	Fairchild	5412	
SN54121	Fairchild	54121	
		9603	
	National	DM54121	
	Signetics	54121	
SN54122	Fairchild	54122	
SN54123	Fairchild	54123	
	National	DM54123	
	Signetics	54123	
SN54125	Fairchild	54125	
	National	DM54125	
		DM7093	
	TI	**SN54425**	**946**
SN54126	Fairchild	54126	
	National	DM54126	
		DM7094	
	Signetics	54126	
	TI	**SN54426**	**946**
SN5413	Fairchild	5413	
	National	DM5413	
SN54132	Fairchild	54132	
	National	DM54132	
	Signetics	54132	
SN54136	Fairchild	54136	
SN5414	Fairchild	5414	
	National	DM5414	
	Signetics	5414	
SN54141	Fairchild	9315	
	National	DM54141	
	Signetics	54141	
SN54145	Fairchild	54145	
	National	DM54145	
SN54147	National	DM54147	
	Signetics	54147	
SN54148	Fairchild	9318	
	Hitachi	HD74148	
	National	DM54148	
		DM74148	
		DM8318	
		DM9318	
	Signetics	54148	
		74148	
		N82148	
	TI	**SN74148**	**883**
SN54150	Fairchild	54150	
	National	DM54150	
SN54151	Fairchild	54151A	
	National	DM54151	
	Signetics	54151	
	TI	**SN54151A**	**884**
SN54151A	Fairchild	54151A	
	National	DM54151	
	Signetics	54151	
	TI	SN54151	
SN54152A	Fairchild	54152A	
SN54153	Fairchild	54153	
	National	DM54153	
	Signetics	54153	
SN54154	Fairchild	9311	
	Hitachi	HD74154	
	National	DM54154	
		DM7213	
		DM74154	
		DM8311	
		DM9311	
	Raytheon	RC9311	
		RM9311	
	Signetics	54154	
		74154	
	TI	SN29311	
		SN39311	
		SN74154	**885**
SN54155	Fairchild	54155	
	National	DM54155	
SN54156	Fairchild	54156	
	National	DM54156	
SN54157	Fairchild	54157	
	National	DM54157	
	Signetics	54157	
SN54159	Fairchild	54159	
SN5416	Fairchild	5416	
	National	DM5416	
SN54160	Fairchild	54160	
		9310	
	National	DM54160	
	Raytheon	RM9310	
	Signetics	54160	
SN54161	Fairchild	54161	
	National	DM54161	
	Signetics	54161	
SN54162	Fairchild	54162	
	National	DM54162	
SN54163	Fairchild	54163	
	National	DM54163	
	Signetics	54163	
SN54164	Fairchild	54164	
	National	DM54164	
		DM7570	
	Signetics	54164	
SN54165	Fairchild	54165	
	National	DM54165	
		DM7590	
	Signetics	54165	
SN54166	Fairchild	54166	
	National	DM54166	
	Signetics	54166	
SN54167	Fairchild	54167	
SN5417	Fairchild	5417	
	National	DM5417	
SN54170	Fairchild	54170	
	National	DM54170	
SN54173	Fairchild	54173	
	National	DM54173	
		DM7551	
	Raytheon	RM8T10	
SN54174	Fairchild	54174	
	National	DM54174	
	Signetics	54174	
SN54175	Fairchild	54175	
	National	DM54175	
	Signetics	54175	
SN54176	Fairchild	54176	
	National	DM54176	
	Raytheon	RM8280	
	Signetics	54176	
		S8280	
SN54177	Fairchild	54177	
	National	DM54177	
		DM7281	
	Raytheon	RM8281	
	Signetics	54177	
		S7281	
		S8281	
SN54178	Fairchild	54178	
	Raytheon	RM8270	
	Signetics	S8270	
SN54179	Fairchild	54179	
	Raytheon	RM8271	
	Signetics	S8271	
SN54180	Fairchild	54180	
	National	DM54180	
	Signetics	54180	
SN54181	Fairchild	54181	
		9341	
	Hitachi	HD74181	
	National	DM54181	
		DM74181	
	Raytheon	RC9341	
		RM9341	
	Signetics	54181	
		74181	
	TI	**SN74181**	**897**
SN54182	Fairchild	54182	
		9342	
	Hitachi	HD74182	
	National	DM54182	
		DM74182	
	Raytheon	RM9342	
	TI	**SN74182**	**898**
SN54184	National	DM54184	
SN54185	National	DM54185	
SN54185A	National	DM54185A	
SN54187	National	DM54187	
SN54190	Fairchild	54190	
	National	DM54190	
	Signetics	54190	
SN54191	Fairchild	54191	
SN54191	National	DM54191	
	Signetics	54191	
SN54192	Fairchild	74192	
		9360	
	National	DM74192	
		DM8560	
	Raytheon	RC9360	
		RM9360	
	Signetics	74192	
	TI	**SN74192**	**902**
SN54193	Fairchild	54193	
	National	DM54193	
		DM7563	
SN54194	National	DM54194	
	Signetics	54194	
SN54195	Fairchild	54195	
		9300	
	National	DM54195	
SN54196	Fairchild	54196	
	National	DM54196	
	Signetics	54196	
SN54198	Fairchild	54198	
	National	DM54198	
SN54199	Fairchild	54199	
	National	DM54199	
SN5420	Fairchild	5420	
	National	DM5420	
	Signetics	5420	
SN5422	Fairchild	5422	
SN5423	Fairchild	5423	
	National	DM5423	
SN5425	Fairchild	5425	
	National	DM5425	
SN54251	National	DM7121	
		SM54251	
SN54259	Fairchild	9334	
	National	DM8334	
		DM9334	
	TI	SN29334	
		SN39334	
		SN74259	**917**
SN5426	National	DM5426	
	Signetics	5426	
SN5427	Fairchild	5427	
	National	DM5427	
SN54279	Fairchild	54279	
	Signetics	54279	
SN54283	Fairchild	54283	
SN54284	National	DM7875A	
SN54285	National	DM7875B	
SN54293	Fairchild	54293	
SN54298	Fairchild	54298	
SN5430	Fairchild	5430	
	National	DM5430	
SN5432	Fairchild	5432	
	National	DM5432	
	Signetics	5432	
SN54365	National	DM7095	
	Signetics	S8T95	
SN54366	National	DM7096	
SN54367	National	DM7097	
	Signetics	S8T97	
SN54368	Motorola	MC6888	
		MC8T98	
	National	DM7098	
		DM8098	
		DS8674	
	Signetics	N8T98	
		S8T98	
	TI	SN74368	
SN5437	Fairchild	5437	
	National	DM5437	
SN5438	Fairchild	5438	
	National	DM5438	
SN5440	Fairchild	5440	
	National	DM5440	
SN5442	Fairchild	5442A	
	National	DM5442	
	Signetics	5442	
SN54425	Fairchild	54125	
	National	DM54125	
		DM7093	
	TI	**SN54125**	**875**
SN54426	Fairchild	54126	
	National	DM54126	
		DM7094	
	Signetics	54126	
	TI	**SN54126**	**875**
SN5443	Fairchild	5443A	
	Signetics	5443	
SN5444	Fairchild	5444A	
	TI	**SN5444A**	**846**

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN5444A	Fairchild	5444A	
	TI	SN5444	
SN5445	Fairchild	5445	
	National	DM5445	
	TI	SN5445A	
SN5445A	Fairchild	5445	
	National	DM5445	
	TI	**SN5445**	**846**
SN5446	Fairchild	5446A	
		9317B	
		9317C	
	National	DM5446	
		DM5447	
	Signetics	5446	
	TI	**SN5446A**	**847**
SN5446A	Fairchild	5446A	
		9317B	
		9317C	
	National	DM5446	
		DM5447	
	Signetics	5446	
	TI	SN5446	
SN5447	Fairchild	5447A	
	National	DM5447	
	Signetics	5447	
	TI	**SN5447A**	**847**
SN5447A	Fairchild	5447A	
	National	DM5447	
	Signetics	5447	
	TI	SN5447	
SN5448	Fairchild	5448	
		7448	
	National	DM5448	
		DM7448	
		DM8848	
	Signetics	N8T54	
	TI	SN5448A	
		SN7448	**847**
		SN7448A	
SN5448A	Fairchild	5448	
		7448	
	National	DM5448	
		DM7448	
		DM8848	
	Signetics	N8T54	
	TI	**SN5448**	**847**
		SN7448	**847**
		SN7448A	
SN5449	Fairchild	5449	
SN5450	Fairchild	5450	
	National	DM5450	
SN5451	Fairchild	5451	
	National	DM5451	
SN5453	Fairchild	5453	
	National	DM5453	
SN5454	Fairchild	5454	
	National	DM5454	
SN5460	Fairchild	5460	
	National	DM5460	
SN5470	Fairchild	5470	
	National	DM5470	
SN5472	Fairchild	5472	
	National	DM5472	
SN5473	Fairchild	5473	
	National	DM5473	
	Signetics	5473	
SN5474	Fairchild	5474	
	National	DM5474	
	Signetics	5474	
SN5475	Fairchild	5475	
	National	DM5475	
	Signetics	5475	
SN5476	Fairchild	5476	
	National	DM5476	
	Signetics	5476	
SN5477	Fairchild	5477	
	Signetics	5477	
SN5480	Fairchild	5480	
SN5482	Fairchild	5482	
SN54836	National	DM7283	
SN5483A	Fairchild	5483A	
	Signetics	5483A	
SN5485	Fairchild	5485	
	National	DM5485	
	Signetics	5485	
SN5486	Fairchild	5486	
	National	DM5486	
	Signetics	5486	
SN5488	Fairchild	5488	
	National	DM5488	
SN5488	Signetics	S8224	
	TI	SN5488A	
SN5488A	Fairchild	5488	
	National	DM5488	
	Signetics	S8224	
	TI	SN5488	
SN5489	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN54S289	
		SN7489	**440,863**
		SN74S289	
SN5490	Fairchild	5490	
	National	DM5490	
	TI	**SN5490A**	**864**
SN5490A	Fairchild	5490	
	National	DM5490	
	TI	SN5490	
SN5491	Fairchild	5491A	
	National	DM5491	
	Signetics	5491	
	TI	**SN5491A**	**864**
SN5491A	Fairchild	5491A	
	National	DM5491	
	Signetics	5491	
	TI	SN5491	
SN5492	Fairchild	5492	
	National	DM5492	
	TI	**SN5492A**	**864**
SN5492A	Fairchild	5492	
	National	DM5492	
	TI	SN5492	
SN5493	Fairchild	5493A	
	National	DM5493	
	Signetics	5493	
	TI	**SN5493A**	**865**
SN5493A	Fairchild	5493A	
	National	DM5493	
	Signetics	5493	
	TI	SN5493	
SN5494	Fairchild	5494	
	TI	SN5494A	
SN5494A	Fairchild	5494	
	TI	**SN5494**	**865**
SN5495	Fairchild	5495A	
	National	DM5495	
SN5495	**TI**	**SN5495A**	**866**
SN5495A	Fairchild	5495A	
	National	DM5495	
	TI	SN5495	
SN5496	Fairchild	5496	
	National	DM5496	
	Signetics	5496	
SN5497	Fairchild	5497	
SN54ALS00	**Motorola**	**SN54ALS00**	**732**
	National	DM54ALS00	
SN54ALS02	**Motorola**	**SN54ALS02**	**732**
	National	DM54ALS02	
SN54ALS04	**Motorola**	**SN54ALS04**	**732**
	National	DM54ALS04	
SN54ALS08	**Motorola**	**SN54ALS08**	**732**
	National	DM54ALS08	
SN54ALS09	**Motorola**	**SN54ALS09**	**732**
	National	DM54ALS09	
SN54ALS160	**Motorola**	**SN54ALS160**	**732**
	National	DM54ALS160	
SN54ALS161	**Motorola**	**SN54ALS161**	**732**
	National	DM54ALS161	
SN54ALS162	**Motorola**	**SN54ALS162**	**732**
	National	DM54ALS162	
SN54ALS163	**Motorola**	**SN54ALS163**	**732**
	National	DM54ALS163	
SN54ALS241	**Motorola**	**SN54ALS241**	**732**
	National	DM54ALS241	
SN54ALS242	**Motorola**	**SN74ALS691**	**732**
	National	DM74ALS691	
SN54ALS243	**Motorola**	**SN54ALS243**	**732**
	National	DM54ALS243	
	TI	**SN54ALS244**	**912**
SN54ALS244	**Motorola**	**SN54ALS243**	**732**
	National	DM54ALS243	
	TI	**SN54ALS243**	**912**
SN54ALS245	**Motorola**	**SN54ALS245**	**732**
	National	DM54ALS245	
SN54ALS273	**Motorola**	**SN54ALS273**	**732**
	National	DM54ALS273	
SN54ALS373	**Motorola**	**SN54ALS373**	**732**
	National	DM54ALS373	
SN54ALS374	**Motorola**	**SN54ALS374**	**732**
	National	DM54ALS374	
SN54ALS573	**Motorola**	**SN54ALS573**	**732**
	National	DM54ALS573	
SN54ALS574	**Motorola**	**SN54ALS574**	**732**
	National	DM54ALS574	
SN54ALS576	**Motorola**	**SN54ALS576**	**732**
	National	DM54ALS576	
SN54ALS580	**Motorola**	**SN54ALS580**	**732**
	National	DM54ALS580	
SN54ALS620	**Motorola**	**SN54ALS620**	**732**
	National	DM54ALS620	
SN54ALS621	**Motorola**	**SN54ALS621**	**732**
	National	DM54ALS621	
SN54ALS623	**Motorola**	**SN54ALS623**	**732**
	National	DM54ALS623	
SN54ALS640	**Motorola**	**SN54ALS640**	**732**
	National	DM54ALS640	
SN54ALS644	**Motorola**	**SN54ALS644**	**732**
	National	DM54ALS644	
SN54ALS74	**Motorola**	**SN54ALS74**	**732**
	National	DM54ALS74	
SN54ALS873	**Motorola**	**SN54ALS873**	**732**
	National	DM54ALS873	
SN54ALS874	**Motorola**	**SN54ALS874**	**732**
	National	DM54ALS874	
SN54ALS876	**Motorola**	**SN54ALS876**	**732**
	National	DM54ALS876	
SN54ALS880	**Motorola**	**SN54ALS880**	**732**
	National	DM54ALS880	
SN54H00	Fairchild	54H00	
	National	DM54H00	
SN54H01	Fairchild	54H01	
	National	DM54H01	
SN54H04	Fairchild	54H04	
	National	DM54H04	
SN54H05	Fairchild	54H05	
	National	DM54H05	
SN54H10	Fairchild	54H10	
	National	DM54H10	
SN54H101	Fairchild	54H101	
SN54H102	Fairchild	54H102	
SN54H103	Fairchild	54H103	
	National	DM54H103	
SN54H106	Fairchild	54H106	
	National	DM54H106	
SN54H108	Fairchild	54H108	
	National	DM54H108	
SN54H11	Fairchild	54H11	
	Motorola	3106	
SN54H11	National	DM54H11	
SN54H183	Fairchild	54H183	
		934183	
SN54H20	Fairchild	54H20	
	National	DM54H20	
SN54H21	Fairchild	54H21	
	National	DM54H21	
SN54H22	Fairchild	54H22	
	National	DM54H22	
SN54H30	Fairchild	54H30	
	National	DM54H30	
SN54H40	Fairchild	54H40	
	National	DM54H40	
SN54H50	Fairchild	54H50	
	National	DM54H50	
SN54H51	Fairchild	54H51	
	National	DM54H51	
SN54H52	Fairchild	54H52	
	National	DM54H52	
SN54H53	Fairchild	54H53	
	National	DM54H53	
	RCA	CD4029	
	Signetics	HEF4029	
SN54H54	Fairchild	54H54	
	National	DM54H54	
SN54H55	Fairchild	54H55	
	National	DM54H55	
SN54H60	Fairchild	54H60	
	National	DM54H60	
SN54H61	Fairchild	54H61	
	National	DM54H61	
SN54H62	Fairchild	54H62	
	National	DM54H62	
SN54H71	Fairchild	54H71	
	National	DM54H71	
SN54H72	Fairchild	54H72	
	National	DM54H72	
SN54H74	Fairchild	54H74	
	National	DM54H74	
SN54H76	Fairchild	54H76	
	National	DM54H76	
SN54H78	Fairchild	54H78	
	National	DM54H78	
SN54H87	Fairchild	54H87	
SN54L01	National	DM54L01	
SN54L02	National	DM54L02	
SN54L03	National	DM54L03	
SN54L10	National	DM54L10	
SN54L157	National	DM71L22	
SN54L164	National	DM54L164	
		DM76L70	
SN54L192	National	DM75L60	
SN54L193	National	DM75L63	
SN54L20	National	DM54L20	
SN54L30	National	DM54L30	
SN54L368A	Fairchild	54LS368A	
	Motorola	SN54LS368A	
	National	DM54LS368	
	Raytheon	54LS368	
	Signetics	54LS368	
		54LS368A	
	TI	**SN54LS368A**	**936**
SN54L42A	National	DM54L42A	
SN54L51	National	DM54L51	
SN54L55	National	DM54L55	
SN54L71	National	DM54L71	
SN54L72	National	DM54L72	
SN54L73	National	DM54L73	
SN54L74	National	DM54L74	
SN54L75	National	DM54L75	
SN54L78	National	DM54L78	
SN54L85	National	DM54L85	
SN54L86	National	DM54L86	
SN54L90	National	DM54L90	
SN54L93	National	DM54L93	
SN54L95	National	DM54L95	
SN54L98	National	DM54L98	
SN54LS00	Fairchild	54LS00	
	Motorola	SN54LS00	
	National	DM54LS00	
	Raytheon	54LS00	
	Signetics	54LS00	
SN54LS01	Fairchild	54LS01	
	Motorola	SN54LS01	
	National	DM54LS01	
	Raytheon	54LS01	
SN54LS02	Fairchild	54LS02	
	Motorola	SN54LS02	
	National	DM54LS02	
	Raytheon	54LS02	
	Signetics	54LS02	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN54LS03	Fairchild	54LS03	
	Motorola	SN54LS03	
	National	DM54LS03	
	Raytheon	54LS03	
SN54LS04	Fairchild	54LS04	
	Motorola	SN54LS04	
	National	DM54LS04	
	Raytheon	54LS04	
	Signetics	54LS04	
SN54LS05	Fairchild	54LS05	
	Motorola	SN54LS05	
	National	DM54LS05	
	Raytheon	54LS05	
SN54LS08	Fairchild	54LS08	
	Motorola	SN54LS08	
	National	DM54LS08	
	Raytheon	54LS08	
	Signetics	54LS08	
SN54LS09	Fairchild	54LS09	
	Motorola	SN54LS09	
	National	DM54LS09	
	Raytheon	54LS09	
SN54LS10	Fairchild	54LS10	
	Motorola	SN54LS10	
	National	DM54LS10	
	Raytheon	54LS10	
	Signetics	54LS10	
SN54LS107	National	DM54LS107	
		DM54LS107A	
	Raytheon	54LS107	
	Signetics	54LS107	
SN54LS107A	Motorola	SN54LS107A	
	National	DM54LS107	
	Raytheon	54LS107	
	Signetics	54LS107	
SN54LS109	Fairchild	54LS109	
	Motorola	SN54LS109A	
	National	DM54LS109	
		DM54LS109A	
	Raytheon	54LS109	
	Signetics	54LS109	
	TI	**SN54LS109A**	**870**
SN54LS109A	Fairchild	54LS109	
	Motorola	SN54LS109A	
	National	DM54LS109	
		DM54LS109A	
	Raytheon	54LS109	
	Signetics	54LS109	
	TI	SN54LS109	
SN54LS11	Fairchild	54LS11	
	Motorola	SN54LS11	
	National	DM54LS11	
	Raytheon	54LS11	
SN54LS112	Fairchild	54LS112	
	Motorola	SN54LS112A	
	National	DM54LS112	
	Raytheon	54LS112	
	Signetics	54LS112	
	TI	**SN54LS112A**	**871**
SN54LS112A	Fairchild	54LS112	
	Motorola	SN54LS112A	
	National	DM54LS112	
	Raytheon	54LS112	
	Signetics	54LS112	
	TI	SN54LS112	
SN54LS113	Fairchild	54LS113	
	Motorola	SN54LS113A	
	National	DM54LS113	
	Raytheon	54LS113	
	Signetics	54LS113	
	TI	**SN54LS113A**	**871**
SN54LS113A	Fairchild	54LS113	
	Motorola	SN54LS113A	
	National	DM54LS113	
	Raytheon	54LS113	
	Signetics	54LS113	
	TI	SN54LS113	
SN54LS114	Fairchild	54LS114	
	Motorola	SN54LS114A	
	National	DM54LS114	
		DM54LS114A	
	Raytheon	54LS114	
	TI	SN54LS114A	
SN54LS114A	Fairchild	54LS114	
	Motorola	SN54LS114A	
	National	DM54LS114	
		DM54LS114A	
	Raytheon	54LS114	
	TI	SN54LS114	
SN54LS12	Motorola	SN54LS12	
	National	DM54LS12	
	Raytheon	54LS12	
SN54LS122	Motorola	SN54LS122	
	National	DM54LS122	
	Raytheon	54LS122	
SN54LS123	Motorola	SN54LS123	
	National	DM54LS123	
	Raytheon	54LS123	
SN54LS125A	Motorola	SN54LS125A	
	National	DM54LS125	
	Raytheon	54LS125	
	Signetics	54LS125A	
SN54LS126	Fairchild	54LS126	
		SN54LS126	
	Motorola	SN54LS126A	
	National	DM54LS126	
	Raytheon	54LS126	
	Signetics	54LS126A	
	TI	SN54LS126A	
SN54LS126A	Fairchild	54LS126	
		SN54LS126	
	Motorola	SN54LS126A	
	National	DM54LS126	
	Raytheon	54LS126	
	Signetics	54LS126A	
	TI	SN54LS126	
SN54LS13	Fairchild	54LS13	
	Motorola	SN54LS13	
	National	DM54LS13	
	Raytheon	54LS13	
	TI	SN54S13	
SN54LS132	Motorola	SN54LS132	
	National	DM54LS132	
	Raytheon	54LS132	
	Signetics	54LS132	
SN54LS136	Fairchild	54LS136	
	Motorola	SN54LS136	
	National	DM54LS136	
	Raytheon	54LS136	
	Signetics	54LS136	
SN54LS137	Motorola	SN54LS137	
SN54LS138	AMD	SN54LS138	
	Fairchild	54LS138	
	Motorola	SN54LS138	
	National	DM54LS138	
	Raytheon	54LS138	
	Signetics	54LS138	
SN54LS139	AMD	SN54LS139	
	Fairchild	54LS139	
	Motorola	SN54LS139	
	National	DM54LS139	
	Raytheon	54LS139	
	Signetics	54LS139	
SN54LS14	Fairchild	54LS14	
	Motorola	SN54LS14	
	National	DM54LS14	
	Raytheon	54LS14	
	Signetics	54LS14	
SN54LS145	Fairchild	54LS145	
	Motorola	SN54LS145	
SN54LS147	Motorola	SN54LS147	
SN54LS148	AMD	SN54LS148	
	Motorola	SN54LS148	
SN54LS15	Fairchild	54LS15	
	Motorola	SN54LS15	
	National	DM54LS15	
	Raytheon	54LS15	
SN54LS151	AMD	SN54LS151	
	Fairchild	54LS151	
	Motorola	SN54LS151	
	National	DM54LS151	
	Raytheon	54LS151	
	Signetics	54LS151	
SN54LS152	Fairchild	54LS152	
	Raytheon	54LS152	
SN54LS153	AMD	SN54LS153	
	Fairchild	54LS153	
	Motorola	SN54LS153	
	National	DM54LS153	
	Raytheon	54LS153	
	Signetics	54LS153	
SN54LS155	Fairchild	54LS155	
	Motorola	SN54LS155	
	National	DM54LS155	
	Raytheon	54LS155	
		74LS155	
SN54LS156	Fairchild	54LS156	
	Motorola	SN54LS156	
	National	DM54LS156	
	Raytheon	54LS156	
SN54LS157	AMD	SN54LS157	
	Fairchild	54LS157	
	Motorola	SN54LS157	
	National	DM54LS157	
	Raytheon	54LS157	
	Signetics	54LS157	
SN54LS158	AMD	SN54LS158	
	Fairchild	54LS158	
	Motorola	SN54LS158	
	National	DM54LS158	
	Raytheon	54LS158	
	Signetics	54LS158	
SN54LS160	National	DM54LS160A	
SN54LS160A	AMD	SN54LS160A	
		SN74S160	**1227**
	Fairchild	93S10	
	Motorola	SN54LS160A	
	National	DM54LS160	
	Raytheon	54LS160	
	Signetics	54LS160	
		54LS160A	
SN54LS161	AMD	SN54LS161A	
	Fairchild	54LS161A	
	Motorola	SN54LS161A	
	National	DM54LS161A	
	Raytheon	54LS161	
	Signetics	54LS161A	
	TI	**SN54LS161A**	**889**
SN54LS161A	AMD	SN54LS161A	
	Fairchild	54LS161A	
	Motorola	SN54LS161A	
	National	DM54LS161A	
	Raytheon	54LS161	
	Signetics	54LS161A	
	TI	SN54LS161	
SN54LS162	AMD	SN54LS162A	
	Motorola	SN54LS162A	
	National	DM54LS162A	
	Raytheon	54LS162	
	Signetics	54LS162A	
	TI	**SN54LS162A**	**890**
SN54LS162A	AMD	SN54LS162A	
	Motorola	SN54LS162A	
	National	DM54LS162A	
	Raytheon	54LS162	
	Signetics	54LS162A	
	TI	SN54LS162	
SN54LS163	AMD	SN54LS163A	
	Motorola	SN54LS163A	
	National	DM54LS163	
		DM54LS163A	
	Raytheon	54LS163	
	Signetics	54LS163A	
	TI	54LS163A	
		SN54LS163A	
SN54LS163A	AMD	SN54LS163A	
	Motorola	SN54LS163A	
	National	DM54LS163	
		DM54LS163A	
	Raytheon	54LS163	
	Signetics	54LS163A	
	TI	54LS163A	
		SN54LS163	
SN54LS164	AMD	SN54LS164	
	Fairchild	54LS164	
	Motorola	SN54LS164	
		SN54LS164A	
	National	DM54LS164	
		DM54LS164A	
	Raytheon	54LS164	
	Signetics	54LS164	
	TI	SN54LS164A	
SN54LS164A	AMD	SN54LS164	
	Fairchild	54LS164	
	Motorola	SN54LS164	
		SN54LS164A	
	National	DM54LS164	
		DM54LS164A	
	Raytheon	54LS164	
	Signetics	54LS164	
	TI	**SN54LS164**	**891**
SN54LS165	Fairchild	54LS165	
	Motorola	SN54LS165	
SN54LS166	Motorola	SN54LS166	
SN54LS168	AMD	SN54LS168A	
	Fairchild	54LS168	
	Motorola	SN54LS168	
	National	DM54LS168	
SN54LS169	AMD	SN54LS169A	
	Fairchild	54LS169	
	Motorola	SN54LS169	
	National	DM54LS169	
SN54LS170	Fairchild	54LS170	
	Motorola	SN54LS170	
	National	DM54LS170	
	Raytheon	54LS170	
SN54LS173A	Fairchild	54LS173	
	Motorola	SN54LS173A	
	National	DM54LS173	
	Signetics	54LS173	
SN54LS174	AMD	SN54LS174	
	Fairchild	54LS174	
	Motorola	SN54LS174	
	National	DM54LS174	
	Raytheon	54LS174	
	Signetics	54LS174	
SN54LS175	AMD	SN54LS175	
	Fairchild	54LS175	
	Motorola	SN54LS175	
	National	DM54LS175	
	Raytheon	54LS175	
	Signetics	54LS175	
SN54LS181	AMD	SN54LS181	
	Fairchild	54LS181	
	Motorola	SN54LS181	
	Raytheon	54LS181	
	Signetics	54LS181	
SN54LS182	Motorola	SN54LS182	
SN54LS189	Fairchild	54LS189	
	Motorola	SN54LS189	
	National	DM54LS189	
	TI	**SN54LS189A**	**440,900**
SN54LS189A	Fairchild	54LS189	
	Motorola	SN54LS189	
	National	DM54LS189	
	TI	SN54LS189	
SN54LS190	AMD	SN54LS190	
	Motorola	SN54LS190	
	National	DM54LS190	
	Raytheon	54LS190	
	Signetics	54LS190	
SN54LS191	AMD	SN54LS191	
	Motorola	SN54LS191	
	National	DM54LS191	
	Raytheon	54LS191	
	Signetics	54LS191	
SN54LS192	AMD	SN54LS192	
	Fairchild	54LS192	
	Motorola	SN54LS192	
	National	DM54LS192	
	Raytheon	54LS192	
	Signetics	54LS192	
SN54LS193	AMD	SN54LS193	
	Fairchild	54LS193	
	Motorola	SN54LS193	
	National	DM54LS193	
	Raytheon	54LS193	
	Signetics	54LS193	
SN54LS194A	AMD	SN54LS194A	
	Fairchild	54LS194A	
	Motorola	SN54LS194A	
SN54LS195A	AMD	SN54LS195A	
	Fairchild	54LS195A	
	Motorola	SN54LS195A	
	Raytheon	54LS195A	
	Signetics	54LS195A	
SN54LS196	Motorola	SN54LS196	
	National	DM54LS196	
	Raytheon	54LS196	
SN54LS197	Motorola	SN54LS197	
	National	DM54LS197	
	Raytheon	54LS197	
	Signetics	54LS197	
SN54LS20	Fairchild	54LS20	
	Motorola	SN54LS20	
	National	DM54LS20	
	Raytheon	54LS20	
	Signetics	54LS20	
SN54LS200	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN54LS200	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
SN54LS21	Fairchild	54LS21	
	Motorola	SN54LS21	
	National	DM54LS21	
	Raytheon	54LS21	
SN54LS22	Fairchild	54LS22	
	Motorola	SN54LS22	
	National	DM54LS22	
	Raytheon	54LS22	
SN54LS221	Motorola	SN54LS221	
	National	DM54LS221	
	Raytheon	54LS221	
	Signetics	54LS221	
SN54LS240	AMD	SN54LS240	
	Fairchild	54LS240	
	MMI	54LS240	
	Motorola	SN54LS240	
	Raytheon	54LS240	
SN54LS241	AMD	SN54LS241	
	Fairchild	54LS241	
	MMI	54LS241	
	Motorola	SN54LS241	
	Raytheon	54LS241	
SN54LS242	AMD	SN54LS242	
	Motorola	SN54LS242	
	Raytheon	54LS242	
SN54LS243	AMD	SN54LS243	
	Motorola	SN54LS243	
	Raytheon	54LS243	
SN54LS244	AMD	SN54LS244	
	Fairchild	54LS244	
	MMI	54LS244	
	Motorola	SN54LS244	
	Raytheon	54LS244	
SN54LS245	Fairchild	54LS245	
	Motorola	SN54LS245	
SN54LS247	Fairchild	54LS247	
	Motorola	SN54LS247	
	National	DM54LS247	
SN54LS248	Fairchild	54LS248	
	Motorola	SN54LS248	
	National	DM54LS248	
	Signetics	54LS248	
SN54LS249	Fairchild	54LS249	
	Motorola	SN54LS249	
	National	DM54LS249	
SN54LS251	AMD	SN54LS251	
	Fairchild	54LS251	
	Motorola	SN54LS251	
	Raytheon	54LS251	
	Signetics	54LS251	
SN54LS253	AMD	SN54LS253	
	Fairchild	54LS253	
	Motorola	SN54LS253	
	National	DM54LS253	
		DM7214	
	Raytheon	54LS253	
	Signetics	54LS253	
SN54LS257	AMD	SN54LS257	
	Motorola	SN54LS257A	
	National	DM54LS257	
	Raytheon	54LS257	
	Signetics	54LS257	
	TI	**SN54LS257A**	**916**
SN54LS257A	AMD	SN54LS257	
	Motorola	SN54LS257A	
	National	DM54LS257	
	Raytheon	54LS257	
	Signetics	54LS257	
	TI	SN54LS257	
SN54LS258	AMD	SN54LS258	
	Fairchild	54LS258A	
	Motorola	SN54LS258A	
	National	DM54LS258	
	Raytheon	54LS258	
	Signetics	54LS258	
	TI	**SN54LS258A**	**917**
SN54LS258A	AMD	SN54LS258	
SN54LS258A	Fairchild	54LS258A	
	Motorola	SN54LS258A	
	National	DM54LS258	
	Raytheon	54LS258	
	Signetics	54LS258	
	TI	SN54LS258A	
SN54LS259	Fairchild	54LS259	
	Motorola	SN54LS259	
SN54LS26	Fairchild	54LS26	
	Motorola	SN54LS26	
	National	DM54LS26	
	Raytheon	54LS26	
SN54LS261	Raytheon	54LS261	
SN54LS265A	Fairchild	54LS365A	
	Motorola	SN54LS365A	
	Raytheon	54LS365	
	Signetics	54LS365	
		54LS365A	
	TI	**SN54LS365A**	**935**
SN54LS266	Fairchild	54LS266	
		9386	
	Motorola	SN54LS266	
	National	DM54LS266	
	Raytheon	54LS266	
	Signetics	54LS266	
SN54LS27	Fairchild	54LS27	
	Motorola	SN54LS27	
	National	DM54LS27	
	Raytheon	54LS27	
SN54LS273	AMD	**SN54LS273**	**1227**
	Fairchild	54LS273	
	Motorola	SN54LS273	
	Raytheon	54LS273	
SN54LS279	Fairchild	54LS279	
	Motorola	SN54LS279	
	National	DM54LS279	
	Raytheon	54LS279	
	Signetics	54LS279	
SN54LS28	Fairchild	54LS28	
	Motorola	SN54LS28	
	Raytheon	54LS28	
	Signetics	54LS194A	
		54LS28	
SN54LS280	Motorola	SN54LS280	
SN54LS281	AMD	SN54LS281	
SN54LS283	Fairchild	54LS283	
	Motorola	SN54LS283	
	National	DM54LS283	
	Raytheon	54LS283	
	Signetics	54LS283	
SN54LS289	Fairchild	54LS289	
	National	DM54LS289	
	TI	**SN54LS289A**	**440,924**
SN54LS289A	Fairchild	54LS289	
	National	DM54LS289	
	TI	SN54LS289	
SN54LS290	Motorola	SN54LS290	
	National	DM54LS290	
	Raytheon	54LS290	
	Signetics	54LS290	
SN54LS293	Fairchild	54LS293	
	Motorola	SN54LS293	
	National	DM54LS293	
	Raytheon	54LS293	
	Signetics	54LS293	
SN54LS295B	Motorola	SN54LS295A	
	Raytheon	54LS295A	
SN54LS298	AMD	SN54LS298	
	Fairchild	54LS298	
	Motorola	SN54LS298	
	Raytheon	54LS298	
SN54LS299	AMD	**SN54LS299**	**1227**
	Fairchild	54LS299	
	MMI	54LS299	
	Motorola	SN54LS299	
	Raytheon	54LS299	
SN54LS30	Fairchild	54LS30	
	Motorola	SN54LS30	
	National	DM54LS30	
	Raytheon	54LS30	
	Signetics	54LS30	
SN54LS300	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
SN54LS300	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
SN54LS314	Fairchild	93L415	
SN54LS32	Fairchild	54LS32	
		74LS32	
	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	**732**
		SN54LS32	
		SN74LS32	
	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN74LS32**	**843**
SN54LS322	AMD	SN54LS322	
	Motorola	SN54LS322	
	Raytheon	54LS322	
		54LS322A	
	TI	**SN54LS322A**	**930**
SN54LS322A	AMD	SN54LS322	
	Motorola	SN54LS322	
	Raytheon	54LS322	
		54LS322A	
	TI	SN54LS322	
SN54LS323	AMD	SN54LS323	
		SN74LS323	
	Fairchild	54LS323	
		74LS323	
	Motorola	SN54LS323	
		SN74LS323	
	Raytheon	54LS323	
		74LS323	
	TI	SN54LS323A	
		SN74LS323	**930**
SN54LS323A	AMD	SN54LS323	
		SN74LS323	
	Fairchild	54LS323	
		74LS323	
	Motorola	SN54LS323	
		SN74LS323	
	Raytheon	54LS323	
		74LS323	
	TI	**SN54LS323**	**930**
		SN74LS323	**930**
SN54LS33	Fairchild	54LS33	
	Motorola	SN54LS33	
	Raytheon	54LS33	
SN54LS347	Fairchild	54LS347	
SN54LS352	Fairchild	54LS352	
	Motorola	SN54LS352	
	National	DM54LS352	
SN54LS353	Fairchild	54LS353	
	Motorola	SN54LS353	
	National	DM54LS353	
SN54LS365A	Fairchild	54LS365A	
	Motorola	SN54LS365A	
	Raytheon	54LS365	
	Signetics	54LS365	
		54LS365A	
	TI	SN54LS265A	
SN54LS366A	Fairchild	54LS366A	
	Motorola	SN54LS366A	
	National	DM54LS366	
	Raytheon	54LS366	
	Signetics	54LS366A	
SN54LS367A	Fairchild	54LS367A	
	Motorola	SN54LS367A	
	National	DM54LS367	
	Raytheon	54LS367	
	Signetics	54LS367	
		54LS367A	
SN54LS368A	Fairchild	54LS368A	
	Motorola	SN54LS368A	
	National	DM54LS368	
	Raytheon	54LS368	
	Signetics	54LS368	
		54LS368A	
SN54LS368A	TI	SN54L368A	
SN54LS37	Fairchild	54LS37	
	Motorola	SN54LS37	
	National	DM54LS37	
	Raytheon	54LS37	
	Signetics	54LS37	
SN54LS373	AMD	**SN54LS373**	**1227**
	MMI	54LS373	
	Motorola	SN54LS373	
	Raytheon	54LS373	
	Signetics	**54LS373**	**783**
SN54LS374	AMD	**SN54LS374**	**1227**
	MMI	54LS374	
	Motorola	SN54LS374	
	National	DM54LS374	
	Raytheon	54LS374	
SN54LS375	Fairchild	54LS375	
	Motorola	SN54LS375	
	Raytheon	54LS375	
	Signetics	54LS375	
SN54LS377	AMD	**SN54LS377**	**1227**
	Fairchild	54LS377	
	Motorola	SN54LS377	
	Raytheon	54LS377	
SN54LS378	AMD	SN54LS378	
	Fairchild	54LS378	
	Motorola	SN54LS378	
SN54LS379	AMD	SN54LS379	
	Fairchild	54LS379	
	Motorola	SN54LS379	
SN54LS38	Fairchild	54LS38	
	Motorola	SN54LS38	
	National	DM54LS38	
	Raytheon	54LS38	
SN54LS381	AMD	**SN54LS381**	**1227**
SN54LS384	AMD	SN54LS384	
	Motorola	SN54LS384	
	Raytheon	54LS384	
SN54LS385	AMD	SN54LS385	
	Motorola	SN54LS385	
	Raytheon	54LS385	
SN54LS386	Motorola	SN54LS386	
	National	DM54LS386	
	Raytheon	54LS386	
		RM8241	
	Signetics	S82S41	
	TI	54LS386	
SN54LS390	Fairchild	54LS390	
	Motorola	SN54LS390	
SN54LS393	Fairchild	54LS393	
	Motorola	SN54LS393	
SN54LS395	Motorola	SN54LS395A	
	National	DM54LS395	
	Raytheon	54LS395A	
	Signetics	54LS395	
	TI	**SN54LS395A**	**943**
SN54LS395A	Motorola	SN54LS395A	
	National	DM54LS395	
	Raytheon	54LS395A	
	Signetics	54LS395	
	TI	SN54LS395	
SN54LS398	Motorola	SN54LS398	
SN54LS399	AMD	SN54LS399	
	Fairchild	54LS399	
	Motorola	SN54LS399	
SN54LS40	Fairchild	54LS40	
	Motorola	SN54LS40	
	National	DM54LS40	
	Raytheon	54LS40	
SN54LS42	Fairchild	54LS42	
	Motorola	SN54LS42	
	National	DM54LS42	
	Raytheon	54LS42	
	Signetics	54LS42	
SN54LS424	AMD	SN54LS424	
SN54LS47	Fairchild	54LS47	
		74LS47	
	Hitachi	HD74LS47	
	Motorola	SN54LS47	
		SN74LS47	
	National	DM54LS47	
		DM74LS47	
	SGS	T74LS47	
	TI	**SN74LS47**	**847**
SN54LS48	Fairchild	54LS48	
	Motorola	SN54LS48	
	National	DM54LS48	
SN54LS49	Fairchild	54LS49	
	Motorola	SN54LS49	
	National	DM54LS49	
SN54LS490	Fairchild	54LS490	
	Motorola	SN54LS490	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN54LS51	Fairchild	54LS51	
	Motorola	SN54LS51	
	National	DM54LS51	
	Raytheon	54LS51	
	Signetics	54LS51	
SN54LS54	Fairchild	54LS54	
	Motorola	SN54LS54	
	National	DM54LS54	
	Raytheon	54LS54	
SN54LS540	Motorola	SN54LS540	
SN54LS55	Fairchild	54LS55	
	Motorola	SN54LS55	
	National	DM54LS55	
	Raytheon	54LS55	
	TI	54LS55	
SN54LS604	Motorola	SN54LS604	
SN54LS605	Motorola	SN54LS605	
SN54LS606	Motorola	SN54LS606	
SN54LS607	Motorola	SN54LS607	
SN54LS620	Motorola	SN54LS620	
SN54LS621	Motorola	SN54LS621	
SN54LS622	Motorola	SN54LS622	
SN54LS623	Motorola	SN54LS623	
SN54LS640	Motorola	SN54LS640	
SN54LS641	Motorola	SN54LS641	
SN54LS642	Motorola	SN54LS642	
SN54LS644	Motorola	SN54LS644	
SN54LS645	Motorola	SN54LS645	
SN54LS668	Motorola	SN54LS668	
SN54LS669	Motorola	SN54LS669	
SN54LS670	Fairchild	54LS670	
	Motorola	54LS670	
		SN54LS670	
	National	DM54LS670	
	Raytheon	54LS670	
	Signetics	54LS670	
SN54LS673	Motorola	SN54LS673	
SN54LS674	Motorola	SN54LS674	
SN54LS73	Motorola	SN54LS73A	
	National	DM54LS73	
	Raytheon	54LS73	
	Signetics	54LS73	
	TI	**SN54LS73A**	**856**
SN54LS73A	Motorola	SN54LS73A	
	National	DM54LS73	
	Raytheon	54LS73	
	Signetics	54LS73	
	TI	SN54LS73	
SN54LS74	Fairchild	54LS74	
	Motorola	SN54LS74A	
	National	DM54LS74	
		DM54LS74A	
	Raytheon	54LS74	
	Signetics	54LS74	
	TI	**SN54LS74A**	**857**
SN54LS74A	Fairchild	54LS74	
	Motorola	SN54LS74A	
	National	DM54LS74	
		DM54LS74A	
	Raytheon	54LS74	
	Signetics	54LS74	
	TI	SN54LS74	
SN54LS75	Motorola	SN54LS75	
	National	DM54LS75	
	Raytheon	54LS75	
	Signetics	54LS75	
SN54LS76	Motorola	SN54LS76A	
	National	DM54LS76	
	Raytheon	54LS76	
	Signetics	54LS76	
	TI	**SN54LS76A**	**858**
SN54LS76A	Motorola	SN54LS76A	
	National	DM54LS76	
	Raytheon	54LS76	
	Signetics	54LS76	
	TI	SN54LS76	
SN54LS77	Motorola	SN54LS77	
	Raytheon	54LS77	
SN54LS78	Motorola	SN54LS78A	
	National	DM54LS78	
	Raytheon	54LS78	
	TI	**SN54LS78A**	**859**
SN54LS78A	Motorola	SN54LS78A	
	National	DM54LS78	
	Raytheon	54LS78	
	TI	SN54LS78	
SN54LS795	Motorola	SN54LS795	
SN54LS796	Motorola	SN54LS796	
SN54LS83A	Fairchild	54LS83A	
SN54LS83A	Motorola	SN542S83A	
		SN54LS83A	
	National	DM54LS83A	
	Raytheon	54LS83A	
	Signetics	54LS83	
		54LS83A	
SN54LS85	Fairchild	54LS85	
	Motorola	SN54LS85	
	National	DM54LS85	
	Raytheon	54LS85	
	Signetics	54LS85	
SN54LS86	Motorola	SN54LS86	
	National	DM54LS86	
	Raytheon	54LS86	
	Signetics	54LS86	
SN54LS90	Motorola	SN54LS90	
	National	DM54LS90	
	Raytheon	54LS90	
	Signetics	54LS90	
SN54LS91	Motorola	SN54LS91	
	Raytheon	54LS91	
SN54LS92	Motorola	SN54LS92	
	National	DM54LS92	
	Raytheon	54LS92	
	Signetics	54LS92	
SN54LS93	Fairchild	54LS93	
	Motorola	SN54LS93	
	National	DM54LS93	
	Raytheon	54LS93	
	Signetics	54LS93	
SN54LS95B	Fairchild	54LS95B	
	Motorola	SN54LS95B	
	National	DM54LS95B	
	Raytheon	54LS95B	
	Signetics	54LS95B	
SN54LS96	Signetics	54LS96	
SN54S00	Fairchild	54S00	
	Signetics	54S00	
SN54S02	Fairchild	54S02	
	Signetics	54S02	
SN54S04	Signetics	54S04	
SN54S05	Fairchild	54S05A	
SN54S08	Fairchild	54S08	
	Signetics	54S08	
SN54S09	Fairchild	54S09	
SN54S10	Fairchild	54S10	
SN54S11	Fairchild	54S11	
	Signetics	54S11	
SN54S112	Fairchild	54S112	
SN54S113	Fairchild	54S113	
SN54S114	Fairchild	54S114	
SN54S13	Fairchild	54LS13	
	Motorola	SN54LS13	
	National	DM54LS13	
	Raytheon	54LS13	
	TI	**SN54LS13**	**837**
SN54S132	Fairchild	54S132	
SN54S133	Fairchild	54S133	
SN54S134	Fairchild	54S134	
SN54S135	Fairchild	54S135	
SN54S138	AMD	SN54S138	
	Fairchild	54S138	
SN54S139	AMD	SN54S139	
	Fairchild	54S139	
	Signetics	54S139	
SN54S140	Fairchild	54S140	
	National	DM54S140	
	Signetics	54S140	
SN54S15	Fairchild	54S15	
SN54S151	AMD	SN54S151	
	Fairchild	54S151	
	Signetics	54S151	
SN54S153	AMD	SN54S153	
	Fairchild	54S153	
	Signetics	54S153	
SN54S157	AMD	SN54S157	
	Fairchild	54S157	
	Signetics	54S157	
SN54S158	AMD	SN54S158	
	Fairchild	54S158	
	Signetics	54S158	
SN54S174	AMD	SN54S174	
	Fairchild	54S174	
SN54S175	AMD	SN54S175	
	Fairchild	54S175	
		93S411	
SN54S181	AMD	SN54S181	
	Fairchild	93S41M	
	Signetics	54S181	
SN54S182	Fairchild	54S182	
		93S42	
SN54S182	MMI	54S182	
SN54S189	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN74S189	
SN54S194	AMD	SN54S194	
	Fairchild	54S194	
SN54S20	Fairchild	54S20	
SN54S200	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S201	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
SN54S201	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
	TI	SN54S200	
		SN74LS200	
		SN74S200	
		SN74S201	**440,905**
SN54S22	Fairchild	54S22	
	National	DM54S22	
SN54S240	AMD	SN54S240	
	MMI	54S240	
		SN54S240	**715**
	Raytheon	54S240	
SN54S241	AMD	SN54S241	
	MMI	54S241	
		SN54S241	**715**
	Raytheon	54S241	
SN54S244	AMD	SN54S244	
	MMI	54S244	
		SN54S244	**715**
	Raytheon	54S244	
SN54S251	AMD	SN54S251	
SN54S251	Signetics	54S251	
SN54S257	AMD	SN54S257	
		SN74S257	
	Fairchild	74S257	
	Hitachi	HD74S257	
	National	DM7123	
		DM74S257	
		DM8123	
	Signetics	54S257	
		74S257	
	TI	**SN74S257**	**916**
SN54S258	AMD	SN54S258	
	Fairchild	54S258	
	Signetics	54S258	
SN54S260	Fairchild	54S260	
	Signetics	54S260	
SN54S283	MMI	54S283	
SN54S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN7489	**440,863**
		SN74S289	
SN54S30	Fairchild	54S30	
SN54S300	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN54S301	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN74206	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
SN54S314	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN74S314	
SN54S32	Fairchild	54S32	
SN54S37	Signetics	54S37	
SN54S373	MMI	54S373	
		SN54S373	**715**
SN54S374	MMI	54S374	
		SN54S374	**715**
SN54S381	MMI	54S381	
SN54S40	Fairchild	54S40	
SN54S412	AMD	3212	
		8212	
	Intel	8212	
	National	DP8212	
		INS8212	
	NEC-Micro	μPB8212	
	TI	**SN74S412**	**945**
SN54S454	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN74S454	
		TBP24S81	**440,3968**
		TBP24S81M	**440,3968**
SN54S51	Fairchild	54S51	
SN54S64	Fairchild	54S64	
SN54S74	Fairchild	54S74	
SN54S85	Signetics	54S85	
SN54S86	Fairchild	54S86	
	Signetics	54S86	
SN55107	AMD	LM107	
	AD	**AD741S**	**3153**
	Intersil	LM107	
	National	LM107	
	Raytheon	LM107	
	SiliconG	SG107	
SN55107	TI	LM107	
	Thomson-CSF	SFC2107	
SN55107B	Fairchild	55107	
	Motorola	MC55107	
	National	DS55107	
		LM55107A	
	TI	SN55107	
SN55108	Fairchild	55108	
	Motorola	MC55108	
	National	DS55108	
		LM55108A	
	TI	SN55108B	
SN55108B	Fairchild	55108	
	Motorola	MC55108	
	National	DS55108	
		LM55108A	
	TI	SN55108	
SN55109	Fairchild	μA109	
	Motorola	LM109	
	National	LM109	
	SiliconG	SG109	
	Thomson-CSF	SFC2109	
SN55110	TI	SN55110A	
SN55110A	TI	SN55110	
SN55114	Fairchild	96114	
		9614	
	TI	SN75114	
SN55115	Fairchild	96115	
		9615	
	TI	9615	
		SN75115	
SN55121	National	DS55121	
	Signetics	S8T13	
SN55122	National	DS55122	
SN55123	**Motorola**	**LM123**	**3294**
		MC78T05	
	National	**LM123**	**3299**
	SiliconG	SG123	
SN55138	SiliconG	SG55138	
SN55154	SiliconG	SG55154	
SN55180	National	DS7800	
SN55182	National	DS7820	
SN55183	National	DS7830	
SN5520	National	LM5520	
	SiliconG	SG5520	
SN55207	AMD	LM207	
	National	LM207	
	RCA	CA207	
	SiliconG	SG207	
	Thomson-CSF	SFC2207	
SN5522	Motorola	MC5522	
		MC5523	
	National	LM5522	
	SiliconG	SG5522	
SN55236	SiliconG	SG55236	
SN5524	Fairchild	MC5524	
	Motorola	MC5524	
	National	LM5524	
	Raytheon	RM5524	
	SiliconG	SG5524	
SN5526	SiliconG	SG5526	
SN5527	SiliconG	SG5527	
SN5528	Fairchild	MC5528	
	Motorola	MC5528	
	National	LM5528	
	SiliconG	SG5528	
SN55325	Fairchild	MC55325	
	Motorola	MC55325	
	National	DS55325	
		LM55325	
	Signetics	55325	
	SiliconG	SG55325	
SN5535	Motorola	MC5535	
	National	LM5535	
	SiliconG	SG5535	
SN5536	SiliconG	SG5536	
SN55361	National	DS55361	
SN55365	National	DS55365	
SN5537	SiliconG	SG5537	
SN55450	Fairchild	55450	
	Signetics	55450	
	SiliconG	SG55450	
SN55451	Fairchild	55451	
	National	DS55451	
	Signetics	55451	
	SiliconG	SG55451	
SN55452	Fairchild	55452	
	National	DS55452	
	Signetics	55452	
	SiliconG	SG55452	
SN55453	Fairchild	55453	
	National	DS55453	
		LM55453	
	Signetics	55453	
	SiliconG	SG55453	
SN55454	National	DS55454	
	Signetics	55454	
	SiliconG	SG55454	
SN55460	National	DS55460	
	SiliconG	SG55460	
SN55461	National	DS55461	
	SiliconG	SG55461	
SN55462	National	DS55462	
	SiliconG	SG55462	
SN55463	National	DS55463	
	SiliconG	SG55463	
SN55464	National	DS55464	
	SiliconG	SG55464	
SN55471	SiliconG	SG55471	
SN55472	SiliconG	SG55472	
SN55473	SiliconG	SG55473	
SN55474	SiliconG	SG55474	
SN55480	National	DS7880	
SN55493	National	DS55493	
SN55494	National	DS55494	
SN72748P	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		μA748	
	Thomson-CSF	SFC2201	
		SFC2748	
SN7400	Fairchild	7400	
	Hitachi	HD7400	
	National	DM7400	
	Signetics	7400	
	Toshiba	TC7400	
SN7401	Fairchild	7401	
	Hitachi	HD7401	
	National	DM7401	
SN7402	Fairchild	7402	
	Hitachi	HD7402	
	National	DM7402	
	Signetics	7402	
SN7403	Fairchild	7403	
	Hitachi	HD7403	
	National	DM7403	
	Signetics	7403	
SN7404	Fairchild	7404	
	Hitachi	HD7404	
	National	DM7404	
	Signetics	7404	
	Toshiba	TC7404	
SN7405	Fairchild	7405	
	Hitachi	HD7405	
	National	DM7405	
	Signetics	7405	
SN7406	Fairchild	7406	
	Hitachi	HD7406	
	National	DM7406	
	Signetics	7406	
SN7407	Fairchild	7407	
	Hitachi	HD7407	
	National	DM7407	
	Signetics	7407	
SN7408	Fairchild	7408	
	Hitachi	HD7408	
	National	DM7408	
	Signetics	7408	
SN7409	Fairchild	7409	
	Hitachi	HD7409	
	National	DM7409	
SN7410	Fairchild	7410	
	Hitachi	HD7410	
SN7410	National	DM7410	
	Signetics	7410	
	Toshiba	TC7410	
SN74107	Fairchild	74107	
	Hitachi	HD74107	
	National	DM74107	
	Signetics	74107	
SN74109	National	DM74109	
	Signetics	74109	
SN74116	Fairchild	9308	
	Raytheon	RC9308	
		RM9308	
	TI	SN29308	
		SN39308	
SN7412	Fairchild	7412	
	Hitachi	HD7412	
SN74121	Fairchild	74121	
	Hitachi	HD74121	
	National	DM74121	
	Signetics	74121	
SN74122	Fairchild	74122	
		9601	
	National	DM8601	
		DM9601	
	Raytheon	RF8601	
		RF9601	
	Signetics	8T22	
		N8T22	
		S8T22	
SN74123	Fairchild	74123	
	National	DM74123	
	Signetics	74123	
SN74125	Fairchild	74125	
	Hitachi	HD74125	
	National	DM74125	
		DM8093	
	Signetics	74125	
	TI	**SN74425**	**946**
SN74126	Fairchild	74126	
	Hitachi	HD74126	
	National	DM74126	
		DM8094	
	Signetics	74126	
	TI	**SN74426**	**946**
SN74128	Signetics	74128	
SN74129	Fairchild	74193	
	National	DM74193	
		DM8563	
	Signetics	74193	
	TI	**SN74193**	**902**
SN7413	Fairchild	7413	
	Hitachi	HD7413	
	National	DM7413	
	Signetics	7413	
SN74132	Fairchild	74132	
	Hitachi	HD74132	
	National	DM74132	
	Signetics	74132	
SN74136	Fairchild	74136	
	Hitachi	HD74136	
SN7414	Fairchild	7414	
	Hitachi	HD7414	
	National	DM7414	
	Signetics	7414	
SN74141	Fairchild	74141	
		93141	
	Hitachi	HD74141	
		HD7441	
	National	DM74141	
		DM7441	
	Signetics	74141	
		7441	
SN74145	Fairchild	74145	
	Hitachi	HD74145	
	National	DM74145	
	Signetics	74145	
SN74147	Hitachi	HD14508	
		HD74147	
	Motorola	MC14508	
	National	DM74147	
	RCA	CD4508	
	SGS	HCF4508	
	Signetics	74147	
		HEF4508	
		N82147	
	SSS	SCL4508	
	Solitron	CM4508	
	Toshiba	TC4508	
SN74148	Fairchild	9318	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN74148	Hitachi	HD74148	
	National	DM54148	
		DM74148	
		DM8318	
		DM9318	
	Signetics	54148	
		74148	
		N82148	
	TI	**SN54148**	**883**
SN74150	Fairchild	74150	
	Hitachi	HD74150	
	National	DM74150	
	Signetics	74150	
SN74151	Fairchild	74151	
	Hitachi	HD74151	
	National	DM74151	
	Signetics	74151	
	TI	**SN74151A**	**884**
SN74151A	Fairchild	74151	
	Hitachi	HD74151	
	National	DM74151	
	Signetics	74151	
	TI	SN74151	
SN74153	Fairchild	74153	
	Hitachi	HD74153	
	National	DM74153	
	Signetics	74153	
SN74154	Fairchild	9311	
	Hitachi	HD74154	
	National	DM54154	
		DM7213	
		DM74154	
		DM8311	
		DM9311	
	Raytheon	RC9311	
		RM9311	
	Signetics	54154	
		74154	
	TI	SN29311	
		SN39311	
		SN54154	**885**
SN74155	Fairchild	74155	
	National	DM74155	
	Signetics	74155	
SN74156	Fairchild	74156	
	Hitachi	HD74156	
	National	DM74156	
	Signetics	74156	
SN74157	Fairchild	74157	
		9322	
	Hitachi	HD74157	
	National	DM74157	
		DM8322	
		DM9322	
	Raytheon	RC9322	
		RM9322	
	Signetics	74157	
	TI	SN29322	
		SN29602	
		SN39322	
SN74159	Fairchild	74159	
SN7416	Fairchild	7416	
	Hitachi	HD7416	
	National	DM7416	
	Signetics	7416	
SN74160	Fairchild	74160	
	Hitachi	HD74160	
	National	DM74160	
	Signetics	74160	
SN74161	Fairchild	74161	
	Hitachi	HD74161	
	National	DM74161	
	Signetics	74161	
SN74162	Fairchild	74162	
	Hitachi	HD74162	
	National	DM74162	
SN74163	Fairchild	74163	
	Hitachi	HD74163	
	National	DM74163	
	Signetics	74163	
SN74164	AMD	74164	
	Fairchild	74164	
	Hitachi	HD74164	
	National	DM74164	
		DM8570	
		DM8579	
	Signetics	74164	
SN74165	Fairchild	74165	
	National	DM74165	
		DM8590	
SN74165	Signetics	74165	
SN74166	Fairchild	74166	
	Hitachi	HD74166	
	National	DM74166	
	Signetics	74166	
SN7417	Fairchild	7417	
	Hitachi	HD7417	
	National	DM7417	
	Signetics	7417	
SN74170	Fairchild	74170	
	Hitachi	HD74170	
	National	DM74170	
	Signetics	74170	
SN74172	Signetics	74172	
SN74173	Fairchild	74173	
	National	DM74173	
		DM8551	
	Raytheon	RC8T10	
	Signetics	8T10	
		N8T10	
SN74174	Fairchild	74174	
	Hitachi	HD74174	
	National	DM74174	
	Signetics	74174	
SN74175	Fairchild	74175	
	Hitachi	HD74175	
	National	DM74175	
	Signetics	74175	
SN74176	Fairchild	74176	
		96176	
	National	DM74176	
		DM8280	
	Raytheon	RC8280	
	Signetics	74176	
		N8280	
SN74177	Fairchild	74177	
	National	DM74177	
		DM8281	
	Raytheon	RC8281	
	Signetics	74177	
		N8281	
SN74178	Raytheon	RC8270	
SN74179	Fairchild	74179	
	Raytheon	RC8271	
	Signetics	N8271	
SN74180	Fairchild	74180	
	Hitachi	HD74180	
	National	DM74180	
	Signetics	74180	
SN74181	Fairchild	54181	
		9341	
	Hitachi	HD74181	
	National	DM54181	
		DM74181	
	Raytheon	RC9341	
		RM9341	
	Signetics	54181	
		74181	
	TI	**SN54181**	**897**
SN74182	Fairchild	54182	
		9342	
	Hitachi	HD74182	
	National	DM54182	
		DM74182	
	Raytheon	RM9342	
	TI	**SN54182**	**898**
SN74184	National	DM74184	
SN74185	National	DM74185	
SN74185A	National	DM74185A	
SN74187	National	DM74187	
SN74190	Fairchild	74190	
	Hitachi	HD74190	
	National	DM74190	
	Signetics	74190	
SN74191	Fairchild	74191	
	Hitachi	HD74191	
	National	DM74191	
	Signetics	74191	
SN74192	Fairchild	74192	
		9360	
	National	DM74192	
		DM8560	
	Raytheon	RC9360	
		RM9360	
	Signetics	74192	
	TI	**SN54192**	**902**
SN74193	Fairchild	74193	
	National	DM74193	
		DM8563	
	Signetics	74193	
	TI	SN74129	
SN74194	Fairchild	74194	
	Hitachi	HD74194	
	National	DM74194	
	Signetics	74194	
SN74195	Fairchild	74195	
	National	DM74195	
	Signetics	74195	
SN74196	Fairchild	74196	
	National	DM74196	
		DM8290	
	Raytheon	RC8290	
	Signetics	74196	
SN74197	Fairchild	74197	
	National	DM74197	
		DM8291	
	Raytheon	RC8291	
	Signetics	74197	
SN74198	Fairchild	74198	
	Hitachi	HD74198	
	National	DM74198	
	Signetics	74198	
SN74199	Fairchild	74199	
	National	DM74199	
	Signetics	74199	
SN7420	Fairchild	7420	
		9004	
	Hitachi	HD7420	
	National	DM7420	
		DM9004C	
	Signetics	7420	
	Toshiba	TC7420	
SN74206	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74LS300	
		SN74S300	
		SN74S301	**927**
SN7422	Fairchild	7422	
	Hitachi	HD7422	
SN74221	Signetics	74221	
SN7423	Fairchild	7423	
	National	DM7423	
SN7425	Fairchild	7425	
	National	DM7425	
SN74251	National	DM74251	
		DM8121	
SN74259	Fairchild	9334	
	National	DM8334	
		DM9334	
	TI	SN29334	
		SN39334	
		SN54259	**917**
SN7426	Fairchild	7426	
	Hitachi	HD7426	
	National	DM7426	
		DM8810	
	Signetics	7426	
SN7427	Fairchild	7427	
	Hitachi	HD7427	
	National	DM7427	
	Signetics	7427	
SN74279	Fairchild	74279	
	Signetics	74279	
SN7428	Signetics	7428	
SN74283	Fairchild	74283	
SN74284	National	DM8875A	
SN74285	National	DM8875B	
SN74290	Fairchild	74290	
SN74293	Fairchild	74293	
SN74298	Fairchild	74298	
	Signetics	74298	
SN7430	Fairchild	7430	
	Hitachi	HD7430	
	National	DM7430	
	Signetics	7430	
SN7432	Fairchild	7432	
SN7432	Hitachi	HD7432	
	National	DM7432	
	Signetics	7432	
SN7433	Signetics	7433	
SN74365	Motorola	MC6885	
		MC8T95	
	National	DM8095	
	Signetics	N8T95	
SN74365A	Signetics	74365A	
	TI	**SN74366A**	**935**
SN74366	Motorola	MC6886	
		MC8T96	
	National	DM8096	
	Signetics	N8T96	
SN74366A	Signetics	74365A	
	TI	**SN74366A**	**935**
SN74367	Motorola	MC6887	
		MC8T97	
	National	DM8097	
	Signetics	N8T97	
SN74367A	Signetics	74367A	
SN74368	Motorola	MC6888	
		MC8T98	
	National	DM7098	
		DM8098	
		DS8674	
	Signetics	N8T98	
		S8T98	
	TI	SN54368	
SN74368A	Signetics	74368A	
SN7437	Fairchild	7437	
	Hitachi	HD7437	
	National	DM7437	
	Signetics	7437	
SN7438	Fairchild	7438	
	Hitachi	HD7438	
	National	DM7438	
	Signetics	7438	
SN7440	Fairchild	7440	
	Hitachi	HD7440	
	National	DM7440	
	Signetics	7440	
SN7442	Fairchild	7442	
	Hitachi	HD7442	
	National	DM7442	
		DM8842	
	Signetics	7442	
	TI	**SN7442A**	**845**
SN74425	Fairchild	74125	
	Hitachi	HD74125	
	National	DM74125	
		DM8093	
	Signetics	74125	
	TI	**SN74125**	**875**
SN74426	Fairchild	74126	
	Hitachi	HD74126	
	National	DM74126	
		DM8094	
	Signetics	74126	
	TI	**SN74126**	**875**
SN7442A	Fairchild	7442	
	Hitachi	HD7442	
	National	DM7442	
		DM8842	
	Signetics	7442	
	TI	SN7442	
SN7443	Hitachi	HD7443	
SN7444	Hitachi	HD7444	
SN7445	Fairchild	7445	
	Hitachi	HD7445	
	National	DM7445	
	Signetics	7445	
SN7446	Fairchild	7446	
	Hitachi	HD7446	
	National	DM7446	
	TI	**SN7446A**	**847**
SN7446A	Fairchild	7446	
	Hitachi	HD7446	
	National	DM7446	
	TI	SN7446	
SN7447	Fairchild	7447	
	Hitachi	HD7447	
	National	DM7447	
	TI	**SN7447A**	**847**
SN7447A	Fairchild	7447	
	Hitachi	HD7447	
	National	DM7447	
	TI	SN7447	
SN7448	Fairchild	5448	
		7448	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN7448	National	DM5448	
		DM7448	
		DM8848	
	Signetics	N8T54	
	TI	**SN5448**	**847**
		SN5448A	
		SN7448A	
SN7448A	Fairchild	5448	
		7448	
	National	DM5448	
		DM7448	
		DM8848	
	Signetics	N8T54	
	TI	**SN5448**	**847**
		SN5448A	
		SN7448	**847**
SN7450	Fairchild	7450	
	Hitachi	HD7450	
	National	DM7450	
	Signetics	7450	
SN7451	Fairchild	7451	
	Hitachi	HD7451	
	National	DM7451	
	Signetics	7451	
SN7453	Fairchild	7453	
	Hitachi	HD7453	
	National	DM7453	
SN7454	Fairchild	7454	
	Hitachi	HD7454	
	National	DM7454	
SN7460	Fairchild	7460	
	Hitachi	HD7460	
	National	DM7460	
SN7470	Fairchild	7470	
	Hitachi	HD7470	
	National	DM7470	
SN7472	Fairchild	7472	
	Hitachi	HD7472	
	National	DM7472	
SN7473	Fairchild	7473	
	Hitachi	HD7473	
	National	DM7473	
	Signetics	7473	
SN7474	Fairchild	7474	
	Hitachi	HD7474	
	National	DM7474	
	Signetics	7474	
SN7475	Fairchild	7475	
	Hitachi	HD7475	
	National	DM7475	
	Signetics	7475	
SN7476	Fairchild	7476	
	Hitachi	HD7476	
	National	DM7476	
	Signetics	7476	
SN7477	Signetics	7477	
SN7482	Hitachi	HD7482	
	National	DM7482	
SN7483	Fairchild	7483	
	Hitachi	HD7483	
	National	DM7483	
	Signetics	7483	
	TI	**SN7483A**	**861**
SN7483A	Fairchild	7483	
	Hitachi	HD7483	
	National	DM7483	
	Signetics	7483	
	TI	SN7483	
SN7485	Fairchild	7485	
	Hitachi	HD7485	
	National	DM7485	
	Signetics	7485	
SN7486	Fairchild	7486	
	Hitachi	HD7486	
	National	DM7486	
	Signetics	7486	
SN7488	Fairchild	7488	
	Motorola	MC4002	
	National	DM7488	
	Signetics	7488	
		N8224	
	TI	**SN7488A**	**863**
SN7488A	Fairchild	7488	
	Motorola	MC4002	
	National	DM7488	
	Signetics	7488	
		N8224	
SN7488A	TI	SN7488	
SN7489	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN74S289	
SN7490	Fairchild	7490	
	Hitachi	HD7490	
	National	DM7490	
	Signetics	7490	
	TI	**SN7490A**	**864**
SN7490A	Fairchild	7490	
	Hitachi	HD7490	
	National	DM7490	
	Signetics	7490	
	TI	SN7490	
SN7491	Fairchild	7491	
	Hitachi	HD7491	
	National	DM7491	
	Signetics	7491	
	TI	**SN7491A**	**864**
SN7491A	Fairchild	7491	
	Hitachi	HD7491	
	National	DM7491	
	Signetics	7491	
	TI	SN7491	
SN7492	Fairchild	7492	
	Hitachi	HD7492	
	National	DM7492	
	Signetics	7492	
	TI	**SN7492A**	**864**
SN7492A	Fairchild	7492	
	Hitachi	HD7492	
	National	DM7492	
	Signetics	7492	
	TI	SN7492	
SN7493	Fairchild	7493	
	Hitachi	HD7493	
	National	DM7493	
	Signetics	7493	
	TI	**SN7493A**	**865**
SN7493A	Fairchild	7493	
	Hitachi	HD7493	
	National	DM7493	
	Signetics	7493	
	TI	SN7493	
SN7494	Fairchild	7494	
	Hitachi	HD7494	
	Signetics	7494	
SN7495	Fairchild	7495	
	Hitachi	HD7495	
	National	DM7495	
	Signetics	7495	
	TI	**SN7495A**	**866**
SN7495A	Fairchild	7495	
	Hitachi	HD7495	
	National	DM7495	
	Signetics	7495	
	TI	SN7495	
SN7496	Fairchild	7496	
	Hitachi	HD7496	
	National	DM7496	
	Signetics	7496	
SN7497	Fairchild	7497	
SN74ALS00	**Motorola**	**SN74ALS00**	**732**
	National	DM74ALS00	
SN74ALS02	**Motorola**	**SN74ALS02**	**732**
	National	DM74ALS02	
SN74ALS04	**Motorola**	**SN74ALS04**	**732**
	National	DM74ALS04	
SN74ALS08	**Motorola**	**SN74ALS08**	**732**
	National	DM74ALS08	
SN74ALS09	**Motorola**	**SN74ALS09**	**732**
	National	DM74ALS09	
SN74ALS160	**Motorola**	**SN74ALS161**	**732**
	National	DM74ALS161	
SN74ALS161	**Motorola**	**SN74ALS162**	**732**
	National	DM74ALS162	
SN74ALS162	**Motorola**	**SN74ALS163**	**732**
	National	DM74ALS163	
	TI	**SN74ALS163**	**890**
SN74ALS163	**Motorola**	**SN74ALS163**	**732**
	National	DM74ALS163	
	TI	**SN74ALS162**	**890**
SN74ALS241	**Motorola**	**SN74ALS241**	**732**
	National	DM74ALS241	
SN74ALS242	**Motorola**	**SN74ALS242**	**732**
	National	DM74ALS242	
SN74ALS243	**Motorola**	**SN74ALS243**	**732**
	National	DM74ALS243	
SN74ALS244	**Motorola**	**SN74ALS244**	**732**
	National	DM74ALS244	
SN74ALS245	Motorola	SN74ALS245	
	National	DM74ALS245	
SN74ALS273	**Motorola**	**SN74ALS273**	**732**
	National	DM74ALS273	
SN74ALS32	**Motorola**	**SN74ALS32**	**732**
	National	DM74ALS32	
SN74ALS373	**Motorola**	**SN74ALS373**	**732**
	National	DM74ALS373	
SN74ALS374	**Motorola**	**SN74ALS374**	**732**
	National	DM74ALS374	
SN74ALS573	**Motorola**	**SN74ALS573**	**732**
	National	DM74ALS573	
SN74ALS574	Motorola	SN74ALS574	
	National	DM74ALS574	
SN74ALS576	**Motorola**	**SN74ALS576**	**732**
	National	DN74ALS576	
SN74ALS580	**Motorola**	**SN74ALS580**	**732**
	National	DM74ALS580	
SN74ALS620	**Motorola**	**SN74ALS620**	**732**
	National	DM74ALS620	
SN74ALS621	**Motorola**	**SN74ALS621**	**732**
	National	DM74ALS621	
SN74ALS623	**Motorola**	**SN74ALS623**	**732**
	National	DM74ALS623	
SN74ALS640	**Motorola**	**SN74ALS643**	**732**
	National	DM74ALS643	
SN74ALS644	**Motorola**	**SN74ALS644**	**732**
	National	DM74ALS644	
SN74ALS74	**Motorola**	**SN74ALS74**	**732**
	National	DM74ALS74	
SN74ALS873	**Motorola**	**SN74ALS873**	**732**
	National	DM74ALS873	
SN74ALS874	**Motorola**	**SN74ALS874**	**732**
	National	DM74ALS874	
SN74ALS876	**Motorola**	**SN74ALS876**	**732**
	National	DM74ALS876	
SN74ALS880	**Motorola**	**SN74ALS160**	**732**
	National	DM74ALS160	
SN74H00	Fairchild	74H00	
	National	DM74H00	
SN74H01	Fairchild	74H01	
		74H08	
	National	DM74H01	
		DM74H08	
SN74H04	Fairchild	74H04	
	National	DM74H04	
SN74H05	Fairchild	74H05	
SN74H10	Fairchild	74H10	
	National	DM74H10	
SN74H101	Fairchild	74H101	
	Signetics	74H101	
SN74H103	Fairchild	74H103	
	National	DM74H103	
SN74H106	Fairchild	74H106	
	National	DM74H106	
SN74H108	Fairchild	74H108	
	National	DM74H108	
SN74H11	Fairchild	74H11	
	National	DM74H11	
SN74H183	Fairchild	74H183	
	Hitachi	HD74H183	
SN74H20	Fairchild	74H20	
	National	DM74H20	
SN74H21	Fairchild	74H21	
	National	DM74H21	
SN74H22	Fairchild	74H22	
SN74H30	Fairchild	74H30	
	National	DM74H30	
SN74H40	Fairchild	74H40	
	National	DM74H40	
SN74H50	Fairchild	74H50	
	National	DM74H50	
SN74H51	Fairchild	74H51	
	National	DM74H51	
SN74H52	Fairchild	74H52	
SN74H53	Fairchild	74H53	
SN74H54	Fairchild	74H54	
SN74H55	Fairchild	74H55	
SN74H61	Fairchild	74H61	
SN74H62	Fairchild	74H62	
	National	DM74H62	
SN74H72	Fairchild	74H72	
SN74H73	Fairchild	74H73	
SN74H74	Fairchild	74H74	
	National	DM74H74	
SN74H87	Fairchild	74H87	
SN74LS00	Fairchild	74LS00	
	Hitachi	HD74LS00	
	Motorola	SN74LS00	
	National	DM74LS00	
	Raytheon	74LS00	
	SGS	T74LS00	
	Signetics	74LS00	
SN74LS01	Fairchild	HD74LS01	
	Hitachi	HD74LS01	
	Motorola	SN74LS01	
	National	DM74LS01	
	Raytheon	74LS01	
	Signetics	74LS01	
SN74LS02	Fairchild	74LS02	
	Hitachi	HD74LS02	
	Motorola	SN74LS02	
	National	DM74LS02	
	Raytheon	74LS02	
	SGS	T74LS02	
	Signetics	74LS02	
SN74LS03	Fairchild	74LS03	
	Hitachi	HD74LS03	
	Motorola	SN74LS03	
	National	DM74LS03	
	Raytheon	74LS03	
	SGS	T74LS03	
SN74LS04	Fairchild	74LS04	
	Hitachi	HD74LS04	
	Motorola	SN74LS04	
	National	DM74LS04	
	Raytheon	74LS04	
	SGS	T74LS04	
	Signetics	74LS04	
SN74LS05	Fairchild	74LS05	
	Hitachi	HD74LS05	
	Motorola	SN74LS05	
	National	DM74LS05	
	NEC-Electron	μPB74LS05	
	Raytheon	74LS05	
	SGS	T74LS05	
	Signetics	74LS05	
SN74LS08	Fairchild	74LS08	
	Hitachi	HD74LS08	
	Motorola	SN74LS08	
	National	DM74LS08	
	Raytheon	74LS08	
	SGS	T74LS08	
	Signetics	74LS08	
		SN74LS08	
SN74LS09	Fairchild	74LS09	
	Hitachi	HD74LS09	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN74LS09	Motorola	SN74LS09	
	National	DM74LS09	
	Raytheon	74LS09	
	SGS	T74LS09	
SN74LS10	Fairchild	74LS10	
	Hitachi	HD74LS10	
	Motorola	SN74LS10	
	National	DM74LS10	
	Raytheon	74LS10	
	SGS	T74LS10	
	Signetics	74LS10	
SN74LS107A	Hitachi	HD74LS107	
	Motorola	SN74LS107A	
	National	DM74LS107	
	Raytheon	74LS107	
	Signetics	74LS107	
SN74LS109	SGS	T74LS109	
SN74LS109A	Fairchild	74LS109	
	Hitachi	HD74LS109	
	Motorola	SN74LS109	
		SN74LS109A	
	National	DM74LS109	
	Raytheon	74LS109	
	Signetics	74LS109	
	TI	SN74S109A	
SN74LS11	Fairchild	74LS11	
	Hitachi	HD74LS11	
	Motorola	SN74LS11	
	National	DM74LS11	
	Raytheon	74LS11	
	SGS	T74LS11	
	Signetics	74LS11	
SN74LS112A	Fairchild	74LS112	
	Hitachi	HD74LS112	
	Motorola	SN74LS112A	
	National	DM74LS112	
	Raytheon	74LS112	
	SGS	T74LS112	
	Signetics	74LS112	
SN74LS113A	Fairchild	74LS113	
	Hitachi	HD74LS113	
	Motorola	SN74LS113A	
	National	DM74LS113	
	Raytheon	74LS113	
	SGS	T74LS113	
	Signetics	74LS113	
SN74LS114	SGS	T74LS114	
SN74LS114A	Fairchild	74LS114	
	Hitachi	HD74LS114	
	Motorola	74LS114A	
		SN74LS114A	
	National	DM74LS114	
	Raytheon	74LS114	
SN74LS12	Hitachi	HD74LS12	
	Motorola	SN74LS12	
	National	DM74LS12	
	Raytheon	74LS12	
	Signetics	74LS12	
SN74LS122	Hitachi	HD74LS122	
	Motorola	SN74LS122	
	National	DM74LS122	
	Raytheon	74LS122	
SN74LS123	Hitachi	HD74LS123	
	Motorola	SN74LS123	
	National	DM74LS123	
	Raytheon	74LS123	
SN74LS124	Motorola	SN74LS124	
SN74LS125A	Fairchild	74LS125A	
	Motorola	SN74LS125A	
	National	DM74LS125	
	Raytheon	74LS125	
	SGS	T74LS125	
	Signetics	74LS125A	
SN74LS126A	Fairchild	74LS126	
	Motorola	SN74LS126A	
	National	DM74LS126	
	Raytheon	74LS126	
	SGS	T74LS126	
	Signetics	74LS126A	
SN74LS13	Fairchild	74LS13	
	Hitachi	HD74LS13	
	Motorola	SN74LS13	
	National	DM74LS13	
	Raytheon	74LS13	
	Signetics	74LS13	
SN74LS132	Fairchild	74LS132	
	Hitachi	HD74LS132	
	Motorola	SN74LS132	
	National	DM74LS132	
SN74LS132	Raytheon	74LS132	
	SGS	T74LS132	
	Signetics	74LS132	
SN74LS136	Fairchild	74LS136	
	Hitachi	HD74LS136	
	Motorola	SN74LS136	
	National	DM74LS136	
	Raytheon	74LS136	
	SGS	T74LS136	
	Signetics	74LS136	
SN74LS137	Motorola	SN74LS137	
SN74LS138	Fairchild	74LS138	
	Hitachi	HD74LS138	
	Motorola	SN74LS138	
	National	DM74LS138	
	Raytheon	74LS138	
	SGS	T74LS138	
	Signetics	74LS138	
SN74LS139	Fairchild	74LS139	
	Hitachi	HD74LS139	
	Motorola	SN74LS139	
	National	DM74LS139	
	Raytheon	74LS139	
	SGS	T74LS139	
	Signetics	74LS139	
SN74LS14	Fairchild	74LS14	
	Hitachi	HD74LS14	
	Motorola	SN74LS14	
	National	DM74LS14	
	Raytheon	74LS14	
	Signetics	74LS14	
SN74LS145	Fairchild	74LS145	
	Motorola	SN74LS145	
SN74LS148	Hitachi	HD74LS148	
	Motorola	SN74LS148	
SN74LS15	Fairchild	74LS15	
	Hitachi	HD74LS15	
	Motorola	SN74LS15	
	National	DM74LS15	
	Raytheon	74LS15	
	SGS	T74LS15	
SN74LS151	Fairchild	74LS151	
	Hitachi	HD74LS151	
		HD74LS151A	
	Motorola	SN74LS151	
	National	DM74LS151	
	Raytheon	74LS151	
	SGS	T74LS151	
	Signetics	74LS151	
SN74LS152	SGS	T74LS152	
SN74LS153	Fairchild	74LS153	
	Hitachi	HD74LS153	
	Motorola	SN74LS153	
	National	DM74LS153	
	Raytheon	74LS153	
	SGS	T74LS153	
	Signetics	74LS153	
SN74LS155	Fairchild	74LS155	
	Hitachi	HD74LS155	
	Motorola	SN74LS155	
	National	DM74LS155	
	Raytheon	74LS155	
	Signetics	74LS155	
SN74LS156	Fairchild	74LS156	
	Hitachi	HD74LS156	
	Motorola	SN74LS156	
	National	DM74LS156	
	Raytheon	74LS156	
	SGS	T74LS156	
	Signetics	74LS156	
SN74LS157	Fairchild	74LS157	
	Hitachi	HD74LS157	
	Motorola	SN74LS157	
	National	DM74LS157	
	Raytheon	74LS157	
	SGS	T74LS157	
	Signetics	74LS157	
SN74LS158	Fairchild	74LS158	
	Hitachi	HD74LS158	
	Motorola	SN74LS158	
	National	DM74LS158	
	Raytheon	74LS158	
	SGS	T74LS158	
	Signetics	74LS158	
SN74LS160	SGS	T74LS160	
SN74LS160A	Fairchild	74LS160	
	Hitachi	HD74LS160A	
	Motorola	SN74LS160A	
	National	DM74LS160	
	Raytheon	74LS160	
	Signetics	74LS160	
		74LS160A	
SN74LS161	SGS	T74LS161	
SN74LS161A	AMD	SN74LS161	
	Fairchild	74LS161A	
	Hitachi	HD74LS161A	
	Motorola	SN74LS161A	
	National	DM74LS161	
	NEC-Electron	μPB74LS161	
	Raytheon	74LS161	
	Signetics	74LS161A	
SN74LS162A	Fairchild	74LS162	
	Hitachi	HD74LS162A	
	Motorola	SN74LS162A	
	National	DM74LS162	
	Raytheon	74LS162	
	SGS	T74LS162	
	Signetics	74LS162A	
SN74LS163A	Fairchild	74LS163	
	Hitachi	HD74LS163	
		HD74LS163A	
	Motorola	SN74LS163A	
	National	DM74LS163	
	Raytheon	74LS163	
	SGS	T74LS163	
	Signetics	74LS163A	
SN74LS164	Fairchild	74LS164	
	Hitachi	HD74LS164	
	Motorola	SN74LS164A	
	National	DM74LS164	
	Raytheon	74LS164	
	SGS	T74LS164	
	Signetics	74LS164	
		74LS164A	
SN74LS165	Fairchild	74LS165	
	Motorola	SN74LS165	
	SGS	T74LS165	
SN74LS166A	Motorola	SN74LS166	
SN74LS168	Fairchild	74LS168	
	Hitachi	HD74LS168	
	Motorola	SN74LS168	
	National	DM74LS168	
	Signetics	74LS168A	
SN74LS170	Fairchild	74LS170	
	Motorola	SN74LS170	
	National	DM74LS170	
	Raytheon	74LS170	
	SGS	T74LS170	
	Signetics	74LS170	
SN74LS173	SGS	T74LS173	
SN74LS173A	Fairchild	74LS173	
	Motorola	SN74LS173A	
	National	DM74LS173	
	Signetics	74LS173	
SN74LS174	Fairchild	74LS174	
	Hitachi	HD74LS174	
	Motorola	SN74LS174	
	National	DM74LS174	
	Raytheon	74LS174	
	SGS	T74LS174	
	Signetics	74LS174	
SN74LS175	Fairchild	74LS175	
	Hitachi	HD74LS175	
	Motorola	SN74LS175	
	Raytheon	74LS175	
	SGS	T74LS175	
	Signetics	74LS175	
SN74LS181	Fairchild	74LS181	
	Hitachi	HD74LS181	
	Motorola	SN74LS181	
	Raytheon	74LS181	
	SGS	T74LS181	
	Signetics	74LS181	
SN74LS182	Motorola	SN74LS182	
SN74LS183	Motorola	SN74LS183	
SN74LS190	Fairchild	74LS190	
	Hitachi	HD74LS190	
	Motorola	SN74LS190	
	National	DM74LS190	
	Raytheon	74LS190	
	SGS	T74LS190	
SN74LS191	Fairchild	74LS191	
	Hitachi	HD74LS191	
	Motorola	SN74LS191	
	National	DM74LS191	
	Raytheon	74LS191	
	SGS	T74LS191	
	Signetics	74LS191	
SN74LS192	Fairchild	74LS192	
	Hitachi	HD74LS192	
	Motorola	SN74LS192	
	National	DM74LS192	
	Raytheon	74LS192	
	SGS	T74LS192	
SN74LS192	Signetics	74LS192	
SN74LS193	Fairchild	74LS193	
	Hitachi	HD74LS193	
	Motorola	SN74LS193	
	National	DM74LS193	
	Raytheon	74LS193	
	SGS	T74LS193	
	Signetics	74LS193	
SN74LS194A	Fairchild	74LS194A	
	Hitachi	HD74LS194A	
	Motorola	SN74LS194A	
	National	DM74LS194	
	SGS	T74LS194A	
	Signetics	74LS194A	
SN74LS195A	Fairchild	74LS195A	
	Hitachi	HD74LS195A	
	Motorola	SN74LS195A	
	National	DM74LS195	
	Raytheon	74LS195A	
	SGS	T74LS195A	
	Signetics	74LS195A	
SN74LS196	Fairchild	74LS196	
	Hitachi	HD74LS196	
	Motorola	SN74LS196	
	National	DM74LS196	
	Raytheon	74LS196	
	Signetics	N82S80	
SN74LS197	Fairchild	74LS197	
	Hitachi	HD74LS197	
	Motorola	SN74LS197	
	National	DM74LS197	
	Raytheon	74LS197	
	Signetics	74LS197	
SN74LS20	Fairchild	74LS20	
	Hitachi	HD74LS20	
	Motorola	SN74LS20	
	National	DM74LS20	
	Raytheon	74LS20	
	SGS	T74LS20	
	Signetics	74LS20	
SN74LS200	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74S200	
		SN74S201	440,905
SN74LS21	Fairchild	74LS21	
	Hitachi	HD74LS21	
	Motorola	SN74LS21	
	National	DM74LS21	
	Raytheon	74LS21	
	SGS	T74LS21	
	Signetics	74LS21	
SN74LS22	Fairchild	74LS22	
	Hitachi	HD74LS22	
	Motorola	SN74LS22	
	National	DM74LS22	
	Raytheon	74LS22	
	SGS	T74LS22	
SN74LS221	Fairchild	74LS221	
	Hitachi	HD74LS221	
	Motorola	SN74LS221	
	National	DM74LS221	
	Raytheon	74LS221	
SN74LS240	AMD	SN74LS240	
	Fairchild	74LS240	
	Hitachi	HD74LS240	
	MMI	74LS240	
	Motorola	SN74LS240	
	Raytheon	74LS240	
	Signetics	74LS240	
SN74LS241	AMD	SN74LS241	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN74LS241	Fairchild	74LS241	
	Hitachi	HD74LS241	
	MMI	74LS241	
	Motorola	SN74LS241	
	Raytheon	74LS241	
	Signetics	74LS241	
SN74LS242	AMD	SN74LS242	
	Fairchild	74LS242A	
	Motorola	SN74LS242	
	Raytheon	74LS242	
	Signetics	74LS242	
SN74LS243	AMD	SN74LS243	
	Fairchild	74LS243A	
	Motorola	SN74LS243	
	Raytheon	74LS243	
	Signetics	74LS243	
SN74LS244	AMD	SN74LS244	
	Fairchild	74LS244	
	Hitachi	HD74LS244	
	MMI	74LS244	
	Motorola	SN74LS244	
	Raytheon	74LS244	
	Signetics	74LS244	
SN74LS245	Fairchild	74LS245	
	GTEMicro	G74SC245	
	Mitel	**MD74SC245**	**702,706**
	Motorola	SN74LS245	
	Plessey	MV74SC245	
	SPI	**SP74SC245**	**761**
	Signetics	**74LS245**	**779**
		N8T245	
SN74LS247	Fairchild	74LS247	
	Hitachi	HD74LS247	
	Motorola	SN74LS247	
	National	DM74LS247	
SN74LS248	Fairchild	74LS248	
	Hitachi	HD74LS248	
	Motorola	SN74LS248	
	National	DM74LS248	
	SGS	T74LS248	
SN74LS249	Fairchild	74LS249	
	Hitachi	HD74LS249	
	Motorola	SN74LS249	
	National	DM74LS249	
	SGS	T74LS249	
SN74LS251	Fairchild	74LS251	
	Hitachi	HD74LS251	
	Motorola	SN74LS251	
	National	DM74LS251	
	Raytheon	74LS251	
	SGS	T74LS251	
	Signetics	74LS251	
SN74LS253	Fairchild	74LS253	
	Hitachi	HD74LS253	
	Motorola	SN74LS253	
	National	DM74LS253	
		DM8214	
	Raytheon	74LS253	
	SGS	T74LS253	
	Signetics	74LS253	
SN74LS256	SGS	T74LS256	
SN74LS257	Fairchild	74LS257A	
	Hitachi	HD74LS257	
	Motorola	SN74LS257A	
	National	DM74LS257	
	Raytheon	74LS257	
	SGS	T74LS257	
	Signetics	74LS257	
		74LS257A	
SN74LS258	Fairchild	74LS258A	
	Hitachi	HD74LS258	
	Motorola	SN74LS258A	
	National	DM74LS258	
	Raytheon	74LS258	
	SGS	T74LS258	
	Signetics	74LS258	
SN74LS259	Fairchild	74LS259	
	Motorola	SN74LS259	
	SGS	T74LS259	
	Signetics	74LS259	
SN74LS26	Fairchild	74LS26	
	Hitachi	HD74LS26	
	Motorola	SN74LS26	
	National	DM74LS26	
	Raytheon	74LS26	
	SGS	T74LS26	
	Signetics	74LS26	
SN74LS260	SGS	T74LS260	
SN74LS261	Raytheon	74LS261	
SN74LS266	Fairchild	74LS266	
	Motorola	SN74LS266	
	National	DM74LS266	
	Raytheon	74LS266	
		RC8242	
	SGS	T74LS266	
	Signetics	74LS266	
		N8242	
SN74LS27	Fairchild	74LS27	
	Hitachi	HD74LS27	
	Motorola	SN74LS27	
	National	DM74LS27	
	Raytheon	74LS27	
	SGS	T74LS27	
	Signetics	74LS27	
SN74LS273	**AMD**	**SN74LS273**	**1227**
	Fairchild	74LS273	
	Motorola	SN74LS273	
	Raytheon	74LS273	
	SGS	T74LS273	
	Signetics	74LS273	
SN74LS279	Fairchild	74LS279	
	Hitachi	HD74LS279	
	Motorola	SN74LS279	
	National	DM74LS279	
	Raytheon	74LS279	
	Signetics	74LS279	
SN74LS28	Fairchild	74LS28	
	Motorola	SN74LS28	
	Raytheon	74LS28	
	SGS	T74LS28	
SN74LS280	Hitachi	HD74LS280	
	Motorola	SN74LS280	
SN74LS283	Fairchild	74LS283	
	Hitachi	HD74LS283	
		HD74LS283A	
	Motorola	SN74LS283	
	National	DM74LS283	
	Raytheon	74LS283	
	SGS	T74LS283	
	Signetics	74LS283	
SN74LS289	Fairchild	74LS289	
	National	DM74LS289	
SN74LS290	Fairchild	74LS290	
	Hitachi	HD74LS290	
	Motorola	SN74LS290	
	National	DM74LS290	
	Raytheon	74LS290	
	SGS	T74LS290	
	Signetics	74LS290	
SN74LS292	SGS	T74LS292	
SN74LS293	Fairchild	74LS293	
	Hitachi	HD74LS293	
	Motorola	SN74LS293	
	National	DM74LS293	
	SGS	T74LS293	
	Signetics	74LS293	
SN74LS295A	SGS	T74LS295A	
SN74LS295B	Fairchild	74LS295A	
	Motorola	SN74LS295A	
	Raytheon	74LS295A	
	Signetics	74LS295A	
		74LS295B	
SN74LS298	Fairchild	74LS298	
	Hitachi	HD74LS298	
	Motorola	SN74LS298	
	Raytheon	74LS298	
	SGS	T74LS298	
	Signetics	74LS298	
SN74LS299	**AMD**	**SN74LS299**	**1227**
	Fairchild	74LS299	
	Hitachi	HD74LS299	
	Motorola	SN74LS299	
	Raytheon	74LS299	
	SGS	T74LS299	
SN74LS30	Fairchild	74LS30	
	Hitachi	HD74LS30	
	Motorola	SN74LS30	
	National	DM74LS30	
	Raytheon	74LS30	
	SGS	T74LS30	
	Signetics	74LS30	
SN74LS300	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
SN74LS300	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74S300	
		SN74S301	**927**
SN74LS32	Fairchild	54LS32	
		74LS32	
	Hitachi	HD74LS32	
	Motorola	**SN54ALS32**	**732**
		SN54LS32	
		SN74LS32	
	National	DM54ALS32	
		DM54LS32	
		DM74LS32	
	Raytheon	54LS32	
		74LS32	
	SGS	T74LS32	
	Signetics	54LS32	
		74LS32	
	TI	**SN54LS32**	**843**
SN74LS322A	AMD	SN74LS322	
	Fairchild	74LS322	
	Motorola	SN74LS322	
	Raytheon	74LS322	
		74LS322A	
SN74LS323	AMD	SN54LS323	
		SN74LS323	
	Fairchild	54LS323	
		74LS323	
	Motorola	SN54LS323	
		SN74LS323	
	Raytheon	54LS323	
		74LS323	
	TI	**SN54LS323**	**930**
		SN54LS323A	
SN74LS33	Fairchild	74LS33	
	Motorola	SN74LS33	
	Raytheon	74LS33	
	Signetics	74LS33	
SN74LS352	Fairchild	74LS352	
	Motorola	SN74LS352	
	National	DM74LS352	
	SGS	T74LS352	
SN74LS353	Fairchild	74LS353	
	Motorola	DM74LS353	
		SN74LS353	
	National	DM74LS353	
	SGS	T74LS353	
SN74LS365A	Fairchild	74LS365A	
	Motorola	SN74LS365A	
	National	DM74LS365	
	Raytheon	74LS365	
	SGS	T74LS365A	
	Signetics	74LS365	
		74LS365A	
SN74LS366A	Fairchild	74LS366A	
	Motorola	SN74LS366A	
	National	DM74LS366	
	Raytheon	74LS366	
	SGS	T74LS366A	
	Signetics	74LS366A	
SN74LS367A	Fairchild	74LS367A	
	Hitachi	HD74LS367	
		HD74LS367A	
	Motorola	SN74LS367A	
	National	DM74LS367	
	Raytheon	74LS367	
	SGS	T74LS367A	
	Signetics	74LS367	
		74LS367A	
SN74LS368A	Fairchild	74LS368A	
	Hitachi	HD74LS368	
	Motorola	SN73LS368A	
		SN74LS368A	
	National	DM74LS368	
	Raytheon	74LS368	
	SGS	T74LS3	
	Signetics	74LS368	
		74LS368A	
SN74LS37	Fairchild	74LS37	
	Hitachi	HD74LS37	
	Motorola	SN74LS37	
	National	DM74LS37	
SN74LS37	Raytheon	74LS37	
	SGS	T74LS37	
	Signetics	74LS37	
SN74LS373	**AMD**	**SN74LS373**	**1227**
	Fairchild	74LS373	
	MMI	74LS373	
	Motorola	SN74LS373	
	Raytheon	74LS373	
	SGS	T74LS373	
	Signetics	**74LS373**	**783**
SN74LS374	AMD	SN74LS374	
	Fairchild	74LS374	
	MMI	74LS374	
	Motorola	SN74LS374	
	National	DM74LS374	
	Raytheon	74LS374	
	SGS	T74LS374	
	Signetics	74LS374	
SN74LS375	Fairchild	74LS375	
	Motorola	SN74LS375	
	Raytheon	74LS375	
	Signetics	74LS375	
SN74LS377	**AMD**	**SN74LS377**	**1227**
	Fairchild	74LS377	
	Motorola	SN74LS377	
	Raytheon	74LS377	
	SGS	T74LS377	
	Signetics	74LS377	
SN74LS378	AMD	SN74LS378	
	Fairchild	74LS378	
	Motorola	SN74LS378	
	SGS	T74LS378	
	Signetics	74LS378	
		SN74LS378	
SN74LS379	AMD	SN74LS379	
	Fairchild	74LS379	
	Motorola	SN74LS379	
	SGS	T74LS379	
SN74LS38	Fairchild	74LS38	
	Hitachi	HD74LS38	
	Motorola	SN74LS38	
	National	DM74LS38	
	Raytheon	74LS38	
	SGS	T74LS38	
	Signetics	74LS38	
SN74LS381	**AMD**	**SN74LS381**	**1227**
SN74LS384	AMD	SN74LS384	
	Motorola	SN74LS384	
	Raytheon	74LS384	
SN74LS385	AMD	SN74LS385	
	Motorola	SN74LS385	
	Raytheon	74LS385	
SN74LS386	Hitachi	HD74LS386	
	Motorola	SN74LS386	
	National	DM74LS386	
	Raytheon	74LS386	
SN74LS390	Fairchild	74LS390	
	Motorola	SN74LS390	
	SGS	T74LS390	
SN74LS393	Fairchild	74LS393	
	Motorola	SN74LS393	
	SGS	T74LS393	
	Signetics	74LS393	
SN74LS395	SGS	T74LS395	
SN74LS395A	Fairchild	74LS395	
	Motorola	SN74LS395A	
	National	DM74LS395	
	Raytheon	74LS395A	
	Signetics	74LS395	
SN74LS398	Motorola	SN74LS398	
SN74LS399	AMD	SN74LS399	
	Motorola	SN74LS399	
SN74LS40	Fairchild	74LS40	
	Hitachi	HD74LS40	
	Motorola	SN74LS40	
	National	DM74LS40	
	Raytheon	74LS40	
	SGS	T74LS40	
	Signetics	74LS40	
SN74LS42	Fairchild	74LS42	
	Hitachi	HD74LS42	
	Motorola	SN74LS42	
	National	DM74LS42	
	Raytheon	74LS42	
	SGS	T74LS42	
	Signetics	74LS42	
SN74LS424	AMD	SN74LS424	
SN74LS47	Fairchild	54LS47	
		74LS47	
	Hitachi	HD74LS47	
	Motorola	SN54LS47	
		SN74LS47	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

ALTERNATE SOURCE DIRECTORY

© IC MASTER 1983

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN74LS47	National	DM54LS47	
		DM74LS47	
	SGS	T74LS47	
	TI	**SN54LS47**	**847**
SN74LS48	Fairchild	74LS48	
	Hitachi	HD74LS48	
	Motorola	SN74LS48	
	National	DM74LS48	
	SGS	T74LS48	
	Signetics	74LS48	
SN74LS49	Fairchild	74LS49	
	Hitachi	HD74LS49	
	Motorola	SN74LS49	
	National	DM74LS49	
	SGS	T74LS49	
SN74LS490	Fairchild	74LS490	
	Motorola	SN74LS490	
	SGS	T74LS490	
	Signetics	74LS490	
SN74LS51	Fairchild	74LS51	
	Hitachi	HD74LS51	
	Motorola	SN74LS51	
	National	DM74LS51	
	Raytheon	74LS51	
	SGS	T74LS51	
	Signetics	74LS51	
SN74LS54	Fairchild	74LS54	
	Hitachi	HD74LS54	
	Motorola	SN74LS54	
	National	DM74LS54	
	Raytheon	74LS54	
	SGS	T74LS54	
	Signetics	74LS54	
SN74LS540	Fairchild	74LS540	
	Motorola	SN74LS540	
	Signetics	**74LS540**	**2775**
SN74LS541	Fairchild	74LS541	
	Motorola	SN74LS541	
	Signetics	**74LS541**	**2775**
SN74LS55	Fairchild	74LS55	
	Hitachi	HD74LS55	
	Motorola	SN74LS55	
	National	DM74LS55	
	Raytheon	74LS55	
	SGS	T74LS55	
SN74LS604	Motorola	SN74LS604	
SN74LS605	Motorola	SN74LS605	
SN74LS606	Motorola	SN74LS606	
SN74LS607	Motorola	SN74LS607	
SN74LS621	Motorola	SN74LS621	
SN74LS622	Motorola	SN74LS622	
SN74LS640	Motorola	SN74LS640	
	Signetics	74LS640	
		8T125	
		N8T125	
SN74LS641	Motorola	SN74LS641	
	Signetics	74LS641	
SN74LS642	Motorola	SN74LS642	
	Signetics	**74LS642**	**2772**
SN74LS643	Motorola	SN74LS643	
SN74LS644	Motorola	SN74LS644	
SN74LS645	Motorola	SN74LS645	
	Signetics	74LS645	
SN74LS668	Motorola	SN74LS668	
SN74LS669	Motorola	SN74LS669	
SN74LS670	Fairchild	74LS670	
	Motorola	SN74LS670	
	National	DM74LS670	
	Raytheon	74LS670	
	SGS	T74LS670	
	Signetics	74LS670	
SN74LS673	Motorola	SN74LS673	
SN74LS674	Motorola	SN74LS674	
SN74LS688	AMD	25LS2521	
SN74LS73A	Hitachi	HD74LS73	
	Motorola	SN74LS73A	
	National	DM74LS73	
	Raytheon	74LS73	
	Signetics	74LS73	
SN74LS74A	Fairchild	74LS74	
	Hitachi	HD74LS74	
		HD74LS74A	
	Motorola	SN74LS74A	
	National	DM74LS74	
	Raytheon	74LS74	
	SGS	T74LS74	
	Signetics	74LS74	
SN74LS75	Hitachi	HD74LS75	
	Motorola	SN74LS75	
	National	DM74LS75	
SN74LS75	Raytheon	74LS75	
	Signetics	74LS75	
SN74LS76A	Hitachi	HD74LS76	
	Motorola	SN74LS76A	
	National	DM74LS76	
	Raytheon	74LS76	
	Signetics	74LS76	
SN74LS78A	Hitachi	HD74LS78	
	Motorola	SN74LS78A	
	National	DM74LS78	
	Raytheon	74LS78	
SN74LS795	Motorola	SN74LS795	
SN74LS796	Motorola	SN74LS796	
SN74LS83A	Fairchild	74LS83A	
	Hitachi	HD74LS183A	
		HD74LS83A	
	Motorola	SN74LS83A	
	National	DM74LS83A	
	Raytheon	74LS83	
		74LS83A	
	Signetics	74LS83	
		74LS83A	
SN74LS85	Fairchild	74LS85	
	Hitachi	HD74LS85	
	Motorola	SN74LS85	
	National	DM74LS85	
	Raytheon	74LS85	
	Signetics	74LS85	
SN74LS86	Fairchild	74LS86	
	Hitachi	HD74LS86	
	Motorola	SN74LS86	
	National	DM74LS86	
	Raytheon	74LS86	
	SGS	T74LS86	
	Signetics	74LS86	
SN74LS90	Fairchild	74LS90	
	Motorola	SN74LS90	
	National	DM74LS90	
	Raytheon	74LS90	
	SGS	T74LS90	
	Signetics	74LS90	
SN74LS91	Hitachi	HD74LS91	
	Motorola	SN74LS91	
	Raytheon	74LS91	
SN74LS92	Fairchild	74LS92	
	Hitachi	HD74LS92	
	Motorola	SN74LS92	
	National	DM74LS92	
	Raytheon	74LS92	
	SGS	T74LS92	
	Signetics	74LS92	
SN74LS93	Fairchild	74LS93	
	Hitachi	HD74LS93	
	Motorola	SN74LS93	
	National	DM74LS93	
	Raytheon	74LS93	
	SGS	T74LS93	
	Signetics	74LS93	
SN74LS95B	Fairchild	74LS95B	
	Hitachi	HD74LS95B	
	Motorola	SN74LS95B	
	National	DM74LS95B	
	Raytheon	74LS95B	
	SGS	T74LS95B	
	Signetics	74LS95B	
SN74LS96	Signetics	74LS96	
SN74S00	Fairchild	74S00	
	Hitachi	HD74S00	
	National	DM74S00	
	Signetics	74S00	
SN74S02	Fairchild	74S02	
	Hitachi	HD74S02	
	National	DM74S02	
	Signetics	74S02	
	TI	**SN74S32**	**843**
SN74S03	Fairchild	74S03	
	Hitachi	HD74S03	
	National	DM74S03	
	Signetics	74S03	
SN74S04	Fairchild	74S04	
	Hitachi	HD74S04	
	National	DM74S04	
	Signetics	74S04	
SN74S05	Fairchild	74S05	
	Hitachi	HD74S05	
	National	DM74S05	
	Signetics	74S05	
SN74S08	Fairchild	74S08	
	Signetics	74S08	
SN74S10	Fairchild	74S10	
	Hitachi	HD74S10	
	National	DM74S10	
SN74S10	Signetics	74S10	
SN74S109	Fairchild	74S109	
SN74S109A	Fairchild	74LS109	
	Hitachi	HD74LS109	
	Motorola	SN74LS109	
		SN74LS109A	
	National	DM74LS109	
	Raytheon	74LS109	
	Signetics	74LS109	
	TI	**SN74LS109A**	**870**
SN74S11	Fairchild	74S11	
	Hitachi	HD74S11	
	National	DM74S11	
	Signetics	74S11	
SN74S112	Fairchild	74S112	
	Hitachi	HD74S112	
	Motorola	SN74S112	
	National	DM74S112	
	Signetics	74S112	
SN74S113	Fairchild	74S113	
	Hitachi	HD74S113	
	National	DM74S113	
	Signetics	74S113	
SN74S114	Hitachi	HD74S114	
	National	DM74S114	
SN74S12	Hitachi	HD74S12	
SN74S132	Fairchild	74S132	
SN74S133	Fairchild	74S133	
	Hitachi	HD74S133	
	National	DM74S133	
	Signetics	74S133	
SN74S134	Hitachi	HD74S134	
	National	DM74S134	
	Signetics	74S134	
SN74S135	Fairchild	74S135	
	Hitachi	HD74S135	
	National	DM74S135	
	Signetics	74S135	
SN74S138	AMD	SN74S138	
	Fairchild	74S138	
	National	DM74S138	
	Signetics	74S138	
SN74S139	AMD	SN74S139	
	Fairchild	74S139	
	National	DM74S139	
	Signetics	74S139	
SN74S140	Fairchild	74S140	
	Hitachi	HD74S140	
	National	DM74S140	
	Signetics	74S140	
SN74S15	Fairchild	74S15	
	Hitachi	HD74S15	
	National	DM74S15	
SN74S151	AMD	SN74S151	
	Fairchild	74S151	
	Hitachi	HD74S151	
	National	DM74S151	
	Signetics	74S151	
SN74S153	AMD	SN74S153	
	Fairchild	74S153	
	Hitachi	HD74S153	
	National	DM74S153	
	Signetics	74S153	
SN74S157	AMD	SN74S157	
	Fairchild	74S157	
	Hitachi	HD74S157	
	National	DM74S157	
	Signetics	74S157	
SN74S158	AMD	SN74S158	
	Fairchild	74S158	
	Hitachi	HD74S158	
	National	DM74S158	
	Signetics	74S158	
SN74S168	Signetics	74S168	
SN74S169	Signetics	74S169	
SN74S174	AMD	SN74S174	
	Fairchild	74S174	
	Hitachi	HD74S174	
	National	DM74S174	
	Signetics	74S174	
SN74S175	AMD	SN74S175	
	Fairchild	74S175	
	Hitachi	HD74S175	
	National	DM74S175	
	Signetics	74S175	
SN74S181	AMD	SN74S181	
	Fairchild	93S41C	
	Hitachi	HD74S181	
	Signetics	74S181	
SN74S182	Fairchild	74S182	
	Hitachi	HD74S182	
	MMI	74S182	
SN74S182	National	DM74S182	
	Signetics	74S182	
SN74S189	AMD	AM27LS03	
		AM27S03	
		AM54S189	
		AM74S189	
		SN54S189	
		SN74S189	
	Fairchild	54S189	
		74S189	
		93405	
	Hitachi	HD74S189	
	MMI	5561	
		6561	
	National	DM54S189	
		DM74S189	
		DM7599	
		DM8599	
	Raytheon	RC8225	
	Signetics	54S189	
		74S189	
	TI	SN54S189	
SN74S194	AMD	SN74S194	
	Fairchild	74S194	
	Signetics	74S194	
SN74S195	AMD	SN74S195	
	Fairchild	74S195	
		93S00C	
	National	DM74S195	
	Signetics	74S195	
SN74S196	Signetics	74S196	
SN74S197	Signetics	74S197	
SN74S20	Fairchild	74S20	
	Hitachi	HD74S20	
	National	DM74S20	
	Signetics	74S20	
SN74S200	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S201	**440,905**
SN74S201	AMD	AM27LS00	
		AM29721	
	Fairchild	93421	
		93L420	
		93L421	
	Intel	3106	
	MMI	5531	
		6531	
	Motorola	4256	
	National	93L420	
		93L421	
		DM54S200	
		DM74S200	
	NEC-Electron	μPB2200	
	Signetics	54S200	
		54S201	
		74200	
		N82S116	
		N82S16	
		S82S116	
		S82S16	
	TI	SN54LS200	
		SN54S200	
		SN54S201	
		SN74LS200	
		SN74S200	
SN74S22	Fairchild	74S22	
	Hitachi	HD74S22	
	National	DM74S22	
SN74S240	AMD	SN74S240	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

© IC MASTER 1983

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN74S240	MMI	74S240	
		SN74S240	**715**
	Signetics	74S240	
SN74S241	AMD	SN74S241	
	MMI	74S241	
		SN74S241	**715**
	Signetics	74S241	
SN74S244	MMI	**SN74S244**	**715**
SN74S251	AMD	SN74S251	
	Hitachi	HD74S251	
	National	DM74S251	
	Signetics	74S251	
SN74S257	AMD	SN54S257	
		SN74S257	
	Fairchild	74S257	
	Hitachi	HD74S257	
	National	DM7123	
		DM74S257	
		DM8123	
	Signetics	54S257	
		74S257	
	TI	**SN54S257**	**916**
SN74S258	AMD	SN74S258	
	Fairchild	74S258	
	Hitachi	HD74S258	
	Signetics	74S258	
SN74S280	Hitachi	HD74S280	
	National	DM74S280	
	Signetics	74S280	
SN74S281	National	DM74S281	
SN74S289	AMD	3101	
		3101A	
		31L0101	
		AM27LS02	
		AM27S02	
		AM3101	
		AM3101A	
		AM5489-1	
		AM54S289	
		AM7489-1	
		AM74S289	
		SN54S289	
		SN74S289	
	Fairchild	54S289	
		7489	
		74S289	
	Hitachi	HD7489	
		HD74S289	
	Intel	3101	
	Intersil	5501	
	MMI	5560	
		6560	
	Motorola	4064	
	National	DM5489	
		DM54S289	
		DM7489	
		DM74S289	
		DM7589	
		DM8589	
		MM54S289	
		MM74S289	
	NEC-Electron	μPB2089	
		μPB2289	
	Signetics	3101	
		3101A	
		54S301	
		7489	
		82S25	
		N3101	
		N54S289	
		N74S289	
		N8225	
		N8255	
		N82S25	
		S3101	
		S74S289	
		S8225	
		S82S25	
	TI	SN5489	
		SN54S289	
		SN7489	**440,863**
SN74S30	Fairchild	74S30	
	National	DM74S30	
SN74S300	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
SN74S300	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S301	**927**
SN74S301	AMD	AM2701	
		AM27LS01	
		AM29720	
	Fairchild	93411	
		93L411	
	Intel	3107	
	MMI	5530	
		6530	
	National	DM74S206	
		N82S117	
		N82S17	
		S82S117	
		S82S17	
	Signetics	74S301	
		82S17	
	TI	SN54LS300	
		SN54S300	
		SN54S301	
		SN74206	
		SN74LS300	
		SN74S300	
SN74S314	AMD	93415	
		93425	
		AM93415	
	AMI	4015	
		4025	
	Fairchild	93415	
		93425A	
	Fujitsu	93415	
		93425	
	Hitachi	**HM2510**	**3789**
		HM2511	**3789**
	Intel	2115A	
	Motorola	MCM2115	
		MCM93415	
	Signetics	82S10	
		N82S10	
		N82S110	
		S82S10	
		S82S110	
	TI	SN54S314	
SN74S32	Fairchild	74S02	
	Hitachi	HD74S02	
	National	DM74S02	
	Signetics	74S02	
	TI	**SN74S02**	**833**
SN74S37	Signetics	74S37	
SN74S373	MMI	74S373	
		SN74S373	**715**
	Signetics	74S373	
SN74S374	MMI	74S374	
		SN74S374	**715**
	Signetics	74S374	
SN74S40	Fairchild	74S40	
	Hitachi	HD74S40	
	National	DM74S40	
	Signetics	74S40	
SN74S412	AMD	3212	
		8212	
	Intel	8212	
	National	DP8212	
		INS8212	
	NEC-Micro	μPB8212	
	TI	**SN54S412**	**945**
SN74S428	AMD	8228	
	Intel	8228	
	National	DP8228	
		INS8228	
	NEC-Micro	μPB8228	
	TI	**TIM8228**	**3980**
SN74S438	AMD	8238	
	Intel	8238	
	National	DP8238	
		INS8238	
	NEC-Micro	μPB8238	
	TI	**TIM8238**	**3980**
SN74S454	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		TBP24S81	
			440,3968
		TBP24S81M	
			440,3968
SN74S51	Fairchild	74S51	
	Hitachi	HD74S51	
	National	DM74S51	
	Signetics	74S51	
SN74S571	AMD	AM27S13	
	Fairchild	93446	
	Fujitsu	MB7053	
	Harris	HM7621	
	Intel	3622	
	MMI	6306	
	Motorola	MCM7621	
	National	DM74S571	
	Signetics	82S131	
SN74S65	Fairchild	74S65	
	Hitachi	HD74S65	
	National	DM74S65	
SN74S74	Fairchild	74S74	
	Hitachi	HD74S74	
	National	DM74S74	
	Signetics	74S74	
SN74S85	Signetics	74S85	
SN74S86	Fairchild	74S86	
	Hitachi	HD74S86	
	National	DM74S86	
	Signetics	74S86	
SN75107	Fairchild	75107	
	Motorola	MC75107	
	National	DS75107	
		LM75107A	
	TI	SN75107B	
SN75107A	Hitachi	HD75107A	
SN75107B	Fairchild	75107	
	Motorola	MC75107	
	National	DS75107	
		LM75107A	
	TI	SN75107	
SN75108	Fairchild	75108	
	Motorola	MC75108	
	National	DS75108	
		LM75108A	
	TI	SN75108B	
SN75108A	Hitachi	HD75108A	
SN75108B	Fairchild	75108	
	Motorola	MC75108	
	National	DS75108	
		LM75108A	
	TI	SN75108	
SN75109	Motorola	MC75109	
	TI	SN75109A	
SN75109A	Motorola	MC75109	
	TI	SN75109	
SN75110	Fairchild	75110	
	Hitachi	HD75110	
	Motorola	MC75110	
	National	LM75110	
	TI	SN75110A	
SN75110A	Fairchild	75110	
	Hitachi	HD75110	
	Motorola	MC75110	
	National	LM75110	
	TI	SN75110	
SN75114	Fairchild	96114	
		9614	
	TI	SN55114	
SN75115	Fairchild	96115	
		9615	
	TI	9615	
		SN55115	
SN75121	Motorola	MC8T13	
	National	DS75121	
		LM75121	
	Signetics	N8T13	
	TI	N8T13	
SN75122	Motorola	MC8T14	
	National	DS75122	
		LM75122	
	Signetics	N8T14	
	TI	N8T14	
SN75123	Motorola	MC8T23	
	National	DS75123	
		LM75123	
	Signetics	N8T23	
	TI	N8T23	
SN75124	Motorola	MC8T24	
	National	DS75124	
		LM75124	
	Signetics	N8T24	
	TI	N8T24	
SN75125	**Motorola**	**MC75125**	**2753**
	National	DS75125	
SN75126	**Motorola**	**MC3485**	**2753**
SN75127	**Motorola**	**MC75127**	**2753**
	National	DS75127	
SN75128	**Motorola**	**MC75128**	**2753**
	National	DS75128	
SN75129	**Motorola**	**MC75129**	**2753**
	National	DS75129	
SN75138	SiliconG	SG75138	
SN75140	Motorola	MC75140	
SN75150	Fairchild	75150	
	National	DS75150	
SN75152	Fairchild	9627	
SN75154	Fairchild	75154	
	Hitachi	HD75154	
	National	DS75154	
	SiliconG	SG75154	
SN75160	National	DS75160	
SN75161	National	DS75161	
SN75162	National	DS75162	
SN75180	National	DS8800	
SN75182	National	DS8820	
		DS8880	
	Signetics	DS8820	
	TI	DS8820	
		SN75480	
SN75183	National	DS8830	
	Signetics	DS8830	
	TI	DS8830	
SN75188	AMD	MC1488	
	Exar	**XR1488**	**3188**
	Fairchild	μA1488	
	Harris	HA1488	
	Hitachi	HD75188	
	Motorola	**MC1488**	**2753**
	National	DS1488	
	Raytheon	RM1488	
	Signetics	MC1488	
	SiliconG	SG1488	
	TI	MC1488	
SN75189	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189A	
		SN85189	
SN75189A	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SN75462	TI	MC1489A	
		SN75189	
		SN85189	
SN7520	Fairchild	7520	
	Motorola	MC7520	
	SiliconG	SG7520	
SN75207B	National	DS75207	
SN75208B	National	DS75208	
SN7521	Fairchild	7521	
	Motorola	MC7521	
	National	LM7521	
	SiliconG	SG7521	
SN7522	Motorola	MC7522	
	SiliconG	SG7522	
SN75224	Fairchild	75S24	
	Hitachi	HA1902	
	Motorola	MC7524	
	National	75S24	
	Signetics	SN7524	
	SiliconG	SG7524	
	TI	SN7524	
SN7523	Motorola	MC7523	
	National	LM7523	
	Raytheon	RC7523	
	SiliconG	SG7523	
SN75234	Fairchild	75S234	
SN75235	Motorola	MC75235	
SN75236	SiliconG	SG75236	
SN7524	Fairchild	75S24	
	Hitachi	HA1902	
	Motorola	MC7524	
	National	75S24	
	Signetics	SN7524	
	SiliconG	SG7524	
	TI	SN75224	
SN7528	Motorola	MC7528	
	Raytheon	RC7528	
	SiliconG	SG7528	
	Thomson-CSF	SFC2528	
SN75322	National	DS75322	
SN75324	National	DS75324	
SN75325	Motorola	MC75325	
	National	DS75325	
	SiliconG	SG75325	
SN75361	National	DS75361	
	TI	SN75361A	
SN75361A	National	DS75361	
	TI	SN75361	
SN75362	National	DS75362	
SN75365	Motorola	MC75365	
	National	DS75365	
SN75368	Motorola	MC75358	
		MC75368	
SN75430	Fairchild	75430	
SN75450	Fairchild	75450	
	Motorola	MC75450	
	National	DS75450	
	SiliconG	SG75450	
SN75450A	Hitachi	HD75450A	
SN75451	Fairchild	75451	
	Motorola	MC75451	
	National	DS75451	
	SiliconG	SG75451	
SN75451A	Hitachi	HD75451A	
SN75452	Fairchild	75452	
	Hitachi	HD75452	
	Motorola	MC75452	
	National	DS75452	
	SiliconG	SG75452	
SN75453	Fairchild	75453	
	Hitachi	HD75453	
	Motorola	MC75453	
	National	DS75453	
		LM75453	
	SiliconG	SG75453	
SN75454	Motorola	MC75454	
	National	DS75454	
	SiliconG	SG75454	
SN75460	Motorola	MC75460	
	National	DS75460	
	SiliconG	SG75460	
SN75461	Fairchild	75461	
	Motorola	MC75401	
		MC75461	
	National	DS75461	
	SiliconG	SG75461	
SN75462	Fairchild	75462	
	Motorola	MC75402	
		MC75462	
SN75475	National	DS75462	
	SiliconG	SG75462	
SN75463	Motorola	MC75403	
		MC75463	
	National	DS75463	
	SiliconG	SG75463	
SN75464	Motorola	MC75404	
		MC75464	
	National	DS75464	
SN75466	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	ULN2001	
	Toshiba	TD62001	
		TD62101	
SN75467	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	ULN2002	
	Toshiba	TD62002	
SN75468	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	ULN2003	
		ULN2004	
	Toshiba	TD62003	
		TD62004	
SN75469	Sprague	ULN-2024	
SN75470	SiliconG	SG75470	
SN75471	Fairchild	75471	
	SiliconG	SG7541	
		SG75471	
SN75472	Fairchild	75472	
	SiliconG	SG7542	
		SG75472	
SN75473	SiliconG	SG7543	
SN75474	SiliconG	SG7544	
SN75475	Motorola	MC1472	
	Sprague	UDN-5712	
SN75189A	TI	SN75477	
SN75476	Sprague	UDN-5711	
SN75477	Motorola	MC1472	
	Sprague	UDN-5712	
	TI	SN75475	
SN75478	Sprague	UDN-5713	
SN75479	Sprague	UDN-5714	
SN75480	National	DS8820	
		DS8880	
	Signetics	DS8820	
	TI	DS8820	
		SN75182	
SN75491	Fairchild	75491	
	Motorola	MC75491	
	National	DS75491	
SN75492	Fairchild	75492	
	Motorola	MC75492	
	National	DS75492	
SN75493	National	DS75493	
SN75494	National	DS75494	
SN76001	SGS	TBA820	
	Thomson-CSF	TBA820	
SN76111	Motorola	μA758	
	National	**LM1800**	**3325,3328**
	RCA	CA758	
	Signetics	μA758	
	TI	SN76116	
SN76115	Exar	XR1310	
	Hitachi	HA1156	
	National	**LM1310**	**3325,3328**
	RCA	CA1310	
	Sanyo	LA3350	
	Sprague	ULN-2211	
		ULN-3810	
	Toshiba	TA7157	
SN76116	Motorola	μA758	
	National	**LM1800**	**3325,3328**
	RCA	CA758	
	Signetics	μA758	
	TI	SN76111	
SN76131	Exar	XR4739	
	Fairchild	μA739	
		μA749	
	Motorola	MC1339	
	National	**LM1303**	**3325**
	Raytheon	RC4739	
	SGS	TBA231	
	TI	SN76149	
SN76149	Exar	XR4739	
	Fairchild	μA739	
		μA749	
	Motorola	MC1339	
	National	**LM1303**	**3325**
	Raytheon	RC4739	
	SGS	TBA231	
	TI	SN76131	
SN76177	National	LM377	
SN76227	Motorola	MC1327	
		TDA1327	
SN76242	RCA	CA3070	
SN76243	RCA	CA3071	
	TI	SN76246	
SN76246	RCA	CA3071	
	TI	SN76243	
SN76266	National	LM3066	
	RCA	CA3066	
SN76267	RCA	CA3067	
SN76298	Motorola	MC1398	
	RCA	CA1398	
SN76489	GI	AY-3-8913	
SN76591	Motorola	MC1391	
	National	LM1391	
	RCA	CA1391	
SN76594	Motorola	MC1394	
	National	LM1394	
	RCA	CA1394	
SN76600	Motorola	MC1350	
	Thomson-CSF	ESM1350	
SN76635	National	LM1820	
	RCA	CA3123	
SN76642	Fairchild	ULN-2136	
	Motorola	MC1352	
		MC1357	
	RCA	CA1352	
		CA2111	
		CA3014	
	Sanyo	LA1352	
	Sprague	ULN-2111	
		ULN-2136	
	TI	SN76642	
		SN76643	
		SN76669	
SN76643	Fairchild	ULN-2136	
	Motorola	MC1352	
		MC1357	
	RCA	CA1352	
		CA2111	
		CA3014	
	Sanyo	LA1352	
	Sprague	ULN-2111	
		ULN-2136	
	TI	SN76642	
		SN76650	
		SN76669	
SN76650	Fairchild	ULN-2136	
	Motorola	MC1352	
		MC1357	
	RCA	CA1352	
		CA2111	
		CA3014	
	Sanyo	LA1352	
	Sprague	ULN-2111	
		ULN-2136	
	TI	SN76642	
		SN76643	
		SN76669	
SN76651	Motorola	MC1351	
SN76666	Motorola	M5140	
		MC1358	
		MC1364	
	National	LM3064	
	RCA	CA3064	
		CA3065	
	Sanyo	LA1365	
SN76669	Fairchild	ULN-2136	
	Motorola	MC1352	
		MC1357	
	RCA	CA1352	
		CA2111	
		CA3014	
	Sanyo	LA1352	
	Sprague	ULN-2111	
		ULN-2136	
	TI	SN76642	
		SN76643	
		SN76650	
SN76675	**National**	**LM3075**	**3325,3327**
	RCA	CA3075	
SN76676	RCA	CA3076	
SN76689	Hitachi	HA1137	
		LA1230	
	Motorola	MC1389	
	National	CA3089	
		LM3089	**3325,3327**
	RCA	CA3089	
	Sanyo	LA1230	
		LA3089	
	SGS	TCA3089	
		TDA1200	
	Signetics	CA3089	
	Siliconix	CA3089	
SN85189	AMD	MC1489	
	Exar	XR1489	
		XR1489A	**3188**
	Fairchild	μA1489	
		μA1489A	
	Hitachi	HD75189	
	Motorola	**MC1489**	**2753**
		MC1489A	**2753**
	National	DS1489	
		DS1489A	
	Signetics	MC1489	
		MC1489A	
	SiliconG	SG1489	
		SG1489A	
	TI	MC1489A	
		SN75189	
		SN75189A	
TBP18S030	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	**3826**
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
TBP18S030	TI	**TBP18S030M**	**440,3965**
TBP18S030M	AMD	AM27LS19	
		AM27S19	
	Harris	HM7603	
	MMI	5331-1	
		53LS081	
		6331-1	**3826**
		63LS081	
	National	DM54S288	
		DM74S288	
		DM7578	
		DM8578	
	Signetics	82S123	
		N82S123	
		S82S123	
	Supertex	MM74S288	
		SM74S288	
	TI	**TBP18S030**	**440,3965**
TBP18SA030	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		6330-1	**3826**
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBPSA030M	
TBP24S10	AMD	AM27S11	
		AM27S21	
	Harris	HM7611	
		HM7611-2	**3696**
	Intel	M3621	
	Intersil	IM5623	
	MMI	5301-1	
		6301-1	**3826**
	National	DM54S287	
		DM74S287	
		DM76L97	
		DM86L97	
	Raytheon	29661	
	Signetics	N82S129	
		S82S129	
TBP24S41	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41M**	**440,3968**
		TBP28S41	
		TBP28S41M	
TBP24S41M	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP28S41	
		TBP28S41M	
TBP24S81	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81M	**440,3968**
TBP24S81M	AMD	AM27S185	
	Fujitsu	**MB7128**	**3679**
	Harris	HM7685	
		HM7685-2	**3714**
	MMI	53101	
		63101	
		63S841	**3826,3833**
	Motorola	MCM7685	
	National	DM77S185	
		DM87S185	
	Raytheon	29651	
		29651A	
		29651AM	
	Signetics	82HS185	
		N82S185	
		S82HS185	
		S82S185	
	TI	SN54S454	
		SN74S454	
		TBP24S81	**440,3968**
TBP24SA10	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	**3696**
	Intel	M3601	
	MMI	5300-1	
		6300-1	**3826**
	National	DM54S387	
		DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
TBP24SA10	TI	**TBP24SA10M**	**440,3967**
TBP24SA10M	AMD	AM27S20	
	Fairchild	93417	
	Fujitsu	MB7057	
	Harris	HM7610	
		HM7610-2	**3696**
	Intel	M3601	
	MMI	5300-1	
		6300-1	**3826**
	National	DM54S387	
		DM74S387	
	Raytheon	29660	
	Signetics	N82S126	
		S82S126	
	TI	**TBP24SA10**	**440,3967**
TBP24SA41	AMD	AM27S32	
	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642	
		HM7642-2	**3705**
	Intel	M3605	
	MMI	5352-1	
		6352	
	National	DM54S572	
		DM74S572	
	Raytheon	29640	
	Signetics	N82S136	
		S82S136	
	TI	**TBP24SA41M**	**440,3968**
TBP24SA41M	AMD	AM27S32	
	Fairchild	93452	
	Fujitsu	MB7121	
	Harris	HM7642	
		HM7642-2	**3705**
	Intel	M3605	
	MMI	5352-1	
		6352	
	National	DM54S572	
		DM74S572	
	Raytheon	29640	
	Signetics	N82S136	
		S82S136	
	TI	**TBP24SA41**	**440,3968**
TBP24SA81	AMD	AM27S184	
	Fujitsu	MB7127	
	Harris	HM7684	
	MMI	53100	
		63100	
	Motorola	MCM7684	
	National	DM77S184	
		DM87S184	
	Raytheon	29650	
	Signetics	N82S184	
TBP28L22	MMI	5309-1	
		6309-1	**3826**
	TI	**TBP28L22M**	**440,3969**
TBP28L22M	MMI	5309-1	
		6309-1	**3826**
	TI	**TBP28L22**	**440,3969**
TBP28L86	Fairchild	93L451	
	Signetics	N82LS181	
		S82LS181	
TBP28LA22	MMI	5308-1	
		6308-1	**3826**
	TI	**TBP28LA22M**	**440,3969**
TBP28LA22M	MMI	5308-1	
		6308-1	**3826**
	TI	**TBP28LA22**	**440,3969**
TBP28S166	AMD	AM27S191	
	Fairchild	93511	
		93Z511	
	Fujitsu	7138	
		MB7138	
		MBM7138	
	Harris	HM76161	
	Hitachi	HN25169	
	Intel	3636B	
		M3636	
	National	87S191	
		DM77S191	
		DM87S191	
	Raytheon	29681	
		29681A	
TBP28S166	Signetics	82S191	
		N82S191	
		S82S191	
	Supertex	MM82S191	
		SM82S191	
TBP28S2708	Harris	HM7608	
	Raytheon	29635	
	Signetics	N82S2708	
		S82S2708	
TBP28S41	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
TBP28S41M	AMD	AM27S33	
		AM27S33M	
		AM27S41	
	Fairchild	93453	
		93453C	
		93453M	
	Fujitsu	MB7122	
		MB7134	
	Harris	HM76165	
		HM7643	
		HM7643-2	**3705**
		HM7643A	
	Hitachi	HN25045	
	Intel	3625A	
		M3625	
	MMI	5353	
		53S1641	**3836**
		6353-1	**3826**
		63S1641	**3826,3836**
	Motorola	MCM7643	
		MCM7643M	
	National	74S573	
		DM54S573	
		DM54S573A	
		DM74S573	
	NEC-Micro	μPB426	
	Raytheon	29641	
	Signetics	82HS137	
		82S137	
		N82S137	
		S82HS137	
		S82S137	
	TI	**TBP24S41**	**440,3968**
		TBP24S41M	**440,3968**
		TBP28S41	
TBP28S42	AMD	AM27S29	
	Fujitsu	MB7124	
		MBM7124	
	Harris	HM7649	
	MMI	5349-1	
		6349-1	**3826**

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
TBP28S42	Motorola	MCM7649	
	National	DM54S472	
		DM74S472	
	Raytheon	29621	
	Signetics	N82S147	
		S82S147	
	TI	DM54S472	
		TBP28S42M	
			440,3975
TBP28S42M	AMD	AM27S29	
	Fujitsu	MB7124	
		MBM7124	
	Harris	HM7649	
	MMI	5349-1	
		6349-1	**3826**
	Motorola	MCM7649	
	National	DM54S472	
		DM74S472	
	Raytheon	29621	
	Signetics	N82S147	
		S82S147	
	TI	DM54S472	
		TBP28S42	
			440,3975
TBP28S46	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	**3826**
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	**TBP28S46M**	
			440,3976
TBP28S46M	AMD	AM27S31	
	Fairchild	93448	
	Fujitsu	MB7126	
	Harris	HM7641	
	Intel	M3624	
	MMI	5341-1	
		6341-1	**3826**
	Motorola	MCM7641	
	National	DM54S474	
		DM74S474	
		DM77S474	
		DM87S474	
	Raytheon	29625	
	Signetics	N82S141	
		S82S141	
	TI	**TBP28S46**	
			440,3976
TBP28S86	AMD	AM27PS181	
		AM27S181	
		AM27S181M	
		AM27S281	
	Fairchild	93451M	
		93Z451	**3652**
		F93451	
	Fujitsu	**MB7132**	**3679**
		MB7132H	**3679**
	Harris	HM7681	
		HM7681-2	**3711**
	Hitachi	HN25089	
	Intel	3628	
		3628A	
		3628B	
		M3628	
	MMI	5381-1	
		6381-1	**3826**
	Motorola	MCM7681	
	National	87S181	
		DM77S181	
		DM87S181	
		DM87S228	
	Raytheon	29631	
		29631A	
		29631AM	
		29633	
	Signetics	825181	
		82HS181	
		N82S181	
		S82HS181	
		S82S181	
	Supertex	SM82S181	
	TI	TBP28S86	
TBP28SA42	AMD	AM27S28	
	Fujitsu	MB7123	
		MB7124	
		MC7124	
	Harris	HM7648	
	MMI	5348	
		6348	
	National	DM54S473	
		DM74S473	
	Raytheon	29620	
	Signetics	N82S146	
		S82S146	
TBP28SA46	AMD	AM27S30	
	Fairchild	93438	
	Harris	HM7640	
	Intel	M3604	
	MMI	5340-1	
		6340-1	**3826**
	National	DM54S475	
		DM74S475	
		DM77S295	
		DM77S475	
		DM87S295	
		DM87S475	
		SN54S475	
		SN74S475	
	Raytheon	29624	
	Signetics	N82S140	
		S82S140	
TBP28SA86	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	**TBP28SA86M**	**3978**
TBP28SA86M	AMD	AM27S180	
		AM27S280	
	Fairchild	93450	
		93Z450	**3652**
	Fujitsu	**MB7131**	**3679**
	Harris	HM7680	
	MMI	5380-1	
		6380-1	**3826**
TBP28SA86M	Motorola	MCM7680	
	National	DM77S180	
		DM87S180	
		DM87S229	
	NEC-Micro	μPB408	
	Raytheon	29630	
	Signetics	N82S180	
		S82S180	
	TI	TBP28SA86	
TBPSA030M	AMD	AM27S18	
	Harris	HM7602	
	MMI	5330-1	
		6330-1	**3826**
		63LS080	
	National	DM54S188	
		DM59S188	
		DM74S188	
		DM7577	
		DM7588	
		DM8577	
	Signetics	N82S23	
		S82S23	
	Supertex	MM74S188	
		SM74S188	
	TI	TBP18SA030	
TIM8228	AMD	8228	
	Intel	8228	
	National	DP8228	
		INS8228	
	NEC-Micro	μPB8228	
	TI	**SN74S428**	**946**
TIM8238	AMD	8238	
	Intel	8238	
	National	DP8238	
		INS8238	
	NEC-Micro	μPB8238	
	TI	**SN74S438**	**946**
TL072	Exar	XR072	
	Fairchild	μAF772	
	PMI	OP-25	
TL074	Exar	XR074	
	Motorola	MC34004	
	National	**LF347**	**3309,3326**
	TI	TL084C	
TL080	**RCA**	**CA030**	**3348**
TL081	Fairchild	μAF771	
	RCA	**CA031**	**3348**
TL081AC	**Motorola**	**MC34001B**	**3293**
TL081C	**Motorola**	**MC34001**	**3293**
TL081M	**Motorola**	**MC35001B**	**3293**
TL082	**Exar**	**XR082**	**3206**
	RCA	**CA032**	**3348**
TL082AC	**Motorola**	**MC34002B**	**3293**
TL082BC	**Motorola**	**MC34002A**	**3293**
TL082C	**Motorola**	**MC34002**	**3293**
TL082M	**Motorola**	**MC35002B**	**3293**
TL083	**Exar**	**XR033**	**3206**
	RCA	**CA033**	**3348**
TL084	**Exar**	**XR034**	**3206**
	Fairchild	μAF774	
	RCA	**CA084**	**3348**
TL084AC	**Motorola**	**MC34004B**	**3293**
TL084BC	**Motorola**	**MC34004A**	**3293**
TL084C	Exar	XR074	
	Motorola	MC34004	
	National	**LF347**	**3309,3326**
	TI	TL074	
TL084M	Motorola	MC35004	
TL182	Intersil	DG182	
	Siliconix	DG182	
TL185	Harris	HI5045	
	Intersil	DG185	
		IH5045	
	Siliconix	DG185	
		DG5045	
TL188	Harris	HI5042	
	Intersil	DG188	
		IH5042	
	Siliconix	DG188	
		DG5042	
TL431	Fairchild	μA431	
	Motorola	TL431	
TL493	Motorola	TL493	
TL494	Fairchild	μA494	
	Motorola	TL494	
TL495	Motorola	TL495	
TL514	Motorola	MC1414	
	National	**LM1414**	**3317**
	TI	TL720	
TL720	Motorola	MC1414	
	National	**LM1414**	**3317**
	TI	TL514	
TMS2147	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	Toshiba	TMM315	
	Universal	UM2147	
TMS2508	Harris	HM6758	
	TI	TMS2758	
TMS2516	AMD	2716	
	Fairchild	F2716	
	Fujitsu	MBM2716	
	Hitachi	**HM462716**	**3789**
	Intel	**2716**	**3818,3822**
		M2716	
	Mitsubishi	M5L2716	
	Mostek	MK2716	
	Motorola	MCM2716	
	National	MM2716	
	NEC-Micro	μPD2716	
	OKI	**MSM2716**	**3873**
	Panasonic	MN2716	
	SGS	M2716	
TMS2532	**Hitachi**	**HM462532**	**3789**
	Motorola	MCM2532	
	National	MM2532	
		NMC2532	
		TDA2530	
		TDA2532	
	Plessey	TDA2530	
	Siemens	TDA2530	
	Signetics	TDA2530	
		TDA2532	
	SiliconG	SG2532	
	Universal	UM2532	
TMS2564	Supertex	CM6400	
TMS2708	AMD	2708	
	Fairchild	F2708	
	Hitachi	HN462708	
	Motorola	MC27A08	
		MCM2708	
	National	MM2708	
	NEC-EA	EA2708	
	Panasonic	MN2708	
	Rockwell	2708	
	SGS	M2708	
TMS2758	Harris	HM6758	
	TI	TMS2508	
TMS4016	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	Toshiba	TC5516	
		TMM2016	
TMS4043	AMD	2112	
	Synertek	SY2112	
TMS4044	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
TMS4044	RCA	CDM5104	
	Zilog	6104	
		Z6104	
TMS4045	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS40L45	
	Toshiba	TMM314	
		TMM314A	
TMS40L45	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
	Toshiba	TMM314	
		TMM314A	
TMS4108-15	National	MM5298	
TMS4116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	Toshiba	TMM416	
	Zilog	Z6116	
TMS4164	Fairchild	F64K	
	Fujitsu	MB8264	
		MB8265	
	Hitachi	HM4864	
	Intel	2164	
TMS4164	Motorola	MCM6664	
		MCM6665	
	National	NMC4164	
	NEC-Micro	μPD4164	
	Toshiba	TMM4164	
TMS4516	AMD	AM4516	
	Fujitsu	MB8118	
	Hitachi	HM4816	
		HM4816A	
	Intel	2118	
	Intersil	IM7118	
	Mostek	4516	
		MK4516	
	National	NMC5295	
	NEC-Micro	2118	
TMS4732	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	R03-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
	Toshiba	TMM333	
	Universal	UM2332	
TMS4764	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	Toshiba	TM2364	
TMS8080	AMD	9080	
		9080A	
		AM9080	
	Intel	8080A	
		D8080	
		MD8080	
		P8080	
	National	DP8080A	
		INS8080A	
	NEC-Micro	μPD8080	
	TI	TMS8080A	
TMS8080A	AMD	9080	
		9080A	
		AM9080	
	Intel	8080A	
		D8080	
		MD8080	
		P8080	
	National	DP8080A	
		INS8080A	
	NEC-Micro	μPD8080	
	TI	TMS8080	
TMS9900	AMI	S9900	
TMS99000	AMI	S99000	
TMS9901	AMI	S9901	
TMS9902	AMI	S9902	
TMS9903	AMI	S9903	
TMS9904	AMI	S9904	
TMS9927	SSS	SND5027	
	SMC	CRT5027	
TMS9940	AMI	S9940	
TMS9980	AMI	S9980	
TMS9981	AMI	S9981	
TMS9995	AMI	S9995	
TP4000 Series	RCA	CD4XXX	
TP4000 series	Fairchild	34XXX	
		F4XXX	
	Hitachi	HD14XXX	
	Motorola	MC14XXX	
	National	CD4XXX	
	OKI	MSM4XXX	
	SGS	HCF4XXX	
	SSS	SCL4XXX	
	Solitron	CM4XXX	
	Toshiba	TC4XXX	
TP4002	Fairchild	F4002	
	Hitachi	HD14002	
	Motorola	MC14002	
	National	CD4002	
	RCA	CD4002	
	SGS	HCF4002	
	Signetics	HEF4002	
	SSS	SCL4002	
	Solitron	CM4002	
	Toshiba	TC4002	
UCN4810	Fairchild	F4068	
	Hitachi	HD14068	
	Motorola	MC14068	
	RCA	CD4068	
	SGS	HCF4068	
	Signetics	HEF4068	
	SSS	SCL4068	
		SCL4412	
	Solitron	CM4068	
	Toshiba	TC4068	
UDN2841	Sprague	UDN-2841	
UDN2842	Sprague	UDN-2842	
UDN2843	Sprague	UDN-2843	
UDN2844	Sprague	UDN-2844	
UDN2845	Sprague	UDN-2845	
UDN2846	Sprague	UDN-2846	
ULN2001	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
	Toshiba	TD62001	
		TD62101	
ULN2002	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
	Toshiba	TD62002	
ULN2003	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
	Toshiba	TD62003	
		TD62004	
ULN2004	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
	Toshiba	TD62003	
		TD62004	
ULN2005A	**Sprague**	**ULN-2005A**	**2843**
ULN2064	Sprague	ULN-2064	
	Toshiba	TD62064	
ULN2065	Sprague	ULN-2065	
ULN2066	Sprague	ULN-2066	
ULN2067	Sprague	ULN-2067	
ULN2068	**Motorola**	**ULN2068**	**2753**
	Sprague	ULN-2068	
ULN2069	Sprague	ULN-2069	
ULN2074	Motorola	ULN2074	
	Sprague	ULN-2074	
	Toshiba	TD62074	
ULN2075	Sprague	ULN-2075	
XR4151	**Exar**	**XR4151**	**3193**
	Raytheon	RC4151	
		RM4151	
		RV4151	
XR4152	Raytheon	RV4152	
XR4156	AMD	LM148	
		LM248	
		LM348	
	Exar	XR4212	
	Harris	HA-4741	
	MicroPwr	MP5511	
	Motorola	MC4741	
	National	LM148	
		LM248	
		LM348	
	NEC-Electron	μPC4741	
	PMI	OP-11	
	Raytheon	HA4741	
		LM148	
		LM348	
		RC4156	
		RM4156	
	TI	LM148	
		LM248	
uA2240	Exar	XR2240	
	Fairchild	μA2240	
	Intersil	ICL8240	
uA709	Fairchild	μA709	
	Hitachi	HA1303	
	Motorola	MC1709	
	National	LM1709	
		LM709	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Texas Instruments (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
µA709	NEC-Electron	µPC255	
		µPC55	
	Raytheon	RC709	
		RM709	
	RCA	CA3038	
	Thomson-CSF	SFC2709	
	Toshiba	TA7502	
uA710	Fairchild	µA710	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM710	
		MC1710	
	National	**LM710**	**3317**
	PMI	CMP-01	
		CMP-02	
	Raytheon	RM710	
	SiliconG	SG710	
	Thomson-CSF	SFC2710	
uA711	Fairchild	µA711	
	Motorola	MC1711	
	National	**LM711**	**3317**
	SiliconG	SG711	
	Thomson-CSF	SFC2711	
uA714	AMD	LM108	
	AD	**AD108**	**3153**
	Fairchild	µA108	
		µA725	
	Intel	ISBC108	
	Intersil	ICL108	
		LM108	
	MicroPwr	MP5501	
		MP5505	
		MP5508	**401,3292**
		OP-05	
		OP08	
	Motorola	LM108	
	National	LM108	
		LM108A	
	NEC-Electron	µPC154	
	PMI	OP-05	
		OP-06	
		OP-07	
		OP-08	
		OP01	
		PM108	
		PM725	
	Raytheon	LM108	
		RC725	
		RM725	
	RCA	**CA3493**	**3351**
	Signetics	LM108	
	SiliconG	SG108	
uA723	Fairchild	µA723	
	Hitachi	HA17723	
	Intersil	LM723	
	Motorola	**MC1723**	**3295**
	National	LM723	
	Raytheon	RC723	
		RM723	
	RCA	CA723	
		LM723	
	SGS	L123	
	Signetics	µA723	
	SiliconG	SG723	
	Thomson-CSF	SFC2723	
uA733	AMD	AM592	
		NE592	
		SE592	
	Fairchild	µA733	
	Hitachi	HA17733	
	Intersil	µA733	
	Motorola	MC1733	
		NE592	
		SE592	
	National	LM733	
	Raytheon	RM592	
	Signetics	SE592	
		µA733	
	SiliconG	SG733	
uA741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		µA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
µA741	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	µPC151	
		µPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	µA741	
	SiliconG	SG300	
		SG741	
	Thomson-CSF	SFC2741	
	Toshiba	TA7504	
uA747	AMD	747	
	Fairchild	µA747	
	Hitachi	HA17747	
	Motorola	MC1747	
	National	LM747	
	NEC-Electron	µPC251	
	PMI	OP-04	
		PM747	
	Raytheon	RC747	
		RM747	
	RCA	CA747	
	Signetics	µA747	
	SiliconG	SG747	
	TeledyneS	747	
uA747-1	Fairchild	µA747-1	
uA748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	µA201	
		µA748	
	Intersil	LM748	
		µA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		µA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
	Thomson-CSF	SFC2201	
		SFC2748	
uA777	SiliconG	SG777	
uA7805	AMD	LM309	
	Fairchild	µA309	
		µA7805	
	Lambda	LLM309	
		LMC7805	
		LµA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	µPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	Thomson-CSF	SFC2309	
	Toshiba	TA78005	
uA7806	Fairchild	µA7806	
	Lambda	LMC7806	
		LµA7806	
	Motorola	MC7806	
	SiliconG	SG340-6	
		SG7806	
uA7808	Fairchild	µA7808	
	Lambda	LMC7808	
		LµA7808	
	Motorola	**MC7808**	**3294**
	NEC-Electron	µPC7808	
	SiliconG	SG340-8	
		SG7808	
	TI	LM340-8	
uA7812	Fairchild	µA7812	
µA7812	Lambda	LMC7812	
		LµA7812	
	Motorola	**MC7812**	**3294**
	National	LM7812	
	NEC-Electron	µPC7812	
	SGS	L7812	
	SiliconG	SG7812	
	Toshiba	TA78012	
uA7815	Fairchild	µA7815	
		µA78L15	
	Lambda	LMC7815	
		LµA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	µPC7815	
		µPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		µA78L15	
	Toshiba	TA78015	
uA7818	Fairchild	µA7818	
	Lambda	LMC7818	
	NEC-Electron	µPC7818	
	SiliconG	SG340-18	
		SG7818	
	TI	LM340-18	
uA7824	Fairchild	µA7824	
	Lambda	LMC7824	
		LµA7824	
	Motorola	MC7824	
	NEC-Electron	µPC7824	
	SGS	L7824	
	SiliconG	SG7824	
	TI	LM340-24	
uA78L02	Fairchild	µA78L02	
	Motorola	MC7802	
uA78L02A	Fairchild	µA78L02A	
uA78L05	Fairchild	µA78L05	
	Motorola	MC78L05	
	National	LM340LA-5	
		LM78L05	
	NEC-Electron	µPC78L05	
uA78L05A	Fairchild	µA78L05A	
uA78L06	Fairchild	µA78L06	
	Motorola	MC78L06	
	TI	µA87L06	
uA78L06A	Fairchild	µA78L06A	
uA78L08	Motorola	MC78L08	
	NEC-Electron	µPC78L08	
uA78L08A	Fairchild	µA78L08A	
uA78L09A	Fairchild	µA78L09A	
uA78L10A	Fairchild	µA78L10A	
uA78L12	Fairchild	µA78L12	
	Motorola	MC78L12	
	National	**LM340LA-12**	**3299**
		LM78L12	
	NEC-Electron	µPC78L12	
uA78L12A	Fairchild	µA78L12A	
uA78L15	Fairchild	µA7815	
		µA78L15	
	Lambda	LMC7815	
		LµA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	µPC7815	
		µPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		µA7815	
	Toshiba	TA78015	
uA78L15A	Fairchild	µA78L15A	
uA78M05	Fairchild	µA78M05	
	Motorola	MC78M05	
	National	**LM341-5**	**3300**
		LM342-05	
		LM78M05	
	NEC-Electron	µPC78M05	
	NEC-Micro	µPC78M05	
µA78M05	Sanyo	L78M05	
uA78M06	Fairchild	µA78M06	
	Motorola	MC78M06	
	Sanyo	L78M06	
uA78M08	Fairchild	µA78M08	
	Motorola	MC78M08	
	NEC-Electron	µPC78M08	
	NEC-Micro	µPC78M08	
	Sanyo	L78M08	
uA78M10	Fairchild	µA78M10	
uA78M20	Motorola	MC78M20	
uA78M24	Fairchild	µA78M24	
	Motorola	MC78M24	
	Sanyo	L78M24	
uA7905	Fairchild	µA7905	
		µA79M05	
	Lambda	LMC7905	
		LµA7905	
	Motorola	MC7905	
	National	LM320MP5	
		LM7905	
		LM79M05	
	SiliconG	SG120-5	
		SG320-05	
		SG320P-5	
		SG7905	
uA7906	Lambda	LMC7906	
	Motorola	MC7906	
uA7908	Fairchild	MC7908	
		µA7908	
		µA79M08	
	Lambda	LMC7908	
		LµA7908	
	Motorola	MC7908	
	SiliconG	SG7908	
	TI	µA79M08	
uA7912	Fairchild	µA7912	
		µA79M12	
	Motorola	MC7912	
	National	LM120-12	
		LM320MP12	
		LM7912	
		LM79M12	
	SiliconG	SG120-12	
		SG320P-12	
		SG7912	
uA7915	Fairchild	µA7915	
	Lambda	LµA7915	
	Motorola	MC7915	
	National	LM120-15	
		LM320-15	
		LM320T15	
		LM7915	
	SiliconG	SG120-15	
		SG320-15	
		SG7915	
uA7918	Lambda	LµA7918	
	Motorola	MC7918	
uA7924	Lambda	LMC7924	
	Motorola	MC7924	
uA79M06	Fairchild	µA79M06	
uA79M08	Fairchild	MC7908	
		µA7908	
		µA79M08	
	Lambda	LMC7908	
		LµA7908	
	Motorola	MC7908	
	SiliconG	SG7908	
	TI	µA7908	
uA87L06	Fairchild	µA78L06	
	Motorola	MC78L06	
	TI	µA78L06	
uA9636	Fairchild	µA9636	
uA9636A	Fairchild	µA9636A	
uA9637	Fairchild	µA9637	
uA9637A	Fairchild	µA9637A	
uA9638	Fairchild	µA9638	
uAA170	Siemens	µAA170	
uAA171	Siemens	µAA171	

Thomson-CSF Components Corporation

ESM1350	Motorola	MC1350
	TI	SN76600
SFC2018	National	LM3018
	RCA	CA3018
SFC2036	RCA	CA3036
SFC2054	Motorola	CA3054
	RCA	CA3026
		CA3054

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Thomson-CSF Components Corporation (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
SFC2054	SiliconG	SG3822	
	Sprague	ULN-2054	
SFC2101	AMD	LM101	
	AD	AD101	
	Fairchild	μA101	
	Intersil	AD101	
	Motorola	LM101	
	Raytheon	LM101	
	Signetics	LM101	
	SiliconG	SG101	
	TI	LM101	
SFC2104	National	LM104	
SFC2105	AMD	LM105	
	Fairchild	μA105	
	Intersil	LM105	
	National	LM105	
	SiliconG	SG105	
SFC2107	AMD	LM107	
	AD	**AD741S**	**3153**
	Intersil	LM107	
	National	LM107	
	Raytheon	LM107	
	SiliconG	SG107	
	TI	LM107	
		SN55107	
SFC2109	Fairchild	μA109	
	Motorola	LM109	
	National	LM109	
	SiliconG	SG109	
	TI	SN55109	
SFC2111	AMD	LM111	
	AD	AD111	
	Fairchild	μA111	
	Intersil	LM111	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM111	
	National	**LM111**	**3317**
	PMI	PM111	
	Raytheon	LM111	
	Signetics	LM111	
	SiliconG	SG111	
	TI	LM111	
SFC2201	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2748	
SFC2204	National	LM204	
	SiliconG	SG204	
SFC2205	AMD	LM205	
	National	LM205	
	SiliconG	SG205	
SFC2207	AMD	LM207	
	National	LM207	
	RCA	CA207	
	SiliconG	SG207	
	TI	SN55207	
SFC2209	Fairchild	μA209	
	Lambda	LLM209	
	Motorola	LM209	
	National	LM209	
	SiliconG	SG209	
SFC2211	AMD	LM211	
	AD	AD211	
	Motorola	LM211	
	National	**LM211**	**3317**
	PMI	PM211	
	RCA	LM211	
SFC2211	Signetics	LM211	
	SiliconG	SG211	
	TI	LM211	
SFC2301	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	
	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Toshiba	TA7506	
SFC2304	National	LM304	
	NEC-Electron	μPC142	
	SiliconG	SG304	
SFC2305	AMD	LM305	
	Fairchild	μA305	
	Intersil	LM305	
	National	LM305	
	NEC-Electron	μPC141	
	SiliconG	SG305	
SFC2307	AMD	LM307	
	AD	**AD741J**	**3153**
	Intersil	LM307	
	Motorola	LM307	
	National	LM307	
	Raytheon	LM307	
	RCA	CA307	
	SiliconG	SG307	
	TI	LM307	
SFC2309	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Toshiba	TA78005	
SFC2311	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC3111	
SFC2524	Thomson-CSF	SFC2525	
SFC2525	Thomson-CSF	SFC2524	
SFC2528	Motorola	MC7528	
	Raytheon	RC7528	
	SiliconG	SG7528	
	TI	SN7528	
SFC2709	Fairchild	μA709	
	Hitachi	HA1303	
	Motorola	MC1709	
	National	LM1709	
		LM709	
	NEC-Electron	μPC255	
		μPC55	
	Raytheon	RC709	
		RM709	
SFC2709	RCA	CA3038	
	TI	μA709	
	Toshiba	TA7502	
SFC2710	Fairchild	μA710	
	MicroPwr	COMP-01	
		COMP-02	
	Motorola	LM710	
		MC1710	
	National	**LM710**	**3317**
	PMI	CMP-01	
		CMP-02	
	Raytheon	RM710	
	SiliconG	SG710	
	TI	μA710	
SFC2711	Fairchild	μA711	
	Motorola	MC1711	
	National	**LM711**	**3317**
	SiliconG	SG711	
	TI	μA711	
SFC2723	Fairchild	μA723	
	Hitachi	HA17723	
	Intersil	LM723	
	Motorola	**MC1723**	**3295**
	National	LM723	
	Raytheon	RC723	
		RM723	
	RCA	CA723	
		LM723	
	SGS	L123	
	Signetics	μA723	
	SiliconG	SG723	
	TI	μA723	
SFC2741	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Toshiba	TA7504	
SFC2748	AMD	748	
		LM201	
	AD	AD201	
	Fairchild	μA201	
		μA748	
	Intersil	LM748	
		μA748	
	Motorola	LM201	
		MC1748	
	National	LM201	
		LM748	
	Plessey	SL748	
	Raytheon	RM748	
	RCA	CA201	
		CA748	
		LM748	
	Signetics	LM201	
		μA748	
	SiliconG	SG201	
		SG748	
	TI	LM201	
		SN72748P	
		μA748	
	Thomson-CSF	SFC2201	
SFC3111	AMD	LM311	
	AD	AD311	
	Fairchild	μA2903	
		μA311	
SFC3111	Intersil	LM311	
	Motorola	LM2903	
		LM311	
	National	**LM2903**	**3317**
		LM311	**3317**
	NEC-Electron	μPC271	
		μPC311	
	PMI	PM311	
	Raytheon	LM311	
	RCA	CA311	
		LM311	
	Signetics	LM2903	
		LM311	
	SiliconG	SG311	
	TI	LM2903	
		LM311	
	Thomson-CSF	SFC2311	
TBA600	Fairchild	TBA800	
	Plessey	TBA800	
	SGS	TBA800	
TBA820	SGS	TBA820	
	TI	SN76001	
TBA830	SGS	TBA830	
TCA900	SGS	TCA900	

Toshiba America

Manufacturer Device	Replacement Source	Device	IC Master Page
◆TA7084	Motorola	MC1461	
TA7085	Motorola	MC1463	
TA7157	Exar	XR1310	
	Hitachi	HA1156	
	National	**LM1310**	**3325,3328**
	RCA	CA1310	
	Sanyo	LA3350	
	Sprague	ULN-2211	
		ULN-3810	
	TI	SN76115	
TA7502	Fairchild	μA709	
	Hitachi	HA1303	
	Motorola	MC1709	
	National	LM1709	
		LM709	
	NEC-Electron	μPC255	
		μPC55	
	Raytheon	RC709	
		RM709	
	RCA	CA3038	
	TI	μA709	
	Thomson-CSF	SFC2709	
TA7504	AMD	741	
		SSS741	
	AD	**AD741**	**3153**
	Fairchild	3871	
		μA741	
	Hitachi	HA17741	
	Intersil	AD741	
		ICL741	
	MicroPwr	MP5501	
		MP5502	**401,3292**
		OP-02	
	Mostek	MK3871	
	Motorola	LM741	
		MC1741	
	National	LM741	
	NEC-Electron	μPC151	
		μPC741	
	PMI	OP-02	
		OP01	
		PM741	
		SSS741	
	Raytheon	RC741	
		RM741	
	RCA	CA3056	
		CA741	
	Signetics	μA741	
	SiliconG	SG300	
		SG741	
	TI	μA741	
	Thomson-CSF	SFC2741	
TA7506	AD	AD301	
	Fairchild	LM301	
		μA301A	
	Intersil	AD301	
	Motorola	LM301	
	National	LM301	
		LM301A	
	NEC-Electron	μPC157	
		μPC301	
	Raytheon	LM301	
	RCA	CA301	
		LM301	

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Toshiba America (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
TA7506	Signetics	LM301	
	SiliconG	SG301	
	TI	LM301	
		LM301A	
	Thomson-CSF	SFC2301	
TA7607	RCA	CA7607	
TA7611	RCA	CA7611	
TA7613	Hitachi	HA12402	
	Motorola	MC14094	
	RCA	CD4094	
	Sprague	ULN-2204	
	Telefunken	TDA1083	
TA78005	AMD	LM309	
	Fairchild	μA309	
		μA7805	
	Lambda	LLM309	
		LMC7805	
		LμA7805	
	Motorola	LM309	
		MC7805	
	National	LM309	
		LM7805	
	NEC-Electron	μPC7805	
	SGS	L7805	
		L7810	
	SiliconG	SG309	
		SG340-05	
		SG340-5	
	TI	μA7805	
	Thomson-CSF	SFC2309	
TA78012	Fairchild	μA7812	
	Lambda	LMC7812	
		LμA7812	
	Motorola	**MC7812**	**3294**
	National	LM7812	
	NEC-Electron	μPC7812	
	SGS	L7812	
	SiliconG	SG7812	
	TI	μA7812	
TA78015	Fairchild	μA7815	
		μA78L15	
	Lambda	LMC7815	
		LμA7815	
	Motorola	**MC7815**	**3294**
		MC78L15	
	National	**LM340-15**	**3299**
		LM340LA-15	**3299**
		LM340T-15	
		LM7815	
		LM78L15	
	NEC-Electron	μPC7815	
		μPC78L15	
	SGS	L7815	
	SiliconG	SG340-15	
		SG7815	
	TI	LM340-15	
		μA7815	
		μA78L15	
TC4001	Fairchild	F4001	
	Hitachi	HD14001	
	Motorola	MC14001	
	National	CD4001	
		MM74C02	
	OKI	MSM4001	
	RCA	CD4001	
	Sanyo	LC4001B	
	SGS	HCF4001	
	Signetics	HEF4001	
	SSS	SCL4001	
	Solitron	CM4001	
TC4002	Fairchild	F4002	
	Hitachi	HD14002	
	Motorola	MC14002	
	National	CD4002	
	RCA	CD4002	
	SGS	HCF4002	
	Signetics	HEF4002	
	SSS	SCL4002	
	Solitron	CM4002	
	TI	TP4002	
TC4006	Fairchild	F4006	
	Hitachi	HD14006	
	Motorola	MC14006	
	National	CD4006	
	RCA	CD4006	
	SGS	HCF4006	
	SSS	SCL4006	
	Solitron	CM4006	
TC4007	Fairchild	F4007	
TC4007	Hitachi	HD14007	
	Motorola	MC14007	
	National	CD4007	
	RCA	CD4007	
	SGS	HCF4007	
	Signetics	HEF4007	
	SSS	SCL4007	
	Solitron	CM4007	
TC4008	Fairchild	F4008	
	Hitachi	HD14008	
	Motorola	MC14008	
	National	CD4008	
		MM74C83	
	RCA	CD4008	
	SGS	HCF4008	
	Signetics	HEF4008	
	SSS	SCL4008	
	Solitron	CM4008	
TC4009	Hitachi	HD14009	
	National	CD4009	
	RCA	CD4009	
	SGS	HCF4009	
	SSS	SCL4009	
	Solitron	CM4009	
TC4010	Hitachi	HD14010	
	National	CD4010	
	RCA	CD4010	
	SGS	HCF4010	
	SSS	SCL4010	
	Solitron	CM4010	
TC40107	RCA	CD40107	
	SGS	HCF40107	
TC4011	Fairchild	F4011	
	Hitachi	HD14011	
	Motorola	MC14011	
	National	CD4011	
		MM74C00	
	OKI	MSM4011	
	RCA	CD4011	
	Sanyo	LC4011	
	SGS	HCF4011	
	Signetics	HEF4011	
	SSS	SCL4011	
	Solitron	CM4011	
TC4012	Fairchild	F4012	
	Hitachi	HD14012	
	Motorola	MC14012	
	National	CD4012	
	RCA	CD4012	
	SGS	HCF4012	
	Signetics	HEF4012	
	SSS	SCL4012	
	Solitron	CM4012	
TC4013	Fairchild	F4013	
	Hitachi	HD14013	
	Motorola	MC14013	
	National	CD4013	
		MM74C74	
	OKI	MSM4013	
	RCA	CD4013	
	Sanyo	LC4013	
	SGS	HCF4013	
	Signetics	HEF4013	
	SSS	SCL4013	
	Solitron	CM4013	
TC4014	Fairchild	F4014	
	Hitachi	HD14014	
	Motorola	MC14014	
	National	CD4014	
	RCA	CD4014	
	SGS	HCF4014	
	Signetics	HEF4014	
	SSS	SCL4014	
	Solitron	CM4014	
TC4015	Fairchild	F4015	
	Hitachi	HD14015	
	Motorola	MC14015	
	National	CD4015	
		MM74C164	
	OKI	MSM4015	
	RCA	CD4015	
	Sanyo	LC4015	
	SGS	HCF4015	
	Signetics	HEF4015	
	SSS	SCL4015	
	Solitron	CM4015	
TC4016	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
TC4016	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4066	
TC40160	Fairchild	F40160	
	Hitachi	HD14160	
	Motorola	MC14160	
	National	CD40160	
		MM54C160	
		MM74C160	
	RCA	CD40160	
	SGS	HCF40160	
	Signetics	HEF4060	
	SSS	SCL4160	
TC40161	Fairchild	F40161	
	Hitachi	HD14161	
	Motorola	MC14161	
	National	CD40161	
		MM54C161	
		MM74C161	
	RCA	CD40161	
	SGS	HCF40161	
	Signetics	HEF40161	
	SSS	SCL4161	
TC40162	Fairchild	F40162	
	Hitachi	HD14162	
	Motorola	MC14162	
	National	CD40162	
		MM54C162	
		MM74C162	
	RCA	CD40162	
	SGS	HCF40162	
	Signetics	HEF40162	
	SSS	SCL4162	
TC40163	Fairchild	F40163	
	Hitachi	HD14163	
	Motorola	MC14163	
	National	CD40163	
		MM54C163	
		MM74C163	
	RCA	CD40163	
	SGS	HCF40163	
	Signetics	HEF40163	
	SSS	SCL4163	
TC4017	Fairchild	F4017	
	Hitachi	HD14017	
	Motorola	MC14017	
	National	CD4017	
	RCA	CD4017	
	SGS	HCF4017	
	Signetics	HEF4017	
	SSS	SCL4017	
	Solitron	CM4017	
TC40174	Fairchild	F40174	
	Hitachi	HD14174	
	Motorola	MC14174	
	National	CD40174	
		MM54C174	
		MM74C174	
	RCA	CD40174	
	SGS	HCF40174	
	Signetics	HEF40174	
	SSS	SCL4174	
TC40175	Fairchild	F40175	
	Hitachi	HD14175	
	Motorola	MC14175	
	National	CD40175	
		MM54C175	
		MM74C175	
	Signetics	HEF40175	
TC4018	Fairchild	F4018	
	Hitachi	HD14018	
	Motorola	MC14018	
	National	CD4018	
	RCA	CD4018	
TC4018	SGS	HCF4018	
	Signetics	HEF4018	
	SSS	SCL4018	
	Solitron	CM4018	
TC4019	Fairchild	F4019	
	National	CD4019	
	OKI	MSM4019	
	RCA	CD4019	
	Sanyo	LC4019	
	SGS	HCF4019	
	Signetics	HEF4019	
	SSS	SCL4019	
	Solitron	CM4019	
TC40192	Fairchild	F4029	
	Motorola	MC14029	
	National	CD40192	
		CD4029	
	RCA	CD40192	
		CD4029	
	SGS	HCF40192	
		HCF4029	
	Signetics	HEF40192	
	SSS	SCL4029	
		SCL4192	
	Solitron	CM4029	
	Toshiba	TC4029	
TC40193	Fairchild	F40193	
	National	CD40193	
		MM54C193	
		MM74C193	
	RCA	CD40193	
	SGS	HCF40193	
	Signetics	HEF40193	
	SSS	SCL4193	
TC4020	Fairchild	F4020	
	Hitachi	HD14020	
	Motorola	MC14020	
	National	CD4020	
	RCA	CD4020	
	SGS	HCF4020	
	Signetics	HEF4020	
	SSS	SCL4020	
	Solitron	CM4020	
TC4021	Fairchild	F4021	
	Hitachi	HD14021	
	Motorola	MC14021	
	National	CD4021	
	RCA	CD4021	
	SGS	HCF4021	
	Signetics	HEF4021	
	SSS	SCL4021	
	Solitron	CM4021	
TC4022	Fairchild	F4022	
	Hitachi	HD14022	
	Motorola	MC14022	
	National	CD4022	
	RCA	CD4022	
	SGS	HCF4022	
	Signetics	HEF4022	
	SSS	SCL4022	
	Solitron	CM4022	
TC4023	Fairchild	F4023	
	Hitachi	HD14023	
	Motorola	MC14023	
	National	CD4023	
		MM74C10	
	RCA	CD4023	
	SGS	HCF4023	
	Signetics	HEF4023	
	SSS	SCL4023	
	Solitron	CM4023	
TC4024	Fairchild	F4024	
	Hitachi	HD14024	
	Motorola	MC14024	
	National	CD4024	
	RCA	CD4024	
	SGS	HCF4024	
	Signetics	HEF4024	
	SSS	SCL4024	
	Solitron	CM4024	
TC4025	Fairchild	F4025	
	Hitachi	HD14025	
	Motorola	MC14025	
	National	CD4025	
	RCA	CD4025	
	SGS	HCF4025	
	Signetics	HEF4025	
	SSS	SCL4025	
	Solitron	CM4025	
TC4028	Fairchild	F4028	
	Hitachi	HD14028	
	Motorola	MC14028	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Toshiba America (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
TC4028	National	CD4028	
		MM74C42	
	OKI	MSM4028	
	Sanyo	LC4028	
	SGS	HCF4028	
	Signetics	HEF4028	
	SSS	SCL4028	
	Solitron	CM4028	
TC4029	Fairchild	F4029	
	Motorola	MC14029	
	National	CD40192	
		CD4029	
	RCA	CD40192	
		CD4029	
	SGS	HCF40192	
		HCF4029	
	Signetics	HEF40192	
	SSS	SCL4029	
		SCL4192	
	Solitron	CM4029	
	Toshiba	TC40192	
TC4030	Fairchild	F4030	
	National	CD4030	
	RCA	CD4030	
	SGS	HCF4030	
	Signetics	HEF4030	
	SSS	SCL4030	
	Solitron	CM4030	
TC4032	Hitachi	HD14032	
	Motorola	MC14032	
	RCA	CD4032	
	SGS	HCF4032	
	Solitron	CM4032	
TC4034	Fairchild	F4034	
	Hitachi	HD14034	
	Motorola	MC14034	
	National	CD4034	
	RCA	CD4034	
	SGS	HCF4034	
	SSS	SCL4034	
	Solitron	CM4034	
TC4035	Fairchild	F4035	
	Hitachi	HD14035	
	Motorola	MC14035	
	National	CD4035	
	RCA	CD4035	
	SGS	HCF4035	
	Signetics	HEF4035	
	SSS	SCL4035	
	Solitron	CM4035	
TC4036	RCA	CD4036	
	Solitron	CM4036	
TC4038	Hitachi	HD14038	
	Motorola	MC14038	
	RCA	CD4038	
	SGS	HCF4038	
	Solitron	CM4038	
TC4039	RCA	CD4039	
	Solitron	CM4039	
TC4040	Fairchild	F4040	
	Hitachi	HD14040	
	Motorola	MC14040	
	National	CD4040	
	RCA	CD4040	
	SGS	HCF4040	
	Signetics	HEF4040	
	SSS	SCL4040	
	Solitron	CM4040	
TC4042	Fairchild	F4041	
		F4042	
	Hitachi	HD14042	
	Motorola	MC14042	
	National	CD4041	
		CD4042	
	RCA	CD4041	
		CD4042	
	SGS	HCF4041	
		HCF4042	
	Signetics	HEF4041	
		HEF4042	
	SSS	SCL4041	
		SCL4042	
	Solitron	CM4041	
		CM4042	
TC4043	Hitachi	HD14043	
	Motorola	MC14043	
	National	CD4043	
	RCA	CD4043	
	SGS	HCF4043	
	Signetics	HEF4043	
TC4043	SSS	SCL4043	
	Solitron	CM4043	
TC4044	Fairchild	F4044	
	Hitachi	HD14044	
	Motorola	MC14044	
	National	CD4044	
	RCA	CD4044	
	SGS	HCF4044	
	Signetics	HEF4044	
	SSS	SCL4044	
	Solitron	CM4044	
TC4047	Fairchild	F4047	
	National	CD4047	
	RCA	CD4047	
	SGS	HCF4047	
	Signetics	HEF4042	
		HEF4047	
	SSS	SCL4047	
	Solitron	CM4047	
TC4049	Fairchild	F4049	
	Hitachi	HD14049	
	Motorola	MC14049	
	National	CD4049	
	OKI	MSM4049	
	RCA	CD4009	
		CD4049	
	Sanyo	LC4049	
	SGS	HCF4049	
	Signetics	HEF4049	
	SSS	SCL4049	
	Solitron	CM4049	
TC4050	Fairchild	F4050	
	Hitachi	HD14050	
	Motorola	MC14050	
	National	CD4050	
	RCA	CD4010	
		CD4050	
	SGS	HCF4050	
	Signetics	HEF4050	
	SSS	SCL4050	
	Solitron	CM4050	
TC4051	Fairchild	F4051	
	Motorola	MC14051	
	National	CD4051	
	RCA	CD4051	
	SGS	HCF4051	
	Signetics	HEF4046	
		HEF4051	
	SSS	SCL4051	
	Solitron	CM4051	
TC4052	Fairchild	F4052	
	Hitachi	HD14052	
	Motorola	MC14052	
	National	CD4052	
	RCA	CD4052	
	SGS	HCF4052	
	Signetics	HEF4052	
	SSS	SCL4052	
	Solitron	CM4052	
TC4053B	Fairchild	F4053	
	Motorola	MC14053	
	National	CD4053	
	RCA	CD4053	
	SGS	HCF4052	
	Signetics	HEF4053	
	SSS	SCL4053	
	Solitron	CM4053	
TC4054	RCA	CD4054	
	SGS	HCF4054	
TC4055	Mitel	MD4055	
	RCA	CD4055	
	SGS	HCF4055	
TC4056	Mitel	MD4056	
	RCA	CD4056	
	SGS	HCF4056	
TC4063	RCA	CD4063	
	SGS	HCF4063	
TC4066	Fairchild	F4016	
		F4066	
	Hitachi	HD14016	
		HD14066	
	MicroPwr	MP7516	
	Motorola	MC14016	
		MC14066	
	National	CD4016	
		CD4066	
	RCA	CD4016	
		CD4066	
	Sanyo	LC4016	
		LC4066	
	SGS	HCF4016	
		HCF4066	
TC4066	Signetics	HEF4016	
		HEF4066	
		N4066	
	SSS	SCL4016	
		SCL4066	
	Solitron	CM4016	
		CM4066	
		HCF4016	
	Toshiba	TC4016	
TC4068	Fairchild	F4068	
	Hitachi	HD14068	
	Motorola	MC14068	
	RCA	CD4068	
	SGS	HCF4068	
	Signetics	HEF4068	
	SSS	SCL4068	
		SCL4412	
	Solitron	CM4068	
	TI	UCN4810	
TC4069	Fairchild	F4069	
	Hitachi	HD14069	
	Motorola	MC14069	
	National	CD4069	
		MM54C04	
		MM74C04	
	OKI	MSM4069	
	RCA	CD4069	
	Sanyo	LC4069	
	SGS	HC4069	
		HCF4069	
	Signetics	HEF4069	
	SSS	SCL4069	
		SCL4449	
	Solitron	CM4069	
TC4071	Fairchild	F4071	
	Hitachi	HD14071	
	Motorola	MC14071	
	National	CD4071	
		MM74C32	
	OKI	MSM4071	
	RCA	CD4071	
	Sanyo	LC4071	
	SGS	HCF4071	
	Signetics	HEF4071	
	SSS	SCL4071	
	Solitron	CM4071	
TC4072	Fairchild	F4072	
	Hitachi	HD14072	
	Motorola	MC14072	
	National	CD4072	
	RCA	CD4072	
	SGS	HCF4072	
	Signetics	HEF4072	
	SSS	SCL4072	
TC4073	Fairchild	F4073	
	Hitachi	HD14073	
	Motorola	MC14073	
	National	CD4073	
	RCA	CD4073	
	SGS	HCF4073	
	Signetics	HEF4073	
	SSS	SCL4073	
	Solitron	CM4073	
TC4075	Fairchild	F4075	
	Hitachi	HD14075	
	Motorola	MC14075	
	National	CD4075	
	RCA	CD4075	
	SGS	HCF4075	
	Signetics	HEF4075	
	SSS	SCL4075	
	Solitron	CM4075	
TC4076	Fairchild	F4076	
	Hitachi	HD14076	
	Motorola	MC14076	
	National	CD4076	
		MM54C173	
		MM74C173	
	RCA	CD4076	
	SGS	HCF4076	
	Signetics	HEF4076	
	SSS	SCL4076	
	Solitron	CM4076	
TC4078	Fairchild	F4078	
	Hitachi	HD14078	
	Motorola	MC14078	
	RCA	CD4078	
	SGS	HCF4078	
	Signetics	HEF4078	
	SSS	SCL4078	
	Solitron	CM4078	
TC4081	Fairchild	F4081	
TC4081	Hitachi	HD14081	
	Motorola	MC14081	
	National	CD4081	
		MM74C08	
	OKI	MSM4081	
	RCA	CD4081	
	Sanyo	LC4081	
	SGS	HCF4081	
	Signetics	HEF4081	
	SSS	SCL4081	
	Solitron	CM4081	
TC4082	Fairchild	F4082	
	Hitachi	HD14082	
	Motorola	MC14082	
	National	CD4082	
	RCA	CD4082	
	SGS	HCF4082	
	Signetics	HEF4082	
	SSS	SCL4082	
TC4085	Fairchild	F4085	
	National	CD4085	
	RCA	CD4085	
	SGS	HCF4085	
	Signetics	HEF4085	
	SSS	SCL4085	
TC4086	Fairchild	F4086	
	RCA	CD4086	
	SGS	HCF4086	
	Signetics	HEF4086	
	SSS	SCL4086	
TC4093	Fairchild	F4093	
	Hitachi	HD14093	
	Motorola	MC14093	
	National	CD4093	
	OKI	MSM4093	
	RCA	CD4093	
	Sanyo	LC4093	
	SGS	HCF4093	
	Signetics	HEF4093	
	SSS	SCL4093	
TC4094	Hitachi	HD14094	
	Motorola	MC14094	
	RCA	CD4094	
	SGS	HCF4094	
	Signetics	HEF4094	
	SSS	SCL4094	
TC4099	Hitachi	HD14099	
	Motorola	MC14099	
	National	CD4099	
	RCA	CD4099	
	SGS	HCF4099	
	SSS	SCL4099	
TC40H000	**Motorola**	**MC74HC00**	**733**
	National	MM74HC00	
	RCA	**CD74HC00**	**740**
	SPI	**SP74HC00**	**766**
	Signetics	PCF74HC00	
TC40H002	Motorola	MC74HC02	
	National	MM74HC02	
	RCA	**CD74HC02**	**740**
	SPI	**SP74HC02**	**766**
	Signetics	PCF74HC02	
TC40H004	Motorola	MC74HC04	
	National	MM74HC04	
	RCA	**CD74HC04**	**740**
	SPI	**SP74HC04**	**766**
TC40H010	Motorola	MC74HC10	
		MC74HC10	
	National	MM74HC10	
	RCA	CD74H10	
		CD74HC10	**740**
	SPI	**SP74HC10**	**766**
	Signetics	PCF74HC10	
TC40H011	Motorola	MC74HC11	
	National	MM74HC11	
	RCA	**CD74HC11**	**740**
	SPI	**SP74HC11**	**766**
	Signetics	PCF74HC11	
TC40H020	Motorola	MC74HC20	
	National	MM74HC20	
	RCA	**CD74HC20**	**740**
	SPI	**SP74HC20**	**766**
	Signetics	PCF74HC20	
TC40H027	Motorola	MC74HC27	
	National	MM74HC27	
	RCA	**CD74HC27**	**740**
	SPI	**SP74HC27**	**766**
	Signetics	PCF74HC27	
TC40H032	Motorola	MC74HC32	
	National	MM74HC32	
	RCA	**CD74HC32**	**740**

◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Toshiba America (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
TC40H032	**SPI**	**SP74HC32**	**767**
	Signetics	PCF74HC32	
TC40H074	Motorola	MC74HC74	
	National	MM74HC74	
	RCA	**CD74HC74**	**739**
	SPI	SD74HC74	
	Signetics	PCF74HC74	
TC40H076	Motorola	MC74HC76	
	National	MM74HC76	
	RCA	**CD74HC76**	**739**
	SPI	**SP74HC76**	**767**
	Signetics	PCF74HC76	
TC40H107	Motorola	MC74HC107	
	National	MM74HC107	
	RCA	**CD74HC107**	**739**
	SPI	**SP74HC107**	**768**
	Signetics	PCF74HC107	
TC40H139	Motorola	MC74HC139	
	National	MM74HC139	
	RCA	**CD74HC139**	**739**
	SPI	**SP74HC139**	**769**
	Signetics	PCF74HC139	
TC40H153	Motorola	MC74HC153	
	National	MM74HC153	
	RCA	**CD74HC153**	**740**
	SPI	**SP74HC153**	**769**
	Signetics	PCF74HC153	
TC40H157	Motorola	MC74HC157	
	National	MM74HC157	
	RCA	CD74HC157	
	SPI	**SP74HC157**	**769**
	Signetics	PCF74HC157	
TC40H158	Motorola	MC74HC158	
	National	MM74HC158	
	RCA	CD74HC158	
	SPI	**SP74HC158**	**769**
	Signetics	PCF74HC158	
TC40H174	Motorola	MC74HC174	
	National	MM74HC174	
	RCA	**CD74HC174**	**739**
	SPI	**SP74HC174**	**770**
	Signetics	PCF74HC174	
TC40H175	Motorola	MC74HC175	
	National	MM74HC175	
	RCA	**CD74HC175**	**739**
	SPI	**SP74HC175**	**770**
	Signetics	PCF74HC175	
TC40H192	Motorola	MC74HC192	
	National	MM74HC192	
	RCA	**CD74HC192**	**739**
	SPI	**SP74HC192**	**770**
	Signetics	PCF74HC192	
TC40H193	Motorola	MC74HC193	
	National	MM74HC193	
	RCA	**CD74HC193**	**739**
	SPI	**SP74HC193**	**770**
	Signetics	PCF74HC193	
TC40H240	Motorola	MC74HC240	
	National	MM74HC240	
	RCA	**CD74HC240**	**740**
	SPI	**SP74HC240**	**770**
	Signetics	PCF74HC240	
TC4508	Hitachi	HD14508	
		HD74147	
	Motorola	MC14508	
	National	DM74147	
	RCA	CD4508	
	SGS	HCF4508	
	Signetics	74147	
		HEF4508	
		N82147	
	SSS	SCL4508	
	Solitron	CM4508	
	TI	**SN74147**	**882**
TC4510	Fairchild	F4510	
	Hitachi	HD14510	
	Motorola	MC14510	
	National	CD4510	
	RCA	CD4510	
	SGS	HCF4510	
	Signetics	HEF4510	
	SSS	SCL4510	
	Solitron	CM4510	
TC4511	Fairchild	F4511	
	Hitachi	HD14511	
	Mitel	MD4511	
	MMI	4511	
	Motorola	MC14511	
	National	CD4511	
TC4511	NEC-Micro	μPD4511	
	RCA	CD4511	
	SGS	HCF4511	
	Signetics	HEF4511	
	SSS	SCL4511	
	Solitron	CM4511	
TC4512	Fairchild	F4512	
	Hitachi	HD14512	
	Motorola	MC14512	
	National	CD4512	
	RCA	CD4512	
	SGS	HCF4512	
	SSS	SCL4512	
TC4514	Fairchild	F4514	
	Hitachi	HD14514	
	Motorola	MC14514	
	National	CD4514	
	RCA	CD4514	
	SGS	HCF4514	
	Signetics	HEF4514	
	SSS	SCL4514	
	Solitron	CM4514	
TC4515	Fairchild	F4515	
	Hitachi	HD14515	
	Motorola	MC14515	
	National	CD4515	
	RCA	CD4515	
	SGS	HCF4515	
	Signetics	HEF4515	
	SSS	SCL4515	
	Solitron	CM4515	
TC4516	Fairchild	F4516	
	Hitachi	HD14516	
	Motorola	MC14516	
	National	CD4516	
	RCA	CD4516	
	SGS	HCF4516	
	Signetics	HEF4516	
	SSS	SCL4516	
	Solitron	CM4516	
TC4518	Fairchild	F4518	
	Hitachi	HD14518	
	Motorola	MC14518	
	National	CD4518	
	RCA	CD4518	
	SGS	HCF4518	
	Signetics	HEF4518	
	SSS	SCL4518	
	Solitron	CM4518	
TC4520	Fairchild	F4520	
	Hitachi	HD14520	
	Motorola	MC14520	
	National	CD4520	
	OKI	MSM4520	
	RCA	CD4520	
	Sanyo	LC4520	
	SGS	HCF4520	
	Signetics	HEF4520	
	SSS	SCL4520	
	Solitron	CM4520	
TC4521	Fairchild	F4521	
	Motorola	MC14521	
	RCA	CD4045	
	SGS	HCF4045	
	Signetics	HEF4521	
	SSS	SCL4445	
	Solitron	CM4045	
TC4522	Fairchild	F4522	
	Hitachi	HD14522	
	Motorola	MC14522	
	National	CD4522	
	RCA	CD4522	
	Signetics	HEF4522	
	SSS	SCL4522	
TC4526	Fairchild	F4526	
	Hitachi	HD14526	
	Motorola	MC14526	
	National	CD4526	
	Signetics	HEF4526	
	SSS	SCL4526	
TC4527	Fairchild	F4527	
	Hitachi	HD14527	
	Motorola	MC14527	
	National	CD4527	
	RCA	CD4527	
	SGS	HCF4527	
	Signetics	HEF4527	
	SSS	SCL4527	
	Toshiba	TR4527	
TC4528	Fairchild	F4528	
	Hitachi	HD14528	
	Motorola	MC14528	
TC4528	National	CD4528	
		MM74C221	
	RCA	CD4098	
	SGS	HCF4098	
	Signetics	HEF4528	
	SSS	SCL4528	
TC4531	Fairchild	F4531	
	Hitachi	HD14531	
	Motorola	MC14531	
	RCA	CD40101	
	SGS	HCF40101	
	Signetics	HEF4531	
	SSS	SCL4531	
TC4532	Fairchild	F4532	
	Hitachi	HD14532	
	Motorola	MC14532	
	RCA	CD4532	
	SGS	HCF4532	
	Signetics	HEF4532	
	SSS	SCL4532	
TC4539	Fairchild	F4539	
	Hitachi	HD14539	
	Motorola	MC14539	
	Signetics	HEF4539	
TC4543	Fairchild	F4543	
	Hitachi	HD14543	
	Motorola	MC14543	
	National	CD4543	
	RCA	CD4055	
		CD4056	
		CD4543	
	Signetics	HEF4543	
TC4555	Fairchild	F4555	
	Hitachi	HD14555	
	Motorola	MC14555	
	RCA	CD4555	
	SGS	HCF4555	
	Signetics	HEF4555	
	SSS	SCL4555	
TC4556	Fairchild	F4556	
	Motorola	MC14556	
	RCA	CD4556	
	SGS	HCF4556	
	Signetics	HEF4556	
	SSS	SCL4556	
TC4560	Hitachi	HD14560	
	Motorola	MC14560	
TC4561	Hitachi	HD14561	
	Motorola	MC14561	
TC4572	Hitachi	HD14572	
	Motorola	MC14572	
TC4583	Fairchild	F4583	
	Hitachi	HD14583	
	Motorola	MC14583	
TC4585	Fairchild	F40085	
	Hitachi	HD14585	
	Motorola	MC14585	
	National	MM74C85	
	RCA	CD4585	
	Signetics	HEF4585	
	SSS	SCL4585	
TC4XXX	Fairchild	34XXX	
		F4XXX	
	Hitachi	HD14XXX	
	Motorola	MC14XXX	
	National	CD4XXX	
	OKI	MSM4XXX	
	SGS	HCF4XXX	
	SSS	SCL4XXX	
	Solitron	CM4XXX	
	TI	TP4000 series	
TC5047	NEC-Micro	μPD445	
TC5508	AMI	S6508	
	Fairchild	4736B	
	Harris	**HM6508**	
		669,1333,3754	
	Intel	2125A	
	Motorola	MCM2125	
	National	MM74C929	
		NMC6508	
	NEC-Micro	μPD443	
	SSS	SCM21C02	
TC5514	Fujitsu	MB8414	
	Harris	HM6514	
	Hitachi	**HM4334**	**3789**
	Intersil	IM6514	
	MicroPwr	MP6514	
	Mitsubishi	M58981	
	National	NMC6514	
	NEC-Micro	μPD444/6514	
		μPD6514	
TC5514	**OKI**	**MSM5115**	**3873**
	RCA	MWS5114	
		MWS5514	
TC5516	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TMM2016	
TC5517	**Fujitsu**	**MB8417**	**3676**
	MicroPwr	MP6118	
TC5518	**Fujitsu**	**MB8418**	**3676**
TC5565	Hitachi	HM6464	
TC7400	Fairchild	7400	
	Hitachi	HD7400	
	National	DM7400	
	Signetics	7400	
	TI	**SN7400**	**833**
TC7404	Fairchild	7404	
	Hitachi	HD7404	
	National	DM7404	
	Signetics	7404	
	TI	**SN7404**	**834**
TC7410	Fairchild	7410	
	Hitachi	HD7410	
	National	DM7410	
	Signetics	7410	
	TI	**SN7410**	**836**
TC7420	Fairchild	7420	
		9004	
	Hitachi	HD7420	
	National	DM7420	
		DM9004C	
	Signetics	7420	
	TI	**SN7420**	**839**
◆TD3400	Fairchild	7400	
	Hitachi	HD7400	
	National	DM7400	
	Signetics	7400	
	TI	**SN7400**	**833**
	Toshiba	TC7400	
◆TD3401	Fairchild	7401	
	Hitachi	HD7401	
	National	DM7401	
	TI	**SN7401**	**833**
◆TD3402	Fairchild	7402	
	Hitachi	HD7402	
	National	DM7402	
	Signetics	7402	
	TI	**SN7402**	**833**
◆TD3403	Fairchild	7403	
	Hitachi	HD7403	
	National	DM7403	
	Signetics	7403	
	TI	**SN7403**	**834**
◆TD3404	Fairchild	7404	
	Hitachi	HD7404	
	National	DM7404	
	Signetics	7404	
	TI	**SN7404**	**834**
	Toshiba	TC7404	
◆TD3405	Fairchild	7405	
	Hitachi	HD7405	
	National	DM7405	
	Signetics	7405	
	TI	**SN7405**	**834**
◆TD3406	Fairchild	7406	
	Hitachi	HD7406	
	National	DM7406	
	Signetics	7406	
	TI	**SN7406**	**835**
◆TD3407	Fairchild	7407	
	Hitachi	HD7407	
	National	DM7407	
	Signetics	7407	
	TI	**SN7407**	**835**
◆TD3408	Fairchild	7408	
	Hitachi	HD7408	
	National	DM7408	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Toshiba America (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
◇TD3408	Signetics	7408	
	TI	**SN7408**	**835**
◇TD3409	Fairchild	7409	
	Hitachi	HD7409	
	National	DM7409	
	TI	**SN7409**	**836**
◇TD3410	Fairchild	7410	
	Hitachi	HD7410	
	National	DM7410	
	Signetics	7410	
	TI	**SN7410**	**836**
	Toshiba	TC7410	
◇TD34107	Fairchild	74107	
	Hitachi	HD74107	
	National	DM74107	
	Signetics	74107	
	TI	**SN74107**	**869**
◇TD34121	Fairchild	74121	
	Hitachi	HD74121	
	National	DM74121	
	Signetics	74121	
	TI	**SN74121**	**873**
◇TD3416	Fairchild	7416	
	Hitachi	HD7416	
	National	DM7416	
	Signetics	7416	
	TI	**SN7416**	**838**
◇TD3417	Fairchild	7417	
	Hitachi	HD7417	
	National	DM7417	
	Signetics	7417	
	TI	**SN7417**	**838**
◇TD34192	Fairchild	74192	
		9360	
	National	DM74192	
		DM8560	
	Raytheon	RC9360	
		RM9360	
	Signetics	74192	
	TI	**SN54192**	**902**
		SN74192	**902**
◇TD34193	Fairchild	74193	
	National	DM74193	
		DM8563	
	Signetics	74193	
	TI	SN74129	
		SN74193	**902**
◇TD3420	Fairchild	7420	
		9004	
	Hitachi	HD7420	
	National	DM7420	
		DM9004C	
	Signetics	7420	
	TI	**SN7420**	**839**
	Toshiba	TC7420	
◇TD3421	TI	SN7421	
◇TD3426	Fairchild	7426	
	Hitachi	HD7426	
	National	DM7426	
		DM8810	
	Signetics	7426	
	TI	**SN7426**	**841**
◇TD3430	Fairchild	7430	
	Hitachi	HD7430	
	National	DM7430	
	Signetics	7430	
	TI	**SN7430**	**842**
◇TD3437	Fairchild	7437	
	Hitachi	HD7437	
	National	DM7437	
	Signetics	7437	
	TI	**SN7437**	**844**
◇TD3438	Fairchild	7438	
	Hitachi	HD7438	
	National	DM7438	
	Signetics	7438	
	TI	**SN7438**	**844**
◇TD3440	Fairchild	7440	
	Hitachi	HD7440	
	National	DM7440	
	Signetics	7440	
	TI	**SN7440**	**845**
◇TD3441	Fairchild	74141	
		93141	
	Hitachi	HD74141	
		HD7441	
	National	DM74141	
		DM7441	
	Signetics	74141	
		7441	
◇TD3441	**TI**	**SN74141**	**881**
◇TD3442	Fairchild	7442	
	Hitachi	HD7442	
	National	DM7442	
		DM8842	
	Signetics	7442	
	TI	SN7442	
		SN7442A	**845**
◇TD3447	Fairchild	7447	
	Hitachi	HD7447	
	National	DM7447	
	TI	SN7447	
		SN7447A	**847**
◇TD3450	Fairchild	7450	
	Hitachi	HD7450	
	National	DM7450	
	Signetics	7450	
	TI	**SN7450**	**848**
◇TD3451	Fairchild	7451	
	Hitachi	HD7451	
	National	DM7451	
	Signetics	7451	
	TI	**SN7451**	**848**
◇TD3460	Fairchild	7460	
	Hitachi	HD7460	
	National	DM7460	
	TI	**SN7460**	**852**
◇TD3472	Fairchild	7472	
	Hitachi	HD7472	
	National	DM7472	
	TI	**SN7472**	**856**
◇TD3473	Fairchild	7473	
	Hitachi	HD7473	
	National	DM7473	
	Signetics	7473	
	TI	**SN7473**	**856**
◇TD3474	Fairchild	7474	
	Hitachi	HD7474	
	National	DM7474	
	Signetics	7474	
	TI	**SN7474**	**857**
◇TD3475	Fairchild	7475	
	Hitachi	HD7475	
	National	DM7475	
	Signetics	7475	
	TI	**SN7475**	**858**
◇TD3476	Fairchild	7476	
	Hitachi	HD7476	
	National	DM7476	
	Signetics	7476	
	TI	**SN7476**	**858**
◇TD3486	Fairchild	7486	
	Hitachi	HD7486	
	National	DM7486	
	Signetics	7486	
	TI	**SN7486**	**862**
◇TD3490	Fairchild	7490	
	Hitachi	HD7490	
	National	DM7490	
	Signetics	7490	
	TI	SN7490	
		SN7490A	**864**
◇TD3491	Fairchild	7491	
	Hitachi	HD7491	
	National	DM7491	
	Signetics	7491	
	TI	SN7491	
		SN7491A	**864**
◇TD3492	Fairchild	7492	
	Hitachi	HD7492	
	National	DM7492	
	Signetics	7492	
	TI	SN7492	
		SN7492A	**864**
◇TD3495	Fairchild	7495	
	Hitachi	HD7495	
	National	DM7495	
	Signetics	7495	
	TI	SN7495	
		SN7495A	**866**
◇TD3503A	National	DM74184	
	TI	**SN74184**	**899**
TD62001	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
TD62001	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62101	
TD62002	Exar	XR2002	
		XR2202	**3200**
	Fairchild	9666	
		MC1412	
	Mitsubishi	M54525	
	Motorola	**MC1412**	**2753**
		ULN2002	
	NEC-Micro	UPA2002	
	RIFA	PBD352304	
		PBD352314	
	Sanyo	LB1232	
	SGS	L202	
	Signetics	NE56202	
	SiliconG	SG2002	
	Sprague	ULN-2002	
		ULN-2022	
		ULS-2002	
	TI	SN75467	
		ULN2002	
TD62003	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62004	
TD62004	Exar	XR2003	
		XR2203	**3200**
		XR2204	**3200**
	Fairchild	9667	
		9668	
		MC1413	
	Motorola	**MC1413**	**2753**
		MC1416	**2753**
		ULN20003	
		ULN2003	
		ULN2004	
	RIFA	PBD352303	
	Sanyo	LB1233	
		LB1234	
	SGS	L203	
		L204	
	Signetics	ULN2003	
		ULN2004	
	SiliconG	SG2003	
		SG2004	
	Sprague	ULN-2003	
		ULN-2004	
		ULN-2023	
		ULS-2003	
		ULS-2004	
	TI	SN75468	
		ULN2003	
		ULN2004	
	Toshiba	TD62003	
TD62064	Sprague	ULN-2064	
	TI	ULN2064	
TD62074	Motorola	ULN2074	
TD62074	Sprague	ULN-2074	
	TI	ULN2074	
TD62101	Exar	XR2001	
		XR2201	**3200**
	Fairchild	9665	
	Mitsubishi	M54524	
	Motorola	**MC1411**	**2753**
		ULN2001	
		XR2201	
	NEC-Micro	UPA2001	
	RIFA	PBD352301	
		PBD352311	
	Sanyo	LB1231	
	SGS	L201	
	Signetics	ULN2001	
	SiliconG	SG2001	
		SG3851	
	Sprague	ULN-2001	
		ULN-2021	
		ULS-2001	
		ULS-2011	
	TI	SN75466	
		ULN2001	
	Toshiba	TD62001	
TM2332	AMD	AM9233	
	AMI	**S2333**	**3608**
	CSG	MPS2333	
	Fairchild	F3533	
	GI	R03-9333	
	Intel	2332	
	NEC-EA	8332	
		EA8333	
	RCA	CDM5332	
	Signetics	2332	
	Synertek	**SY2333**	**3950**
	Universal	UM2333-45	
TM2364	AMD	9264	
		9265	
	AMI	S68364	
		S68A364	**3613**
	GTEMicro	2364	
	Intel	2364	
	Intersil	IM7364	
	MicroPwr	MP2364	
	Mostek	MK36000	
	Motorola	**MCM68364**	**3840**
	National	MM52164	
		MM5235	
	NEC-EA	EA8364	
		LA8364	
	NEC-Micro	μPD2364	
	Rockwell	R2364	
	SGS	M36000	
	Signetics	2364	
		2664A	
	SMC	ROM36000	
	Synertek	SY2364	
	TI	TMS4764	
TMM2016	AD	AD515	
	Burr-Brown	3528	
	Fairchild	F3528	
	Fujitsu	MB8128	
		MB8416	**3676**
	Harris	HM6116	
	Hitachi	HM6116	
	IDT	IDT6116	
	MicroPwr	MP6116	
	Mitsubishi	M5K8725	
	NEC-Micro	μPD446	
	OKI	**MSM2128**	**3873**
		MSM5128	**3873**
	RCA	CDM6116	
	Synertek	SY2128	
		SY2129	
	TI	TMS4016	
	Toshiba	TC5516	
TMM213D-1	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	

◇ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

© IC MASTER 1983

Toshiba America (Cont'd)

Manufacturer Device	Replacement Source	Device	IC Master Page
TMM2147	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
	Universal	UM2147	
TMM23256	Mostek	MK38000	
	NEC-EA	μPD2/83256	
TMM2364	AMD	AM9264	
	AMI	S4264	
	GTEMicro	2364-3	
	Mostek	MK36000-5	
	NEC-EA	UPD2/8364-30	
	Signetics	**2664A-30**	**3907**
	Synertek	SY2364-3	
	Weitek	SC8164	
TMM2732	AMD	2732	
	Fairchild	F2732	
	Hitachi	**HN462732**	**3789**
	Intel	2732	
		2732A	**3819,3822**
		M2732	
	Mitsubishi	M5L2732	
	National	MM2732	
		NMC2732	
	NEC-Micro	μPD2732	
	Toshiba	TMM324C	
	Universal	UM2732	
TMM2764	Fujitsu	MBM2764	
	Hitachi	HN462764	
		HN482764	**3789**
	Intel	**2764**	**3820,3822**
		M2764	
	Intersil	2764	
	Mostek	MK2764	
	National	NMC2764	
	NEC-Micro	μPD2764	
	SEEQ	5133	
TMM314	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314A	
TMM314A	AMD	2114	
		9114	
	CSG	MCS2114	
		MPS2114	
	EMM	2114	
	Fairchild	F2114	
	Fujitsu	MB8114	
	GTEMicro	2114	
	Hitachi	472114	
		HM2114	
		HM472114	
	Intel	2114	
		2114A	
TMM314A	Intersil	2114	
		IM2114	
	MicroPwr	MP2114	
		MP2114C	
	Mitsubishi	M5L2114	
	Motorola	MCM2114	
		MCM21L14	
	National	MM2114	
	NEC-Micro	μPD2114	
	OKI	**MSM2114**	**3873**
	Panasonic	MN2114	
	Supertex	CM2114	
	Synertek	**SY2114**	**3941**
	TI	TMS4045	
		TMS40L45	
	Toshiba	TMM314	
TMM315	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Universal	UM2147	
◆TMM322	AMD	2708	
	Fairchild	F2708	
	Hitachi	HN462708	
	Motorola	MC27A08	
		MCM2708	
	National	MM2708	
	NEC-EA	EA2708	
	Panasonic	MN2708	
	Rockwell	2708	
	SGS	M2708	
	TI	TMS2708	
TMM324C	AMD	2732	
	Fairchild	F2732	
	Hitachi	**HN462732**	**3789**
	Intel	2732	
		2732A	**3819,3822**
		M2732	
	Mitsubishi	M5L2732	
	National	MM2732	
		NMC2732	
	NEC-Micro	μPD2732	
	Toshiba	TMM2732	
	Universal	UM2732	
TMM331A	AMD	AM9218	
	AMI	S6831B	
	CSG	MPS2316	
	Fairchild	3516	
		68316	
		68316E	
		F3516	
		F35316	
		F68316	**1281**
	GI	RO3-8316	
		RO3-9316	
	GTEMicro	2316	
	Intel	2316	
	Mostek	MK34000	
	Motorola	MCM68316	
		MCM68A316	
		MM2316	
	National	MM52116	
		MM5258	
	NEC-EA	EA2316	
		EA8316	
	NEC-Micro	μPD2316	
	OKI	MSM3870	
	Rockwell	R2316	
	SGS	M2316	
	Signetics	TDA2600	
	TI	SBP8316	
TMM333	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	RO3-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
TMM333	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Universal	UM2332	
TMM4116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
	Zilog	Z6116	
TMM416	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Zilog	Z6116	
TMM4164	Fairchild	F64K	
	Fujitsu	MB8264	
		MB8265	
	Hitachi	HM4864	
	Intel	2164	
	Motorola	MCM6664	
		MCM6665	
	National	NMC4164	
	NEC-Micro	μPD4164	
	TI	TMS4164	
TMP8048	AMD	8048	
	Fujitsu	MBL8048	
	Intel	8048	
	National	INS8048	
	NEC-Micro	μPD8048	
		μPD80C48	
	Signetics	SCN8048	
TMP8085A	AMD	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	Intel	8085	
		8085A	
		D8085	
		ID8085	
		MD8085	
		P8085	
	NEC-Micro	μPD8085	
TMP8155	AMD	8155	
		D8155	
		ID8155	
		MD8155	
		P8155	
	NEC-Micro	μPD8155	
TMP8355	AMD	8355	
	Intel	8355	
	NEC-Micro	μPD8355	
TMP8755	Intel	8755A	
	NEC-Micro	μPD8755A	
TR4527	Fairchild	F4527	
	Hitachi	HD14527	
	Motorola	MC14527	
	National	CD4527	
	RCA	CD4527	
	SGS	HCF4527	
	Signetics	HEF4527	
	SSS	SCL4527	
	Toshiba	TC4527	

TRW

MPY16HJ	**Weitek**	**WTL1016**	**1036**

Universal Semiconductor, Inc.

2147	Fujitsu	2147	
	National	NMC2147H	
HCM1200	Nitron	NC91200	
HCM360	Nitron	NC9360	
HCM540	Nitron	NC9540	
HCM720	Nitron	NC9720	
HCM960	Nitron	NC9960	
UM2147	AMD	9147	
	AMI	4017	
	Fujitsu	MBM2147	
	Hitachi	HM4847	
		HM6147	**3789**
	Intel	2147	
	Intersil	2147	
	ITT	4547	
	Motorola	MCM2147	
	National	MM2147	
	NEC-Micro	μPD2147	
	Synertek	**SY2147**	**3941**
	TI	TMS2147	
	Toshiba	TMM315	
UM2332	AMD	9232	
	AMI	S68322	
		S68A332	
	CSG	MPS2332	
	Fairchild	F3532	
	GI	RO3-9332	
	GTEMicro	2332	
	Intersil	IM7332	
	Motorola	MC68332	
		MCM68332	
		MCM68A332	**3840**
	National	MM52132	
	NEC-EA	EA8332	
	NEC-Micro	μPD2332	
	RCA	CDM5333	
	Rockwell	R2332	
	SiliconG	SG3532	
	SMC	ROM4732	
	Synertek	**SY2332**	**3950**
	TI	4732	
		TMS4732	
	Toshiba	TMM333	
UM2332-35	**Fairchild**	**F3532-35**	**1282**
UM2333-35	**Fairchild**	**F3533-35**	**1282**
UM2333-45	AMD	AM9233	
	AMI	**S2333**	**3608**
	CSG	MPS2333	
	Fairchild	F3533	
	GI	RO3-9333	
	Intel	2332	
	NEC-EA	8332	
		EA8333	
	RCA	CDM5332	
	Signetics	2332	
	Synertek	**SY2333**	**3950**
	Toshiba	TM2332	
UM2532	**Hitachi**	**HN462532**	**3789**
	Motorola	MCM2532	
	National	MM2532	
		NMC2532	
		TDA2530	
		TDA2532	
	Plessey	TDA2530	
	Siemens	TDA2530	

◆ Discontinued

The manufacturers report their devices can be used as direct replacements.
Performance details often differ, so compare the specifications considering your requirements.

Manufacturer Device	Replacement Source	Device	IC Master Page
Universal Semiconductor, Inc. (Cont'd)			
UM2532	Signetics	TDA2530	
		TDA2532	
	SiliconG	SG2532	
	TI	TMS2532	
UM2732	AMD	2732	
	Fairchild	F2732	
	Hitachi	**HN462732**	**3789**
	Intel	2732	
		2732A	**3819,3822**
		M2732	
	Mitsubishi	M5L2732	
	National	MM2732	
		NMC2732	
	NEC-Micro	μPD2732	
	Toshiba	TMM2732	
		TMM324C	
Weitek Corporation			
SC8164	AMD	AM9264	
	AMI	S4264	
	GTEMicro	2364-3	
	Mostek	MK36000-5	
	NEC-EA	UPD2/8364-30	
	Signetics	**2664A-30**	**3907**
	Synertek	SY2364-3	
	Toshiba	TMM2364	
WTL1016	TRW	MPY16HJ	
WTL1516	AMD	29516	
WTL1517	AMD	29517	
Western Digital			
1791	Synertek	SY1791	
1793	Synertek	SY1793	
BR1941	SMC	COM5016	
FD1761	SMC	FDC1761	
FD1763	SMC	FDC1763	
FD1765	SMC	FDC1765	
FD1767	SMC	FDC1767	
FD1771	National	INS1771	
FD1791	**Fujitsu**	**MB8876**	**1308**
	Siemens	SAB1791	
	SMC	FDC1791	
FD1792	SMC	FDC1792	
FD1793	**Fujitsu**	**MB8877**	**1308**
	Siemens	SAB1793	
	SMC	FDC1793	
FD1794	SMC	FDC1794	
FD1795	Siemens	SAB1795	
	SMC	FDC1795	
FD1797	Siemens	SAB1797	
	SMC	FDC1797	
TR1402	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1602	
		TR1863	
TR1602	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1402	
		TR1863	
TR1863	AMI	S1602	
	Fairchild	3730	
		F6850	**1280**
	Fujitsu	MB7768A	
		MB8868A	
	GI	AY3-1015	
		AY6-1013	
	Harris	HM6402	
	Hitachi	**HD6850**	**1345**
		HD68A50	**1345**
	Motorola	**MC6850**	**1351**
	National	MM5303	
	RCA	CDP6402	
	SMC	COM2017	
		COM2502H	
		COM8017	
	Western	TR1602	
		TR1602	
TR1983	AMD	8251	
		9551	
		D8251	
		ID8251	
		MD8251	
		P8251	
	Intel	8251A	
		D8251	
		ID8251	
		MD8251	
		P8251	
	National	DP8251	
		INS8251	
	NEC-Micro	μPB8251	
		μPD8251	
		μPD8251A	
	SMC	COM8251A	
UC1671	SMC	COM1671	
Xicor			
X2001	NCR	NCR52001	
X2002	NCR	NCR52002	
X2004	NCR	NCR52004	
X2210	NCR	5210	
X2212	NCR	5212	
X2816	SEEQ	5123	
Zilog			
6104	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	Z6104	
Z6104	AMD	4044	
		9244	
		AM9244E	
	EMM	4044	
	Fujitsu	4044	
	Hitachi	**HM4315**	**3789**
	Intel	2141	
		2141-2	
	Intersil	IM7141	
	Mostek	MK4104	
	Motorola	MCM6641	
		MCM66L41	
	National	MM2141	
		MM5257	
		NMC2141	
	NEC-Micro	μPD4104	
		μPD4104-3	
	RCA	CDM5104	
	TI	TMS4044	
	Zilog	6104	
Z6116	AMD	9016	
		AM9016	
	Fairchild	F16K	
		F4116	
Z6116	Fujitsu	MB8116	
	Hitachi	HM4716	
	Intel	2117	
	Intersil	IM7116	
	ITT	ITT4116	
	Mostek	MK4116	
	Motorola	MCM4116	
	National	MM5290	
	NEC-Micro	μPD416	
	Panasonic	MN4116	
	SGS	M4116	
	Siemens	HYB4116	
	Signetics	2690	
		2960	
	Signetics	2960	
	Sprague	UCN4116	
	TI	TMS4116	
	Toshiba	TMM416	
Z6132	National	NMC6132	
Z8	SGS	Z8	
	Synertek	Z8	
Z80	Mostek	MK3880	
	NEC-Micro	μPD780	
	SGS	Z80	
		Z80-CPU	
		Z80CPUB	
	Zilog	Z80-CPU	
Z80-CPU	Mostek	MK3880	
	NEC-Micro	μPD780	
	SGS	Z80	
		Z80-CPU	
		Z80CPUB	
	Zilog	**Z80**	**1581**
Z80-CTC	Mostek	MK3882	
	SGS	Z80-CTC	
		Z80CPUB	
Z80-DMA	Mostek	MK3883	
	SGS	Z80	
		Z80CPUB	
Z80-PIO	Mostek	MK3881	
	SGS	Z80-PI	
		Z80CPUB	
Z80-SIO	Mostek	MK3884	
		MK3885	
		MK3887	
	SGS	Z80-SIO	
		Z80CPUB	
Z8000	SGS	Z8000	
Z8001	AMD	AMZ8001	
	SGS	Z8001	
Z8002	AMD	AMZ8002	
	SGS	Z8002	
Z8010	AMD	AMZ8010	
	SGS	Z8010	
Z8036	SGS	Z8036	
Z8038	SGS	Z8038	
Z8060	SGS	Z8060	
Z8090	SGS	Z8090	
Z80DART	SGS	Z80DART	
Z8400	SGS	Z8400	
Z8410	SGS	Z8410	
Z8420	SGS	Z8420	
Z8430	SGS	Z8430	
Z8440	SGS	Z8440	
Z8441	SGS	Z8441	
Z8442	SGS	Z8442	
Z8449	SGS	Z8449	
Z8470	SGS	Z8470	
Z8530	AMD	Z8530	
Z8536	AMD	Z8536	
Z8538	AMD	Z8538	
Z8590	AMD	Z8590	
Z8591	AMD	Z8591	
Z8592	AMD	Z8592	
Z8593	AMD	Z8593	
Z8594	AMD	Z8594	
Z8601	SGS	Z8601	
	Synertek	**Z8601**	**1540**
Z8602	SGS	Z8602	
	Synertek	**Z8602**	**1541**
Z8603	**Synertek**	**Z8603**	**1542**
Z8611	SGS	Z8611	
	Synertek	**Z8611**	**1543**
Z8612	SGS	Z8612	
	Synertek	**Z8612**	**1544**
Z8613	**Synertek**	**Z8613**	**1545**
Z8671	Synertek	Z8671	
Z8681	**Synertek**	**Z8681**	**1546**

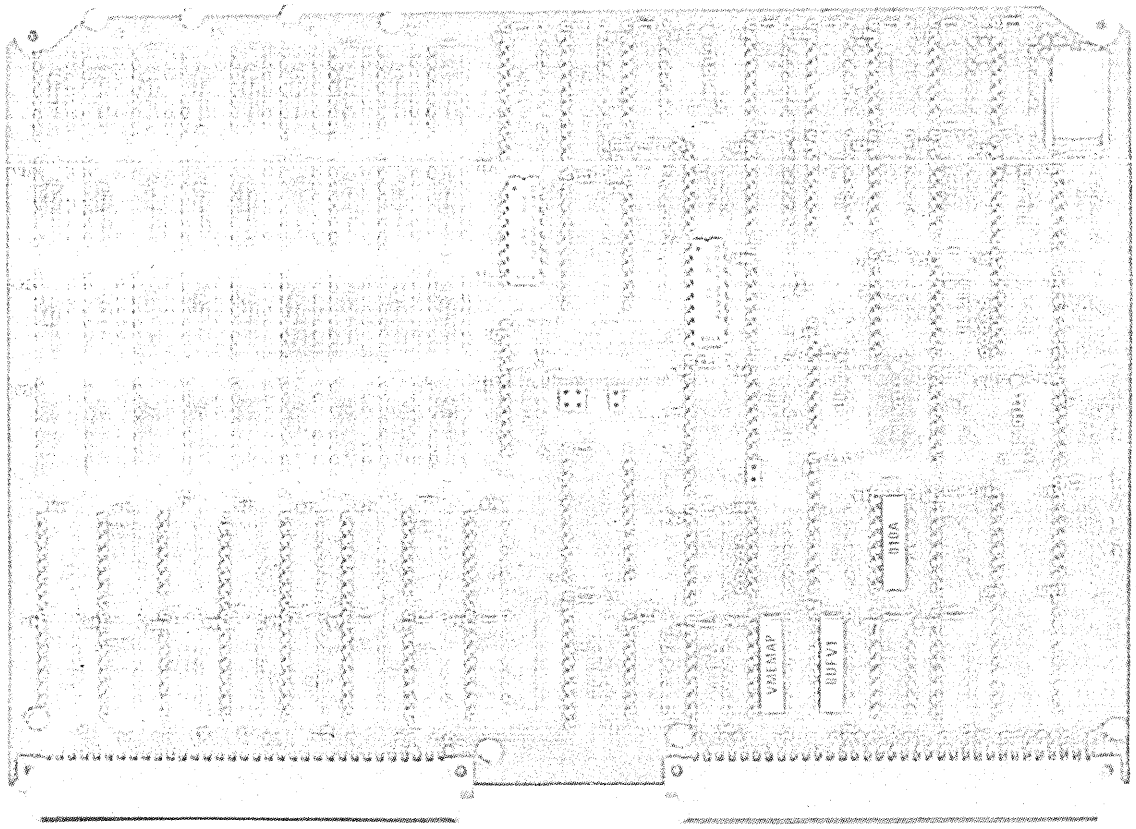
◆ Discontinued

Bold face device numbers indicate manufacturers data is provided in the IC Master on the pages noted.

Last Page This Section. Next Page 2300.

© IC MASTER 1983

For Key Data On Every IC On This Board, The Place To Look Is...



This Signetics Memory Module provides 256K bytes of dynamic random access memory, plus parity protection.

Equipment and system design often require the use of a wide variety of integrated circuits in order to obtain optimum performance. One way for an engineer to be certain that he hasn't overlooked the best device for his application is to refer to the pages of IC MASTER.

Surveys conducted by IC MASTER, integrated circuit manufacturers, and independent research agencies confirm that four out of five IC MASTER users have specified one or more products as the result of using IC MASTER.

Device No.	Description
74LS00	Quadruple 2-Input NAND Gate
74LS08	Quadruple 2-Input AND Gate
74LS04	Hex Inverter
74LS20	Dual 4-Input NAND Gate
74LS32	Quadruple 2-Input OR Gate
74LS37	Quadruple 2-Input NAND Buffer
74LS24	Schmitt Trigger
74LS74	Dual D-Type Edge-Triggered Flip-Flop
74LS132	Quadruple 2-Input Schmitt Trigger
74LS112	Dual J-K Edge-Triggered Flip-Flop
74LS10	Triple-3-Input NAND Gate
74LS244	Octal Buffer/Line Driver
74LS645	Octal Bus Transceiver
AM25LS2521	8-Bit Equal-to Comparator
74S38	AND/NAND Gate
N7411	Triple-3-Input AND Gate
N74S40	Dual 4-Input NAND Buffer
TMS4164	64K Dynamic RAM
7641	512 x 8 PROM
7642	1K x 4 PROM

Representative list of ICs on Signetics SMVME3100 Memory Card. Key specifications for all of these ICs can be found in IC MASTER.

IC MASTER

BE SURE. BEGIN WITH THE IC MASTER

The Arrow Lines

Manufacturers alphabetically

A
Alco
Alpha
AMD
AMI
Amphenol
Analog Devices
Applied Digital Data Systems
Arrow•ACS/2200
Augat
AVX

B
Beckman
Belden
Burndy
Bussmann

C
Cambion
Cannon ITT
Cornell Dubilier
Centralab
Chicago Miniature
C & K
Clarostat
CDC
- Drives
- Media

Corning
Crydom
CTS

D
Dataproducts
Data Technology Corporation
Dialight
Dilog

E
Elec-trol

F
Fairchild

G
General Electric
- Capacitors
- Relays
- Semiconductors

General Instrument
- Microelectronics
- Optoelectronics
- Semiconductors

H
Hi-G

I
IBM
Intel
- Semiconductors
- Systems

International Rectifier
Inmos
Intersil

L
Littelfuse
Litronix

M
Magnecraft
Mallory
Mepco/Electra
MicroPro
Microsemiconductor
MMI
Mostek
Murata/Erie

N
NEC
- Printers

O
OMTI

P
Prentice
Power One

Q
Quantum

R
Raytheon
RCA
Rotron

S
Seagate Technology
Sealectro
Siemens
Signetics
Spectra-Strip
Spectrol
Sprague
Standard Power
Struthers Dunn

T
TeleVideo
- Systems
- Terminals

Texas Instruments, Inc.
- Connectors
- Semiconductors
- Systems
- Terminals & Printers

Thermalloy
Thomas & Betts
TRW
- Capacitors
- Cinch
- Globe Motors
- IRC
- LSI
- Optron
- Semiconductors
- UTC

Tusonix

U
Unitrode

V
Verbatim

NORTHWEST
Denver, Colorado (303) 758-2100
Salt Lake City, Utah (801) 539-1135
San Francisco, California (408) 745-6600
Seattle, Washington (206) 643-4800

SOUTHWEST
Albuquerque, New Mexico (505) 243-4566
Los Angeles, California (213) 701-7500
Newport Beach, California (714) 851-8961
San Diego, California (714) 565-4800

NORTH CENTRAL
Cedar Rapids, Iowa (319) 395-7230
Chicago, Illinois (312) 397-3440
Madison, Wisconsin (608) 273-4977
Milwaukee, Wisconsin (414) 764-6600
Minneapolis, Minnesota (612) 830-1800

SOUTH CENTRAL
Austin, Texas (512) 835-4180
Dallas, Texas (214) 386-7500
Houston, Texas (713) 491-4100
Tulsa, Oklahoma (918) 665-7700

MIDWEST
Cleveland, Ohio (216) 248-3990
Detroit, Michigan (313) 971-8220
Grand Rapids, Michigan (616) 243-0912
Pittsburgh, Pennsylvania (412) 856-7000

TRI-STATE
Dayton, Ohio (513) 435-5563
Indianapolis, Indiana (317) 243-9353
St. Louis, Missouri (314) 567-6888

NORTHEAST
Boston, Massachusetts (617) 933-8130
Manchester, New Hampshire (603) 668-6968

EMPIRE
Hauppauge, New York (516) 231-1000
Rochester, New York (716) 275-0300
Syracuse, New York (315) 652-1000
Wallingford, Connecticut (203) 265-7741

MID-ATLANTIC
Baltimore, Maryland (301) 247-5200
Fairfield, New Jersey (201) 575-5300
Moorestown, New Jersey (609) 235-1900
Richmond, Virginia (804) 282-0413

SOUTHEAST
Atlanta, Georgia (404) 449-8252
Fort Lauderdale, Florida (305) 776-7790
Huntsville, Alabama (205) 882-2730
Melbourne, Florida (305) 725-1480
Raleigh, North Carolina (919) 876-3132
Winston Salem, North Carolina (919) 725-8711

Arrow International TWX: (510) 224-6021

Arrow...blue ribbon service

© IC MASTER 1983

MANUFACTURERS AND DISTRIBUTORS/ REPRESENTATIVES DIRECTORY

The Manufacturers and Distributors/Representatives Directory is a comprehensive telephone directory of the entire IC industry. It places at your fingertips the names and phone numbers you need to know. It includes manufacturers, international sales offices, representatives and distributors; for manufacturers with data pages, it also includes domestic sales offices, representatives and distributors. The manufacturers' listings tell you where and whom to call to obtain technical and ordering information. It enables you to ask for the right person or phone extension. It gives you the terminology understood by the individual company's switchboard operators, e.g., in some companies you should ask for sales, in others, customer service. This directory will reduce frustration and save you time.

© IC MASTER 1993

Action Instruments

Action Instruments Company, Inc.
8601 Aero Drive
San Diego, California 92123
619-279-5726

Adaptive Science

Adaptive Science Corporation
4700 San Pablo Avenue
Emeryville, California 94608
415-652-1805

Advanced Digital Technology

Advanced Digital Technology
696 East Trimble Road
San Jose, California 95131
408-946-0503
TWX: 910-338-2030

Advanced Micro Devices

Advanced Micro Devices, Inc.
901 Thompson Place
Sunnyvale, California 94086
408-732-2400
TWX: 910-339-9380
TELEX: 34-6306

Specific product information:
Bipolar Microprocessors ..... Geoff Tate
Bipolar Memory ..... Ralph Cognac
Logic (MSI) ..... Mike Walton
Hi-Rel Logic and Interface ..... Mike Ewing
Microcomputer Board Information ..... Advanced Micro Devices, 3340 Scott Blvd., Santa Clara, CA 95051, 408-988-7777, Telex: 171-142
MOS Microprocessors and Support Circuits ... Dick Koeltl
MOS Serial Memory, Mask-programmable ROMs and E-PROMs ..... Bill DeMatteis
MOS-RAMs ..... Lowell Turriff
Computer Interface ..... Lyle Pittroff

Application engineering:
Bipolar ..... John Mick
MOS/Lic ..... Clive Ghest

Literature:
Literature Dept.

Price and delivery:
Contact AMD Sales Office, Rep. or Dist.

Follow-up an order:
Customer Service Dept.

All other information:
Corporate Communications Dept.

Sales Offices & Representatives

AL **Huntsville**
Electronic Mfrs. Agents, 205-533-6440

AZ **Tempe**
AMD, 602-244-9511

CA **Beverly Hills**
AMD, 213-278-9700/1

CA **Newport Beach**
AMD, 714-752-6262

CA **Santa Clara**
AMD, 408-727-1300

CA **Santa Clara**
I² Inc., 408-988-3400

CA **San Diego**
Bestronics Inc., 407-278-2150

CA **Woodland Hills**
AMD, 213-992-4155

CO **Denver**
AMD, 303-426-7100

CT **Cheshire**
Scientific Comps., 203-272-2965

FL **Boca Raton**
Conley & Assocs., 305-395-6108

FL **Ft. Lauderdale**
AMD, 305-771-6510

FL **Oviedo**
Conley & Assocs., 305-365-3283

FL **Tampa**
Conley & Assocs., 813-885-7658

GA **Atlanta**
AMD, 404-449-7920

GA **Atlanta**
Elctrn. Mfrs. Agents, 404-449-9430

IL **Elk Grove Village**
Oasis Sales, 312-640-1850

IL **Schaumburg**
AMD, 312-882-8660

IN **Ft. Wayne**
Electro Reps., Inc., 219-483-0518

IN **Indianapolis**
Electro Reps., Inc., 317-255-4147

IA **Cedar Rapids**
Lorenz Sales, 319-377-4666

KS **Overland Park**
Kebco Sales, 913-649-1051

MD **Linthicum**
AMD, 301-796-9310

MA **Woburn**
AMD, 617-933-1234

MI **Brighton**
S.A.I. Mktg. Corp., 313-227-1786

MI **Livonia**
AMD, 313-425-3440

MN **Edina**
AMD, 612-929-5400

MO **Maryland Heights**
Kebco Mfrs., 314-576-4111

NE **Lincoln**
Lorenz Sales, 402-475-4660

NJ **Bellmawr**
Dolfuss-Root & Co., 216-238-0300

NJ **Bellmawr**
T.A.I. Corp., 609-933-2600

NJ **Edison**
AMD, 201-985-6800

NM **Albuquerque**
The Thorson Co., 505-265-5655

NY **East Syracuse**
AMD, 315-437-7546

NY **East Syracuse**
Nycom, Inc., 315-437-8343

NY **Poughkeepsie**
AMD, 914-471-8180

NY **Woodbury**
AMD, 516-364-8020

NC **Charlotte**
AMD, 704-525-1875

OH **Centerville**
Dolfuss-Root & Co., 513-433-6776

OH **Columbus**
AMD, 614-864-9906

OR **Tigard**
AMD, 503-620-1021

PA **Bridgeville**
Dolfuss-Root & Co., 412-221-4420

PA **Horsham**
AMD, 215-441-8210

TX **Austin**
Bonser-Philhower Sales, 512-458-3569

TX **Dallas**
AMD, 214-234-5886

TX **Dallas**
Bonser-Philhower Sales, 214-234-8438

TX **Houston**
Bonser-Philhower Sales, 713-783-0063

UT **Salt Lake City**
R² Mktg., 801-290-2631

WA **Bellevue**
Venture Elctrns., 206-454-4594

WI **Menomonee Falls**
Oasis Sales, Inc., 414-445-6682

Can **Burnaby, British Columbia**
Vitel Elctrns., 604-438-6121

Can **Ottawa, Ontario**
Vitel Elctrns., 613-236-0396

Can **Rexdale, Ontario**
Vitel Elctrns., 416-245-8528

Can **St. Laurent, Quebec**
Vitel Elctrns., 514-331-7393

Intl **Argentina, Buenos Aires**
Thiko, S. A. Elctrna., TEL: (1) 30-4132

Intl **Australia, Prospect**
A.J. Distrs. Pty., Ltd., TEL: (8) 269-1244

Intl **Australia, Sydney**
R & D Elctrns., TEL: (61) 439-5488

Intl **Australia, Victoria**
R & D Elctrns., TEL: (03) 288-8232/62

Intl **Austria, Brunn am Gebirge**
Kontron Ges.m.b.H., TEL: (02236) 8 66 31

Intl **Belgium, Bruxelles**
AMD, TEL: (02) 771 9993

Intl **Belgium, Ougree**
MCA Tronix, TEL: (041) 362780/362795

Intl **Denmark, Copenhagen**
Advanced Elctrn. of Denmark ApS., TEL: (01) 19 44 33

Intl **Finland, Espoo**
Korndel OY, TEL: (90) 885 011

Intl **France, Cannes**
AMD, S.A., TEL: (093) 43 60 75

Intl **France, Le Chesnay**
A2M, TEL: (01) 954.91.13

Intl **France, Lyon Cedex**
LED, TEL: (078) 58.85.85

Intl **France, Neuilly-Sur-Seine**
RTF, TEL: (01) 747.11.01

Intl **France, Rungis Cedex**
AMD, S.A., TEL: (01) 686.91.86

Intl **France, St. Germain du Puch**
A2M

Intl **France, St. Sebastian/Loire**
RTF

Intl **Germany, Burgwedel**
EBV-Elektronik Vertriebs GmbH, TEL: (05139) 50 38

Intl **Germany, Dusseldorf**
EBV-Elektronik Vertriebs GmbH, TEL: (0211) 8 48 46/7

Intl **Germany, Filderstadt**
AMD, TEL: (07158) 62 63 0

Intl **Germany, Frankfurt**
EBV-Elektronik Vertriebs GmbH, TEL: (0611) 72 04 16

Intl **Germany, Heilbronn**
Elbatex GmbH, TEL: (07131) 89 00 1

Intl **Germany, Kiel-Raisdorf**
Nordelektronik Vertriebs GmbH, TEL: (04307) 54 83

Intl **Germany, Muenchen**
AMD, TEL: (089) 40 19 76

Intl **Germany, Muenchen**
Cosmos Elektronik GmbH, TEL: (089) 60 20 88

Intl **Germany, Muenchen**
EBV-Elektronik Vertriebs GmbH, TEL: (089) 6 11 05-1

Intl **Germany, Muenchen**
MEV-Mikro Elektronik Vertriebs GmbH, TEL: (08170) 71 61

Intl **Germany, Stuttgart**
EBV-Elektronik Vertriebs GmbH, TEL: (0711) 24 74 81/83

Intl **Germany, Quickborn**
Nordelektronik Vertriebs GmbH, TEL: (04106) 40 31

Intl **Holland, Oss**
Archobel BV, TEL: (04120) 24200/27574

Intl **Hong Kong, Hong Kong**
Flint Elctrns. Co., TEL: (5) 255732

Intl **India, Bangalore**
SRI RAM Assoc.

© IC MASTER 1983

Advanced Micro Devices (Cont)

Intl **India, Bombay**
Hindustan Semiconductor, TEL: 818105/812772

Intl **Israel, Tel-Aviv**
Talviton Elctrns., TEL: (3) 444572

Intl **Italy, Milano**
Indelco, S.r.L., TEL: (02) 386-9161

Intl **Italy, Roma**
Indelco, S.r.L., TEL: (06) 5140722

Intl **Italy, Segrate**
AMD, S.r.L., TEL: (02) 215 4913-4-5

Intl **Japan, Harashi**
Danichi Elctrns.

Intl **Japan, Osaka**
AMD, K.K., TEL: (06) 386-9161

Intl **Japan, Tokyo**
AMD, K.K., TEL: (03) 329-2751

Intl **Japan, Tokyo**
Advanced Technology Corp. Of Japan, TEL: (03) 265-9416

Intl **Japan, Tokyo**
Danichi Elctrns., TEL: (03) 813-6876

Intl **Japan, Tokyo**
ISI Ltd., TEL: (03) 264-3301

Intl **Japan, Tokyo**
Kantmatsu Denshi K.K.

Intl **Japan, Tokyo**
Microtek, Inc., TEL: (03) 363-2317

Intl **Korea, Seoul**
Dunksung Trading Co., TEL: 778-3198

Intl **Korea, Seoul**
Leewood Intl., Inc., TEL: 28-5827

Intl **New Zealand, Auckland**
G.T.S. Engrg., Ltd., TEL: (9) 543 214

Intl **Norway, Stroemmen**
A/S Kjell Bakke, TEL: (02) 71 18 72

Intl **South Africa, Ranburg**
South Continental Devices (Pty.) Ltd., TEL: (011) 789-2400

Intl **Spain, Madrid**
Regula S.A., TEL: (01) 459 33 00/04/08

Intl **Spain, Madrid**
Sagitron, SA, TEL: (01) 275-4824

Intl **Sweden, Sundyberg**
AMD AB

Intl **Sweden, Vallingby**
Svensk Teleindustri AB, TEL: (08) 89 04 35

Intl **Switzerland, Zurich**
Kurt Hirt AG, TEL: (01) 302 21 21

Intl **Taiwan, Taipei**
Everdata Intl. Corp., TEL: 752-9911

Intl **Taiwan, Taipei**
Multitech Intl. Corp., TEL: 768-1232

Intl **United Kingdom, Derby**
Quardon Elctrns., TEL: (0332) 32651

Intl **United Kingdom, Essex**
ITT Elctrn. Svcs., TEL: (0279) 26777

Intl **United Kingdom, Kent**
Candy Elctrn. Comps., TEL: (0622) 54051

Intl **United Kingdom, Middlesex**
Dage (Eurosem), Ltd., TEL: (01) 868 0028

Intl **United Kingdom, Middlesex**
Hawke-Cramer Comps. Ltd., TEL: (01) 979-7799

Intl **United Kingdom, Oxon**
Memec, Ltd., TEL: (084 421) 3146

Intl **United Kingdom, Surrey**
AMD, (U.K.) Ltd., TEL: (04862) 22121

Distributors

AL **Huntsville**
Hamilton/Avnet Elctrns., 205-533-1170

AL **Huntsville**
Hall-Mark Elctrns., 205-837-8700

AZ **Phoenix**
Wyle Distribution Grp., 602-249-2232

AZ **Tempe**
Hamilton/Avnet Elctrns., 602-275-7851

CA **Costa Mesa**
Avnet Elctrns., 714-754-6084

CA **Costa Mesa**
Hamilton/Avnet Elctrns., 714-641-1850

CA **Culver City**
Hamilton Electro Sales, 213-558-2131

CA **El Segundo**
Wyle Distribution Grp., 213-322-8100

CA **Irvine**
Schweber Elctrns., 213-537-4320

CA **Irvine**
Wyle Distribution Grp., 714-641-1600

CA **San Diego**
Hamilton/Avnet Elctrns., 714-571-7500

CA **San Diego**
Wyle Distribution Grp., 714-565-9171

CA **Santa Clara**
Schweber Elctrns., 408-496-0200

CA **Santa Clara**
Wyle Distribution Grp., 408-727-2500

CA **Sunnyvale**
Arrow Elctrns., 408-739-3011

CA **Sunnyvale**
Bell Inds., 408-734-8570

CA **Sunnyvale**
Hamilton/Avnet Elctrns., 408-743-3300

CO **Commerce City**
Wyle Distribution Grp., 303-287-9611

CO **Englewood**
Hamilton/Avnet Elctrns., 303-740-1000

CO **Wheatridge**
Bell Inds., 303-424-1985

CT **Danbury**
Schweber Elctrns., 203-792-3500

CT **Georgetown**
Hamilton/Avnet Elctrns., 203-762-0361

CT **Hamden**
Arrow Elctrns., 203-248-3801

CT **Hamden**
Wilshire Elctrns., 203-281-1166

FL **Ft. Lauderdale**
Arrow Elctrns., 305-776-7790

FL **Ft. Lauderdale**
Hall-Mark Elctrns., 305-971-9280

FL **Ft. Lauderdale**
Hamilton/Avnet Elctrns., 305-971-2900

FL **Orlando**
Hall-Mark Elctrns., 305-855-4020

FL **Orlando**
Pioneer/Fl., 305-859-3600

FL **Palm Bay**
Arrow Elctrns., 305-725-1480

FL **St. Petersburg**
Hamilton/Avnet Elctrns., 813-576-3930

GA **Norcross**
Arrow Elctrns., 404-449-8252

GA **Norcross**
Hamilton/Avnet Elctrns., 404-448-0800

IL **Bensenville**
Hall-Mark Elctrns., 312-860-3800

IL **Elk Grove Village**
Pioneer/Chicago, 312-437-9680

IL **Schaumburg**
Arrow Elctrns., 312-893-9420

IL **Schiller Park**
Hamilton/Avnet Elctrns., 312-678-6310

IN **Indianapolis**
Pioneer/In., 317-849-7300

KS **Overland Park**
Hamilton/Avnet Elctrns., 913-888-8900

KS **Shawnee Mission**
Hall-Mark Elctrns., 913-888-4747

MD **Baltimore**
Arrow Elctrns., 301-247-5200

MD **Baltimore**
Hall-Mark Elctrns., 301-796-9300

MD **Gaithersburg**
Pioneer/Wa., 301-948-0710

MD **Hanover**
Hamilton/Avnet Elctrns., 301-796-5000

MA **Bedford**
Schweber Elctrns., 617-275-5100

MA **Burlington**
Wilshire Elctrns., 617-272-8200

MA **Woburn**
Arrow Elctrns., 617-933-8130

MA **Woburn**
Hamilton/Avnet Elctrns., 617-935-9700

MI **Ann Arbor**
Arrow Elctrns., 313-971-8220

MI **Livonia**
Hamilton/Avnet Elctrns., 313-522-4700

MI **Livonia**
Pioneer/Mi., 313-525-1800

MN **Bloomington**
Hall-Mark Elctrns., 612-884-9056

MN **Edina**
Arrow Elctrns., 612-830-1800

MN **Edina**
Hamilton Avnet Elctrns., 612-941-3801

MO **Earth City**
Hall-Mark Elctrns., 314-291-5350

MO **Earth City**
Hamilton/Avnet Elctrns., 314-344-1200

NJ **Cherry Hill**
Hamilton/Avnet Elctrns., 609-424-0100

NJ **Clifton**
Wilshire Elctrns., 201-340-1900

NJ **Fairfield**
Hamilton/Avnet Elctrns., 201-575-3390

NJ **Fairfield**
Schweber Elctrns., 201-227-7880

NJ **Moorestown**
Arrow Elctrns., 609-235-1900

NJ **Saddle Brook**
Arrow Elctrns., 201-797-5800

NM **Albuquerque**
Electronic Devices Co., Inc., 505-293-1935

NM **Albuquerque**
Hamilton/Avnet Elctrns., 505-765-1500

NY **Buffalo**
Summit Distrs., Inc., 716-884-3450

NY **East Syracuse**
Hamilton/Avnet Elctrns., 315-437-2642

NY **Endwell**
Wilshire Elctrns., 607-754-1570

NY **Farmingdale**
Arrow Elctrns., 516-694-6800

NY **Liverpool**
Arrow Elctrns., 315-652-1000

NY **Hauppauge**
Wilshire Elctrns., 516-543-5599

NY **Melville**
Hamilton/Avnet Elctrns., 516-454-6000

NY **Rochester**
Arrow Elctrns., 716-275-0300

NY **Rochester**
Hamilton/Avnet Elctrns., 716-442-7820

NY **Rochester**
Wilshire Elctrns., 716-235-7620

NY **Westbury**
Schweber Elctrns., 516-334-7474

NC **Kernersville**
Arrow Elctrns., 919-996-2039

NC **Raleigh**
Hall-Mark Elctrns., 919-832-4465

NC **Raleigh**
Hamilton/Avnet Elctrns., 919-829-8030

OH **Cincinnati**
Arrow Elctrns., 513-761-5432

OH **Cleveland**
Hamilton/Avnet Elctrns., 216-461-1400

OH **Cleveland**
Pioneer/Cleveland, 216-587-3600

OH **Dayton**
Hamilton/Avnet Elctrns., 513-433-0610

OH **Kettering**
Arrow Elctrns., 513-253-9176

OH **Reading**
Arrow Elctrns., 513-761-5432

OH **Solon**
Arrow Elctrns., 216-248-3990

© IC MASTER 1983

Advanced Micro Devices (Cont)

OK Tulsa
Hall-Mark Elctrns., 918-835-8458
OR Lake Oswego
Hamilton/Avnet Elctrns., 503-635-8831
PA Horsham
Schweber Elctrns., 215-441-0600
PA Pittsburgh
Pioneer/Pittsburgh, 412-782-2300
TX Austin
Hall-Mark Elctrns., 512-837-2814
TX Austin
Hamilton/Avnet Elctrns., 512-837-8911
TX Dallas
Hall-Mark Elctrns., 214-234-7300
TX Dallas
Hamilton/Avnet Elctrns., 214-661-8661
TX Dallas
Schweber Elctrns., 214-661-5010
TX Houston
Hall-Mark Elctrns., 713-781-6100
TX Houston
Hamilton/Avnet Elctrns., 713-780-1771
TX Houston
Schweber Elctrns., 713-784-3600
UT Salt Lake City
Bell Inds., 801-972-6969
UT Salt Lake City
Hamilton/Avnet Elctrns., 801-972-2800
WA Bellevue
Hamilton/Avnet Elctrns., 206-746-8750
WA Bellevue
Wyle Distribution Grp., 206-453-8300
WI New Berlin
Hamilton/Avnet Elctrns., 414-784-4510
WI Oak Creek
Arrow Elctrns., 414-764-6600
WI Oak Creek
Hall-Mark Elctrns., 414-761-3000
Can Burnaby, British Columbia
Vitel Elctrns., 604-438-6121
Can Ottawa, Ontario
Vitel Elctrns., 613-236-0396
Can Roxdale, Ontario
Vitel Elctrns., 416-245-8528
Can St. Laurent, Quebec
Vitel Elctrns., 514-331-7393

Advent Products

Advent Products, Inc.
965 North Main Street
Orange, California 92667
714-997-0800

Alphatron

Alphatron, Inc.
10351 Bubb Road
Cupertino, California 95014
408-446-1494

American Automation

American Automation
14731 Franklin Avenue
Tustin, California 92680
714-731-1651
TWX: 910-595-2670

Sales Offices & Representatives

CA San Diego
Applied Micro Technology, 714-223-2632
CA Saratoga
Applied Micro Technology, 408-370-3922
CA Tustin
American Automation, 714-731-1661
CA Woodland Hills
Applied Micro Technology, 213-888-2027
Intl England, East Sussex
CREALEC Labs., TEL: (08926) 63739

American Microsystems

American Microsystems, Inc.
3800 Homestead Road
Santa Clara, California 95051
408-246-0330
TWX: 910-338-0018 or 910-338-0024

Specific product information:
Consumer
Custom
Customer Tooling
Memory
Microcomputers/Microprocessors
Telecommunication

Application engineering:
Consumer
Memory
Microcomputers/Microprocessors
Telecommunication

Literature:
Literature Department

Price and delivery:
Contact AMI Sales Office, Representatives or Distributors

Follow-up an order:
Customer Service

All other information:
Corporate Communications

Sales Offices & Representatives

AL Huntsville
Rep, Inc., 205-881-9270
CA Los Angeles
Ed Landa Co., 213-879-0770
CA Newport Beach
Sales Office, 714-851-5931
CA San Diego
Hadden Assocs., 714-565-9445
CA Santa Clara
Sales Office, 408-738-4151
CO Englewood
Sales Office, 303-694-0629
FL Altamonte Springs
Sales Office, 305-830-8889
GA Tucker
Rep, Inc., 404-938-4358
IL Elk Grove Village
Oasis Sales, 312-640-1850
IL Elk Grove Village
Sales Office, 312-437-6496
IN Fort Wayne
Giesting & Assocs., 219-486-1912
IN Indianapolis
Giesting & Assocs., 317-263-0005
IN Noblesville
Sales Office, 317-773-6330
IA Cedar Rapids
Comstrand, Inc., 319-377-1575
KS Overland Park
Kebco, Inc., 913-649-1051
KS Wichita
Kebco, Inc., 316-733-1301
MD Rockville
Mechtronics Sales, 301-340-2130
MA Burlington
Electronic Tech. Sales, Inc., 617-272-5610
MA Lexington
Sales Office, 617-861-6530
MI Coloma
Giesting & Assocs., 616-468-4200
MI Livonia
Sales Office, 313-478-4220
MI Northville
Giesting & Assocs., 313-348-3811
MN Minneapolis
Comstrand, Inc., 612-788-9234
MO Blue Springs
Kebco, Inc., 816-229-3370
MO Maryland Heights
Kebco, Inc., 314-576-4111
NH Nashua
Comp Tech, Inc., 603-883-9380
NY Clinton
Advanced Comps., 315-853-6438
NY Endicott
Advanced Comps., 607-785-3191
NY Monsey
Sales Office, 914-352-5333
NY North Syracuse
Advanced Comps., 315-699-2671
NY Rochester
Advanced Comps., 716-554-7017
NY Scottsville
Advanced Comps., 716-889-1429
NY West Babylon
Astrorep, 516-422-2500, 201-624-4408;203-324-4208
NC Raleigh
Rep, Inc., 919-851-3007
NC Raleigh
Sales Office, 919-847-9468
OH Cincinnati
Giesting & Assocs., 513-521-8800
OH Cleveland
Giesting & Assocs., 216-431-4241
OH Dayton
Giesting & Assocs., 513-293-4044
OH Galion
Giesting & Assocs., 419-468-3737
OH Worthington
Sales Office, 614-436-0330
OK Oklahoma City
Ammon & Rizos, 405-942-2552
PA Ambler
Sales Office, 215-643-0217
TN Jefferson City
Rep, Inc., 615-475-4105
TX Austin
Ammon & Rizos, 901-874-1369
TX Dallas
Ammon & Rizos, 214-233-5591
TX Houston
Ammon & Rizos, 713-781-6240
TX Richardson
Sales Office, 214-231-5721, 214-231-5285
WA Battle Ground
Sales Office, 206-687-3101
WA Bellevue
SD-R² Prods. & Sales, 206-747-9424, 206-624-2621
WI Brookfield
Oasis Sales, 414-782-6660
Can Mississauga, Ontario
Vitel Elctrns., 416-676-9720
Can Ottawa, Ontario
Vitel Elctrns., 613-596-0400
Can Port Moody, British Columbia
Vitel Elctrns., 604-461-3322
Can Quebec, Quebec
Vitel Elctrns., 514-331-7393
Intl Argentina, Buenos Aires
YEL S.R.L., TEL: 46 2211
Intl Australia, New South Wales
Crosshouse
Intl Australia, Preston, Victoria
Rifa Pty. Ltd., TEL: (03) 480 1211
Intl Austria, Graz
Austria Microsystems Inc. GmbH, TEL: (43) 3136/3666

© IC MASTER 1983

American Microsystems (Cont)

Intl **Austria, Vienna**
PCS Handelsgesellschaft, TEL: (222) 627197

Intl **Belgium, Brussels**
Betea Automation, TEL: (02) 7368050

Intl **Brazil, Sao Paulo**
Datatronix Elctrna. Ltda., TEL: 11-826-0111

Intl **Chili**
Victronics Ltda., TEL: 36440-30237

Intl **England, Derby**
Quarndon Elctrns. Ltd., TEL: (0332) 32651

Intl **England, Greater Manchester**
Vako Elctrns. Ltd., TEL: (061)652-6316

Intl **England, Harlow, Essex**
VSI Elctrns. (UK) Ltd., TEL: (0279) 2935477

Intl **England, Swindon**
AMI Microsystems, Ltd., TEL: (0793) 37852

Intl **England, West Drayton Middx**
Semiconductor Specialists, TEL: (08954) 46415/7

Intl **Finland, Espoo**
OY Atomica AB, TEL: (80) 423533

Intl **France, Montrouge**
Produits Electronique, TEL: (01) 7353320

Intl **France, Sevres**
Tekelec Airtronic, TEL: (01) 534-75-35

Intl **France, Vincennes**
AMI Microsystems, S.A.R.L., TEL: (01) 374 00 90

Intl **Hong Kong, Kowloon**
Electrocon Products Ltd., TEL: 3-687214-6

Intl **India**
Semiconductor Complex Ltd., TEL: 87495

Intl **Italy, Milano**
Mesa SpA, TEL: (02) 434333

Intl **Italy, Milano**
AMI Microsystems S.p.A., TEL: (02) 293745

Intl **Italy, Roma**
C.I.D. s.r.l., TEL: (06) 63 83979

Intl **Japan, Tokyo**
Kyokuto Boeki Kaisha, Ltd.

Intl **Japan, Tokyo**
Logic House, Inc.

Intl **Japan, Tokyo**
Logic Sys. Intl., Ltd.

Intl **Japan, Tokyo**
Taiyo Elec. Co., TEL: (03) 379-2926

Intl **Japan, Tokyo**
AMI Japan Ltd., TEL: (3) 586-8131

Intl **Mexico**
Dicopel S.A., TEL: (905) 561-3211, (905) 687-1800

Intl **Netherlands, Eindhoven**
Techmation Elec. NV, TEL: (02968) 6451

Intl **Netherlands, Rotterdam**
DMA Nederland, BV, TEL: 010-361288

Intl **New Zealand, Auckland**
David P. Reid (NZ) Ltd., TEL: 492-189

Intl **Singapore, Singapore**
Dynamar Intl., Ltd., TEL: 746-6188

Intl **South Africa, Transvaal**
Radiokom Pty., Ltd., TEL: (011) 485712

Intl **South Korea, Seoul**
Kortronics Enterprise, TEL: Seoul-634-5497

Intl **Spain, Barcelona**
Interface S.A., TEL: (03) 3017851

Intl **Sweden, Spanga**
A.B. Rifa, TEL: (08) 7522500

Intl **Switzerland, Zurich**
W. Moor AG, TEL: (01) 8406644

Intl **Taiwan, Taipei**
Promotor Co., Ltd., TEL: (02) 536-4057

Intl **West Germany, Berlin**
Aktiv Elektronik GmbH, TEL: (030) 6845088

Intl **West Germany, Hamburg**
Microscan GmbH

Intl **West Germany, Munich**
AMI Microsystems GmbH, TEL: (089) 483081

Intl **West Germany, Nettetal**
Onmi-Ray GmbH, TEL: (02153) 7961

Intl **West Germany, Stuttgart**
Ditronic GmbH, TEL: (0711) 724844

Intl **West Germany, Stuttgart**
Mikrotec GmbH, TEL: (0711) 616036

Intl **West Germany, Viersen**
Mostron Halbleitervertriebs, TEL: (0216) 17024

Intl **Yugoslavia, Ljubljana**
ISKRA/Standard/Iskra IEZE, TEL: (051) 551-353

PR **San Juan**
Electronic Tech. Sales, Inc., 809-780-8259

Distributors

AZ **Phoenix**
Kierulff Elctrns., 602-243-4101

AZ **Scottsdale**
Western Microtechnology, 602-948-4240

AZ **Tempe**
Anthem Elctrns., 602-244-0900

AZ **Tucson**
Kierulff Elctrns., 602-624-9986

CA **Canoga Park**
Schweber Elctrns., 213-999-4702

CA **Chatsworth**
Anthem Elctrns., 213-700-1000

CA **Chatsworth**
Arrow Elctrns., 213-701-7500

CA **Cupertino**
Western Microtechnology, 408-725-1660

CA **Irvine**
Schweber Elctrns., 714-556-3880

CA **Los Angeles**
Kierulff Elctrns., 213-725-0325

CA **Newport Beach**
Arrow Elctrns., 714-851-8961

CA **Palo Alto**
Kierulff Elctrns., 415-968-6292

CA **Sacramento**
Kierulff Elctrns., 916-924-8522

CA **San Diego**
Anthem Elctrns., 714-279-5200

CA **San Diego**
Arrow Elctrns., 714-565-4800

CA **San Diego**
Kierulff Elctrns., 714-278-2112

CA **San Jose**
Anthem Elctrns., 408-946-8000

CA **Santa Clara**
Schweber Elctrns., 408-496-0200

CA **Sunnyvale**
Arrow Elctrns., 408-745-6600

CA **Tustin**
Anthem Elctrns., 714-730-8000

CA **Tustin**
Kierulff Elctrns., 714-731-5711

CO **Denver**
Arrow Elctrns., 303-758-2100

CO **Denver**
Kierulff Elctrns., 303-371-6500

CT **Danbury**
Schweber Elctrns., 203-792-3742

CT **Wallingford**
Arrow Elctrns., 203-265-7741

CT **Wallingford**
Kierulff Elctrns., 203-265-1115

FL **Ft. Lauderdale**
Arrow Elctrns., 305-776-7790

FL **Hollywood**
Schweber Elctrns., 305-927-0511

FL **Palm Bay**
Arrow Elctrns., 305-725-1480

FL **St. Petersburg**
Kierulff Elctrns., 813-576-1966

GA **Norcross**
Arrow Elctrns., 404-449-8252

GA **Norcross**
Schweber Elctrns., 404-449-9170

IL **Elk Grove Village**
Kierulff Elctrns., 312-640-0220

IL **Elk Grove Village**
Schweber Elctrns., 312-354-3750

IL **Schaumburg**
Arrow Elctrns., 312-893-9420

IN **Indianapolis**
Arrow Elctrns., 317-243-9353

MD **Baltimore**
Arrow Elctrns., 301-247-5200

MD **Baltimore**
Kierulff Elctrns., 301-247-5020

MD **Gaithersburg**
Schweber Elctrns., 301-840-5900

MA **Bedford**
Schweber Elctrns., 617-275-5100

MA **Billerica**
Kierulff Elctrns., 617-935-5134

MA **Woburn**
Arrow Elctrns., 617-933-8130

MI **Ann Arbor**
Arrow Elctrns., 313-971-8220

MI **Livonia**
Schweber Elctrns., 313-525-8100

MN **Eden Prairie**
Schweber Elctrns., 612-941-5280

MN **Edina**
Arrow Elctrns., 612-830-1800

MN **Edina**
Kierulff Elctrns., 612-941-7500

MO **Earth City**
Schweber Elctrns., 314-739-0526

MO **Maryland Heights**
Kierulff Elctrns., 314-739-0855

MO **St. Louis**
Arrow Elctrns., 314-567-6888

NH **Manchester**
Arrow Elctrns., 603-668-6968

NJ **Fairfield**
Arrow Elctrns., 201-575-5300

NJ **Fairfield**
Kierulff Elctrns., 201-575-6750

NJ **Fairfield**
Schweber Elctrns., 201-227-7880

NM **Albuquerque**
Arrow Elctrns., 505-243-4566

NM **Albuquerque**
Bell Elctrns., 505-292-2700

NY **Farmingdale**
Arrow Elctrns., 516-293-6363, 516-694-6800

NY **Hauppauge**
Arrow Elctrns., 516-231-1000

NY **Liverpool**
Arrow Elctrns., 315-652-1000

NY **Rochester**
Arrow Elctrns., 716-275-0300

NY **Rochester**
Schweber Elctrns., 716-424-2222

NY **Westbury**
Schweber Elctrns., 516-334-7474

NC **Greensboro**
Kierulff Elctrns., 919-852-9440

NC **Winston Salem**
Arrow Elctrns., 919-725-8711

OH **Beachwood**
Schweber Elctrns., 216-464-2970

OH **Centerville**
Arrow Elctrns., 513-435-5563

OH **Cleveland**
Kierulff Elctrns., 216-587-6558

OH **Columbus**
Arrow Elctrns., 614-885-8362

OH **Solon**
Arrow Elctrns., 216-248-3990

OK **Tulsa**
Arrow Elctrns., 918-665-7700

OK **Tulsa**
Kierulff Elctrns., 918-352-7537

OR **Portland**
Kierulff Elctrns., 503-641-9150

PA **Horsham**
Schweber Elctrns., 215-441-0600

PA **Monroeville**
Arrow Elctrns., 412-856-7000

© IC MASTER 1983

American Microsystems (Cont)

PA **Moorestown**
Arrow Elctrns., 609-235-1900
TX **Austin**
Kierulff Elctrns., 512-835-2090
TX **Austin**
Schweber Elctrns., 512-458-8253
TX **Dallas**
Arrow Elctrns., 214-386-7500
TX **Dallas**
Kierulff Elctrns., 800-442-1041
TX **Dallas**
Schweber Elctrns., 214-661-5010
TX **Houston**
Kierulff Elctrns., 713-530-7030
TX **Houston**
Schweber Elctrns., 713-784-3600
TX **Stafford**
Arrow Elctrns., 713-491-4100
UT **Salt Lake City**
Kierulff Elctrns., 801-973-6913
WA **Bellevue**
Arrow Elctrns., 206-643-4800
WA **Tukwila**
Kierulff Elctrns., 206-575-4420
WI **Madison**
Arrow Elctrns., 608-273-4977
WI **Oak Creek**
Arrow Elctrns., 414-764-6600
WI **Waukesha**
Kierulff Elctrns., 414-784-8160
Can **Downsview, Ontario**
Cesco Elctrns., Ltd., 416-661-0220
Can **Downsview, Ontario**
Future Elctrns., Inc., 416-663-5563
Can **Montreal, Quebec**
Cesco Elctrns., Ltd., 514-735-5511
Can **Montreal, Quebec**
Future Elctrns., Inc., 514-731-7441
Can **Ottawa, Ontario**
Future Elctrns. Inc., 613-820-8313
Can **Point Claire, Quebec**
Future Elctrns., Inc., 514-694-7710
Can **Quebec**
Cesco Elctrns., Ltd., 418-687-4231
Can **Vancouver, British Columbia**
Future Elctrns., Inc., 604-438-5545
Intl **Argentina, Buenos Aires**
YEL S.R.L., TEL: 46 2211
Intl **Australia, New South Wales**
Crosshouse
Intl **Australia, Preston, Victoria**
Rifa Pty. Ltd., TEL: (03) 480 1211
Intl **Austria, Vienna**
PCS Handelsgesellschaft, TEL: (222) 627197
Intl **Belgium, Brussels**
Betea Automation, TEL: (02) 7368050
Intl **Brazil, Sao Paulo**
Datatronix Electronica Ltda., TEL: 11-826-0111
Intl **Chili**
Victronics Ltda., TEL: 36440-30237
Intl **England, Derby**
Quarndon Elctrns. Ltd., TEL: (0332) 32651
Intl **England, Greater Manchester**
Vako Elctrns. Ltd., TEL: (061) 652-6316
Intl **England, Harlow, Essex**
VSI Elctrns. (UK) Ltd., TEL: (0279) 2935477
Intl **England, West Drayton Mddx**
Semiconductor Specialists, TEL: (08954) 46415/7
Intl **Finland, Espoo**
OY Atomica AB, TEL: (80) 423533
Intl **France, Montrouge**
Produits Electronique, TEL: (01) 7353320
Intl **France, Sevres**
Tekelec Airtronic, TEL: (01) 534-75-35
Intl **Hong Kong, Kowloon**
Electrocon Prods. Ltd., TEL: 3-687214-6
Intl **India**
Semiconductor Complex Ltd., TEL: 87495
Intl **Italy, Milano**
Mesa SpA, TEL: (02) 434333
Intl **Italy, Roma**
C.I.D. s.r.l., TEL: (06) 63 83979
Intl **Japan, Tokyo**
Kyokuto Boeki Kaisha, Ltd.
Intl **Japan, Tokyo**
Logic House, Inc.
Intl **Japan, Tokyo**
Logic Sys. Intl., Ltd.
Intl **Japan, Tokyo**
Taiyo Electric Co., TEL: (03) 379-2926
Intl **Mexico**
Dicopel S.A., TEL: (905) 561-3211, (905) 687-1800
Intl **Netherlands, Badhoevedore**
Techmation Elec. NV, TEL: (02968) 6451
Intl **Netherlands, Rotterdam**
DMA Nederland, BV, TEL: 010-361288
Intl **New Zealand, Auckland**
David P. Reid (NZ) Ltd., TEL: 492-189
Intl **Singapore, Singapore**
Dynamar Intl. Ltd., TEL: 746-6188
Intl **South Africa, Transvaal**
Radiokom Pty., Ltd., TEL: (011) 485712
Intl **South Korea, Seoul**
Kortronics Enterprise, TEL: Seoul-634-5497
Intl **Spain, Barcelona**
Interface S.A., TEL: (03) 3017851
Intl **Sweden, Spanga**
A.B. Rifa, TEL: (08) 7522500
Intl **Switzerland, Zurich**
W. Moor AG, TEL: (01) 8406644
Intl **Taiwan, Taipei**
Promotor Co., Ltd., TEL: (02) 536-4057
Intl **West Germany, Berlin**
Aktiv Elektronik GmbH, TEL: (030)6845088
Intl **West Germany, Hamburg**
Microscan GmbH
Intl **West Germany, Hattetal**
Onmi-Ray GmbH, TEL: (02153) 7961
Intl **West Germany, Stuttgart**
Ditronic GmbH, TEL: (0711) 724844
Intl **West Germany, Stuttgart**
Mikrotec GmbH, TEL: (0711) 616036
Intl **West Germany, Viersen**
Mostron Halbleitervertriebs, TEL: (0216) 17024
Intl **Yugoslavia, Ljubljana**
ISKRA/Standard/Iskra IEZE, TEL: (051) 551-353

Amperex

Amperex Electronic Corporation
Providence Pike
Slatersville, Rhode Island 02876
401-762-3800
TWX: 710-382-6332

Analog Devices

Analog Devices
PO Box 280 Route 1 Industrial Park
Norwood, Massachusetts 02062
617-329-4700
TWX: 710-394-6577
TELEX: 924-491

Specific product information:
Regional Offices:
Massachusetts, Mac Wylie, ... 617-329-4700 ext. 1310
Illinois, Ed Kruft, ... 312-894-3300
California, Walter Borlase, ... 714-842-1717
Texas, Jack Coe, ... 214-231-5094

Literature:
Steve Martin, Director Mail Supervision ..... 617-329-4700 ext. 1391

Price and delivery:
See Product Information

Place an order:
Regional Offices:
Massachusetts, Mac Wylie, ... 617-329-4700 ext. 1310
Illinois, Ed Kruft, ... 312-894-3300
California, Walter Borlase, ... 213-595-1783
Texas, Jack Coe, ... 214-231-5094

Follow-up an order:
Vin Ciccolo, Manager of Customer Service, ... 617-329-4700 ext. 1311

All other information:
Eric Janson, Technical Publicity Manager ..... ext. 1263

Sales Offices & Representatives

AL **Huntsville**
Currie, Peak & Frazier, 205-536-1506
AZ **Tempe**
Piper Sales Co., 602-949-0048
CA **Huntington Beach**
Analog Devices, 714-842-1717
CA **San Jose**
Analog Devices, 408-947-0633
CO **Longmont**
Piper Sales Co., 303-443-5337
FL **Orlando**
Currie, Peak & Frazier, 305-855-0843
GA **Duluth**
Currie, Peak & Frazier, 404-476-3107
IL **Glendale Heights**
Analog Devices, 312-653-5000
IL **Northfield**
Torkelson Assocs., 312-446-9085
IN **Indianapolis**
Torkelson Assocs., 317-244-7867
KS **Shawnee Mission**
Technical Sales Assocs., 913-888-3330
MD **Baltimore**
Rep-Tron, Inc., 301-799-7490
MI **Birmingham**
Analog Devices, Inc., 313-644-1866
MI **Detroit**
Rathsburg Assocs., Inc., 313-882-1717
MN **Minneapolis**
Torkelson Assocs., 612-835-2414
MO **St. Louis**
Technical Sales, 314-725-5361
NJ **Maplewood**
Harwood-Sandler Assocs., 516-673-1900
NM **Albuquerque**
Grady Moore Assocs., 505-262-1416
NY **Hamburg**
Labtronics, 716-648-0107
NY **Huntington**
Harwood-Sandler Assocs., 516-673-1900
NY **Kirkwood**
Labtronics, Inc., 607-775-3739
NY **N. Tonawanda**
Labtronics, 716-693-2257
NY **Syracuse**
Labtronics, 315-454-9314
NY **Utica**
Labtronics, Inc., 315-735-2153
NC **Greensboro**
Currie, Peak & Frazier, 919-273-3040
OH **Cleveland**
Electro Sales Assocs., 216-261-5440
OH **Dayton**
Electro Sales Assocs., 513-426-5551
OH **Dublin**
Analog Devices, Inc., 614-764-8795
PA **Ft. Washington**
Analog Devices, 215-643-7790
PA **Allison Park**
Electro Sales Assocs., 412-487-3801
SC **Columbia**
Currie, Peak & Frazier, 803-254-1971

© IC MASTER 1983

Analog Devices (Cont)

TX **Houston**
Analog Devices, 713-664-6704

TX **Richardson**
Analog Devices, 214-231-5094

WA **Renton**
Analog Devices, Inc., 206-251-9550

WI **Brookfield**
Torkelson Assocs., 414-784-7736

Can **Mississauga, Ontario**
Tracan Elctrns. Corp., 416-625-7752

Can **Ottawa, Ontario**
Tracan Elctrns. Corp., 613-722-7667

Can **Pointe Claire, Quebec**
Tracan Elctrns. Corp., 514-694-5343

Can **North Vancouver, British Columbia**
Tracan Elctrns. Western Ltd., 604-984-4141

Intl **Argentina, Buenos Aires**
Rayo Elctrna. s.r.l., TEL: 37-9890

Intl **Australia, Artarmon**
Parameters Pty., Ltd., TEL: 02 439 3288

Intl **Australia, Nordialloc**
Parameters, Pty., Ltd., TEL: 03 90 74 44

Intl **Austria, Vienna**
Intl. Elctrns. Co., TEL: 0222/85 93 04

Intl **Austria, Wien**
Walter Rekirsch Elektronische Gerate Ges. m.b.H. & Co., TEL: 23-55-55-0

Intl **Belgium, Antwerpen**
Analog Devices Benelux, TEL: 031/37 48 03

Intl **Brazil, Sao Paulo**
Artimar Ltd., TEL: 230-0277

Intl **Denmark, Herlev**
Analog Devices APS, TEL: (02) 845 800

Intl **Finland, Helsinki**
SW Instrs., TEL: 90 73 82 65

Intl **France, Alencon**
Analog Devices, S.A., TEL: 33 26 07 61

Intl **France, Rungis**
Analog Devices, S.A., TEL: 687 34 11

Intl **France, Grenoble**
Analog Devices, S.A., TEL: (1676) 22 21 90

Intl **France, Toulouse**
Analog Devices, S.A., TEL: 61 41 11 81

Intl **Holland, Oosterhout**
Analog Devices Benelux, TEL: 0162051080

Intl **Hong Kong, Kowloon**
Comets, TEL: 3-333566

Intl **India, New Delhi**
CH Krishnan & Assoc., TEL: 664850

Intl **Ireland, Limerick**
Analog Devices BV, TEL: 061 29011

Intl **Israel, Kfar Saba**
Analog Devices (Israel) Ltd., TEL: 052-21023

Intl **Italy, Bologna**
Dott. Ing. Giuseppe de Mico, TEL: (051) 55 56 14

Intl **Italy, Firenze**
Dott. Ing. Giuseppe de Mico, TEL: (55) 894115

Intl **Italy, Milano**
Analog Devices, SRL, TEL: 68 98 045

Intl **Italy, Milano**
Dott. Ing. Giuseppe de Mico, TEL: 9520551

Intl **Italy, Padova**
Dott. Ing. Giuseppe de Mico, TEL: 049 65 29 09

Intl **Italy, Roma**
Dott. Ing. Giuseppe de Mico, TEL: 06/31 62 04

Intl **Italy, Torino**
Dott. Ing. Giuseppe de Mico, TEL: 011 65 03 271

Intl **Japan, Osaka**
Analog Devices of Japan, Inc., TEL: 06/372 1814

Intl **Japan, Tokyo**
Analog Devices of Japan, Inc., TEL: 03/26 36 82 6

Intl **Malaysia, Kuala Lumpur**
General Engrs. (Electr.) Corp.

Intl **New Zealand, Auckland**
W. Arthur Fisher Ltd., TEL: 59 55 25

Intl **New Zealand, Christchurch**
W. Arthur Fisher Ltd., TEL: 67-692

Intl **New Zealand, Lower Hutt**
W. Arthur Fisher Ltd., TEL: 850 243

Intl **Norway, Hvalstad**
Estronic, TEL: (2) 78 60 10

Intl **Pakistan, Karachi**
Superior Elctrn. Assoc., TEL: 61 36 55

Intl **Singapore, Asia**
General Engrs. (Electr.) Corp., TEL: 2714081

Intl **South Africa, Durbin**
L'Electron (Pty.) Ltd., TEL: 37-9224/5

Intl **South Africa, Johannesburg**
L'Electron (Pty) Ltd., TEL: 786-5150

Intl **Spain, Barcelona**
Interface, S.A., TEL: 933017851

Intl **Spain, Bilbao**
Interface, S.A., TEL: 944150893

Intl **Spain, Madrid**
Interface, S.A., TEL: 914563151

Intl **Sweden, Bromma**
Analog Devices AB, TEL: 08-282740

Intl **Switzerland, Geneva**
Analog Devices, S.A., TEL: 022 3157 60

Intl **Taiwan, Taipei**
Taiwan Automation Co., TEL: 02 771 0940

Intl **Thailand, Bankok**
Dynamic Supp. Engrg., TEL: 82455

Intl **Turkey, Ankara**
Simge Ltd., TEL: 29 77 44

Intl **Turkey, Istanbul**
Simge Ltd, TEL: 669184

Intl **United Kingdom, Edgeboston**
Analog Devices, Ltd.

Intl **United Kingdom, Surrey**
Analog Devices, Ltd., TEL: 01/94 10 46 6

Intl **West Germany, Berlin**
Herrn Horst Walkusat, TEL: 030/31 64 41

Intl **West Germany, Buchholz**
Analog Devices GmbH, TEL: 04187/381

Intl **West Germany, Koeln**
Analog Devices GmbH, TEL: 0221/68 60 06

Intl **West Germany, Munchen**
Analog Devices GmbH, TEL: 089/53 03 19

Intl **West Germany, Karlsruhe**
Analog Devices GmbH, TEL: 0721/61 60 75

Analogic

Analogic Corporation
Audubon Road
Wakefield, Massachusetts 01880
617-246-0300
TWX: 710-348-0425

Analog Systems

Analog Systems Division
P.O. Box 35879
Tucson, Arizona 85740
602-293-4923

Apex Microtechnology

Apex Microtechnology Corporation
1130 East Pennsylvania Street
Tucson, Arizona 85714
602-746-0849

Applied Micro Circuits

Applied Micro Circuits Corporation
8808 Balboa Avenue
San Diego, California 92123
714-268-0097

Applied Microsystems

Applied Microsystems Corporation
5020 148th Avenue N.E., P.O. Box 568
Redmond, Washington 98052
206-882-2000

Applied Micro Technology

Applied Micro Technology Inc.
P.O. Box 3042
Tucson, Arizona 85702
602-622-8605

Applied Systems

Applied Systems Corporation
26401 Harper Avenue
St. Clair Shores, Michigan 48081
313-779-8700

Aptek Microsystems

Aptek Microsystems, Inc.
Hillsboro Plaza, 700 N.W. 12th Avenue
Deerfield Beach, Florida 33441
305-421-8450
TELEX: 441020

Sales Offices & Representatives

Intl **West Germany, Buchenstrasse**
Consar GmbH, TEL: 011 49 9355/2655

Array Technology

Array Technology
922 South Saratoga/Sunnyvale Road
San Jose, California 95129
408-252-9900

AWI

AWI
3212 Scott Boulevard
Santa Clara, California 95050
408-727-9912

Bedford Computer Systems

Bedford Computer Systems
4 Lyberty Way
Westford, Massachusetts 01886
617-275-0870

© IC MASTER 1983

Boston Systems Office

Boston Systems Office, Inc.
469 Moody Street
Waltham, Massachusetts 02154
617-894-7800
TWX: 710-324-0760

Burr-Brown Research

Burr-Brown Research Corporation
International Airport Industrial Park
Tucson, Arizona 85734
602-746-1111
TELEX: 66-6491
TWX: 910-952-1111
Specific product information:
Sales Department ..... (602) 746-7220

Sales Offices & Representatives

AL **Huntsville**
Conley & Assocs., 205-882-0316

CA **Los Angeles**
Burr-Brown, 213-991-8544; 805-496-7581

CA **San Jose**
Burr-Brown, 408-559-8600

CA **Santa Ana**
Burr-Brown, 714-835-0712

CO **Denver**
Burr-Brown, 303-663-4440

FL **Boca Raton**
Conley & Assocs., Inc., 305-395-6108

FL **Oviedo**
Conley & Assocs., Inc., 305-365-3283

FL **Tampa**
Conley & Assocs., Inc., 813-885-7658

GA **Atlanta**
Conley & Assocs., 404-447-6992

IL **Addison**
Burr-Brown, 312-832-6520

KS **DeSoto**
Midtec Assocs., 913-441-6565

MD **Silver Spring**
Marktron, Inc., 301-460-6100

MA **Needham**
Burr-Brown, 617-444-9020

MI **Detroit**
Burr-Brown, 313-474-6533

MN **Bloomington**
Elctrn. Sales, 612-884-8291

MO **Florissant**
Midtech Assocs.-St. Louis, 314-837-5200

NM **Albuquerque**
Vermillion Sales, 505-883-3668

NY **Clinton**
Advanced Comps.Corp., 315-853-6438

NY **Endicott**
Advanced Comps. Corp., 607-785-3191

NY **Port Chester**
Burr-Brown, 914-253-9333

NY **Scottsville**
Advanced Comps. Corp., 716-889-1429

NY **Syracuse**
Advanced Comps., 315-699-2671

NC **Winston-Salem**
Murcota Corp., 919-722-9445

OH **Cleveland**
K-T Marketing Inc., 216-248-9123

OH **Dublin**
Burr-Brown, 614-764-9764

PA **Hatboro**
QED Elctrns., 215-674-9600

TX **Dallas**
Burr-Brown Resch. Corp., 214-681-5781

TX **Houston**
Burr-Brown Resch. Corp., 713-988-6546

UT **Sandy**
Aspen Sales, 801-943-1346

WA **Bellevue**
Burr-Brown, 206-455-2611

Can **Mississauga, Ontario**
Allan Crawford Assocs., 416-678-1500

Intl **Australia, Clayton-Victoria**
Kenelec, TEL: (03) 560-1011

Intl **Austria, Wien**
Burr-Brown GmbH, TEL: 0222/62 63 71

Intl **Belgium, Bruxelles**
BETEA, TEL: (02) 736-8050

Intl **Benelux, Shiphol**
Burr-Brown Intl. B.V., TEL: 020-470590

Intl **Denmark, Hoersholm**
Mer-el A/S, TEL: 02-571000

Intl **England, Hertfordshire**
Burr-Brown Intl., Ltd., TEL: (0923) 33837

Intl **England, Hertfordshire**
Burr-Brown European Branch Office, TEL: (0923) 46759

Intl **Finland, Kauniainen**
OY Findip A B, TEL: 90-5052255

Intl **France, Le Chesnay**
Burr-Brown Intl. S.A., TEL: (01) 3-954-3558

Intl **Germany, Bremen**
Burr-Brown Intl. GmbH, TEL: 0421/25 39 31

Intl **Germany, Duesseldorf**
Burr-Brown Intl. GmbH, TEL: 02154/8445

Intl **Germany, Filderstadt**
Burr-Brown Intl. GmbH, TEL: (0711) 70 10 25

Intl **Germany, Munchen**
Burr-Brown Intl. GmbH,, TEL: 089/61 7737

Intl **Germany, Zirndorf**
Siex Elektronikelemente GmbH, TEL: 60 71 78

Intl **Hong Kong**
Schmidt & Co. (H.K. Ltd.), TEL: (780) 5-455644

Intl **India, Bombay**
Oriole Services & Consits. Pty., Ltd., TEL: 672973

Intl **Israel, Tel-Aviv**
Racom Elctrns. Co., Ltd., TEL: 03-491922

Intl **Italy, Milano**
Metroelettronica, TEL: (2) 5462641

Intl **Italy, Rome**
Metroelettronica, TEL: 627-0713

Intl **Japan, Osaka**
Burr-Brown Japan Ltd., TEL: 06/305-3287

Intl **Japan, Tokyo**
Burr-Brown Japan, Ltd., TEL: (03) 586-8141

Intl **New Zealand, Aukland**
McLean Information Technology Ltd., TEL: 501-801

Intl **Norway, Oslo**
H.C.A. Melbye, TEL: (02) 106050

Intl **Portugal, Lisbon**
Telectra, TEL: 686072

Intl **Spain, Barcelona**
Unitronics SA, TEL: 269.26.55

Intl **Spain, Madrid**
Unitronics SA, TEL: 242 5204

Intl **Sweden, Vallingby**
Svenski Teleindustri, TEL: 380320

Intl **Switzerland, Ruschlikon**
Burr-Brown Intl., AG, TEL: 01/724 09 28

Intl **Taiwan, Taipei**
Alpha Precision Instrmn., TEL: (02) 7412104

Intl **Yugoslavia, Ljubljana**
Elektrotehna N. Sol O. Ljubljana, TEL: 061/311-564

California Devices

California Devices Inc.
282 Kinney Drive
San Jose, California 95112
408-295-3700
TELEX: 352120

Sales Offices & Representatives

AZ **Tempe**
Jan Devices, Inc., 602-966-5198

CA **Newport Beach**
Jan Devices, Inc., 714-646-9808

CA **Roseda**
Jan Devices, Inc., 213-708-1100

CA **Santa Clara**
Magna Sales, Inc., 408-727-8753

FL **Lighthouse Point**
R. C. Simon & Co. Inc., 305-941-2757

FL **Riverview**
R. C. Simon & Co. Inc., 813-689-6524

IL **Barrington**
OMNI Elctrn. Mktg., 312-381-9087

IN **Indianapolis**
Insul-Reps Inc., 317-842-5203

KS **Overland Park**
Advanced Technical Sales, 913-492-4333

MA **Burlington**
Mill-Bern Assocs., Inc., 617-273-1313

MA **Dedham**
California Devices Inc., 617-329-8071

MN **Minneapolis**
Intl. Elctrns., Inc., 612-571-0000

NV **Carson City**
Magna Sales, Inc., 702-883-1471

NY **Endwell**
Tri-Tech Elctrns. Inc., 607-754-1094

NY **Fairport**
Tri-Tech Elctrns. Inc., 716-223-5720

NY **Fayetteville**
Tri-Tech Elctrns. Inc., 315-446-2881

NY **Jericho**
J-Square Mktg., 516-935-3200

NY **Poughkeepsie**
Tri-Tech Elctrns. Inc., 914-473-3880

NC **Raleigh**
J & B Sales Inc., 919-772-3546

OH **Rocky River**
Norm Case & Assocs., Inc., 216-333-0400

OH **Westerville**
Norm Case & Assocs., Inc., 614-895-0404

OR **Canby**
Magna Sales, Inc., 503-263-1648

TN **Knoxville**
Insul-Reps Inc., 615-691-7586

TX **Austin**
Sundance Sales, Inc., 512-250-0320

TX **Houston**
Sundance Sales, Inc., 713-668-8923

TX **Richardson**
Sundance Sales, Inc., 214-699-0451

Intl **England, Crawley**
California Devices, Inc., TEL: 0293-21365

Intl **France, Poissy**
California Devices, Inc., TEL: (3) 979.25.87

Intl **Italy, Milano**
CEFRA s.r.l., TEL: 02-23-52-64

Intl **West Germany, Offenbach**
Neutron GmbH, TEL: (6 11) 81 39 30

© IC MASTER 1983

Central Data

Central Data Corporation
1602 Newton Drive
Champaign, Illinois 61820
217-359-8010

Distributors

Intl **Australia, Victoria**
R & D Elctrns.
Intl **England, Berks**
Data Translation, Ltd.
Intl **France, Villacoublay**
Kontron Electronique
Intl **Hong Kong, North Point**
Seed Hong Kong
Intl **Italy, Ivrea**
Polytech, S.r.l.
Intl **Japan, Chiba**
Microboards
Intl **Malaysia, Singapore**
Digitech Pte., Ltd.
Intl **Netherlands, AA Rijswijk**
C.N. Rood B.V.
Intl **New Zealand, Auckland**
Technology Mktg., Ltd.
Intl **Spain, Madrid**
Unitronics, S.A.
Intl **Switzerland, Langenthal**
MEMOTEC AG
Intl **West Germany, Munchen**
Stemmer Elektronix

Cermetek Microelectronics

Cermetek Microelectronics, Inc.
1308 Borregas Avenue
Sunnyvale, California 94086
408-734-8150
TWX: 910-379-6931

Sales Offices & Representatives

Intl **Cyprus, Nicosia**
Eltrom Elctrns. Ltd., TEL: 21-61088
Intl **England, Bourne End, Bucks**
Micro-Marketing (Elctrns.) Ltd., TEL: 06285-29222
Intl **England, Camberley Surrey**
Dialogue Distribution Ltd., TEL: 0276-682001
Intl **England, Maidenhead, Berkshire**
Micromark Elctrns., TEL: (0628) 72631
Intl **France, Palaiseau**
Franelec, TEL: 6-930-2005
Intl **Holland, Rotterdam**
DMA Holding B. V., TEL: 010-36.12.88
Intl **India, Bangalor**
Electrolink Systems, TEL: 41894
Intl **Israel, Tel-Aviv**
R. N. Electronics, TEL: (03) 707129
Intl **Italy, Milano**
Cefra S. R. L., TEL: (02) 23.52.64-23.60.154
Intl **Sweden, Vallingby**
Svensk Teleindustri
Intl **West Germany, Munchen**
Scantec GmbH, TEL: (089) 134093

Distributors

Intl **England, Camberley Surrey**
Dialogue Distribution Ltd., TEL: 0276-682001
Intl **England, Maidenhead, Berkshire**
Micromark Elctrns., TEL: (0628) 72631

CGRS Microtech

CGRS Microtech
P.O. Box 102
Langhorne, Pennsylvania 19047

Cherry Semiconductor

Cherry Semiconductor Corporation
2000 South County Trail
East Greenwich, Rhode Island 02818
401-885-3600
TELEX: WUI-6817157

Specific product information:
Marketing & Sales Department 401 885-3600

Sales Offices & Representatives

Intl **England, Harpenden**
Cherry Electrical Prods. Ltd., TEL: (058) 27-63100
Intl **Hong Kong, Wanchai**
CET, Ltd., TEL: 5-729-376
Intl **Japan, Tokyo**
Nippon Imex, TEL: 03-321-4415
Intl **Singapore, Asia**
Dynamar Intl., Ltd., TEL: 7476188
Intl **Taiwan, Tapei**
Dynamar (Taiwan) Ltd., TEL: 5418251-4
Intl **West Germany, Auerbach/OPF**
Cherry Mikroschalter GMBH, TEL: (09643) 181

Citel

Citel Inc.
392 Potrero Avenue
Sunnyvale, California 94086
408-738-4773

Comark

Comark Corporation
257 Crescent Street
Waltham, Massachusetts 02154
617-894-7000

Comdial Semiconductor

Comdial Semiconductor
1230 Bordeau Drive
Sunnyvale, California 94086
408-744-1800

Comlinear

Comlinear Corporation
2468 East 9th Street
Loveland, Colorado 80537
303-669-9433
Application engineering:
Kurt Rentel

Sales Offices & Representatives

Intl **England, Cheshire**
DI-AN Data Systems, TEL: 061 442 9768
Intl **Japan, Tokyo**
Internix, Inc., TEL: 03 369 1101

Commodore Semiconductor Group/MOS Technology

Commodore Semiconductor Group/MOS Technology
950 Rittenhouse Road
Norristown, Pennsylvania 19403
215-666-7950
TWX: 510-660-4168
Application engineering:
215-666-7950
Literature:
Local Sales Office
Price and delivery:
Local Sales Office, or
Western 408-727-1130
Central 214-387-0006
Eastern 1-800-345-6386

Computer Aided Engineering

Computer Aided Engineering
1333 Bordeaux Avenue
Sunnyvale, California 94086
408-745-1440

Computer Automation

Computer Automation
NAKED MINI Division
18651 Von Karman
Irvine, California 92713
714-833-8830
TWX: 910-595-1767
Specific product information:
Ext. 584
Literature:
Ext. 290
Ext. 581
Place an order:
Sales Office
Follow-up an order:
Ext. 277
All other information:
Marketing ..... ext. 381
Communications ..... ext. 581

Sales Offices & Representatives

Intl **England, Hertfordshire**
CAI, Ltd., TEL: Rickmansworth (09237)
Intl **Germany, Frankfurt**
Computer Automation GmbH

Distributors

Intl **Argentina, Buenos Aires**
Fate Elctrnca. A.A.I.C.I., TEL: 45-0208
Intl **Australia, Melbourne**
Consolidated Elctrns. Inds., TEL: 440-791
Intl **Belgium, Brussels**
Geveke Elctrns., TEL: 02-241 45-50
Intl **Denmark, Copenhagen**
SC Metric A/S, TEL: (02) 80-4200
Intl **Finland, Helsinki**
Finn Metric OY, TEL: 90-460-844
Intl **France, Boitespostale**
Yrel Electronique et Informatique, TEL: 956 81-42
Intl **India, Bombay**
Micronic Devices, TEL: 486170
Intl **Italy, Milano**
C.A.I. S.P.A., TEL: 02236 3851
Intl **Netherlands, Amsterdam**
Geveke Elektronica, TEL: 020-802802
Intl **New Zealand, Auckland**
David Reid Data Prods., Ltd., TEL: 499-197

© IC MASTER 1983

Computer Automation (Cont)

Intl **Norway, Oslo**
Metric A.S., TEL: 02-282624
Intl **Japan, Tokyo**
Showa Info. Sys., TEL: 403-7101
Intl **South Africa, Braamfontein**
Tran Sys. Pty Ltd., TEL: 39-6575
Intl **Sweden, Stockholm**
Scandia Metric AB, TEL: 08-820400
Intl **Switzerland, Wil**
Datacare AG, TEL: 073/22 05 92
Intl **Taiwan, Taipei**
Far East Elctrns., TEL: 5615444
Intl **West Germany, Dusseldorf**
Geveke Elektronik, TEL: 0211/773082

Control Logic

Control Logic, Inc.
Nine Tech Circle
Natick, Massachusetts 01760
617-655-1170

Creative Micro Systems

Creative Micro Systems
3822 Cerritos Avenue
Los Alamitos, California 90720
213-493-2404

Cromemco

Cromemco
280 Bernardo Avenue
Mountain View, California 94043
415-964-7400
TWX: 910-379-6988

Distributors

AL **Huntsville**
Hall-Mark Elctrns., 205-827-8700
AZ **Phoenix**
Hall-Mark Elctrns., 602-243-6601
AZ **Phoenix**
Kierulff Elctrns., 602-243-4101
AZ **Tucson**
Kierulff Elctrns., 602-624-9986
CA **Los Angeles**
Kierulff Elctrns., 213-725-0325
CA **Palo Alto**
Kierulff Elctrns., 415-968-6292
CA **San Diego**
Hall-Mark Elctrns., 714-268-1201
CA **San Diego**
Kierulff Elctrns., 714-278-2112
CA **Sunnyvale**
Hall-Mark Elctrns., 408-773-9990
CA **Tustin**
Kierulff Elctrns., 714-731-5711
CO **Denver**
Kierulff Elctrns., 303-371-6500
CO **Englewood**
Hall-Mark Elctrns., 303-934-5859
CT **Wallingford**
Kierulff Elctrns., 203-265-1115
FL **Ft. Lauderdale**
Hall-Mark Elctrns., 305-971-9280
FL **Orlando**
Hall-Mark Elctrns., 305-855-4020
FL **St. Petersburg**
Hall-Mark Elctrns., 813-576-8691
FL **St. Petersburg**
Kierulff Elctrns., 813-576-1966
GA **Norcross**
Hall-Mark Elctrns., 404-447-8000
IL **Bensenville**
Hall-Mark Elctrns., 312-860-3800
IL **Elk Grove Village**
Kierulff Elctrns., 312-640-0200
KS **Lenexa**
Hall-Mark Elctrns., 913-888-4747
MD **Baltimore**
Hall-Mark Elctrns., 301-796-9300
MA **Billerica**
Kierulff Elctrns., 617-667-8331;617-935-5134
MN **Bloomington**
Hall-Mark Elctrns., 612-854-4747
MN **Edina**
Kierulff Elctrns., 612-941-7500
MO **Earth City**
Hall-Mark Elctrns., 314-291-5350
MO **Maryland Hgts.**
Kierulff Elctrns., 314-739-0855
NJ **Cherry Hill**
Hall-Mark Elctrns., 609-424-7300
NJ **Fairfield**
Hall-Mark Elctrns., 201-575-4414
NJ **Fairfield**
Kierulff Elctrns., 201-575-6750
NC **Greensboro**
Kierulff Elctrns., 919-852-9440
NC **Raleigh**
Hall-Mark Elctrns., 919-872-0712
OH **Cleveland**
Kierulff Elctrns., 216-587-6558
OH **Highland Heights**
Hall-Mark Elctrns., 216-473-2907
OH **Westerville**
Hall-Mark Elctrns., 614-891-4555
OK **Tulsa**
Hall-Mark Elctrns., 918-665-3200
OK **Tulsa**
Kierulff Elctrns., 918-252-7537
TX **Austin**
Hall-Mark Elctrns., 512-258-8848
TX **Austin**
Kierulff Elctrns., 512-835-2090
TX **Dallas**
Hall-Mark Elctrns., 214-341-1147
TX **Dallas**
Kierulff Elctrns., 214-343-2400
TX **Houston**
Hall-Mark Elctrns., 713-781-6100
TX **Houston**
Kierulff Elctrns., 713-530-7030
UT **Salt Lake City**
Kierulff Elctrns., 801-973-6913
WA **Tukwila**
Kierulff Elctrns., 206-575-4420
WI **Oak Creek**
Hall-Mark Elctrns., 414-761-3000
WI **Waukesha**
Kierulff Elctrns., 414-784-8160

Cubit

Cubit Inc.
240 Polaris Avenue
Mountain View, California 94043
415-962-8237

Curtis Electro Devices

Curtis Electro Devices, Inc.
P.O. Box 4090
Mountain View, California 94040
415-964-3846

Custom Integrated Circuits

Custom Integrated Circuits
5353 Wayzata Boulevard, Suite 603
Minneapolis, Minnesota 55416
612-542-1115

Custom MOS Arrays

Custom MOS Arrays, Inc.
211 Topaz Street
Milpitas, California 95035
408-946-9111

Cybernetic Micro Systems

Cybernetic Micro Systems
P.O. Box 3000
San Gregorio, California 94074
415-726-3000
TELEX: 171-135 attention: Cybernetics

Distributors

Intl **Argentina, Buenos Aires**
YEL S.R.L., TEL: 46-2211
Intl **Belgium, Gent**
Belcomp, TEL: 091/25 22 88
Intl **England, Cheltenham**
Dataplus, Ltd., TEL: 0242-30030
Intl **France, Paris**
Ets Andre Kovacs, TEL: 250-89-70
Intl **India, Bombay**
M.J. Exports Pvt Ltd., TEL: 230644
Intl **Israel, Tel-Aviv**
R.N. Elctrns. Agencies Ltd., TEL: (03) 708 174;(03) 796927
Intl **Italy, Milano**
Skylab, S.R.L., TEL: (02) 688 38 06
Intl **Japan, Tokyo**
Systems Mktg., Inc., TEL: 03-254-2751
Intl **Latin America**
Intectra
Intl **Norway, Oslo**
Hans H. Schive As, TEL: (02) 55 76 92
Intl **South Africa, Cape Town**
Eagle Elec. Co. (Pty.) Ltd., TEL: 45-1421
Intl **Sweden, Stockholm**
Satt Elctrns., TEL: 08/81 01 00
Intl **Switzerland, Zug**
Anatec Electronische Bauteile, TEL: (042) 31 5477
Intl **West Germany, Munchen**
Scantec GmbH, TEL: (089) 13 40 93

Cybersystems

Cybersystems, Inc.
7540-A South Memorial Parkway
Huntsville, Alabama 35802
205-883-4410

© IC MASTER 1983

Data General

Data General Corporation
4400 Computer Drive
Westboro, Massachusetts 01587
617-366-8911
TWX: 710-390-1217
TELEX: 94-8460

Sales Offices & Representatives

Intl **Australia, Adelaide**
Data General, TEL: (08) 2237344
Intl **Australia, Brisbane**
Data General, TEL: (07) 2295744
Intl **Australia, Melbourne**
Data General, TEL: (03) 831-3311
Intl **Australia, Newcastle**
Data General, TEL: (049) 262922
Intl **Australia, Sydney**
Data General, TEL: (02) 9081366
Intl **Australia, South Perth**
Data General, TEL: (09) 3979122
Intl **Austria, Vienna**
Data General, TEL: (43-222) 626146
Intl **Belgium, Brussels**
Data General, TEL: (32-2) 6604944
Intl **Brazil, Sao Paulo**
Data General, TEL: 2410425/5430138 & 542-8951
Intl **Denmark, Copenhagen**
Data General, TEL: (45-1) 305666
Intl **England, Birmingham**
Data General, TEL: (44-21) 7073433
Intl **England, Bristol**
Data General, TEL: (44-272) 698271
Intl **England, Hounslow**
Data General, TEL: (44-1) 5727455
Intl **England, London**
Data General, TEL: (44-1) 741-8341/741-1011/621-1130
Intl **England, Manchester**
Data General, TEL: (44-61) 969-3935
Intl **England, Northolt**
Data General, TEL: (44-1) 8415151
Intl **England, Southall**
Data General, TEL: (44-1) 5742651
Intl **England, South Harrow**
Data General, TEL: (44-1) 8649611
Intl **France, Paris EHQ**
Data General, TEL: (33-1) 776-44-15
Intl **France, Le Plessis Robinson**
Data General, TEL: (33-1) 6302430
Intl **France, Paris**
Data General, TEL: (33-1) 252-5301 (North); (33-1) 252-5302 (West)
Intl **France, Lille**
Data General, TEL: (33-20) 913825
Intl **France, Lyon**
Data General, TEL: (33-78) 41-02-82
Intl **France, Nantes**
Data General, TEL: (40) 898154
Intl **France, Strasbourg**
Data General, TEL: (33-88) 833800
Intl **Germany, Eschborn**
Data General, TEL: (49-6196) 4941
Intl **Germany, Dusseldorf**
Data General, TEL: (49-211) 596031-34
Intl **Germany, Hamburg**
Data General, TEL: (49-40) 858001
Intl **Germany, Stuttgart**
Data General, TEL: (49-711) 702061
Intl **Germany, Munich**
Data General, TEL: (49-89) 3519011-14
Intl **Germany, Hannover**
Data General, TEL: (49-511) 326081
Intl **Germany, Nuremberg**
Data General, TEL: (49-911) 203443
Intl **Holland, Amsterdam**
Data General, TEL: (31-20) 838801
Intl **Holland, Rijswijk**
Data General, TEL: (31-70) 907694
Intl **Hong Kong, Kowloon**
Data General, TEL: 05-240151-5
Intl **Ireland, Dublin**
Data General, TEL: (353-1) 60-21-86/60-23-86
Intl **Italy, Milano**
Data General, TEL: (39-2) 6121451/6120141
Intl **Italy, Roma**
Data General, TEL: (39-6) 5013651/1611/1825
Intl **Italy, Padua**
Data General, TEL: (39-49) 654909/654377
Intl **New Zealand, Auckland**
Data General, TEL: 30294
Intl **New Zealand, Wellington**
Data General, TEL: 723095
Intl **Scotland, Glasgow**
Data General, TEL: (44-41) 3323205
Intl **Sweden, Stockholm**
Data General, TEL: (46-8) 830520
Intl **Sweden, Gothenberg**
Data General, TEL: (46-31) 813190
Intl **Sweden, Malmoe**
Data General, TEL: (46-40) 103585
Intl **Switzerland, Lausanne**
Data General, TEL: (41-21) 277131
Intl **Switzerland, Zurich**
Data General, TEL: (41-1) 440355
Intl **Thailand, Bangkok**
Data General, TEL: 234-8820/4551/4552

Distributors

Intl **Australia, Melbourne, Victoria**
AJF Systems, TEL: (03) 679 306
Intl **Australia, Mortlake, NSW**
Elmeasco Pty. Ltd., TEL: (02) 736-2888
Intl **Australia, Victoria**
Total Elctrns. Corp.
Intl **Italy, Milano**
Adelsy S.P.A., TEL: (02) 4985051
Intl **United Kingdom, Reading**
Celdis Ltd., TEL: 0734-585171
Intl **United Kingdom, West Horndon, Essex**
Comma, TEL: Brentwood (0277) 811131

Data I/O

Data I/O Corporation
10525 Willows Road N.E. C-46
Redmond, Washington 98052
206-881-6444
TELEX: 320290

Data Translation

Data Translation, Inc.
100 Locke Drive
Marlboro, Massachusetts 01752
617-481-3700
TELEX: 951-646
Specific product information:
Price and delivery:
See Product Information
Place an order:
See Product Information

Sales Offices & Representatives

Intl **Australia, Kilkenny, S. Australia**
Werner Elctrns. Pty. LTD., TEL: 268-2776
Intl **Australia, Rozelle, N.S.W.**
AMPEC Elctrns. Pty. LTD., TEL: 02/818-1166
Intl **Belgium, Brussels**
C.N. Rood A.S., TEL: 02735.21.35
Intl **Chile, Santiago**
Interlog, TEL: 225-3689
Intl **Denmark, Kobenhavn Nv**
Imdata APS, TEL: 01 83 3400
Intl **England, Slough Berkshire**
Data Translation LTD., TEL: 06286-3412
Intl **Finland, Helsinki**
Turion OY, TEL: 90-377 787
Intl **France, Meudon La Foret**
Sacasa, TEL: 630 68 39
Intl **Greece, Athens**
Elecomp LTD., TEL: 951-4944
Intl **India, Bombay**
Sapphire Systems & Services (P) LTD., TEL: 231860/231570
Intl **Israel, Ramat Hasharon**
Dynamicon LTD., TEL: 03-727010
Intl **Italy, Milano**
Eledra S.P.A., TEL: 34-97-51
Intl **Japan, Tokyo**
ASR Intl., TEL: (03) 437-5471
Intl **Japan, Tokyo**
Takachiho Koheki Co, TEL: 03-355-1111
Intl **Netherlands, Rijswijk**
C.N. Rood B.V., Cort v.d. Lindenstraat, TEL: 070-996360
Intl **New Zealand, Wellington**
Anderson Digital Elctrns., TEL: 693-008
Intl **Norway, Torshov Oslo**
Elektronix A/S, TEL: 02229850
Intl **Portugal, Lisboa**
Ditram Componentes E. Electronica, Lda., TEL: 54-5313
Intl **Singapore**
General Engineers Corp. Pte., TEL: 2729412
Intl **South Africa, Pretoria**
Elctrns. Building Elements Pty. LTD., TEL: (27) 11-816-1782
Intl **Spain, Madrid**
Instrumatic, TEL: 2502577
Intl **Spain, Malaga**
Instrumatic, TEL: 213199
Intl **Sweden, Vallingby**
Scancopter AB, TEL: (08)380065
Intl **Switzerland, Geneva**
Instrumatic SA, TEL: 022/360830
Intl **Switzerland, Zurich**
Instrumatic AG, TEL: 01/724 1410
Intl **Taiwan, Taipei**
A-Tek Enterprises Co.
Intl **West Germany, Puchheim**
Stemmer Elektronik, TEL: (089) 806061

Datel-Intersil

Datel-Intersil, Inc.
11 Cabot Blvd.
Mansfield, Massachusetts 02048
617-339-9341
TELEX: 951340
TWX: 710-346-1953
Specific product information:
Tom Hospod ..... ext. 257
Bob Leonard ..... ext. 141
Application engineering:
Tom Hospod ..... ext. 257
Bob Leonard ..... ext. 141
Literature:
Literature "Hot Line" ..... ext. 100
Price and delivery:
Ellen Dore
Follow-up an order:
Bill Hager

Sales Offices & Representatives

AL **Huntsville**
Intl. Sci. Instr., 205-533-6880

© IC MASTER 1983

Datel-Intersil (Cont)

AZ **Phoenix**
Tech. Sales, Inc., 602-246-1614
CA **Santa Ana**
Datel-Intersil, Inc., 714-835-2751
CA **Sunnyvale**
Datel-Intersil, Inc., 408-733-2424
CO **Denver**
Cleveland Entprs. of Co., 303-751-3252
CT **Hamden**
J.B.L. Assocs., 203-281-3161
FL **Coral Springs**
H. A. Inc., 305-752-7520
FL **Largo**
H. A. Inc., 813-595-8170
GA **Atlanta**
Intl. Sci. Instrs., 404-452-0144
HI **Honolulu**
Adtech, Inc., 808-941-0708
IL **Elmhurst**
Sector Engrg. Sales, Inc., 312-530-7850
IN **Indianapolis**
Sector Engrg. Sales, Inc., 317-842-1120
IA **Cedar Rapids**
Tech. Reps., Inc., 319-393-1300
KS **Wichita**
Tech. Reps., Inc., 316-681-0242
MA **Mansfield**
Datel-Intersil, Inc., 617-339-9341
MI **Farmington Hills**
Anderson Elctrns., Inc., 313-553-7600
MN **Minneapolis**
J.R. Assoc., 612-559-5673
MO **Earth City**
Tech. Reps., Inc., 314-291-0001
MO **Kansas City**
Tech. Reps., Inc., 816-756-3575
NM **Albuquerque**
Cleveland Entprs., Inc., 505-265-7893
NY **East Babylon**
Astrorep, Inc., 516-422-2500
NY **Great Neck**
SET Mktg., Inc., 516-466-0550
NY **Liverpool**
R&D Assocs., Inc., 315-457-0100
NC **Greensboro**
Everett Bolte Sales, 919-294-4141
OH **Cleveland**
Instrmn. Sys., 216-845-8800
OH **Dayton**
Instrmn. Sys., 513-294-2838
OR **Portland**
Hood Engrg. Co., 503-244-0760
PA **Glenside**
Wyncote Instrmn. Co., 215-572-6500
PA **Pittsburgh**
Instrmn. Sys., 412-243-1111
TX **Austin**
Technical Mktg., Inc., 512-835-0064
TX **Carrollton**
Technical Mktg., Inc., 214-387-3601
TX **Dallas**
Datel-Intersil, Inc., 214-241-0651
TX **Houston**
Technical Mktg., Inc., 713-777-9228
UT **Salt Lake City**
Cleveland Entprs. of Co., 801-355-8424
VA **Arlington**
H. J. Heffernan Co., 703-522-6666
WA **Bellevue**
Hood Engrg. Co., 206-453-9375
WI **Milwaukee**
Sector Engrg. Sales, Inc., 414-352-8280
Can **Kirkland, Quebec**
R. N. Longman Sales, Inc., 514-694-3911
Can **Mississauga, Ontario**
R. N. Longman Sales, Inc., 416-677-8100
Intl **Australia, Concord N.S.W.**
Elmeasco Instrs. Pty. Ltd., TEL: 02-7362888
Intl **Austria, Singerstrasse 2**
Othmar Lackner, TEL: 222-531185
Intl **Belgium, Brussels**
Simac Elctrns. sprl, TEL: 02-219-2451, 52, 53
Intl **Denmark, Copenhagen**
Paratron A/S, TEL: 01-162588
Intl **Denmark, Kokkedal**
C-88 APS, TEL: 02-244 888
Intl **England, Basingstoke-Hants**
Intersil Datel (U.K.) Ltd., TEL: 0256-57361
Intl **Finland, Helsinki**
Havulinna OY, TEL: (358) 0 799711
Intl **France, Saint Cloud**
Intersil Datel SARL, TEL: 602 5711
Intl **Germany, Muenchen**
Intersil Datel GmbH, TEL: 089 530741
Intl **India, Secunderabad**
Kaytronics, TEL: 76025
Intl **Israel, Tel Aviv**
STG Intl. Ltd., TEL: 248231
Intl **Italy, Milano**
3G Elctrns. S.R.L., TEL: 5455951
Intl **Japan, Osaka**
Datel KK, TEL: 06-354-2025
Intl **Japan, Tokyo**
Datel KK, TEL: 793-1031
Intl **Netherlands, Veldhoven**
Simac Elctrns. b.v., TEL: 040-533725
Intl **New Zealand, Aukland**
David Reid Ltd., TEL: 488-049
Intl **Norway, Oslo**
Morgenstierne Co A/S, TEL: 02/35 61 10
Intl **South Africa, Braamfontein**
Peter Jones Elec. Equip. Pty. Ltd., TEL: 37-7943
Intl **South Africa, Pretoria**
Elctrn. Bldg. Elements Pty., TEL: 46-9221
Intl **Spain, Madrid**
Belport Electronica, TEL: 262-8837
Intl **Spain, Madrid**
EMECO, S. A., TEL: 458.80.11, 458.89.43
Intl **Sweden, Hagersten**
Martinsson & Co. AB, TEL: 08-744 03 00
Intl **Switzerland, Zurich**
Traco Elctrns. Co. Ltd., TEL: 01-201-0711
Intl **Taiwan, Taipei**
Multitech Intl. Corp., TEL: 7691225

Distributors

Can **Mississauga, Ontario**
R.N. Longman Sales, Inc., 416-677-8100
Can **Kirkland, Quebec**
R.N. Longman Sales, Inc., 514-694-3911

Datricon

Datricon Corporation
200 Datricon Plaza, 155 B Avenue
Lake Oswego, Oregon 97034
503-636-7671

Digelec

Digelec, Inc.
7335 East Acoma Drive, Suite 103
Scottsdale, Arizona 85260
602-991-7268

Digital Equipment

Digital Equipment Corporation
77 Reed Road
Hudson, Massachusetts 01749
617-568-4000

Digital Microsystems

Digital Microsystems Inc.
1755 Embarcadero
Oakland, California 94606
415-532-3686

Digitek

Digitek Inc.
17505 68th N.E. P.O. Box 468
Kenmore, Washington 98028
206-485-6571

Dionics

Dionics Inc.
65 Rushmore Street
Westbury, New York 11590
516-997-7474
TWX: 510-222-0974

Distributed Computer Systems

Distributed Computer Systems
223 Crescent Street
Waltham, Massachusetts 02154
617-899-6619

Diversified Technology

Diversified Technology Inc.
P.O. Box 465, 112 East State Street
Ridgeland, Mississippi 39157
601-856-4121

E & L Instruments

E & L Instruments
61 First Street
Derby, Connecticut 06418
203-735-8774

E-H International

E-H International, Inc.
7303 Edgewater Drive
Oakland, California 94621
415-638-5656

Elind

Elind
Via Torino, 30
Cernusco, Milan, Italy 20063
(02) 9.041.319
(02) 9.043.983
TELEX: 331113

© IC MASTER 1983

EMM

EMM
20630 Plummer Street, P.O. Box 668
Chatsworth, California 91311
213-998-9090
TELEX: 69-1404

Sales Offices & Representatives

Intl **England, Maidenhead, Berkshire**
EM Ltd., TEL: (0628) 72134
Intl **France, Juvisy Sur Orge**
EMM, TEL: 06-921-7231
Intl **India, Madras**
Southern Elctrns., TEL: 412374/412943
Intl **Israel, Tel Aviv**
Eastronics, Ltd. (Computer Products), TEL: (3) 47 51 51
Intl **Israel, Tel Aviv**
STG Intl., Ltd. (Memory Products), TEL: (3) 248-231
Intl **West Germany, Obersursel/Taunus**
EMM, TEL: (06171) 2931

Distributors

Intl **Finland, Helsinki**
OY Fintronic AB, TEL: (0) 6926022
Intl **France, Sevres**
Tekelec Airtronic, TEL: (01) 534 75 35
Intl **Holland, Rijswijk**
Rodelco BV Elctrns., TEL: 070-995750
Intl **Italy, Milano**
Adelsy S.P.A., TEL: (02) 4524651/2/3/4/5
Intl **Japan, Tokyo**
Nissho Elctrns. Co., TEL: 03/544-8386
Intl **Norway, Hvalstad**
Nordisk Elektronik A/S, TEL: (02) 786210
Intl **South Australia, Prospect**
A. J. Distributors, TEL: (08) 269 1244
Intl **Sweden, Stockholm**
Nordisk Elektronik AB, TEL: (08) 635040
Intl **Switzerland, Zurich**
Industrade AG, TEL: (01) 363 22 30
Intl **Taiwan, Taipei**
Taiwan Automation Co., TEL: (02) 7710940
Intl **West Germany, Quickborn b. Hamburg**
Enatechnik GmbH, TEL: 04106/612-1

Emulogic

Emulogic Inc.
Three Technology Way
Norwood, Massachusetts 02062
617-329-1031
TWX: 710-336-5908

Epson America

Epson America, Inc.
3415 Kashiwa Street
Torrance, California 90505
213-539-9140

ETI

ETI Corporation
ETI Micro Division
6918 Sierra Court
Dublin, California 94568
415-829-6600

Exar

Exar Integrated Systems, Inc.
750 Palomar Avenue, P.O. Box 62229
Sunnyvale, California 94088
408-732-7970
TWX: 910-339-9233

Sales Offices & Representatives

AL **Huntsville**
Rep, Inc., 205-881-9270
AZ **Scottsdale**
Summit Sales, 602-998-4850
CA **Glendale**
Orion Sales, 213-240-3151
CA **Mountain View**
Intectra, 415-967-8818
CA **San Diego**
Harvey King, 714-566-5252
CA **Santa Clara**
Criterion, 408-988-6300
CA **Tustin**
Orion Sales, 714-832-9687
CO **Wheatridge**
Waugaman Assoc., Inc., 303-423-1020
CT **Ridgefield**
Phoenix Sales, 203-438-9644
FL **Ft. Lauderdale**
Donato & Assoc., Inc., 305-733-3450
GA **Tucker**
Rep, Inc., 404-938-4358
IL **Des Plaines**
Janus, Inc., 312-298-9330
IA **Cedar Rapids**
Dytronix, Inc., 319-377-8275
MD **Baltimore**
Comp. Sales, Inc., 301-484-3647
MA **Burlington**
Contact Sales, Inc., 617-273-1520
MN **Lakeville**
Dan'l Engrg., 612-435-6000
MO **Bridgeton**
Dy-Tronix, Inc., 314-731-5799
MO **Independence**
Dy-Tronix, Inc., 816-373-6600
NM **Albuquerque**
Syntech, 505-266-7951
NY **Buffalo**
Quality Comps., 716-837-5430
NY **Great Neck**
Trionic Assocs., 516-466-2300
NY **Manlius**
Quality Comps., 315-682-8885
NC **Raleigh**
Zucker Assocs., 919-782-8433
OH **Columbus**
McFadden Sales, 614-459-1280
OR **Portland**
SD-R² Prods. & Sales, 503-297-8677
PA **Bala Cynwyd**
Vantage Sales Co., 215-667-0990
TN **Jefferson City**
Rep, Inc., 615-475-4105
TX **Austin**
Tech. Mktg., 512-835-0064
TX **Carrollton**
Tech. Mktg., 214-387-3601
TX **Houston**
Tech. Mktg., 713-777-9228
UT **Salt Lake City**
Waugeman Assoc., Inc., 801-254-0570
WA **Bellevue**
SD-R² Prods. & Sales, 206-747-9424
WI **Milwaukee**
Janus, Inc., 414-476-9104
Can **Etobicoke, Ontario**
R.F.Q. Ltd., 416-626-1445
Can **Ottawa, Ontario**
R.F.Q. Ltd., 613-820-8445/8446
Intl **Argentina, Pisos**
Rayo Elctrns. SRL, TEL: 67 9306
Intl **Australia, Melbourne**
Total Elctrns., TEL: 67 9306
Intl **Brasil, Sao Paulo**
ROHM Do Brasil Industria Elctrna. Ltda., TEL: 55 11 421-4577
Intl **Denmark, Horsholm**
Mer-el A/S, TEL: 571000
Intl **France, Sevres**
Tekelec/Airtronic, TEL: (1) 534 75 35
Intl **Germany (West), Muehlenstrasse**
ROHM Elctrns. GmbH, TEL: (02161) 29 805
Intl **Greece, Piraeus**
General Elctrns. Ltd., TEL: 49 13 595
Intl **Hong Kong, Kowloon**
ROHM Elctrns. (H.K.) Co., Ltd., TEL: 3-688841/3-672307
Intl **India, Bombay**
Zenith Elctrns., TEL: 38 42 14
Intl **Italy, Milano**
Eledra 3S S.p.A., TEL: 34.93.041
Intl **Japan, Tokyo**
Tokyo Electron Ltd., TEL: 03-343-4411
Intl **Netherlands, Zoetermeer**
Tekelec/Airtronic B.V., TEL: 079-310100
Intl **New Zealand, Auckland**
Professional Elctrns. Ltd., TEL: 46 94 50
Intl **Norway, Oslo**
Hefro Teknisk A/S, TEL: 38 02 86
Intl **Singapore, Singapore**
ROHM Elctrns. Co. Pte. Ltd., TEL: 2834327
Intl **South Africa, Transvaal**
South Continental Devices (Pty.) Ltd., TEL: 48 05 15
Intl **Spain, Madrid**
Unitronics, S.A., TEL: 242 52-04
Intl **Sweden, Upplands Vasby**
Lagercrantz Electronix AB, TEL: (0760) 86 120
Intl **Switzerland, Zurich**
Amera Elctrns. AG, TEL: (01) 57 11 12
Intl **United Kingdom, Thame, Oxon**
Thame Comps., TEL: (084 421) 3146

Distributors

AL **Huntsville**
Pioneer Elctrns., 205-837-9300
AL **Huntsville**
Resisticap, Inc., 205-881-9270
AL **Huntsville**
R. M. Elctrns., 205-852-1550
AZ **Phoenix**
Sterling Elctrns., 602-258-4531
AZ **Tempe**
Bell Inds., 602-966-7800
AR **Little Rock**
Carlton-Bates Co., 501-562-9100
CA **Anaheim**
Zeus West, Inc., 714-632-6880
CA **Chatsworth**
JACO, 213-998-2200
CA **Cupertino**
Western Microtechnology, 408-725-1664
CA **Roseville**
Bell Inds., 916-969-3100
CA **Santa Ana**
VSI Elctrns. (USA) Inc., 213-299-7760
CA **Sunnyvale**
Bell Inds., 408-734-8570
CA **Sunnyvale**
Diplomat Elctrns., 408-734-1900
CO **Denver**
Diplomat Elctrns., 303-427-5544
CO **Wheatridge**
Bell Inds., 303-424-1985
CT **Danbury**
Diplomat Elctrns., 203-797-9674

© IC MASTER 1983

Exar (Cont)

DIPLOMAT

The first distributor to call for

EXAR

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

CT East Haven
JV Elctrns., Inc., 203-469-2321

FL Clearwater
Diplomat Southland, 813-443-4514

FL Ft. Lauderdale
Diplomat Southland, 305-971-7160

FL Palm Bay
Diplomat Southland, 305-725-4520

IL Bensenville
Diplomat Elctrns., 312-595-1000

IL Elk Grove Village
GBL-Goold, 312-593-3220

IL Hoffman Estates
Intercomp, 312-843-2040

IL Lombard
R.M. Elctrns., 312-932-5150

IN Carmel
Altex Elctrns., Inc., 317-848-1323

IN Indianapolis
Graham Elctrns., 317-634-8202

IN Indianapolis
R. M. Elctrns., 317-247-9701

IA Cedar Rapids
DEECO, Inc., 319-365-7551

KS Lenexa
Comp. Specialties, 913-492-3555

MD Columbia
Diplomat Elctrns., 301-995-1226

MD Gaithersburg
Pioneer Elctrns., 301-948-0710

MA Holliston
Diplomat Elctrns., 617-429-4121

MA Norwood
Gerber Elctrns., 617-329-2400

MA Wilmington
RC Components, 617-657-4310

MI Farmington
Diplomat Elctrns., 313-477-3200

MI Farmington Hills
Ambur Elctrns., Inc., 313-477-8670

MI Grand Rapids
R. M. Elctrns., 616-531-9300

MN Fridley
Diplomat Elctrns., 612-572-0313

MO St. Louis
Olive Indl. Elect., 314-426-4500

NJ Totowa
Diplomat Elctrns., 201-785-1830

NM Albuquerque
Bell Inds., 505-292-2700

NY Hauppauge
JACO, 516-273-5500

NY Liverpool
Diplomat Elctrns., 315-652-5000

NY Melville
Diplomat Elctrns., 516-454-6400

NY Port Chester
Zeus Comps., Inc., 914-937-7400

OH Brunswick
Component Elect., Inc., 216-225-3401

OH Cincinnati
Graham Elctrns., 513-772-1661

OK Tulsa
Quality Comps., 918-664-8812

OK Tulsa
Radio, Inc., 918-587-9123

OR Lake Oswego
Bell Inds., 503-241-4115

OR Portland
Radar Elec. Co., Inc., 503-233-3691

PA Erie
Advacom, 814-476-7774

PA Horsham
Pioneer Elctrns., 215-674-4000

TX Addison
Quality Comps., 214-387-4949

TX Austin
Quality Comps., 512-835-0220

TX Houston
Quality Comps., 713-772-7100

UT Salt Lake City
Bell Inds., 801-972-6969

UT Salt Lake City
Diplomat Elctrns., 801-486-4134

WA Bellevue
JACO, 206-455-2727

WA Seattle
Radar Elec. Co., Inc., 206-282-2511

WA Seattle
Western Electromotive, 206-575-1910

WI Mequon
Taylor Elec. Co., 414-241-4321

Can Burnaby, British Columbia
R-A-E Indl. Elctrns., 604-291-8866

Can Calgary, Alberta
Cam Gard Supply Ltd., 403-287-0520

Can Pointe Claire, Quebec
Future Elctrns., 514-694-7710

Can Saskatoon, Saskatchewan
Cam Gard Supply Ltd., 306-652-6424

Can Toronto, Ontario
Cam Gard Supply Ltd., 416-252-5031

Can Vancouver, British Columbia
Cam Gard Supply Ltd., 604-291-1441

Can Vancouver, British Columbia
Intek Elctrns. Ltd., 604-324-6831

Can Winnepeg, Manitoba
Cam Gard Supply Ltd., 204-786-8401

Intl Finland, Helsinki
Yleiselektroniikka/oy, TEL: 90-562 1122

Fairchild

Fairchild Camera and Instrument Corp.
Semiconductor Groups
464 Ellis Street
Mountain View, California 94042
415-962-5011
TWX: 910-379-6345

Specific product information:
Local field sales office or franchised distributor, or contact the specific product marketing department at 464 Ellis Street, Mountain View, CA. Request through main switchboard: (415) 962-5011:
LSI Products
Microprocessors (MOS, Bipolar, ECL)
Memories (Bipolar, MOS, CCD)
LSI Logic (ECL, MOS, CCD)
Analog (CCD)
IC Components
Digital SSI & MSI (TTL, CMOS, ECL)
Linear

Application engineering:
See Product Information

Literature:
Local field sales office or franchised distributor.

Price and delivery:
Local field sales office or franchised distributor.

Place an order:
Local field sales office or franchised distributor.

Follow-up an order:
Customer Service Center, 401 Ellis Street, Mountain View, CA 94042, (415) 962-4486

All other information:
Fairchild Information Line, (415) 962-4401

Sales Offices & Representatives

AL Huntsville
Field Sales Office, 205-837-8960-A&C, 205-837-7873-LSI

AZ Phoenix
Field Sales Office, 602-864-1000

CA Encino
Field Sales Office, 213-990-9800

CA San Diego
Field Sales Office, 714-560-1332

CA Santa Ana
Field Sales Office, 714-557-7350

CA Santa Clara
Field Sales Office, 408-980-9990

CO Denver
Field Sales Office, 303-695-4927-LSI, 303-695-4950-Disti

CT Meriden
Field Sales Office, 203-634-8722-LSI, 203-634-8720-A&C

FL Altamonte Springs
Field Sales Office, 305-834-7000

FL Fort Lauderdale
Field Sales Office, 305-485-7970

GA Norcross
Field Sales Office, 404-441-2740-OEM, 404-441-2730-Disti

IL Itasca
Field Sales Office, 312-773-3300

IN Indianapolis
Field Sales Office, 317-849-5412

IA Cedar Rapids
Field Sales Office, 319-395-0090

KS Overland Park
Field Sales Office, 913-649-3974

MD Columbia
Field Sales Office, 301-730-1510

MA Framingham
Field Sales Office, 617-872-4900

MI Farmington Hills
Field Sales Office, 313-478-7400

MN Edina
Field Sales Office, 612-835-3322

© IC MASTER 1983

Fairchild (Cont)

NJ **Totowa**
Field Sales Office, 201-256-9006

NM **Albuquerque**
Field Sales Office, 505-884-5601

NY **Hauppauge**
Field Sales Office, 516-348-0900-LSI & A&C, 516-348-7777-Disti

NY **Poughkeepsie**
Field Sales Office, 914-473-5730

NC **Raleigh**
Field Sales Office, 919-876-9643, 919-876-0542-Disti

OH **Cleveland**
Field Sales Office, 216-447-9700

OH **Columbus**
Field Sales Office, 614-459-5748

OH **Dayton**
Field Sales Office, 513-890-5813-LSI, 513-890-5878-Dist

OK **Tulsa**
Field Sales Office, 918-627-1591

OR **Beaverton**
Field Sales Office, 503-641-7871

PA **Willow Grove**
Field Sales Office, 215-657-2711

TN **Knoxville**
Field Sales Office, 615-691-4011

TX **Austin**
Field Sales Office, 512-346-3990

TX **Houston**
Field Sales Office, 713-771-3547

TX **Richardson**
Field Sales Office, 214-234-3811-LSI, 214-234-3391-Disti;214-234-3963-A&C

WA **Bellevue**
Field Sales Office, 206-455-3190

Can **Downsview, Ontario**
Field Sales Office, 416-665-5903

Intl **Australia, New South Wales**
Fairchild Australia Pty. Ltd., TEL: (02) 439-5911

Intl **Austria, Schwendenplatz**
Fairchild Elctrns., TEL: 0222 635821

Intl **Brazil, Sao Paulo**
Fairchild Semiconductors, Ltda, TEL: 66-9092

Intl **France, Paris**
Fairchild Camera & Instr. S.A., TEL: 331-584 55 66

Intl **Germany, Munich**
Fairchild Camera & Instr., TEL: (089) 320031

Intl **Holland, Eindhoven**
Fairchild Semiconductor, TEL: 00-31-40-446909

Intl **Hong Kong, Kowloon**
Fairchild Semiconductor (HK) Ltd., TEL: K-890271

Intl **Italy, Milano**
Fairchild Semiconduttori, S.P.A., TEL: 02 6 88 74 51

Intl **Italy, Roma**
Fairchild Semiconduttori, S.P.A., TEL: 06 327 4006

Intl **Japan, Osaka**
Fairchild Japan Corp., TEL: 06-541-6138

Intl **Japan, Tokyo**
Fairchild Japan Corp., TEL: 03 400 8351

Intl **Korea, Seoul**
Fairchild Semikor Ltd., TEL: 85-0067

Intl **Mexico, Mexico City**
Fairchild Mexicana S.A., TEL: 905-563-5411

Intl **Scotland, West Lothian**
Fairchild Semiconductor Ltd., TEL: Livingston 0506 32891

Intl **Singapore, Toa Payoh**
Fairchild Semiconductor Pty. Ltd., TEL: 531-066

Intl **Sweden, Stockholm**
Fairchild Semiconductor AB, TEL: 8-449255

Intl **Taiwan, Taipei**
Fairchild Semiconductor (Taiwan) Ltd., TEL: 573205

Intl **United Kingdom, Cheshire**
GEC - Fairchild, Ltd., TEL: 051-336-3975

Intl **United Kingdom, Hertfordshire**
Fairchild Camera & Instr. (UK) Ltd., TEL: 0707 51111

Intl **West Germany, Hanover**
Fairchild Camera & Instr., TEL: 0511 17844

Intl **West Germany, Leonberg**
Fairchild Camera & Instr., TEL: 07152 41026

Ferranti

Ferranti Electric, Inc.
87 Modular Avenue
Commack, New York 11725
516-543-0200
TWX: 510-226-1490

Specific product information:
Ken Kushman

Application engineering:
Ken Kushman

Literature:
Helen Nelson

Price and delivery:
Dina Gentile

Follow-up an order:
Vivian Dennis

All other information:
Ken Kushman

Sales Offices & Representatives

Intl **United Kingdom, Chadderton-Oldham**
Ferranti, Ltd., TEL: (061) 624-0515

Intl **West Germany, Munchen**
Ferranti GmbH, TEL: (089) 293-871

Fujitsu America

Fujitsu America
910 Sherwood, Suite 23
Lake Bluff, Illinois 60044
312-295-2610

Sales Offices & Representatives

AZ **Phoenix**
Sanford Sales Assocs., 602-957-3570

CA **Long Beach**
Application Reps., Inc., 213-594-6608

CA **San Jose**
Applied Elctrn. Mktg., 408-225-6144

CA **Santa Ana**
SC Cubed (SC³), 714-972-4670

CO **Denver**
Donohue Sales, 303-458-6384

FL **Altamonte Springs**
"C" Assocs., 305-831-1717

FL **Hollywood**
"C" Assocs., 305-922-5230

GA **Lawrenceville**
Tek-Rep Mktg., 404-963-1600

GA **Stone Mountain**
Dixie Tech. Mktg., Inc., 404-962-2530

IL **Elk Grove Village**
John G. Twist Co., 312-593-0200

IL **Highland Park**
Bransky Sales, 312-433-2375

IN **Noblesville**
McFadden Sales, Inc., 317-877-5070

IA **Cedar Rapids**
John G. Twist Co., 319-393-8703

IA **Des Moines**
The Beams Co., 515-255-1148

KS **Prairie Village**
John G. Twist Co., 913-236-4646

KS **Shawnee Mission**
The Beams Co., 913-631-0300

KS **Wichita**
John G. Twist Co., 316-686-6685

ME **E. Sebago**
Electrical Comps. Inc.

MD **Gaithersburg**
Mechtronic Sales, Inc.

MD **Rockville**
Mechtronic Sales, Inc., 301-340-2130

MA **Fall River**
Electrical Comps. Inc., 617-674-0064

MA **Longmeadow**
Electrical Comps. Inc., 413-567-0153

MA **Natick**
Electrical Comps. Inc., 617-655-2225

MN **Minneapolis**
John G. Twist Co., 612-854-4600

MN **St. Paul**
Skor, Inc., 612-645-6461

MO **St. Louis**
The Beams Co., 314-569-1060

MO **St. Louis**
John G. Twist Co., 314-432-2830

NE **Lincoln**
John G. Twist Co., 402-474-5151

NV **Reno**
Applied Elctrn. Mktg., 702-851-1956

NJ **Bridgeton**
The Rep Force, 609-455-0891; 609-455-0987

NJ **Parlin**
JMR Sales Inc., 201-727-5335

NY **East Setauket**
JMR Sales Inc., 516-689-8871

NY **Endicott**
Tech-Mark, Inc., 607-748-7473

NY **Grand Island**
Tech-Mark, Inc., 716-773-9319

NY **Mendon**
Tech-Mark, Inc., 716-624-3840

NY **Whitesboro**
Tech-Mark, Inc., 315-736-0585

NC **Charlotte**
Robert W. Chapman Co., 704-525-2421

NC **Greensboro**
Robert W. Chapman Co., 919-282-0740

NC **Raleigh**
Robert W. Chapman Co., 919-782-2624

OH **Columbus**
McFadden Sales, Inc., 614-459-1280

OR **Portland**
Hilpak, 503-292-4764

PA **King of Prussia**
Monteiro Assocs., Inc., 215-265-0634

TN **Morristown**
Tek-Rep Mktg., 615-581-3489

TX **Dallas**
United Comps. Inc., 214-324-1448

VA **Midlothian**
Robert W. Chapman Co., 804-794-3748

WI **Brookfield**
John G. Twist Co., 414-782-2670

WI **Cedarburg**
Bransky Sales, 414-377-6837

Can **Calgary, Alberta**
Haltronics Ltd., 403-263-3388

Can **Oakville, Ontario**
Haltronics Ltd., 416-844-2121

Can **Ottawa, Ontario**
Haltronics Ltd., 613-226-2121

Can **Pointe Claire, Quebec**
Haltronics Ltd., 514-694-2121

Intl **Puerto Rico, Rio Piedras**
P.Q. Elctrn. Engrg. Specialties, Inc., TEL: AC 809-780-2643

© IC MASTER 1983

Fujitsu Microelectronics

Fujitsu Microelectronics, Inc.
2985 Kifer Road
Santa Clara, California 95051
408-727-1700
TWX: 910-338-0190
Specific product information:
Ed Alemany
Application engineering:
Bill Johnston
Literature:
Tim Henard
Price and delivery:
Respective sales office
Follow-up an order:
Respective sales office
All other information:
Ed Alemany (LD) 408-727-1700

Sales Offices & Representatives

AZ **Scottsdale**
Thom Luke Sales, 602-941-1901
CA **Auburn**
Straube Assocs., 916-885-0632
CA **Campbell**
Fujitsu Microelectronics, 408-866-5600
CA **Del Mar**
Reed Elctrn. Mktg., 714-452-1456
CA **Los Alamitos**
Reed Elctrn. Mktg., 714-821-9600
CA **Mountain View**
Straube Assocs., 415-969-6060
CO **Westminster**
Straube Assocs., 303-426-0890
CT **North Haven**
Comp. Rep. Assoc., 203-239-9762
FL **Clearwater**
Dyne-A-Mark Corp., 813-441-4702
FL **Fort Lauderdale**
Dyne-A-Mark Corp., 305-771-6501
FL **Maitland**
Dyne-A-Mark Corp., 305-831-2097
FL **Palm Bay**
Dyne-A-Mark, 305-727-0192
GA **Stone Mountain**
Dixie Tech. Mktg., 404-962-2530
ID **Boise**
Straube Assocs., 208-343-9850
IL **Rolling Meadows**
Sieger Assocs., 312-991-6161
IL **Rolling Meadows**
Fujitsu Microelectronics, 312-934-6400
IN **Indianapolis**
Sieger Assocs., 317-842-0373
KS **Overland Park**
P M R Corp., 913-381-0004
KS **Wichita**
P M R Corp., 316-684-4141
MD **Baltimore**
Comp. Sales, Inc., 301-484-3647
MA **Newton Centre**
Fujitsu Microelectronics, 617-964-7080
MA **Westwood**
Comp. Rep. Assocs., 617-329-3454
MI **Brighton**
AP Assoc., 313-229-6550
MN **Burnsville**
Electromec Sales Inc., 612-894-8200
MO **Maryland Heights**
P M R Corp., 314-569-1220
NJ **Fairfield**
T.A.M., 201-575-4390
NM **Albuquerque**
Straube Assocs., 505-292-0428
NY **Mendon**
Tech-Mark/Upstate Assoc., 716-624-3840
NY **S. Hauppauge**
Technical Applications Mktg., 516-348-0800
OH **Cleveland**
Del Steffen & Assoc., 216-461-8333
OH **Dayton**
Del Steffen & Assoc., 513-293-3145
OH **Lexington**
Del Steffen & Assoc., 419-884-2313
OK **Tulsa**
Ion Assocs., 918-664-0186
OR **Hillsboro**
Olson Ferree & Assocs., 503-640-9660
PA **Carnegie**
Del Steffen & Assocs., 412-276-7366
PA **Erdenheim**
Omni Sales, 215-233-4600
RI **Warwick**
Edwards Elctrns., 401-781-8000
TX **Austin**
Ion Assocs., 512-458-2108
TX **Grand Prairie**
Ion Assocs., 214-647-8225
TX **Houston**
Ion Assocs., 713-461-5311
UT **Salt Lake City**
Straube Assocs., 801-263-2640
WA **Bellevue**
Olsen-Ferree & Assocs., 206-883-7792
Can **Islington, Ontario**
Pipe-Thompson Ltd., 416-236-2355

Distributors

AZ **Phoenix**
Cetec Elctrns., 602-272-7951
AZ **Phoenix**
Sterling Elctrns., 602-258-4351
AZ **Tempe**
Marshall Inds., 602-968-6181
AZ **Tempe**
Time Elctrns.-AZ, 602-967-2000
AZ **Tucson**
Marshall Inds., 602-790-5687
CA **Canoga Park**
Marshall Inds., 213-999-5001
CA **El Monte**
Marshall Inds., 213-686-0141
CA **Irvine**
Marshall Inds., 714-556-6400
CA **San Diego**
Cetec Elctrns., 714-278-5020
CA **San Diego**
Marshall Inds., 714-578-9600
CA **San Diego**
Weatherford, 714-695-1700
CA **San Jose**
Cetec Elctrns., 408-263-7373
CA **Santa Ana**
Fujitsu Microelectronics, 714-547-9525
CA **Santa Ana**
Pacesetter Elctrns., 714-557-7131
CA **Southgate**
Cetec Elctrns., 213-773-6521
CA **Sunnyvale**
Marshall Inds., 408-732-1100
CA **Torrance**
Time Elctrns. West, 213-320-0880
CO **Denver**
Marshall Inds., 303-427-1818
CO **Denver**
Weatherford, 303-428-6900
CO **Wheatridge**
Bell Inds., 303-424-1985
CT **Orange**
Milgray Connecticut, 203-795-0711
CT **Wallingford**
Marshall Inds., 203-265-3822
FL **Fort Lauderdale**
Time Elctrns.-Fl., 305-974-4800
FL **Orlando**
Marshall Inds., 305-841-1878
FL **Winter Park**
Milgray Elctrns., 305-647-5747
GA **Atlanta**
Milgray Atlanta, 404-393-9666
GA **Norcross**
Marshall Inds., 404-923-5750
IL **Bensenville**
Marshall Inds., 312-595-6622
IL **Hoffman Estates**
Intercomp Inc., 312-843-2040
IL **Northbrook**
Classic Comp. Supply, 312-272-9650
KS **Overland Park**
Milgray Kansas, 913-236-8800
MD **Gaithersburg**
Marshall Inds., 301-840-9450
MD **Rockville**
Milgray Washington, 301-468-6400
MA **Burlington**
Marshall Inds., 617-272-8200
MA **Burlington**
Milgray Elctrns.-New England, 617-272-6800
MA **Needham Heights**
Cavalier Comps., 617-449-3112
MA **Waltham**
Sterling Elctrns., 617-894-6200
MA **Westboro**
Future Elctrns. Corp., 617-366-2400
MA **Woburn**
Time Elctrns.-New England, 617-935-8080
MI **Livonia**
Camelot Elctrns., 313-591-0055
MN **Plymouth**
Marshall Inds., 612-559-2211
MO **St. Louis**
Time Elctrns.-Midwest, 314-391-6444
NJ **Clifton**
Marshall Inds., 201-340-1900
NJ **Marlton**
Milgray Elctrns., 609-983-5010
NJ **Mt. Laurel**
Marshall Inds., 215-627-1920
NJ **Perth Amboy**
Sterling Elctrns., 201-442-8000
NY **East Syracuse**
Marshall Inds., 315-432-0644
NY **Endwell**
Marshall Inds., 607-754-1570
NY **Freeport**
Milgray Elctrns., 516-546-5600
NY **Hauppauge**
Current Comps., 516-273-2600
NY **Hauppauge**
Fujitsu Microelectronics, 516-227-1049
NY **Hauppauge**
Marshall Inds., 516-273-2424
NY **Hauppauge**
Mast Distrs., 516-273-2422
NY **Rochester**
Marshall Inds., 716-235-7620
OH **Cleveland**
Milgray Cleveland, 216-881-8800
OH **Columbus**
Camelot Elctrns., 614-239-0056
OH **Dayton**
Marshall Inds., 513-236-8088
OK **Tulsa**
Radio, Inc., 918-587-9123
OR **Lake Oswego**
Parrott Elctrns., 503-684-3100
PA **Broomall**
Time Elctrns. Mid-Atlantic, 215-359-1200
RI **Warwick**
W. H. Edwards, 401-781-8000
TX **Addison**
Active Comp. Tech., 214-980-1888
TX **Dallas**
Marshall Inds., 214-233-5200
TX **Dallas**
Weatherford, 214-931-7333
TX **Houston**
Marshall Inds., 713-789-6600

© IC MASTER 1983

Fujitsu Microelectronics (Cont)

TX **Houston**
Weatherford, 713-688-7406

TX **Richardson**
Fujitsu Microelectronics, 214-669-1616

TX **San Antonio**
Weatherford, 512-340-3764

WA **Bellevue**
Bell Inds., 206-747-1515

WA **Seattle**
Weatherford, 206-575-1340

WA **Tukwila**
Marshall Inds., 206-575-3120

WI **Milwaukee**
Marsh Elctrns., 414-475-6000

WI **New Berlin**
Classic Comps., 414-786-5300

Can **Pointe Claire, Quebec**
Future Elctrns. Corp., 514-694-7710

General Instrument

General Instrument Corporation
Microelectronics Division
600 W. John Street
Hicksville, New York 11802
516-733-3107
TWX: 510-221-1866

Sales Offices & Representatives

AZ **Tempe**
Spectrum Assoc., 602-966-1788

CA **El Segundo**
Microelectronics Div./General Instrument Corp., 213-322-7745

CA **El Segundo**
Varigon Assoc., 213-322-1120

CA **San Diego**
Varigon Assoc., 714-299-5413

CA **San Jose**
Quad Rep, 408-946-4000

CA **Santa Clara**
Microelectronics Div./General Instrument Corp., 408-496-0844

CO **Denver**
Eggeman Assoc., 303-433-5063

CT **Stratford**
Gerald Rosen Co., 203-375-5456

FL **St. Petersburg**
Microelectronics Div./General Instrument Corp., 813-577-4024

IL **Arlington Heights**
Microelectronics Div./General Instrument Corp., 312-981-0040

IN **Indianapolis**
Microelectronics Div./General Instrument Corp., 317-872-7740

IN **South Bend**
Microelectronics Div./General Instrument Corp., 219-291-0585

KS **DeSoto**
Midtec Assoc., 913-441-6565

MD **Columbia**
Microelectronics Div./General Instrument Corp., 301-730-8992

MA **Framingham**
Gerald Rosen Co., 617-879-5505

MI **Lake Orion**
Microelectronics Div./General Instrument Corp., 313-391-4070

MN **Bloomington**
Quantum Sales, 612-884-4700

MO **Florissant**
Midtec Assoc., 314-837-5200

NH **Merrimack**
Microelectronics Div./General Instrument Corp., 603-424-3303

NJ **Teaneck**
R.T. Reid Assoc., 201-692-0200

NY **Syracuse**
PI'Tronics, Inc., 315-454-9346

OH **Cincinnati**
G&H Sales Co., 513-272-0580

OH **Grove City**
G&H Sales Co., 614-878-1128

OR **Portland**
Jas. J. Backer Co., 503-297-3776

OR **Salem**
Jas. J. Backer Co., 503-362-0717

PA **Huntingdon Valley**
Knowles Assoc., 215-947-5641

TX **Dallas**
Microelectronics Div./General Instrument Corp., 214-934-1654

WA **Seattle**
Jas. J. Backer Co., 206-285-1300

Can **Islington, Ontario**
Pipe-Thompson Ltd., 416-274-1269

Intl **England, London**
General Instrument Microelectronics Ltd., TEL: 01-439-1895

Intl **England, London**
General Instrument Microelectronics Ltd., TEL: 01-439-1891

Intl **France, Paris**
Southern European Sales Off., TEL: 365 72 50

Intl **Germany, Munchen**
General Instrument Deutschland GmbH, TEL: (089) 27 24 049

Intl **Hong Kong**
General Instrument Hong Kong Ltd., TEL: (5) 434360

Intl **Japan, Tokyo**
General Instrument Intl. Corp., TEL: (03) 437-0281

Intl **Taiwan, Taipei**
General Instrument Microelectronics Taiwan, TEL: 886-2-914-6234

Distributors

AL **Huntsville**
Arrow, 205-830-1103

AL **Huntsville**
Hall-Mark, 205-839-8700

CA **Chatsworth**
Anthem, 213-700-1000

CA **Chatsworth**
Arrow, 213-907-0817

CA **Newport Beach**
Arrow, 714-851-8961

CA **San Diego**
Anthem, 714-453-9008

CA **San Diego**
Arrow, 714-565-4800

CA **Santa Ana**
VSI, 714-557-7131

CA **Sunnyvale**
Anthem, 408-946-8000

CA **Sunnyvale**
Arrow, 408-745-6600

CA **Sunnyvale**
Diplomat, 408-734-1900

CA **Sunnyvale**
VSI, 408-734-5470

CA **Tustin**
Anthem, 714-730-8000

CO **Denver**
Arrow, 303-758-2100

CO **Denver**
Hall-Mark, 303-934-3111

CT **Wallingford**
Arrow, 203-265-7741

FL **Clearwater**
Diplomat, 813-443-4514

FL **Ft. Lauderdale**
Arrow, 305-776-7790

FL **Ft. Lauderdale**
Diplomat, 305-971-7160

FL **Ft. Lauderdale**
Hall-Mark, 305-971-9280

FL **Orlando**
Hall-Mark, 305-855-4020

FL **Palm Bay**
Arrow, 305-725-1480

FL **Palm Bay**
Diplomat, 305-725-4520

FL **St. Petersburg**
Hall-Mark, 813-576-8691

GA **Norcross**
Arrow, 404-449-8252

GA **Norcross**
Hall-Mark, 404-447-8000

IL **Bensenville**
Hall-Mark, 312-860-3800

IL **Rosemont**
Advent, 312-297-6200

IL **Schaumburg**
Arrow, 312-397-3440

IN **Indianapolis**
Advent, 317-872-4910

IN **Indianapolis**
Arrow, 317-243-9353

IA **Cedar Rapids**
Advent, 319-363-0221

IA **Cedar Rapids**
Arrow, 319-395-7230

KS **Lenexa**
Hall-Mark, 913-888-4747

MD **Baltimore**
Arrow, 301-247-5200

MD **Baltimore**
Hall-Mark, 301-796-9300

MA **Burlington**
Lionex, 617-272-9400

MA **Woburn**
Arrow, 617-933-8130

MI **Ann Arbor**
Arrow, 313-971-8220

MI **Farmington Hills**
Advent, 313-477-1650

MI **Grand Rapids**
Arrow, 616-243-0912

MN **Bloomington**
Hall-Mark, 612-854-3223

MN **Edina**
Arrow, 612-830-1800

MO **St. Louis**
Arrow, 314-567-6888

MO **St. Louis**
Hall-Mark, 314-291-5350

NH **Manchester**
Arrow, 603-668-6968

NJ **Fairfield**
Arrow, 201-575-5300

NJ **Fairfield**
Lionex, 201-227-7960

NJ **Totowa**
Diplomat, 201-785-1830

NM **Albuquerque**
Arrow, 505-243-4566

NY **Hauppauge**
Arrow, 516-231-1000

NY **Hauppauge**
Lionex, 516-273-1660

NY **Melville**
Diplomat, 516-454-6400

NY **Rochester**
Arrow, 716-275-0300

NY **Syracuse**
Arrow, 315-652-1000

NC **Raleigh**
Arrow, 919-876-3132

NC **Raleigh**
Hall-Mark, 919-832-4465

NC **Winston-Salem**
Arrow, 919-725-8711

© IC MASTER 1983

General Instrument (Cont)

OH **Cleveland**
Arrow, 216-248-3990
OH **Cleveland**
Hall-Mark, 216-473-2907
OH **Columbus**
Hall-Mark, 614-891-4555
OH **Dayton**
Arrow, 513-435-5563
OK **Tulsa**
Hall-Mark, 918-665-3200
PA **Philadelphia**
Arrow, 609-235-1900
PA **Philadelphia**
Hall-Mark, 609-424-0880
PA **Philadelphia**
Pioneer, 215-674-4000
PA **Pittsburgh**
Arrow, 412-856-7000
TX **Austin**
Arrow, 512-835-4180
TX **Austin**
Hall-Mark, 512-258-8848
TX **Dallas**
Arrow, 214-386-7500
TX **Dallas**
Hall-Mark, 214-341-1147
TX **Houston**
Arrow, 713-491-4100
TX **Houston**
Diplomat, 713-771-9555
TX **Houston**
Hall-Mark, 713-781-6100
UT **Salt Lake City**
Arrow, 801-539-1135
WA **Bellevue**
Arrow, 206-643-4800
WI **Madison**
Arrow, 608-273-4977
WI **Oak Creek**
Arrow, 414-764-6600
WI **Oak Creek**
Hall-Mark, 414-761-3000
Can **Calgary, Alberta**
Future, 403-259-6408
Can **Downsview, Ontario**
Future, 416-663-5563
Can **Edmonton, Alberta**
R-A-E, 403-451-4001
Can **Montreal, Quebec**
Future, 514-694-7710
Can **Ottawa, Ontario**
Future, 613-820-8313
Can **Vancouver, British Columbia**
Future, 604-438-5545
Can **Vancouver, British Columbia**
R-A-E, 604-291-8866
Intl **Australia, Victoria, Sandringham**
Daneva Control Pty. Ltd., TEL: (03) 598-5622
Intl **Austria, Wien**
Elbatex GmbH, TEL: 0222/88 56 11
Intl **Belgium, Bruxelles**
Vekano, TEL: 7620505
Intl **Denmark, Herlev**
A/S Nordisk-Elektronik, TEL: 84.20.00
Intl **England, London**
Bee Arosales (Exporters), TEL: 01-636-6614/ 01-636 8211
Intl **Finland, Espoo**
Jorma Sarkkinen Ky., TEL: 046.10.88
Intl **France, Boulogne**
Gedis, TEL: 604.81.70
Intl **France, Montrouge**
P.E.P., TEL: 735.33.20
Intl **Germany, Berlin**
Roederstein-Baulemente Vertriebs GmbH, TEL: 0 30/7 91 40 29
Intl **Germany, Heilbronn**
Elbatex GmbH, TEL: 0 71 31/8 90 01
Intl **Germany, Munchen**
Electronic 2000 Vertriebs-GmbH, TEL: 0 89/ 43 40 61
Intl **Germany, Wiesbaden**
Elcowa, TEL: 06121 65005
Intl **Holland, Geldermalsen**
Curijn Hasselaar, TEL: 03455-3150
Intl **Israel, Tel-Aviv**
Alexander Schneider Ltd., TEL: 3 320.89-3 346.07
Intl **Italy, Milan**
Adrep Srl, TEL: (02) 408.41.01
Intl **Italy, Milan**
Claitron, TEL: 3088506 ¢ 3088083
Intl **Italy, Milan**
Intl. Commerce Co., TEL: 4045747 ¢ 405197
Intl **Italy, Milan**
Intesi, TEL: 51741
Intl **Italy, Modena**
Hellis Di B. Prati, TEL: 059-804104 ¢ 802562
Intl **Italy, Rome**
3 C.E., TEL: 5420625
Intl **Italy, Trieste**
Rapido SARL
Intl **Korea, Seoul**
Dae Ho Corp., TEL: 777-3848, 2487
Intl **New Zealand, Auckland**
David Reid Professional Prods. Ltd., TEL: 499-197
Intl **Norway, Oslo**
J.M. Feiring A/S, TEL: (02) 19.62.00
Intl **Portugal, Lisbon**
Decada, TEL: 574984
Intl **South Africa, Transvaal**
Pace Elctrn. Comps. (Pty.) Ltd., TEL: 616-361211
Intl **Spain, Madrid**
Sagitron S.A., TEL: 4-02.60.85
Intl **Sweden, Taby**
Bexab Elektronic AB, TEL: 468 768 0560
Intl **Switzerland, Wettingen**
Elbatex AG, TEL: 056/26 56 41
Intl **Switzerland, Zurich**
Ellyptic AG, TEL: 01 493 10 00
Intl **United Kingdom, Keighley**
Semicomps Ltd., TEL: 0535 65191
Intl **United Kingdom, Oldham**
Vako Elctrns. Ltd., TEL: 061-652 6316
Intl **United Kingdom, Slough**
Crellon Elctrns. Ltd., TEL: 06286 4434
Intl **United Kingdom, Stevenage**
Campbell Collins Ltd., TEL: 0438 69466
Intl **United Kingdom, West Drayton**
Semiconductor Specialists Ltd., TEL: West Drayton 45522

General Micro Systems

General Micro Systems Inc.
1320 Chaffey Court
Ontario, California 91762
714-621-7532

GTE Microcircuits

GTE Microcircuits Division
GTE Products Corporation
2000 W. 14th St.
Tempe, Arizona 85281
602-968-4431
TWX: 910-951-1383

Sales Offices & Representatives

Intl **West Germany, Munich**
GTE Microcircuits Div., GTE Sylvania Licht GmbH, TEL: 089/1 78 20 31

Harris Semiconductor

Harris Semiconductor
Analog & Digital Bipolar/Digital CMOS Products Divisions/ Department ICM
P. O. Box 883
Melbourne, Florida 32901
305-724-7000
TWX: 510-959-6259
Specific product information:
Field Sales Office
Application engineering:
Field Sales Office
Literature:
Field Sales Office
Price and delivery:
Field Sales Office
Place an order:
Field Sales Office
Follow-up an order:
Customer Service ..... (305) 724-7410
All other information:
Marketing Communications ..... (305) 724-7407

Sales Offices & Representatives

AL **Huntsville**
Elctrn. Mktg. Assocs., 205-837-7363
AZ **Phoenix**
Compass Mktg. & Sales, Inc., 602-266-5400
AZ **Scottsdale**
Harris Semiconductor, 602-998-9766
CA **Costa Mesa**
Harris Semiconductor, 714-540-2176
CA **Mountain View**
Brooks Tech. Grp., 415-960-3880
CA **Mountain View**
Harris Semiconductor, 415-964-6443
CA **San Diego**
Hadden Assocs., 714-565-9444
CA **Woodland Hills**
Harris Semiconductor, 213-992-0686
CO **Denver**
Comp. Sales, Inc., 303-759-1666
CT **Ridgefield**
Phoenix Sales Co., 203-438-9644
FL **Clearwater**
Delmac Sales, 813-447-5192
FL **Ft. Lauderdale**
Harris Semiconductor, 305-739-0016
FL **Orlando**
Delmac Sales, 305-898-4688
FL **Tamarac**
Delmac Sales, 305-726-1330
GA **Atlanta**
Elctrn. Mktg. Assocs., 404-448-1215
GA **Atlanta**
Harris Semiconductor, 404-256-4000
IL **Collinsville**
AME Sales, 618-345-7404
IL **Elk Grove Village**
Oasis Sales, Inc., 312-640-1850
IL **Rosemont**
Harris Semiconductor, 312-692-4960
IN **Carmel**
Harris Semiconductor, 317-844-8011
IN **Carmel**
Oasis Sales, Inc., 317-848-5265
IA **Cedar Rapids**
Cahill Assocs., Inc., 319-377-8219
KS **Overland Park**
AME Sales, 913-492-8836
MA **Burlington**
Harris Semiconductor, 617-273-5942
MA **Burlington**
Mill Bern Assocs., Inc., 617-273-1313
MI **Novi**
Action Comp. Sales, 313-349-3940

© IC MASTER 1983

Harris Semiconductor (Cont)

MN **St. Paul**
Cahill, Schmitz & Cahill, Inc., 612-646-7217
NM **Albuquerque**
Compass Mktg. & Sales Inc., 505-292-7377
NY **Binghamton**
Precision Sales, 607-648-8833
NY **Great Neck**
Trionic Assoc. Inc., 516-466-2300
NY **Liverpool**
Precision Sales, 315-451-3480
NY **Melville**
Harris Semiconductor, 516-249-4500
NY **Pittsford**
Precision Sales, 716-381-2820
NY **Pleasant Valley**
Precision Sales, 914-635-3233
NC **Raleigh**
Elctrn. Mktg. Assocs., 919-847-8800
OH **Chagrin Falls**
Midwest Mktg. Assocs., 216-247-6655
OH **Dayton**
Midwest Mktg. Assocs., 513-433-2511
OR **Beaverton**
Harris Semiconductor, 503-297-7621
PA **Broomall**
L. D. Lowery, Inc., 215-356-5300
PA **Wayne**
Harris Semiconductor, 215-687-6680
SC **Greenville**
Elctrn. Mktg. Assocs., 803-233-4637
TX **Dallas**
Harris Semiconductor, 214-248-3237
TX **Dallas**
Nova Mktg., 214-385-9669
TX **Houston**
Nova Mktg., 713-988-6082
UT **Salt Lake City**
Comp. Sales, Inc., 801-466-8623
VA **Charlottesville**
L. D. Lowery, Inc., 804-973-6672
VA **Lanoxa**
L. D. Lowery, Inc., 804-966-5455
WA **Federal Way**
Harris Semiconductor, 206-838-4878
WI **Brookfield**
Oasis Sales, Inc., 414-782-6660
Can **Etobicoke, Ontario**
RFQ Ltd., 416-626-1445
Can **Ottawa, Ontario**
RFQ Ltd., 613-820-8445
Can **West Vancouver, British Columbia**
Blakewood Elect. Systems, Inc., 604-926-8000

Distributors

AL **Huntsville**
Hall-Mark/Huntsville, 205-827-8700
AL **Huntsville**
Hamilton/Avnet, 205-837-7210
AL **Huntsville**
Schweber Elctrns., 205-882-2200
AZ **Tempe**
Hamilton/Avnet, 602-231-5100
CA **Costa Mesa**
Avnet Elctrns., 714-754-6111
CA **Costa Mesa**
Hamilton Electro, 714-641-4107
CA **Culver City**
Hamilton/Avnet, 213-558-2011
CA **Culver City**
Hamilton Electro Sales, 213-558-2011
CA **Cupertino**
Western Microtechnology Sales, 408-725-1660
CA **Irvine**
Schweber Elctrns., 714-556-3880
CA **Los Angeles**
Schweber Elctrns., 213-537-4320
CA **San Diego**
Hamilton/Avnet, 714-571-7523
CA **Santa Clara**
Schweber Elctrns., 408-496-0200
CA **Sunnyvale**
Hamilton/Avnet, 408-743-3355
CO **Denver**
Hall-Mark/Denver, 303-934-5859
CO **Englewood**
Hamilton/Avnet, 303-779-9998
CT **Danbury**
Hamilton/Avnet, 203-797-1100
CT **Danbury**
Schweber Elctrns., 203-792-3742
CT **Norwalk**
Harvey Elctrns., 203-853-1515
FL **Altamonte Springs**
Schweber Elctrns., 305-331-7555
FL **Ft. Lauderdale**
Hall-Mark/Miami, 305-971-9280
FL **Ft. Lauderdale**
Hamilton/Avnet, 305-971-2900
FL **Hollywood**
Schweber Elctrns., 305-927-0511
FL **Orlando**
Hall-Mark/Orlando, 305-855-4020
FL **St. Petersburg**
Hall-Mark/St. Petersburg, 813-576-8691
FL **St. Petersburg**
Hamilton/Avnet, 813-576-3930
GA **Norcross**
Hall-Mark/Atlanta, 404-447-8000
GA **Norcross**
Hamilton/Avnet, 404-447-7500
GA **Norcross**
Schweber Elctrns., 404-449-9170
IL **Bensenville**
Hall-Mark/Chicago, 312-860-3800
IL **Bensenville**
Hamilton/Avnet, 312-860-8525
IL **Elk Grove Village**
Schweber Elctrns., 312-364-3768
IN **Carmel**
Hamilton/Avnet, 317-844-9333
KS **Lenexa**
Hall-Mark/Kansas City, 913-888-4747
KS **Overland Park**
Hamilton/Avnet, 913-888-8900
MD **Baltimore**
Hall-Mark/Baltimore, 301-796-9300
MD **Columbia**
Hamilton/Avnet, 301-995-3500
MD **Gaithersburg**
Schweber Elctrns., 301-840-5900
MA **Bedford**
Schweber Elctrns., 617-275-5100
MA **Lexington**
Harvey Elctrns., 617-863-2100
MA **Wilmington**
R C Components, 617-273-1860
MA **Woburn**
Hamilton/Avnet, 617-935-9700
MI **Grand Rapids**
Hamilton/Avnet, 617-243-8805
MI **Livonia**
Hamilton/Avnet, 313-522-4700
MI **Livonia**
Schweber Elctrns., 313-525-8100
MN **Bloomington**
Hall-Mark/Minneapolis, 612-854-4747
MN **Eden Prairie**
Schweber Elctrns., 612-941-5280
MN **Minnetonka**
Hamilton/Avnet, 612-932-0662
MO **Earth City**
Hall-Mark/St. Louis, 314-291-5350
MO **Earth City**
Hamilton/Avnet, 800-325-8654
NJ **Cherry Hill**
Hall-Mark/Philadelphia, 609-424-7300
NJ **Cherry Hill**
Hamilton/Avnet, 609-424-0110
NJ **Fairfield**
Hall-Mark/North Jersey, 201-575-4414
NJ **Fairfield**
Hamilton/Avnet, 201-575-3390
NJ **Fairfield**
Schweber Elctrns., 201-227-7880
NJ **Pinebrook**
Harvey Elctrns., 201-227-1262
NM **Albuquerque**
Hamilton/Avnet, 505-765-1500
NY **Binghamton**
Harvey Elctrns., 607-748-8211
NY **East Syracuse**
Hamilton/Avnet, 315-437-2641
NY **Fairport**
Harvey Elctrns., 716-381-7070
NY **Melville**
Hamilton/Avnet, 516-464-6000
NY **Rochester**
Hamilton/Avnet, 716-475-9130
NY **Rochester**
Schweber Elctrns., 716-424-2222
NY **Westbury**
Schweber Elctrns., 516-334-7474, ext. 474
NY **Woodbury**
Harvey Elctrns., 516-921-8700
NC **Raleigh**
Hall-Mark/Raleigh, 919-832-4465
NC **Raleigh**
Hamilton/Avnet, 919-829-8030
OH **Beachwood**
Schweber Elctrns., 216-464-2970
OH **Cleveland**
Hamilton/Avnet, 216-831-3500
OH **Dayton**
Hamilton/Avnet, 513-433-0610
OH **Dayton**
Schweber Elctrns., 513-439-1800
OH **Highland Heights**
Hall-Mark/Cleveland, 216-473-2907
OH **Westerville**
Hall-Mark/Columbus, 614-891-4555
OK **Tulsa**
Hall-Mark/Tulsa, 918-835-8458
OR **Lake Oswego**
Hamilton/Avnet, 503-635-8831
PA **Hersham**
Schweber Elctrns., 215-441-0600
PA **Pittsburgh**
Schweber Elctrns., 412-782-1600
TX **Austin**
Hall-Mark/Austin, 512-258-8848
TX **Austin**
Hamilton/Avnet, 800-252-9163
TX **Austin**
Schweber Elctrns., 512-458-8253
TX **Dallas**
Hall-Mark/Corporate, 214-343-5000
TX **Dallas**
Hall-Mark/Dallas, 214-341-1147
TX **Dallas**
Schweber Elctrns., 214-661-5010
TX **Houston**
Hall-Mark/Houston, 713-781-6100
TX **Houston**
Hamilton/Avnet, 713-780-1771
TX **Houston**
Schweber Elctrns., 713-784-3600
TX **Irving**
Hamilton/Avnet, 214-659-4111
UT **Salt Lake City**
Hamilton/Avnet, 801-972-2800
WA **Bellevue**
Hamilton/Avnet, 206-643-3950
WI **Brookfield**
Schweber Elctrns., 414-784-9020
WI **New Berlin**
Hamilton/Avnet, 414-784-4510
WI **Oak Creek**
Hall-Mark/Milwaukee, 414-761-3000
Can **Calgary, Alberta**
Hamilton/Avnet, 403-230-3586

© IC MASTER 1983

Harris Semiconductor (Cont)

Can **Mississauga, Ontario**
Hamilton/Avnet, 416-677-7432

Can **Heatan, Ontario**
Hamilton/Avnet, 613-226-1700

Can **St. Laurent, Quebec**
Hamilton/Avnet, 514-331-6443

Intl **Argentina, Buenos Aires**
Elko S.R.L., TEL: 9-011-54-1-40-8971

Intl **Australia, Crows Nest**
VSI Elctrns., TEL: 61-439-4655

Intl **Austria, Wien**
Transistor, TEL: 0222/829401

Intl **Belgium, Brussels**
Betea, S.A., TEL: 32-2-7368050

Intl **Denmark, Glostrup**
Ditz Schweitzer A.S., TEL: 45-2-453044

Intl **Finland, Helsinki**
Yleiselektroniikka oy, TEL: 9-011-358-0-90-562-1122

Intl **France, Le Chesnay**
Harris Semiconductor, TEL: 33-3-9549077

Intl **France, Le Chesnay**
Matra-Harris Semiconductor, TEL: 33-3-9548000

Intl **Germany, Camberg Wurges**
Jermyn GmbH, TEL: 9-011-49-06434-231

Intl **Germany, Eching Bei Munchen**
Kontron Elektronik GmbH, TEL: 49-89-319011

Intl **Germany, Frankfurt**
Spoerle Elctrn. KG, TEL: 06103/3040

Intl **Germany, Munich**
Harris Semiconductor, TEL: 49-89-473047

Intl **Germany, Patzbrunn**
Sasco GmbH, TEL: 49-89-46-111

Intl **Germany, Quickborn**
Alfred Neye-Enatechnik GmbH, TEL: 49-4106-6121

Intl **Israel, Ramat-Gan**
MRBD Inds. Ltd., TEL: 3-721-918

Intl **Italy, Cinisello Balsamo (Milano)**
Harris Semiconductor, TEL: 39-2-6187249

Intl **Italy, Cinisello Balsamo**
Lasi Elettronica, TEL: 39-2-9273578

Intl **Italy, Milano**
Murata-Erie Elettronica SpA, TEL: 39-2-6073786

Intl **Japan, Tokyo**
Harris Semiconductor Inc., TEL: 81-3-485-1031

Intl **Netherlands, Badhoevedorp**
Techmation Elctrns. B.V., TEL: 31-02968-6451

Intl **South Africa, Dunswart**
Allied Elctrn. Comps., TEL: 27-11-8921001

Intl **Spain, Madrid**
Unitronics SA, TEL: 34-242-5204

Intl **Sweden, Solna**
A B Betoma, TEL: 46-8-820280

Intl **Switzerland, Baden-Daettwil**
W. Stolz A.G., TEL: 41-56-840151

Intl **United Kingdom, Ashford, Middlesex**
Hy-Comp Ltd. (Chips Only), TEL: 44-7-842-46273

Intl **United Kingdom, Hartlepool**
SDP (Chips Only), TEL: 44 429 33721

Intl **United Kingdom, Kirkmuirhill, Lanksh.**
Phoenix Elctrns. Ltd. (Rep. Only), TEL: 44-55589-2393

Intl **United Kingdom, Slough, Berks**
Harris Semiconductor, TEL: 44-753-34666

Intl **United Kingdom, Slough, Berks**
Macro Mktg. Ltd., TEL: 44-6286-4422

Intl **United Kingdom, Thame, Oxon**
Thames Comps., TEL: 44-84421-3146

Harris Semiconductor

Harris Semiconductor
Custom Integrated Circuits Division/Department ICM
P. O. Box 883
Melbourne, Florida 32901
305-724-7000
TWX: 510-959-6259

Specific product information:
Field Sales Office—Custom Integrated Circuits

Application engineering:
Kenneth V. Worland 305-724-7481

Literature:
Field Sales Office—Custom Integrated Circuits

Price and delivery:
Field Sales Office—Custom Integrated Circuits

Place an order:
Field Sales Office—Custom Integrated Circuits

Follow-up an order:
Custom Integrated Circuits Division 305-729-5055

All other information:
Marketing Communications 305-729-5585

Sales Offices & Representatives

CA **Costa Mesa**
Harris Semiconductor Custom Integrated Circuits, 714-957-6557

DC **Washington**
Harris Semiconductor Custom Integrated Circuits, 202-342-3931

MA **Burlington**
Harris Semiconductor Custom Integrated Circuits, 617-273-1020

MN **Bloomington**
Harris Semiconductor Custom Integrated Circuits, 612-854-3224

NY **Garden City**
Harris Semiconductor Custom Integrated Circuits, 516-747-6776

Intl **United Kingdom, Slough**
Harris Systems Ltd., Semiconductor Custom Integrated Circuits, TEL: 34666

Henize Interactive Control

Henize Interactive Control
401 Astor Avenue
Dayton, Ohio 45449
513-859-8118

Heurikon

Heurikon Corporation
3001 Latham Drive
Madison, Wisconsin 53713
608-271-8700

Hewlett-Packard

Hewlett-Packard
Data Systems Division
11000 Wolfe Road
Cupertino, California 95014
408-257-7000
910-338-0221

Hilevel Technology

Hilevel Technology, Inc.
18902 Bardeen Way
Irvine, California 92715
619-752-5215

Hitachi

Hitachi America, Ltd.
1800 Bering Drive
San Jose, California 95131
408-292-6404
TELEX: 17-1581
TWX: 910-338-2103

Sales Offices & Representatives

AL **Huntsville**
Technology Mktg. Assocs., Inc., 205-883-7893

CA **Culver City**
Bestronics Inc., 213-870-9191

CA **Irvine**
Bestronics Inc., 714-979-9910

CA **San Diego**
Bestronics, 714-452-5500

CA **San Jose**
Quadrep, Inc., 408-946-4000

CA **San Jose**
Western Regional Office, 408-292-6404

CO **Denver**
Parker-Webster Co., 303-751-2600

FL **Orlando**
Technology Mktg. Assocs., Inc., 305-857-3760

FL **Pompano Beach**
Technology Mktg. Assocs., Inc., 305-942-0774

GA **Atlanta**
Technology Mktg. Assocs., Inc., 404-257-0374

IL **Rolling Meadows**
Sumer Inc., 312-991-8500

IN **Indianapolis**
Elctrn. Sales & Engrg., Inc., 317-849-4260

MD **Pasadena**
Robert Elctrn. Sales, 301-766-6374

MA **Lexington**
Eastern Regional Office, 617-861-1642

MA **Loxington**
Technology Sales, Inc., 617-862-1306

MN **Minneapolis**
Comstrand, Inc., 612-788-9234

NJ **Hamburg**
ABC Elctrn. Sales Co., 201-827-9716

NY **Fayetteville**
S.F. Foster Co., Inc., 315-637-5427

NY **Pleasantville**
ABC Elctrn. Sales Co., 914-769-8088

NY **Webster**
S.F. Foster Co., Inc., 716-265-2072

NY **Williston Park**
ABC Elctrn. Sales Co., 516-747-6610

OK **Tulsa**
West & Assocs., 918-627-3609

OR **Tualatin**
Crown Elctrns., 503-638-7561

PA **Oreland**
CMS Mktg., Inc., 215-885-5106

TX **Austin**
West & Assocs., 512-441-6973

TX **Dallas**
West & Assocs., 214-661-9400

TX **Houston**
Central Regional Office, 713-974-0534

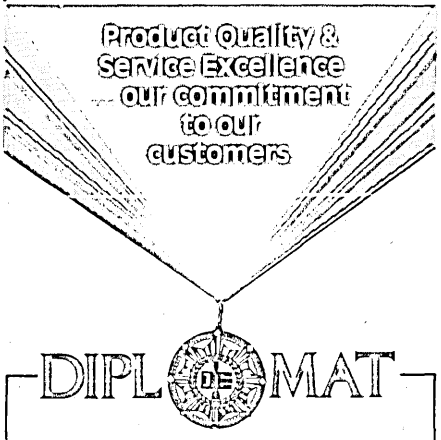
TX **Houston**
West & Assocs., 713-777-4108

© IC MASTER 1983

Hitachi (Cont)

UT Salt Lake City
Parker-Webster Co., 801-487-5911

WI Brookfield
Sumer Inc., 414-784-6641



DIPLOMAT

The first distributor to call for

HITACHI

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

Distributors

AL Huntsville
RM Elctrns., 205-852-1550

AZ Scottsdale
Western Micro Technology, 602-948-4240

AZ Tempe
Marshall Inds., 602-968-6181

CA Canoga Park
Marshall Inds., 213-999-5001

CA Chatsworth
Jaco Elctrns., 213-998-2200

CA Cupertino
Western Micro Technology, 408-725-1660

CA El Monte
Marshall Inds., 213-686-0141

CA Irvine
Marshall Inds., 714-556-6400

CA Mountain View
Time Elctrns., 415-965-8000

CA North Hollywood
Sterling Elctrns., 213-764-4111

CA San Diego
Marshall Inds., 714-278-6350

CA San Diego
Sterling Elctrns., 714-565-2441

CA San Jose
Jaco Elctrns., 408-263-1100

CA Santa Clara
Sterling Elctrns., 408-727-7411

CA Sunnyvale
Marshall Inds., 408-732-1100

CA Torrance
Time Elctrns., 213-320-0880

CO Arvada
Marshall Inds., 303-423-9670

CO Denver
Diplomat Elctrns., Inc., 303-427-5544

CT Orange
Milgray Elctrns., 203-795-0711

CT Wallingford
Marshall Inds., 203-265-7738

FL Fort Lauderdale
Time Elctrns., 305-974-4800

FL Orlando
Marshall Inds., 305-859-1620

FL Winter Park
Milgray Elctrns., 305-647-5747

GA Atlanta
Time Elctrns., 404-351-3545

IL Bensenville
Marshall Inds., 312-595-6622

IL Lombard
RM Elctrns., 312-932-5150

IN Indianapolis
RM Elctrns., 317-247-9701

KS Overland Park
Milgray Elctrns., 913-236-8800

MD Baltimore
Resco/Baltimore, 301-823-0070

MD Beltsville
Resco/Beltsville, 301-937-9100

MD Columbia
Diplomat Elctrns., Inc., 301-995-1226

MA Natick
Future Elctrns., 617-879-0860

MA Newton
Marshall Inds., 617-965-5115

MA Waltham
Sterling Elctrns., 617-894-6200

MA Wilmington
R C Comps., Inc., 617-273-1860

MA Woburn
Time Elctrns., 617-935-8080

MI Grand Rapids
RM Elctrns., 616-531-9300

MN Plymouth
Marshall Inds., 612-559-2211

MO St. Louis
Time Elctrns., 314-391-6444

NJ Perth Amboy
Sterling Elctrns., 201-442-8000

NY Elmsford
Future Elctrns., 914-592-2150

NY Farmingdale
Marshall Inds., 516-293-4141

NY Freeport
Milgray Elctrns., 516-546-5600

NY Hauppauge
Jaco Elctrns., 516-273-5500

NY Hauppauge
Time Elctrns., 516-273-0100

NC Raleigh
Resco/Raleigh, 919-781-5700

OH Cleveland
CAM/RPC, 216-461-4700

OH Cleveland
Milgray Elctrns., 216-881-8800

OH Dayton
Marshall Inds., 513-236-8088

PA Clifton Heights
Time Elctrns., 215-622-2500

PA King of Prussia
Marshall Inds., 215-331-3330

PA Pittsburgh
CAM/RPC, 412-782-3770

TX Addison
Active Comp. Technology, 214-980-1888

TX Dallas
Marshall Inds., 214-233-5200

TX Dallas
RM Elctrns., 214-263-8361

TX Dallas
Sterling Elctrns., 214-243-1600

TX Houston
Marshall Inds., 713-777-0358

TX Houston
Sterling Elctrns., 713-623-6600

UT Salt Lake City
Diplomat Elctrns., 801-486-4134

VA Richmond
Sterling Elctrns., 804-266-2190

WA Tukwila
Marshall Inds., 206-575-3120

WA Tukwila
Sterling Elctrns., 206-575-1910

Can Downsview, Ontario
Future Elctrns., 416-663-5563

Can Montreal, Quebec
Future Elctrns., 514-731-7441

Can Ottawa, Ontario
Future Elctrns., 613-820-8313

Can Vancouver, British Columbia
Future Elctrns., 604-438-5545

Holt

Holt, Inc.
8 Chrysler Street
Irvine, California 92714
714-754-1844
TELEX: 182704

Sales Offices & Representatives

CO Littleton
Tom Milheiser, 303-770-5906

CT Danbury
Kapco Assocs., 203-797-1955

MA Woburn
Wotech Assocs., 617-935-3787

PA Blue Bell
Techparts, 215-628-3200

Hughes

Hughes Aircraft Co.
Solid State Products
500 Superior Avenue
Newport Beach, California 92663
714-759-2942
TWX: 910-596-1374

Sales Offices & Representatives

Intl South India, Trivandrum
Kryonix

Distributors

Intl Hong Kong, Kowloon
Tektron Elctrns., Ltd., TEL: 3-856199

Intl Japan, Tokyo
Nihon Teksel Co., Ltd., TEL: (03) 461-5121

Intl Singapore, Beach Road
Tektron Elec. Ltd., TEL: 3-856199

© IC MASTER 1983

Hybrid Systems

Hybrid Systems Corporation
22 Linnell Circle
Billerica, Massachusetts 01821
617-667-8700
TWX: 710-347-1575
Specific product information:
Henry Diamond, National Sales Manager ..... ext. 60
Art Berg, East Coast Regional Sales Manager ..... ext. 13
Jack Worthen, Northeast Regional Sales Manager .... ext. 17
Charles J. Bevivino, West Coast Regional Sales Manager ext. 18
Literature:
Cheryl Kane ..... ext. 11
Price and delivery:
Patricia G. Bradley ..... ext. 12
All other information:
Janet J. Ray ..... ext 14
Product Marketing:
Director of Marketing, Barry Friedman ..... ext. 54

Sales Offices & Representatives

AL **Huntsville**
Electronic Sales, Inc., 205-533-1735
AZ **Phoenix**
Relcom, 602-893-1209
CA **Los Altos**
Cain White & Co., 415-948-6533
CA **San Marcos**
Relcom, 714-741-9600
CA **Thousand Oaks**
Relcom, 805-529-4363
CA **Walnut**
Relcom, 714-598-9077
CA **Woodland Hills**
Relcom, 213-340-9143
CO **Boulder**
Star Sales, 303-440-4193
CT **Enfield**
MECO, Inc., 1-800-225-3409
FL **Orlando**
Delmac Sales, Inc., 305-898-4688
FL **South Clearwater**
Delmac Sales, Inc., 813-447-5192
FL **Tamarac**
Delmac Sales, Inc., 305-726-1330
GA **Norcross**
Electronic Sales, Inc., 404-448-6554
IL **Arlington Heights**
MJ Petersen & Assoc., Ltd., 312-577-8200
KS **Olathe**
Rush & West Assoc., 913-764-2700
MD **Baltimore**
Burgin Kreh Assocs., Inc., 301-265-8500
MA **Reading**
MECO, Inc., 617-944-6660
MI **Wyoming**
Berberich Assoc., Inc., 616-538-8879
MN **Minneapolis**
Northstar Comps., Inc., 612-553-1888
MO **Ballwin**
Rush & West Assoc., 314-394-7271
NY **Commack**
ERA, Inc., 516-543-0510
NY **Syracuse**
T-Squared Elctrns., 315-463-8592
NY **Victor**
T-Squared Elctrns., 716-924-9101
NC **Raleigh**
Burgin Kreh Assoc., Inc., 919-781-1100
OH **Dayton**
Berberich Assocs., Inc., 513-433-0342
PA **Pittsburgh**
Ron Moser Assoc., 412-931-0266
TX **Austin**
OM Sales Co., Inc., 512-452-1838
TX **Dallas**
OM Sales Co., Inc., 214-241-3876
TX **Houston**
OM Sales Co., Inc., 713-789-4426
VA **Lynchburg**
Burgin Kreh Assoc., Inc., 804-239-2626
WI **Wauwatosa**
Larson Assocs., Inc., 414-258-0529
Can **Concord, Ontario**
Kaytronics, 416-669-2262
Can **Kanata, Ontario**
Kaytronics, 613-592-6606
Can **Surrey, British Columbia**
Kaytronics, 604-581-7611
Can **Ville St. Pierre, Quebec**
Kaytronics, 514-367-0101
Intl **Australia, Rozelle NSW**
AMPEC Engrg. Co., TEL: 6128181166
Intl **Austria, Wien**
Transistor Vetriebsgeseleschaft mbH, TEL: 829451
Intl **Denmark, Copenhagen**
Scansupply, TEL: 835090
Intl **England, Camberley, Surrey**
Hybrid Co. Comp. U.K. Ltd. Camberley, TEL: 0276/28128
Intl **Finland, Helsinki**
Carlo Casagrande Oy, TEL: 640711
Intl **France, Rungis**
Hybrid Sys. S.A.R.L., TEL: 33-1687-8336
Intl **Germany, Darmstadt**
Hybrid Sys. GmbH, TEL: 06151-291595
Intl **Israel, Tel-Aviv**
Vectronics Ltd., TEL: 23 44 24/ 22 84 72
Intl **Italy, Milano**
Tekelec/Airtronic, TEL: 73 80 641
Intl **Japan, Tokyo**
Tokyo Elec. Ltd. Panetron Div.
Intl **Netherlands, Montfoort**
Koning en Hartman, TEL: 210101
Intl **Norway, Oslo**
Elektronix A/S
Intl **Sweden, Bromma**
Ferner Elctrns. AB
Intl **Switzerland, Zurich**
Industrade AG, TEL: 4131 363 2230

Hy Comp

Hy Comp Inc.
75 Union Avenue, Box 377
Sudbury, Massachusetts 01776
617-443-4631
Application engineering:
John J. Madden
Follow-up an order:
Customer Services:
Nancy Oelschlegel
All other information:
James Chacharone, V.P./Marketing Manager

ILC Data Device

ILC Data Device Corp.
105 Wilbur Place
Bohemia, New York 11716
516-567-5600
TWX: 510-228-7324

Sales Offices & Representatives

Intl **Australia, Brookvale**
Allied Capacitors Pty. Ltd., TEL: 77-9-011-61-2-938-2135
Intl **Belgium, Brussells**
Techmation, TEL: 32-2-241.65.73
Intl **Denmark, Copenhagen**
Advanced Elctrn. of Denmark ApS, TEL: 45-1-194433
Intl **England, Berkshire**
DDC United Kingdom, Ltd., TEL: 44-4886-2141
Intl **Finland, Helsinki**
OY Suomen Bofors AB, TEL: 358-0-553-166
Intl **France, Courbevoie**
DDC Electronique, TEL: 33-1-333-5888
Intl **India, Ludhiana**
Inde Assoc., TEL: 34761
Intl **Israel, Ramat Hasharon**
R D T Elctrns., TEL: 972-3-48.32.11
Intl **Italy, Milan**
Microelit Italia s.r.l., TEL: 39-2-469 0444
Intl **Italy, Roma**
Microelit Italia, s.r.l., TEL: 77-9-011-39-6-890892
Intl **Japan, Tokyo**
Minebea Co., Ltd., TEL: 77-9-011-81-3-763-6241
Intl **Norway, Oslo**
Henaco A/S, TEL: 77-9-011-47-2-162110
Intl **Sweden, Tyreso**
Hybridteknik A/B, TEL: 46-8-7126720
Intl **Switzerland, Baden-Daettwil**
W. Stolz AG, TEL: 41-56-840151
Intl **Taiwan, Taipei**
Tai I Trading Co., Ltd., TEL: 86-2-772-6226
Intl **West Germany, Munchen**
Fey Elektronik Bauelemente GmbH, TEL: 49-89-184041
Intl **Yugoslavia, Titova**
Elektrotehna, TEL: 61-32-02-41

Inconix

Inconix Corporation
10 Tech Circle
Natick, Massachusetts 01760
617-655-1170

Inductive Technology

Inductive Technology, Inc.
801 West Bradley
Champaign, Illinois 61820
217-359-6118

Industrial Micro-Systems

Industrial Micro-Systems Inc.
189 Hitchcock Road
Southington, Connecticut 06489
203-628-4844

Inmos

Inmos
P.O. Box 16000
Colorado Springs, Colorado 80935
303-630-4000
TWX: 910-920-4904
Specific product information:
Field Sales Offices
Application engineering:
Applications 303-630-4256
Literature:
Field Sales Offices
Place an order:
Field Sales Offices/Distributors
All other information:
Marketing 303-630-4361

© IC MASTER 1983

Inmos (Cont)

Sales Offices & Representatives

AL **Huntsville**
Macro-Marketing Assoc., 205-883-9630

AZ **Phoenix**
Compass Mktg. & Sales, 602-266-5400

CA **Los Angeles**
Ed Landa Co., 213-879-0770

CA **San Diego**
Hadden Assoc., 714-565-9444

CA **San Jose**
Inmos Sales, 408-298-1786

CA **Santa Clara**
Criterion Sales, 408-988-6300

CO **Denver**
Component Sales, 303-759-1666

CT **Yalesville**
Kanan Assoc., 203-265-2404

FL **Altamonte Springs**
E.I.R., Inc., 305-830-9600

GA **Woodstock**
Macro-Marketing Assoc., 205-883-9630

IL **Schaumburg**
Micro-Tex, 312-885-1131

IN **Indianapolis**
SAI Mktg., 317-241-9276

KS **Shawnee Mission**
B.C. Electronic Sales, 913-888-6680

KS **Wichita**
B.C. Electronic Sales, 316-942-9840

MD **Severna Park**
New Era Sales, 301-544-4100

MA **Burlington**
Inmos Sales, 617-273-5150

MA **Reading**
Kanan Assoc., 617-944-8484

MI **Brighton**
SAI Mktg., 313-227-1786

MN **Edina**
Mel Foster Tech Sales, 612-941-9790

MN **Minneapolis**
Inmos Sales, 612-831-5626

MO **St. Louis**
B.C. Electronic Sales, 314-731-1255

NJ **Teaneck**
R.T. Reid Assoc., 201-692-0200

NM **Albuquerque**
Compass Mktg. & Sales, 505-292-7377

NY **E. Syracuse**
L-Mar Assoc., 315-437-7779

NY **Rochester**
L-Mar Assoc., 716-544-8000

NC **Greensboro**
D.H.R. Mktg., 919-273-2671

NC **Raleigh**
D.H.R. Mktg., 919-876-5450

OH **Centerville**
SAI Mktg., 513-435-3181

OH **Dayton**
Inmos Sales, 513-439-0988

OH **Shaker Heights**
SAI Mktg., 216-751-3633

OH **Zanesville**
SAI Mktg., 614-454-8942

OR **Boring**
Westerberg & Assoc., 503-297-1719

PA **Huntingdon Valley**
Knowles Assoc., 215-947-5641

SC **Greenville**
D.H.R. Mktg., 803-235-3594

TX **Dallas**
Nova Mktg., 214-385-9669

TX **Houston**
Nova Mktg., 713-988-6082

UT **Salt Lake City**
Component Sales, 801-466-8623

WA **Bellevue**
Westerberg & Assoc., 206-453-8881

WI **Waukesha**
Micro-Tex, 414-542-5352

Can **Mississauga, Ontario**
Vitel Elctrns., 416-836-1776

Can **Ottawa, Ontario**
Vitel Elctrns., 613-596-0400

Can **St. Laurent, Quebec**
Vitel Elctrns., 514-331-7393

Intl **Italy, Milan**
Cefra SRL, TEL: 392-235264

Intl **Japan, Tokyo**
Matsushita Electric, TEL: 03-435-4501

Intl **United Kingdom, Bristol**
Inmos Sales, TEL: 44-272-290-861

Intl **West Germany**
Inmos Sales, TEL: 49-8903-191028/29

Distributors

AZ **Tempe**
Anthem Elctrns., 602-244-0900

CA **Chatsworth**
Anthem Elctrns., 213-700-1000

CA **Chatsworth**
Arrow Elctrns., 213-701-7500

CA **Newport Beach**
Arrow Elctrns., 714-851-8961

CA **San Diego**
Anthem Elctrns., 714-453-4871

CA **San Diego**
Arrow Elctrns., 714-565-4800

CA **San Jose**
Anthem Elctrns., 408-946-8000

CA **Sunnyvale**
Arrow Elctrns., 408-745-6600

CA **Tustin**
Anthem Elctrns., 714-730-8000

CO **Denver**
Arrow Elctrns., 303-758-2100

CT **Wallingford**
Arrow Elctrns., 203-265-7741

FL **Ft. Lauderdale**
Arrow Elctrns., 305-776-7790

FL **Palm Bay**
Arrow Elctrns., 305-725-1480

GA **Norcross**
Arrow Elctrns., 404-449-8252

IL **Schaumburg**
Arrow Elctrns., 312-893-9420

IN **Indianapolis**
Arrow Elctrns., 317-243-9353

MD **Baltimore**
Arrow Elctrns., 301-247-5200

MA **Burlington**
Lionex Corp., 617-272-9400

MA **Woburn**
Arrow Elctrns., 617-933-8130

MI **Ann Arbor**
Arrow Elctrns., 313-971-8220

MN **Edina**
Arrow Elctrns., 612-830-1800

MO **St. Louis**
Arrow Elctrns., 314-567-6888

NH **Manchester**
Arrow Elctrns., 603-668-6968

NJ **Fairfield**
Lionex Corp., 201-227-7960

NJ **Moorestown**
Arrow Elctrns., 609-235-1900

NJ **Saddlebrook**
Arrow Elctrns., 201-797-5800

NM **Albuquerque**
Arrow Elctrns., 505-243-4566

NY **Farmingdale**
Arrow Elctrns., 516-694-6800

NY **Hauppauge**
Arrow Elctrns., 516-231-1000

NY **Hauppauge**
Lionex Corp., 516-273-1660

NY **Liverpool**
Arrow Elctrns., 315-652-1000

NY **Rochester**
Arrow Elctrns., 716-275-0300

NC **Winston-Salem**
Arrow Elctrns., 919-725-8711

OH **Centerville**
Arrow Elctrns., 513-435-5563

OH **Solon**
Arrow Elctrns., 216-248-3990

OK **Tulsa**
Quality Comps., 918-664-8812

PA **Monroeville**
Arrow Elctrns., 412-856-7000

TX **Addison**
Quality Comps., 214-387-4949

TX **Austin**
Arrow Elctrns., 512-835-4180

TX **Austin**
Quality Comps., 512-835-0220

TX **Dallas**
Arrow Elctrns., 214-386-7500

TX **Houston**
Quality Comps., 713-772-7100

TX **Stafford**
Arrow Elctrns., 713-491-4100

UT **Salt Lake City**
Arrow Elctrns., 801-539-1135

WA **Bellevue**
Arrow Elctrns., 206-643-4800

WI **Oak Creek**
Arrow Elctrns., 414-764-6600

Can **Baxter Ctr. (Ottawa), Ontario**
Future Elctrns., 613-820-8313

Can **Calgary, Alberta**
Future Elctrns., 403-259-6437

Can **Downfrsn, Ontario**
Future Elctrns., 416-663-5563

Can **Pointe Claire (Montreal), Quebec**
Future Elctrns., 514-694-7710

Can **Vancouver, British Columbia**
Future Elctrns., 604-438-5545

Intl **Belgium, Brussels**
Diode, TEL: 322-4285105

Intl **Denmark, Copenhagen**
Advanced Elctrn., TEL: 451-94433

Intl **Finland, Helsinki**
Field Oy, TEL: 358-0 6922577

Intl **France, Servos**
Tekelec Airtronic, TEL: 331-534-7535

Intl **Israel**
R.D.T. Elctrns. Ltd., TEL: 972-3483211

Intl **Italy, Milan**
Cefra SRL, TEL: 392-235264

Intl **Netherlands, Badhoevedorp**
Techmation Elctrns., TEL: 31-4189-2222

Intl **Norway, Oslo**
Ola Tandberg Elektro, TEL: 472-197030

Intl **Spain, Madrid**
Amitron, TEL: 341-24856863

Intl **Sweden, Stockholm**
Gosta Backstrom, TEL: 468-541080

Intl **Switzerland, Zurich**
Omni Ray, TEL: 411-2520766

Intl **United Kingdom, High Wycombe, Bucks**
Rapid Recall, TEL: 44-494-26271

Intl **United Kingdom, Sunbury on Thames, Middlesex**
Hawke Elctrns., TEL: 44-9327-85577

Intl **West Germany, Munich**
Astronic, TEL: 49-89-304011

Intl **West Germany, Quickborn**
Astek Elctrns., TEL: 49-4106-71084

Intl **West Germany, Stuttgart**
Ditronic, TEL: 49-711-722079

© IC MASTER 1983

Integrated Circuit Engineering

Integrated Circuit Engineering Corporation
15022 North 75th Street
Scottsdale, Arizona 85260
602-998-9780

Sales Offices & Representatives

Intl **Hong Kong, Kowloon**
Tektron Elctrns. Ltd., TEL: (011) (852) (3) 856199

Intl **Japan, Tokyo**
Nihon Teksel Co., Ltd., TEL: (011) (81) (3) 461-5121

Intl **Switzerland, Walchwil**
Nicotec SA, TEL: (011) (41) (42) 771830

Integrated Circuit Systems

Integrated Circuit Systems, Inc.
1012 West Ninth Avenue
King of Prussia, Pennsylvania 19406
215-265-8690

Integrated Computer Systems

Integrated Computer Systems
3304 Pico Boulevard, P.O. Box 5339
Santa Monica, California 90405
213-450-2060
TWX: 910-343-6965

Sales Offices & Representatives

Intl **England, Surrey**
ICS-UK, TEL: Leatherhead (0372) 379211

Intl **France, Rueil-Malmaison**
ICS-France, TEL: (01) 749 40 37

Intl **Sweden, Lund**
ICSP/Utbildningshuset AB, TEL: (0406) 30 70 70

Integrated Device Technology

Integrated Device Technology, Inc.
3236 Scott Boulevard
Santa Clara, California 95051
408-727-6116
TWX: 910-338-2070

Sales Offices & Representatives

AL **Huntsville**
Montgomery Marketing, 205-830-0498

AZ **Tempe**
Argus Sales Inc., 602-968-7791

CA **San Diego**
Adem Assocs., 619-695-2050

CA **Cupertino**
Thresum Assocs., Inc., 408-996-9889

CA **La Mirada**
Select Electronics, 714-739-8891

CA **Santa Clara**
IDT Sales Office—Western Area, 408-727-6116

CO **Englewood**
Elcom, 303-770-4400

FL **Boca Raton**
Lawrence Assocs., Inc., 305-368-7373

FL **Clearwater**
Lawrence Assocs., Inc., 813-584-8110

FL **West Melbourne**
Lawrence Assocs., Inc., 305-724-8294

GA **Norcross**
Montgomery Marketing, 404-447-6124

IL **Elmhurst**
Circuit Sales, Inc., 312-833-2242

MD **Baltimore**
Microcomp, 301-247-0400

MA **Lexington**
Nova Sales, 617-861-1820

MA **North Andover**
IDT Sales Office—Eastern Area, 617-689-9299

MI **Bloomfield Hills**
Enco Marketing, 313-642-0203

MN **Minneapolis**
Comprehensive Tech. Sales, 612-888-7011

NJ **Mt. Laurel**
Comtek Inc., 609-235-8505

NY **Buffalo**
Quality Components, 716-837-5430

NY **Jamaica**
SJ Associates, 212-291-3232

NY **Manlius**
Quality Components, 315-682-8885

NC **Carey**
Montgomery Marketing, 919-467-6319

OH **Cleveland**
Norm Case Assocs., 216-333-0400

TX **Austin**
IDT Sales Office—Central Area, 512-327-8441

TX **Austin**
OM Sales, 512-452-1838

TX **Dallas**
OM Sales, 214-241-3876

TX **Houston**
OM Sales, 713-789-4426

UT **Salt Lake City**
Elcom, 801-532-7940

Can **Montreal, Quebec**
Bytewide Marketing Inc., 514-481-1167

Intl **Denmark, Kokkedal**
C-88, TEL: 02-24-48-88

Intl **England, Thame Oxon**
Thame Components, Ltd., TEL: 084-421

Intl **Finland, Helsinki**
Turion OY, TEL: 90-372-144

Intl **France, Levallois Perret**
REA, TEL: 75-81-111

Intl **Germany, Munchen**
Scantec GmbH, TEL: 089-13-40-93

Intl **Israel, Tel Aviv**
Vectronics, Ltd., TEL: 23-44-24;22-84-72

Intl **Italy, Milano**
Cefra s.r.l., TEL: 02-23-52-64

Intl **Netherlands, Eindhoven**
Auriema, TEL: 040-816565

Intl **Norway, Oslo**
Eltron A/S, TEL: 02-46-28-70

Intl **Sweden, Vallingby**
Svensk Teleindustri, TEL: 08-38-03-20

Intl **Switzerland, Zug**
Anatec, TEL: 042-31-54-77

Distributors

AZ **Tempe**
Anthem, 602-244-0900

CA **Chatsworth**
Anthem, 213-700-1000

CA **San Diego**
Anthem, 714-279-5200

CA **San Jose**
Anthem, 408-946-8000

CA **Tustin**
Anthem, 714-730-8000

CO **Denver**
ACT, 303-422-9229

OH **Highland Heights**
Component Electronics, 216-473-5230

TX **Addison**
ACT, 214-980-1888

TX **Austin**
ACT, 512-452-5254

Integrated Photomatrix

Integrated Photomatrix, Inc.
1101 Bristol Road
Mountainside, New Jersey 07092
201-233-7200
TELEX: 138275

Integrated Technology

Integrated Technology Corporation
1445 West Alemeda, Unit 44
Tempe,, Arizona 85282
602-968-3459

Intel

Intel Corporation
3065 Bowers Avenue
Santa Clara, California 95051
408-987-8080
TELEX: 34-6372
TWX: 910-338-0026

Sales Offices & Representatives

AL **Huntsville**
Intel Corp., 205-533-9353

AZ **Phoenix**
Intel Corp., 602-869-4980

CA **Sacramento**
Intel Corp., 916-929-4078

CA **San Diego**
Earle Assocs., Inc., 714-278-5441

CA **San Diego**
Intel Corp., 714-268-3563

CA **Santa Ana**
Intel Corp., 714-835-9642

CA **Santa Clara**
Intel Corp., 408-987-8086

CA **Tarzana**
Intel Corp., 213-708-0333

CO **Colorado Springs**
Intel Corp.

CO **Denver**
Intel Corp., 303-321-8086

CT **Danbury**
Intel Corp., 203-792-8366

CT **Manchester**
EMC Corp., 203-646-8085

CT **Wallingford**
EMC Corp., 203-265-6991

FL **Ft. Lauderdale**
Intel Corp., 305-771-0600

FL **Maitland**
Intel Corp., 305-628-2393

GA **Norcross**
Intel Corp., 404-449-0541

IL **Rolling Meadows**
Intel Corp., 312-981-7200

IN **Indianapolis**
Intel Corp., 317-875-0623

IA **Cedar Rapids**
Intel Corp., 319-393-5510

KS **Overland Park**
Intel Corp., 913-642-8080

MD **Hanover**
Intel Corp., 301-796-7500

© IC MASTER 1983

Intel (Cont)

MD **Silver Spring**
Intel Corp., 301-431-1200

MA **Chelmsford**
Intel Corp., 617-256-1800

MA **Newton**
EMC Corp., 617-244-4740

MI **Southfield**
Intel Corp., 313-353-0920

MN **Bloomington**
Intel Corp., 612-835-6722

MO **Earth City**
Intel Corp., 314-291-1990

NJ **Edison**
Intel Corp., 201-225-3000

NM **Albuquerque**
BFA Corp., 505-292-1212

NM **Las Cruces**
BFA Corp., 505-523-0601

NY **Hauppauge**
Intel Corp., 516-231-3300

NY **Poughkeepsie**
Intel Corp., 914-473-2303

NY **Rochester**
Intel Corp., 716-424-1050

NY **Syracuse**
T-Squared, 315-463-8592

NY **Victor**
T-Squared, 716-924-9101

NC **Greensboro**
Intel Corp., 919-294-1541

OH **Cleveland**
Intel Corp., 216-464-2736

OH **Dayton**
Intel Corp., 513-890-5350

OK **Tulsa**
Intel Corp., 918-749-8688

OR **Beaverton**
Intel Corp., 503-641-8086

PA **Fort Washington**
Intel Corp., 215-641-1000

PA **Hatboro**
Q.E.D. Elctrns., 215-674-9600

PA **Pittsburgh**
Intel Corp., 412-823-4970

TX **Austin**
Intel Corp., 512-454-3628

TX **Dallas**
Intel Corp., 214-241-8087

TX **Houston**
Indl. Digital Sys. Corp., 713-988-9421

TX **Houston**
Intel Corp., 713-784-3400

UT **Salt Lake City**
Intel Corp., 801-533-8086

VA **Richmond**
Intel Corp., 804-282-5668

WA **Bellevue**
Intel Corp., 206-453-8086

WI **Brookfield**
Intel Corp., 414-784-9060

Can **Ottawa, Ontario**
Intel Corp., 613-829-9714

Can **Roxdale, Ontario**
Intel Corp., 416-675-2105

Intl **Argentina, Buenos Aires**
VLC S.R.L., TEL: 85-1201/9242

Intl **Australia, Burwood, Victoria**
A.J.F. Sys. & Comps. Pty. Ltd., TEL: 61 3 288-4044

Intl **Australia, Crows Nest, NSW**
Intel Semiconductor Pty. Ltd., TEL: 011-61-2-436-2-2744

Intl **Australia, Lane Cove, N.S.E.**
A.J.F. Sys. & Comps. Pty. Ltd.

Intl **Austria, Vienna**
Bacher Elektronische Geraete GmbH, TEL: (222) 83 56 46

Intl **Belgium, Brussels**
Inelco Belgium S.A., TEL: (02) 216 01 60

Intl **Belgium, Brussels**
Intel Corp. S.A., TEL: (02) 661 07 11

Intl **Brazil, Pirituba Sao Paulo**
Icotron S.A., TEL: 261-0211

Intl **Chile, Santiago**
DIN, TEL: 227 564

Intl **China, Hong Kong**
Schmidt & Co. Ltd., TEL: 011-852-5-455-644

Intl **Colombia, Bogota**
Intl. Computer Machines, TEL: 211-7282

Intl **Cyprus, Nicosia**
Cyprus Eltrom Elctrns., TEL: 21-27982

Intl **Denmark, Copenhagen East**
Intel Denmark A/S, TEL: (01) 18 20 00

Intl **Denmark, Copenhagen**
Scandinavian Semiconductor Supply A/S, TEL: (01) 83 50 90

Intl **Denmark, Gloskrup**
MultiKomponent A/S, TEL: (02) 45 66 45

Intl **Finland, Helsinki**
Oy Fintronic AB, TEL: (0) 692 60 22

Intl **Finland, Helsinki**
Intel Finland OY, TEL: 0/716 955

Intl **France, Asnieres**
Metrologie, TEL: (1) 791 44 44

Intl **France, Bagnolet**
Jermyn S.A., TEL: (1) 859 04 04

Intl **France, Gentilly**
Celdis S.A., TEL: (01) 546 13 13

Intl **France, Rungis Cedex**
Intel Corp., S.A.R.L., TEL: (01) 687 22 21

Intl **France, Sevres**
Tekelec Airtonic, TEL: (01) 534 75 35

Intl **Germany, Camberg**
Jermyn GmbH, TEL: (06434) 231

Intl **Germany, Dusseldorf**
Intel Semiconductor GmbH, TEL: (211) 65 10 54

Intl **Germany, Feilbach**
Intel Semiconductor GmbH, TEL: (711) 58 00 82

Intl **Germany, Hannover**
Intel Semiconductor GmbH, TEL: (511) 32 70 81

Intl **Germany, Muenchen**
Intel Semiconductor GmbH, TEL: (89) 53891

Intl **Germany, Munich**
Electronic 2000 Vertriebs GmbH, TEL: (89) 43 40 61

Intl **Germany, Quickborn-Hamburg**
Neye Enatechnik GmbH, TEL: (4106) 6121

Intl **Germany, Wiesbaden**
Intel Semiconductor GmbH, TEL: (6121) 70 08 74

Intl **Greece, Athens**
American Tech. Entprs., TEL: 30-1-8811271

Intl **Hong Kong, Hong Kong**
Intel Semiconductor Corp., TEL: 011-852-5-450-847

Intl **Hong Kong, Hong Kong**
Schmidt & Co. Ltd., TEL: 5-455-644

Intl **India, Bombay**
Micronic Devices, TEL: 486-170

Intl **Israel, Haifa**
Intel Semiconductor Ltd., TEL: 4/524 261

Intl **Israel, Tel Aviv**
Eastronics Ltd., TEL: (3) 47 51 51

Intl **Italy, Assago (Milano)**
Intel Corp. Italia Spa, TEL: (02) 824 00 06

Intl **Italy, Milano**
Eledra 3S S.P.A., TEL: (2) 34 97 51

Intl **Japan, Ibaraki-Ken**
Intel Japan K.K., TEL: 029747-8511

Intl **Japan, Kitakyushu City**
Asahi Elctrns. Co. Ltd., TEL: (093) 511-6471

Intl **Japan, Tokyo**
Hamilton-Avnet Elctrns. Japan Ltd., TEL: (03) 662-9911

Intl **Japan, Tokyo**
Ryoyo Elec. Corp., TEL: (03) 543-7711

Intl **Japan, Tokyo**
Tokyo Electron Ltd., TEL: (03) 343-4411

Intl **Korea, Seoul**
Koram Digital, TEL: 2-753-8123

Intl **Netherlands, Aalsmeer**
Inelco Nether. Comp. Sys. BV, TEL: (2977) 28855

Intl **Netherlands, Gravenhage**
Koning & Hartman, TEL: 31 (70) 210.101

Intl **Netherlands, Rotterdam**
Intel Semiconductor Nederland B.V., TEL: (10) 149122

Intl **New Zealand, Auckland**
McLean Information Technlg. Ltd., TEL: 501-801, 501-219, 587-037

Intl **Norway, Hvalstad**
Nordisk Elektronic (Norge) A/S, TEL: (2) 786 210

Intl **Norway, Skjetten**
Intel Norway A/S, TEL: (2) 742 420

Intl **Portugal, Lisboa**
Ditram, TEL: (19) 545 313

Intl **Singapore, Singapore**
General Engrs. Corp. Pty. Ltd., TEL: 271-3167

Intl **South Africa, Pretoria**
Elctrn. Bldg. Elements, Pty. Ltd., TEL: 011-27-12-46-9221

Intl **Spain, Barcelona**
Interface S.A., TEL: (3) 301 78 51

Intl **Spain, Madrid**
ITT SESA, TEL: (1) 419 54 00

Intl **Sweden, Bromma**
Intel Sweden A.B., TEL: (08) 98 53 85

Intl **Sweden, Stockholm**
AB Gosta Backstrom, TEL: (8) 541 080

Intl **Sweden, Stockholm**
Nordisk Electronik AB, TEL: (8) 635 040

Intl **Switzerland, Zurich**
Industrade AG, TEL: (1) 363 22 30

Intl **Switzerland, Zurich**
Intel Semiconductor A.G., TEL: (01) 55 45 02

Intl **Taiwan, Taipei**
Taiwan Automation Co., TEL: 771-0940

Intl **Turkey, Ankara**
Turkelek Elctrns., TEL: 189483

Intl **United Kingdom, Berkshire**
Bytech Ltd., TEL: (0734) 61031

Intl **United Kingdom, Berkshire**
Comway Microsystems Ltd., TEL: 44 (344) 55333

Intl **United Kingdom, Berkshire**
DECADE Ltd., TEL: (0734) 413127

Intl **United Kingdom, Bucks**
Rapid Recall, Ltd., TEL: (0494) 26 271

Intl **United Kingdom, Cheshire**
Intel Corp. (U.K.) Ltd., TEL: (0270) 626 560

Intl **United Kingdom, Kent**
Jermyn Inds. (Mogul), TEL: (0732) 450144

Intl **United Kingdom, Middlesex**
M.E.D.L., TEL: (01) 9049307

Intl **United Kingdom, Nantwich**
Rapid Recall, TEL: (0270) 627505

Intl **United Kingdom, Wiltshire**
Intel Corp. (U.K.) Ltd., TEL: (0793) 488.388

Distributors

AL **Huntsville**
Arrow Elctrns., 205-830-1103

AL **Huntsville**
Hamilton/Avnet Elctrns., 205-837-7210

AL **Huntsville**
Pioneer/Huntsville, 205-837-9300

AZ **Phoenix**
Wyle Distribution Grp., 602-249-2232

AZ **Tempe**
Hamilton/Avnet Elctrns., 602-231-5140

CA **Chatsworth**
Arrow Elctrns., Inc., 213-701-7500

CA **Costa Mesa**
Avnet Elctrns., 714-754-6051

CA **Costa Mesa**
Hamilton Electro Sales, 714-641-4109

© IC MASTER 1983

Intel (Cont)

CA **Culver City**
Hamilton/Avnet Elctrns., 213-558-2193
CA **El Segundo**
Wyle Distribution Grp., 213-322-8100
CA **Irvine**
Wyle Distribution Grp., 714-641-1600
CA **Sacramento**
Hamilton/Avnet Elctrns., 916-920-3150
CA **San Diego**
Hamilton/Avnet Elctrns., 714-563-1969
CA **San Diego**
Wyle Distribution Grp., 714-565-9171
CA **Santa Clara**
Wyle Distribution Grp., 408-727-2500
CA **Sunnyvale**
Arrow Elctrns., Inc., 408-745-6600
CA **Sunnyvale**
Hamilton/Avnet Elctrns., 408-571-7526
CA **Torrance**
Hamilton/Avnet Elctrns., 213-558-2987
CO **Englewood**
Hamilton/Avnet Elctrns., 303-740-1017
CO **Thornton**
Wyle Distribution Grp., 303-457-9953
CT **Danbury**
Hamilton/Avnet Elctrns., 203-797-2800
CT **Norwalk**
Harvey Elctrns., 203-853-1515
CT **Wallingford**
Arrow Elctrns., 203-265-7741
FL **Ft. Lauderdale**
Arrow Elctrns., 305-776-7790
FL **Ft. Lauderdale**
Hamilton/Avnet Elctrns., 305-971-2900
FL **Ft. Lauderdale**
Pioneer/Ft. Lauderdale, 305-771-7520
FL **Orlando**
Pioneer/Orlando, 305-859-3600
FL **Palm Bay**
Arrow Elctrns., 305-725-1480
FL **St. Petersburg**
Hamilton/Avnet Elctrns., 813-576-3930
GA **Norcross**
Arrow Elctrns., 404-449-8252
GA **Norcross**
Hamilton/Avnet Elctrns., 404-447-7500
GA **Norcross**
Pioneer/Georgia, 404-448-1711
IL **Bensenville**
Hamilton/Avnet Elctrns., 312-860-7780
IL **Elk Grove Village**
Pioneer/Chicago, 312-437-9680
IL **Schaumburg**
Arrow Elctrns., 312-893-9420
IN **Carmel**
Hamilton/Avnet Elctrns., 317-844-9333
IN **Indianapolis**
Arrow Elctrns., 317-243-9353
IN **Indianapolis**
Pioneer/Indiana, 317-849-7300
KS **Overland Park**
Hamilton/Avnet Elctrns., 913-888-8900
MD **Columbia**
Hamilton/Avnet Elctrns., 301-995-3500
MD **Gaithersburg**
Mesa, 301-948-4350
MD **Gaithersburg**
Pioneer, 301-948-0710
MA **Lexington**
Harvey/Boston, 617-863-1200
MA **Woburn**
Arrow Elctrns., 617-933-8130
MA **Woburn**
Hamilton/Avnet Elctrns., 617-935-9700
MI **Ann Arbor**
Arrow Elctrns., 313-971-8220
MI **Grand Rapids**
Hamilton/Avnet Elctrns., 616-243-8805
MI **Livonia**
Hamilton/Avnet Elctrns., 313-522-4700
MI **Livonia**
Pioneer/Michigan, 313-525-1800
MN **Edina**
Arrow Elctrns., 612-830-1800
MN **Minnetonka**
Hamilton/Avnet Elctrns., 612-932-0666
MN **Minnetonka**
Pioneer/Twin Cities, 612-935-5444
MO **Earth City**
Hamilton/Avnet Elctrns., 314-344-1200
MO **St. Louis**
Arrow Elctrns., 314-567-6888
NH **Manchester**
Arrow Elctrns., 603-668-6968
NJ **Cherry Hill**
Hamilton/Avnet Elctrns., 609-424-0100
NJ **Fairfield**
Hamilton/Avnet Elctrns., 201-575-3390
NJ **Fairfield**
Meas. Technlg. Sales Corp., 201-227-5552
NJ **Mocrestown**
Arrow Elctrns., 215-928-1800
NJ **Pinebrook**
Harvey Elctrns., 201-227-1262
NJ **Saddle Brook**
Arrow Elctrns., 201-797-5800
NM **Albuquerque**
Alliance Elctrns. Inc., 505-292-3360
NM **Albuquerque**
Hamilton/Avnet Elctrns., 505-765-1500
NY **Binghamton**
Harvey Elctrns., 607-748-8211
NY **E. Syracuse**
Hamilton/Avnet Elctrns., 315-437-2641
NY **Fairport**
Harvey/Rochester, 716-381-7070
NY **Farmingdale**
Arrow Elctrns., 516-694-6800
NY **Hauppage**
Arrow Elctrns., 516-231-1000
NY **Liverpool**
Arrow Elctrns., 315-652-1000
NY **Melville**
Hamilton/Avnet Elctrns., 516-454-6000
NY **Port Washington**
Meas. Technlg. Sales Corp., 516-449-5959
NY **Rochester**
Arrow Elctrns., 716-275-0300
NY **Rochester**
Hamilton/Avnet Elctrns., 716-475-9130
NY **Woodbury**
Harvey Elctrns., 516-921-8920
NC **Greensboro**
Pioneer/Carolina, 919-273-4441
NC **Raleigh**
Arrow Elctrns., 919-876-3132
NC **Raleigh**
Hamilton/Avnet Elctrns., 919-829-8030
NC **Winston-Salem**
Arrow Elctrns., 919-725-8711
OH **Centerville**
Arrow Elctrns., 513-435-5563
OH **Cleveland**
Pioneer/Cleveland, 216-587-3600
OH **Dayton**
Hamilton/Avnet Elctrns., 513-433-0610
OH **Dayton**
Pioneer/Dayton, 513-236-9900
OH **Solon**
Arrow Elctrns., 216-248-3990
OH **Warrensville Heights**
Hamilton/Avnet Elctrns., 216-831-3500
OK **Tulsa**
Comps. Specialties, Inc., 918-664-2820
OR **Beaverton**
Almac/Stroum Elctrns., 503-641-9070
OR **Lake Oswego**
Hamilton/Avnet Elctrns., 503-635-7848
PA **Horsham**
Pioneer/Delaware Valley, 215-674-4000
PA **Monroeville**
Arrow Elctrns., 412-856-7000
PA **Pittsburgh**
Pioneer/Pittsburgh, 412-782-2300
TX **Austin**
Comp. Specialties, Inc., 512-837-8922
TX **Austin**
Hamilton/Avnet Elctrns., 512-837-8911
TX **Austin**
Pioneer/Austin, 512-835-4000
TX **Dallas**
Arrow Elctrns., 214-386-7500
TX **Dallas**
Comp. Specialties, Inc., 214-357-6511
TX **Dallas**
Pioneer/Dallas, 214-386-7300
TX **Houston**
Comp. Specialties, Inc., 713-771-7237
TX **Houston**
Hamilton/Avnet Elctrns., 713-780-1771
TX **Houston**
Pioneer/Houston, 713-988-5555
TX **Irving**
Hamilton/Avnet Elctrns., 214-659-4100
TX **Stafford**
Arrow Elctrns., 713-491-4100
UT **Salt Lake City**
Arrow Elctrns., 801-539-1135
UT **Salt Lake City**
Hamilton/Avnet Elctrns., 801-972-2800
WA **Bellevue**
Almac/Stroum Elctrns., 206-643-9992
WA **Bellevue**
Hamilton/Avnet Elctrns., 206-453-5844
WA **Bellevue**
Wyle Distribution Grp., 206-453-8300
WI **New Berlin**
Hamilton/Avnet Elctrns., 414-784-4510
WI **Oakcreek**
Arrow Elctrns., 414-764-6600
Can **Brampton, Ontario**
Zentronics, 416-451-9600
Can **Calgary, Alberta**
Hamilton/Avnet, 403-230-3686
Can **Calgary, Alberta**
L.A. Varah, 403-230-1235
Can **Calgary, Alberta**
Zentronics, 403-272-1021
Can **Entean, Ontario**
Hamilton/Avnet, 613-226-1700
Can **Hamilton, Ontario**
L.A. Varah, 416-561-9311
Can **Mississauga, Ontario**
Hamilton/Avnet, 416-677-7432
Can **Ottawa, Ontario**
Zentronics, 613-238-6411
Can **St. Laurent, Quebec**
Hamilton/Avnet, 514-331-6443
Can **St. Laurent, Quebec**
Zentronics, 514-735-5361
Can **Vancouver, British Columbia**
L.A. Varah, 604-873-3211
Can **Vancouver, British Columbia**
Zentronics, 604-688-2533
Can **Waterloo, Ontario**
Zentronics, 519-884-5700
Can **Winnipeg, Manitoba**
L.A. Varah, 204-633-6190
Can **Winnipeg, Manitoba**
Zentronics, 204-775-8661
Intl **Argentina, Buenos Aires**
VLC S.R.L., TEL: 85-1201/9242
Intl **Australia, Burwood, Victoria**
A.J.F. Sys. & Comps. Pty. Ltd., TEL: 61 3 288-4044
Intl **Australia, Lane Cove, N.S.E.**
A.J.F. Sys. & Comps. Pty. Ltd.
Intl **Austria, Vienna**
Bacher Elektronische Geraete GmbH, TEL: (222) 83 56 46
Intl **Belgium, Brussels**
Ineico Belgium S.A., TEL: (02) 216 01 60

© IC MASTER 1983

Intel (Cont)

Intl **Brazil, Pirituba Sao Paulo**
Icotron S.A., TEL: 261-0211

Intl **Chile, Santiago**
Din, TEL: 227 564

Intl **China, Hong Kong**
Schmidt & Co. Ltd., TEL: 011-852-5-455-644

Intl **Colombia, Bogota**
Intl. Computer Machines, TEL: 211-7282

Intl **Cyprus, Nicosia**
Cyprus Eltrom Elctrns., TEL: 21-27982

Intl **Denmark, Copenhagen**
Scandinavian Semiconductor Supply A/S, TEL: (01) 83 50 90

Intl **Denmark, Glostrup**
MultiKomponent A/S, TEL: (02) 45 66 45

Intl **Finland, Helsinki**
Oy Fintronic AB, TEL: (0) 692 60 22

Intl **France, Asnieres**
Metrologie, TEL: (1) 791 44 44

Intl **France, Bagnolet**
Jermyn S.A., TEL: (1) 859 04 04

Intl **France, Gentilly**
Celdis S.A., TEL: (01) 546 13 13

Intl **France, Sevres**
Tekelec Airtronic, TEL: (01) 534 75 35

Intl **Germany, Camberg**
Jermyn GmbH, TEL: (06434) 231

Intl **Germany, Munich**
Electronic 2000 Vertriebs GmbH, TEL: (89) 43 40 61

Intl **Germany, Quickborn-Hamburg**
Neye Enatechnik GmbH, TEL: (4106) 6121

Intl **Greece, Athens**
American Tech. Entprs., TEL: 30-1-8811271

Intl **Hong Kong, Hong Kong**
Schmidt & Co. Ltd., TEL: 5-455-644

Intl **India, Bombay**
Micronic Devices, TEL: 486-170

Intl **Israel, Tel Aviv**
Eastronics Ltd., TEL: (3) 47 51 51

Intl **Italy, Milano**
Eledra 3S S.P.A., TEL: (2) 34 97 51

Intl **Japan, Kitakyushu City**
Asahi Elctrns. Co. Ltd, TEL: (093) 511-6471

Intl **Japan, Tokyo**
Hamilton-Avnet Elctrns. Japan Ltd., TEL: (03) 662-9911

Intl **Japan, Tokyo**
Ryoyo Elec. Corp., TEL: (03) 543-7711

Intl **Japan, Tokyo**
Tokyo Electron Ltd., TEL: (03) 343-4411

Intl **Korea, Chung-Ku Seoul**
Koram Digital, TEL: 2-753-8123

Intl **Netherlands, Aalsmeer**
Inelco Nether. Comp. Sys. BV, TEL: (2977) 28855

Intl **Netherlands, Gravenhage**
Koning & Hartman, TEL: 31 (70) 210.101

Intl **New Zealand, Auckland**
McLean Information Technlg. Ltd., TEL: 501-801, 501-219, 587-037

Intl **Norway, Hvalstad**
Nordisk Elektronic (Norge) A/S, TEL: (2) 786 210

Intl **Portugal, Lisboa**
Ditram, TEL: (19) 545 313

Intl **Singapore, Singapore**
General Engrs. Corp. Pty. Ltd., TEL: 271-3167

Intl **South Africa, Pretoria**
Elctrn. Bldg. Elements, Pty. Ltd., TEL: 011-27-12-46-9221

Intl **Spain, Barcelona**
Interface S.A., TEL: (3) 301 78 51

Intl **Spain, Madrid**
ITT SESA, TEL: (1) 419 54 00

Intl **Sweden, Stockholm**
AB Gosta Backstrom, TEL: (8) 541 080

Intl **Sweden, Stockholm**
Nordisk Electronik AB, TEL: (8) 635 040

Intl **Switzerland, Zurich**
Industrade AG, TEL: (1) 363 22 30

Intl **Taiwan, Taipei**
Taiwan Automation Co., TEL: 771-0940

Intl **Turkey, Ankara**
Turkelek Elctrns., TEL: 189483

Intl **United Kingdom, Berkshire**
Bytech Ltd., TEL: (0734) 61031

Intl **United Kingdom, Berkshire**
Comway Microsystems Ltd., TEL: 44 (344) 55333

Intl **United Kingdom, Berkshire**
DECADE Ltd., TEL: (0734) 413127

Intl **United Kingdom, Bucks**
Rapid Recall, Ltd., TEL: (0494) 26 271

Intl **United Kingdom, Kent**
Jermyn Inds. (Mogul), TEL: (0732) 450144

Intl **United Kingdom, Middlesex**
M.E.D.L., TEL: (01) 9049307

Intl **United Kingdom, Nantwich**
Rapid Recall, TEL: (0270) 627505

Interdesign

Interdesign
Ferranti Electronics, Ltd. Subsidiary
1500 Green Hills Road
Scotts Valley, California 95066
408-438-2900
TWX: 910-598-4513

Sales Offices & Representatives

Intl **France, Sevres**
ATAC Diffusion, TEL: 507-11-11

Intl **Israel, Ramat Gan**
Electis Engrg. Co. Ltd., TEL: 011-972-3-724014

Intl **Japan, Shinjuku-ku-Tokyo**
Microtek, Inc., TEL: 03-363-2317

Intl **Sweden, Solna**
Sattco AB, TEL: 8/734 00 40

Intl **United Kingdom, Oldham**
Ferranti Elctrns. Ltd., TEL: 061-624-0515

Intl **West Germany, Munich**
Ferranti GmbH, TEL: (089) 293871

International Cybernetics

International Cybernetics Corporation
1347 East Bay Drive
Largo, Florida 33541
813-585-6333

International Microcircuits

International Microcircuits, Inc.
3350 Scott Boulevard Bldg. 37
Santa Clara, California 95051
408-727-2280
TWX: 910-338-2032

International Microelectronic Products

International Microelectronic Products
2830 North First Street
San Jose, California 95134
408-262-9100
TWX: 910-338-2274

Specific product information:
Gary Hess

Application engineering:
Gary Hess

Literature:
Adina Deplitch

Price and delivery:
Henri De Roule

Place an order:
Adina Deplitch

Follow-up an order:
Adina Deplitch

All other information:
Shel Schumaker

Sales Offices & Representatives

AL **Huntsville**
20th Century Marketing, Inc., 205-533-9281

AZ **Scottsdale**
Summit Sales, 602-998-4850

CA **Los Alamitos**
Santana Sales, Inc., 213-431-3533, 714-827-9100

CA **San Jose**
I.M.P., 408-262-9100

CA **San Diego**
Littlefield & Smith Assoc., 714-455-0055

CO **Aurora**
Electrodyne, 303-695-8903

FL **Fort Lauderdale**
Donato & Assoc., Inc., 305-733-3450

FL **Palm Harbor**
Donato & Assoc., Inc., 813-785-3327

GA **Norcross**
Montgomery Marketing, Inc., 404-447-6124

GA **Stone Mountain**
20th Century Marketing, Inc., 404-292-7988

IL **Schaumburg**
Gassner & Clark, 312-882-8608

IN **Carmel**
Rich Electronic Marketing, Inc., 317-844-8462

IN **Fort Wayne**
Rich Electronic Marketing, Inc., 219-432-5553

KY **Louisville**
Rich Electronic Marketing, Inc., 502-499-7808

MI **Warren**
DEM Electronic Sales, 313-575-9444

MN **Minneapolis**
S & R Component Sales, 612-559-3090

NC **Cary**
Montgomery Marketing, Inc., 919-467-6319

OH **Dayton**
The Lyons Corp., 513-278-0714

OH **Richfield**
The Lyons Corp., 216-659-9224

TN **Knoxville**
20th Century Marketing, Inc., 615-966-3608

TX **Austin**
Sundance Sales, Inc., 512-250-0320

TX **Houston**
Sundance Sales, Inc., 713-668-8923

TX **Richardson**
Sundance Sales, Inc., 214-699-0451

UT **Salt Lake City**
Electrodyne, 801-486-3801

WA **Redmond**
Quadra Sales Corp., 206-883-3550

Intl **Belgium, Ougree**
MCA-Tronix, TEL: (41) 36 27 80

Intl **France, Buc**
ERN, TEL: 956.00.11

Intl **Israel, Tel-Aviv**
STG International Ltd., TEL: 248231

Intl **Italy, Milan**
Cefra S.R.L., TEL: 23 60 154

Intl **Japan, Nagano-ken**
Internix, Inc., TEL: (0268) 25-1616

Intl **Japan, Osaka**
Internix, Inc., TEL: (06) 364-5971

Intl **Japan, Tokyo**
Internix, Inc., TEL: 03-369-1101

© IC MASTER 1983

International Microelectronic Products

Intl **Korea, Seoul**
Duksung Trading Co., TEL: 854-5047, 854-5831

Intl **Netherlands, Zoetermeer**
Tekelec Airtronic B.V., TEL: 079-310100

Intl **Spain, Barcelona**
Interface, TEL: (3) 301 78 51

Intl **Spain, Bilbao**
Interface S.A., TEL: (4) 415 08 93

Intl **Spain, Madrid**
Interface S.A., TEL: (1) 456 31 51

Intl **Sweden, Vallingby**
Svensk Teleindustri AB, TEL: 8-380320

Intl **Switzerland, Zurich-Schlieren**
Datacomp AG, TEL: 1-730 21 65

Intl **United Kingdom, Birmingham**
Steatite Microelectronics, TEL: 021 454 6961

Intl **West Germany, Muenchen**
Scantec GmbH, TEL: 89 134093

International Microsystems

International Microsystems, Inc.
11554 C Avenue
Auburn, California 95603
916-885-7262

Intersil

Intersil, Inc.
10710 N. Tantau Avenue
Cupertino, California 95014
408-996-5000
TWX: 910-338-0533

Specific product information:
Memory 408-996-5679
Analog
Analog Switches/Multiplexers 408-996-5264
Linear 408-996-5513
Timers, Counters 408-996-5251
Watch, Clock 408-996-5484
Data Acquisition Products 408-996-5152
Discretes:
FETs Bipolar 408-996-5136
FETs, Power 408-996-5501

Application engineering:
408-996-5615

Literature:
Marketing Service Department 408-996-5403

Price and delivery:
Customer Service Department 408-996-5411

Place an order:
Customer Service Department 408-996-5411

Follow-up an order:
Customer Service Department 408-996-5411

All other information:
Marketing Services Department 408-996-5403

Sales Offices & Representatives

Intl **England, Hampshire**
Intersil Elctrns., Ltd., TEL: 0256-57361

Intl **France, St. Cloud-Cedex**
Intersil Inc., TEL: (1) 602.58.98

Intl **Hong Kong**
Intersil Datel, TEL: 3-7214286-7

Intl **West Germany, M((;u))nchen**
Intersil GmbH, TEL: 89/530741

Distributors

Intl **Australia, Burwood-Victoria**
R & D Electronics Pty. Ltd., TEL: 288-8232

DIPLOMAT

The first distributor to call for

INTERSIL

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

Intl **Australia, Crows Nest-NSW**
R & D Electronics Pty. Ltd., TEL: 439-5488

Intl **Austria, Vienna**
Transistor Vertriebs GmbH, TEL: (02 22) 82 94 51

Intl **Belgium, Brussels**
Simac Elctrns. SPRL, TEL: 02-2192453

Intl **Cyprus, Nicosia**
Poly Elctrns. Svcs. Ltd., TEL: 21-27982

Intl **Denmark, Copenhagen**
E. V. Johanssen Electronik A-S, TEL: 45-1-839022

Intl **Finland, Espoo**
Nabla Elektronikka Oy, TEL: 90-46 28 29

Intl **France, Sevres**
Tekelec-Airtronic, TEL: (1) 534.75.35

Intl **Hong Kong, Kowloon**
Conmos Prods. Ltd., TEL: 3-7560103-8

Intl **India, Bombay**
Zenith Elctrns., TEL: 384214

Intl **Israel, Tel-Aviv**
Vectronics Ltd., TEL: 234424

Intl **Italy, Milano**
Metroelettronica, TEL: 546.26.41

Intl **Italy, Roma**
Metroelettronica, TEL: 827.28.41

Intl **Italy, Torino**
Metroelettronica, TEL: 54.64.36

Intl **Japan, Nagano**
Internix Inc., TEL: (0268) 25-1610

Intl **Japan, Osaka**
Internix Inc., TEL: 06-364-5971

Intl **Japan, Tokyo**
Internix Inc., TEL: (03) 369-1101

Intl **Korea, Seoul**
Duk Sung Trading Co., TEL: 856-9764

Intl **Netherlands, Eindhoven**
Auriema Nederland B.V., TEL: 040-816565

Intl **New Zealand, Auckland**
Delphi Industries Ltd., TEL: 563-259

Intl **Norway, Oslo**
Hans H. Schive A/S, TEL: 02 78.51.60

Intl **Portugal, Lisboa**
Decada Equipamentos, TEL: 57 4984

Intl **South Africa, Pretoria-Transvaal**
Eletronic Bldg., Elements Pty. Ltd., TEL: 46-9221

Intl **Spain, Madrid**
Hispano Electronica, TEL: 619 41 08

Intl **Sweden, Vallingby**
Svensk Teleimport AB, TEL: 08-890265

Intl **Switzerland, Geneva**
Laser & Elctrn. Equip., TEL: (022) 29 10 10

Intl **Switzerland, Zurich**
Laser & Electronic-Equipment, TEL: 01 55 33 30

Intl **Taiwan, Taipei**
Galaxy Far East, TEL: (02) 7811895-7

Intl **Thailand, Bangkok**
Science, Engineering & Education Co. Ltd., TEL: 2337821

Intl **Turkey, Ankara**
Turkelek Elektronik Ltd., TEL: 18 94 83

Intl **United Kingdom, Derby**
Quarndon Elctrns., TEL: (0332) 32651

Intl **United Kingdom, England-Bucks**
Rapid Recall Ltd., TEL: (0494) 26271

Intl **United Kingdom, England-Cheshire**
Rapid Recall Ltd., TEL: (0270) 627505

Intl **United Kingdom, Leeds, Yorkshire**
Farnell Elctrn. Comps., TEL: (0532) 636311

Intl **United Kingdom, Slough-Berks**
Macro-Mktg. Ltd., TEL: (06286) 63011

Intl **United Kingdom, England-Surrey**
Tranchant Elctrns. Ltd., TEL: (0737) 69217

Intl **West Germany, B((;u))ckeburg**
Spezial Elctrn. KG, TEL: 05722 2030

Intl **West Germany, Ellwangen**
Spezial Elctrn., TEL: (07961) 4047

Intl **West Germany, Freiburg**
Spezial Elctrn., TEL: 06031/4634

Intl **West Germany, Hamburg**
Electronica GmbH, TEL: (040) 338862-63

Intl **West Germany, M((;u))nchen**
Spezial Elctrn. KG, TEL: 89/530387

Intl **West Germany, N((;u))rnberg-Fischbach**
Semtech GmbH, TEL: (0911) 831003

Intronics

Intronics, Inc.
57 Chapel Street
Newton, Massachusetts 02158
617-964-4000
TWX: 710-335-6835

Sales Offices & Representatives

Intl **Belgium, Brussels**
Intercontinental Svcs., Inc., TEL: (02) 660.13.56

Intl **Denmark, Ballerup**
Tage Olsen A/S, TEL: (02) 65 81 11

Intl **France, Ivry sur Seine**
Gisco, TEL: (01) 670-1158

Intl **France, Ivry sur Seine**
Gisco/Powerline, TEL: (01) 672-1732

Intl **Israel, Tel-Aviv**
Electrondart Ltd., TEL: (03) 782460

Intl **Italy, Milano**
Auriema, Italia SRL, TEL: (02) 430602

Intl **Japan, Tokyo**
Internix, Inc., TEL: 369-1101

© IC MASTER 1983

Intronics (Cont)

Intl **Japan, Tokyo**
Jepico Corp, TEL: (03) 348-0611
Intl **Netherlands, Den Haag**
Koning En Hartman, TEL: 070/210101
Intl **South Africa, Pinegowrie**
South Continental Devices (Pty) Ltd.,, TEL: 480515
Intl **Spain, Barcelona**
Mares, TEL: (03) 2476200
Intl **Sweden, Stockholm**
Martinsson & Co., TEL: (08) 744 0300
Intl **Switzerland, Wallisellen**
Sicovend AG, TEL: (01) 8303161
Intl **United Kingdom, Reading**
Powerline Elctrns., Ltd., TEL: (0734) 868567
Intl **United Kingdom, Sunbury-on-Thames**
Pascall Elctrns., Ltd., TEL: (0932) 787418
Intl **West Germany, Muenchen**
Tekelec Airtronic, TEL: (89) 59 4621

ITT Semiconductors

ITT Semiconductors
470 Broadway
Lawrence, Masschusetts 01841
617-688-1881
TWX: 710-342-1357
TELEX: 947413

Sales Offices & Representatives

Intl **Brazil, Sao Paulo**
ITT Comps., TEL: (005511) 257-5285
Intl **England, Kent**
ITT Semiconductors, TEL: 3003333
Intl **Hong Kong, Kowloon**
Isostat Far East Switches Ltd.
Intl **India, New Delhi**
Krishan Auropa Co.
Intl **Israel, Tel-Aviv**
Radion Engrg. Co., Ltd.
Intl **Japan, Tokyo**
ITT Semiconductors, TEL: 3478881-5
Intl **Korea, Seoul**
Korea Intl. Trading Co.
Intl **New Zealand, Aukland**
STC Waldo Hunter
Intl **Taiwan, Taipei**
Origineering Ltd.
Intl **West Germany, Freiburg**
Intermetall (H.Q.), TEL: (761) 5171

KineticSystems

KineticSystems Corporation
11 Maryknoll Drive
Lockport, Illinois 60441
815-838-0005
TWX: 910-638-2831

Sales Offices & Representatives

Intl **Australia, Redfern**
Quentron Optics Pty., Ltd., TEL: 698-9277
Intl **Belgium, Kinove**
Canberra Positronika N.V., TEL: 054-33.58.78
Intl **Denmark, Copenhagen HV**
Hans Buch & Co., TEL: 01-83 12 12
Intl **Egypt, Dokki, Giza**
RFI, TEL: 717120
Intl **England, Northwich, Cheshire**
Sension Limited, TEL: Northwich (0606) 44321
Intl **Finland, Espoo**
Oy Emmett AB, TEL: 90-882 044
Intl **France, BUC**
INEL Instrumentation Electronique, TEL: (1) 956.31.90
Intl **Italy, Milano**
Elettronucleonica S.P.A., TEL: 02/49.82.451
Intl **Japan, Tokyo**
TOYO Corp., TEL: 03 279 0771
Intl **Netherlands, Eindhoven**
Canberra Positronika B.V., TEL: (040) 41 63 55
Intl **Sweden, Stockholm**
Nucletron AB, TEL: 46 - 8 44 90 55
Intl **Switzerland, Zuchwil**
Kinetic Systems Intl. S.A., TEL: (065) 25 29 25
Intl **West Germany, Frankfurt**
Canberra Elektronik GmbH, TEL: 0611/62 40 74

Kontron Electronics

Kontron Electronics Inc.
630 Price Avenue
Redwood City, California 94063
415-361-1012; 800-227-0834

Sales Offices & Representatives

AL **Arab**
Synergetics Reps., 205-498-3380
AZ **Phoenix**
Scientific Devices, 602-957-0401
CA **Los Alamitos**
Scientific Devices, 213-598-7678
CA **Mountain View**
Scientific Devices, 415-964-4230
CA **San Diego**
Scientific Devices, 714-279-6642
CO **Boulder**
Scientific Devices, 303-449-9466
FL **Casselberry**
Synergetics Reps., 305-339-0978
FL **Coral Springs**
Synergetics Reps., 305-753-6700
FL **Largo**
Synergetics Reps., 813-586-2871
GA **Lawrenceville**
Synergetics Reps., 404-963-0968
IL **Chicago**
Comtel Midwest Engineering Co., 312-539-4838
IN **Indianapolis**
Comtel Midwest Engineering Co., 317-253-1681
MD **Cockeysville**
Bytech, 301-667-1591
MA **Woburn**
Programmable Devices, 617-935-9530
MI **Detroit**
EQS Systems, 313-961-3042
MN **Minneapolis**
Comtel Midwest Engineering Co., 612-476-1551
NM **Albuquerque**
Syntech, 505-266-7951
NY **Latham**
J. Cameron Assocs. Inc., 518-371-5947
NY **Rochester**
J. Cameron Assocs. Inc., 716-473-4590
NC **Greensboro**
Synergetics Reps., 919-288-7566
OH **Chesterland**
EQS Systems, 216-729-2222
OH **Columbus**
EQS Systems, 614-228-3453
OH **Dayton**
EQS Systems, 513-294-2476
OR **Portland**
Evolutionary Elctrns., Inc., 503-289-3988
PA **Pittsburgh**
EQS Systems, 412-261-2604
TX **Austin**
Crockett Southwest Co., 512-451-8269
TX **Dallas**
Crockett Southwest Co., 214-251-1776
TX **Houston**
Crockett Southwest Co., 713-778-1836
WA **Redmond**
Seattle Telecom & Data Inc., 206-883-6336
WI **New Berlin**
Comtel Midwest Engineering Co., 414-544-6042
PR **San Juan**
Synergetics Reps., 809-762-2688

Kontron Electronics

Kontron Electronics, Inc.
FutureData Division
5730 Buckingham Parkway
Culver City, California 90230
213-641-7200
TWX: 910-328-7202

Distributors

Intl **Austria, Voesendorf**
Kontron Elektronik Ges.m.b.H., TEL: 0043-222-670630
Intl **Belgium, Bruxelles**
C. N. Rood S.A., TEL: 0032-2-7352135
Intl **Brazil, Sao Paulo**
Cosele, Ltda., TEL: 257-3535
Intl **England, St. Albans**
Kontron Instruments, TEL: 0044-727-66222
Intl **Finland, Sf Ozzio-Espoo**
Oy Emmet Ab, TEL: 0035-80-882044
Intl **France, Le Chesnay**
A2M, TEL: 0033-3-9549113
Intl **Holland, Rijswijk**
C. N. Rood bv, TEL: 0031-70-996360
Intl **Israel, Tel Aviv**
Vectronics, TEL: (03) 23-4424
Intl **Italy, Cinisello Balsamo**
Celdis Italiana S.p.A., TEL: 0039-2-6120041
Intl **Norway, Oslo**
Bergman Instrumentering A/S, TEL: 0047-2-162210
Intl **Spain, Madrid**
Hispano Elctrna. SA, TEL: 341 6194108
Intl **Sweden, Upplands Vesby**
Lagercrantz Elektronik AB, TEL: (760) 86120
Intl **Switzerland, Zurich**
Kontron/FutureData, TEL: 0041-1-552420/553232
Intl **West Germany, Munchen**
Kontron Messtechnik GmbH, TEL: 0049-89-319011

Lambda

Lambda Semiconductors
121 International Drive
Corpus Christi, Texas 78410
512-289-0403 (In Texas); 1-800-255-9606
TWX: 910-876-1404

Sales Offices & Representatives

Intl **England, High Wycombe, Bucks**
Lambda Electronics, TEL: 44-494-36386

© IC MASTER 1983

Lambda (Cont)

Intl **France, Les Ulis, Cedex**
Lambda Electronique S.A., TEL: 33-6-012-1487

Intl **Germany, Achern**
Lambda Netzgerate GmbH, TEL: 49-7841-5031

Intl **Israel, Tel Aviv**
IsLambda Electronics Ltd., TEL: 972-3-242-194

Intl **Japan, Tokyo**
Nemic-Lambda K.K., TEL: 03-490-5813

Laserdyne

Laserdyne Corporation
2772 Main Street
Irvine, California 92714
714-754-7566

LSI Computer Systems

LSI Computer Systems, Inc.
1235 Walt Whitman Road
Melville, New York 11747
516-271-0400
TWX: 510-226-7833

Specific product information:
Ronald Colino
Application engineering:
Ronald Colino
Literature:
Bonnie Cohen
Price and delivery:
Bonnie Cohen
Follow-up an order:
Bonnie Cohen
All other information:
Bonnie Cohen
For Intl. sales: Mavex Technology, 516-473-2673

Sales Offices & Representatives

AL **Huntsville**
REMCO, 205-533-3763

CA **San Diego**
Mesa, 714-278-8021

CA **Santa Clara**
Fischer Assocs., 408-733-7350

CA **Westlake Village**
Western Mktg., 213-889-6270

GA **Atlanta**
REMCO, 404-477-6937

IL **Elmhurst**
Fiat Engrg. Assocs., 312-547-6200

MD **Fulton**
Gans & Pugh, Inc., 301-953-3724

NH **Merrimack**
Mech-Tron Co., 603-424-5300

NJ **Hasbrouck Heights**
Comp-Tech Sales, 201-288-7400

NY **New Hyde Park**
Comp-Tech Sales, 516-593-2628

NY **Penfield**
Barthel Entprs., 716-377-3018

NC **Raleigh**
REMCO, 919-847-5079

OH **Cleveland**
Components, Inc., 216-243-9200

OH **West Carrollton**
Components, Inc., 513-866-0661

TX **Houston**
Electronic Mktg. Assoc., 713-498-8120

VA **Arlington**
Gans & Pugh, Inc., 703-527-3262

LSI Logic

LSI Logic Corporation
1601 McCarthy Boulevard
Milpitas, California 95035
408-263-9494
TELEX: 172 153

Master Logic

Master Logic Corporation
761 E. Evelyn Avenue
Sunnyvale, California 94086
408-732-7777

Specific product information:
Stephen R. Allen
Application engineering:
Stephen R. Allen
Literature:
Stephen R. Allen
Price and delivery:
Stephen R. Allen
Follow-up an order:
Stephen R. Allen
All other information:
Charles A. Allen

Matrix

Matrix Corporation
1639 Green Street
Raleigh, North Carolina 27603
919-833-2837

Matrox

Matrox Electronic Systems Ltd.
5800 Andover Avenue, T.M.R.
Montreal, Quebec, H4T 1H4, Canada
514-735-1182
TWX: 05-825651

Sales Offices & Representatives

Intl **Australia, Epping**
Mace Co. Pty. Ltd., TEL: 86-4060

Intl **Austria, Vienna**
Bacher Elektronishe Gerate, Ges. m.b.h., TEL: (0220) 835646-0

Intl **Denmark, Glostrup**
Jorgen Andersen Ingeniorfirma A.S., TEL: (02) 92 88 88

Intl **England, London**
Perdix Comps., TEL: 01-690 1914/5

Intl **Finland, Helsinki**
Oy Fintronic, AB, TEL: 90-692 60 22

Intl **France, Asnieres**
Metrologie, TEL: 791 44 44

Intl **Greece, Athens**
American Tech. Entprs. S.A., TEL: 8219.470-8811.271

Intl **Israel, Givatayim**
EIM Intl. Elctrns. Ltd., TEL: (03) 744-041

Intl **Italy, Milano**
3-G Elctrns. s.r.l., TEL: 5455951

Intl **Japan, Tokyo**
Internix Inc., TEL: 369-1101

Intl **Netherlands, Drimmelen**
Matrox Benelux, TEL: 01626-3850

Intl **New Zealand, Auckland**
GTS Engrg., Ltd., TEL: 546-745

Intl **Norway, Oslo**
Nordisk Electronik AS, TEL: 02-55-2485

Intl **Portugal, Lisboa**
Ditram Components E Electronics Lta

Intl **South Africa, Johannesburg**
L'Electron (PTY) Ltd., TEL: 786-5150

Intl **Spain, Madrid**
Unitronics S.A., TEL: 242-52-04

Intl **Sweden, Stockholm**
Micro Scandia Industriautomation AB, TEL: 32685

Intl **Switzerland, Zurich**
Relais-Rohr, TEL: (01) 301 09 70

Intl **Taiwan, Taipei**
Multitech Intl. Corp., TEL: (02) 7681232

Intl **West Germany, Munchen**
Ernst Rauscher Systemberatung, TEL: 089-878061

Micrel

Micrel
1235 Midas Way
Sunnyvale, California 94086
408-245-2500
TWX: 910-379-0007

MCE

Micro-Circuit Engineering, Inc.
1111 Fairfield Drive
W. Palm Beach, Florida 33407
305-845-2837
TELEX: 513463 (MCE MPAB)

Sales Offices & Representatives

AL **Huntsville**
Montgomery Mktg., Inc., 205-830-0498

AZ **Phoenix**
Shefler-Kahn, 602-257-9015

CA **San Jose**
QCI, 408-942-1070

CA **Sunnyvale**
MCE, Inc., 408-732-6090

CA **Woodland Hills**
Relcom, 213-340-9143

CO **Littleton**
Simpson Assocs., 303-794-8381

FL **Altamonte Springs**
EIR Inc., 305-830-9600

GA **Norcross**
Montgomery Mktg., Inc., 404-447-6124

IL **Rolling Meadows**
Sieger Assocs., 312-991-6161

IN **Fort Wayne**
Giesting & Assocs., 219-486-1912

IN **Indianapolis**
Giesting & Assocs., 317-263-0005

MD **Baltimore**
J.A. Maguire, 301-377-0223

MA **Burlington**
N.E.T.S., 617-272-0434

MI **Coloma**
Giesting & Assocs., 616-468-4200

MI **Northville**
Giesting & Assocs., 313-348-3811

MN **Bloomington**
Sieger Assocs., 612-884-7788

NM **Albuquerque**
Shefler-Kahn, 505-296-0749

NY **Binghamton**
Precision Sales, 607-648-8833

NY **Congers**
ERA, 516-543-0510

NY **Liverpool**
Precision Sales, 315-451-3480

© IC MASTER 1983

MCE (Cont)

NY **Pittsford**
Precision Sales, 716-381-2820

NY **Pleasant Valley**
Precision Sales, 914-635-3233

NC **Cary**
Montgomery Mktg., Inc., 919-467-6319

OH **Cincinnati**
Giesting & Assocs., 513-521-8800

OH **Dayton**
Giesting & Assocs., 513-293-4044

OH **Mentor**
Giesting & Assocs., 216-942-3407

TX **Austin**
West Assocs., 512-454-3681

TX **Dallas**
West Assocs., 214-248-7060

TX **Houston**
West Assocs., 713-777-4108

UT **Midvale**
Simpson Assocs., 801-566-3691

VA **Portsmouth**
J.A. Maguire, 804-398-0202

Intl **United Kingdom, Tewkesbury**
MCE, Ltd., TEL: 0684-297777

Intl **West Germany, Munich**
MCE Micro-Circuit Engrg. Vertr. GmbH, TEL: 089-463085

Intl **West Germany, Nuernberg**
MCE Micro-Circuit Engrg. Vertr. GmbH, TEL: 0911-533933

Microcircuits Technology

Microcircuits Technology, Inc.
1157 San Antonio Road
Mountain View, California 94043
415-969-3600
TELEX: 172 750

Micro Computer Control

Micro Computer Control
P.O. Box 275
Hopewell, New Jersey 08525
609-466-1751

Micro Innovators

Micro Innovators Inc.
2348A Walsh Avenue
Santa Clara,, California 95051
408-988-0911

Micro-Link

Micro-Link Corporation
624 South Range Line Road, P.O. Box 517
Carmel, Indiana 46032
317-846-1721
TWX: 810-260-2634

Micro Networks

Unitrode Corporation
Micro Networks Company
324 Clark Street
Worcester, Massachusetts 01606
617-852-5400
TWX: 710-340-0067
TELEX: 951808

Specific product information:
Mark Vaughan ..... Ext. 219

Application engineering:
Mark Vaughan ..... Ext. 219

Literature:
Karen LaVigne ..... Ext. 220

Price and delivery:
Linda Palmer ..... Ext. 275

Follow-up an order:
Linda Palmer ..... Ext. 275

All other information:
John Munn ..... Ext. 225

Sales Offices & Representatives

Intl **Australia, Burwood**
R & D Elctrns., TEL: 288-8232

Intl **Austria, Bad Vcaslau**
Kapla Electronik, TEL: 02252-7459

Intl **Belgium, Brussels**
Belram S.A., TEL: 34.33.32

Intl **Belgium, Bruxellas**
I.S.I., TEL: 02/660-13 56

Intl **Cyprus, Nicosia**
Poly Elctrns., TEL: 21-27982

Intl **Denmark, Copenhagen**
Semicap, TEL: 01-221510

Intl **England, Sunbury-on-Thames**
Pascall Elctrns. Ltd., TEL: Sunbury, 09327-87418

Intl **Finland, Helsinki**
Turion OY, TEL: 90-377787

Intl **France, Orsay**
Microel, TEL: 6-9070824

Intl **Germany, Munchen**
Tekelec Airtronic, TEL: (089) 594-621

Intl **Greece, Athens**
Theodore D. Tzitzinias, TEL: 942 4071

Intl **Hong Kong, Hong Kong**
Schmidt & Co. (H.K.) Ltd., TEL: 5-455644

Intl **India, Trivandrum**
Kryonix, TEL: 63805

Intl **Israel, Bnei Brak**
Electrondart Ltd., TEL: 3-782460

Intl **Italy, Milano**
Microelit S.R.L., TEL: 46.90.444

Intl **Japan, Tokyo**
Internix, TEL: (03) 369-1101

Intl **Korea, Seoul**
Han Sun Intl., TEL: 28-0958

Intl **Netherlands, Breda**
Indelec B.V., TEL: 076-142333

Intl **Norway, Oslo**
Eltron, TEL: 02-15-20-51

Intl **South Africa, Bryanston**
S'Electronics

Intl **Spain, Madrid**
Compania Electronica de Technicas, TEL: 754-4530

Intl **Sweden, Vallingby**
Scancopter, TEL: 08/38 00 65

Intl **Switzerland, Zurich**
Telemeter AG, TEL: 01-202-7872

Intl **Taiwan, Taipei**
Tai I Trading Co., Ltd., TEL: 393 61111

Micron Technology

Micron Technology Inc.
2805 East Columbia Road
Boise, Idaho 83706
208-383-4000

Micropac

Micropac Industries, Inc.
905 East Walnut Street
Garland, Texas 75040
214-272-3571
TWX: 910-860-5186

All other information:
Ext. 23, 37

Sales Offices & Representatives

Intl **Austria, Wien**
Transistor Vertriebs, TEL: 0043/222829451

Intl **Belgium, Brussels**
Manudax, TEL: 00322/22152500

Intl **Denmark, Copenhagen**
Semicap, TEL: 00451/221510

Intl **France, Boulogne**
ASAP, TEL: 00331/6047878

Intl **France, Paris**
Comptoir Commercial D'Importation (CCI), TEL: 00331/2362045

Intl **Great Britian, Harrold-Bedford**
Synchro Svcs., TEL: 0044/234720575

Intl **Great Britain, Thame-Oxford**
Gain Elctrns., TEL: 0044/844215477

Intl **Italy, Milano**
El Pack S.R.I., TEL: 00392/6471673

Intl **Netherlands, Nijmegen**
Varilec B.V., TEL: 00318/0445660

Intl **Norway, Tonsbert**
UMI A.S., TEL: 004733/22214

Intl **Sweden, Solna**
AB Betoma, TEL: 00468/820280

Intl **Switzerland, Baden**
Cometec AG, TEL: 004156/223152

Intl **Switzerland, Zurich**
Egli, Fischer Co. Ltd., TEL: 00411/2020234

Intl **West Germany, Gesthacht**
Microlec, TEL: 04152/72324

Intl **West Germany, Homberg**
IV Elctrn., TEL: 06172/23061

Intl **West Germany, Munich**
DIPL-Ing. Ernst Fey Nachf, TEL: 089-184041

Intl **West Germany, Munich**
Neumueller GmbH, TEL: 089/61181

Intl **West Germany, Munich**
Nucletron Vertriebs GmbH, TEL: 089/146081

Intl **West Germany, Stuttgart**
Ditronic GmbH, TEL: 0711/724844

Micro Power Systems

Micro Power Systems, Inc.
3100 Alfred Street
Santa Clara, California 95050
408-727-5350
TWX: 910-338-0154

Specific product information:
Standard Products Division ..... ext. 237

Literature:
Standard Products Division ..... ext. 237

© IC MASTER 1983

Micro Power Systems (Cont)

Sales Offices & Representatives

AL **Huntsville**
R.W. Mitscher Co., Inc., 205-852-7676

AZ **Phoenix**
Sun West Mktg. Assoc., 602-241-8163

CA **La Mirada**
Select Elctrns., 714-739-8891

CA **San Diego**
D² Sales, Inc. 714-560-6266

CA **Sunnyvale**
NES, 408-738-3259

CO **Littleton**
Quatra Inc., 303-795-3187

FL **Clearwater Beach**
Perrott Assocs., Inc., 813-443-5214

FL **Orlando**
Perrott Assocs., Inc., 305-275-1132

GA **Lawrenceville**
R.W. Mitscher Co., Inc., 404-923-3239

IL **Rolling Meadows**
KMA Sales, 312-398-5300

IN **Ft. Wayne**
Coombs Assocs., 219-747-4017

IA **Marion**
REP Assocs., 319-393-0231

KS **Parker**
S.W. Woolard Co., 913-898-6552

KY **Louisville**
K.W. Elctrn. Sales, 502-451-1860

MD **Baltimore**
Stemler Assocs., 301-944-8262

MD **Rockville**
Stemler Assocs., 301-774-2268

MA **Burlington**
Dynamic Sales of New England, 617-272-5676

MI **Livonia**
Lowell Wendt Mktg. Co., 313-464-2722

MN **Minneapolis**
Peterson Sales Assocs., 612-884-3483

NJ **Marlton**
Stemler Assocs., 609-966-4070

NY **Buffalo**
R.W. Mitscher Co., Inc., 716-633-7970

NY **Fayetteville**
R.W. Mitscher Co., Inc., 315-637-6561

NY **Melville**
Comtronic Assocs., 516-224-6086

NY **N. Syracuse**
R.W. Mitscher Co., Inc., 315-458-1321

NY **Pittsford**
R.W. Mitscher Co., Inc., 716-586-4012

NY **Red Hook**
R.W. Mitscher Co., Inc., 914-758-8575

NY **Rochester**
R.W. Mitscher Co., Inc., 716-227-0839

NC **Raleigh**
R.W. Mitscher Co., Inc., 919-876-0160

OH **Columbus**
K.W. Elctrn. Sales, Inc., 614-888-0483

OH **Dayton**
K.W. Elctrn. Sales, Inc., 513-890-2150

OH **Shaker Heights**
K.W. Elctrn. Sales, Inc., 216-491-9177

OR **Tigard**
Elctrn. Comp. Sales, 503-245-2342

PA **Ben Salem**
Stemler Assocs., 215-638-4850

SC **Columbia**
R.W. Mitscher Co., Inc., 803-772-1907

TN **Johnson City**
R.W. Mitscher Co., Inc., 615-282-6240

TX **Austin**
TMI, 512-835-0064

TX **Carrollton**
TMI, 214-387-3601

TX **Houston**
TMI, 713-777-9228

UT **Sandy**
Quatra, 303-795-3187

WA **Mercer Island**
Elctrn. Comp. Sales, 206-232-9301

WI **Milwaukee**
KMA Sales, 414-259-1771

Distributors

AZ **Phoenix**
Lion Elctrn., 602-869-9611

AZ **Scottsdale**
Memco, 602-952-2254

CA **Laguna Hills**
MP Systems, 714-770-6411

CA **Reseda**
Jan Devices, 213-708-1100

CA **Santa Ana**
Pacesetter Elctrns., 714-557-7131

CA **Sunnyvale**
Future Elctrns., 408-745-6570

CA **Sunnyvale**
Pacesetter Elctrns., 408-734-5470

CO **Wheat Ridge**
Bell Inds., 303-424-1985

CT **Danbury**
Pilgrim Elctrns., 203-792-7274

CT **Stratford**
Utronics, Inc., 203-378-4201

FL **Clearwater**
Diplomat Elctrns., 813-443-4515

GA **Atlanta**
Wholesale Industrial Elect., 404-447-8431

IL **Elk Grove Village**
GBL Goold Elctrns., 312-593-3220

MD **Baltimore**
Whitney Distrs., 301-944-8080

MA **Wakefield**
Aved Elctrns., Inc., 617-245-7406

MI **Livonia**
Reptron Elctrns., Inc., 313-525-2700

MN **Minneapolis**
The Joel Co., 612-545-5669

MO **St. Louis**
Abrams & Assocs., 314-569-0447

MO **St. Louis**
Olive Industrial Elect. Supply, 314-426-4500

NY **Buffalo**
Summitt Distrs., 716-887-2800

NY **E. Syracuse**
Add Elctrns., 315-437-0300

NY **Millbrook**
Villa Real Elec., 914-677-3447

OH **Englewood**
Argent Inds., 513-836-8633

OH **Solon**
REH Elctrns., 216-248-1636

OK **Tulsa**
Quality Comps., 918-664-8812

PA **Broomall**
Time Mid-Atlantic, 215-359-1200

PA **Pittsburgh**
Adlertronics, 412-821-5565

TX **Addison**
Quality Comps., Inc., 214-387-4949

TX **Austin**
Quality Comps., Inc., 512-835-0220

TX **Houston**
Quality Comps., Inc., 713-772-7100

WA **Federal Way**
Bombers Elctrn. Sales, 206-941-0518

WA **Seattle**
Robert E. Priebe Co., 206-682-8242

WI **Mequon**
Taylor Elctrn. Co., 414-241-4321

Intl **Australia, Rozelle**
Ampec Elctrns., TEL: (02) 818-1166

Intl **Austria, Scheydgasse**
Burisch Ges.m.b.H. & Co. KG, TEL: (0222) 387638

Intl **Belgium, Brussels**
SA Sotronic NV, TEL: (02) 7361007

Intl **Denmark, Copenhagen**
Advanced Elctrns. of Denmark Aps, TEL: (01) 194433

Intl **England, Essex**
Pronto Elctrn. Sys., Ltd., TEL: 01-599 3041/2

Intl **Finland, Helsinki**
Ferrado Oy AB, TEL: 90-55-0002

Intl **France**
Le Chesnay, TEL: (1) 955-32-49

Intl **France, Neuilly-Sur-Sane**
Radio Television Francaise, TEL: 747-11-01

Intl **Holland, Zoetermeer**
Tekelec Airtronic, TEL: 079-310100

Intl **Israel, Tel-Aviv**
R N Elctrns., TEL: (03) 471659

Intl **Israel, Tel Aviv**
STG Intl. Ltd., TEL: (03) 248231

Intl **Italy, Milano**
Syscom Elctrns., TEL: 02-6.189.159

Intl **Italy, Milano**
Tekelec Airtronic, TEL: 02-7380641

Intl **Japan, Tokyo**
Kaigai Elctrns., TEL: 586-0471

Intl **Norway, Oslo**
Ettron A/S, TEL: 02-152051

Intl **South Africa, Randburg**
South Continental Devices, TEL: (011) 789-2400

Intl **Spain, Barcelona**
Diode Espana, TEL: 217 26 19

Intl **Spain, Bilbao**
Diode Espana, TEL: 424 86 55

Intl **Spain, Madrid**
Diode Espana, TEL: 455 36 86

Intl **Sweden, Danderyd**
Setron AB

Intl **Switzerland, Schwelz**
Anatec AG, TEL: (042) 367633

Intl **Taiwan, Taipei**
Strong Elctrns., TEL: (02) 521-8826

Intl **West Germany, Munich**
Kontron Elecktronik GmbH, TEL: (089) 31901-381

Intl **West Germany, Munich**
Tekelec Airtronic, TEL: (089) 594621

Micro Sciences

Micro Sciences Corporation
145 Commack Road
Commack,, New York 11725
516-499-0635

MilerTronics

MilerTronics
303 Airport Road
Greenville, South Carolina 29607
803-242-9232

Miller Technology

Miller Technology Inc.
647 North Santa Cruz Avenue
Los Gatos, California 95030
408-395-2032

© IC MASTER 1983

Mitel Corp.

Mitel Semiconductor
P.O. Box 13320
Kanata, Ontario, Canada K2K 1X5
613-592-5630
TELEX: 053-3221
TWX: 610-562-8529
Specific product information:
Customer Service
Application engineering:
Customer Service
Literature:
Customer Service
Price and delivery:
Customer Service
Place an order:
Customer Service
Follow-up an order:
Customer Service
All other information:
Customer Service

Sales Offices & Representatives

AL Huntsville
A.B. Andrews & Co., 205-539-6817
AZ Phoenix
Eltron Inc., 602-266-2164
CA Glendale
Orion Sales, 213-240-3151
CA Los Gatos
Pro Assocs., 408-358-3861
CA San Diego
L & S Assocs., 714-455-0055
CA San Diego
Mitel Semiconductor, 714-276-3421
CA San Mateo
Mitel Semiconductor, 415-570-6011
CA Tustin
Orion Sales, 714-832-9687
CO Aurora
Electrodyne Inc., 303-695-8903
CT Kensington
Norm Stachelek, 203-828-6161
DC Washington
Mitel Semiconductor, 703-661-8600
FL Boca Raton
Mitel Semiconductor, 305-994-8588
FL Clearwater
Hutto, Hawkins, Peregoy (H.H.P.), 813-797-4447
FL Ft. Lauderdale
Hutto, Hawkins, Peregoy (H.H.P.), 305-971-5750
FL Maitland
Hutto, Hawkins, Peregoy (H.H.P.), 305-831-2474
IL Oakbrook
Mitel Semiconductor, 312-655-3930
IL Rolling Meadows
KMA Sales, 312-398-5300
IN Ft. Wayne
Scott Electronics Inc., 219-743-1586
IN Indianapolis
Scott Elctrns. Inc., 317-897-9976
KS Overland Park
Advanced Tech. Sales, Inc., 913-492-4333
KY Louisville
Scott Elctrns. Inc., 502-964-0640
MA Burlington
Contact Sales Inc., 617-273-1520
MI Troy
Scott Elctrns. Inc., 513-791-2513
MN New Brighton
T.W.C. Sales, 612-636-1770
MT Clayton
Advanced Tech. Sales, Inc., 314-721-4401
NJ Haddonfield
Mesa Techn. Assocs., 609-429-9531
NY Endwell
Tri Tech Elctrns., Inc., 607-754-1094
NY Fairport
Tri Tech Elctrns., Inc., 716-223-5720
NY Fayetteville
Tri Tech Elctrns., Inc., 315-446-2881
NY Poughkeepsie
Tri Tech Elctrns., Inc., 914-473-3880
NY Valley Cottage
L.R.C. Assocs., 914-268-4435
NC Raleigh
A.B. Andrews & Co., 919-549-0563
OH Cleveland
Scott Elctrns. Inc., 216-473-5050
OH Cincinnati
Scott Elctrns. Inc., 513-791-2503
OH Kettering
Scott Elctrns. Inc., 513-294-0539
OH Reynoldsburg
Scott Elctrns. Inc., 614-863-1281
OK Tulsa
Jerry Robison & Assocs., 918-492-0390
PA Havertown
Mitel Semiconductor, 215-449-5556
PA Pittsburgh
Scott Elctrns. Inc., 412-963-6116
TX Austin
Logic 1, 512-459-1297
TX Dallas
Mitel Semiconductor, 214-387-5581
TX Houston
Logic 1, 713-879-1566
TX Richardson
Logic 1, 214-234-0765
UT Salt Lake City
Electrodyne Inc., 801-486-3801
VA Vinton
A.B. Andrews & Co., 703-890-1128
WA Redmond
Quadra Sales Corp., 206-883-3550
WI Milwaukee
KMA Sales Co., 414-259-1771
Can Edmonton, Alberta
Deskin Sales, 403-451-4805
Can Markham, Ontario
Deskin Sales, 416-496-2511, 416-475-1412
Can Ottawa, Ontario
Deskin Sales, 613-236-8166
Can Richmond, British Columbia
Deskin Sales, 604-273-4963
Can Saint Laurent, Quebec
Deskin Sales, 514-331-2860
Can Transcona, Manitoba
Deskin Sales, (0) Zenith 06009
Intl Argentina, Buenos Aires
YEL S.R.L., TEL: 46-2211
Intl Australia, Sydney
Benmar Intl. Pty. Ltd., TEL: (02) 233-7939
Intl Austria, Scheydgasse
Burisch GMBH & Co. KG, TEL: (0-22-2) 38 76 38
Intl Denmark
Mitel Semiconductor, TEL: 01-134712
Intl Denmark, Marlendalsvej
Advanced Eltrn. of Denmark APS, TEL: (01) 19 44 33
Intl Finland, Helsinki
Yleiselektroniikka OY, TEL: 90-562 1122
Intl France, Neuilly-sur-Seine
Technology Resources SA, TEL: (1) 747 4717/7051
Intl Germany, Munchen
Atlantik Elektronik GmbH, TEL: 089 858 20 86/87/88/89
Intl Greece, Athens
Cybernetics, TEL: 01030 1 958 8464
Intl Holland, Wassenaar
Werner Elctrns. BV, TEL: 01751 19225
Intl Hong Kong, Kowloon
Draco Intl. Ltd., TEL: 3-891331, 3-446117
Intl Hong Kong, Tsuen Wan
Mitel (Asia) Ltd., TEL: 0-4636-41-6
Intl India, Bangalore
Flash Entprs., TEL: 72660
Intl Israel, Tel-Aviv
Vectronics, TEL: 23-44-24
Intl Italy, Milano
AMZ Elettronica SRL, TEL: (02) 4088441
Intl Japan, Tokyo
Mitel Japan, TEL: (03) 402-9941
Intl Japan, Tokyo
Tokyo Electron Ltd., TEL: 03-343-4411
Intl Korea, Seoul
Duksung Trading Co., TEL: 856-9764
Intl New Zealand, Auckland
G.T.S. Engrg. Ltd., TEL: 456-2591
Intl Norway, Asker
Intelco AS, TEL: (47 2) 78 06 76
Intl South Africa, Pinegowrie
Radiokom
Intl South Wales, Gwent
Mitel Semiconductor, TEL: 0291-423355
Intl Spain, Madrid
Compania Electronica, TEL: 754-30 01, 754-30-77
Intl Sweden, Tyreso
LM Ericsson Telemateriel AB, TEL: 8 742 4491
Intl Switzerland, Zurich
EGLI Fischer & Co., TEL: (01) 202 02 34
Intl Taiwan, Taipei
Fairply Enterprises, TEL: 581-2156
Intl United Kingdom, Essex
Pronto Elctrns. Sys., TEL: 01-554-6222

Distributors

AL Huntsville
Contact Elctrns., 205-881-9321
AZ Phoenix
Sterling Elctrns. Inc., 602-258-4531
AZ Scottsdale
Western Microtechnology, 602-948-4240
CA San Diego
Anthem, 714-279-5200
CA Santa Ana
Pacesetter Elctrns., 714-557-7131
CA Sunnyvale
Pacesetter Elctrns., 408-734-5470
CO Englewood
Industrial Elctrns. Inc., 303-771-2636
CT East Haven
J.V. Elctrns., 203-469-2321
FL Ft. Lauderdale
Time Elctrns., 305-974-4800
IL Northbrook
Classic Comps., 312-272-9650
MA Wilmington
R C Comps., 617-657-4310
NJ Bellmawr
Mid Atlantic, 609-931-5303
NM Albuquerque
Sterling Elctrns. Inc., 505-884-1900
NY Plainview
ACI Elctrns. Corp., 516-293-6630
NY Syracuse
ADD Elctrns., 315-437-0300
OK Tulsa
Quality Comps. Inc., 918-664-8812
TX Addison
Quality Comps. Inc., 214-387-4949
TX Austin
Quality Comps. Inc., 512-835-0220
TX Houston
Quality Comps. Inc., 713-722-7100
VA Glen Allen
Hermitage, 804-798-3830
WA Redmond
Paccom Inc., 206-883-9200
WI Mequon
Taylor Electric Co., 414-241-4321
WI New Berlin
Classic Components, 414-786-5300

© IC MASTER 1983

Mitel Corp. (Cont)

Can **Burnaby, British Columbia**
R-A-E Indl. Elctrns. Ltd., 604-291-8866

Can **Toronto, Ontario**
Canadian General Electric Co., Ltd., (416) 537-4481

Intl **Argentina, Buenos Aires**
YEL S.R.L., TEL: 46-2211

Intl **Australia, Sydney**
Benmar Intl. Pty. Ltd., TEL: (02) 233-7939

Intl **Austria, Schoydgasse**
Burisch GMBH & Co. KG, TEL: (0-22-2) 38 76 38

Intl **Denmark**
Mitel Semiconductor, TEL: 01-134712

Intl **Denmark, Marlendalsvej**
Advanced Elctrn. of Denmark APS, TEL: (01) 19 44 33

Intl **Finland, Helsinki**
Yleiselektroniikka OY, TEL: 90-562 1122

Intl **France, Neuilly-sur-Seine**
Technology Resources SA, TEL: (1) 747 4717/ 7051

Intl **Germany, Munchen**
Atlantik Elektronik GmbH, TEL: 089 858 20 86/87/88/89

Intl **Greece, Athens**
Cybernetics, TEL: 01030 1 958 8464

Intl **Holland, Wassenaar**
Werner Elctrns. BV, TEL: 01751 19225

Intl **Hong Kong, Kowloon**
Draco Intl Ltd., TEL: 3-891331, 3-446117

Intl **Hong Kong, Tsuen Wan**
Mitel (Asia) Ltd., TEL: 0-4636-41-6

Intl **India, Bangalore**
Flash Entprs., TEL: 72660

Intl **Israel, Tel-Aviv**
Vectronics, TEL: 23-44-24

Intl **Italy, Milano**
AMZ Elettronica SRL, TEL: (02) 4088441

Intl **Japan, Tokyo**
Mitel Japan, TEL: (03) 402-9941

Intl **Japan, Tokyo**
Tokyo Electron Ltd., TEL: 03-343-4411

Intl **Korea, Seoul**
Duksung Trading Co., TEL: 856-9764

Intl **New Zealand, Auckland**
G.T.S. Engrg. Ltd., TEL: 456-2591

Intl **Norway, Asker**
Intelco AS, TEL: (47 2) 78 06 76

Intl **South Africa, Pinegowrie**
Radiokom

Intl **South Wales, Gwent**
Mitel Semiconductor, TEL: 0291-423355

Intl **Spain, Madrid**
Compania Electronica, TEL: 754-30 01, 754-30-77

Intl **Sweden, Tyreso**
LM Ericsson Telemateriel AB, TEL: 8 742 4491

Intl **Switzerland, Zurich**
EGLI Fischer & Co., TEL: (01) 202 02 34

Intl **Taiwan, Taipei**
Fairply Enterprises, TEL: 581-2156

Intl **United Kingdom, Essex**
Pronto Elctrns. Sys., TEL: 01-554-6222

Mitsubishi Electronics

Mitsubishi Electronics America, Inc.
Semiconductor Division
777 North Pastoria Avenue
Sunnyvale, California 94086
408-730-5900
TELEX: 172296 MELA SUVL.
TWX: 910-339-9549

DIPLOMAT

The first distributor to call for

MITSUBISHI ELECTRONICS

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

Monolithic Memories

Monolithic Memories, Inc.
1165 East Arques Avenue
Sunnyvale, California 94086
408-739-3535
TWX: 910-339-9229

Sales Offices & Representatives

AL **Huntsville**
REP, Inc., 205-881-9270

AZ **Scottsdale**
Summit Sales, 602-998-4850

CA **Cupertino**
Monolithic Memories, 408-996-1477

CA **Cupertino**
Thresum Assocs., 408-996-9889

CA **Fountain Valley**
Bager Elctrns., 714-957-3367

CA **Hayward**
Monolithic Memories, 408-243-1375

CA **Huntington Beach**
Monolithic Memories, 714-556-1216

CA **Irvine**
Monolithic Memories, 714-556-1216

CA **Pasadena**
Monolithic Memories, 714-556-1216

CA **San Diego**
Littlefield & Smith, 714-455-0055

CO **Denver**
Monolithic Memories, 303-370-0751

CO **Wheatridge**
Waugaman Assocs., 303-423-1020

CT **North Haven**
Comp Rep Assocs., 203-239-9762

FL **Altamonte Springs**
Dyne-A-Mark, 305-831-2097

FL **Longwood**
Monolithic Memories, 305-830-7867

FL **Clearwater**
Dyne-A-Mark, 813-441-4702

FL **Fort Lauderdale**
Dyne-A-Mark, 305-771-6501

FL **Palm Bay**
Dyne-A-Mark, 305-727-0192

GA **Dunwoody**
Monolithic Memories, 404-393-3120

GA **Tucker**
Rep, Inc., 404-938-4358

IL **Lombard**
Monolithic Memories, 312-932-1940

IL **Naperville**
Monolithic Memories, 312-961-9200

IL **Rolling Meadows**
Sumer, 312-991-8500

IN **Indianapolis**
Leslie M. DeVoe, 317-842-3245

IA **Cedar Rapids**
S & O Sales, 319-393-1845

KS **Olathe**
Rush & West, 913-764-2700

MD **Baltimore**
Monolithic Sales, 301-296-2444

MA **Chelmsford**
Monolithic Memories, 617-256-3573

MA **Framingham**
Monolithic Memories, 617-655-7070

MA **Newton Centre**
Monolithic Memories, 617-332-4840

MA **Westwood**
Comp Rep Assocs., 617-329-3454

MI **Grosse Point**
Greiner Assocs., 313-499-0188

MN **Edina**
Mel Foster Technical Sales, 612-941-9790

MN **Edina**
Monolithic Memories, 612-922-2260

MO **Ballwin**
Rush & West, 314-394-7271

NJ **Sussex**
Monolithic Memories, 201-875-9430

NJ **Teaneck**
R. T. Reid Assoc., 201-692-0200

NY **Buffalo**
L-Mar Assocs., 716-675-1277

NY **Rochester**
L-Mar Assocs., 716-544-8000

NY **Syracuse**
L-Mar Assocs., 315-437-7779

NC **Raleigh**
Rep, Inc., 919-851-3007

OH **Cincinnati**
Makin Assocs., 513-871-2424

OH **Columbus**
Makin Assocs., 614-459-2423

OH **Dayton**
Monolithic Memories, 513-439-0470

OH **Mentor**
Makin Assocs., 216-464-4330

OK **Tulsa**
West & Assocs., 918-627-3609

OR **Portland**
N. W. Mktg., 503-297-2581

PA **Oreland**
CMS Mktg., 215-885-5106

TN **Jefferson City**
Rep, Inc., 615-475-4105

TX **Austin**
West & Assocs., 512-454-3681

TX **Dallas**
Monolithic Memories, 214-233-5833

TX **Dallas**
West & Assocs., 214-248-7060

© IC MASTER 1983

Monolithic Memories (Cont)

TX **Garland**
Monolithic Memories, 214-233-5833
TX **Houston**
West & Assocs., 713-777-4108
UT **South Jordan**
Waugaman Assocs., 801-254-0570
VA **Reston**
Monolithic Sales, 703-620-9558
WA **Bellevue**
Northwest Mktg., 206-455-5846
WI **Brookfield**
Sumer, 414-784-6641
Can **Brampton, Ontario**
Cantec, 416-791-5922
Can **Kitchener, Ontario**
Cantec, 519-744-6341
Can **Ottawa, Ontario**
Cantec, 613-725-3704
Can **Dollard Des Ormeaux, Quebec**
Cantec, 514-683-6131
PR **Mayaguez**
Comp Rep Assocs., 809-832-9529

Distributors

AL **Huntsville**
Hall-Mark Elctrns., 205-837-8700
AZ **Phoenix**
Kierulff Elctrns., 602-243-4101
AZ **Tempe**
Anthem Elctrns., 602-244-0900
AZ **Tempe**
Bell Inds., 602-966-7800
AZ **Tempe**
Marshall Elctrns., 602-968-6181
AZ **Tucson**
Kierulff Elctrns., 602-624-9986
CA **Canoga Park**
Marshall Elctrns., 213-999-5001
CA **Chatsworth**
Anthem Elctrns., 213-700-1000
CA **Chatsworth**
Arrow Elctrns., 213-701-7500
CA **El Monte**
Marshall Elctrns., 213-686-0141
CA **Irvine**
Marshall Elctrns., 714-556-6400
CA **Los Angeles**
Kierulff Elctrns., 213-725-0325
CA **Newport Beach**
Arrow Elctrns., 714-851-8961
CA **Palo Alto**
Kierulff Elctrns., 415-968-6292
CA **San Diego**
Anthem Elctrns., 714-279-5200
CA **San Diego**
Arrow Elctrns., 714-565-4800
CA **San Diego**
Kierulff Elctrns., 714-278-2112
CA **San Jose**
Anthem Elctrns., 408-946-8000
CA **Sunnyvale**
Arrow Elctrns., 408-745-6600
CA **Sunnyvale**
Diplomat/Westland, 408-734-1900
CA **Tustin**
Anthem Elctrns., 714-730-8000
CA **Tustin**
Image Elctrns., 714-730-0303
CA **Tustin**
Kierulff Elctrns., 714-731-5711
CO **Denver**
Arrow Elctrns., 303-758-2100
CO **Denver**
Kierulff Elctrns., 303-371-6500
CO **Wheatridge**
Bell Inds., 303-424-1985
CT **South Norwalk**
Bond Elctrns., 203-852-1001
CT **Wallingford**
Arrow Elctrns., 203-265-7741
CT **Wallingford**
Marshall Elctrns., 203-265-3822
FL **Clearwater**
Diplomat/Southland, 813-443-4514
FL **Ft. Lauderdale**
Arrow Elctrns., 305-776-7790
FL **Ft. Lauderdale**
Hall-Mark Elctrns., 305-971-9280
FL **Orlando**
Hall-Mark Elctrns., 305-855-4020
FL **Palm Bay**
Arrow Elctrns., 305-725-1480
FL **St. Petersburg**
Kierulff Elctrns., 813-576-1966
GA **Norcross**
Arrow Elctrns., 404-449-8252
GA **Norcross**
Diplomat Elctrns., 404-449-4133
GA **Norcross**
Hall-Mark Elctrns., 404-447-8000
IL **Bensenville**
Hall-Mark Elctrns., 312-860-3800
IL **Elk Grove Village**
Kierulff Elctrns., 312-640-0200
IL **Schaumburg**
Arrow Elctrns., 312-893-9420
IN **Indianapolis**
Advent Elctrns., 317-872-4910
IN **Indianapolis**
Arrow Elctrns., 317-243-9353
IA **Cedar Rapids**
Advent Elctrns., 319-363-0221
KS **Lenexa**
Hall-Mark Elctrns., 913-888-4747
MD **Baltimore**
Arrow Elctrns., 301-247-5200
MD **Baltimore**
Hall-Mark Elctrns., 301-796-9300
MD **Gaithersburg**
Pioneer Wash., 301-948-0710
MA **Billerica**
Kierulff Elctrns., 617-667-8331
MA **Burlington**
Lionex, 617-272-9400
MA **Woburn**
Arrow Elctrns., 617-933-8130
MI **Ann Arbor**
Arrow Elctrns., 313-971-8220
MI **Farmington**
Diplomat/Northland, 313-477-3200
MI **Grand Rapids**
RS Elctrns., 616-241-3483
MI **Kalamazoo**
RS Elctrns., 616-381-5470
MI **Livonia**
RS Elctrns., 313-525-1155
MN **Bloomington**
Hall-Mark Elctrns., 612-941-7500
MN **Edina**
Arrow Elctrns., 612-830-1800
MN **Edina**
Kierulff Elctrns., 612-835-4388
MO **Earth City**
Hall-Mark Elctrns., 314-291-5350
MO **St. Louis**
Arrow Elctrns., 314-567-6888
NH **Manchester**
Arrow Elctrns., 603-668-6968
NJ **Fairfield**
Arrow Elctrns., 201-575-5300
NJ **Cherry Hill**
Hall-Mark Elctrns., 609-424-0880
NJ **Fairfield**
Kierulff Elctrns., 201-575-6750
NJ **Fairfield**
Lionex, 201-227-7960
NJ **Moorestown**
Arrow Elctrns., 609-235-1900
NJ **Mt. Laurel**
Marshall Elctrns., 215-627-1920
NJ **Totowa**
Diplomat/IPC, 201-785-1830
NM **Albuquerque**
Arrow Elctrns., 505-243-4556
NM **Albuquerque**
Bell Inds., 505-292-2700
NY **Buffalo**
Summit Distrs., 716-884-3450
NY **East Syracuse**
ADD Elctrns., 315-437-0300
NY **Endwell**
Marshall Elctrns., 607-754-1570
NY **Farmingdale**
Arrow Elctrns., 516-694-6800
NY **Hauppauge**
Arrow Elctrns., 516-231-1000
NY **Hauppauge**
Current Comps., 516-273-2600
NY **Hauppauge**
Lionex, 516-273-1660
NY **Liverpool**
Arrow Elctrns., 315-652-1000
NY **Melville**
Diplomat Elctrns., 516-454-6400
NY **Rochester**
Summit Distrs., 716-334-8110
NY **Rochester**
Arrow Elctrns., 716-275-0300
NC **Raleigh**
Hall-Mark Elctrns., 919-832-4465
NC **Raleigh**
Resco Raleigh, 919-781-5700
NC **Winston-Salem**
Arrow Elctrns., 919-725-8711
OH **Centerville**
Arrow Elctrns., 513-435-5563
OH **Cleveland**
Hall-Mark Elctrns., 216-473-2907
OH **Dayton**
Marshall Elctrns., 513-236-8088
OH **Solon**
Arrow Elctrns., 216-248-3990
OH **Westerville**
Hall-Mark Elctrns., 614-891-4555
OK **Tulsa**
Hall-Mark Elctrns., 918-835-8458
OK **Tulsa**
Quality Components, 918-664-8812
OK **Tulsa**
Radio, Inc., 918-587-9123
OR **Portland**
Kierulff Elctrns., 503-641-9150
PA **Horsham**
Pioneer/Delaware Valley, 215-674-4000
PA **Monroeville**
Arrow Elctrns., 412-856-7000
TX **Addison**
Quality Comps., 214-387-4949
TX **Austin**
Hall-Mark Elctrns., 512-258-8848
TX **Austin**
Quality Comps., 512-835-0220
TX **Dallas**
Arrow Elctrns., 214-386-7500
TX **Dallas**
Hall-Mark Elctrns., 214-234-7300
TX **Houston**
Hall-Mark Elctrns., 713-781-6100
TX **Houston**
Quality Comps., 713-772-7100
TX **Stafford**
Arrow Elctrns., 713-491-4100
UT **Salt Lake City**
Bell Inds., 801-972-6969
UT **Salt Lake City**
Kierulff Elctrns., 801-973-6913
WA **Bellevue**
Almac/Stroum Elctrns., 206-643-9992
WA **Bellevue**
Arrow Elctrns., 206-643-4800

© IC MASTER 1983

Monolithic Memories (Cont)

WA **Tukwila**
Kierulff Elctrns., 206-575-4420
WI **Oak Creek**
Arrow Elctrns., 414-764-6600
WI **Oak Creek**
Hall-Mark Elctrns., 414-761-3000
WI **Waukesha**
Kierulff Elctrns., 414-784-8160
Can **Brampton, Ontario**
Zentronics Ltd., 416-451-9600
Can **Calgary, Alberta**
Future Elctrns., 403-259-6408
Can **Calgary, Alberta**
Zentronics Ltd., 403-230-1422
Can **Dartmouth, Nova Scotia**
Zentronics Ltd., 902-463-8411
Can **Edmonton, Alberta**
Zentronics Ltd., 403-463-3014
Can **Ottawa, Ontario**
Future Elctrns., 613-820-8313
Can **Ottawa, Ontario**
Zentronics Ltd., 613-238-6411
Can **Toronto, Ontario**
Future Elctrns., 416-663-5563
Can **Vancouver, British Columbia**
Future Elctrns., 604-438-5545
Can **Vancouver, British Columbia**
RAE Elctrns., 604-291-8866
Can **Vancouver, British Columbia**
Zentronics Ltd., 604-688-2533
Can **Waterloo, Ontario**
Zentronics Ltd., 519-884-5700
Can **Winnipeg, Manitoba**
Zentronics Ltd., 204-775-8661
Can **Montreal, Quebec**
Future Elctrns., 514-694-7710
Can **Montreal, Quebec**
Zentronics Ltd., 514-735-5361
Intl **Australia, Burwood**
R & D Elctrns. Pty. Ltd., TEL: 3-288-8232
Intl **Australia, Crows Nest**
R & D Elctrns. Pty. Ltd., TEL: 2-439-5488
Intl **Austria, Wien**
Ing. Ernst Steiner, TEL: 22-8274740
Intl **Denmark, Kokkedal**
C-88, TEL: 2-244888
Intl **England, Berkshire**
Macro Mktg. Ltd., TEL: 628663011
Intl **England, Birmingham**
Memory Devices Ltd., TEL: 021-455-9395
Intl **England, East Molesey**
Memory Devices Ltd., TEL: 1-9411066
Intl **England, Hampshire**
Monolithic Memories Ltd., TEL: (0252) 517431
Intl **England, Middlesex**
Hy-Comp Ltd., TEL: (07842) 46273
Intl **Finland, Vantaa**
Telercas O.Y., TEL: 0-821655
Intl **France, Asnieres**
Alfatronic S.A.R.L., TEL: 1-7914444
Intl **France, Les Ulis Cedex**
Generim S.A.R.L., TEL: 1-9077878
Intl **France, Rungis Cedex**
Monolithic Memories France S.A.R.L., TEL: 1-6874500
Intl **Germany, Berlin**
Dr. Dohrenberg Vertriess GmbH, TEL: 030-2138043-45
Intl **Germany, Gerlingen-Stuttgart**
Positron Bauelemente Vertriebs GmbH, TEL: 07 156-23051
Intl **Germany, Munich**
Astronic GmbH, TEL: 304011
Intl **Germany, Munich**
Elctrn. 2000 Vertriebs GmbH, TEL: 89-434061
Intl **Germany, Munich**
Monolithic Memories, GmbH, TEL: 89-984961
Intl **Germany, Quickborn**
Nordelektronik GmbH KG, TEL: 04106-4031
Intl **Germany, Wiesbaden**
Elcowa GmbH, TEL: 06121-65005
Intl **India, New Delhi**
Comps. & Sys. Ltd., TEL: 011-277388
Intl **India, PIN**
Kryonix, TEL: 011-63805
Intl **Israel, Tel Aviv**
Telsys Ltd., TEL: (3) 494891-5
Intl **Italy, Milano**
Comprel S.R.L., TEL: 2-6120641
Intl **Japan, Tokyo**
Monolithic Memories Japan KK, TEL: 3-427-29-3401
Intl **Netherlands, Heeswijk**
Manudax Nederland B.V., TEL: 04139-2901
Intl **Norway, Oslo**
Henaco A/S, TEL: 2-162110
Intl **Singapore, Kolam Ayer**
Dynamar International Ltd., TEL: 747-6188
Intl **South Africa, Pinegowrie**
Radiokom Ltd., TEL: 789-1400
Intl **Spain, Madrid**
Sagitron, TEL: (1) 275-4824
Intl **Sweden, Solna**
Naxab, TEL: 8-985140
Intl **Switzerland, Zurich**
Industrade AG, TEL: 01-3632230
Intl **Taiwan, Taipei**
Multitech Intl. Corp., TEL: (2) 769-1225

Monolithic Systems

Monolithic Systems Corporation
84 Inverness Circle East
Englewood, Colorado 80112
303-770-7400

Monosil

Monosil, Inc.
3060 Raymond Street
Santa Clara, California 95050
408-727-6562
TWX: 910-338-0540

Mostek

Mostek Corporation
1215 West Crosby Road
Carrollton, Texas 75006
214-466-6000
TELEX: 730423

Specific product information:
Microcomputers Components ..... Frank Marshall
Microcomputer Systems ..... Frank Marshall
Telecommunications ..... Bob Cook
Memory Systems ..... Frank Marshall
Memory Products ..... Jeff Schlageter

Literature:
Literature Department M/S 1109

Price and delivery:
Contact Sales Office or Dist.

Follow-up an order:
Customer Service

Sales Offices & Representatives

Intl **Austria, Vienna**
Transistor Vertriebsges. mbH, TEL: (0222) 829451, 829404
Intl **Belgium, Brussels**
Mostek International, TEL: 02/762.18.80
Intl **Belgium, Brussels**
Sotronic, TEL: 02-736.10.07
Intl **Denmark, Copenhagen**
Semicap APS, TEL: 01-22.15.10
Intl **Finland, Helsinki**
Insele Oy, TEL: 0 735 774
Intl **France, Bonneuil**
Mecodis, TEL: (1) 339.20.20
Intl **France, BUC**
Copel, TEL: (1) 956.10.18
Intl **France, Chalon/Saone**
Facen
Intl **France, Fresnes Cedex**
Mostek France s.a.r.l., TEL: (1) 666.21.25
Intl **France, Lilis**
Facen
Intl **France, Montrouge**
P.E.P., TEL: (1) 735.33.20
Intl **France, Nancy**
Facen
Intl **France, Rouen**
Facen
Intl **France, Rungis Cedex**
Scaib, TEL: (1) 687.23.13
Intl **France, Strasbourg**
Facen
Intl **France, Villeurbanne**
Sorhodis, TEL: (7) 885-0044
Intl **France, Wasquehal, Nord**
Facen, TEL: (20) 98.92.15
Intl **Germany, Berlin**
Dr Dohrenberg, TEL: (030) 213.80.43
Intl **Germany, Berlin**
Neye Enatechnik GmbH
Intl **Germany, Darmstadt**
Neye Enatechnik GmbH
Intl **Germany, Dusseldorf**
Neye Enatechnik GmbH
Intl **Germany, Hannover**
Neye Enatechnik GmbH
Intl **Germany, Michelstadt**
Siegfried Ecker, TEL: (06061) 2233
Intl **Germany, Munchen**
Dema-Electronic GmbH, TEL: (089) 2724053
Intl **Germany, Munchen**
Mostek GmbH, TEL: (089) 95.10.71
Intl **Germany, Munchen**
Neye Enatechnik GmbH
Intl **Germany, Neuhausen/Filder**
Mostek GmbH, TEL: (07158) 66.45
Intl **Germany, Quickborn**
Mostek GmbH, TEL: (04106) 2077/78
Intl **Germany, Quickborn**
Neye Enatechnik GmbH, TEL: (04106) 612-1
Intl **Germany, Ratingen**
Raffel-Electronic GmbH, TEL: (02102) 280.24
Intl **Germany, Stuttgart**
Neye Enatechnik GmbH
Intl **Germany, Tubingen**
Matronic GmbH, TEL: (07071) 24331
Intl **Hong Kong**
Mostek Asia Ltd., TEL: 5.296.886
Intl **Italy, Bari**
Comprel s.r.l.
Intl **Italy, Bologna**
Comprel s.r.l.
Intl **Italy, Bologna**
Emesa S.P.A.
Intl **Italy, Chiavari**
Comprel s.r.l.
Intl **Italy, Cinisello B.**
Comprel s.r.l., TEL: (02) 61.20.641/2/3/4/5
Intl **Italy, Firenze**
Comprel s.r.l.
Intl **Italy, Loreto**
Comprel s.r.l.
Intl **Italy, Milano**
Emesa S.P.A., TEL: (02) 869.0616, (02) 860.307
Intl **Italy, Milano**
Mostek Italia SRL, TEL: (02) 318.5337/ 349.2696, (02) 34.23.89
Intl **Italy, Padova**
Comprel s.r.l.
Intl **Italy, Roma**
Comprel s.r.l.

© IC MASTER 1983

Mostek (Cont)

Intl **Italy, Roma**
Emesa S.P.A.

Intl **Italy, Torino**
Comprel s.r.l.

Intl **Italy, Torino**
Emesa S.P.A.

Intl **Italy, Vicenza**
Comprel s.r.l.

Intl **Japan, Tokyo**
Mostek Japan KK, TEL: (03) 404.7261

Intl **Netherlands, Amsterdam**
Nijkerk Elektronika BV, TEL: (020) 428.933

Intl **Norway, Oslo**
Hefro Teknisk A/S, TEL: 02-38.02.86

Intl **Portugal, Lisboa**
Digicontrole LDA, TEL: (19) 292 39 24

Intl **Spain, Barcelona**
Comelta S.A., TEL: (03) 309 5116

Intl **Spain, Madrid**
Comelta S.A., TEL: (01) 7543001

Intl **Sweden, Farsta**
Traco AB, TEL: 08-13.21.60

Intl **Sweden, Jarfalla**
Mostek Scandinavia AB, TEL: 08-36.2820

Intl **Switzerland, Langenthal**
Memotec AG, TEL: 063-28.11.22

Intl **United Kingdom, Gants Hill, Ilford, Essex**
Pronto Elctrn. Systems Ltd., TEL: 01-554.62.22

Intl **United Kingdom, Harlow, Essex**
VSI Elctrns. (UK) Ltd., TEL: (0279) 35477

Intl **United Kingdom, London**
Mostek U.K. Ltd., TEL: 01-2049322

Intl **United Kingdom, Oldham, Lancashire**
Lock Distribution Ltd., TEL: 061-652.04.31

Intl **United Kingdom, Reading, Berks**
Celdis Ltd., TEL: 0734-58.51.71

Intl **United Kingdom, Thame, Oxon**
Thame Components Ltd., TEL: 084-421.31.46

Distributors

Intl **Austria, Vienna**
Transistor Vertriebsges. mbH, TEL: (0222) 829451, 829404

Intl **Belgium, Brussels**
Sotronic, TEL: 02-736.10.07

Intl **Denmark, Copenhagen**
Semicap APS, TEL: 01-22.15.10

Intl **Finland, Helsinki**
Insele Oy, TEL: 0 735 774

Intl **France, Bonneuil**
Mecodis, TEL: (1) 339.20.20

Intl **France, BUC**
Copel, TEL: (1) 956.10.18

Intl **France, Chalon/Saone**
Facen

Intl **France, Lille**
Facen

Intl **France, Montrouge**
P.E.P., TEL: (1) 735.33.20

Intl **France, Nancy**
Facen

Intl **France, Rouen**
Facen

Intl **France, Rungis Cedex**
Scaib, TEL: (1) 687.23.13

Intl **France, Strasbourg**
Facen

Intl **France, Villeurbanne**
Sorhodis, TEL: (7) 885 0044

Intl **France, Wasquehal, Nord**
Facen, TEL: (20) 98.92.15

Intl **Germany, Berlin**
Dr Dohrenberg, TEL: (030) 213.80.43

Intl **Germany, Berlin**
Neye Enatechnik GmbH

Intl **Germany, Darmstadt**
Neye Enatechnik GmbH

Intl **Germany, Dusseldorf**
Neye Enatechnik GmbH

Intl **Germany, Hannover**
Neye Enatechnik GmbH

Intl **Germany, Michelstadt**
Siegfried Ecker, TEL: (06061) 2233

Intl **Germany, Munchen**
Dema-Electronic GmbH, TEL: (089) 2724053

Intl **Germany, Munchen**
Neye Enatechnik GmbH

Intl **Germany, Quickborn**
Neye Enatechnik GmbH, TEL: (04106) 612-1

Intl **Germany, Ratingen**
Raffel-Electronic GmbH, TEL: (02102) 280.24

Intl **Germany, Stuttgart**
Neye Enatechnik GmbH

Intl **Germany, Tubingen**
Matronic GmbH, TEL: (07071) 24331

Intl **Italy, Bari**
Comprel s.r.l.

Intl **Italy, Bologna**
Comprel s.r.l.

Intl **Italy, Bologna**
Emesa S.P.A.

Intl **Italy, Chiavari**
Comprel s.r.l.

Intl **Italy, Cinisello B.**
Comprel s.r.l., TEL: (02) 61.20.641/2/3/4/5

Intl **Italy, Firenze**
Comprel s.r.l.

Intl **Italy, Loreto**
Comprel s.r.l.

Intl **Italy, Milano**
Emesa S.P.A., TEL: (02) 869.0616, (02) 860.307

Intl **Italy, Padova**
Comprel s.r.l.

Intl **Italy, Roma**
Comprel s.r.l.

Intl **Italy, Roma**
Emesa S.P.A.

Intl **Italy, Torino**
Comprel s.r.l.

Intl **Italy, Torino**
Emesa S.P.A.

Intl **Italy, Vicenza**
Comprel s.r.l.

Intl **Netherlands, Amsterdam**
Nijkerk Elektronika BV, TEL: (020) 428.933

Intl **Norway, Oslo**
Hefro Teknisk A/S, TEL: 02-38.02.86

Intl **Portugal, Lisboa**
Digicontrole LDA, TEL: (19) 292 39 24

Intl **Spain, Barcelona**
Comelta S.A., TEL: (03) 309 5116

Intl **Spain, Madrid**
Comelta S.A., TEL: (01) 7543001

Intl **Sweden, Farsta**
Traco AB, TEL: 08-13.21.60

Intl **Switzerland, Langenthal**
Memotec AG, TEL: 063-28.11.22

Intl **United Kingdom, Gants Hill, Ilford, Essex**
Pronto Elctrn. Systems Ltd., TEL: 01-554.62.22

Intl **United Kingdom, Harlow, Essex**
VSI Elctrns. (UK) Ltd., TEL: (0279) 35477

Intl **United Kingdom, Oldham, Lancashire**
Lock Distribution Ltd., TEL: 061-652.04.31

Intl **United Kingdom, Reading, Berks**
Celdis Ltd., TEL: 0734-58.51.71

Intl **United Kingdom, Thame, Oxon**
Thame Components Ltd., TEL: 084-421.31.46

Motorola

Motorola Semiconductor Products
5005 East McDowell Road
Phoenix, Arizona 85008
Specific product information:
Local sales office
Application engineering:
Local sales office
Literature:
Local sales office
Price and delivery:
Local sales office
Place an order:
Local sales office
Follow-up an order:
Local sales office

Sales Offices & Representatives

AL **Huntsville**
Motorola, 205-830-1050

AL **Huntsville**
Pen-Tech Assocs., 205-881-9298

AZ **Scottsdale**
Automotive/Motorola Semiconductor Inter-Company Office, 602-994-6831

AZ **Scottsdale**
Motorola, 602-994-6326

AZ **Scottsdale**
Motorola Semiconductor Inter-Company Office, 602-949-3811

CA **Encino/Sherman Oaks**
Motorola, 213-986-6850

CA **Inglewood**
Basic Sys. Corp., 213-673-4300

CA **Orange**
Motorola, 714-634-2844

CA **San Diego**
Addem, 714-268-8448

CA **San Diego**
Motorola, 714-560-4644

CA **San Jose**
Motorola, 408-985-0510

CA **Santa Clara**
Basic Sys. Corp., 408-727-1800

CO **Boulder**
Westek Data Prods., Inc., 303-989-1900

CO **Denver**
Motorola, 303-773-6800

CT **Hamden**
J & J Assocs., 203-624-7800

CT **New Haven/Hamden**
Motorola, 203-281-0771

FL **Casselberry/Maitland**
Motorola, 305-831-3422

FL **Deerfield Beach**
Pen-Tech Assocs., 305-421-4989

FL **Ft. Lauderdale**
Motorola Semiconductor Inter-Company Office, 305-475-6120

FL **Maitland**
Pen-Tech Assocs., 305-645-3444

FL **Pompano Beach/Ft. Lauderdale**
Motorola, 305-491-8141

FL **St. Petersburg**
Motorola, 813-576-6030

GA **Atlanta**
Motorola, 404-256-0222

GA **Marietta**
Pen-Tech Assocs., 404-424-1931

IL **Chicago**
First Rep Co., 312-992-0830

IL **Chicago/Schaumburg**
Motorola, 312-576-7800

IL **Franklin Park/Schaumburg**
Motorola Semiconductor Inter-Company Office, 312-576-2788

© IC MASTER 1983

Motorola (Cont)

IL **Schaumburg**
Motorola Semiconductor Inter-Company Office, 312-576-5518

IN **Carmel**
Carter, McCormic & Peirce, 317-844-4175

IN **Ft. Wayne**
Motorola, 219-484-0436

IN **Indianapolis**
Motorola, 317-849-7060

IN **Kokomo**
Motorola, 317-457-6634

IA **Cedar Rapids**
Motorola, 319-377-9439

KS **Kansas City/Mission**
Motorola, 913-384-3050

KS **Overland Park**
Power-Tronics, Inc., 913-341-2645

MD **Bethesda**
Powell-Pendergraph, Inc., 301-656-4535

MD **Hyattsville**
Motorola, 301-577-2600

MA **Berlin**
Motorola, 617-562-3856

MA **Burlington**
Motorola, 617-273-5020

MA **Winchester**
J & J Assocs., 617-729-5770

MI **Detroit/Westland**
Motorola, 313-261-6200

MI **Farmington Hills**
Carter, McCormic & Peirce, 313-477-7700

MN **Minneapolis**
Motorola, 612-545-0251

MO **Manchester**
Power-Tronics, Inc., 314-394-5544

MO **St. Louis**
Motorola, 314-872-7681

NJ **River Edge**
Motorola, 201-488-1200

NY **Elmont**
Crane & Egert Corp., 516-488-2100

NY **Long Island/Hauppauge**
Motorola, 516-231-9000

NY **Pittsford**
Motorola, 716-248-5494

NY **Poughkeepsie/Fishkill**
Motorola, 914-896-8970

NY **Syracuse**
Motorola, 315-454-9373

NC **High Point**
Pen-Tech Assocs., 919-883-9125

NC **Raleigh**
Motorola, 919-876-6025

OH **Cleveland**
Carter, McCormic & Peirce, 216-779-5100

OH **Cleveland**
Motorola, 216-461-3160

OH **Columbus/Worthington**
Motorola, 614-846-9460

OH **Dayton**
Carter, McCormic & Peirce, 513-222-7700

OH **Dayton**
Motorola, 513-294-2231

OK **Tulsa**
Motorola, 918-664-5227

OR **Beaverton**
Thorson Co. Northwest, 503-644-5900

OR **Portland**
Motorola, 503-641-3681

PA **Monroeville**
Carter, McCormic & Peirce, 412-372-4415

PA **Philadelphia/Ft. Washington**
Motorola, 215-643-4500

PA **Willow Grove**
Powell-Pendergraph, Inc., 215-657-0330

TN **Knoxville**
Motorola, 615-690-5592

TX **Austin**
Motorola, 512-452-7673

TX **Dallas**
Motorola, 214-661-9829

TX **Dallas**
Digital Mktg. Southwest, 214-638-3073

TX **Ft. Worth**
Motorola Semiconductor Inter-Company Office, 817-232-6255

TX **Houston**
Motorola, 713-688-4583

TX **Houston**
Digital Mktg. Southwest, 713-965-0060

UT **Salt Lake City**
Motorola, 801-539-1190

UT **Salt Lake City**
Westek Data Prods., Inc., 801-363-8113

VA **Charlottesville**
Motorola, 804-977-3691

VA **Richmond**
Powell-Pendergraph, Inc., 804-270-1400

WA **Bellevue**
Motorola, 206-454-4160; 206-622-9960 (Seattle Access)

WA **Bellevue**
Thorson Co. Northwest, 206-455-9180

WI **Milwaukee**
First Rep Co., 414-546-2033

WI **Milwaukee/Wauwatosa**
Motorola, 414-476-5554

Can **Downsview, Ontario**
Motorola, 416-661-6400

Can **Montreal, Quebec**
Motorola, 514-731-6881

Can **Ottawa, Ontario**
Motorola, 613-729-4361

Can **Winnipeg, Manitoba**
Motorola, 204-889-0693

Intl **Australia, Melbourne**
Motorola, TEL: (03) 561-3555

Intl **Australia, Sydney**
Motorola, TEL: 438-1955; 439-2242

Intl **Austria, Vienna**
Motorola, TEL: (0222) 65 01 26

Intl **Brazil, Sao Paulo**
Motorola, TEL: 707-286

Intl **Denmark, Gladsaxevej**
Motorola, TEL: (01) 67 44 22

Intl **England, East Kilbride**
Motorola, TEL: (03552) 39 101

Intl **England, Manchester, Lancashire**
Motorola, TEL: 061-833-0731

Intl **England, Wembley, Middlesex**
Motorola, TEL: 01-902-8836

Intl **France, Grenoble**
Motorola, TEL: (076) 90 22 81

Intl **France, Paris**
Motorola, TEL: (01) 555-91-01

Intl **France, Toulouse**
Motorola, TEL: (061) 41 11 88

Intl **Germany, Langenhagen/Hannover**
Motorola, TEL: (0511) 78-20-37

Intl **Germany, Munich**
Motorola, TEL: (089) 92 481

Intl **Germany, Nurenberg**
Motorola, TEL: (0911) 65761

Intl **Germany, Sindelfingen**
Motorola, TEL: (07031) 83074

Intl **Germany, Wiesbaden**
Motorola, TEL: (06121) 76-1921

Intl **Holland, Utrecht**
Motorola, TEL: 030 510207

Intl **Hong Kong, Hung Hom, Kowloon**
Motorola, TEL: 3-632201-8; 3-336211-22

Intl **Israel, Tel Aviv**
Motorola, TEL: 338973

Intl **Italy, Bologna**
Motorola, TEL: (051) 533 446

Intl **Italy, Milan**
Motorola, TEL: (02) 824 2021

Intl **Italy, Roma**
Motorola, TEL: (03) 831 4746

Intl **Japan, Osaka**
Motorola, TEL: (06) 305 1421

Intl **Japan, Tokyo**
Motorola, TEL: 03-440-3311

Intl **Korea, Seoul**
Motorola, TEL: 261-7137

Intl **Mexico, D.F.**
Motorola, TEL: (525) 524-0706

Intl **Netherlands**
Motorola, TEL: (030) 443 808

Intl **Norway, Oslo**
Motorola, TEL: (02) 671467

Intl **Singapore**
Motorola, TEL: 2945438

Intl **South Africa, Bramley**
Motorola, TEL: 786 1184

Intl **Spain, Madrid**
Motorola, TEL: (01) 279 0802

Intl **Sweden, Solna**
Motorola, TEL: 08/82 02 95

Intl **Switzerland, Geneva**
Motorola, TEL: (022) 991 111

Intl **Switzerland, Zurich**
Motorola, TEL: (01) 730 40 74

Intl **Taiwan, Taipei**
Motorola, TEL: 7528944-9

Distributors

AL **Huntsville**
Hall-Mark Elctrns., 205-837-8700

AL **Huntsville**
Hamilton/Avnet Elctrns., 205-837-7210

AL **Huntsville**
Pioneer/Standard, 205-837-9300

AZ **Phoenix**
Kierulff, 602-243-4101

AZ **Phoenix**
Wyle Distribution Grp., 602-249-2232

AZ **Tempe**
Hamilton/Avnet Elctrns., 602-231-5100

CA **Anaheim**
Zeus West, 714-632-6880

CA **Costa Mesa**
Avnet, 714-754-6155; 213-558-2345

CA **Costa Mesa**
Hamilton Electro Sales, 714-641-4111

CA **Culver City**
Hamilton/Avnet Corporate Headquarters, 213-558-2000

CA **Culver City**
Hamilton Electro Sales/L.A., 213-558-2000

CA **Irvine**
Schweber Elctrns., 213-537-4321; 714-556-3880

CA **Irvine**
Wyle Distribution Grp., 714-641-1600

CA **Los Angeles**
Wyle Distribution Grp., 213-322-8100

CA **Palo Alto**
Kierulff Elctrns.,Inc., 415-968-6292

CA **Palo Alto**
Semi Dice North, 415-967-4392

CA **San Diego**
Hamilton/Avnet Elctrns., 714-571-7510

CA **San Diego**
Kierulff Elctrns., 714-278-2118

CA **San Diego**
Wyle Distribution Grp., 714-565-9171

CA **Santa Clara**
Schweber Elctrns., 408-496-0200

CA **Santa Clara**
Wyle Distribution Grp., 408-727-2500

CA **Sunnyvale**
Bell Inds., 408-734-8570

CA **Sunnyvale**
Hamilton/Avnet Elctrns., 408-743-3300

CO **Denver**
Hamilton/Avnet Elctrns., 303-740-1017

CO **Denver**
Kierulff Elctrns., 303-371-6500

CO **Denver**
Wyle Distribution Grp., 303-457-9953

© IC MASTER 1983

Motorola (Cont)

CT **Danbury**
Hamilton/Avnet Elctrns., 203-797-2800

CT **Danbury**
Schweber Elctrns., 203-792-3500

CT **Norwalk**
Harvey Elctrns., 203-853-1515

FL **Ft. Lauderdale**
Hall-Mark Elctrns., 305-971-9280

FL **Ft. Lauderdale**
Hamilton/Avnet Elctrns., 305-971-2900

FL **Hollywood**
Schweber Elctrns., 305-927-0511

FL **Orlando**
Hall-Mark Elctrns., 305-855-4020

FL **Orlando**
Pioneer/Orlando, 305-859-3600

FL **St. Petersburg**
Hamilton/Avnet Elctrns., 813-576-3930

FL **St. Petersburg**
Kierulff Elctrns. Inc., 813-576-1966

GA **Atlanta**
Schweber Elctrns., 404-449-9170

GA **Norcross**
Hamilton/Avnet Elctrns., 404-447-6027

IL **Bensenville**
Hall-Mark Elctrns., 312-860-3800

IL **Chicago**
Bell Ind., 312-982-9210

IL **Chicago**
Newark Elctrns. Corp., 312-638-4411

IL **Elk Grove Village**
Kierulff, 312-640-0200

IL **Elk Grove Village**
Pioneer/Standard, 312-437-9680

IL **Elk Grove Village**
Schweber Elctrns., 312-364-3750

IL **Elmhurst Industrial Park**
Semiconductor Specialists, Inc./Chicago, 312-279-1000

IL **Schiller Park**
Hamilton/Avnet Elctrns., 312-671-6090

IN **Indianapolis**
Graham Elctrns. Supply, Inc., 317-634-8202

IN **Indianapolis**
Hamilton/Avnet Elctrns., 317-844-9333

IN **Indianapolis**
Pioneer/Standard, 317-849-7300

KS **Overland Park**
Hamilton/Avnet Elctrns., 913-888-8900

KS **Shawnee Mission**
Hall-Mark Elctrns., 913-888-4747

MD **Baltimore**
Hall-Mark Elctrns., 301-796-9300

MD **Gaithersburg**
Pioneer/Standard, 301-948-0710

MD **Gaithersburg**
Schweber Elctrns., 301-840-5900

MD **Hanover**
Hamilton/Avnet Elctrns., 301-621-5410

MD **Savage**
Pyttronic Inds., Inc., 301-792-0780

MA **Bedford**
Schweber Elctrns., 617-275-5100

MA **Boston**
Kierulff Elctrns., 617-667-8331

MA **Boston**
Lionex Corp., 617-272-9400

MA **Burlington**
Zeus Comps., 617-273-0750

MA **Lexington**
Harvey Elctrns., 617-861-9200

MA **Needham**
Impact Sales Co., Inc., 617-444-3971

MA **Wakefield**
Massachusetts Comps., Inc., 617-245-5967

MA **Woburn**
Hamilton/Avnet Elctrns., 617-935-9700

MI **Livonia**
Hamilton/Avnet Elctrns., 313-522-4700

MI **Livonia**
Pioneer-Standard Elctrns., 313-525-1800

MI **Livonia**
R S Elctrns., 313-525-1155

MI **Livonia**
Schweber Elctrns., 313-525-8100

MN **Bloomington**
Hall-Mark Elctrns., 612-854-3223

MN **Eden Prairie**
Schweber Elctrns., 612-941-5280

MN **Edina**
Kierulff Elctrns., 612-941-7500

MN **Minnetonka**
Hamilton/Avnet Elctrns., 612-932-0664

MO **Earth City**
Hall-Mark Elctrns., 314-291-5350

MO **Earth City**
Hamilton/Avnet Elctrns., 314-344-1200

NJ **Cherry Hill**
Hall-Mark Elctrns., 609-424-0880

NJ **Cherry Hill**
Hamilton/Avnet Elctrns., 609-424-0110; 215-925-6900

NJ **Fairfield**
Hamilton/Avnet Elctrns., 201-575-3390

NJ **Fairfield**
Schweber Elctrns., 201-227-7880

NJ **Pinebrook**
Harvey Elctrns., 201-575-3510

NM **Albuquerque**
Alliance Elctrns., 505-292-3360

NM **Albuquerque**
Hamilton/Avnet Elctrns., 505-765-1500

NY **East Syracuse**
Hamilton/Avnet Elctrns., 315-437-2641

NY **Elmsford**
Zeus Comps., 914-937-7400

NY **Fairport**
Harvey Elctrns., 716-381-7070

NY **Farmingdale**
Harrison Radio Corp., 516-293-7990

NY **Hauppauge**
JACO Elctrns., 516-273-5500

NY **Melville**
Hamilton/Avnet Elctrns., 516-454-6000

NY **Rochester**
Hamilton/Avnet Elctrns., 716-475-9130

NY **Rochester**
Schweber Elctrns., 716-424-2222

NY **Vestal**
Harvey Elctrns., 607-748-8211

NY **Westbury**
Schweber Elctrns., 516-334-7474

NY **Woodbury**
Harvey Radio, 516-921-8700

NC **Greensboro**
Pioneer/Carolina, 919-273-4441

NC **Raleigh**
Hall-Mark Elctrns., 919-832-4465

NC **Raleigh**
Hamilton/Avnet Elctrns., 919-829-8030

OH **Beachwood**
Schweber Elctrns., 216-464-2970

OH **Centerville**
Hamilton/Avnet Elctrns., 513-433-0610

OH **Cleveland**
Hall-Mark Elctrns., 216-473-2907

OH **Cleveland**
Hamilton/Avnet Elctrns., 216-831-3500

OH **Cleveland**
Pioneer/Standard, 216-587-3600

OH **Dayton**
Pioneer/Standard, 513-236-9900

OH **Worthington**
Hall-Mark Elctrns., 614-846-1882

OK **Tulsa**
Hall-Mark Elctrns., 918-835-8458

OK **Tulsa**
Radio Inc., 918-587-9123

OR **Beaverton**
Almac/Stroum Elctrns., 503-641-9070

OR **Lake Oswego**
Hamilton/Avnet Elctrns., 503-635-8831

PA **Horsham**
Pioneer/Delaware Valley, 215-674-4000

PA **Horsham**
Schweber Elctrns., 215-441-0600

PA **Montgomeryville**
Pyttronic Inds., Inc., 215-643-2850

PA **Pittsburgh**
Pioneer/Standard, 412-782-2300

TX **Austin**
Hall-Mark Elctrns., 512-258-8848

TX **Austin**
Hamilton/Avnet Elctrns., 512-837-8911

TX **Dallas**
Hall-Mark Corporate, 214-343-5000

TX **Dallas**
Hall-Mark Elctrns., 214-341-1147

TX **Dallas**
Schweber Elctrns., 214-661-5010

TX **Dallas**
Trevino Elctrns., Inc., 214-358-2418

TX **Houston**
Hall-Mark Elctrns., 713-781-6100

TX **Houston**
Hamilton/Avnet Elctrns., 713-780-1771

TX **Houston**
Schweber Elctrns., 713-784-3600

TX **Irving**
Hamilton/Avnet Elctrns., 214-661-8661

UT **Salt Lake City**
Bell Inds., 801-972-6969

UT **Salt Lake City**
Hamilton/Avnet Elctrns., 801-972-4300

WA **Bellevue**
Hamilton/Avnet Elctrns., 206-643-3950

WA **Seattle**
Almac/Stroum Elctrns., 206-763-2300

WA **Seattle**
Wyle Distribution Grp., 206-453-8300

WI **New Berlin**
Hamilton/Avnet Elctrns., 414-784-4510

WI **Oak Creek**
Hall-Mark Elctrns., 414-761-3000

Can **Calgary, Alberta**
L.A. Varah, Ltd., 403-276-8818

Can **Calgary, Alberta**
Zentronics, Ltd., 403-230-1422

Can **Edmonton, Alberta**
Intek Elctrns., Ltd., 403-437-2755

Can **Hamilton, Ontario**
L. A. Varah, Ltd., 416-561-9311

Can **London, Ontario**
C.M. Peterson Co., Ltd., 519-434-3204

Can **Mississauga, Ontario**
Hamilton/Avnet Int'l. Canada Ltd., 416-677-7432

Can **Mississauga, Ontario**
Zentronics, Ltd., 416-676-9000

Can **Montreal, Quebec**
Cesco Elctrns., Ltd., 514-735-5511

Can **Montreal, Quebec**
Zentronics, Ltd., 514-735-5361

Can **Ottawa, Ontario**
Hamilton/Avnet Int'l. Canada Ltd., 613-226-1700

Can **Ottawa, Ontario**
Zentronics, Ltd., 613-238-6411

Can **Quebec City, Quebec**
Cesco Elctrns., Ltd., 418-524-4641

Can **St. Laurent, Quebec**
Hamilton/Avnet Int'l. Canada Ltd., 514-331-6443

Can **Vancouver, British Columbia**
Intek Elctrns., Ltd., 604-324-6831

Can **Vancouver, British Columbia**
L.A. Varah, Ltd., 604-873-3211

Can **Vancouver, British Columbia**
Zentronics, Ltd., 604-325-3292

Can **Willowdale, Ontario**
Electro Sonic, Inc., 416-494-1555

© IC MASTER 1983

Motorola (Cont)

Can **Winnipeg, Manitoba**
Zentronics, Ltd., 204-775-8661

Intl **Germany, Munchen**
Sasco Vertrieb von Etektronischen, TEL: (089) 46 111

Intl **Germany, Nurnberg**
Sasco, TEL: (0911) 204152

Intl **Germany, Quickborn**
Neye Enatechnik GmbH, TEL: (04106) 6121

Intl **Germany, Schwalbach**
Technoprojekt, TEL: (06196) 82100

Intl **Germany, Stuttgart**
E.B.V. Elektronik Vertriebs GmbH, TEL: (0711) 247481

Intl **Germany, Stuttgart**
R.T.G., TEL: (0711) 766428

Intl **Germany, Stuttgart**
Sasco, TEL: (0711) 244521

Intl **Germany, Stuttgart**
Technoprojekt, TEL: (0711) 561712

Intl **Germany, Unterhaching**
E.B.V. Elektronik Vertriebs GmbH, TEL: (089) 61105-1

Intl **Germany, Wiesbaden**
R.T.G., TEL: (06121) 527309

Intl **Greece, Thessaloniki**
Macedonian Elctrns. Ltd., TEL: 30 68 00

Intl **Holland, Am Utrecht**
B.V. Diode, TEL: (30) 88 42 14

Intl **Holland, Heeswijk**
Manudax-Nederland B.V., TEL: 04139-1252

Intl **Hong Kong, Kowloon**
Manshing Color & Chemical Co. Ltd., TEL: 3-335121

Intl **Hong Kong, Wanchi**
Alberta Elctrns. Co. Ltd., TEL: 5-283641

Intl **Italy, Bologna**
Celdis Italiana S.p.A., TEL: 051 788078

Intl **Italy, Bologna**
Cramer Italiana S.p.A., TEL: 051 422890/ 434368

Intl **Italy, Milano**
Celdis Italiana S.p.A., TEL: 02 6120041

Intl **Italy, Milano**
Cramer Italia S.p.A., TEL: 02 809326

Intl **Italy, Milano**
Silverstar S.p.A., TEL: 02 4996

Intl **Italy, Roma**
Celdis Italiana S.p.A., TEL: 06 423855/ 4271550

Intl **Italy, Roma**
Cramer Italia S.p.A., TEL: 06 5717981

Intl **Italy, Torino**
Celdis Italiana S.p.A., TEL: 011 359312/ 359369

Intl **Italy, Torino**
Cramer Italia S.p.A., TEL: 011 6192062

Intl **Italy, Torino**
Silverstar S.p.A., TEL: 011 443275/6-442321

Intl **Japan, Osaka**
Shinko Elec. Co., Ltd., TEL: 06-643-1241

Intl **Japan, Tokyo**
Fuji Elctrns. Co., Ltd., TEL: 03-816-7601

Intl **Japan, Tokyo**
Intl. Rectifier Corp., Japan Ltd., TEL: 03-494-2411

Intl **Japan, Tokyo**
Mareui Shoji Co., Ltd., TEL: 0422-554-6181

Intl **Japan, Tokyo**
Omron Tateishi Elctrns. Co., TEL: 03-436-7172

Intl **Japan, Tokyo**
Tokyo Denshi Kagaku Kizai Co., Ltd., TEL: 03-255-8828

Intl **Korea, Seoul**
Seung Junsang SA, TEL: 267-6656

Intl **Malaysia, Kuala Lumpur**
Comptronics Son. BHD, TEL: 480072

Intl **New Zealand, Auckland**
Cema Elekon Ltd., TEL: 760-019

Intl **Norway, Oslo**
Ola Tandberg Elektro AS, TEL: (02) 19 70 30

Intl **Portugal, Lisbon**
Equipamentos De Laboratorio LDA, TEL: 97 65 51

Intl **Singapore, Singapore**
General Elctrns. 4 Instrmn. Corp. Pte., Ltd., TEL: 258-7633

Intl **Singapore, Singapore**
Transco Elctrns. Pte. Ltd., TEL: 294-7127

Intl **Spain, Barcelona**
Hispano Elctrna. S.A., TEL: 330 9718/330 2716

Intl **Spain, Madrid**
Hispano Elctrna. S.A., TEL: 01 619 4108

Intl **Sweden, Stockholm**
AB Gosta Backstrom, TEL: 08-541080

Intl **Sweden, Stockholm**
Distributoren Interelko AB, TEL: (08) 13 21 60

Intl **Switzerland, Wettingen**
Elbatex AG., TEL: (056) 265641

Intl **Switzerland, Zurich**
Omni Ray AG, TEL: (01) 34 07 66

Intl **Taiwan, Taipei**
Strong Elctrns. Co. Ltd., TEL: 521-8826

Intl **Thailand, Bangkok**
G. Simonradio Co. Ltd., TEL: 234-0991

Intl **Turkey, Istanbul**
ERA Elektronik Sanayi, TEL: 64 65 00

Intl **United Kingdom, Reading-Berks**
Celdis Ltd., TEL: (0734) 58 22 11

Intl **United Kingdom, Slough-Berkshire**
Crellon Elctrns. Ltd., TEL: (06286) 4300

Intl **United Kingdom, Harlow-Essex**
ITT Elctrn. Svcs., TEL: (0279) 2677

Intl **United Kingdom, Sevenoaks-Kents**
Jermyn Distribution Ltd., TEL: (732) 50155

Intl **United Kingdom, Oldham-Lancashire**
A.M. Lock & Co. Ltd., TEL: (061) 652 0431/5

Intl **United Kingdom, Sundbury on Thames-Middlesex**
Hawke Elctrns. Ltd., TEL: 01 979 7799

Murray Consulting

Murray Consulting
716 South Meramec Avenue
St. Louis,, Missouri 63105

National Semiconductor

National Semiconductor Corporation
2900 Semiconductor Drive
Santa Clara, California 95051
408-721-5000
TELEX: 346353
TWX: 910-339-9240

Specific product information:
Digital Dept. Head ..... ext. 5716
Bipolar Logic ..... ext. 5832
CMOS Logic ..... ext. 5720
Interface ..... ext. 5873
Discrete Devices ..... ext. 5710
Hybrid Devices ..... ext. 5854
Linear IC ..... ext. 5717
Advanced Linear ..... ext. 5884
Consumer Linear ..... ext. 5853

Application engineering:
Transducers ..... ext. 6523
Discrete ..... ext. 5566
Hybrid ..... ext. 6264
Advanced Linear ..... ext. 5613
Consumer ..... ext. 5607
Standard ..... ext. 5622
Microprocessors ..... ext. 5264
MOS/LSI ..... ext. 6587-6523

Literature:
Marketing Services ..... ext. 5142

Price and delivery:
Local sales office

Place an order:
Local sales office

Follow-up an order:
Customer Service
Distributor Sales ..... ext. 6610
OEM Sales ..... ext. 6620

All other information:
Public Relations ..... ext. 5287

Sales Offices & Representatives

AL **Huntsville**
New Interep Assocs., 205-533-1730

AZ **Scottsdale**
Desert Technical Sales, 602-947-8583

AZ **Scottsdale**
Natl. Semiconductor, Rocky Mountain Regional Off., 602-941-1780

CA **Encino**
Great American Rep. Co., 213-990-4870

CA **Encino**
Natl. Semiconductor, Los Angeles Regional Off., 213-995-8335

CA **Irvine**
Natl. Semiconductor, Western Area Off., 714-957-1626

CA **San Diego**
Natl. Semiconductor, District Sales Off., 714-560-8330

CA **San Diego**
S.R. Elctrns., 714-560-8330

CA **Santa Clara**
Bay Tech Sales, Inc., 408-727-9404

CA **Santa Clara**
Natl. Semiconductor, Northwest Regional Off., 408-247-6397

CA **Tustin**
Great American Rep. Co., 714-832-8113

CO **Aurora**
Monaghan Sales Assocs., 303-360-0955

CO **Englewood**
Natl. Semiconductor, District Sales Off., 303-752-1894

CT **Westport**
NRG Ltd., 203-226-7527

CT **Wilton**
Natl. Semiconductor, Northeast Regional Sales Off., 203-762-0378

FL **Ft. Lauderdale**
QXI, 305-485-6030

FL **Miami**
Natl. Semiconductor, Eastern Area Off., 305-949-3162

FL **St. Petersburg**
QXI, 813-821-2281

GA **Atlanta**
Action Component Sales, 404-393-9494

GA **Atlanta**
Natl. Semiconductor, Dixie Regional Off., 404-393-2626

IL **Arlington Heights**
Delta Tech. Sales, 312-253-9440

IL **Schaumburg**
Natl. Semiconductor, West-Central Regional Off., 312-397-8777

IN **Ft. Wayne**
Advanced Comp. Sales, 219-484-0722

IN **Indianapolis**
Advanced Comp. Sales, 317-545-6441

IN **Indianapolis**
Natl. Semiconductor, North-Central Regional Off., 317-842-5006

IA **Cedar Rapids**
Stan Clothier Co., 319-395-0245

KY **Louisville**
Advanced Comp. Sales, 502-459-9895

© IC MASTER 1983

National Semiconductor (Cont)

MD **Columbia**
Natl. Semiconductor, Capitol Regional Off., Baltimore: 301-995-0820; Washington: 301-621-5621

MD **Glen Burnie**
Trimark, Inc., 301-768-2800

MA **Burlington**
Natl. Semiconductor, Northeast Regional Off., 617-273-3170

MA **Lexington**
A/D Sys. Sales, Inc., 617-861-6371

MI **Farmington Hills**
Natl. Semiconductor, District Sales Off., 313-553-0600

MI **St. Joseph**
Rep. of Elctrn. Prods., 616-983-7702

MI **Southfield**
Rep. of Elctrn. Prods., 313-559-1080

MN **Bloomington**
Natl. Semiconductor, Central Area Off., 612-888-3060

MN **Minneapolis**
Stan Clothier Co., 612-944-3456

MO **Earth City**
Cen Tech, 314-291-4230

MO **Kansas City**
Natl. Semiconductor, District Sales Off., 816-931-9600

MO **Raytown**
Cen Tech, 816-358-8100

NJ **Franklin Lakes**
Northeast Comps. Corp., 201-891-6520

NJ **Paramus**
Natl. Semiconductor, Mid-Atlantic Regional Off., 201-967-5300, 516-222-1543

NM **Albuquerque**
Reptronix, Inc., 505-881-8001

NY **Melville**
Parallax Sales, 516-694-9090

NY **Poughkeepsie**
Natl. Semiconductor, IBM District Sales Off., 914-473-8330

NY **Rochester**
Electra Sales Corp., 716-461-5252

NY **Syracuse**
Electra Sales Corp., 315-463-1248

NY **Syracuse**
Natl. Semiconductor, Empire Regional Off., 315-463-8047

NC **Cary**
Engrg. Devices Corp., 919-469-9323

OH **Columbus**
Micro-Tec, Inc., 614-888-9761

OH **Dayton**
Micro-Tec, Inc., 513-866-0380

OH **Dayton**
Natl. Semiconductor, District Sales Off., 513-435-6886

OH **Highland Heights**
Micro-Tec, Inc., 216-442-1555

OH **Highland Heights**
Natl. Semiconductor, East Central Regional Off., 216-461-0191

OR **Beaverton**
Meritech, Inc., 503-644-0304

PA **Ft. Washington**
Natl. Semiconductor, Liberty Regional Off., 215-643-4910

PA **Huntingdon Valley**
Omega Elctrn. Sales, Inc., 215-947-4135

PA **Pittsburgh**
Micro-Tec, Inc., 216-442-1555

TN **Knoxville**
Action Component Sales, 615-690-1172

TX **Austin**
Carter Assocs., Inc., 512-451-0201

TX **Dallas**
Natl. Semiconductor, Central Regional Off., 214-690-4552

TX **Garland**
Carter Assocs., Inc., 214-276-7151

TX **Houston**
Carter Assocs., Inc., 713-789-1680

UT **Murray**
Monaghan Sales Assocs., 801-261-5402

VA **Newport News**
Trimark, Inc., 804-874-2325

WA **Bellevue**
Meritech, Inc., 206-454-4600

WA **Bellevue**
Natl. Semiconductor, Cascade Regional Off., 206-453-9944

WI **Milwaukee**
Delta Technical Sales, 414-527-3800

Can **Brampton, Ontario**
Canadian Micro Sales, Inc., 416-453-9121

Can **Mississauga, Ontario**
Natl. Semiconductor, Canadian Regional Off., 416-678-2920

Can **Montreal, Quebec**
Canadian Micro Sales, 514-748-6579

Can **Ottawa, Ontario**
Canadian Micro Sales/NSC, 613-596-1999

Intl **Australia, Bayswater, Victoria**
NS Elctrns. Pty. Ltd., TEL: 03-729-6333

Intl **Belgium, Brussels**
Natl. Semiconductor Benelux, TEL: (02) 4661807

Intl **Brasil, Sao Paulo**
NS Elctrns. Do Brasil

Intl **Denmark, Copenhagen**
Natl. Semiconductor (UK), Ltd., TEL: (01) 213211

Intl **Finland, Helsinki**
Natl. Semiconductor, TEL: (0) 14 03 44

Intl **France, Fontenay-aux-Roses**
Natl. Semiconductor, TEL: (01) 660-8140

Intl **Hong Kong, Kowloon**
Natl. Semiconductor Hong Kong, Ltd., TEL: 3-899235

Intl **Italy, Milano**
Natl. Semiconductor S.p.A., TEL: (02) 345-2046/7/8/9

Intl **Japan, Tokyo**
NS Japan K.K., TEL: (03) 349-0811

Intl **Korea, Seoul**
Natl. Semiconductor Hong Kong, Ltd., TEL: 267-9473

Intl **Mexico, Mexico**
Elctrna. NSC de Mexico SA, TEL: (905) 531-1689, 531-0659

Intl **Singapore**
Natl. Semiconductor PTE, Ltd., TEL: 652 700047

Intl **Spain, Madrid**
Natl. Semiconductor, TEL: (01) 733-2954/733-2958

Intl **Sweden, Skarholmen**
Natl. Semiconductor AB, TEL: (08) 970190

Intl **Switzerland, Wallisellen-Zurich**
Natl. Semiconductor Switzerland, TEL: (01) 830-2727

Intl **Taiwan, Taipei**
Natl. Semiconductor Taiwan, Ltd., TEL: 7310393-4, 7310465-6

Intl **United Kingdom, Bedford**
Natl. Semiconductor (UK), Ltd., TEL: 0234-47147

Intl **West Germany, Munchen**
Natl. Semiconductor GmbH, TEL: (089) 58 30 81

PR **Puerto Rico**
Natl. Semiconductor

Distributors

AL **Huntsville**
Hamilton/Avnet Elctrns., 205-837-7210

AL **Huntsville**
Pioneer Elctrns., 205-837-9300

AL **Huntsville**
Schweber Elctrns., 205-882-2200

AZ **Tempe**
Anthem Elctrns., 602-244-0900

AZ **Tempe**
Hamilton/Avnet Elctrns., 602-894-9600

CA **Canoga Park**
Schweber Elctrns., 213-999-4702

CA **Chatsworth**
Anthem Elctrns., 213-700-1000

CA **Costa Mesa**
Avnet Elctrns., 714-754-6050

CA **Costa Mesa**
Hamilton Electro Sales, 714-641-4159

CA **Culver City**
Hamilton Electro Sales, 213-558-2121

CA **Hawthorne**
Hamilton/Avnet Elctrns.

CA **Irvine**
Schweber Elctrns., 714-556-3880; 213-537-4320

CA **Sacramento**
Hamilton/Avnet Elctrns., 916-925-2216

CA **Sacramento**
Schweber Elctrns., 916-929-9732

CA **San Diego**
Anthem Elctrns., 714-279-5200

CA **San Diego**
Hamilton/Avnet Elctrns., 714-571-7510

CA **San Jose**
Anthem Elctrns., 408-946-8000

CA **Santa Clara**
Schweber Elctrns., 408-748-4700

CA **Sunnyvale**
Bell Inds., 408-734-8570

CA **Sunnyvale**
Hamilton/Avnet Elctrns., 408-743-3355

CA **Tustin**
Anthem Elctrns., 714-730-8000

CA **Woodland Hills**
Avnet Elctrns., 213-883-0000

CO **Englewood**
Hamilton/Avnet Elctrns., 303-741-1000

CO **Wheatridge**
Bell Inds., 303-779-9998

CT **Danbury**
Hamilton/Avnet Elctrns., 203-797-2853

CT **Danbury**
Schweber Elctrns., 203-792-3500

CT **Norwalk**
Harvey Elctrns., 203-853-1515

FL **Altamonte Springs**
Schweber Elctrns., Inc., 305-331-7555

FL **Ft. Lauderdale**
Hamilton/Avnet, 305-971-3493

FL **Ft. Lauderdale**
Hammond Elctrns., 305-973-7103

FL **Ft. Lauderdale**
Pioneer Elctrns., 305-771-7520

FL **Hollywood**
Schweber Elctrns., Inc., 305-927-0511

FL **Orlando**
Hammond Elctrns., 305-849-6060

FL **Orlando**
Pioneer/Florida, 305-859-3600

FL **St. Petersburg**
Hamilton/Avnet, 813-576-3930

GA **Norcross**
Hamilton/Avnet Elctrns., 404-447-7500

GA **Norcross**
Pioneer/Georgia Elctrns., 404-448-1711

GA **Norcross**
Schweber Elctrns., 404-449-9170

IL **Bensenville**
Hamilton/Avnet Elctrns., 312-860-7780

IL **Elk Grove Village**
Pioneer Elctrns., 312-437-9680

IL **Elk Grove Village**
Schweber Elctrns., Inc., 312-364-3750

IL **Lombard**
R.M. Electronics, 312-932-5150

© IC MASTER 1983

National Semiconductor (Cont)

IL **Rosemont**
Advent Elctrns., 312-298-4210

IN **Carmel**
Hamilton/Avnet Elctrns., 317-844-9333

IN **Indianapolis**
Advent Indiana, Inc., 317-872-4910

IN **Indianapolis**
Pioneer Indiana Elctrns., Inc., 317-849-7300

IA **Cedar Rapids**
Advent Elctrns., 319-363-0221

IA **Cedar Rapids**
Schweber Elctrns., 319-373-1417

KS **Overland Park**
Hamilton/Avnet Elctrns., 913-888-8900

MD **Columbia**
Hamilton/Avnet Elctrns., 301-995-3500

MD **Gaithersburg**
Pioneer Washington Elctrns., 301-948-0710

MD **Gaithersburg**
Schweber Elctrns., Inc., 301-840-5900

MA **Bedford**
Schweber Elctrns., 617-275-5100

MA **Burlington**
Lionex Inc., 617-272-9400

MA **Lexington**
Harvey Elctrns., 617-861-9200

MA **Woburn**
Hamilton/Avnet Elctrns., 617-273-7500

MI **Grand Rapids**
Hamilton/Avnet, 616-243-8805

MI **Grand Rapids**
R-M Michigan, Inc., 616-531-9300

MI **Livonia**
Hamilton/Avnet Elctrns., 313-522-4700

MI **Livonia**
Pioneer/Michigan, 313-525-1800

MN **Eden Prairie**
Schweber Elctrns., 612-941-5280

MN **Minnetonka**
Hamilton/Avnet Elctrns., 612-932-0600

MN **Minnetonka**
Pioneer/Twin Cities, 612-935-5444

MO **Earth City**
Hamilton/Avnet Elctrns., 314-344-1200

NJ **Cherry Hill**
Hamilton/Avnet Elctrns., 609-424-0100

NJ **Fairfield**
Hamilton/Avnet Elctrns., 201-575-3390

NJ **Fairfield**
Lionex Corp., 201-227-7960

NJ **Fairfield**
Schweber Elctrns., 201-227-7880

NJ **Pine Brook**
Harvey Elctrns., 201-575-3510

NM **Albuquerque**
Bell/Century Elctrns., 505-292-2700

NM **Albuquerque**
Hamilton/Avnet Elctrns., 505-765-1500

NY **Binghamton**
Harvey Elctrns., 607-748-8211

NY **Buffalo**
Summit Distrs., 716-887-2800

NY **East Syracuse**
Hamilton/Avnet Elctrns., 315-437-2642

NY **Fairport**
Harvey Elctrns., 716-381-7070

NY **Hauppauge**
Lionex Corp., 516-273-1660

NY **Melville**
Hamilton/Avnet Elctrns., 516-454-6060

NY **Rochester**
Hamilton/Avnet Elctrns., 716-475-9130

NY **Rochester**
Schweber Elctrns., Inc., 716-424-2222

NY **Rochester**
Summit Elctrns. of Rochester Inc., 716-334-8110

NY **Westbury**
Schweber Elctrns. Inc, 516-334-7474

NY **Woodbury**
Harvey Elctrns., 516-921-8700

NC **Greensboro**
Hammond Elctrns. of Carolina, Inc., 919-275-6391

NC **Greensboro**
Pioneer Carolina, Inc., 919-273-4441

NC **Raleigh**
Hamilton/Avnet, 919-829-8030

OH **Cleveland**
Hamilton/Avnet Elctrns., 216-831-3500

OH **Cleveland**
Pioneer Standard, 216-587-3600

OH **Dayton**
Hamilton/Avnet Elctrns., 513-433-0610

OH **Dayton**
Pioneer Standard, 513-236-9900

OH **Highland Heights**
CAM/OHIO Elctrns., 216-461-4700

OK **Tulsa**
Quality Components, 918-664-8812

OK **Tulsa**
Radio Inc., 918-587-9123

OK **Tulsa**
Schweber Elctrns., 918-622-8000

OR **Lake Oswego**
Bell Inds., Inc., 503-241-4115

OR **Lake Oswego**
Hamilton/Avnet Elctrns., 503-635-7850

PA **Horsham**
Pioneer Elctrns. Corp., 215-674-4000

PA **Horsham**
Schweber Elctrns., 215-441-0600

PA **Pittsburgh**
CAM/RPC Elctrns., 412-782-3770

PA **Pittsburgh**
Pioneer/Pittsburgh, 412-782-2300

SC **Greenville**
Hammond Elctrns. of Carolina, Inc., 803-233-4121

TN **Knoxville**
Hammond Elctrns., 615-691-3491

TX **Addison**
Quality Components, 214-387-4949

TX **Austin**
Hamilton/Avnet Elctrns., 512-837-8911

TX **Austin**
Quality Components, 512-835-0220

TX **Austin**
Schweber Elctrns., 512-458-8253

TX **Dallas**
Pioneer/Dallas, 214-386-7300

TX **Dallas**
Schweber Elctrns., 214-661-5010

TX **Houston**
Hamilton/Avnet Elctrns., 713-780-1771

TX **Houston**
Pioneer/Houston, 713-988-5555

TX **Houston**
Quality Components, 713-772-7100

TX **Houston**
Schweber Elctrns., 713-784-3600

TX **Irving**
Hamilton/Avnet Elctrns., 214-659-4151

UT **Salt Lake City**
Bell Inds., 801-972-6969

UT **Salt Lake City**
Hamilton/Avnet Elctrns., 801-972-4300

WA **Bellevue**
Hamilton/Avnet Elctrns., 206-746-8750

WA **Seattle**
Almac/Stroum Elctrns., 206-763-2300

WI **Brookfield**
Schweber Elctrns., 414-784-9020

WI **New Berlin**
Hamilton/Avnet, 414-784-4516

Can **Brampton, Ontario**
Zentronics, 416-451-9600

Can **Burnaby, British Columbia**
R-A-E Industrial Elctrns. Ltd., 604-291-8866

Can **Calgary, Alberta**
Hamilton/Avnet Elctrns.

Can **Calgary, Alberta**
Zentronics, 403-230-1422

Can **Doval, Quebec**
Semad Elctrns., Ltd., 514-636-4614

Can **Downsview, Ontario**
Semad Elctrns., Ltd., 416-663-5650

Can **Edmonton, Alberta**
Zentronics, 403-463-3014

Can **Mississauga, Ontario**
Hamilton/Avnet Elctrns., Ltd., 416-677-7432

Can **Ottawa, Ontario**
Hamilton/Avnet Elctrns., 613-226-1700

Can **Ottawa, Ontario**
Semad Elctrns., Ltd., 613-772-6571

Can **Ottawa, Ontario**
Zentronics, 613-238-6411

Can **St. Laurent, Quebec**
Hamilton/Avnet Elctrns., Ltd., 514-331-8555

Can **St. Laurent, Quebec**
Zentronics, 514-735-5361

Can **Vancouver, British Columbia**
Intek Elctrns., Ltd., 604-324-6831

Can **Vancouver, British Columbia**
Zentronics, 604-688-2533

Can **Waterloo, Ontario**
Zentronics, 519-884-5700

Can **Willowdale, Ontario**
Electro Sonic Inc., 416-494-1666

Can **Winnipeg, Manitoba**
Zentronics, 204-775-8661

NCR

NCR Corporation
Microelectronics Division
8181 Byers Road
Miamisburg, Ohio 45342
513-866-7217
TELEX: 241 669

Sales Offices & Representatives

Intl **Ireland, Dublin**
Nets Ltd., TEL: 450-635

NEC Electronics U.S.A.

NEC Electronics U.S.A. Inc.
Electron Division
252 Humboldt Court
Sunnyvale, California 94086
408-745-6520
TELEX: 35-7475
TWX: 910-339-9539

Specific product information:
Consumer IC's ..... Ken Wong
Industrial IC's ..... T. Takagaki
Discrete Semiconductors ..... Jim McAuley

Literature:
Karen Maestas

Price and delivery:
Customer Service Dept.

Place an order:
Customer Service Dept.

Follow-up an order:
Customer Service Dept.

All other information:
Ed Damour

© IC MASTER 1983

NEC Electronics U.S.A.

NEC Electronics U.S.A. Inc.
Electronic Arrays Division
550 E. Middlefield Road
Mountain View, California 94043
415-964-4321
TWX: 910-379-6985

Specific product information:
LSI Products ..... Mike Cassidy
BOM Products ..... R. Eiler
RAM Products ..... M. McCoy

Literature:
Marketing Services

Price and delivery:
Local Field Sales Offices (preferred), or Customer Service

Follow-up an order:
Customer Service

All other information:
Marketing Services

Sales Offices & Representatives

Intl **Australia, Prospect**
A. J. Ferguson, TEL: 269-1244

Intl **Belgium, Bruxelles**
Betea Spri., TEL: 02 649 99 00

Intl **Denmark, Hoersholm**
C-88, TEL: 02-570888

Intl **Finland, Helsinki**
S.W. Instrs., TEL: 738265/713575

Intl **France, Paris**
Technology Resources S.A., TEL: 01 747 4717

Intl **Germany, Duesseldorf**
NEC Elctrns. GmbH, TEL: 0211 3069 71

Intl **Holland, Breda**
Famatra Benelux, TEL: 076-133457

Intl **Hong Kong, Kowloon**
S.S.I. Far East Ltd., TEL: 3-672112-3.

Intl **India, Bombay**
Hinditron Svcs. Pvt. Ltd., TEL: 36 5 3 44

Intl **Israel, Ramat-Gan**
Telsys, Ltd., TEL: 482126

Intl **Italy, Milano**
Comprel Elettronica, TEL: 02/6120641

Intl **Japan, Osaka**
Rikei Corp., TEL: 06 (374) 1771

Intl **Japan, Tokyo**
Rikei Corp., TEL: 03-345-1411

Intl **Korea, Seoul**
Duk Sung Trading Co., TEL: 777-2325

Intl **Norway, Strommen**
Kjell Bakke, TEL: 02 711872

Intl **Spain, Madrid**
Belport Elctrna., TEL: 01 262 88 37/8

Intl **Sweden, Vallingby**
Teleimport AB, TEL: 8-890265

Intl **Switzerland, Zurich**
Dimos AG, TEL: 01-626 140

Intl **Switzerland, Zurich**
Ellyptic AG, TEL: (01) 330589

Intl **Taiwan, Taipei**
Mardel Ltd., TEL: 5943127-8

Intl **United Kingdom, Molesey-Surrey**
Memory Device, Ltd., TEL: 01 941 0466

Intl **Yugoslavia, Maribor**
Ellyptic AG, TEL: (062) 31041

DIPLOMAT

The first distributor to call for

NEC

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

NEC Electronics U.S.A.

NEC Electronics U.S.A. Inc.
Microcomputer Division
One Natick Executive Park
Natick, Massachusetts 01760
617-655-8833
TWX: 710-386-2110

Specific product information:
Memories ..... Jim Kelley
Microcomputers ..... David Millet

Application engineering:
Contact Nearest Regional Office

Literature:
Contact Nearest Regional Office, Sales Rep., Distributor

Price and delivery:
Contact Nearest Regional Office

Follow-up an order:
Contact Nearest Regional Office

Nitron

Nitron, Inc.
10420 Bubb Road
Cupertino, California 95014
408-255-7550
TWX: 910-338-0222

Specific product information:
Gate Array, Custom, Standard Products ..... Ext. 202
Non-Volatile Memories ..... Ext. 202
HiRel, Customer-Owned Tooling ..... Ext. 201

Literature:
Ext. 201 or 202

Price and delivery:
Customer Service ..... Ext. 300 & 408-255-7555

Follow-up an order:
Customer Service ..... Ext. 300

All other information:
Marketing ..... Ext. 202

Sales Offices & Representatives

Intl **Australia, Punchbowl**
T-Mac Elctrns., TEL: 790-24964

Intl **Austria, Vienna**
Burisch GMBH U Co KG, TEL: 022 (Wien) 387638

Intl **Denmark, Copenhagen**
Advanced Elctrn., TEL: 45-1-194433

Intl **England, Oxfordshire**
Peter Gray Elctrns., Ltd., TEL: Henley 6543

Intl **Finland, Helsinki**
S W Instrs., TEL: (90) 738265

Intl **France, Levallois-Perret**
REA Radio Equipment Antares, TEL: 01-7851111

Intl **Italy, Milano**
Comprel, SRL, TEL: 02 6120641

Intl **Japan, Tokyo**
Jepico Corp., TEL: (03) 348-0611

Intl **Korea, Seoul**
Duksung Trading, TEL: 777-2325, 778-3198

Intl **Netherlands, Breda**
Tetraco, TEL: 076-222660

Intl **Norway, Stroommen**
A/S Kjellbakke, TEL: 02-7118 72

Intl **South Africa, Pretoria**
Desatron (Pty) Ltd., TEL: 2711 836-3851

Intl **Spain, Barcelona**
Interface S.A., TEL: 93-301 78 51

Intl **Sweden, Vallingby**
Svensk Teleindustrie, TEL: 08-380320

Intl **Switzerland, Zuerich**
Ellyptic AG, TEL: 01-541100

Intl **Taiwan, Taipei**
Galaxy Far East Corp., TEL: (02) 7811895-7

Intl **United Kingdom, Surrey**
Robin Reynolds, TEL: Ashtead (03722) 72741

Nortek

Nortek
2432 N. W. Johnson
Portland, Oregon 97210
503-226-3515

Octagon Systems

Octagon Systems Corporation
5150 West 80th Avenue
Westminster, Colorado 80030
303-426-8540

Ohio Scientific

Ohio Scientific
1333 S. Chillicothe Road
Aurora, Ohio 44202
216-562-2020

© IC MASTER 1983

OKI Semiconductor

OKI Semiconductor, Inc.
1333 Lawrence Expressway, Suite 401
Santa Clara, California 95051
408-984-4842
TWX: 910-338-0508

Sales Offices & Representatives

AZ Scottsdale
Semi-Systems AZ, 602-991-1151

CA Irvine
Centaur Corp., 714-556-5420

CA Los Gatos
Pro Assocs. Inc., 408-358-3861

CA San Diego
Littlefield & Smith, 714-455-0055

CO Aurora
Electrodyne (Main Office), 303-695-8903

FL Clearwater Beach
Perrott Assoc., 813-443-5214;813-443-5414

FL Orlando
Perrott Assoc. (Main Office), 305-275-1132

FL Sunrise
Perrott Assoc., 305-792-2211

IL Elk Grove Village
John G. Twist Co. (Main Office), 312-593-0200

IN Greenwood
Valentine & Assoc. (Main Office), 317-888-2260

IN South Bend
Valentine & Assoc., 219-288-7070

IA Cedar Rapids
John G. Twist Co., 319-393-8703

KS Prairie Village
John G. Twist Co., 913-236-4646

KS Wichita
John G. Twist Co., 316-686-6685

MA Lexington
John E. Boeing Co., 617-862-2500

MI Livonia
Luebbe Sales, 313-477-3131

MN Bloomington
John G. Twist Co., 612-835-2120

MO St. Louis
John G. Twist Co., 314-432-2830

NJ Boonton
PAF Assocs., 201-335-0660

NY Albany
Reagan/Compar Albany, Inc., 518-489-4777

NY Smithtown
PAF Assocs. (Main Office), 516-360-0940

OH Cincinnati
Luebbe Sales (Main Office), 513-871-4211

OH Cleveland
Luebbe Sales, 216-333-0425

OH Columbus
Luebbe Sales, 614-431-0474

OH Dayton
Luebbe Sales, 513-294-0426

OR Beaverton
Quest Mktg., 503-644-8077

PA Pittsburgh
Luebbe Sales, 412-931-0414

PA Southampton
Campbell Assoc., 215-322-6630

TX Austin
EMA, 512-837-0893

TX Grapevine
EMA (Main Office), 817-481-7502

TX Houston
EMA, 713-498-8120

UT Salt Lake City
Electrodyne, 801-486-3801

WA Renton
Quest Mktg. (Main Office), 206-223-1541

WI Brookfield
John G. Twist Co., 414-782-2670

Can Markham, Ontario
RPS Elctrns., 416-474-0113

Can Montreal, Quebec
RPS Elctrns. (Main Office), 514-341-3663

Can Nepean, Ontario
RPS Elctrns., 613-828-1715

Intl Japan, Tokyo
OKI Elec. Ind. Co. Ltd., TEL: 03/454-2111

Intl West Germany, Dusseldorf
OKI Elec. Europe GMBH, TEL: 0049/211-592031

Distributors

AL Huntsville
Contact Elctrns., 205-881-9321

AL Huntsville
RM Elctrns., 205-852-1550

AZ Phoenix
Kachina Elctrns. (Main Office), 602-269-6201

AZ Tucson
Kachina Elctrns., 602-792-2223

CA Fullerton
Pyramid Elctrns., 714-773-0781

CA Irvine
Ryno Elctrns., 714-557-5021

CA San Diego
Ryno Elctrns. (Main Office), 714-292-6022

CA San Jose
Eric Elctrns., 406-262-1111

CA Santa Ana
Pacesetter Elctrns. (Main Office), 213-299-7760

CA Sunnyvale
Pacesetter Elctrns., 408-734-5470

CO Wheat Ridge
A.C.T. Rocky Mountain, 303-422-9229

CT Cheshire
Future Elctrns., 203-272-1851

CT East Haven
J.V. Elctrns., 203-272-1851

CT Orange
Milgray Elctrns., 203-795-0711

FL Winter Park
Milgray Elctrns., 305-647-5747

GA Atlanta
Milgray Elctrns., 404-393-9666

IL Arlington Heights
Reptron Elctrns., 312-593-7070

IL Lombard
RM Elctrns., 312-932-5150

IL Palatine
OHM Elctrns. Inc., 312-359-5500

IN Indianapolis
RM Elctrns., 317-247-9701

KS Overland Park
Milgray Elctrns., 913-236-8800

MD Rockville
Milgray Elctrns., 800-257-7111

MA Burlington
Milgray Elctrns., 617-272-6800

MA Westboro
Future Elctrns., 617-366-2400; 617-879-0860

MI Grand Rapids
RM Elctrns. (Main Office), 616-531-9300

MI Livonia
Reptron Elctrns. (Main Office), 313-525-2700

MN St. Paul
Gopher Elctrns. Co., 612-483-3322

NH Hudson
C & H Elctrns., 603-882-1133

NJ Marlton
Milgray Elctrns., 609-983-5010

NY East Syracuse
Future Elctrns., 315-272-1851

NY Freeport
Milgray Elctrns. (Main Office), 516-546-5600

OH Cleveland
Milgray Elctrns., 216-447-1520

OH Columbus
Reptron Elctrns., 614-436-6675

TX Addison
A.C.T. (Main Office), 214-980-1888

TX Dallas
RM Elctrns., 214-263-8361

WA Kent
Shannon Ltd., 206-763-0545

WI New Berlin
RM Elctrns., 414-784-4420

Can Pointe-Claire, Quebec
Future Elctrns. (Main Office), 514-694-1877

Can Pointe-Claire, Quebec
Repco Engrg., 514-694-1877

Oliver Advanced Engineering

Oliver Advanced Engineering, Inc.
676 West Wilson Avenue
Glendale, California 91203
213-240-0080
TELEX: 194773

Specific product information:
Marketing & Sales Department 213-240-0080

Sales Offices & Representatives

CA Anaheim
Vinger Mktg., 714-630-8120

DE Wilmington
Advanced Technology Assocs., Inc., 302-429-9001

IL Wheeling
Engrg. Prods. Assocs., Inc., 312-537-4860

IN Indianapolis
Engrg. Prods. Assocs., Inc., 317-894-7156

IA Iowa City
Engrg. Prods. Assocs., Inc., 319-354-5344

MD Baltimore
Advanced Technology Assocs., Inc., 301-995-0727

MA Waltham
Comark, 617-894-7000

MN Minneapolis
Engrg. Prods. Assocs., Inc., 612-925-1883

VA Vienna
Advanced Technology Assocs., Inc., 703-556-0500

Intl Austria, Wien
Elbatex Ges.m.b.H., TEL: (0222) 86 56 11 Serie

Intl Belgium, Zoutleeuw
Belcomp PVBA, TEL: 011/78 05 12

Intl Denmark, Horsholm
C-88 aps, TEL: 02* 57 08 88

Intl France, Orsay
Microel "Le Parana", TEL: 907-08-24

Intl Germany, Munich
Scantec GmbH, TEL: (089) 134093

Intl India, Bombay
Echbee Corp., TEL: 25 34 89/25 83 41

Omnibyte

Omnibyte Corporation
245 W. Roosevelt Road, Building 1-5
West Chicago, Illinois 60185
312-231-6880

Sales Offices & Representatives

Intl Australia, Burwood, Victoria
Rank Elctrns. Pty. Ltd., TEL: (03) 29 3724

Intl England, Newbury, Berkshire
Measurement Systems, Ltd., TEL: 0635-45420

© IC MASTER 1983

Omnibyte (Cont)

Intl **India, Hyderabad**
International Trade Agencies, TEL: 31543 - 31216

Intl **Sweden, Akersberga**
Reinstedt Computer HB, TEL: 46 76422080

Intl **Switzerland, Zurich**
Omni Ray AG, TEL: (01) 47 8200

Intl **Taiwan, Taipei**
Strong Elctrns. Co., Ltd., TEL: (02) 5218826

Intl **West Germany, Stuttgart**
Claus Polack, TEL: Stuttgart 762610

Optical Electronics

Optical Electronics Inc.
P.O. Box 11140
Tucson, Arizona 85734
602-624-8358
TWX: 910-952-1283

Oscar, I.S., Associates

Oscar, I.S., Associates, Inc.
8811 Colesville Road
Silver Spring, Maryland 20910
301-588-4495

Pacific Cyber/Metrix

Pacific Cyber/Metrix Inc.
6800 Sierra Court
Dublin, California 94566
415-829-8700

Panasonic

Panasonic
Matsushita Electric Corporation, Industrial Division
1 Panasonic Way
Secaucus, New Jersey 07094
201-348-7275
TWX: 710-992-8920

Percom Data

Percom Data Corporation
Sales & Manufacturing
11220 Pagemill Road
Dallas, Texas 75243
214-340-7081

Phoenix Digital

Phoenix Digital Corporation
2315 North 35th Avenue
Phoenix, Arizona 85009
602-278-3591

Pico Design

Pico Design, Inc.
1333 Lawrence Expressway, Suite 340
Santa Clara,, California 95051
408-249-8090

Plessey Semiconductors

Plessey Semiconductors
1641 Kaiser
Irvine, California 92714
714-540-9979
TWX: 910-595-1930

Application engineering:
ext. 33
Literature:
Lorna Roe ext.60
Price and delivery:
Pat Dilley ext.49
Follow-up an order:
Pat Dilley ext.49

Sales Offices & Representatives

AL **Huntsville**
Remco, 205-883-9260

AZ **Phoenix**
Eltron, 602-266-2164

AZ **Scottsdale**
Faser Tech. Sales, 602-948-4404

CA **Goleta**
S. C. Cubed, 714-972-4670

CA **San Diego**
Littlefield & Smith Assocs., 714-455-0055

CA **Sunnyvale**
Western Regional Sales Office, 408-245-9890

FL **Plantation**
Gallagher Assoc., 305-473-2101

GA **Duluth**
Remco, 404-476-1730

GA **Norcross**
Southeastern Sales, 404-447-6910

IL **Elk Grove Village**
Micro Sales Inc., 312-956-1000

IL **Schiller Park**
Midwestern Regional Sales Office, 312-678-3280

MD **Beltsville**
Applied Engrg. Consits., 301-937-8321

MA **Natick**
Wayland Engrg. Sales, 617-655-6080

MI **Brighton**
SAI Mktg. Corp., 313-227-1786

MN **Bloomington**
Elctrns. Sales Agency, Inc., 612-884-8291

MO **Independence**
Engrg. Svcs. Co., 816-254-3600

MO **St. Louis**
Engrg. Svcs. Co., 314-997-1515

NY **Hauppauge**
Eastern Regional Sales Office, 516-273-3060

NY **Plainview**
Robert Smith Assocs., 516-681-3155

NY **Skaneateles**
Robtron, Inc., 315-685-5731

NY **Spring Valley**
Robert Smith Assocs., 914-354-6067

NC **Raleigh**
Remco, 919-787-1461

OH **Centerville**
SAI Mktg. Corp., 513-435-3181

OH **Shaker Heights**
SAI Mktg. Corp., 213-751-3633

OH **Zanesville**
SAI Mktg. Corp., 614-454-8942

PA **Huntingdon Valley**
Dick Knowles Assocs., 215-947-5641

TX **Arlington**
W. Pat Fralia Co., Inc., 817-640-9101

TX **Austin**
W. Pat Fralia Co., Inc., 512-451-3325

TX **Houston**
W. Pat Fralia Co., Inc., 713-772-1572

VA **Lorton**
Applied Engrg. Consits., 703-550-9799

Can **Bolton, Ontario**
MacKay Assocs., 416-626-3805

Distributors

CA **Irvine**
Plessey Semiconductors, 714-540-9979

Can **Toronto, Ontario**
GEC Canada Ltd., 416-364-9281

Polycore Electronics

Polycore Electronics Inc.
1107 Tourmaline Drive
Newbury Park, California 91320
805-498-8832
213-991-1061

Pragmatic Designs

Pragmatic Designs, Inc.
950 Benicia Avenue
Sunnyvale, California 94086
408-736-8670

Precision Monolithics

Precision Monolithics Inc.
1500 Space Park Drive
Santa Clara, California 95050
408-727-9222
TWX: 910-338-0528
Specific product information:
ext. 162
Application engineering:
ext. 162
Literature:
ext. 186
Price and delivery:
ext. 171
Follow-up an order:
ext. 171
All other information:
ext. 162

Sales Offices & Representatives

Intl **Australia, Victoria**
RIFA

Intl **Austria, Vienna**
Ing. Otto Folger, TEL: 0222/ 43 26 39

Intl **Belgium, Voorburg**
Bourns (Belgium) B.V., TEL: 070-87 44 00

Intl **Denmark, Ballerup**
Tage Olsen A/S, TEL: 02-65 81 11

Intl **Eastern Europe, Vienna**
Eltrans, TEL: 0222/24 71 37

Intl **Finland, Helsinki**
Insele Oy, TEL: 80/73 57 74

Intl **France, Paris**
Ohmic S.A., TEL: 01/203 9633

Intl **Germany, Stuttgart**
Bourns GmbH, TEL: 0711/24 29 36

Intl **Greece, Athens**
Germanis Co., TEL: 01-821 5825

Intl **India, Bombay**
Hind Indl. & Mercantile Corp., TEL: 373544

Intl **Israel, Tel Aviv**
Rapac Elctrns. Ltd., TEL: 03-47 71 15

Intl **Italy, Milano**
Technic S.r.L., TEL: 02/569 57 46

Intl **Japan, Tokyo**
Nippon PMI Corp., TEL: (03) 234-1411

© IC MASTER 1983

Precision Monolithics (Cont)

Intl **Netherlands, Voorburg**
Bourns (Nederland) B.V., TEL: 070 87 44 00

Intl **Portugal, Lisbon**
Telectra S.A.R.L., TEL: 19/68 60 72

Intl **Spain, Madrid**
Hispano Elctrna. S.A., TEL: 1-619-4108

Intl **Sweden, Taby**
Bexab Electronik AB, TEL: 08-768 0560

Intl **Switzerland, Baar**
Bourns (Schweiz) AG, TEL: 042/33 33 33

Intl **Turkey, Ankara**
Nel, Nukleer Elektronik Ltd., TEL: 041-30 15 10

Intl **United Kingdom, Middlesex**
Bourns Electronics, Ltd., TEL: 01/572 6531

Intl **Yugoslavia, Zagreb**
Unitrade/Podravka, TEL: 041-41 9284

PREMA

PREMA GmbH
Robert-Koch-Strasse 10
Mainz 42, West Germany 6500
(0 61 31) 5 80 37

Pro-Log

Pro-Log Corporation
2411 Garden Road
Monterey, California 93940
408-372-4593
TWX: 910-360-7082

Distributors

Intl **Australia, Kilkenny**
Werner Elctrn. Ind., TEL: (08) 268-2766

Intl **Austria, Vienna**
Walter Rekirsch Elecktronische, TEL: (0222) 23 55 55-0

Intl **Belgium, Netherlands**
Indelec, B.V., TEL: 076 142333 or 145630

Intl **Denmark, Copenhagen**
E. V. Johanssen Elektronik A-S, TEL: 45 183 90 22

Intl **Finland, Kaunialnen**
OY Findip AB, TEL: 90-5052255

Intl **France, Versailles**
YREL, TEL: 956-81-42

Intl **Germany, Buckeburg**
Spezial-Elctrn. KG, TEL: (0 57 22) 203106

Intl **Germany, Munchen**
Spezial-Elctrn. KG, TEL: 089/530387

Intl **India, New Delhi**
C. H. Krishnan & Assocs., TEL: 66 48 50

Intl **Italy, Rome**
Technitron, Srl, TEL: 6-8395841-2, 837035-6

Intl **Japan, Tokyo**
C. Itoh & Co. Ltd., TEL: (03) 863-7688

Intl **Korea, Seoul**
M-C Intl. Korea, Ltd., TEL: 24228

Intl **Norway, Oslo**
Elektronix AS, TEL: 02-229850

Intl **Singapore, Singapore**
Intl. Control Sys., TEL: 2224288

Intl **South Africa, Sandton**
Transvaal Inst. Pty. Ltd., TEL: 406427

Intl **Spain, Madrid**
Unitronics, S.A., TEL: 242-52-04

Intl **Sweden, Stockholm**
Logtek Electronik AB, TEL: 770-07-25

Intl **Switzerland, Zurich**
Max Meier Elektronik AG, TEL: 01/491 2121

Intl **Taiwan, Taipei**
Multitech Intl. Corp., TEL: (02) 7681232

Intl **Thailand, Bangkok**
Kriangpat Co. Ltd., TEL: 251-6777

Intl **United Kingdom, Camberley**
Technitron, Inc., U.K., TEL: Camberley (276) 26517

Quay

Quay Corporation
527 Industrial Way West, P.O. Box 783
Eatontown, New Jersey 07724
201-542-7340

Specific product information:
Consult Factory for nearest Distributor/Representative

Raytheon Semiconductor

Raytheon Company
Semiconductor Division
350 Ellis Street
Mountain View, California 94042
415-968-9211
TWX: 910-379-6481

Specific product information:
Linear ..... J. Shupenis
Digital ..... G. Jones
Discrete ..... G. Jones
LSI/Memory ..... R. Francis

Price and delivery:
Local Field Sales Office

Place an order:
Local Field Sales Office

Follow-up an order:
Customer Service

Sales Offices & Representatives

Intl **France, Le Plessis Robinson**
Raytheon Semiconductor France, TEL: 631 06 76

Intl **Germany, Munchen**
Raytheon HALBLEITER GmbH, TEL: 089/539693

Intl **Japan, Tokyo**
New Japan Radio Co., Ltd., TEL: 03-591-3451

Intl **United Kingdom, Essex**
Raytheon Semiconductor, TEL: (0268) 288562

DIPLOMAT

The first distributor to call for

RAYTHEON

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

RCA

RCA Solid State Division
Box 3200
Somerville, New Jersey 08876
201-685-6000
TWX: 710-480-9333

Sales Offices & Representatives

AL **Huntsville**
W. A. Brown Inst., Inc., 205-883-8660

AL **Huntsville**
CSR Electronics, 205-533-2444

AL **Huntsville**
RCA, 205-881-4100

AZ **Phoenix**
Cleveland Enterprises, Inc., 602-944-4679

AZ **Scottsdale**
C. T. Carlberg & Assoc., 602-277-2808

AZ **Scottsdale**
Thom Luke Sales, Inc., 602-941-1901

AZ **Scottsdale**
RCA, 602-947-7235

CA **Concord**
SLK & Company, 415-827-1270

CA **Los Altos**
RCA, 415-948-8996

CA **Los Gatos**
Hefte Inds., 408-264-8319

CA **Pasadena**
A-F Sales, 213-681-5631

© IC MASTER 1983

RCA (Cont)

CA **San Diego**
C & K Assocs., 714-279-0420

CA **Saratoga**
Applied Micro Tech., 408-370-3922

CA **Sherman Oaks**
RCA, 213-468-4200

CA **Torrance**
Allen Edwards & Assoc., 213-328-9770

CA **Tustin**
RCA, 714-832-5302

CO **Denver**
Cleveland Enterprises of Colorado, 303-751-3252

CO **Englewood**
RCA Corp., 303-740-8441

CO **Westminster**
RPM Associates, 303-430-0501

CT **Meriden**
New England Technical, 203-237-8827

FL **Apopka**
G. F. Bohman Assoc., Inc., 305-886-1882

FL **Enterprise**
Audio Mktg., Inc., 305-322-8327

FL **Ft. Lauderdale**
G. F. Bohman Assoc., Inc., 305-979-0008

FL **Ft. Lauderdale**
W. A. Brown Inst., Inc., 305-776-4800

FL **Lake Park**
RCA, 305-626-6350

FL **Melbourne**
W. A. Brown Inst., Inc., 305-723-0766

FL **Miami**
Coaxial Sys. Assoc. (CSA), 305-854-0253

FL **Orlando**
W. A. Brown Assoc., Inc., 305-425-5505

FL **Orlando**
Coaxial Sys. Assoc. (CSA), 305-352-0437

FL **Tequsta**
Coaxial Sys. Assoc. (CSA), 305-746-6626

GA **Atlanta**
W. A. Brown Inst., Inc., 404-455-1035

GA **Atlanta**
CSR Electronics, 404-396-3720

GA **Atlanta**
Leonard Elliott Co., 404-875-9701

IL **Des Plaines**
RCA, 312-391-4380

IL **River Forest**
Denco Sales, Inc., 312-848-5100

IL **Rolling Meadows**
Commodore I, 312-394-5441

IN **Carmel**
Midwest Reps, 317-844-4555

IN **Ft. Wayne**
Commodore I, 219-485-7315

IN **Fort Wayne**
RCA, 219-484-6460

IN **Indianapolis**
RCA, 317-267-6375

KS **Overland Park**
RCA, 913-642-7656

LA **New Orleans**
Carey & Assocs.

MD **Catonsville**
Robert Electronic Sales, 301-788-2380

MD **Reisterstown**
Commercial Video Reps, 301-252-8919, 301-879-1794

MA **Burlington**
New England Technical, 617-272-0434

MA **Wellesley**
RCA, 617-237-7970

MI **Birmingham**
RCA, 313-644-1151

MI **Southfield**
R. Milsk Co., 313-354-3310

MN **Minneapolis**
Comprehensive Tech. Sales, 612-888-7011

MN **Minneapolis**
HMR, Inc., 612-888-2100

MN **Minneapolis**
RCA, 612-929-0676

MO **Kansas City**
Forristal-Young Sales, 816-358-6771

MO **St. Louis**
Forristal-Young Sales, 314-968-9975

NE **Omaha**
Forristal-Young Sales, 402-333-0800

NH **Manchester**
Associated Systems, 603-472-2297

NJ **Cherry Hill**
Langbaum Assocs., 609-778-1141

NJ **Cherry Hill**
RCA, 609-338-5042

NJ **Clark**
RCA, 201-574-3550

NJ **Mt. Laurel**
Comtek, Inc., 609-235-8505

NM **Albuquerque**
C. T. Carlberg & Assoc., 505-888-3883

NM **Albuquerque**
Cleveland Enterprises, Inc., 505-265-7893

NY **Bearsville**
Langbaum Assocs., 914-336-6663

NY **Fairport**
RCA, 716-223-5240

NY **Hamburg**
Labtronics, Inc., 716-648-0107

NY **Kirkwood**
Labtronics, Inc., 607-775-3739

NY **New City**
Langbaum Assocs., 914-634-1141

NY **N. Tonowanda**
Labtronics, Inc., 716-693-2257

NY **Syracuse**
Labtronics, Inc., 315-454-9315

NY **Utica**
Labtronics, Inc., 315-735-2153

NY **West Babylon**
Astrorep, Inc., 516-422-2500, 201-624-4408

NC **Durham**
W. A. Brown Inst., Inc., 919-683-1580

NC **Matthews**
CSR Electronics, 704-847-1404

OH **Columbus**
RCA, 614-436-0036

OH **Columbus**
Weller Elec. Sales, 614-885-7819

OH **Dayton**
Lyons Corp., 513-278-0714

OH **Richfield**
Lyons Corp., 216-659-9224

OR **Hillsboro**
Western Tech. Sales, 503-640-4621

PA **Pittsburgh**
WKM Assocs., Inc., 412-892-2953

SC **Columbia**
W. A. Brown Inst., Inc., 803-798-8070

TN **Knoxville**
RCA, 615-588-2467

TN **Oak Ridge**
W. A. Brown Inst., Inc., 615-482-5761

TN **Tullahoma**
Lester Vihon Assoc., 615-455-5767

TX **Addison**
Southern States Mktg., Inc.

TX **Austin**
Oeler & Menelaides, 512-453-0275

TX **Carrollton**
Digital Mktg., SW, 214-458-0025

TX **Dallas**
Oeler & Menelaides, 214-361-8876

TX **Dallas**
RCA Center, 214-661-3515

TX **Dallas**
Southern States Mktg., Inc., 214-387-2489

TX **Houston**
Carey & Assocs., 713-460-1111

TX **Houston**
Digital Mktg., SW, 713-621-0004

TX **Houston**
Oeler & Menelaides, 713-772-0730

TX **Houston**
Southern States Mktg., Inc., 713-988-0991

TX **Richardson**
Carey & Assocs., 214-234-2202

UT **Salt Lake City**
Cleveland Enterprises of Colorado, 801-355-8424

VA **Arlington**
RCA, 703-558-4161

WA **Bellevue**
Western Tech. Sales, 206-641-3900

WA **Kirkland**
Hefte Inds., 206-821-4788

WA **Seattle**
MAR Corp. (Manufacturers Agents Reps.), 206-575-1798

WA **Spokane**
Western Tech. Sales, 509-922-7600

Can **Calgary, Alberta**
RCA Inc., 403-279-3384

Can **Roxdale, Ontario**
RCA Inc., 416-247-5491

Can **St. Anne de Bellevue, Quebec**
RCA Inc., 514-457-9000

Intl **Belgium, Bruxelles**
RCA S.A., TEL: 02/720.89.80

Intl **Brazil, Sao Paulo**
RCA Solid State Ltda., TEL: 210-4033

Intl **France, Boulogne**
RCA S.A., TEL: (01) 603 87 87

Intl **Hong Kong, Hong Kong**
RCA Intl. Ltd., TEL: 852-5-234-181

Intl **Italy, Milano**
RCA SpA, TEL: (02) 65.97.048-051

Intl **Mexico, Mexico**
RCA S.A. de C.V./Solid State Div., TEL: (905)399-7228

Intl **Singapore, Singapore**
RCA Corp./Solid State Div., TEL: 2224156/2224157

Intl **Sweden, Solna**
RCA Intl. LTD, TEL: 08/83 42 25

Intl **Taiwan, Taipei**
RCA Corp./Solid State Div., TEL: 571-9171-5

Intl **United Kingdom, Sunbury-on-Thames, Middlesex**
RCA LTD, TEL: 093 27 85511

Intl **West Germany, Munchen**
RCA GmbH, TEL: 08971/43047-049

Intl **West Germany, Ostfildern (Kemnat)**
RCA GmbH, TEL: 071145/4001-04

Intl **West Germany, Quickborn**
RCA GmbH, TEL: 04106/2001

Distributors

AL **Huntsville**
Hamilton Avnet Elctrns., 205-837-7210

AZ **Phoenix**
Kierulff Elctrns., Inc., 602-243-4101

AZ **Phoenix**
Sterling Elctrns., Inc., 602-258-4531

AZ **Phoenix**
Wyle Distribution Grp., 602-249-2232

AZ **Tempe**
Hamilton Avnet Elctrns., 602-231-5100

AZ **Tucson**
Kierulff Elctrns., Inc., 602-624-9986

CA **Chatsworth**
Arrow Elctrns., Inc., 213-701-7500

CA **Costa Mesa**
Avnet Elctrns., 714-754-6051

CA **Costa Mesa**
Hamilton Avnet Elctrns., 714-641-4107

CA **Culver City**
Hamilton Electro Sales, 213-558-2020

CA **El Segundo**
Wyle Distribution Grp., 213-322-8100

CA **Irvine**
Schweber Elctrns. Corp., 714-556-3880

© IC MASTER 1983

RCA (Cont)

CA **Irvine**
Wyle Distribution Grp., 714-641-1600
CA **Los Angeles**
Kierulff Elctrns., Inc., 213-725-0325
CA **Palo Alto**
Kierulff Elctrns., Inc., 415-968-6292
CA **Sacramento**
Hamilton Avnet Elctrns., 916-920-3150
CA **San Diego**
Arrow Elctrns., Inc., 714-565-6928
CA **San Diego**
Hamilton Avnet Elctrns., 714-571-7510
CA **San Diego**
Kierulff Elctrns., Inc., 714-278-2112
CA **San Diego**
Wyle Distribution Grp., 714-565-9171
CA **Santa Clara**
Schweber Elctrns. Corp., 408-748-4700
CA **Santa Clara**
Wyle Distribution Grp., 408-727-2500
CA **Sunnyvale**
Arrow Elctrns., Inc., 408-745-6600
CA **Sunnyvale**
Hamilton Avnet Elctrns., 408-743-3300
CA **Tustin**
Kierulff Elctrns., Inc., 714-731-5711
CO **Denver**
Arrow Elctrns., Inc., 303-758-2100
CO **Denver**
Kierulff Elctrns., Inc., 303-371-6500
CO **Englewood**
Hamilton Avnet Elctrns., 303-740-1000
CO **Thornton**
Wyle Distribution Grp., 303-457-9953
CT **Danbury**
Hamilton Avnet Elctrns., 203-797-1100
CT **Danbury**
Schweber Elctrns. Corp., 203-792-3500
CT **Wallingford**
Arrow Elctrns., Inc., 203-265-7741
CT **Wallingford**
Kierulff Elctrns., Inc., 203-265-1115
FL **Ft. Lauderdale**
Arrow Elctrns., Inc., 305-776-7790
FL **Ft. Lauderdale**
Hamilton Avnet Elctrns., 305-971-2900
FL **Hollywood**
Schweber Elctrns. Corp., 305-927-0511
FL **Orlando**
Chip Supply, 305-275-3810
FL **Palm Bay**
Arrow Elctrns., Inc., 305-725-1480
FL **St. Petersburg**
Hamilton Avnet Elctrns., 813-576-3930
FL **St. Petersburg**
Kierulff Elctrns., Inc., 813-576-1966
FL **Winter Park**
Milgray Elctrns., Inc., 305-647-5747
GA **Norcross**
Arrow Elctrns., Inc., 404-449-8252
GA **Norcross**
Hamilton Avnet Elctrns., 404-447-7503
GA **Norcross**
Schweber Elctrns. Corp., 404-449-9170
IL **Bensenville**
Hamilton Avnet Elctrns., 312-860-7700
IL **Chicago**
Newark Elctrns., 312-638-4411
IL **Elk Grove Village**
Kierulff Elctrns., Inc., 312-640-0200
IL **Elk Grove Village**
Schweber Elctrns. Corp., 312-364-3750
IL **Schaumburg**
Arrow Elctrns., Inc., 312-893-9420
IN **Carmel**
Hamilton Avnet Elctrns., 317-844-9333
IN **Indianapolis**
Arrow Elctrns., Inc., 317-243-9353
IN **Indianapolis**
Graham Elctrns. Supply, Inc., 317-634-8202
KS **Overland Park**
Hamilton Avnet Elctrns., 913-888-8900
LA **Metairie**
Sterling Elctrns., Inc., 504-887-7610
MD **Baltimore**
Arrow Elctrns., Inc., 301-247-5200
MD **Columbia**
Hamilton Avnet Elctrns., 301-995-3500
MD **Gaithersburg**
Schweber Elctrns. Corp., 301-840-5900
MD **Savage**
Pyttronic Inds., Inc., 301-792-0780
MD **Timonium**
Zebra Elctrns., Inc., 301-252-6576
MA **Bedford**
Schweber Elctrns. Corp., 617-275-5100
MA **Beverly**
Hybrid Comps., Inc., 617-927-5820
MA **Billerica**
Kierulff Elctrns., Inc., 617-667-8331
MA **Billerica**
A.W. Mayer Co., 617-229-2255
MA **Salem**
Sertech Laboratories, 617-745-2450
MA **Waltham**
Sterling Elctrns., Inc., 617-894-6200
MA **Woburn**
Arrow Elctrns., Inc., 617-933-8130
MA **Woburn**
Hamilton Avnet Elctrns., 617-935-9700
MI **Ann Arbor**
Arrow Elctrns., Inc., 313-971-8220
MI **Grand Rapids**
Hamilton Avnet Elctrns., 616-243-8805
MI **Livonia**
Hamilton Avnet Elctrns., 313-522-4700
MI **Livonia**
Schweber Elctrns. Corp., 313-525-8100
MN **Eden Prairie**
Schweber Elctrns. Corp., 612-941-5280
MN **Edina**
Arrow Elctrns., Inc., 612-830-1800
MN **Edina**
Kierulff Elctrns., Inc., 612-941-7500
MN **Minnetonka**
Hamilton Avnet Elctrns., 612-932-0600
MO **Earth City**
Hamilton Avnet Elctrns., 314-344-1200
MO **Maryland Heights**
Kierulff Elctrns., Inc., 314-739-0855
MO **St. Louis**
Arrow Elctrns., Inc., 314-567-6888
NH **Manchester**
Arrow Elctrns., Inc., 603-668-6968
NJ **Cherry Hill**
Hamilton Avnet Elctrns., 609-424-0110
NJ **Fairfield**
Arrow Elctrns., Inc., 201-575-5300
NJ **Fairfield**
Hamilton Avnet Elctrns., 201-575-3390
NJ **Fairfield**
Kierulff Elctrns., Inc., 201-575-6750
NJ **Fairfield**
Schweber Elctrns. Corp., 201-227-7880
NJ **Moorestown**
Arrow Elctrns., Inc., 609-235-1900
NM **Albuquerque**
Arrow Elctrns., Inc., 505-243-4566
NM **Albuquerque**
Hamilton Avnet Elctrns., 505-765-1500
NM **Albuquerque**
Sterling Elctrns., Inc., 505-884-1900
NY **Buffalo**
Summit Distrs., Inc., 716-884-3450
NY **East Syracuse**
Hamilton Avnet Elctrns., 315-437-2641
NY **Farmingdale**
Arrow Elctrns., Inc., 516-694-6800
NY **Fresport**
Milgray Elctrns., Inc., 516-546-6000
NY **Liverpool**
Arrow Elctrns., Inc., 315-652-1000
NY **Melville**
Hamilton Avnet Elctrns., 516-454-6000
NY **Rochester**
Arrow Elctrns., Inc., 716-275-0300
NY **Rochester**
Hamilton Avnet Elctrns., 716-475-9130
NY **Rochester**
Schweber Elctrns. Corp., 716-424-2222
NY **Westbury**
Schweber Elctrns. Corp., 516-334-7474
NC **Greensboro**
Kierulff Elctrns., Inc., 919-852-9440
NC **Raleigh**
Hamilton Avnet Elctrns., 919-829-8030
NC **Winston-Salem**
Arrow Elctrns., Inc., 919-725-8711
OH **Beachwood**
Schweber Elctrns. Corp., 216-464-2970
OH **Centerville**
Arrow Elctrns., Inc., 513-435-5563
OH **Cleveland**
Hamilton Avnet Elctrns., 216-831-3500
OH **Cleveland**
Kierulff Elctrns., Inc., 216-587-6558
OH **Columbus**
Hughes-Peters, Inc., 614-294-5351
OH **Dayton**
Hamilton Avnet Elctrns., 513-433-0610
OH **Solon**
Arrow Elctrns., Inc., 216-248-3990
OK **Tulsa**
Kierulff Elctrns., Inc., 918-252-7537
OR **Hillsboro**
Wyle Distribution Grp., 503-640-6000
OR **Lake Oswego**
Hamilton Avnet Elctrns., 503-635-8157
PA **Horsham**
Schweber Elctrns. Corp., 215-441-0600
PA **Monroeville**
Arrow Elctrns., Inc., 412-856-7000
PA **Philadelphia**
Herbach & Rademan, Inc., 215-426-1700
TX **Austin**
Hamilton Avnet Elctrns., 512-837-8911
TX **Austin**
Kierulff Elctrns., Inc., 512-835-2090
TX **Austin**
Sterling Elctrns., Inc., 512-836-1341
TX **Dallas**
Arrow Elctrns., Inc., 214-386-7500
TX **Dallas**
Kierulff Elctrns., Inc., 214-343-2400
TX **Dallas**
Schweber Elctrns. Corp., 214-661-5010
TX **Dallas**
Sterling Elctrns., Inc., 214-243-1600
TX **Houston**
Hamilton Avnet Elctrns., 713-975-3515
TX **Houston**
Kierulff Elctrns., Inc., 713-530-7030
TX **Houston**
Schweber Elctrns. Corp., 713-784-3600
TX **Houston**
Sterling Elctrns., Inc., 713-627-9800
TX **Irving**
Hamilton Avnet Elctrns., 214-659-4111
TX **Stafford**
Arrow Elctrns., Inc., 713-491-4100
UT **Salt Lake City**
Hamilton Avnet Elctrns., 801-972-2800
UT **Salt Lake City**
Kierulff Elctrns., Inc., 801-973-6913
UT **Salt Lake City**
Wyle Distribution Grp., 801-974-9953
WA **Bellevue**
Arrow Elctrns., Inc., 206-643-4800
WA **Bellevue**
Hamilton Avnet Elctrns., 206-453-5874
WA **Bellevue**
Wyle Distribution Grp., 206-453-8300

© IC MASTER 1983

RCA (Cont)

WA **Seattle**
Robert E. Priebe Co., 206-682-8242

WA **Tukwila**
Kierulff Elctrns., Inc., 206-575-4420

WI **Mequon**
Taylor Elec. Co., 414-241-4321

WI **New Berlin**
Hamilton Avnet Elctrns.

WI **Oak Creek**
Arrow Elctrns., Inc., 414-764-6600

WI **Waukesha**
Kierulff Elctrns., Inc., 414-784-8160

Can **Burnaby, British Columbia**
R.A.E. Indl. Elctrns., Ltd., 604-291-8866

Can **Calgary, Alberta**
Hamilton Avnet Elec., 403-230-3586

Can **Calgary, Alberta**
L. A. Varah, Ltd., 403-276-8818

Can **Hamilton, Ontario**
L. A. Varah, Ltd., 416-561-9311

Can **Mississauga, Ontario**
Hamilton Avnet (Canada) Ltd., 416-677-7432

Can **Montreal, Quebec**
Cesco Elctrns., Ltd., 514-735-5511

Can **Nepean, Ontario**
Hamilton Avnet (Canada) Ltd., 613-226-1700

Can **Quebec City, Quebec**
Cesco Elctrns., Ltd., 418-524-4641

Can **St. Laurent, Quebec**
Hamilton Avnet (Canada) Ltd., 514-331-6443

Can **Vancouver, British Columbia**
L. A. Varah, Ltd., 604-873-3211

Can **Willowdale, Ontario**
Electro Sonic, Inc., 416-494-1666

Can **Winnipeg, Manitoba**
L. A. Varah, Ltd., 204-633-6190

Intl **Argentina, Buenos Aires**
Eneka S.A.I.C.F.I.

Intl **Argentina, Buenos Aires**
Galli Hnos, S.A.C.I. e Inm.

Intl **Argentina, Buenos Aires**
L.A.D.E., S.R.L.

Intl **Argentina, Buenos Aires**
Radiocom S.A.

Intl **Argentina, Buenos Aires**
Tecnos S.R.L.

Intl **Australia, Rydalmere N.S.W.**
A W A Microelectronics

Intl **Australia, Waterloo, N.S.W.**
Amtron Tyree

Intl **Austria, Vienna**
Bacher Elektronische Gerate GmbH, TEL: 0222/8356460

Intl **Panama, Panama**
Sistelcom, S.A.

Intl **Bahamas, Nassau**
Home Furniture Company Ltd.

Intl **Barbados, Bridgstown**
Da Costa & Musson Ltda.

Intl **Belgium, Bruxelles**
Inelco (Belgium) S.A., TEL: 02/216.01.60

Intl **Bermuda, Hamilton**
DeFontes TV Centre

Intl **Brazil, Manaus**
Comercial Bezerra Ltda., TEL: (092) 232-5363

Intl **Brazil, Recife**
Organizacao Distribuidora E Representacoes Ltda., TEL: (081) 224-2229

Intl **Brazil, Rio de Janeiro**
Saturno Brasileiro Importacao Exportacao Ltda., TEL: (021) 243-4744

Intl **Brazil, Sao Paulo**
Panamericana Commercial Importadora Ltda., TEL: (011) 222-3211

Intl **Chile, Santiago**
Amplitel Ltda.

Intl **Chile, Santiago**
Industria de Radio y Television S.A. (IRT)

Intl **Chile, Santiago**
Raylex Ltda.

Intl **Colombia, Bogota**
Miguel Antonio Pena Pena Y Cia. S. En C.

Intl **Colombia, Bogota**
Electronica Moderna

Intl **Colombia, Bogota**
Jose E Marulanda Montoya

Intl **Costa Rica, San Jose**
Electro-Impex, S.A.

Intl **Costa Rica, San Jose**
Gallito Tecnico, S.A.

Intl **Costa Rica, San Jose**
J. G. Valldeperas, S.A.

Intl **Denmark, Ballerup**
Tage Olsen A/S, TEL: 02/65 81 11

Intl **Dominican Republic, Santo Domingo**
Humberto Garcia, C. por A.

Intl **Ecuador, Guayaquil**
Elecom, S.A.

Intl **Egypt, Cairo**
Sakrco Enterprises, TEL: 744440

Intl **El Salvador, San Salvador**
Raio Electrica, S.A.

Intl **El Salvador, San Salvador**
Radio Parts, S.A.

Intl **Finland, Kerava**
Telercas OY, TEL: 0/248.055

Intl **France, Antony**
Almex S.A., TEL: (01) 666 21 12

Intl **France, Levallois Perret**
Radio Equipments Antares S.A., TEL: (01) 758 11 11

Intl **France, Savres**
Tekelec Airtronic S.A., TEL: (01) 534.75.35

Intl **Greece, Athens**
Semicon Co., TEL: 3253626

Intl **Guatemala, Guatemala City**
Electronica Guatemalteca

Intl **Guatemala, Guatemala City**
Tele-Equipos, S.A.

Intl **Haiti, Port-Au-Prince**
Societe Haitienne D'Automobiles, S.A.

Intl **Holland, Aalsmeer**
Inelco Nederland BV, TEL: (02977) 2 88 55

Intl **Holland, Eindhoven**
Vekano BV, TEL: (40) 81 09 75

Intl **Honduras, San Pedro Sula**
Francisco J. Yones

Intl **Hong Kong**
Gibb Livingston & Co., Ltd.

Intl **Hong Kong, Kowloon**
Chinam Assocs.

Intl **Hong Kong, Kowloon**
Hong Kong Elctrn. Comps. Co.

Intl **Iceland, Reykjavik**
Georg Amundason, TEL: 81180

Intl **India, Bangalore**
Photophone (Comel)

Intl **Indonesia, Jakarta Barat**
NVPD Soedarpo Corp.

Intl **Israel, Tel Aviv**
Aviv Elctrns., TEL: 03-494-450

Intl **Italy, Busa di Vigonza**
IDAC Elettronica SpA, TEL: (049) 72.56.99

Intl **Italy, Ciniscllo Balsamo**
LASI Elettronica SpA, TEL: (02) 61.20.441-5

Intl **Italy, Milano**
Eledra 3S SpA, TEL: (02) 349751

Intl **Italy, Milano**
Silverstar Ltd., TEL: (02) 49.96

Intl **Italy, Tortoreto Lido (Te)**
DEDO Elettronica SpA, TEL: 861/78.134

Intl **Japan, Tokyo**
Okura & Co. Ltd.

Intl **Mexico, Mexico**
Enrique Devesa Ramos

Intl **Mexico, Mexico**
Mantenimiento E Instalaciones Internacionales, S.A.

Intl **Mexico, Mexico**
Mexicana de Bulbos, S.A.

Intl **Mexico, Mexico**
Raytel, S.A.

Intl **Mexico, Mexico**
Sprint S.A.

Intl **Mexico, Mexico City**
Elctrna. Remberg, S.A. de C.V.

Intl **Mexico, Mexico City**
Partes Electronicas, S.A.

Intl **Nepal, Kathmandu**
Continental Commercial Distributors

Intl **Netherland Antilles, Curacao**
El Louvre, S.A.

Intl **New Zealand, Wellington**
A W A NZ Ltd.

Intl **Nicaragua, Managua**
Comercial F.A. Mendieta, S.A.

Intl **Norway, Oslo**
Natl. Elektro A/S, TEL: (472) 64 49 70

Intl **Panama, Rep. of, Panama**
Tropelco, S.A.

Intl **Paraguay, Asuncion**
Compania Commercial Del Paraguay, S.A.

Intl **Peru, Lima**
Arven S.A.

Intl **Peru, Lima**
Deltron S.A.

Intl **Philippines, Metro Manila**
Philippine Elctrn. Inds., Inc.

Intl **Philippines, Metro Manila**
Semitronics

Intl **Portugal, Lisbon**
Telectra Sarl, TEL: 68.60.72-75

Intl **Singapore**
Edward Eu & Co., Ltd.

Intl **South Africa, Dunswart**
Allied Elctrn. Comps. (PTY) Ltd., TEL: (011) 528-661

Intl **South Korea, Republic of, Seoul**
Panwest Co., Ltd.

Intl **South Korea, Republic of, Seoul**
Tong Jin Trading Co.

Intl **Spain, Barcelona**
Electrica Comercial Colominas S.A., TEL: (03) 253.20.07

Intl **Spain, Madrid**
Kontron S.A., TEL: 1/729.11.55

Intl **Sri Lanka, Colombo**
Ceylon SVC & Sup. Co.

Intl **Surinam, Paramaribo**
Kirpalani's Ltd.

Intl **Surinam, Paramaribo**
Surinam Elctrns.

Intl **Sweden, Stockholm**
Ferner Elctrns. AB, TEL: 08/80 25 40

Intl **Switzerland, Zurich**
Baerlocher AG, TEL: (01) 42.99.00

Intl **Taiwan, Taipei**
Delta Engrg. Ltd.

Intl **Taiwan, Taipei**
Haw Sheng Elec. Co., Ltd.

Intl **Thailand, Bangkok**
Anglo Thai Engrg. Ltd.

Intl **Trinidad, Port-of-Spain**
Kirpalani's Ltd.

Intl **Turkey, Ankara**
Teknim Co. Ltd., TEL: 27.58.00

Intl **United Kingdom, Harlow, Essex**
I.T.T. Elctrn. Svcs., TEL: Harlow (0279) 26777

Intl **United Kingdom, Harlow, Essex**
VSI Elctrns. (U.K.) Ltd., TEL: Harlow (0279) 29666

Intl **United Kingdom, Hitchin, Hertfordshire**
ACCESS Elctrn. Components Ltd., TEL: Hitchin (0462) 31 221

Intl **United Kingdom, Sevenoaks, Kent**
Jermyn Distribution, TEL: Sevenoaks (0732) 450144

Intl **United Kingdom, Slough, Berks**
Crellon Elctrns. Ltd., TEL: Burnham (06286)4434

© IC MASTER 1983

RCA (Cont)

Intl **United Kingdom, Slough, Berkshire**
Macro Mktg. Ltd., TEL: Burnham (06286) 4422

Intl **Uruguay, Montevideo**
American Products S.A. (APSA), TEL: 594210

Intl **Venezuela, Caracas**
Benavides, P., S.R.L.

Intl **Venezuela, Caracas**
Dinaradio, C.A.

Intl **Venezuela, Caracas**
Tele-Cuba, S.A.

Intl **West Germany, Dreieich bei Frankfurt**
Spoerle Elctrn. KG, TEL: 06103/3041

Intl **West Germany, Moglingen**
Elkose GmbH, TEL: 07141/4871

Intl **West Germany, Nurnberg**
Beck GmbH & Co., Elektronik Bauelemente KG, TEL: 0911/34961-66

Intl **West Germany, Putzbrunn bei Munchen**
Sasco GmbH, TEL: 089/46111

Intl **West Germany, Quickborn**
ECS Hilmar Frehsdorf Elctrn. Components Service, TEL: 04106/71058-59

Intl **West Germany, Quickborn**
Alfred Neye Enatechnik GmbH, TEL: 04106/6121

Intl **Yugoslavia, Ljubljana**
Avtotehna, TEL: 317 044

PR **Rio Piedras**
Kelvinator Sales of Puerto Rico, Inc.

RCI/Data

RCI/Data
1992 Lakewood Road
Toms River, New Jersey 08753
201-341-5592

RELMS

Relational Memory Systems (RELMS)
1180 Miraloma Way
Sunnyvale, California 94086
408-732-5520
TWX: 910-379-0014

Distributors

Intl **Australia, Adelaide**
Protronics Pty. Ltd., TEL: (08) 212 3111

Intl **France, Asnieres**
Metrologie, TEL: (1) 791.44.44

Intl **India, Bombay**
Micronic Devices, TEL: 468170

Intl **Israel, Tel-Aviv**
Vectronics Ltd., TEL: 234424, 228472, 246312

Intl **Japan, Tokyo**
Nihon Teksel Co., Ltd., TEL: (03) 461-5121

Intl **South Africa, Pinegowrie**
Radiokom, TEL: (011) 789-1400

Intl **Spain, Barcelona**
Interface S.A., TEL: (3) 301 7851

Intl **Sweden, Stockholm**
A.B. Gosta Backstrom, TEL: (46) 08/54 1080

Intl **United Kingdom, Bucks, England**
Rapid Recall, Ltd., TEL: (6285) 24961

Reticon

Reticon Corporation
345 Potrero Avenue
Sunnyvale, California 94086
408-738-4266
TWX: 910-339-9343

Specific product information:
George Hansell

Application engineering:
Cameras ..... John Skurla
Analog ..... Tim Small
Image Sensor ..... Andy Anderson

Literature:
Bobbie Stern

Price and delivery:
Bobbie Stern

Follow-up an order:
Bobbie Stern

All other information:
Alex Findlay

Distributors

Intl **Australia, Burwood, Victoria**
A.J.F. Sys. & Comps. Pty., Ltd., TEL: 288-4044

Intl **Austria, Wien**
Othmar Lackner, TEL: (0222) 53-11-85

Intl **Belgium, Bruxelles**
Inelco, TEL: (02) 660 00 12

Intl **Denmark, Copenhagen**
Scandinavian Supply, TEL: (01) 83 50 90

Intl **Finland, Helsinki**
Havulinna Oy, TEL: (3580) 5052255

Intl **France, Sevres**
Tekelec Airtronic, TEL: (01) 027 75 35

Intl **Germany, Munchen**
Opteltec, Div. Neumuller GmbH, TEL: (089) 611 81

Intl **Germany, Munich**
EG & G Reticon, TEL: 089 91 80 60

Intl **Israel, Tel Aviv**
Telsys Ltd., Elctrn. Engrg., TEL: 4 82126-7,8

Intl **Italy, Milano**
Eledra 3S SPA, TEL: (02) 34 93 041

Intl **Roma**
Eledra 3S SPA, TEL: (06)812 73 24

Intl **Japan, Yokohama**
Tokyo Electron Ltd., TEL: 03-343-4411

Intl **Netherlands, Amsterdam**
Inelco, TEL: (02977) 28855

Intl **New Zealand, Aukland**
Professional Elctrns. Ltd., TEL: 493-029

Intl **Norway, Oslo**
Nordisk Elektronik (Norge) A/S, TEL: (02) 470276

Intl **South Africa, Pretoria**
Electronic Bldg., TEL: 78-9221/6

Intl **Sweden, Stockholm**
Nordisk Elektronik AB, TEL: (08) 63 50 40

Intl **Switzerland, Zurich**
Industrade AG, TEL: (01) 363 22 30

Intl **United Kingdom, Berks**
EG & G Reticon, TEL: (0734) 788666

Riehl Time

Riehl Time Corporation
53 South Jefferson Road
Whippany, New Jersey 07981
201-887-4141

RIFA

RIFA AB
11 Bromma
Sweden,

Rockwell International

Rockwell International
Microelectronic Device Division
P.O. Box 3669, 3310 Miraloma Avenue
Anaheim, California 92803
714-632-3729
TWX: 910-591-1654

Sales Offices & Representatives

Intl **Brazil, Sao Paulo**
Hybrid, TEL: (011) 220-1470

Intl **England, Brighton-Sussex**
Pelco Elctrns Ltd., TEL: 44 0273-722155

Intl **Finland, Helsinki**
Micronor, TEL: 90 803 1965

Intl **Hong Kong, Quarry Bay**
Caduceus Ltd., TEL: 5-632113-8

Intl **India, New Delhi**
Danfoss India, Ltd., TEL: 384698

Intl **Israel, Zahala**
RN Elctrns. Agebcues Ltd., TEL: 03 471659

Intl **Taiwan, Taipei**
Multitech Intl. Corp., TEL: 02 7681232

Distributors

Intl **Australia, Sydney**
GES Pty, Ltd., TEL: 439-2488

Intl **Austria, Wien**
W. Moor GmbH, TEL: 43 (222) 85 86 46

Intl **Denmark, Silkeborg**
Micronor, TEL: 45 (06) 83 60 08

Intl **France, Holtzeim**
System Contact, TEL: (88) 782089

Intl **France, Rungis Cedex**
System Contact, TEL: (01) 867 1258

Intl **Germany, Berlin**
System Kontakt, TEL: 49 (030) 88 22 110

Intl **Italy, Milano**
Dott. Ing G. De Mico S.P.A., TEL: 39 (02) 65 31 31

Intl **Italy, Torino**
Dott. Ing. G. de Mico S.P.A., TEL: 39 (011) 87 82 43

Intl **Japan, Osaka**
Kyokuto Boeki Kaisha, Ltd., TEL: (06) 344-1121

Intl **Japan, Osaka**
Matsushita Elec. Trading Co., TEL: (06) 204-5563

Intl **Japan, Osaka**
Nihon Unicon, Inc., TEL: 06-374-0051

Intl **Japan, Tokyo**
Kyokuto Boeki Kaisha, Ltd., TEL: (03) 244-3803

Intl **Japan, Tokyo**
Marubeni Corp., TEL: 282-3446

Intl **Japan, Tokyo**
Matsushita Elec. Trading Co., TEL: (03) 435-4552

Intl **Japan, Tokyo**
Nihan Unicon, Inc., TEL: (03) 388-1921

Intl **Japan, Tokyo**
Nissho Elctrns., Ltd., TEL: (03) 355-8398

Intl **Netherlands, Breda**
Famatra, TEL: (076) 13 3457

Intl **Norway, Stabbekk**
Micronor, TEL: 47 (02) 54 5130

© IC MASTER 1983

Rockwell International (Cont)

Intl Spain, Madrid
Comeltasa, TEL: 754-4530
Intl Sweden, Stockholm
Micronor, TEL: 46 (08) 15 67 85
Intl Switzerland, Zurich
Aumann & Co. AG, TEL: (01) 53 54 00
Intl West Germany, Bad Friedrichshall
System Kontaki, TEL: 49 07136 5031

Sanken

Sanken Electric Company, Ltd.
1-22-8 Nishi-Ikebukuro
Toshima-ku, Tokyo
986-6151
TELEX: 0272-2323
Specific product information:
In United States call:
Energy Electronic Products
6060 Manchester Avenue
Los Angeles, California 90045
(213) 641-9322
TWX: 910-328-6161

Sanyo

Sanyo Semiconductor Corporation
7 Pearl Court
Allendale, New Jersey 07401
201-825-8080
TELEX: 135138 SANYOSEMI ALNJ

SEEQ Technology

SEEQ Technology, Incorporated
1849 Fortune Drive
San Jose, California 95131
408-942-1990

Sales Offices & Representatives

AZ Scottsdale
Tusar, 602-998-3688
CA Canoga Park
Balzer/Wolf, 213-888-7432
CA Costa Mesa
Balzer/Wolf, 714-979-1775
CA San Diego
Balzer/Wolf, 714-292-5946
CA Sunnyvale
Taarcom, Inc., 408-730-9595
CO Wheatridge
Waugaman Assocs., Inc., 303-423-1020
FL Boca Raton
Lawrence Assocs., Inc., 305-368-7373
FL Clearwater
Lawrence Assocs., Inc., 813-584-8110
FL West Melbourne
Lawrence Assocs., Inc., 813-724-8294
IL Arlington Heights
Micro Sales, Inc., 312-956-1000
IN Ft. Wayne
Arete Sales Inc., 219-485-2375
IA Cedar Rapids
Cahill, Schmitz & Cahill, Inc., 319-377-8219
MA Burlington
Mill-Bern Assocs., Inc., 617-273-1313
MI Novi
Action Component Sales, Inc., 313-349-3940
MN St. Paul
Cahill, Schmitz & Cahill, Inc., 612-646-7217
MO Earth City
Micro Sales, Inc., 314-739-7446
MO Grandview
R. R. Burton & Assocs., 816-763-5385
MO Maryland Heights
R. R. Burton & Assocs., 314-434-1678
NY Binghamton
Precision Sales, 607-648-8833
NY Commack
ERA Inc., 516-543-0510
NY Liverpool
Precision Sales, 315-451-3480
NY Pittsford
Precision Sales, 315-381-2820
NY Pleasant Valley
Precision Sales, 914-635-3233
NC Raleigh
J & B Sales, Inc., 919-772-3546
OH Dayton
The Lyons Corp., 513-278-0714
OH Richfield
The Lyons Corp., 216-659-9224
OR Portland
Northwest Marketing Assocs., 503-297-2581
PA Broomall
L. D. Lowery, 215-356-5300
TX Dallas
Technology Sales, Inc., 214-380-0200
UT Salt Lake City
Waugaman Assocs., Inc., 801-254-0570
WA Bellevue
Northwest Marketing Assocs., 206-455-5846

Distributors

AL Huntsville
Schweber Elctrns., Inc., 205-882-2200
CA Canoga Park
Schweber Elctrns., Inc., 213-999-4702
CA Irvine
Schweber Elctrns., Inc., 714-556-3880
CA Sacramento
Schweber Elctrns., Inc., 916-929-9732
CA Santa Clara
Schweber Elctrns., Inc., 408-748-4700
CT Danbury
Schweber Elctrns., Inc., 203-792-3500
FL Altamonte Springs
Schweber Elctrns., Inc., 305-331-7555
FL Hollywood
Schweber Elctrns., Inc., 305-927-0511
GA Norcross
Schweber Elctrns., Inc., 404-449-9170
IL Elk Grove Village
Schweber Elctrns., Inc., 312-364-3750
IA Cedar Rapids
Schweber Elctrns., Inc., 319-373-1417
KS Overland Park
Schweber Elctrns., Inc., 913-492-2921
MD Gaithersburg
Schweber Elctrns., Inc., 301-840-5900
MA Bedford
Schweber Elctrns., Inc., 617-275-5100
MI Livonia
Schweber Elctrns., Inc., 313-525-8100
MN Eden Prairie
Schweber Elctrns., Inc., 612-941-5280
MO Earth City
Schweber Elctrns., Inc., 314-739-0526
NH Manchester
Schweber Elctrns., Inc., 603-625-2250
NJ Fairfield
Schweber Elctrns., Inc., 201-227-7880
NY Rochester
Schweber Elctrns., Inc., 716-424-2222
NY Westbury
Schweber Elctrns., Inc., 516-334-7474
NC Raleigh
Schweber Elctrns., Inc., 919-876-0000
OH Beachwood
Schweber Elctrns., Inc., 216-464-2970
OH Dayton
Schweber Elctrns., Inc., 513-439-1800
OK Tulsa
Schweber Elctrns., Inc., 918-622-8000
PA Horsham
Schweber Elctrns., Inc., 215-441-0600
PA Pittsburgh
Schweber Elctrns., Inc., 412-782-1600
TX Austin
Schweber Elctrns., Inc., 512-458-8253
TX Dallas
Schweber Elctrns., Inc., 214-661-5010
TX Houston
Schweber Elctrns., Inc., 713-784-3600
WI Brookfield
Schweber Elctrns., Inc., 414-784-9020

Semi Processes

Semi Processes Inc.
1885 Herman Avenue
Santa Clara, California 95050
408-988-4004
TWX: 910-338-0025

Sales Offices & Representatives

AL Huntsville
J. R. Associates, 205-830-2130
AZ Phoenix
Bob Anderson Co., 602-266-2070
CA Garden Grove
Elsco, 213-533-1255, 714-891-4621
CA Mission Viejo
Semi Processes Inc., 714-586-2146
CA Palo Alto
Nor-Cal Assocs., 415-961-8121
FL Coral Springs
H.A., Inc., 305-752-7520
FL Largo
H.A., Inc., 813-595-8170
IL Rolling Meadows
Sieger Assocs., 312-991-6161
IA Hiawatha
Gassner & Clark Co., 319-393-5763
KS Wichita
CARE, 316-681-1107
MA West Boylston
Compatible Comps. Inc., 617-835-3614
MI Detroit
J.C. Hofstetter Co., 313-533-7788
MN Bloomington
Sieger Assocs., 612-884-7788
NH Manchester
Semi Processes Inc., 603-424-5111
NJ Springfield
Gebhardt Assoc., 201-376-4415
NY Binghampton
Precision Sales, 607-648-8833
NY Liverpool
Precision Sales, 315-451-3480
NY Pittsford
Precision Sales, 716-381-2820
NY Pleasant Valley
Precision Sales, 914-635-3222
OH Dayton
J. C. Hofstetter Co., 513-296-1010
OH Medina
J. C. Hofstetter Co., 216-241-4880
OR Portland
Hood Engineering Sales Inc., 503-244-0760
PA Broomall
T.C.A. Associates, 215-353-2022
PA Pittsburgh
J. C. Hofstetter Co., 412-327-1410
TX Arlington
W. Pat Fralia Co. Inc., 817-640-9102
TX Austin
W. Pat Fralia Co. Inc., 512-451-3325

© IC MASTER 1983

Semi Processes (Cont)

TX **Stafford**
W. Pat Fralia Co. Inc., 713-491-9336
WA **Bellevue**
Hood Engineering Sales Inc., 206-453-9375
Intl **Austria, Vienna**
Othmar Lackner, TEL: 0222 531185
Intl **Belgium, Brussels**
Auriema N.V., TEL: (02) 52362 95
Intl **Denmark, Hardrup**
Henckel Elektronik, TEL: 011 452 385791
Intl **England, Buckinghamshire**
Hunter Elctrn. Comp. Ltd., TEL: 6286 65421
Intl **England, Redhill, Surrey**
Tranchant Elctrns. Ltd.
Intl **Finland, Espoo**
OY Atomica A.B., TEL: 42 35 33
Intl **France, Antony Cedex**
Almex SA, TEL: (1) 666 21 12
Intl **Israel, Ramat-Gan**
M.R.B.D. Ltd., TEL: 03-736479, 732624
Intl **Italy, Milano**
Adrep SA, TEL: 02 404 4046/7/8
Intl **Japan, Tokyo**
Hirel Co., Ltd., TEL: 03-260-8401
Intl **Netherlands, Haaften**
Techmation Elctrns. B.V., TEL: 4189 2222
Intl **Norway, Oslo**
Eltron A/S, TEL: 02-4628 70
Intl **Scotland, Lanarkshire**
Phoenix Elctrns. Ltd., TEL: (0555) 892393
Intl **Sweden, Vallingby**
teleimport ab, TEL: (08)89 02 65
Intl **Switzerland, Zurich**
ENA AG., TEL: 64 5757
Intl **West Germany, Berlin**
Aktive elektronik GmbH, TEL: 306 84 5078
Intl **West Germany, Hamburg**
Microscan GmbH, TEL: 406 30 5067
Intl **West Germany, Martinsried (Munich)**
Atlantik Elektronik GmbH, TEL: (089) 857 2086
Intl **West Germany, Viersen (Dusseldorf)**
Mostron GmbH, TEL: 02162 17024

Distributors

AL **Huntsville**
Contact Elctrns. Inc., 205-881-9321
AZ **Tempe**
Bell Inds., 602-966-7800
CA **Cupertino**
Western Microtechnology, 408-725-1660
CA **Gardena**
Bell Inds., 213-515-1800
CA **Los Angeles**
Elmo Semiconductor, 213-465-2163
CA **Roseville**
Bell Inds., 916-969-3100
CA **San Diego**
Bell Inds., 714-268-1277
CA **Santa Ana**
Pacesetter Elctrns. USA Inc., 213-299-7760, 714-557-7131
CA **Sunnyvale**
Bell Inds., 408-773-1100
CA **Sunnyvale**
Pacesetter Elctrns. USA Inc., 408-734-5470
CA **Ventura**
Bond Electro Sales, 805-653-6487
CO **Wheat Ridge**
Bell Inds., 303-424-1985
FL **Orlando**
Chip Supply Inc., 305-275-3810
IL **Chicago**
Bell Inds., 312-982-9210
IL **Hoffman Estates**
Intercomp, 312-843-2040
MA **Mendon**
ADD Elctrns. Corp., 617-478-4200
NM **Albuquerque**
Bell Inds., 505-292-2700
NY **East Syracuse**
ADD Elctrns. Corp., 315-437-0300
OH **Dayton**
Bell Inds., 513-434-8231
OR **Lake Oswego**
Bell Inds., 503-241-4115
TX **Addison**
Active Comp. Technology, 214-980-1888
TX **Austin**
ACT Austin, 512-452-5254
TX **Houston**
Active Comp. Technology, 713-496-4000
UT **Salt Lake City**
ACT Utah, 801-942-6505
UT **Salt Lake City**
Bell Inds., 801-972-6969
WA **Bellevue**
Bell Inds., 206-747-1515
WI **Waukesha**
Bell Inds., 414-784-0235
Intl **Austria, Vienna**
Othmar Lackner, TEL: 0222 531185
Intl **Belgium, Brussels**
Auriema N.V., TEL: (02) 52362 95
Intl **Denmark, Hardrup**
Henckel Elektronik, TEL: 011 452 385791
Intl **England, Buckinghamshire**
Hunter Elctrn. Comp. Ltd., TEL: 6286 65421
Intl **England, Redhill, Surrey**
Tranchant Elctrns. Ltd.
Intl **Finland, Espoo**
OY Atomica A.B., TEL: 42 35 33
Intl **France, Antony Cedex**
Almex SA, TEL: (1) 666 21 12
Intl **Israel, Ramat-Gan**
M.R.B.D. Ltd., TEL: 03-736479, 732624
Intl **Italy, Milano**
Adrep SA, TEL: 02 404 4046/7/8
Intl **Japan, Tokyo**
Hirel Co., Ltd., TEL: 03-260-8401
Intl **Netherlands, Haaften**
Techmation Elctrns. B.V., TEL: 4189 2222
Intl **Norway, Oslo**
Altron A/S, TEL: 02-46 28 70
Intl **Scotland, Lanarkshire**
Phoenix Elctrns. Ltd., TEL: (0555) 892393
Intl **Sweden, Vallingby**
teleimport ab, TEL: (08) 89 02 65
Intl **Switzerland, Zurich**
ENA AG., TEL: 64 5757
Intl **West Germany, Berlin**
Aktive Elektronik GmbH, TEL: 306 84 5078
Intl **West Germany, Hamburg**
Microscan GmbH, TEL: 406 30 5067
Intl **West Germany, Martinsried (Munich)**
Atlantik Elektronik GmbH, TEL: (089) 857 2086
Intl **West Germany, Viersen (Dusseldorf)**
Mostron GmbH, TEL: 02162 17024

SGS-ATES Semiconductor

SGS-ATES Semiconductor Corporation
240 Bear Hill Road
Waltham, Massachusetts 02154
617-890-6688
TELEX: 923495

Specific product information:
Product Marketing ..... Jack Dauber
Application engineering:
Applications ..... J. Lampasona
Literature:
Sales Department ..... Anne Smith
Place an order:
Sales Department ..... Ruben Sonnino
Follow-up an order:
Customer Service ..... Donald Rose

Sales Offices & Representatives

Intl **Belgium, Bruxelles**
SGS-ATES Componenti Elettronici SpA, TEL: 02-3432439
Intl **Denmark, Herlev**
SGS-ATES Scandinavia AB, TEL: 02-948533
Intl **Finland, Kaantopiiri**
SGS-ATES Scandinavia AB, TEL: 90-881395/6
Intl **France, Paris**
SGS-ATES France S.A., TEL: 5842730
Intl **Germany, Berlin**
Sales Office, TEL: 030-3622031/2
Intl **Germany, Haidling**
SGS-ATES Deutschland Holbeiter Bouelemente GmbH, TEL: 08092-691
Intl **Germany, Langenhagen**
Sales Office, TEL: 0511-772075/7.
Intl **Germany, Munchen**
Sales Office, TEL: 089-582047/8
Intl **Germany, Nurnberg**
Sales Office, TEL: 0911-49645/6
Intl **Germany, Stuttgart**
Sales Office, TEL: 0711-713091/2
Intl **Hong Kong, Kowloon**
SGS-ATES Singapore (Pte) Ltd., TEL: 3-662625
Intl **Italy, Agrate Brianza**
Intl. Hdqtrs., TEL: 039-65551
Intl **Italy, Agrate Brianza**
Export Sales Office, TEL: 039-6555287
Intl **Italy, Firenze**
Sales Office, TEL: 055-4377763
Intl **Italy, Milano**
SGS-ATES Componenti Elettronici SpA, TEL: 02-4695651
Intl **Italy, Roma**
Sales Office, TEL: 06-8392848
Intl **Italy, Torino**
Sales Office, TEL: 011-531167
Intl **Mexico, Mexico City**
Mexel, TEL: 905-575-7868
Intl **Norway, Oslo**
SGS-ATES Scandinavia AB, TEL: 2-607222
Intl **Singapore, Singapore**
SGS-ATES Singapore (Pte) Ltd., TEL: 2531411
Intl **Sweden, Marsta**
SGS-ATES Scandinavia AB, TEL: 0760-40120
Intl **United Kingdom, Aylesbury-Bucks**
SGS-ATES (United Kingdom) Ltd., TEL: 0296-5977

Distributors

Intl **Mexico, Mexico City**
Mexel, TEL: 905-575-7868

© IC MASTER 1983

SGS-ATES Semiconductor (Cont)

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

Sharp Electronics

Sharp Electronics Corporation
10 Sharp Plaza, P.O. Box 588
Paramus, New Jersey 07652
201-265-5600
TELEX: 134-327

Siemens

Siemens Corporation
186 Wood Avenue South
Iselin, New Jersey 08830
201-494-1000
TELEX: 84-4491

Specific product information:
Al Liebich

Application engineering:
Al Liebich

Literature:
Lon Cantor

Price and delivery:
Ron Giampietro

Follow-up on order:
Ron Giampietro

All other information:
Al Liebich

Signetics

Signetics Corporation
811 East Arques Ave., P.O. Box 409
Sunnyvale, California 94086
408-739-7700
TWX: 910-339-9283

Specific product information:
Analog 408-746-5724, 5725
Bipolar LSI 408-746-1816
Bipolar Memory 408-746-3564
MOS Memory 408-746-1756
CMOS Gate Arrays 408-746-2194
Logic 408-746-1617
Microprocessor 408-746-2254
Microsystems 408-746-2137
Military 916-924-6047
Philips/Euro-Products 408-746-1338

Application engineering:
Analog 408-746-5724, 5725
Bipolar LSI 408-746-1816
Bipolar Memory 408-746-3564
MOS Memory 408-746-1756
CMOS Gate Arrays 408-746-2194
Logic 408-746-1617
Microprocessor 408-746-2254
Microsystems 408-746-2137
Military 916-924-6047
Philips/Euro-Products 408-746-1338

Literature:
Publication Services 408-746-2111

Sales Offices & Representatives

AL **Huntsville**
Elctrn. Sales, Inc., 205-533-1735

AZ **Phoenix**
Signetics Sales Office, 602-265-4444

CA **Canoga Park**
Signetics Sales Office, 213-340-1431

CA **Cupertino**
Signetics Sales Office, 408-725-8100

CA **Inglewood**
Signetics Sales Office, 213-670-1101

CA **Irvine**
Signetics Sales Office, 714-833-8980

CA **San Diego**
Mesa Engrg., 714-278-8021

CA **San Diego**
Signetics Sales Office, 714-560-0242

CO **Aurora**
Signetics Sales Office, 303-751-5011

CT **Danbury**
Signetics Sales Office, 203-744-3722

CT **Yalesville**
Kanan Assoc., 203-265-2404

FL **Lighthouse Point**
Signetics Sales Office, 305-782-8225

GA **Atlanta**
Signetics Sales Office, 404-953-0067

IL **Elk Grove Village**
Micro-Tex, Inc., 312-640-9633

IL **Schaumburg**
Signetics Sales Office, 312-843-7805

IN **Ft. Wayne**
Insul-Reps, Inc., 219-482-1596

IN **Indianapolis**
Insul-Reps, Inc., 317-842-5203

IN **Kokomo**
Signetics Sales Office, 317-453-6462

IA **Cedar Rapids**
Comstrand Inc., 319-377-1575

KS **Kansas City**
B.C. Elctrn. Sales, 913-342-1211

KS **Overland Park**
Signetics Sales Office, 913-341-8181

KS **Wichita**
B.C. Elctrn. Sales, 316-942-9840

MD **Baltimore**
Micro-Comp, Inc., 301-247-0400

MD **Glen Burnie**
Signetics Sales Office, 301-787-0220

MA **Reading**
Kanan Assocs., 617-944-8484

MA **Woburn**
Signetics Sales Office, 617-938-1000

MI **Bloomfield Hills**
Enco Mktg., 313-642-0203

MN **Edina**
Signetics Sales Office, 612-835-7455

MO **St. Louis**
B.C. Elctrn. Sales, 314-731-1255

NJ **Cherry Hill**
Signetics Sales Office, 609-665-5071

NJ **Piscataway**
Signetics Sales Office, 201-981-0126

NM **Albuquerque**
Power Entprs., 505-298-1918

NY **Ithaca**
Bob Dean, Inc., 607-257-1111

NY **Liverpool**
Signetics Sales Office, 315-451-5470

NY **Melville**
Signetics Sales Office, 516-752-0130

NY **Wappingers Falls**
Signetics Sales Office, 914-297-4074

NC **Raleigh**
Signetics Sales Office, 919-851-2013

OH **Worthington**
Signetics Sales Office, 614-888-7143

OR **Hillsboro**
Western Tech. Sales, 503-640-4621

TN **Greenville**
Signetics Sales Office, 615-639-0251

TX **Austin**
Signetics Sales Office, 512-458-2591

TX **Dallas**
Signetics Sales Office, 214-661-1296

UT **Salt Lake City**
Electrodine, 801-486-3801

VA **Lynchburg**
Micro-Comp, Inc., 804-237-6221

WA **Spokane**
Western Tech. Sales, 509-922-7600

WA **Woodinville**
Signetics Sales Office, 206-483-1988

WI **Waukesha**
Micro-Tek, Inc., 414-542-5352

Can **Etobicoke, Ontario**
Signetics Canada, Ltd., 416-626-6675

Can **Pointe-Claire, Quebec**
Signetics Canada, Ltd./Ltee., 514-697-3385

Distributors

AL **Huntsville**
Hall-Mark Elctrns., 205-837-8700

AL **Huntsville**
Hamilton/Avnet Elctrns., 205-837-7210

AL **Huntsville**
Pioneer Elctrns., 205-837-9300

AZ **Phoenix**
Hamilton/Avnet Elctrns., 602-894-9600

AZ **Phoenix**
Wyle Distribution Grp., 602-249-2232

CA **Costa Mesa**
Avnet Elctrns., 714-754-6111

CA **Costa Mesa**
Hamilton Electro Sales, 714-641-4100

CA **Culver City**
Hamilton/Avnet Elctrns., 213-558-2121

CA **Culver City**
Hamilton Avnet Elctrns. Military, 213-558-2901

CA **El Segundo**
Wyle Distribution Grp., 213-322-8100

CA **Irvine**
Schweber Elctrns., 714-556-3880

© IC MASTER 1983

Signetics (Cont)

CA **Irvine**
Wyle Distribution Grp., 714-979-2125
CA **San Diego**
Anthem Elctrns., 714-279-5200
CA **San Diego**
Hamilton/Avnet Elctrns., 714-571-7510
CA **San Diego**
Wyle Distribution Grp., 714-565-9171
CA **San Jose**
Anthem Elctrns. Inc., 408-946-8000
CA **Santa Clara**
Schweber Elctrns., 408-496-0200
CA **Santa Clara**
Wyle Distribution Grp., 408-727-2500
CA **Sunnyvale**
Arrow Elctrns., 408-745-6600
CA **Sunnyvale**
Hamilton/Avnet Elctrns., 408-743-3366
CO **Denver**
Arrow Elctrns., 303-758-2100
CO **Denver**
Wyle Distribution Grp., 303-457-9953
CO **Englewood**
Hamilton/Avnet Elctrns., 303-740-1000
CO **Thornton**
Wyle Distribution Grp., 303-287-9611
CT **Danbury**
Hamilton/Avnet Elctrns., 203-797-2800
CT **Danbury**
Schweber Elctrns., 203-792-3500
CT **Wallingford**
Arrow Elctrns., 203-265-7741
FL **Ft. Lauderdale**
Arrow Elctrns., 305-776-7790
FL **Ft. Lauderdale**
Hamilton/Avnet Elctrns., 305-971-2900
FL **Hollywood**
Schweber Elctrns., 305-927-0511
FL **Palm Bay**
Arrow Elctrns., 305-725-1480
FL **St. Petersburg**
Hamilton/Avnet Elctrns., 813-576-3930
GA **Atlanta**
Schweber Elctrns., 404-449-9170
GA **Norcross**
Arrow Elctrns., 404-449-8252
GA **Norcross**
Hamilton/Avnet Elctrns., 404-447-7500
IL **Bensenville**
Hamilton/Avnet Elctrns., 312-860-7700
IL **Chicago**
Bell Inds., 312-982-9210
IL **Elk Grove**
Schweber Elctrns., 312-364-3750
IL **Schaumburg**
Arrow Elctrns., 312-893-9420
IN **Indianapolis**
Arrow Elctrns., 317-243-9353
IN **Indianapolis**
Hamilton Avnet Elctrns., 317-844-9333
IN **Indianapolis**
Pioneer Elctrns., 317-849-7300
KS **Overland Park**
Hamilton/Avnet Elctrns., 913-888-8900
MD **Baltimore**
Arrow Elctrns., 301-247-5200
MD **Gaithersburg**
Pioneer Washington Elctrns., 301-948-0710
MD **Gaithersburg**
Schweber Elctrns., 301-840-5900
MD **Columbia**
Hamilton/Avnet Elctrns., 301-995-3500
MA **Bedford**
Schweber Elctrns., 617-275-5100
MA **Burlington**
Lionex Corp., 617-272-9400
MA **Woburn**
Arrow Elctrns., 617-933-8130
MA **Woburn**
Hamilton/Avnet Elctrns., 617-273-7500
MI **Ann Arbor**
Arrow Elctrns., 313-971-8220
MI **Grand Rapids**
Hamilton Avnet Elctrns., 616-243-8805
MI **Livonia**
Hamilton/Avnet Elctrns., 313-522-4700
MI **Livonia**
Pioneer Elctrns., 313-525-1800
MI **Livonia**
Schweber Elctrns., 313-525-8100
MN **Eden Prairie**
Schweber Elctrns., 612-941-5280
MN **Edina**
Arrow Elctrns., 612-830-1800
MN **Minnetonka**
Hamilton/Avnet Elctrns., 612-932-0600
MO **Earth City**
Hamilton/Avnet Elctrns., 314-344-1200
MO **St. Louis**
Arrow Elctrns., 314-567-6888
NH **Manchester**
Arrow Elctrns., 603-668-6968
NJ **Cherry Hill**
Hamilton/Avnet Elctrns., 609-424-0100
NJ **Fairfield**
Hamilton/Avnet Elctrns., 201-575-3390
NJ **Fairfield**
Schweber Elctrns., 201-227-7880
NJ **Moorestown**
Arrow Elctrns., 609-235-1900
NJ **Saddlebrook**
Arrow Elctrns., 201-797-5800
NM **Albuquerque**
Hamilton/Avnet Elctrns., 505-765-1500
NY **Buffalo**
Summit Distrs., 716-887-2800
NY **East Syracuse**
Arrow Elctrns., 315-652-1000
NY **East Syracuse**
Hamilton/Avnet Elctrns., 315-437-2642
NY **Farmingdale**
Arrow Elctrns., 516-694-6800
NY **Liverpool**
Arrow Elctrns., 315-652-1000
NY **Melville**
Hamilton/Avnet Elctrns., 516-454-6012
NY **Rochester**
Arrow Elctrns., 716-275-0300
NY **Rochester**
Hamilton/Avnet Elctrns., 716-475-9130
NY **Rochester**
Schweber Elctrns., 716-424-2222
NY **Westbury**
Schweber Elctrns., 516-334-7474
NC **Greensboro**
Pioneer Elctrns., 919-273-4441
NC **Raleigh**
Hamilton/Avnet Elctrns., 919-829-8030
NC **Winston-Salem**
Arrow Elctrns., 919-725-8711
OH **Beachwood**
Schweber Elctrns., 216-464-2970
OH **Centerville**
Arrow Elctrns., 513-435-5563
OH **Cleveland**
Hamilton/Avnet Elctrns., 216-831-3500
OH **Cleveland**
Pioneer Standard Elctrns., 216-587-3600
OH **Dayton**
Hamilton/Avnet Elctrns., 513-433-0610
OH **Dayton**
Pioneer Standard Elctrns., 513-236-9900
OH **Solon**
Arrow Elctrns., 216-248-3990
OK **Tulsa**
Quality Comps., 918-664-8812
OR **Lake Oswego**
Hamilton/Avnet Elctrns., 503-635-8831
PA **Horsham**
Schweber Elctrns., 215-441-0600
PA **Pittsburgh**
Arrow Elctrns., 412-856-7000
PA **Pittsburgh**
Pioneer/Pittsburgh, 412-782-2300
TX **Austin**
Hamilton/Avnet Elctrns., 512-837-8911
TX **Austin**
Quality Comps., 512-835-0220
TX **Dallas**
Hall-Mark Elctrns., 214-341-1147
TX **Dallas**
Hamilton/Avnet Elctrns., 214-659-4111
TX **Dallas**
Quality Comps., 214-387-4949
TX **Dallas**
Schweber Elctrns., 214-661-5010
TX **Houston**
Hamilton/Avnet Elctrns., 713-780-1771
TX **Houston**
Quality Comps., 713-772-7100
TX **Houston**
Schweber Elctrns., 713-784-3600
UT **Salt Lake City**
Hamilton/Avnet Elctrns., 801-972-4300
WA **Bellevue**
Arrow Elctrns., 206-643-4800
WA **Bellevue**
Hamilton/Avnet Elctrns., 206-453-5844
WA **Bellevue**
Wyle Distribution Grp., 206-453-8300
WI **New Berlin**
Hamilton/Avnet Elctrns., 414-784-4510
WI **Oak Creek**
Arrow Elctrns., 414-764-6600
Can **Calgary, Alberta**
Hamilton Avnet Elctrns., 403-230-3586
Can **Downsview, Ontario**
Cesco Elctrns., 416-661-0220
Can **Mississauga, Ontario**
Hamilton/Avnet Elctrns., 416-677-7432
Can **Mississauga, Ontario**
Zentronics, 416-451-9600
Can **Montreal, Quebec**
Cesco Elctrns., 514-735-5511
Can **Montreal, Quebec**
Zentronics Ltd., 514-735-5361
Can **Ottawa, Ontario**
Cesco Elctrns., 613-729-5118
Can **Ottawa, Ontario**
Hamilton/Avnet Elctrns., 613-226-1700
Can **Ottawa, Ontario**
Zentronics Ltd., 613-238-6411
Can **Quebec City, Ontario**
Cesco Elctrns., 418-524-4641
Can **Ville St. Laurent, Quebec**
Hamilton/Avnet Elctrns., 514-331-6443
Intl **Argentina, Buenos Aires**
Fapesa I.y.c., TEL: 652-7438/7478
Intl **Australia, Adelaide**
Philips Inds.-Elcoma, TEL: (08) 45-0211
Intl **Australia, Brisbane**
Philips Inds.-Elcoma, TEL: (07) 277-3332
Intl **Australia, Lane-Cove N.S.W.**
Philips Inds.-Elcoma, TEL: (02) 427-0888
Intl **Australia, Perth**
Philips Inds.-Elcoma, TEL: (09) 277-4199
Intl **Austria, Wien**
Osterreichische Philips, TEL: 93 26 22
Intl **Belgium, Brussels**
M.B.L.E., TEL: 523 00 00
Intl **Brazil, Sao Paulo**
Ibrape, TEL: (55) 011 211-2600
Intl **Chile, Santiago**
Philips Chilena S.A., TEL: 39-4001
Intl **Columbia, Bogota**
Sadape S.A., TEL: 600600
Intl **Denmark, Kobenhavn**
Miniwatt A/S, TEL: (01) 69 16 22
Intl **Finland, Helsinki**
Oy Philips Ab, TEL: 1 72 71
Intl **France, Paris**
R.T.C., TEL: 355-44-99

© IC MASTER 1983

Signetics (Cont)

Intl **Germany, Hamburg**
Valvo, TEL: (040) 3296-1

Intl **Greece, Athens**
Philips S.A. Hellenique, TEL: 915-311

Intl **Hong Kong**
Philips Hong Kong Ltd., TEL: 12-245121

Intl **India, Bombay**
Peico Elctrns. & Elec. Ltd. Elcoma Div., TEL: 295-144

Intl **Indonesia, Jakarta**
P.T. Philips-Ralin Elctrns., TEL: 581058

Intl **Israel, Tel Aviv**
Rapac Elctrns., Ltd., TEL: 477115-6-7

Intl **Italy, Milano**
Philips S.p.A., TEL: 2-6994

Intl **Japan, Tokyo**
Signetics Japan, Ltd., TEL: (03) 230-1521

Intl **Korea, Seoul**
Philips Elect Korea Ltd., TEL: 44-4202

Intl **Mexico, Mexico City**
Elctrna. S.A. de C.V., TEL: 533-1180

Intl **Netherlands, Eindhoven**
Philips Nederland B.V., TEL: (040) 79 33 33

Intl **New Zealand, Auckland**
Philips Electrical Ind. Elcoma, TEL: 894-160

Intl **Norway, Oslo**
Norsk A/S Philips, TEL: 47-2-336270

Intl **Peru, Lima**
Cadesa, TEL: 628599

Intl **Philippines, Makata-Rizal**
Philips Indl. Dev., Inc., TEL: 868951-9

Intl **Portugal, Lisbon**
Philips Portuguesa SARL, TEL: 68 31 21

Intl **Singapore, Singapore**
Philips Singapore Pte., Ltd., TEL: 538811

Intl **South Africa, Johannesburg**
E.D.A.C. (Pty), Ltd., TEL: 24-6701-3

Intl **Spain, Barcelona**
Copresa S.A., TEL: 329 63 12

Intl **Sweden, Stockholm**
Elcoma A.B., TEL: 08/67 97 80

Intl **Switzerland, Zurich**
Philips A.G., TEL: 01/44 22 11

Intl **Taiwan, Taipei**
Philips Taiwan, Ltd., TEL: (02) 563-1717

Intl **Thailand, Bangkok**
Saeng Thong Radio, Ltd., TEL: 34985/36980

Intl **United Kingdom, London**
Mullard, Ltd., TEL: 01-580 6633

Intl **Uruguay, Montevideo**
Luzilectron S.A., TEL: 943 21

Intl **Venzuela, Caracas**
Industrias Venezolanas Philips S.A., TEL: 239-8180

Silicon General

Silicon General, Inc.
11651 Monarch Street
Garden Grove, California 92641
714-892-5531
TELEX: 69-2411
TWX: 910-596-1804

Specific product information:
John Power

Application engineering:
John Power

Literature:
Inside Sales

Price and delivery:
Liz Nicolai, Western Area
Joe Castellano, Eastern Area

Follow-up an order:
Liz Nicolai, Western Area
Joe Castellano, Eastern Area

Sales Offices & Representatives

Intl **Argentina, Buenos Aires**
YEL srl., TEL: 46-2211

Intl **Australia, Prospect**
A.J. Distrs., TEL: 2691244

Intl **Austria, Wien**
Othmar Lackner Elect., TEL: 531185

Intl **Belgium, Hasselt**
Heynen b.v., TEL: 210006

Intl **Denmark, Copenhagen**
E. V. Johanssen Electronik, TEL: (01) 839022

Intl **England, London**
Power Technology, TEL: 734-866766

Intl **Finland, Espoo**
Panta-Tuote OY, TEL: (90) 598525

Intl **France, Paris**
Radio Equip.-Antares, TEL: 758-11-11

Intl **Germany, Munchen**
Astronic GmbH, TEL: 309031

Intl **Germany, Munchen**
Neumuller GmbH, TEL: 61181

Intl **Hong Kong, Kowloon**
Tektron Elect. Ltd., TEL: 856199

Intl **India, Bombay**
Zenith Electronics, TEL: 384214

Intl **Israel, Tel Aviv**
Talviton Elctrns. Ltd., TEL: 44-45-72

Intl **Italy, Monza**
Exhibo Italiana S.P.A., TEL: 360021

Intl **Japan, Tokyo**
Hakuto Co., Ltd., TEL: 03-502-2211

Intl **Netherlands, Gennep**
Heynen b.v., TEL: 08851-1956

Intl **Norway, Oslo**
Henaco, TEL: 645040

Intl **South Africa, Pretoria**
Elctrn. Bldg. Elements, TEL: 469221

Intl **Spain, Madrid**
Amitron S.A., TEL: 2485863

Intl **Sweden, Vallingby**
Svensk Telaindustri AB, TEL: 380320

Intl **Switzerland, Zurich**
Kontron Elctrns., TEL: 4354111

Product Quality & Service Excellence our commitment to our customers

DIPL DE MAT

The first distributor to call for

SILICON GENERAL

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

Siliconix

Siliconix Inc.
2201 Laurelwood Road
Santa Clara, California 95054
408-988-8000
TWX: 910-338-0227

Specific product information:
Publications ..... ext. 2066

Application engineering:
Analog ..... ext. 2091
Interface ..... ext. 2713
Digital ..... ext. 2091
Mospower FET's ..... ext. 2713
Micropower Linear ..... ext. 2091
Switches ..... ext. 2091

Literature:
Publications ..... ext. 2066

Price and delivery:
Sales Department ..... ext. 2192

Place an order:
Local Sales Office

Follow-up an order:
Local Sales Office

All other information:
Publications ..... ext. 2066
Public Relations ..... ext. 2698

Sales Offices & Representatives

AL **Huntsville**
Rep Inc., 205-881-9270

Siliconix (Cont)

AZ **Tempe**
Quatra Assoc., 602-894-2808
CA **Cupertino**
Costar Inc., 408-446-9339
CA **Fountain Valley**
Bager Elctrns., 714-957-3367
CA **Santa Ana**
Siliconix, 714-547-4474
CA **Santa Clara**
Siliconix, 408-988-8000
CO **Englewood**
Delta Sales, 303-741-0646
CT **Cheshire**
Scientific Components, 203-272-2963
CT **Ridgefield**
Siliconix, 203-431-3535
FL **Clearwater Beach**
Perrott Assocs., 813-443-5214
FL **Orlando**
Perrott Assocs., 305-275-1132
FL **Orlando**
Siliconix, 305-293-4255
FL **Sunrise**
Perrott Assocs., 305-792-2211
GA **Norcross**
Montgomery Mktg., 404-447-6124
IL **Des Plaines**
Electron Mktg. Corp., 312-298-2330
IL **Downers Grove**
Siliconix, 312-960-0106
IN **Indianapolis**
Wilson Technical Sales Inc., 317-298-3345
IA **Cedar Rapids**
Tech. Reps Inc., 319-393-1300
KS **Wichita**
Tech. Reps. Inc., 316-681-0242
MD **Baltimore**
Pro Rep, 301-653-3600
MA **Reading**
Kanan Assocs., 617-944-8484
MA **Waltham**
Siliconix, 617-890-7180
MI **Brighton**
A.P. Assocs., 313-229-6550
MN **Burnsville**
Electromec Sales Inc., 612-894-8200
MO **Earth City**
Tech. Reps. Inc., 314-291-0001
MO **Kansas City**
Tech. Reps. Inc., 816-756-3575
NE **Lincoln**
Tech. Reps. Inc., 402-475-2115
NH **Nashua**
Comp Tech, Inc., 603-883-9380
NJ **Marlton**
B.G.R. Assoc., 609-428-2440
NJ **Teaneck**
R.T. Reid Assoc., 201-692-0200
NY **Endwell**
Tri-Tech, 607-754-1094
NY **Fairport**
Tri-Tech, 716-223-5720
NY **Fayetteville**
Tri-Tech, 315-446-2881
NY **Poughkeepsie**
Tri-Tech, 914-473-3880
NC **Cary**
Montgomery Mktg., 919-467-6319
OH **Cleveland**
Arthur H. Baier Co., 216-461-6161
OH **Dayton**
Arthur H. Baier Co., 513-276-4128
OH **Westlake**
Siliconix Inc., 216-835-4470
OR **Beaverton**
Blair Hirsh Co., 503-641-1875
TN **Jefferson City**
Rep Inc., 615-475-4105
TX **Austin**
EMA, 512-837-0893
TX **Carrollton**
Siliconix Inc., 214-358-4046
TX **Grapevine**
EMA, 817-481-7502
TX **Houston**
EMA, 713-498-8120
UT **Salt Lake City**
Delta Sales Assocs., 801-487-7571
WA **Lynnwood**
Blair Hirsh Co., Inc., 206-774-8151
WI **Milwaukee**
JM Sales, 414-546-0040
Can **Islington, Ontario**
Pipe Thompson, Ltd., 416-236-2355
Can **North Gower, Ontario**
Pipe Thompson, Ltd., 613-258-4067
Intl **Australia, Moorabbin, Victoria**
STC Cannon Comps., Pty., Ltd., TEL: Melbourne 95-1566
Intl **Austria, Vienna**
Ing. Ernst Steiner, TEL: 0222/827474
Intl **Belgium, Antwerpen**
Ritro Elctrns. BV, TEL: 031-353272
Intl **Belgium, Brussels**
Belram S.A.
Intl **Brazil, Sao Paulo**
Cosele Comercio e Servicos, TEL: 230-1253
Intl **Cyprus, Nicosia**
Eltrom/Poly Elctrns. Ltd., TEL: 21 61088
Intl **Denmark, Glostrup**
Ditz Schweitzer A.S., TEL: (02) 45 30 44
Intl **Finland, Kauniainen**
Oy Findip AB, TEL: 358-0-5052255
Intl **France, Antony**
Almex, TEL: 666-21-12
Intl **France, Creteil Credex**
Siliconix SARL, TEL: 377-07-87
Intl **France, Lyon**
Alrodis, TEL: (78) 00-87-12
Intl **France, Marcq-en-Baroeuil**
Sanelec Electronique, TEL: (20) 98-92-13
Intl **France, Possac Cedex**
Composants S.A., TEL: (56) 36 4040
Intl **France, Poitiers**
Composants S.A., TEL: (49) 88.60.50
Intl **France, Rennes Cedex**
Composants S.A., TEL: (99) 54.01.53
Intl **France, Rungis Cedex**
SCAIB, TEL: 687-23-13
Intl **France, Strasbourg Cedex**
A. Baltzinger, TEL: (88) 331852
Intl **France, Toulouse**
Composants S.A., TEL: (61) 20.82.38
Intl **Germany, Berlin**
Ing. Buro Rainer Konig, TEL: 030 772 8009
Intl **Germany, Dusseldorf**
EBV Elektronik GmbH, TEL: (0211) 84846/7
Intl **Germany, Frankfurt**
EBV Elektronik GmbH, TEL: 0611/785037
Intl **Germany, Hamburg**
Ing. Buro K.H. Dreyer, TEL: (040) 669027
Intl **Germany, Hannover**
EBV Elektronik GmbH, TEL: (05139) 5038
Intl **Germany, Homburg**
iv -- elctrn., TEL: (06172) 23061-5
Intl **Germany, Obsralting-Seefeld**
Ultratronik GmbH, TEL: (08152) 7773
Intl **Germany, Schleswig**
Ing. Buro K.H. Dreyer, TEL: (04621) 24055
Intl **Germany, Stuttgart**
Ditronic GmbH, TEL: (0711) 724844, 722079
Intl **Germany, Stuttgart**
EBV Elektronik GmbH, TEL: (0711) 247481
Intl **Germany, Unterhaching**
EBV Elektronik GmbH, TEL: 089-61105-1
Intl **Greece, Athens**
General Elctrns. Ltd., TEL: (1) 490-69-98
Intl **Greece, Piraeus**
General Elctrns. Ltd., TEL: (1) 491-35-95
Intl **Holland, Graveland**
Datron B.V.
Intl **Holland, Hecrenveen**
Tektronix Holland N.V.
Intl **Holland, Koperwerf**
Koning en Harman Elekt BV, TEL: 070-210101
Intl **Hong Kong, Kowloon**
Siliconix, Ltd., TEL: 3-427151
Intl **India, Bombay**
Zenith Elctrns., TEL: 384 214
Intl **Ireland, Republic of**
E.I. Co. Ltd.
Intl **Israel, Tel Aviv**
Telsys Ltd., TEL: 482126-7-8
Intl **Italy, Milano**
Adelsy
Intl **Italy, Milano**
Dott. Ing. Giuseppe DeMico S.P.A., TEL: (02) 9520551
Intl **Japan, Tokyo**
Nippon Siliconix Inc., TEL: (03) 264-7905
Intl **Japan, Tokyo**
Teijin Advanced Prods. Corp., TEL: (03) 506-4670
Intl **Korea, Seoul**
Exim Co. Ltd., TEL: 715-4933
Intl **Malaysia, Ipoh**
Carter Semiconductor, TEL: 513400
Intl **New Zealand, Auckland**
S.T.C. Auckland, TEL: 500-019
Intl **Norway, Lillestrom**
A.S. Kjell Bakke, TEL: (02) 83 02 20
Intl **Philippines, Manila**
Alexan Commercial, TEL: 405923
Intl **Portugal, Lisbon**
Telectra SARL, TEL: 68.60.72
Intl **Singapore**
Reliability Singapore PTE Ltd.
Intl **Singapore, Orchard Towers**
Carter Semiconductor PTE. Ltd., TEL: 235 6653
Intl **South Africa, Cape Town**
Electrolink (Pty) Ltd., TEL: 215 350
Intl **Spain, Barcelona**
Redis Logar SA, TEL: 2549048
Intl **Spain, Madrid**
Comercial Espanola Comp. S.A., TEL: 1 250 6687
Intl **Spain, Madrid**
Redis Logar SA, TEL: 4113561
Intl **Sweden, Solna**
Komponentbolaget NAXAB, TEL: 08 985140
Intl **Switzerland, Landstrasse**
Abelec A.G., TEL: 01-7300455
Intl **Switzerland, Zurich**
Kontron Elctrn. AG, TEL: 01-62-82-82
Intl **Taiwan, Taipei**
Don Business Corp., TEL: 571-2911
Intl **Taiwan, Kaohsiung**
Siliconix Ltd., TEL: 362010
Intl **United Kingdom, Bucks**
Dage Eurosem Ltd., TEL: 0296-32881
Intl **United Kingdom, Edinburgh**
Abercorn Elctrns. Ltd., TEL: 031 669 6479
Intl **United Kingdom, Middlesex**
Semiconductor Specialists (UK) Ltd., TEL: (08954) 45522/46415
Intl **United Kingdom, Morristown-Swansea**
Siliconix Ltd., TEL: (0792) 74681
Intl **United Kingdom, Newbury**
Siliconix Ltd., TEL: (0635) 47609
Intl **United Kingdom, Slough, Berks**
Macro-Mktg. Ltd., TEL: (06286) 4422
Intl **United Kingdom, Sussex**
Hartech Ltd., TEL: (0243) 573164
Intl **United Kingdom, W. Sussex**
Barlec Ltd., TEL: 0403-51881
Intl **Venzuela, Caracas**
P. Benavides SRL, TEL: 52 92 97
Intl **West Germany, Filderstadt**
Siliconix GmbH, TEL: (0711) 702066

© IC MASTER 1983

Siliconix (Cont)

Intl Yugoslavia, Belgium, Brussels
Belram SA, TEL: 734.33.32.734.26.19

Distributors

AL Huntsville
Hamilton/Avnet, 205-837-7210

AL Huntsville
Pioneer/Huntsville, 205-837-9300

AZ Tempe
Hamilton/Avnet, 602-894-9600

CA Anaheim
Zeus West, Inc., 714-632-6880

CA Chatsworth
Anthem Elctrns., Inc., 213-700-1000

CA Costa Mesa
Avnet Elctrns., 714-754-6111

CA Costa Mesa
Hamilton Electro Sales, 714-641-4100

CA Culver City
Hamilton Electro Sales, 213-558-2121

CA San Diego
Anthem Elctrns., Inc., 714-453-9005

CA San Diego
Hamilton/Avnet, 714-571-5710

CA Santa Clara
Wyle Distribution Grp., 408-727-2500

CA Sunnyvale
Bell Inds., 408-734-8570

CA Sunnyvale
Hamilton/Avnet, 408-743-3300

CA Tustin
Anthem Elctrns., Inc., 714-730-8000

CO Englewood
Hamilton/Avnet, 303-740-1000

CO Thornton
Wyle Distribution Grp., 303-457-9953

CO Wheatridge
Bell Inds., 303-424-1985

CT Danbury
Hamilton/Avnet, 203-797-2800

CT Wallingford
Marshall Inds., 203-265-3822

FL Ft. Lauderdale
Hamilton/Avnet, 305-971-2900

FL Orlando
Pioneer Elctrns., 305-859-3600

FL St. Petersburg
Hamilton/Avnet, 813-576-3930

GA Norcross
Hamilton/Avnet, 404-447-7500

GA Norcross
Marshall Inds., 404-923-5750

IL Bensenville
Hamilton/Avnet, 312-678-6310

IL Elk Grove Village
Pioneer/Chicago, 312-437-9680

IN Carmel
Hamilton/Avnet, 317-844-9333

IN Indianapolis
Pioneer/IN, 317-849-7300

KS Overland Park
Hamilton/Avnet, 913-888-8900

MD Columbia
Hamilton/Avnet, 301-995-3500

MD Gaithersburg
Marshall Inds., 301-840-9450

MD Gaithersburg
Pioneer/Washington, 301-948-0710

MA Burlington
Marshall Inds., 617-272-8200

MA Burlington
Milgray New England, 617-272-6800

MA Woburn
Hamilton/Avnet, 617-953-9700

MI Livonia
Hamilton/Avnet, 313-522-4700

MI Livonia
Pioneer/MI, 313-525-1800

MN Minneapolis
Indl. Comps., 612-831-2666

MN Minnetonka
Hamilton/Avnet, 612-932-0600

MN Minnetonka
Pioneer/Twin Cities, 612-935-5444

MN Plymouth
Marshall Inds.

MO Earth City
Hamilton/Avnet, 314-344-1200

NJ Cherry Hill
Hamilton/Avnet, 609-424-0100

NJ Clifton
Marshall Inds., 201-340-1900

NJ Fairfield
Hamilton/Avnet, 201-575-3390

NJ Mt. Laurel
Marshall Inds., 609-234-9100

NM Albuquerque
Alliance Elctrns., 505-293-3360

NM Albuquerque
Bell Inds., 505-292-2700

NM Albuquerque
Hamilton/Avnet, 505-765-1500

NY Buffalo
Summit Inc., 716-887-2800

NY East Syracuse
Hamilton/Avnet, 315-437-2642

NY Endwell
Marshall Inds., 607-754-1570

NY Freeport
Milgray Elec., 516-546-5600

NY Hauppauge
Harvey Military/Components Plus, 516-231-9200

NY Hauppauge
Marshall Inds., 516-273-2424

NY Melville
Hamilton/Avnet, 516-454-6000

NY Port Chester
Zeus Components, 914-937-7400

NY Rochester
Hamilton/Avnet, 716-475-9130

NY Rochester
Marshall Inds., 716-235-7620

NC Greensboro
Pioneer/N.C., 919-273-4441

NC Raleigh
Hamilton/Avnet, 919-829-8030

OH Cleveland
Pioneer/Cleveland, 216-587-3600

OH Dayton
Hamilton/Avnet, 513-433-0610

OH Dayton
Pioneer/Dayton, 513-236-9900

OH Warrensville Heights
Hamilton/Avnet, 216-831-3500

OK Tulsa
Quality Comps., 918-664-8812

OR Lake Oswego
Hamilton/Avnet, 503-635-8836

PA Horsham
Pioneer Elctrns., 215-647-4000

PA Pittsburgh
Pioneer/Pittsburgh, 412-782-2300

TX Addison
Quality Components, 214-387-4949

TX Austin
Hamilton/Avnet, 512-837-8911

TX Austin
Quality Comps., 512-835-0220

TX Houston
Hamilton/Avnet, 713-780-1771

TX Houston
Quality Comps., 713-772-7100

TX Irving
Hamilton/Avnet, 214-659-4151

UT Salt Lake City
Hamilton/Avnet, 801-972-2800

WA Bellevue
Hamilton/Avnet, 206-453-5844

WA Bellevue
Wyle Distribution Grp., 206-453-8300

WI Milwaukee
Marsh Elctrns., Inc., 414-475-6000

WI New Berlin
Hamilton/Avnet, 414-784-4510

Can Burnaby, British Columbia
RAE Indl. Elctrns., Ltd., 604-291-8866

Can Downsview, Ontario
Future Elctrns., 416-663-5563

Can Mississauga, Ontario
Hamilton/Avnet, 416-677-7432

Can Montreal, Pte. Claire, Quebec
Future Elctrns., 514-731-7441

Can Nepean, Ontario
Hamilton/Avnet, 613-226-1700

Can Ottawa, Ontario
Future Elctrns., 613-820-8313

Can St. Laurent, Quebec
Hamilton/Avnet, 514-331-6443

Silicon Systems

Silicon Systems Inc.
14351 Myford Road
Tustin, California 92680
714-731-7110
TWX: 910-595-2809

Specific product information:
Walt Haley

Literature:
Walt Haley

Price and delivery:
Walt Haley

Siltronics

Siltronics Ltd.
436 Highway 7
Kanata, Ontario K2L 1T9
613-836-5003

Solarise Enterprises

Solarise Enterprises Inc.
10080 North Wolfe Road, Suite SW3-180
Cupertino, California 95014
408-446-9343

Solid State Micro Technology for Music

Solid State Micro Technology for Music
2076B Walsh Avenue
Santa Clara, California 95050
408-727-0917
TELEX: 171189

Specific product information:
Dan Parks

Application engineering:
Ron Dow

Literature:
Receptionist

Price and delivery:
Dan Parks

Follow-up an order:
Dan Parks

© IC MASTER 1983

Solid State Micro Technology for Music (Cont)

Sales Offices & Representatives

Intl **France, Boulogne**
Intl. Semiconductor Corp., TEL: (3321) 6085275

Intl **Italy, Milano**
Adelsy S.P.A., TEL: (02) 4524651

Intl **Italy, Ancona**
Adelsy S.P.A., TEL: (071) 716321-2

Intl **Japan, Tokyo**
Nippon Imex Corp., TEL: Tokyo 321-4415

Intl **Sweden, Taby**
I.C. Inventor, TEL: 08-756 50 24

Solid State Scientific

Solid State Scientific, Inc.
Montgomeryville Industrial Center
Montgomeryville, PA 18936
215-855-8400
TWX: 510-661-7267

DIPLOMAT

The first distributor to call for

Solid State Scientific

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

Distributors

Intl **Argentina, Buenos Aires**
Yel S.R.L., TEL: 46 2211

Intl **Australia, Blackburn**
VSI Elctrns., TEL: 02 439 4655

Intl **Australia, Crows Nest, N.S.W.**
VSI Elctrns., TEL: 02 439 4655

Intl **Chile, Santiago**
Victronics Ltda., TEL: 36440

Intl **Denmark, Copenhagen**
Advanced Elctrn. ApS, TEL: 01 1944 33

Intl **England, London-Hammersmith**
Rastra Elctrns. Ltd., TEL: 01 7483143/2906

Intl **Finland, Helsinki**
Oy E. Friis-Mikkelsen AB, TEL: 90 317 377

Intl **France, Buc**
ERN, TEL: 956-00-11

Intl **Greece, Athens**
Macedonian Elctrns. Inc., TEL: 308 800-801

Intl **Hong Kong**
Time Mos Elctrns., TEL: 5-283219-21

Intl **Hong Kong, Kowloon**
Triple S, TEL: 3-884013

Intl **India, Bombay**
Macro International, TEL: 329922 348688

Intl **Israel, Tel Aviv**
Telsys Ltd., TEL: 482126-7-8

Intl **Italy, Milan**
Erie Elettronica SpA, TEL: 2 6884833

Intl **Japan, Tokyo**
Jepico Corp., TEL: (03) 348-0611

Intl **Korea, Seoul**
Yeonil & Co., Ltd., TEL: 967-0475

Intl **Norway, Oslo**
Hefro Teknisk A/S, TEL: 02 38 02 86

Intl **Singapore**
Carter Semiconductor, TEL: 235-6653

Intl **South Africa, Hazelwood**
Elctrnc. Bldg. Elements, TEL: 78 9221/6

Intl **Sweden, Vallingby**
Svensk Teleindustri, TEL: 08 89 04 35

Intl **Switzerland, Wettingen**
Elbatex AG, TEL: 056 26 56 41

Intl **Switzerland, Zurich**
Kurt Hirt AG, TEL: 01/302 21 21

Intl **Taiwan, Taipei**
Derlon Inc. Ltd., TEL: 8823447-9

Intl **West Germany, Offenbach/Main**
Neutron GmbH, TEL: 611 813930

Solitron Devices

Solitron Devices, Inc.
Semiconductor Division
8808 Balboa Avenue
San Diego, California 92123
714-278-8780

Sales Offices & Representatives

Intl **France, Paris**
ERN, Composants ET Materell Electroniques, TEL: 956.00.11

Intl **Hong Kong, Kowloon**
Intl. Sales Corp., TEL: 3-807562, 3-808642

Intl **Israel, Ramat Hasharon**
R.D.T. Elctrns. Engrg., TEL: 212-995-5200

Intl **Italy, Milano**
Syscom Elettronica, TEL: 6.189.251/2/3

Intl **Korea, Seoul**
Taeil Trading Co., TEL: 22-6741, 22-6411

Intl **Switzerland, Baden-Dattwil**
W. Stolz AG, TEL: 056/84 01 51

Intl **United Kingdom, Surrey, England**
Consort Elctrns., Ltd., TEL: 252-871717

Intl **West Germany, Munich**
Bitronic GmbH, TEL: 089/4702098

Intl **West Germany, Stuttgard**
Bitronic GmbH, TEL: 07144 3201

Distributors

Intl **Australia, Victoria**
Instant Comp. Service, TEL: 95 9566

Intl **Brazil, Sao Paulo**
Aplicacoes Artimar, Ltda., TEL: 35-2452; 35-0747

Intl **Finland, Helsinki**
Oy Fintronic A-b, TEL: 601155

Intl **France, Paris**
ERN, Composants ET Materell Electroniques, TEL: 956.00.11

Intl **India, Bombay**
Nayar Elctrns. Ltd., TEL: 24 38 02

Intl **Israel, Ramat Hasharon**
R.D.T. Elctrns. Engrg., TEL: 212-995-5200

Intl **Israel, Tel-Aviv**
R.D.T. Elctrns. Engrg.

Intl **Italy, Milano**
Syscom Elettronica, TEL: 6.189.251/2/3

Intl **Korea, Seoul**
Taeil Trading Co., TEL: 22-6741, 22-6411

Intl **Norway, Hvalstad**
Nordisk Elektronik (Norge) AS

Intl **Norway, Oslo**
Nordisk Elektronik (Norge) AS, TEL: 02/553893

Intl **United Kingdom, Surrey, England**
Consort Elctrns. Ltd., TEL: 252-871717

Intl **West Germany, Munich**
Bitronic GmbH, TEL: 089/4702098

Intl **West Germany, Stuttgard**
Bitronic GmbH, TEL: 07144 3201

Sprague Electric

Sprague Electric Company
Semiconductor Division Integrated Circuit Operations
115 Northeast Cutoff
Worcester, Massachusetts 01606
617-853-5000
TWX: 710-340-6304

Specific product information:
Interface (peripheral power)—Except Military ..... D. Bird
Interface (peripheral power)—Military ..... W. Sullivan
Linear—Radio, Video, SMPS ..... W. Maxwell
Linear—Audio ..... R. Mailloux
Optical & Telecommunications ..... S. Dumery

Sprague Electric

Sprague Electric Company
Semiconductor Division Discrete Components Operation
70 Pembroke Road, P.O. Box 917A
Concord, New Hampshire 03301
603-224-1961
TWX: 710-361-1495
Specific product information:
Hall-Effect I.C.s ..... A. Kendall
Application engineering:
A. Kendall
Literature:
647 Marshall Street, North Adams, Massachusetts 01247
(413) 664-4411, Ext. 2107
Price and delivery:
A. Kendall
Place an order:
A. Kendall
Follow-up an order:
A. Kendall

Sales Offices & Representatives

AL **Huntsville**
Sprague Elec. Co., 205-883-0520

© IC MASTER 1983

Sprague Electric (Cont)

AZ **Tempe**
Sprague Elec. Co., 602-244-0154

CA **Burlingame**
William J. Purdy Co., 415-347-7701

CA **Costa Mesa**
Sprague Elec. Co., 714-549-9913

CA **Inglewood**
Sprague Elec. Co., 213-649-2600

CO **Denver**
William J. Purdy Co., 303-777-1411

CT **Farmington**
Ray Perron & Co., 203-673-4825

CT **Trumbull**
Ray Perron & Co., 203-268-9631

CT **Trumbull**
Sprague Elec. Co., 203-261-2551

DC **Washington**
Sprague Elec. Co. (Gov't sales only), 202-337-7820

FL **Altamonte Springs**
Sprague Elec. Co., 305-831-3636

GA **Smyrna**
Elctrn. Mktg. Assocs., 404-433-9941

IL **Park Ridge**
Sprague Elec. Co., 312-296-6620

IN **Indianapolis**
Sprague Elec. Co., 317-253-4247

MD **Annapolis Junction**
Sprague Elec. Co., 301-792-7657

MA **Newton**
Ray Perron & Co., 617-969-8100

MA **Waltham**
Sprague Elec. Co., 617-899-9100

MI **Jackson**
Sprague Elec. Co., 517-787-3934

MN **Minneapolis**
HMR, Inc., 612-831-7400

MO **St. Louis**
EPI Inc., 314-781-2420

NH **Dover**
Ray Perron & Co., 603-742-2321

NJ **Cherry Hill**
Sprague Elec. Co., 609-795-2299

NJ **Cherry Hill**
Trinkle Sales Inc., 609-795-4200

NJ **Wayne**
Sprague Elec. Co., 201-696-8200

NM **Albuquerque**
William J. Purdy Co., 505-266-7959

NY **Central Islip**
Sprague Elec. Co., 516-234-8700

NY **Larchmont**
Sprague Elec. Co., 914-834-4439

NY **Larchmont**
William Rutt, Inc., 914-834-8555

NY **Syracuse**
Paston Hunter Co., 315-437-2992

NY **Syracuse**
Sprague Elec. Co., 315-437-7311

NC **Winston Salem**
Elctrn. Mktg. Assoc., 919-722-5151

OH **Beachwood**
Elctrn. Salesmasters, Inc., 800-362-2616

OH **Dayton**
Sprague Elec. Co., 513-435-1678

PA **Philadelphia**
Sprague Elec. Co., 215-467-5252

PA **Philadelphia**
Trinkle Sales, Inc., 215-922-2080

SC **Greenville**
Elctrn. Mktg. Assocs., 803-233-4637

TX **Richardson**
Sprague Elec. Co., 214-235-1256

VA **Lexington**
Sprague Elec. Co., 703-463-9161

WA **Seattle**
Sprague Elec. Co., 206-632-7761

Can **Ottawa, Ontario**
Sprague Elec. of Can., 613-238-2542

Can **Toronto, Ontario**
Sprague Elec. of Can., 416-766-6123

Intl **Belgium, Ronse (Renaix)**
Sprague-Benelux, TEL: 215-351 (055)

Intl **England, Salfords**
Sprague Elec. (U.K.) Ltd., TEL: Horley 5666

Intl **France, Dagneux**
Sprague France S.A.R.L., TEL: 6 55 19 19

Intl **Germany, Frankfurt**
Sprague GmbH, TEL: 0611-60551

Intl **Germany, Munich**
Sprague GmbH, TEL: 089-430-1077

Intl **Hong Kong**
Sprague World Trade Corp., TEL: 5-626231-4

Intl **Switzerland, Geneva**
Sprague World Trade Corp., TEL: 98 4021

Intl **Taiwan, Taipei**
Sprague Taiwan Corp., TEL: (02) 752-2458

Stag Microsystems

Stag Microsystems Inc.
1120 San Antonio Road
Palo Alto, California 94303
415-967-0953
TWX: 910-373-2030

Sales Offices & Representatives

CA **Fountain Valley**
Bager Elctrns., 714-770-9159

CA **Santa Clara**
Jack Lang & Assocs., 408-988-1751

CO **Littleton**
Aztec Entprs., 303-795-0250

FL **Coral Springs**
HAI Elctrns., 305-752-7520

IL **Rolling Meadows**
Commodore 1, 312-394-5441

MD **Towson**
Allen Assocs., 301-823-7370

MA **Burlington**
Intersell, 617-273-3844

MO **Raytown**
Paloma Sales, 816-358-7272

NY **Commack**
J. Schwinn & Assoc., 516-543-7677

OH **Cleveland**
Norm Case Assocs., 216-333-0400

TX **Houston**
Spectra Sales Corp., 713-783-8333

TX **Richardson**
Spectra Sales Corp., 214-234-3600

UT **Salt Lake City**
Aztec Entprs., 801-487-4750

Standard Microsystems

Standard Microsystems Corporation
35 Marcus Boulevard
Hauppauge, New York 11787
516-273-3100
TWX: 510-227-8898

Specific product information:
Camille Fraschilla

Application engineering:
Vince Rende

Literature:
Camille Fraschilla

Price and delivery:
Cathy Perigine

Follow-up an order:
Cathy Perigine

All other information:
Cathy Perigine

Sales Offices & Representatives

Intl **Australia, Melbourne**
A.J.F. Sys. & Comp., Pty., Ltd., TEL: (03) 679702

Intl **Finland, Helsinki**
Havulinna Oy, TEL: (90) 755-4144

Intl **France, Sovres**
Tekelec Airtronic, TEL: 33-1-534-7535

Intl **Holland, Amsterdam**
Nijkerk Elktronika B.V., TEL: 020-462221

Intl **Israel, Tel Aviv**
Vectronics, Ltd., TEL: 23 4424

Intl **Italy, Milano**
Dott. Ing. Guiseppe De Mico, TEL: 02-65-31-31

Intl **Japan, Tokyo**
Teijin Advanced Prods. Corp., TEL: 506-4670-6

Intl **Netherlands, Breda**
Famatra Benelux, TEL: (76) 133457

Intl **Norway, Oslo**
National Elektro, TEL: (2) 221900

Intl **Puerto Rico, San Juan**
Millbern Assoc.

Intl **Sweden, Solna**
NAXAB, TEL: 08/98-51-40

Intl **Switzerland, Zurich**
Kontron Elctrn., TEL: 01-62-82-82

Intl **Taiwan, Taipei**
Multitech Intl. Corp., TEL: (02) 769-1225

DIPL DE MAT

The first distributor to call for

STANDARD MICROSYSTEMS CORPORATION

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

Standard Microsystems (Cont)

Distributors

Intl **Australia, Melbourne**
A.J.F. Sys. & Comp., Pty., Ltd., TEL: (03) 679702

Intl **France, Sevres**
Tekelec Airtronics, TEL: 33-1-534-7535

Intl **Great Britian, England**
Thame Components, TEL: 084-421-4561

Intl **Italy, Milano**
Dott. Ing. Guiseppe De Mico, TEL: 02 95 20 551

Intl **Japan, Tokyo**
Teijin Advanced Prods. Corp., TEL: (506) 4670-6

Intl **Netherlands, Breda**
Famatra Benelux, TEL: (76) 222 660

Intl **Norway, Oslo**
National Elektro, TEL: (2) 221900

Intl **Sweden, Solna**
NAXAB, TEL: 08/98-51-40

Intl **Switzerland, Zurich**
Kontron Elctrn., TEL: 01-62-82-82

Intl **Taiwan, Taipei**
Multitech Intl. Corp., TEL: (02) 769-1225

Intl **West Germany, Munchen**
Tekelec Airtronic GmbH, TEL: (89) 594621

Structured Design

Structured Design Inc.
1700 Wyatt Drive, Suite 3
Santa Clara, California 95054
408-988-0725
TELEX: 172931

Specific product information:
Manufacturing Office 408-988-5512

Application engineering:
Manufacturing Office 408-988-5512

Literature:
Marketing Office 408-988-0725

Price and delivery:
Marketing Office (408-988-0725) or Local Representative Office

Place an order:
Marketing Office (408-988-0725) or Local Representative Office

Follow-up an order:
Customer Service 408-988-0725

All other information:
Marketing Office 408-988-0725

Sales Offices & Representatives

AL **Huntsville**
Rep, Inc., 205-881-9270

AZ **Scottsdale**
Summit Sales, 602-998-4850

CA **Cupertino**
Thresum Assoc. Inc., 408-996-9889

CA **Fountain Valley**
Bager, 213-433-1687

CA **Mountain View**
Intectra, 415-967-8818

CA **Sunnyvale**
Micro Aids International, 408-733-0695

CO **Wheatridge**
Waugaman, 303-423-1020

CT **North Haven**
Comp Rep Assoc., 203-239-9762

GA **Tucker**
Rep, Inc., 404-938-4358

IL **Rolling Meadow**
Sumer, Inc., 312-991-8500

IN **Indianapolis**
Devoe Co., 317-842-3245

IA **Cedar Rapids**
S & O Sales, 319-393-1845

KS **Olathe**
Rush & West Assoc., 913-764-2600

MA **Westwood**
Comp Rep Assoc., 617-329-3454

MI **Grosse Point Park**
Greiner Assoc., 313-499-0188

MO **Ballwin**
Rush & West Assoc., 314-394-7271

NJ **Teaneck**
R. T. Reid Assoc., 201-692-0200

NY **Rochester**
L-Mar Assoc., 716-544-8000

NY **Syracuse**
L-Mar Assoc., 315-437-7779

NC **Raleigh**
Rep, Inc., 916-851-3007

OH **Cincinnati**
Makin Assoc., 513-871-2424

OH **Columbus**
Makin Assoc., 614-459-2423

OK **Tulsa**
West & Assoc., 918-627-3609

PA **Glenside**
CMS Marketing, 215-885-5106

TN **Jefferson City**
Rep, Inc., 615-475-4105

TX **Austin**
West & Assoc., 512-441-6973

TX **Dallas**
West & Assoc., 214-248-7060

TX **Houston**
West & Assoc., 713-777-4108

UT **South Jordan**
Waugaman Assoc., 801-254-0570

VA **Reston**
Monolithic Sales, 703-620-9558

Can **Brampton, Ontario**
Cantec Reps. Inc., 416-791-5922

Can **Dollard Des Ormeaux, Quebec**
Cantec Reps. Inc., 514-683-6131

Can **Kitchener, Ontario**
Cantec Reps. Inc., 519-744-6341

Can **Ottawa, Ontario**
Cantec Reps. Inc., 613-725-3704

Intl **Australia, Burwood, Victoria**
R & D Elctrns. Pty. Ltd., TEL: 61-3-288-8232

Intl **Denmark, Horsholm**
C-68, TEL: 2-570668

Intl **Germany, Gerlingen-Stuttgart**
Positron Bauelemente Vertriebs GmbH, TEL: 07-156-23051

Intl **India, Trivandrum**
Kryonix International, TEL: 63805

Intl **Israel, Tel Aviv**
Telsys Ltd., TEL: 972482126

Intl **Italy, Milano**
Elind, TEL: 02-9-041-319

Intl **Norway, Oslo**
Henaco A/S, TEL: 2-157550

Intl **South Africa, Pinegowrie**
Radiokom Ltd., TEL: 789-1400

Intl **Sweden, Solna**
Naxab, TEL: 8-985140

Intl **Taiwan, Taipei**
Multitech International Corp., TEL: 8-011-86

Intl **United Kingdom, East Molesey, Surrey**
Memory Devices Ltd., TEL: 1-9411066

Stynetic Systems

Stynetic Systems Incorporated
Flowerfield—Building 1
Saint James, New York 11780
516-862-7670

Sunrise Electronics

Sunrise Electronics, Inc.
524 South Vermont Avenue
Glendora, California 91740
213-914-1926
TWX: 910-584-3847

Sales Offices & Representatives

CA **Inglewood**
Basic Systems Corp., 213-673-4300

CA **San Diego**
Basic Systems Corp., 714-268-8000

CA **Santa Clara**
Basic Systems Corp., 408-727-1800

CT **Hamden**
Burton Forrester Assocs., 203-248-4380

FL **Clearwater**
Teqspec, 813-725-2201

FL **Cocoa Beach**
Teqspec, 305-783-3444

FL **Fort Lauderdale**
Teqspec, 305-734-4020

GA **Atlanta**
Teqspec, 404-455-7222

IL **Downers Grove**
Physics Equip., Inc., 312-960-4053

IN **Indianapolis**
Carter, McCormic & Peirce, Inc., 317-844-4175

MD **Burtonsville**
Eastern Instrumentation Corp., 301-384-8500

MA **Braintree**
Burton Forrester Assocs., 617-848-7234

MI **Farmington Hills**
Carter, McCormic & Peirce, Inc., 313-477-7700

MO **Independence**
Engineering Services Co., 816-254-3600

MO **St. Louis**
Engineering Services Co., 314-997-1515

NJ **Haddonfield**
Sunday-O'Brien, 609-429-4013

NJ **Ridgefield**
Rical Assoc., 201-945-5250

NY **Penfield**
R. Barthel Entprs., Inc., 716-377-3018

NC **Winston-Salem**
Teqspec, 919-723-8102

OH **Cleveland**
Carter, McCormic & Peirce, Inc., 216-779-5100

OH **Englewood**
Carter, McCormic & Peirce, Inc., 513-222-7700

PA **Pittsburgh**
Carter, McCormic & Peirce, Inc., 412-372-4415

TN **Morristown**
Teqspec, 615-587-0980

TX **Carrollton**
Digital Mktg.-Southwest, 214-458-0025

TX **Houston**
Digital Mktg.-Southwest, 713-270-6232

WA **Redmond**
Desco Northwest, 206-883-6336

WI **Waukesha**
Prairie Assoc., 414-544-1141

Sunshine Semiconductor

Sunshine Semiconductor Inc.
2727 Newport Boulevard West, Suite 209
Newport Beach, California 92663
714-675-6171

© IC MASTER 1983

Supertex

Supertex, Inc.
1225 Bordeaux Drive
Sunnyvale, California 94086
408-744-0100
TWX: 910-339-9388

DIPL DE MAT

The first distributor to call for

Supertex inc.

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

Synapse

Synapse Corporation
199 Main Street, P.O. Box 1016
North Falmouth, Massachusetts 02556
617-563-2267

Synertek

Synertek Inc.
P.O. Box 552 (95052), 3001 Stender Way, M/S 34
Santa Clara, California 95054
408-988-5600
TWX: 910-338-0135

Specific product information:
Memory Products Marketing 408-988-5611
Microprocessor Products Marketing 408-988-5614

Application engineering:
408-988-5690

Literature:
408-748-7047

Price and delivery:
Customer Service (to 99 pcs) 408-988-5682
Customer Service (over 99 pcs) 408-988-5691
Customer Service (to 999 pcs) 408-988-5715
Memory Products (over 999 pcs) 408-988-5611
Microprocesor Products (over 999 pcs) 408-988-5614

All other information:
408-988-5600
For Microcomputer Board information:
Synertek Systems
P.O. Box 522, M/S 61
Santa Clara, CA 95052
408-988-5689

Sales Offices & Representatives

AL **Huntsville**
Elctrn. Mktg. Assocs., 205-837-7363

AZ **Phoenix**
MR Engrg. Sales Co., 602-956-4670

CA **Escondido**
Reider Assocs., 714-741-0496

CA **Garden Grove**
Elsco Elctrns. Inc., 714-891-4621

CA **Long Beach**
Southwest Regional Sales Office, 213-428-8776

CA **Mountain View**
Brooks Tech. Group, 415-960-3880

CA **Mountain View**
Intectra, 415-967-8818

CA **Sunnyvale**
Northwest Regional Sales Office, 408-735-0221

CA **Sunnyvale**
Western Area Sales Office, 408-735-0221

CO **Denver**
Checkmate Sales Inc., 303-752-2666

FL **Clearwater**
Dyne-A-Mark Corp., 813-441-4702,3

FL **Ft. Lauderdale**
Dyne-A-Mark Corp., 305-771-6501,2,3

FL **Maitland**
Dyne-A-Mark Corp., 305-831-2097

FL **Palm Bay**
Dyne-A-Mark Corp., 305-727-0192

FL **Tampa**
Southeast Regional Sales Office, 813-870-2222

GA **Atlanta**
Elctrn. Mktg. Assocs., 404-448-1215

IL **Chicago**
Indl. Reps. Inc., 312-647-7755

IL **Rolling Meadows**
Central Area Sales Office, 312-991-4620

IL **Rolling Meadows**
North Central Regional Sales Office, 312-991-4620

IN **Greenfield**
MSI, 317-894-0377

MD **Baltimore**
Conroy Sales, 301-296-2444

MA **Dover**
Northeast Regional Sales Office, 617-785-0910

MA **Waltham**
Dynasel Assocs. Inc., 617-890-6777

MI **Detroit**
Rathsburg Assocs., 313-882-1717

MN **Minneapolis**
Comprehensive Tech. Sales, 612-888-7011

NJ **Haddonfield**
Sunday O'Brien, 609-429-4013, 215-923-5195

NY **Buffalo**
Quality Comps., 716-837-5430

NY **Great Neck**
Trionic Assocs. Inc., 516-466-2300

NY **Manlius**
Quality Comps., 315-682-8885

NY **Melville**
Eastern Area Sales Office, 516-752-0900

NC **Raleigh**
Elctrn. Mktg. Assocs., 919-847-8800

OH **Medina**
J. N. Bailey & Assoc., 216-723-6808

OH **New Lebanon**
J. N. Bailey & Assoc., 513-226-0512

OK **Tulsa**
Ion Assocs. Inc., 918-664-0186,7,8

SC **Greenville**
Elctrn. Mktg. Assocs., 803-233-4637,8

TX **Austin**
Ion Assocs. Inc., 512-458-2108

TX **Richardson**
South Central Regional Sales Office, 214-235-1105

TX **Grand Prairie**
Ion Assocs. Inc., 214-647-8225

TX **Houston**
Ion Assocs. Inc., 713-681-6266

WA **Bellevue**
Vantage Corp., 206-455-3460

WI **Elm Grove**
Key Entprs. Inc., 414-784-3390

WI **Milwaukee**
Indl. Reps. Inc., 414-259-0965

Can **Montreal, Quebec**
Byte Wide Mktg., 514-481-1167

Intl **Australia, Crows Nest, N.S.W.**
VSI Elec. (Austr.) Pty. Ltd., TEL: (61) (02) 439-4655

Intl **Australia, Goodna**
Energy Control, TEL: (07) 288-2757

Intl **Australia, Notting Hill, Victoria**
Royel Micro Sys. Pty. Ltd., TEL: (61) (03) 543-5122

Intl **Australia, Rozelle, N.S.W.**
Ampec Engrg. Co., TEL: (61) (02) 818-1166

Intl **Austria, Vienna**
Ing. Ernst Steiner, TEL: (43) (222) 82-74-74

Intl **Austria, Wien**
Bacher Elek. Gerate GmbH, TEL: (43) (222) 835646

Intl **Belgium, Brussels**
Synertek (Mgr. Dir., European Mktg.), TEL: (32) (02) 241-4450

Intl **Belgium, Kearbergen**
Microtron, TEL: (32) (01) 6600586

Intl **Denmark, Kokkedal**
C-88, TEL: (45) (02) 5708-88

Intl **England, Bracknell, Berkshire**
Synertek Northern European Sales Off., TEL: Bracknell 24555

Intl **England, Ilford, Essex**
Pronto Elec. Sys. Ltd., TEL: (44) (01) 5993041/2

Intl **England, Slough, Berkshire**
Macro Mktg., TEL: Burnham (44) (6) 936-4422

Intl **England, Thame, Oxon**
Thame Comps. Ltd., TEL: (44) (84) 421-4561

Intl **Finland, Vantaa**
Saehkoeliikk 6 Den, TEL: (90) 562-4266

Intl **France, Bordeaux-Cauderan**
Systemes et Produits Elect., TEL: (056) 021692

Intl **France, Buc.**
ERN, TEL: (33) (3) 956-00-11

Intl **France, Lingolsheim-Strasbourg**
Systemes et Produits Elect., TEL: (088) 786546

Intl **France, Lyon**
Systemes et Produits Elect., TEL: (078) 8240374

Intl **France, Paris**
Paris Sud Electronique, TEL: (33) (01) 920.66.99

Intl **France, Paris**
Synertek Southern European Sales Off.

Intl **Holland, E.P. Capella A.D.**
Alcom Elctrns. Lapella, TEL: (010) 519533

Intl **Hong Kong, Kowloon**
Conmos Prods., TEL: (852) (3) 420103

© IC MASTER 1983

Synertek (Cont)

Intl **Ireland, Dublin**
Neltronics Ltd., TEL: (01) 501845

Intl **Israel, Tel-Aviv**
Aviv Elctrns. Ltd., TEL: (03) 289211-2-3

Intl **Italy, Ancona**
Comprel S.R.L., TEL: (071) 977693

Intl **Italy, Bologna**
Comprel S.R.L., TEL: (051) 551306

Intl **Italy, Firenze**
Comprel S.R.L., TEL: (055) 412018

Intl **Italy, Genova**
Comprel S.R.L., TEL: (01) (85) 301100

Intl **Italy, Milano**
Comprel S.R.L., TEL: (39) (02) 6120641,2,3,4,5

Intl **Italy, Roma**
Comprel S.R.L., TEL: (06) (61) 33060

Intl **Italy, Torino**
Comprel S.R.L., TEL: (011) 489655

Intl **Italy, Vicenza**
Comprel S.R.L., TEL: (04) (44) 26912

Intl **Japan, Tokyo**
High Technology, Inc., TEL: (81) (03) 379-7621

Intl **Japan, Tokyo**
Microtek, Inc., TEL: (81) (03) 363-2317

Intl **Japan, Tokyo**
Synerdyne, Inc., TEL: (81) (03) 461-9311

Intl **Japan, Tokyo**
Taiyo, TEL: (81) (03) 496-5711

Intl **Japan, Tokyo**
Teijin Advanced Prod. Corp., TEL: (81) (03) 506-4821

Intl **Japan, Tokyo**
Unitek Co.

Intl **Korea, Seoul**
Leewood Intl. Inc., TEL: (82) (02) 28-5927

Intl **New Zealand, Auckland**
Professional Elctrns., Ltd., TEL: 493-029

Intl **New Zealand, Auckland**
Southmark Elctrns. Ltd., TEL: (64) (9) 798-005, 798-078

Intl **New Zealand, Palmerston North**
E.C.S., TEL: (64) (63) 77-407

Intl **Norway, Oslo**
Elektronix A/S, TEL: (47) (2) 229850

Intl **South Africa, Johannesburg**
Radiokom (PTY) Ltd., TEL: (27) (11) 789-1400

Intl **Spain, Barcelona**
Semiconductores S.A., TEL: (34) (3) 217-23-40

Intl **Spain, Madrid**
Semiconductores S.A., TEL: (91) 4292250

Intl **Sweden, Solna**
SATTCO AB, TEL: (46) (08) 734-00-40

Intl **Switzerland, Baden-Daettwil**
Stolz AG, TEL: (41) (056) 84-01-51

Intl **Switzerland, Geneve**
Stolz AG, TEL: (41) (2) 2987877

Intl **Switzerland, Zurich-Schlieren**
Datacomp AG, TEL: (41) (01) 730-21-69

Intl **Taiwan, Taipei**
General Inds., TEL: (86) (02) 7645126-9

Intl **Taiwan, Taipei**
Taiwan Automation Co., TEL: (86) (02) 7710940

Intl **West Germany, Ditzingen**
Electronic-2000 GmbH, TEL: (49) (71) 567083

Intl **West Germany, Duesseldorf**
Electronic-2000 GmbH, TEL: (49) (21) 1767141

Intl **West Germany, Langenhagen**
Electronic-2000 GmbH, TEL: (49) (51) 1789878

Intl **West Germany, Marbach**
Bitronic GmbH, TEL: (49) (71) 443201

Intl **West Germany, Munchen**
Electronic-2000 GmbH, TEL: (49) (89) 4702098

Intl **West Germany, Munchen**
Bitronic GmbH, TEL: (49) (89) 4702098

Intl **West Germany, Munchen**
Synertek Central European Sales Off., TEL: (49) (89) 28-40-65/66

Intl **West Germany, Nuernberg**
Electronic-2000 GmbH, TEL: (49) (91) 136739

Intl **West Germany, Quickborn**
Astek GmbH, TEL: (04) (106) 71084

Intl **West Germany, Quickborn, Hamburg**
Hilmar Frehsdorf GmbH ESC Elec. Comp. Serv., TEL: (49) (40) 7 10 58/59

DIPLOMAT

The first distributor to call for

SYNERTEK

A SUBSIDIARY OF HONEYWELL

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

Distributors

AZ **Phoenix**
Kierulff Elctrns., 602-243-4101

AZ **Scottsdale**
Western Microtechnology, 602-948-4240

AZ **Tempe**
Anthem Elctrns. Inc., 602-244-0900

AZ **Tempe**
Bell Inds., 602-966-7800

AR **Little Rock**
Carlton Bates, 501-562-9100

CA **Anaheim**
Zeus Elctrns., 714-632-6880

CA **Chatsworth**
Anthem Elctrns., 213-700-1000

CA **Chatsworth**
Jaco Elctrns., 213-998-2200

CA **Cupertino**
Western Microtechnology, 408-725-1660

CA **Irvine**
Jaco Elctrns., 714-540-5600

CA **Los Angeles**
Kierulff Elctrns., Inc., 213-725-0325

CA **Palo Alto**
Kierulff Elctrns., Inc., 415-968-6292

CA **San Diego**
Anthem Elctrns. Inc., 714-453-4871

CA **San Diego**
Kierulff Elctrns., Inc., 714-278-2112

CA **San Jose**
Anthem Elctrns. Inc., 408-946-8000

CA **San Jose**
Jaco Elctrns., 408-263-1100

CA **Santa Ana**
Zebra Elctrns., 714-662-0358

CA **Tustin**
Anthem Elctrns. Inc., 714-730-8000

CA **Tustin**
Kierulff Elctrns., Inc., 714-731-5711

CO **Denver**
Kierulff Elctrns., 303-371-6500

CT **Orange**
Milgray Elctrns., 203-795-0711

CT **Wallingford**
Kierulff Elctrns., 203-265-1115

FL **Clearwater**
Diplomat Elctrns., 813-443-4514

FL **Ft. Lauderdale**
Diplomat Elctrns., 305-971-7160

FL **Ft. Lauderdale**
Kierulff Elctrns., 305-486-4004

FL **Palm Bay**
Diplomat Elctrns., 305-725-4520

FL **St. Petersburg**
Kierulff Elctrns., 813-576-1966

FL **Winter Park**
Milgray Elctrns., 305-647-5747

GA **Atlanta**
Milgray Elctrns., 404-393-9666

GA **Norcross**
Diplomat Elctrns., 404-449-4133

IL **Elk Grove Village**
GBL Goold Elctrns., 312-593-3220

IL **Elk Grove Village**
Kierulff Elctrns., 312-640-0200

IN **Indianapolis**
Advent Elctrns., 317-872-4910

KS **Overland Park**
Milgray Elctrns., 913-236-8800

MD **Columbia**
Diplomat, 301-995-1226

MD **Rockville**
Milgray Elctrns., 301-468-6400

MD **Timonium**
Zebra Elctrns., 301-252-6576

MA **Billerica**
Kierulff Elctrns., 617-667-8331

MA **Burlington**
Lionex Corp., 617-272-9400

MA **Burlington**
Milgray Elctrns., 617-272-6800

MA **Burlington**
Zeus Elctrns., 617-273-0750

MA **Norwood**
Gerber Elctrns., 617-769-6000

MI **Livonia**
RS Electronics, 313-525-1155

MN **Edina**
Kierulff Elctrns., 612-941-7500

MO **Maryland Heights**
Kierulff Elctrns., Inc., 314-739-0855

NJ **Camden**
General Radio & Supply, 609-964-8560

NJ **Fairfield**
Kierulff Elctrns., 201-575-6750

NJ **Fairfield**
Lionex Corp., 201-227-7960

NJ **Marlton**
Milgray Elctrns., 609-983-5010

NJ **Pompton Plains**
Zebra Elctrns., 201-839-9440

NM **Albuquerque**
Bell Inds., 505-292-2700

© IC MASTER 1983

Synertek (Cont)

NY **East Syracuse**
Add Elctrns., 315-437-0300

NY **Freeport**
Milgray Elctrns., 516-546-5600

NY **Hauppauge**
Lionex Corp., 516-273-1660

NY **Port Chester**
Zeus Components, 914-937-7400

NC **Greensboro**
Kierulff Elctrns., 919-852-9440

OH **Cleveland**
Kierulff Elctrns., Inc., 216-587-6558

OH **Cleveland**
Milgray Elctrns., 216-447-1520

OK **Tulsa**
Kierulff Elctrns., Inc., 918-252-7537

PA **Bethlehem**
Zebra Elctrns., 215-868-0685

TX **Austin**
Kierulff Elctrns., Inc., 512-835-2090

TX **Dallas**
Kierulff Elctrns., Inc., 214-343-2400

TX **Dallas**
Zeus Elctrns., 214-783-7010

TX **Houston**
Kierulff Elctrns., Inc., 713-530-7030

WA **Seattle**
Western Electromotive, 206-575-1910

WA **Tukwila**
Kierulff Elctrns., Inc., 206-575-4420

WI **Milwaukee**
Taylor Elec. Co., 414-241-4321

WI **Waukesha**
Kierulff Elctrns., Inc., 414-784-8160

Can **Downsview, Ontario**
Future Elctrns., 416-663-5563

Can **Ottawa, Ontario**
Future Elctrns., 613-820-9471

Can **Pointe Claire (Montreal), Quebec**
Future Elctrns., 514-694-7710

Can **Vancouver, British Columbia**
Future Elctrns., 604-438-5545

Systems Innovations

Systems Innovations Inc.
505 Westford Street
Lowell, Massachusetts 01851
617-459-4449

Tau Zero

Tau Zero Inc.
805 Business Parkway
Richardson, Texas 75081
214-644-7545

Tektronix

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077
503-644-0161
TWX: 910-467-8708

Sales Offices & Representatives

Intl **Algeria, Algiers**
Measurelec, TEL: 61 50 99 & 61 50 24

Intl **Angola, Luanda**
Tecnidata Representacoes Tecnicas e Electronica Aplicada Lda., TEL: 32025-32309

Intl **Argentina, Buenos Aires**
Coasin S.A., TEL: 52-3185, 51-9363

Intl **Argentina, Cordoba**
Coasin S.A., TEL: 51-3037

Intl **Australia, Adelaide**
Tektronix Australia Pty. Ltd., TEL: (08) 223-2811

Intl **Australia, Canberra**
Tektronix Australia Pty. Ltd., TEL: (062) 82-3655

Intl **Australia, Melbourne**
Tektronix Australia Pty. Ltd., TEL: (03) 813-1455

Intl **Australia, Perth**
Tektronix Australia Pty. Ltd., TEL: (09) 325-4198

Intl **Australia, Queensland**
Tektronix Australia Pty. Ltd., TEL: (07) 394-1560

Intl **Australia, Sydney**
Tektronix Australia Pty. Ltd., TEL: 888-7066

Intl **Austria, Vienna**
Rohde & Schwarz-Tektronix Ges.m.b.H., TEL: Vienna 62 61 41

Intl **Bangladesh, Dacca**
A.Q. Chowdury & Co., TEL: 252 329 312492

Intl **Belgium, Bruxelles**
Tektronix nv/sa, TEL: 02/720 80 20

Intl **Bolivia, La Paz**
Coasin Bolivia S.R.L., TEL: 40962

Intl **Brazil, Sao Paulo**
Tektronix Industria e Comercio Ltda., TEL: 813-3011

Intl **Brazil, Rio de Janeiro**
Tektronix Industria e Comercio Ltda., TEL: 266-5364, 286-6946

Intl **Channel Islands, Guernsey**
Tektronix Ltd., TEL: Guernsey (0481) 35781

Intl **Chile, Santiago**
Equipos Industriales S.A.C.I., TEL: 716-882, 382-942

Intl **Colombia, Bogota**
Selectronica Ltd., TEL: 632874, 422376

Intl **Costa Rica, San Jose**
Electro-Impex, S.A., TEL: 21-59-54

Intl **Denmark, Herlev**
Tektronix A/S, TEL: (02) 84 56 22

Intl **Ecuador, Quito**
Proteco Coasin Cia Ltda., TEL: 52-6759, 52-9684

Intl **Egypt, Cairo**
Giza Sys. Engrg. Co., TEL: 841200, 849399

Intl **El Salvador, San Salvador**
Electronica Cuscatleca, S.A. de C.V., TEL: 22-0297

Intl **Finland, Helsinki**
Tektronix O/Y, TEL: 90-722 400

Intl **France, Aix-Les-Milles**
Tektronix, TEL: (42) 26 62 03

Intl **France, Lyon**
Tektronix, TEL: (78) 76 40 03

Intl **France, Orsay**
Tektronix, TEL: 907 78 27

Intl **France, Rennes**
Tektronix, TEL: (99) 51 21 16

Intl **France, Strasbourg**
Tektronix, TEL: (88) 39 49 35

Intl **France, Toulouse**
Tektronix, TEL: (61) 40 24 50

Intl **Germany, Berlin-West**
Rohde & Schwarz Handels Ges.m.b.H., TEL: (030) 3 41 40 36

Intl **Germany, Hamburg**
Rohde & Schwarz Vertriebs Ges.m.b.H., TEL: (040) 38 01 91

Intl **Germany, Karlsruhe**
Rohde & Schwarz Vertriebs Ges.m.b.H., TEL: (0721) 2 79 81

Intl **Germany, Koln**
Rohde & Schwarz Vertriebs Ges.m.b.H., TEL: (0221) 77 22 1

Intl **Germany, Munchen**
Rohde & Schwarz Vertriebs Ges.m.b.H., TEL: (089) 41 62 1

Intl **Germany, Neu-Isenburg**
Rohde & Schwarz Vertriebs Ges.m.b.H., TEL: (06102) 3136

Intl **Germany, Nurnberg**
Rohde & Schwarz Vertriebs Ges.m.b.H., TEL: (0911) 6 48 81

Intl **Germany, Stuttgart**
Rohde & Schwarz Vertriebs Ges.m.b.H., TEL: (0711) 72 20 39

Intl **Greece, Athens**
Marios Dalleggio Representations, TEL: 710-669

Intl **Hong Kong, Hong Kong**
Schmidt & Co., (H.K.) Ltd., TEL: 5-455-644

Intl **Iceland, Reykjavik**
Kristjan O. Skagfjord Ltd., TEL: 24120

Intl **India, Bangalore**
Hinditron Svcs. Private Ltd., TEL: 33139

Intl **India, Bombay**
Hinditron Svcs. Private Ltd., TEL: 81 13 16/ 81 53 44

Intl **Indonesia, Jakarta**
P.T. Dwi Tunggal Jaya Sakti, TEL: 367390-9, 356801-5

Intl **Iran, Tehran**
Irantronics Co. Ltd., TEL: 828294, 831564

Intl **Iraq, Baghdad**
Al Manar Engrg. WLL, TEL: 60992 or 8880333

Intl **Israel, Tel Aviv**
Eastronics Ltd., TEL: 475151

Intl **Italy, Milano**
Tektronix S.p.A., TEL: 8466440/8466446

Intl **Italy, Roma**
Tektronix S.p.A.

Intl **Italy, Torino**
Tektronix S.p.A., TEL: 330143/372163

Intl **Ivory Coast, Abidjan**
Sitel, TEL: 353600 or 353502

Intl **Japan, Nagoya**
Sony/Tektronix Corp., TEL: 518-3548 (area 052/Nagoya)

Intl **Japan, Osaka-shi**
Sony/Tektronix Corp., TEL: 312-2751 (area 06/Osaka)

Intl **Japan, Tokyo**
Sony/Tektronix Corp., TEL: 710-8141 (area 03/Tokyo)

Intl **Japan, Tokyo**
Sony/Tektronix Corp., TEL: 448-4851 (area 03/Tokyo)

Intl **Jordan, Amman**
Consult-Tel, TEL: 42333

Intl **Kenya, Nairobi**
Engrg. & Sales Co. Ltd., TEL: 26815

Intl **Korea, Seoul**
M-C Intl. (Korea) Ltd., TEL: (56) 6131 thru 6138

Intl **Kuwait, Safat**
Tareq Co., TEL: 436100 & 436045

Intl **Lebanon, Beirut**
Projects S.A.L., TEL: 331680

Intl **Malaysia, Petaling Jaya, Selangor**
McComb Malaysia Sdn. Bhd., TEL: 773455

Intl **Mexico, Mexico**
Tektronix S.A. de C.V., TEL: (905) 687-1021/ 0904

Intl **Morocco, Rabat Agdal**
SCRM, TEL: (07) 749-47

Intl **Netherlands, Amstelveen**
Tektronix Intl., Inc. European Mktg. Centre

Intl **Netherlands, Dadhosvedorp**
Tektronix Holland N.V., TEL: 02968-1456

Intl **New Zealand, Auckland**
W. & K. McLean Ltd., TEL: 587-037

Intl **New Zealand, Wellington**
W. & K. McLean Ltd., TEL: 851-450

Intl **Norway, Oslo**
Tektronix Norge A/S, TEL: 02-212855

Intl **Pakistan, Karachi**
Pak-Land Corp., TEL: 437315, 438084

© IC MASTER 1983

Tektronix (Cont)

Intl **Panama, Panama**
Executive Mktg. Corp., TEL: 64-9354, 64-9851

Intl **Peru, Lima**
Importaciones y Representaciones Electronicas S.A., TEL: 28-86-50

Intl **Philippines, Makati, Rizal**
Philippine Elctrn. Inds., Inc., TEL: 87-99-26, 87-99-27

Intl **Portugal, Lisbon**
Decada Equipamentos de Electronica Lda., TEL: 574984

Intl **Saudi Arabia, Riyadh**
Elctrn. Equip. Mktg. Ltd., TEL: 32700, 37023

Intl **Singapore, Singapore**
MeComb, TEL: 2713333

Intl **South Africa, Durban**
Protea Physical & Nuclear Instrumentation (Pty.) Ltd., TEL: 39-1100

Intl **South Africa, Paardeneiland**
Protea Physical & Nuclear Instrumentation (Pty.) Ltd., TEL: 51-3247

Intl **South Africa, Transvaal**
Protea Physical & Nuclear Instrumentation (Pty.) Ltd., TEL: (27 11)786-3647

Intl **Spain, Barcelona**
Tektronix Espanola S.A., TEL: (93) 330-2008

Intl **Spain, Madrid**
Tektronix Espanola S.A., TEL: (91) 404-1011

Intl **Sri Lanka, Colombo**
Maurice Roche Ltd., TEL: 25846, 25847

Intl **Sudan, Khartoum**
Cine & Photo Supply Co. (CPSC), TEL: 75162, 76943

Intl **Surinam, Paramaribo**
Wong Sang Tsoi & Co., TEL: 73511, 75187

Intl **Sweden, Gothenburg**
Tektronix AB, TEL: 031/42 70 35

Intl **Sweden, Solna**
Tektronix AB, TEL: 08/83 00 80

Intl **Switzerland, Zug**
Tektronix Intl. A.G., TEL: 042 21 91.92

Intl **Syria, Damascus**
General Trading Co., TEL: 114807, 224170

Intl **Taiwan, Taipei**
Heighten Trading Co. Ltd., TEL: 551-916

Intl **Thailand, Bangkok**
Dynamic Supp. Engrg. R.O.P., TEL: 392-8523, 5313; 391-9571

Intl **Turkey, Istanbul**
Erkman Elektronik Aletler, TEL: 44 15 46/44 76 51

Intl **Tunisia, Tunisie**
Societe El Eslek, TEL: 244372

Intl **United Kingdom, Cheadle, Stockport**
Tektronix U.K. Ltd., TEL: 061-428-0799

Intl **United Kingdom, Harpenden, Herts**
Tektronix U.K. Ltd., TEL: Harpenden 63141

Intl **United Kingdom, Livingston, West Lothian**
Tektronix U.K. Ltd., TEL: Livingston 32756/7

Intl **United Kingdom, Maidenhead, Berkshire**
Tektronix U.K. Ltd., TEL: 0628-73211

Intl **Uruguay, Montevideo**
Coasin Uruguaya S.R.L., TEL: 91-79-78

Intl **Venezuela, Caracas**
Equilab, C.A., TEL: 283.1166

Intl **Zambia, Lusaka**
Baird & Tatlock (Zambia) Ltd., TEL: 75315/6

Intl **Zambia, Ndola**
Baird & Tatlock (Zambia) Ltd., TEL: 3522 & 2253/4/6

Teledyne Crystalonics

Teledyne Crystalonics
147 Sherman Street
Cambridge, Massachusetts 02140
617-491-1670

Sales Offices & Representatives

Intl **Belgium, Brussels**
Microtron, TEL: 02-5232217

Intl **France, Paris**
Composants Et Produits Electroniques, TEL: 9804140

Intl **Germany, Heilbronn**
Sinus Elctrns., TEL: 07131/52077

Intl **India, Bombay**
Elctrn. Entprs., TEL: 4430906

Intl **Israel, Tel-Aviv**
STG Intl, TEL: 53549

Intl **Italy, Milan**
Kimates, TEL: 4044218

Intl **Japan, Tokyo**
Teledyne Japan K.K., TEL: 03-4038141

Intl **Netherlands, Rijswijk**
MCA Tronix, TEL: 15-134940

Intl **Sweden, Vallingby**
Svensk Tele Industri AB, TEL: 890435

Intl **Switzerland, Zurich**
G & P Elctrn. AG, TEL: 653231

Intl **United Kingdom, Hook**
Tech. Selling Svcs., TEL: 025672-32993

Teledyne Philbrick

Teledyne Philbrick
Allied Drive at Route 128
Dedham, Massachusetts 02026
617-329-1600
TWX: 710-348-6726

Specific product information:
Sales Department

Application engineering:
Sales Department

Literature:
Publications Dept.

Price and delivery:
Sales Department

Follow-up an order:
Customer Service Dept.

All other information:
Product Sales Dept.

Sales Offices & Representatives

Intl **France, Levallois Perret**
Teledyne Philbrick France, TEL: (1) 757-19-40

Intl **Japan, Osaka**
Teledyne Philbrick Japan, TEL: (06) 365 0431

Intl **Japan, Tokyo**
Teledyne Philbrick Japan, TEL: 403-8921

Intl **United Kingdom, Middlesex**
Teledyne Philbrick UK, TEL: (01) 897-2501

Intl **West Germany, Bramen**
Teledyne Philbrick, TEL: 0421313917

Intl **West Germany, Munich**
Teledyne Philbrick Germany, TEL: 089/7915773

Intl **West Germany, Wiesbaden**
Teledyne Philbrick Germany, TEL: (6121) 7680

Distributors

Intl **Austria, Brunn am Gebirge**
Kontron GmbH & Co., KG, TEL: 02236/86631

Intl **Belgium, Keerbergen**
Microtron P.V.B.A. Int'l., TEL: 016/600586

Intl **Denmark, Lyngby**
Knud Kamuk Aps., TEL: (02) 88 38 33

Intl **Finland, Helsinki**
Turion OY, TEL: 372 144

Intl **Greece, Athens**
Demetrius C. Tzitzinias & Sons, TEL: (00 30 1) 9344790

Intl **Hong Kong, Hong Kong**
Schmidt & Co. Ltd., TEL: 5-455644

Intl **India, Bombay**
Elctrn. Entprs., TEL: 44 30 96

Intl **Ireland, Dublin**
Neitronix Ltd., TEL: (01) 501845

Intl **Israel, Ramat Gan**
Elina Ltd., TEL: (03) 734129

Intl **Italy, Milano**
Eledra, TEL: (02) 34 97 51

Intl **Korea, Seoul**
Vine Overseas Trading Corp., TEL: 266-1663

Intl **Netherlands, Rijswijk**
MCA-Tronix Int'l., b.v., TEL: 015-13 49 40

Intl **New Zealand, Auckland**
Professional Elctrns., Ltd., TEL: 493-029

Intl **Norway, Oslo**
Scancopter A.S., TEL: 02-229850

Intl **Portugal, Lisboa**
Ditram Comps. e Elctrna., Lda., TEL: 45313

Intl **Singapore, Asia**
Microtronics Assocs. PTE Ltd.

Intl **South Africa, Craighall**
K. Baker Assocs., (Pty) Ltd., TEL: 788-1700/1/2

Intl **Spain, Madrid**
Hispano Elctrna. s.a., TEL: 619 41 08

Intl **Sweden, Vallingby**
Scancopter AB, TEL: 08/380065

Intl **Switzerland, Zurich**
Kontron Elctrn. Ltd., TEL: 017302165

Intl **Taiwan, Taipei**
Indl. Elctrns., TEL: (02) 771-4257

Teledyne Semiconductor

Teledyne Semiconductor
1300 Terra Bella Avenue
Mountain View, California 94043
415-968-9241
TWX: 910-379-6494

Specific product information:
ext. 449

Application engineering:
ext. 431

Literature:
ext. 451

Price and delivery:
ext. 304

Follow-up an order:
ext. 337

Sales Offices & Representatives

AL **Huntsville**
Dixie Technical Mktg., 205-830-1040

AZ **Mesa**
Sedco Sales, 602-835-6281

CA **Culver City**
Bestronics, Inc., 213-870-9191

CA **Irvine**
Bestronics, Inc., 714-979-9910

CA **San Diego**
Bestronics, Inc., 714-452-5500

CA **Woodland Hills**
Bestronics, Inc., 213-704-5616

FL **Clearwater**
Electrocraft Inc., 813-576-5404

© IC MASTER 1983

Teledyne Semiconductor (Cont)

FL **Pompano Beach**
Electrocraft Inc., 305-786-0206

FL **Winter Park**
Electrocraft Inc., 305-628-4705

GA **Stone Mountain (Atlanta)**
Dixie Technical Mktg., 404-962-2530

IL **Elgin**
Teledyne Semiconductor, 312-695-2385

IL **Park Ridge**
Metcom Assocs. Corp., 312-696-1490

IN **Ft. Wayne**
Given Corp., 219-432-5585

KS **DeSoto**
Midtec Assocs., Inc., 913-441-6565

MD **Lutherville**
Walker-Houck Assocs., 301-296-6021

MA **Waltham**
Dynasel Assoc., 617-890-6777

MI **Brighton**
KRW Sales, 313-437-7255

MN **Bloomington**
Quantum Sales, 612-884-4700

MO **Florissant**
Midtec Assocs., Inc., 314-837-5200

NH **Salem**
Teledyne Semiconductor, 603-893-9551

NJ **Fairfield**
Tech. Applications & Mktg. (TAM), 201-575-4390

NJ **Haddonfield**
Sunday O-Brien, 609-429-4013

NY **Buffalo**
Quality Components, 716-837-5430

NY **Manlius**
Quality Components, 315-682-8885

NC **Mount Airy**
Dixie Technical Mktg., 919-789-9759

OH **Cincinnati**
Makin & Assocs., 513-871-2424

OH **Columbus**
KRW Sales, 513-845-4131

OR **Portland**
SD-R², 503-297-8677

TX **Austin**
Logic One Sales, Inc., 512-459-1297

TX **Houston**
Logic One Sales, Inc., 713-879-1566

TX **Richardson**
Logic One Sales, Inc., 214-234-0765

WA **Bellevue**
SD-R², 206-747-9424

WI **West Allis**
Metcom Assocs. Corp., 414-476-1300

Can **Mississauga, Ontario**
Vitel Elctrns., 416-676-9720

Can **Port Moody, British Columbia**
Vitel Elctrns., Inc., 604-461-3322

Can **St. Laurent, Quebec**
Vitel Elctrns., 514-331-7393

Can **Stittsville, Ontario**
Vitel Elctrns., 613-836-1776

Intl **England, Middlesex**
Teledyne Semiconductor, TEL: (44) 01-897-2503

Intl **Hong Kong, Kowloon**
Teledyne Semiconductor, TEL: 3-240122

Intl **Israel, Tel Aviv**
RN Electronics Ltd., TEL: 707129

Intl **Korea, Seoul**
Vine Overseas Trading Corp., TEL: 266-1663, 265-3892

Intl **Taiwan, Taipei**
Timkuo Taiwan Ltd., TEL: 5638478/9

Intl **West Germany, Tiengen**
Teledyne Semiconductor, TEL: (49) 7741-5066

Distributors

AL **Huntsville**
Powell Elctrns., 205-539-2731

CA **Chatsworth**
Anthem Elctrns., 213-700-1000

CA **Chatsworth**
Diplomat/Westates Elctrns., 213-341-4411

CA **Costa Mesa**
Diplomat/Westates Elctrns., 714-549-8401

CA **San Diego**
Anthem Elctrns., 714-279-5200

CA **San Diego**
Diplomat/Westates Elctrns., 714-292-5693

CA **San Jose**
Anthem Elctrns., 408-946-8000

CA **Sunnyvale**
Diplomat/Westates Elctrns., 408-744-1555

CA **Tustin**
Anthem Elctrns., 714-730-8000

CO **Englewood**
Diplomat Elctrns., 303-740-8300

CO **Wheat Ridge**
A.C.T. Rocky Mountain, 303-422-9229

CO **Wheat Ridge**
Bell Inds., 303-424-1985

FL **Clearwater**
Diplomat Elctrns., 813-443-4514

FL **Ft. Lauderdale**
Diplomat Elctrns., 305-971-7160

FL **Palm Bay**
Diplomat Elctrns., 305-725-4520

IL **Chicago**
Bell Inds., 312-982-9210

IL **Rosemont**
Advent Elctrns., 312-298-4210

IN **Indianapolis**
Advent Elctrns., 317-872-4910

IA **Cedar Rapids**
Advent Elctrns., 319-363-0221

IA **Cedar Rapids**
Deeco, Inc., 319-365-7551

KS **Lenexa**
Comp. Specialties, 913-492-3555

MD **Columbia**
Diplomat Elctrns., 301-995-1226

MD **Savage**
Pyttronic Inds., 301-792-0780

MA **Framingham**
NOW Electronics, 617-872-5876

MA **Westboro**
Future Elctrns., 617-366-2400

MA **Woburn**
ACI Corp., 617-935-7230

MI **Farmington Hills**
Advent Elctrns., 313-477-1650

MI **Livonia**
Reptron Elctrns., Inc., 313-525-2700

MN **Minneapolis**
Diplomat Elctrns., 612-572-0313

NJ **Totowa**
Diplomat Elctrns., 201-785-1830

NM **Albuquerque**
Bell Inds., 505-292-2700

NY **Buffalo**
Summit Distrs., 716-884-3450

NY **East Syracuse**
Future Elctrns., 315-463-6633

NY **Farmingdale**
SAI, 516-293-2710

NY **Freeport**
Milgray Elctrns., 516-546-5600

NY **Melville**
Diplomat Elctrns., 516-454-6400

NY **Port Chester**
Zeus Comps., 914-937-7400

OH **Cincinnati**
Hughes-Peters, Inc., 513-351-2000

OH **Columbus**
Hughes-Peters, Inc., 614-294-5351

OH **Columbus**
Reptron Elctrns., Inc., 614-436-6675

OK **Tulsa**
Comp. Specialties, 918-664-2820

OK **Tulsa**
Quality Comps., 918-664-8812

PA **Montgomeryville**
Pyttronic Inds., 215-643-2850

PA **Philadelphia**
Almo Elctrns., 215-698-4000

TX **Addison**
Active Comp. Technology, 214-980-1888

TX **Addison**
Quality Comps., 214-387-4949

TX **Austin**
Active Comp. Technology, 512-452-5254

TX **Austin**
Comp. Specialties, 512-837-8922

TX **Austin**
Quality Comps., 512-835-0220

TX **Dallas**
Comp. Specialties, 214-357-6511

TX **Houston**
Comp. Specialties, 713-771-7237

TX **Houston**
Quality Comps., 713-772-7100

UT **Salt Lake City**
Bell Inds., 801-972-6969

UT **Salt Lake City**
Diplomat Elctrns., 801-486-4134

WA **Kent**
Shannon Ltd., 206-763-0545

WI **Milwaukee**
Industrial Elctrns., 414-276-1212

Can **Calgary, Alberta**
Future Elctrns., 403-259-6408

Can **Downsview, Ontario**
Future Elctrns., 416-663-5563

Can **Ottawa, Ontario**
Future Elctrns., 613-820-8313

Can **Pointe Claire, Quebec**
Future Elctrns., 514-694-7710

Can **Vancouver, British Columbia**
Future Elctrns., 604-438-5545

Can **Vancouver, British Columbia**
Intek Elctrns., 604-324-6831

Intl **Australia, Victoria**
Soanar Elctrns. Pty. Ltd., TEL: 890661

Intl **Brazil, Sao Paulo**
Filcres, TEL: (011) 223-7388

Intl **Denmark, Herlev**
Nordisk Elecktronik A/S, TEL: 02-842000

Intl **England, Buckinghamshire**
Macro Mktg. Ltd., TEL: 44-753-3544

Intl **England, Cleveland**
Norsem Elctrns. Grp., TEL: (0429) 33501

Intl **England, Roxburghshire**
Semicomps Northern Ltd., TEL: 2366 KELSO

Intl **Finland, Helsinki**
Fintronic A/B, TEL: 90-6926022

Intl **France, Boulogne**
Satek, TEL: 01-6090805

Intl **India, Madras**
Micro Elctrns. Type II, 23, TEL: 413893

Intl **Italy, Milano**
Eledra S.P.A., TEL: 02-3493041

Intl **Italy, Milano**
Mesa S.P.A., TEL: 02-434333

Intl **Japan, Tokyo**
Sil-Walker, TEL: 03-341-3651

Intl **Japan, Tokyo**
Teijin Advanced Prods. Corp., TEL: 03-506-4670/4676

Intl **Netherlands, Capelle a.d. Ijssel**
Alcom Elctrns., TEL: 01-519533

Intl **Norway, Hvalstad**
Nordisk Elektronik (Norge) A/S, TEL: 02-78 62 10

Intl **South Africa, Johannesburg**
O & C Alexander Sales (Pty.) Ltd., TEL: 724-9366/7/8

© IC MASTER 1983

Teledyne Semiconductor (Cont)

Intl **South Africa, Transvaal**
Fairmont Elctrns. Ltd., TEL: 48-6421/48-6481
Intl **Sweden, Stockholm**
Nordisk Elektronik A/B, TEL: 08-635040
Intl **Switzerland, Zurich**
ENA AG, TEL: 01/645757
Intl **Switzerland, Zurich**
Omni Ray AG, TEL: 01/2520766
Intl **West Germany, Bechtersbohl**
Semitron Electronik GmbH, TEL: 07742/7011
Intl **West Germany, Hannover-Linden**
T. H. Henskes, TEL: 0511/456082
Intl **West Germany, Muhlweg**
Hot Elctrn., TEL: 089/6111092
Intl **West Germany, Nettstal**
Omni Ray GmbH, TEL: 49-2153-7961
Intl **West Germany, Uterhaching**
Metronix GmbH, TEL: 089/6114063

Telefunken

AEG-Telefunken Corporation
P.O. Box 3800, Route 22 at Orr Drive
Somerville, New Jersey 08876
201-722-9800
TELEX: 833409

Telephonics LSI

Telephonics LSI
770 Park Avenue
Huntington, New York 11743
516-549-6300
TWX: 510-226-6983

Telmos

Telmos Inc.
740 Kaifer Road
Sunnyvale, California 94086
408-732-4882
TELEX: 171627 NANET
TWX: 910-379-0029 NANET

Sales Offices & Representatives

Intl **West Germany, Munchen**
Telmos GmbH, TEL: 011 4989-432004

Teltone

Teltone Corporation
10801-120th Avenue NE
Kirkland, Washington 98033
206-827-9626
TWX: 910-449-2862

Specific product information:
Sid Herron
Application engineering:
Sid Herron
Literature:
Julie Todd
Price and delivery:
Pam Hurnblad
Follow-up an order:
Pam Hurnblad
All other information:
Sid Herron

Distributors

Intl **Australia, South Melbourne**
Pacific Communications Pty. Ltd., TEL: (3) 690 5855
Intl **Chile, Santiago**
Compania Standard Electric S.A.C., TEL: (2) 515 515
Intl **Colombia, Bogota**
GTE De Colombia S.A., TEL: 257 6811
Intl **Denmark, Herlev**
Inotec A/S, TEL: (2) 948 033
Intl **Ecuador, Guayaquil**
Grafcomp, TEL: (4) 512 092
Intl **England, Bristol**
Chesilvale Ltd., TEL: (272) 277 162
Intl **Finland, Helsinki**
Norecom Oy, TEL: (0) 520 552
Intl **France, Sevres**
S.A. Tekelec-Airtronic, TEL: (1) 534 7535
Intl **Hong Kong, Wanchai**
CET Ltd., TEL: (5) 729 376
Intl **Italy, Roma**
Stelit S.R.L., TEL: (6) 501 1551
Intl **Korea, Seoul**
Sejin Inds., Inc., TEL: (2) 753 4413
Intl **Kuwait, Safat**
Kuwaiti Danish Computer Co., TEL: 830 160-1
Intl **Malaysia, Selangor**
Emtel
Intl **Netherlands, Almelo**
Group 2000 Nederland B.V., TEL: (5490) 21616
Intl **Norway, Tonsberg**
UMI A.S., TEL: (33) 86 000
Intl **Singapore**
Comtel (S) Pte. Ltd., TEL: 296-0905/6
Intl **Sweden, Vallingby**
Com-Trade AB, TEL: (8) 370 240
Intl **Switzerland, Rustl**
Group 2000 AG, TEL: (55) 317 444
Intl **Taiwan, Taipei**
Vidar-SMS Co. Ltd. (Sun Moon Star Co.), TEL: (2) 581 8521
Intl **Thailand, Bangkok**
R.S. Poly Supply Ltd. Part., TEL: (2) 281 3733
Intl **Venezuela, Caracas**
Applewhite S.A., TEL: (2) 575 3020
Intl **West Germany, Martinsried**
Allmos Elctrn. GmbH, TEL: (89) 857 2086-89

Texas Instruments

Texas Instruments
Semiconductor Group
P.O. Box 225012, M/S 308
Dallas, TX 75265
214-995-2011
TWX: 910-867-4702

Sales Offices & Representatives

AL **Huntsville**
Sales Office, 205-837-7530
AZ **Phoenix**
Sales Office, 602-249-1313
CA **Costa Mesa**
Sales Office, 714-540-7311
CA **El Segundo**
Sales Office, 213-973-2571
CA **San Diego**
Sales Office, 714-278-9600
CA **Sunnyvale**
Sales Office, 408-732-1840
CO **Denver**
Sales Office, 303-751-1780
CT **Hamden**
Sales Office, 203-281-0074
FL **Clearwater**
Sales Office, 813-725-1861
FL **Ft. Lauderdale**
Sales Office, 305-733-3300
FL **Winter Park**
Sales Office, 305-644-3535
GA **Atlanta**
Sales Office, 404-452-4600
IL **Arlington Heights**
Sales Office, 312-640-3000
IN **Ft. Wayne**
Sales Office, 219-424-5174
IN **Indianapolis**
Sales Office, 317-248-8555
IA **Cedar Rapids**
Sales Office, 319-346-1100
MA **Waltham**
Sales Office, 617-890-7400
MI **Southfield**
Sales Office, 313-353-0830
MN **Edina**
Sales Office, 612-830-1600
MO **Kansas City**
Sales Office, 816-523-2500
MO **St. Louis**
Sales Office, 314-432-3333
NJ **Clark**
Sales Office, 201-574-9800
NM **Albuquerque**
Sales Office, 505-265-8491
NY **East Syracuse**
Sales Office, 315-463-9291
NY **Endicott**
Sales Office, 607-754-3900
NY **Melville**
Sales Office, 516-293-2560
NY **Poughkeepsie**
Sales Office, 914-473-2900
NY **Rochester**
Sales Office, 716-461-1800
NC **Charlotte**
Sales Office, 704-527-0930
NC **Raleigh**
Sales Office, 919-787-9376
OH **Beachwood**
Sales Office, 216-464-6100
OH **Dayton**
Sales Office, 513-258-3877
OK **Tulsa**
Sales Office, 918-747-9548
OR **Beaverton**
Sales Office, 503-643-6759
PA **Ft. Washington**
Sales Office, 215-643-6450
TN **Johnson City**
Sales Office, 615-282-1100
TX **Dallas**
Sales Office, 214-238-6531
TX **Houston**
Sales Office, 713-776-6511
UT **Salt Lake City**
Sales Office, 801-973-6310
VA **Arlington**
Sales Office, 703-553-2200
VA **Richmond**
Sales Office, 804-744-1007
VA **Richmond**
Sales Office, 804-275-8148
WA **Bellevue**
Sales Office, 206-455-3480
Can **Ottawa, Ontario**
Sales Office, 613-233-1161
Can **Richmond Hill, Ontario**
Sales Office, 416-884-9181
Can **St. Laurent, Quebec**
Sales Office, 514-341-3232
Intl **Argentina, Buenos Aires**
Sales Office, TEL: 748-1141
Intl **Australia, Sydney**
Sales Office, TEL: 02-887-1122

© IC MASTER 1983

Texas Instruments (Cont)

Intl **Australia, South Melbourne**
Sales Office, TEL: 699-5788

Intl **Austria, Vienna**
Sales Office, TEL: 0222-724186

Intl **Belgium, Brussels**
Sales Office, TEL: 02-7208000

Intl **Brazil, Sao Paulo**
Sales Office, TEL: 011-260-6347

Intl **Denmark, Herlav**
Sales Office, TEL: 02-917400

Intl **Finland, Helsinki**
Sales Office, TEL: 80-408300

Intl **France, Le Plassis Robinson**
Sales Office, TEL: 01-6302343

Intl **France, Lyon**
Sales Office, TEL: 078-373585

Intl **France, Meylan**
Sales Office, TEL: 076-904574

Intl **France, Rennes**
Sales Office, TEL: 099-795481

Intl **France, Toulouse**
Sales Office, TEL: 061-213032

Intl **Germany, Berlin**
Sales Office, TEL: 030-8927013

Intl **Germany, Eschborn**
Sales Office, TEL: 06196-43074

Intl **Germany, Essen**
Sales Office, TEL: 0201-233551

Intl **Germany, Freising**
Sales Office, TEL: 08161-801

Intl **Germany, Hamburg**
Sales Office, TEL: 040-2201154

Intl **Germany, Hanover**
Sales Office, TEL: 0511-648021

Intl **Germany, Munich**
Sales Office, TEL: 089-92341

Intl **Germany, Nuernberg**
Sales Office, TEL: 0911-22877

Intl **Germany, Stuttgart**
Sales Office, TEL: 0711-547001

Intl **Hong Kong, Hong Kong**
Sales Office, TEL: 05-279041

Intl **Italy, Milan**
Sales Office, TEL: 02-253-2451

Intl **Italy, Roma**
Sales Office, TEL: 06-6917127

Intl **Italy, Turin**
Sales Office, TEL: 011-832276

Intl **Japan, Tokyo**
Sales Office, TEL: 03-402-6171

Intl **Korea, Seoul**
Sales Office, TEL: 446-1565

Intl **Mexico, Mexico City**
Sales Office, TEL: 905-567-9200

Intl **Netherlands, Amstelveen**
Sales Office, TEL: 020-473391

Intl **Norway, Oslo**
Sales Office, TEL: 02-689487

Intl **Portugal, Douro**
Sales Office, TEL: 948-1003

Intl **Singapore, Republic of Singapore**
Sales Office, TEL: 65-2581122

Intl **Spain, Barcelona**
Sales Office

Intl **Sweden, Stockholm**
Sales Office, TEL: 08-235480

Intl **Taiwan, Taipei**
Sales Office

Intl **United Kingdom, Bedford**
Sales Office, TEL: 0234-67466

Distributors

AL **Huntsville**
Hall-Mark, 205-837-8700

AZ **Phoenix**
Kierulff Elctrns, 602-243-4101

DIPLOMAT

The first distributor to call for

TEXAS INSTRUMENTS
INCORPORATED

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

AZ **Phoenix**
Wyle Labs, 602-249-2232

AZ **Tempe**
Marshall Inds., 602-968-6181

CA **Anaheim**
R.V. Weatherford, 714-634-9600

CA **Canoga Park**
Marshall Inds., 213-999-5001

CA **Chatsworth**
Jaco, 213-998-2200

CA **El Monte**
Marshall Inds., 213-686-0141

CA **El Segundo**
Wyle Labs, 213-322-8100

CA **Glendale**
R.V. Weatherford, 213-849-3451

CA **Irvine**
Marshall Inds., 714-556-6400

CA **Irvine**
Wyle Labs, 714-641-1600

CA **Los Angeles**
Kierulff Elctrns., 213-725-0325

CA **Palo Alto**
Kierulff Elctrns., 415-968-6292

CA **Pomona**
R.V. Weatherford, 714-623-1261

CA **San Diego**
Arrow Elctrns., 714-565-4800

CA **San Diego**
Kierulff Elctrns., 714-278-2112

CA **San Diego**
Marshall Inds., 714-578-9600

CA **San Diego**
R. V. Weatherford, 714-695-1700

CA **San Diego**
Wyle Labs, 714-565-9171

CA **Santa Barbara**
R.V. Weatherford, 805-965-8551

CA **Santa Clara**
Wyle Labs, 408-727-2500

CA **Sunnyvale**
Arrow Elctrns., 408-745-6600

CA **Sunnyvale**
Marshall Inds., 408-732-1100

CA **Sunnyvale**
United Comps., 408-496-6900

CA **Tustin**
Kierulff Elctrns., 714-731-5711

CO **Denver**
Arrow Elctrns., 303-758-2100

CO **Denver**
Kierulff Elctrns., 303-371-6500

CO **Thornton**
Wyle Labs, 303-457-9953

CT **Danbury**
Diplomat, 203-797-9674

CT **Orange**
Milgray/Ct., 203-795-0714

CT **Wallingford**
Arrow Elctrns., 203-265-7741

CT **Wallingford**
Marshall Elctrns., 203-265-3822

FL **Clearwater**
Diplomat/Southland, 813-443-4514

FL **Ft. Lauderdale**
Arrow Elctrns., 305-776-7790

FL **Ft. Lauderdale**
Diplomat/Ft. Lauderdale, 305-971-7160

FL **Ft. Lauderdale**
Hall-Mark/Ft. Lauderdale, 305-971-9280

FL **Orlando**
Hall-Mark/Orlando, 305-855-4020

FL **Palm Bay**
Arrow Elctrns., 305-725-1480

FL **Palm Bay**
Diplomat/Florida, 305-725-4520

FL **St. Petersburg**
Kierulff Elctrns., 813-576-1966

FL **Winter Park**
Milgray Elctrns., 305-647-5747

GA **Norcross**
Arrow Elctrns., 404-449-8252

GA **Norcross**
Marshall Elctrns., 404-923-5750

IL **Bensenville**
Hall-Mark/Chicago, 312-860-3800

IL **Chicago**
Newark Elctrns., 312-638-4411

IL **Elk Grove Village**
Kierulff Elctrns., 312-640-0200

IL **Schaumburg**
Arrow Elctrns., 312-397-3440

IN **Ft. Wayne**
Graham Elctrns., 219-423-3422

IN **Indianapolis**
Graham Elctrns., 317-634-8202

KS **Lenexa**
Comp. Specialties, 913-492-3555

KS **Lenexa**
Hall-Mark/Kansas City, 913-888-4747

KS **Wichita**
L-Comp Inc., 316-265-9507

MD **Baltimore**
Arrow Elctrns., 301-247-5200

MD **Baltimore**
Hall-Mark/Baltimore, 301-796-9300

MD **Baltimore**
Kierulff, 301-247-5020

MD **Columbia**
Diplomat/Maryland, 301-995-1226

MD **Rockville**
Milgray/Washington, 301-468-6400

MA **Billerica**
Kierulff Elctrns., 617-667-8331

MA **Burlington**
Marshall Elctrns., 617-272-8200

MA **Woburn**
Arrow Elctrns., 617-933-8130

© IC MASTER 1983

Texas Instruments (Cont)

MA **Woburn**
Time Elctrns., 617-935-8080

MI **Ann Arbor**
Arrow Elctrns., 313-971-8220

MI **Oak Park**
Newark Elctrns., 313-967-0600

MN **Edina**
Arrow Elctrns., 612-830-1800

MO **Earth City**
Hall-Mark/St. Louis, 314-291-5350

MO **Kansas City**
Comp. Specialties, 913-492-3555

MO **Kansas City**
L-Comp Inc., 816-221-2400

NH **Manchester**
Arrow Elctrns., 603-668-6968

NJ **Camden**
General Radio Supp., 609-964-8560

NJ **Clifton**
Marshall Elctrns., 201-340-1900

NJ **Fairfield**
Hall-Mark, 201-575-4415

NJ **Fairfield**
Kierulff Elctrns., 201-575-6750

NJ **Marlton**
Milgray/Delaware Valley, 609-983-5010

NJ **Moorestown**
Arrow Elctrns., 609-235-1900

NJ **Saddlebrook**
Arrow Elctrns., 201-797-5800

NM **Albuquerque**
Arrow Elctrns., 505-243-4566

NM **Albuquerque**
Int'l. Elctrns., 505-345-8127

NY **Endwell**
Marshall Elctrns., 607-754-1570

NY **Farmingdale**
Arrow Elctrns., 516-694-6800

NY **Freeport**
Milgray Elctrns., 516-546-5600

NY **Hauppauge**
Arrow Elctrns., 516-231-1000

NY **Hauppauge**
JACO, 516-273-5500

NY **Liverpool**
Arrow/Syracuse, 315-652-1000

NY **Melville**
Diplomat, 516-454-6334

NY **Rochester**
Arrow/Rochester, 716-275-0300

NY **Rochester**
Marshall Elctrns., 716-235-7620

NY **Rochester**
Rochester Radio, 716-454-7800

NC **Greensboro**
Kierulff, 919-852-9440

NC **Raleigh**
Hall-Mark, 919-872-0712

NC **Winston-Salem**
Arrow Elctrns., 919-725-8711

OH **Columbus**
Hall-Mark/Ohio, 614-891-4555

OH **Dayton**
ESCO Elctrns., 513-226-1133

OH **Dayton**
Marshall Inds., 513-236-8088

OH **Kettering**
Arrow Elctrns., 513-435-5563

OH **Solon**
Arrow Elctrns., 216-248-3990

OK **Tulsa**
Comp. Specialties, 918-664-2820

OK **Tulsa**
Hall-Mark/Tulsa, 918-665-3200

OR **Hillsboro**
Wyle Labs, 503-640-6000

PA **Pittsburgh**
Arrow Elctrns., 412-856-7000

TX **Austin**
Comp. Specialties, 512-837-8922

TX **Austin**
Hall-Mark/Austin, 512-258-8848

TX **Dallas**
Comp. Specialties, 214-357-6511

TX **Dallas**
Hall-Mark/Dallas, 214-341-1147

TX **Dallas**
Int'l Elctrns., 214-233-9323

TX **El Paso**
Int'l Elctrns., 915-778-9761

TX **Houston**
Comp. Specialties, 713-771-7237

TX **Houston**
Hall-Mark/Houston, 713-781-6100

TX **Houston**
Harrison Equip., 713-879-2600

UT **Salt Lake City**
Diplomat/Altaland, 801-486-4134

UT **Salt Lake City**
Kierulff Elctrns., 801-973-6913

UT **Salt Lake City**
Wyle Labs, 801-974-9953

VA **Richmond**
Arrow, 804-282-0413

WA **Bellevue**
Arrow Elctrns., 206-643-4800

WA **Bellevue**
United Comps., 206-643-7444

WA **Bellevue**
Wyle Labs, 206-453-8300

WA **Seattle**
Kierulff Elctrns., 206-575-4420

WI **Oak Creek**
Arrow Elctrns., 414-764-6600

WI **Oak Creek**
Hall-Mark/Milwaukee, 414-761-3000

WI **Waukesha**
Kierulff Elctrns., 414-784-8160

Can **Calgary, Alberta**
L. A. Varah, 403-230-1235

Can **Downsview, Ontario**
CESCO Elctrns., 416-661-0220

Can **Hamilton, Ontario**
L. A. Varah, 416-561-9311

Can **Montreal, Quebec**
CESCO Elctrns., 514-735-5511

Can **Montreal, Quebec**
Future Elctrns., 514-694-7710

Can **Ottawa, Ontario**
CESCO Elctrns., 613-226-6903

Can **Ottawa, Ontario**
Future Elctrns., 613-820-8313

Can **Quebec City, Quebec**
CESCO Elctrns., 418-687-4231

Can **Toronto, Ontario**
Future Elctrns., 416-663-5563

Can **Vancouver, British Columbia**
Future Elctrns., 604-438-5545

Can **Vancouver, British Columbia**
L. A. Varah, 604-873-3211

Can **Winnipeg, Manitoba**
L. A. Varah, 204-633-6190

Thomson-CSF Components

Thomson-CSF Components Corporation
Semiconductor Division
6660 Variel Avenue
Canoga Park, California 91303
213-887-1010
TELEX: 69-8481
TWX: 910-494-1954

Toshiba

Toshiba America, Inc.
2441 Michelle Drive
Tustin, California 92680
714-730-5000
TELEX: 18-3812

Specific product information:
Memory & Microcomputer IC;s: 714-955-1155
Other IC's & Semiconductors: CEM Division, Northbrook, Illinois, 312-564-5140

DIPLOMAT

The first distributor to call for

TOSHIBA

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

Trans-Data

Trans-Data
1721 2nd Street, Suite 100
Sacramento, California 95814
916-447-6523

TRW

TRW LSI Products
P.O. Box 2472
La Jolla, California 92038
619-457-1000

All other information:
TRW Semiconductors
14520 Aviation Blvd.
Lawndale, California 90260
(213) 679-4561

© IC MASTER 1983

TRW (Cont)

Sales Offices & Representatives

AL Huntsville
Sales Office, 205-772-9656

AZ Phoenix
Sales Office, 602-971-6250

CA Los Angeles
Sales Office, 213-478-0183

CA Menlo Park
Sales Office, 415-969-6060

CA San Diego
Sales Office, 714-571-1544

CA Tustin
Sales Office, 714-832-4952

CO Westminister
Sales Office, 303-426-0890

CT Orange
Sales Office, 203-795-3515

CT Norwalk
Sales Office, 203-853-4466

FL Ft. Lauderdale
Sales Office, 305-721-1700

FL Orlando
Sales Office, 305-857-3650

IL Elk Grove Village
Sales Office, 312-593-0200

IN Fort Wayne
Sales Office, 219-432-5591

IN Indianapolis
Sales Office, 317-359-9283

IN Kokomo
Sales Office, 317-453-3592

IA Cedar Rapids
Sales Office, 319-393-8703

KS Prairie Village
Sales Office, 913-236-4646

KS Wichita
Sales Office, 316-686-6685

KY Louisville
Sales Office, 502-897-1569

MA Waltham
Sales Office, 617-890-3232

MI Grand Rapids
Sales Office, 616-942-5420

MI Southfield
Sales Office, 313-559-5454

MI St. Joseph
Sales Office, 616-983-7337

MN Minneapolis
Sales Office, 612-854-4600

MO St. Louis
Sales Office, 314-432-2830

NE Lincoln
Sales Office, 402-474-5151

NM Albuquerque
Sales Office, 505-265-7759

NY Rochester
Sales Office, 716-424-2830

NC Charlotte
Sales Office, 704-527-1344

OH Cincinnati
Sales Office, 513-521-2290

OH Columbus
Sales Office, 614-888-9396

OH Dayton
Sales Office, 513-298-9546

OH Middleburg Heights
Sales Office, 216-826-4424

OR Beaverton
Sales Office, 503-643-1644

PA Bala Cynwyd
Sales Office, 215-667-3400

PA Pittsburgh
Sales Office, 412-344-7277

TN Greenville
Sales Office, 615-639-6154

TX Dallas
Sales Office, 214-387-3030

TX Houston
Sales Office, 713-772-5541

UT Salt Lake City
Sales Office, 801-943-5650

VA Richmond
Sales Office, 804-288-8334

WA Bellevue
Sales Office, 206-454-0300

WI Wauwatosa
Sales Office, 414-475-7755

Distributors

AL Huntsville
Hamilton/Avnet, 205-533-1170

AZ Phoenix
Hamilton/Avnet, 602-275-7851

CA Los Angeles
Hamilton/Avnet, 213-558-2121

CA Mountain View
Hamilton/Avnet, 415-961-7000

CA San Diego
Arrow Electrns., 714-565-4800

CA San Diego
Hamilton/Avnet, 714-279-2421

CA San Francisco
Arrow Elctrns., 408-739-3011

CO Denver
Arrow Electrns., 303-758-2100

CO Denver
Hamilton/Avnet, 303-534-1212

CT Georgetown
Hamilton/Avnet, 203-762-0361

CT Hamden
Arrow Elctrncs., 203-265-7741

FL Ft. Lauderdale
Arrow Elctrns., 305-776-7790

FL Melbourne
Arrow Elctrns., 305-725-1480

FL Miami
Hamilton/Avnet, 305-971-2900

GA Atlanta
Arrow Elctrns., 404-449-8252

GA Atlanta
Hamilton/Avnet, 404-448-0800

IL Chicago
Arrow Elctrns., 312-893-9420

IL Chicago
Hamilton/Avnet, 312-678-6310

IN Indianapolis
Arrow Elctrns., 317-243-9353

KS Kansas City
Hamilton/Avnet, 913-888-8900

MD Baltimore
Arrow Elctrns., 301-247-5200

MD Baltimore
Hamilton/Avnet, 301-796-5000

MA Boston
Hamilton/Avnet, 617-933-8000

MA Woburn
Arrow Elctrns., 617-933-8130

MI Ann Arbor
Arrow Elctrns., 313-971-8220

MI Detroit
Hamilton/Avnet, 313-522-4700

MN Minneapolis
Arrow Elctrns., 612-830-1800

MN Minneapolis
Hamilton/Avnet, 612-941-3801

MO St. Louis
Hamilton/Avnet, 314-731-1144

NH Manchester
Arrow Elctrns., 603-668-6968

NJ Cedar Grove
Hamilton/Avnet, 201-239-0800

NJ Moorestown
Arrow Elctrns., 609-235-1900

NJ Mt. Laurel
Hamilton/Avnet, 609-234-2133

NJ Saddle Brook
Arrow Elctrns., 201-797-0300

NM Albuquerque
Arrow Elctrns., 505-243-4566

NM Albuquerque
Hamilton/Avnet, 505-765-1500

NY Hauppauge
Arrow Elctrns., 516-231-1000

NY Rochester
Arrow Elctrns., 716-275-0300

NY Rochester
Hamilton/Avnet, 716-442-7820

NY Syracuse
Arrow Elctrns., 315-652-1000

NY Syracuse
Hamilton/Avnet, 315-437-2641

NY Westbury
Hamilton/Avnet, 516-333-5800

NC Raleigh
Hamilton/Avnet, 919-829-8030

NC Winston-Salem
Arrow Elctrns., 919-725-8711

OH Cincinnati
Arrow Elctrns., 513-761-5432

OH Cleveland
Arrow Elctrns., 216-248-3990

OH Cleveland
Hamilton/Avnet, 216-461-1400

OH Dayton
Arrow Elctrns., 513-253-9176

OH Dayton
Hamilton/Avnet, 513-433-0610

PA Pittsburgh
Arrow Elctrns., 412-351-2000

TX Dallas
Arrow Elctrns., 214-386-7500

TX Dallas
Hamilton/Avnet, 214-661-8661

TX Houston
Arrow Elctrns., 713-491-4100

TX Houston
Hamilton/Avnet, 713-780-1771

UT Salt Lake City
Hamilton/Avnet, 801-972-2800

WA Seattle
Arrow Elctrns., 206-575-0907

WA Seattle
Hamilton/Avnet, 206-746-8750

WI Milwaukee
Arrow Elctrns., 414-764-6600

WI Milwaukee
Hamilton/Avnet, 414-784-4510

Unitrode

Unitrode Corporation
5 Forbes Road
Lexington, Massachusetts 02173
617-861-6540
TELEX: 95-1064
TWX: 710-326-6509

Sales Offices & Representatives

AL Huntsville
Conley & Assocs., Inc., 205-882-0316

AZ Phoenix
Compass Mktg. & Sales, Inc., 602-266-5400

CA Culver City
Bestronics, Inc., 213-870-9191

CA Irvine
Bestronics, Inc., 714-979-9910

CA San Diego
Bestronics, Inc., 714-452-5500

CA San Jose
Unitrode Northwest Office, 408-294-4210

CA Santa Clara
I² Inc., 408-988-3400

© IC MASTER 1983

Unitrode (Cont)

CA **Tarzana**
Unitrode Western Area Office, 213-705-8085
CA **Tustin**
Unitrode So. California Office, 714-730-1077
CA **Woodland Hills**
Bestronics, Inc., 213-704-5616
CO **Denver**
Component Sales, Inc., 303-759-1666
CT **Yalesville**
Kanan Assocs., 203-265-2404
FL **Boca Raton**
Conley & Assocs., Inc., 305-395-6108
FL **Oviedo**
Conley & Assocs., Inc., 305-365-3283
FL **Tampa**
Conley & Assocs., Inc., 813-885-7658
FL **Tampa**
Unitrode Southeast Office, 813-932-5807
GA **Doraville**
Conley & Assocs., Inc., 404-447-6992
IL **Arlington Heights**
Unitrode Mid-America Area Office, 312-394-5240
IL **Elk Grove Village**
Oasis Sales Corp., 312-640-1850
IN **Carmel**
Oasis Sales Corp., 317-848-5265
KS **Olathe**
Rush & West Assocs., 913-764-2700
MD **Severna Park**
New Era Sales, Inc., 301-544-4100
MA **Maynard**
Byrne Assocs. (DEC only), 617-897-3131
MA **Reading**
Kanan Assocs., 617-944-8484
MA **Wakefield**
Unitrode Eastern Area Office, 617-245-3010
MI **Grand Rapids**
Miltimore Sales, Inc., 616-942-9721
MI **Novi**
Miltimore Sales, Inc., 313-349-0260
MN **Eden Prairie**
Electronic Innovators, 612-941-0830
MO **Ballwin**
Rush & West Assocs., 314-394-7271
NJ **Fairfield**
T.A.M., Inc., 201-575-4390
NM **Albuquerque**
Compass Mktg. & Sales, Inc., 505-292-7377
NY **Albany**
Reagan/Compar Albany, Inc., 518-489-7408
NY **Endwell**
Reagan/Compar Albany, Inc., 607-754-8946, 607-723-8743
NY **Fairport**
Reagan/Compar Albany, Inc., 716-271-2230
NY **Melville**
Unitrode Metropolitan New York Office, 516-271-3110,11
NY **New Hartford**
Reagan/Compar Albany, Inc., 315-732-3775
NY **South Hauppauge**
T.A.M., Inc., 516-348-0800
NC **Raleigh**
Conley & Assocs., Inc., 919-876-9862
OH **Cleveland**
Baehr, Greenleaf & Assocs., Inc., 216-221-9030
OH **Columbus**
Baehr, Greenleaf & Assocs., Inc., 614-486-4046
OH **Dayton**
Baehr, Greenleaf & Assocs., Inc., 513-439-0724
OH **Dayton**
Unitrode North Central Office, 513-294-1364
OR **Portland**
Jas. J. Backer Co., 503-297-3777
OR **Portland**
Vantage Corp., 503-227-1369
OR **Salem**
Jas. J. Backer Co., 503-362-0717
PA **Erdenheim**
Omni Sales, 215-233-4600
TX **Austin**
Sundance Sales, Inc., 512-250-0284, 512-250-0320
TX **Dallas**
Unitrode Southwest Office, 214-231-8700
TX **Houston**
Sundance Sales, Inc., 713-668-8923
TX **Richardson**
Sundance Sales, Inc., 214-699-0451
UT **Salt Lake City**
Components Sales, Inc., 801-466-8623
WA **Bellevue**
Vantage Corp., 206-455-3460
WA **Seattle**
Jas. J. Backer Co., 206-285-1300
WI **Brookfield**
Oasis Sales Corp., 414-782-6660
Can **Concord, Ontario**
Kaytronics Ltd., 416-669-2262
Can **Kanata, Ontario**
Kaytronics Ltd., 613-592-6606
Can **Surrey, British Columbia**
Kaytronics Ltd., 604-581-7611
Can **Ville St. Pierre, Quebec**
Kaytronics Ltd., 514-367-0101
Intl **Ireland, Clare**
Unitrode-Ireland, TEL: 353-65-23111
Intl **Italy, Milano**
Unitrode S.R.L., TEL: 431 831, 434 604
Intl **United Kingdom, London**
Unitrode (U.K.) Ltd., TEL: 01-318-1431/4
Intl **West Germany, Unterhaching**
Unitrode Elctrns. GmbH, TEL: 089/6190 04/05/06

Distributors

AL **Huntsville**
Hall-Mark, 205-837-8700
AL **Huntsville**
Hamilton/Avnet, 205-827-7210
AZ **Phoenix**
Wyle Distribution Group, 602-249-6600
AZ **Tempe**
Hamilton/Avnet, 602-275-5100
CA **Anaheim**
Zeus Components, 714-632-6880
CA **Chatsworth**
Arrow Elctrns., Inc., 213-701-7500
CA **Costa Mesa**
Anvet Elctrns., 714-754-6111
CA **Costa Mesa**
Hamilton Electro Sales, 714-641-4100
CA **Culver City**
Hamilton Electro Sales, 213-558-2121
CA **El Segundo**
Wyle Distribution Group, 213-322-8100
CA **Irvine**
Wyle Distribution Group, 714-641-1600
CA **Irvine**
Wyle Military Group, 714-851-9958
CA **Newport Beach**
Arrow Elctrns., Inc., 714-851-8961
CA **Sacramento**
Hamilton Avnet, 916-925-2216
CA **San Diego**
Arrow Elctrns., Inc., 714-565-4800
CA **San Diego**
Hamilton/Avnet, 714-571-7510
CA **San Diego**
Wyle Distribution Group, 714-565-9171
CA **Santa Clara**
Wyle Distribution Group, 408-727-2500
CA **Santa Clara**
Zeus Components, 408-727-0714
CA **Sunnyvale**
Arrow Elctrns., Inc., 408-745-6010
CA **Sunnyvale**
Capsco Sales, Inc., 408-734-3020
CA **Sunnyvale**
Hamilton/Avnet, 408-743-3355
CO **Denver**
Arrow Elctrns., Inc., 303-758-2100
CO **Denver**
Hall-Mark, 303-934-5859
CO **Englewood**
Hamilton/Avnet, 303-740-1000
CO **Thornton**
Wyle Distribution Group, 303-457-9953
CT **Danbury**
Hamilton/Avnet, 203-797-2800
CT **Wallingford**
Arrow Elctrns., Inc., 203-265-7741
FL **Ft. Lauderdale**
Arrow Elctrns., Inc., 305-776-7790
FL **Ft. Lauderdale**
Hamilton/Avnet, 305-971-2900
FL **Miami**
Hall-Mark, 305-971-9280
FL **Orlando**
Hall-Mark, 305-855-4020
FL **Palm Bay**
Arrow Elctrns., Inc., 305-725-1480
FL **St. Petersburg**
Hall-Mark, 813-576-8691
FL **St. Petersburg**
Hamilton/Avnet, 813-576-3930
GA **Norcross**
Arrow Elctrns., Inc., 404-447-7500
GA **Norcross**
Hall-Mark, 404-447-8000
GA **Norcross**
Hamilton/Avnet, 404-447-7500
IL **Bensenville**
Hamilton/Avnet, 312-860-8523
IL **Chicago**
Hall-Mark, 312-860-3800
IL **Schaumburg**
Arrow Elctrns., Inc., 312-893-9420
IN **Carmel**
Hamilton/Avnet, 317-844-9333
IN **Indianapolis**
Arrow Elctrns., Inc., 317-243-9353
IN **Indianapolis**
Pioneer, 317-849-7300
KS **Kansas City**
Hall-Mark, 913-888-4747
KS **Overland Park**
Hamilton/Avnet, 913-888-8900
MD **Baltimore**
Arrow Elctrns., Inc., 301-247-5200
MD **Baltimore**
Hall-Mark, 301-796-9300
MD **Baltimore**
Hamilton/Avnet, 301-995-5000, 301-995-3500
MA **Burlington**
Lionex Corp., 617-272-9400
MA **Burlington**
Zeus Components, 617-273-0750
MA **Woburn**
Arrow Elctrns., Inc., 617-933-8130
MA **Woburn**
Hamilton/Avnet, 617-935-9700
MI **Ann Arbor**
Arrow Elctrns., Inc., 313-971-8220
MI **Livonia**
Hamilton/Avnet, 313-522-4700
MN **Edina**
Arrow Elctrns., Inc., 612-830-1800
MN **Minneapolis**
Hall-Mark, 612-854-3223

© IC MASTER 1983

Unitrode (Cont)

MN **Minnetonka**
Hamilton/Avnet, 612-932-0600

MO **St. Louis**
Arrow Elctrns., Inc., 314-567-6888

MO **St. Louis**
Hall-Mark, 314-291-5350

MO **St. Louis**
Hamilton/Avnet, 314-344-1200

NH **Manchester**
Arrow Elctrns., Inc., 603-668-6968

NJ **Cherry Hill**
Hamilton/Avnet, 609-424-0110

NJ **Fairfield**
Arrow Elctrns., Inc., 201-797-5800

NJ **Fairfield**
Hall-Mark, 201-575-4415

NJ **Fairfield**
Hamilton/Avnet, 201-575-3390

NJ **Fairfield**
Lionex Corp., 201-227-7960

NJ **Moorestown**
Arrow Elctrns., Inc., 215-928-1800

NM **Albuquerque**
Arrow Elctrns., Inc., 505-243-4566

NM **Albuquerque**
Hamilton/Avnet, 505-765-1500

NY **Farmingdale**
Arrow Elctrns., Inc., 516-694-6800

NY **Hauppauge**
Arrow Elctrns., Inc., 516-231-1000

NY **Hauppauge**
Harvey Military Components, 516-231-9200

NY **Hauppauge**
Lionex Corp., 516-273-1660

NY **Liverpool**
Arrow Elctrns., Inc., 315-652-1000

NY **Melville**
Hamilton/Avnet, 516-454-6060

NY **Port Chester**
Zeus Components, 914-937-7400

NY **Rochester**
Arrow Elctrns., Inc., 716-275-0300

NY **Rochester**
Hamilton/Avnet, 716-475-9130

NY **Syracuse**
Hamilton/Avnet, 315-437-2641

NC **Raleigh**
Hall-Mark, 919-872-0712

NC **Raleigh**
Hamilton/Avnet, 919-829-8030

NC **Winston-Salem**
Arrow Elctrns., Inc., 919-721-1661;800-334-0421; 919-725-8711;800-334-0422

OH **Centerville**
Arrow Elctrns., Inc., 513-435-5563

OH **Cleveland**
Hall-Mark, 216-473-2907

OH **Cleveland**
Hamilton/Avnet, 216-831-3500

OH **Columbus**
Hall-Mark, 614-891-4555

OH **Dayton**
Hamilton/Avnet, 513-433-0610

OH **Dayton**
Pioneer, 513-236-9900

OH **Solon**
Arrow Elctrns., Inc., 216-248-3990

OK **Tulsa**
Hall-Mark, 918-665-3200

OR **Lake Oswego**
Hamilton/Avnet, 503-635-6626

PA **Moorsville**
Arrow Elctrns., Inc., 412-856-7000

PA **Philadelphia**
Hall-Mark, 609-424-7300

TX **Austin**
Hall-Mark, 512-258-8848

TX **Austin**
Hamilton/Avnet, 512-837-8911

TX **Dallas**
Arrow Elctrns., Inc., 214-386-7500

TX **Dallas**
Hall-Mark, 214-343-5000

TX **Dallas**
Hamilton/Avnet, 214-659-4111

TX **Dallas**
Zeus Components, 214-783-7010

TX **Houston**
Hall-Mark, 713-781-6100

TX **Houston**
Hamilton/Avnet, 713-780-1771

TX **Houston**
Lenert Co., Inc., 713-225-1465

TX **Stafford**
Arrow Elctrns., Inc., 713-491-4100

UT **Salt Lake City**
Hamilton/Avnet, 801-972-2800

UT **Salt Lake City**
Wyle Distribution Group, 801-974-9953

WA **Bellevue**
Arrow Elctrns., Inc., 206-643-4800

WA **Bellevue**
Hamilton/Avnet, 206-643-3950

WA **Bellevue**
Wyle Distribution Group, 206-453-8300

WI **Oak Creek (Milwaukee)**
Arrow Elctrns., Inc., 414-764-6600

WI **Oak Creek (Milwaukee)**
Hamilton/Avnet, 414-784-4510

WI **Milwaukee**
Hall-Mark, 414-761-3000

Can **Downsview, Ontario**
Future Elctrns., Inc., 416-663-5563

Can **Montreal, Quebec**
Future Elctrns., Inc., 514-694-7710

Can **Montreal, Quebec**
Hamilton/Avnet, 514-331-6443

Can **Nepean, Ontario**
Hamilton/Avnet, 613-226-1700

Can **Ottawa, Ontario**
Future Elctrns., Inc., 613-820-8313

Can **Toronto, Ontario**
Hamilton/Avnet, 416-677-7432

Can **Vancouver, British Columbia**
Future Elctrns., Inc., 604-438-5545

Intl **Australia, Crows Nest N.S.W.**
VSI Elctrns. (Australia) Pty. Ltd., TEL: 439-4655

Intl **Austria, Graz**
Dahms Elektronik, TEL: (0316) 64.0.30

Intl **Austria, Vienna**
Dahms Elektronik, TEL: (0222) 57-25-77

Intl **Belgium, Bruxelles**
J.P. LeMaire, TEL: 478 48 47

Intl **Brazil, Sao Paulo**
Cosele Ltda., TEL: 255-1733, 259-3719

Intl **China, Peoples Republic of, Beijing**
Rikei Corp., TEL: 66-8541

Intl **Denmark, Glostrup**
Ditz Schweitzer A/S, TEL: 45.30.44

Intl **Finland, Helsinki**
Nores Oy, TEL: 520-311

Intl **France, Antony Cedex**
C.C.I., TEL: (1) 666 21-82

Intl **France, Lyon**
Spetelec, TEL: (7) 876 01 40

Intl **France, Rungis Cedex**
Spetelec, TEL: (1) 686.56.65

Intl **France, Rungis Principal**
UniRep, TEL: (1) 686-39-42

Intl **Germany, Burgwedel**
EBV Elektronik GmbH, TEL: 05139/5038

Intl **Germany, Carl-Zeiss**
Frehsdorf KG, TEL: 04106-71058

Intl **Germany, Duesseldorf**
EBV Elektronik GmbH, TEL: 211-84-84-6/7

Intl **Germany, Frankfurt**
EBV Elektronik GmbH, TEL: 611-785037

Intl **Germany, Heddesheim**
Metronik GmbH, TEL: 06203-4701

Intl **Germany, Nuremberg**
Metronik GmbH, TEL: 0911/46 80 66-67

Intl **Germany, Ottobrunn**
Protec GmbH, TEL: (089) 60-30-06

Intl **Germany, Stuttgart**
EBV Elektronik GmbH, TEL: 711/24 74 81

Intl **Germany, Unterhaching/Munich**
EBV Elektronik GmbH, TEL: (089) 611-051

Intl **Germany, Unterhaching**
Metronik GmbH, TEL: 089-6114063

Intl **Germany, Unterhaching**
Unitrode Elctrns. GmbH, TEL: 089/6190 04/05/06

Intl **Hong Kong, Kowloon**
Karin Elctrn. Supplies Co., Ltd., TEL: 3-455699

Intl **India, Bombay**
Sujata Sales & Exports Ltd., TEL: 234658

Intl **Ireland, Malahide**
Nets, Ltd., TEL: 450-635

Intl **Israel, Tel-Aviv**
S.T.G. Intl., TEL: 03-248231

Intl **Italy, Milano**
Microelit, s.r.l., TEL: (02) 46.90.444

Intl **Italy, Milano**
Unitrode S.R.L., TEL: 431 831, 434 604

Intl **Japan, Tokyo**
Hamilton/Avnet Elctrns., TEL: 03-662-9911

Intl **Japan, Tokyo**
High Technology Intl., Inc., TEL: 03-379-7621

Intl **Japan, Tokyo**
Rikei Corp., TEL: Tokyo 345-1411

Intl **Korea R.O.K., Gwanak-Ku**
Duksung Trading Co., TEL: 854-5047

Intl **Netherlands, Koperwerf**
Koning en Hartman Elektrotechniek B.V., TEL: 70-210101

Intl **New Zealand, Auckland**
Professional Elctrns., TEL: 493-029, 499-048

Intl **Norway, Oslo**
Neco A/S, TEL: 25-93-10

Intl **Singapore, Singapore**
Dynamar International Ltd., TEL: 7476188

Intl **South Africa, Capetown**
Electrolink (Pty) Ltd., TEL: 215350

Intl **Spain, Barcelona**
Sisteco S.A., TEL: 321-7347

Intl **Sweden, Solna**
AB Betoma, TEL: 08-82-0280

Intl **Switzerland, Baden-Daettwil**
Stolz AG, TEL: 056-84.01.51

Intl **Taiwan, Taipei**
Dynamar International Ltd., TEL: 235-1139

Intl **United Kingdom, London**
Unitrode (U.K.) Ltd., TEL: 01-318-1431/4

Intl **United Kingdom, Maidstone, Kent**
Candy Elctrn. Comps., TEL: 0622-54051

Intl **United Kingdom, Orpington, Kent**
House of Power, TEL: 0689 71531/7

Intl **United Kingdom, Thames, Oxon**
Thame Comps. Ltd., TEL: (084 421) 4561

Universal

Universal Semiconductor Inc.
1925 Zanker Road
San Jose, California 95112
408-279-2830
TWX: 910-338-7617

All other information:
Sales & Mktg. ..... (408) 279-2830

VLSI Technology

VLSI Technology, Inc. (VTI)
1101 McKay Drive
San Jose, California 95131
408-942-1810
TELEX: 278-807
TELEX: 176-151

Sales Offices & Representatives

CA El Segundo
Varigon Assocs., 213-322-1120
CA Sunnyvale
James Inds., Inc., 408-749-1122
FL Boca Raton
Lawrence Assocs., Inc., 305-368-7373
FL Clearwater
Lawrence Assocs., Inc., 305-339-2828
FL West Melbourne
Lawrence Assocs., Inc., 305-724-8294
IL Schaumburg
James Inds., Inc., 312-884-8000
MN Minneapolis
Micro Resources, Inc., 612-830-1454
NY Pleasantville
ABC Electronics, 914-769-8088
NY Williston Park
ABC Electronics, 516-747-6610
OH Rocky River
Norm Case Assocs., 216-333-0400
OR Portland
Micro Sales, Inc., 503-297-4749
WA Bellevue
Micro Sales, Inc., 206-451-0568

Votrax

Votrax Division of Federal Screw Works
500 Stephenson Highway
Troy, Michigan 48084
Business Products Group—313-588-2050
Consumer Products Group—313-588-0341
TWX: 8102324140 VOTRAX TRMI

Distributors

Intl Australia, Sydney
Dick Smith Electronics Pty., Ltd., TEL: 61 2 888 3200
Intl West Germany, Wiesbaden
Dr. Otto Soskuty, TEL: 6121 463822

Weitek

Weitek Corporation
3255 Scott Boulevard, Building 2D
Santa Clara, California 95054
408-727-6625
TELEX: 171596 AAA Com Suvl

Sales Offices & Representatives

AZ Scottsdale
Thorson Desert States, 602-998-2444
CA San Diego
Littlefield & Smith, 714-455-0055
CA Tustin
SCCC, 714-731-9206
FL Boca Raton
Lawrence Associates, 305-724-8294
IL Schaumburg
Microtex, 312-885-1131
MD Baltimore
Component Sales Corp., 301-484-3647
MA Burlington
Contact Sales, Inc., 617-273-1520
MN Bloomington
Comtek, 612-888-7011
NY Commack
E.R.A., 516-543-0510
NY Skaneateles
Robtron, 315-686-5731
OH Dayton
Lyons Corp., 513-278-0714
PA King of Prussia
RJI Associates, 215-265-5211
TX Addison
A.C.T., 214-980-1888
WA Bellevue
Western Tech Sales, 206-641-3900
Can Downsview, Ontario
Har-Tech, 416-665-7773
Intl Japan, Tokyo
Nippon Imex Corp.

Western Digital

Western Digital Corporation
2445 McCabe Way
Irvine, California 92714
714-557-3550
TWX: 910-595-1139

Sales Offices & Representatives

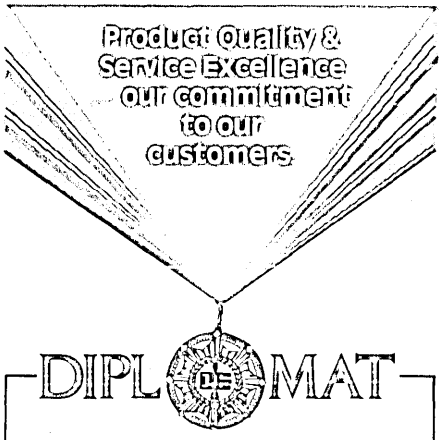
AL Huntsville
Rep. Inc., 205-881-9270
AZ Scottsdale
Dar-C Inc., 602-948-2240
CA Culver City
Bestronics, 213-870-9191
CA Irvine
Bestronics, 714-979-9910
CA Los Altos
El Repco, 415-962-0660
CA San Diego
El Repco, 714-452-5500
CA Woodland Hills
Bestronics, 213-704-5616, 714-521-6392
CO Denver
Component Sales, 303-759-1666
CT North Haven
Comp. Rep. Assoc., 203-239-9762
FL Clearwater
Dyne-A-Mark Inc., 813-441-4702
FL Ft. Lauderdale
Dyne-A-Mark Inc., 305-771-6501
FL Maitland
Dyne-A-Mark Inc., 305-831-2097
FL Palm Bay
Dyne-A-Mark Inc., 305-727-0192
GA Tucker
Rep. Inc., 404-938-4358
IL Des Plaines
Janus, 312-298-9330
IA Cedar Rapids
Technical Rep., Inc., 319-393-1300
KS Wichita
Technical Rep., Inc., 316-681-0242
MD Severna Park
New Era Sales, 301-544-4100
MA Woburn
Component Technology, 617-933-5390
MI Grosse Pointe Park
Greiner Assoc., 313-499-0188
MN Edina
Mel Foster Tech. Sales, 612-941-9790
MO Earth City
Technical Rep., Inc., 314-291-0001
MO Kansas City
Technical Rep., Inc., 816-756-3575
NE Lincoln
Technical Rep., Inc., 402-475-2115
NY Commack
E.R.A., 516-543-0510
NY Rochester
Ossmann Components, 716-424-4460
NY Syracuse
Ossmann Components, 315-455-6611
NC Raleigh
Rep. Inc., 919-851-3007
OH Aurora
E.M.A., 216-562-6104
OH Centerville
E.M.A., 513-433-2800
PA Erdenheim
Omni Sales, 215-233-4600
TN Jefferson City
Rep. Inc., 615-475-4105
TX Austin
West & Assoc., 512-454-3681
TX Houston
West & Assoc., 713-777-4108
UT Salt Lake City
Component Sales, 801-466-8623
WA Renton
Components West, 206-271-5252
WI Milwaukee
Janus, 414-476-9104
Can Downsview, Ontario
Weber Elctrns., 416-663-5670
Intl Australia, Sandringham, Victoria
Daneva Australia, TEL: 61/03-5985622
Intl Belgium, Ougree (Liege)
MCA Tronix, TEL: 41/362795, 41/362780
Intl Brazil, Sao Paulo-SP
Cosele Ltda., TEL: 230/1733, 230/1994
Intl Denmark, Kokkedal
C-88, TEL: 45/02-244888
Intl England, Ilford, Essex
Pronto Enctrns., TEL: 44/01-5546222
Intl Finland, Espoo
Komdel OY, TEL: 358/90-885011
Intl France, Levallois-Perret
Technology Resources, TEL: 33/1-757-3133
Intl Hong Kong, Quarry Bay
White & Allcock, TEL: 852/5-632112-8, 852/5-644312
Intl Israel, Givataim
E.I.M. Intl., TEL: 761423, 767251
Intl Italy, Milano
Comprel S.R.L., TEL: 39/2-6120641
Intl Japan, Tokyo
Panetron Div., TEL: 81/03-343-4411
Intl Netherlands, Am Utrecht
Diode BV, TEL: 31/030-884214
Intl Norway, Hasbru
Hans. h. Schive, TEL: 47/02-785160
Intl South Africa, Pingowrie
South Continental Dev., TEL: 27/(011) 798-2400
Intl South India, Trivandrum, PIN
Kryonix
Intl Spain, Madrid
Diode SA., TEL: 455/3686
Intl Sweden, Vasllingby
Teleimport AB, TEL: 46/08-890265
Intl Switzerland, Baden Dattwil
W. Stolz AG, TEL: 41/056-840151
Intl Taiwan, Taipei
Taiwan Automation, TEL: 886/02-77109403
Intl West Germany, Munchen
Electronics 2000, TEL: 49/089-434061

Distributors

AL Huntsville
R.M. Electronics, 205-852-1550
AZ Phoenix
Kierulff Elctrns., 602-243-4104

© IC MASTER 1983

Western Digital (Cont)



DIPLOMAT

The first distributor to call for

WESTERN DIGITAL CORPORATION

Melville, NY 516-454-6400 • Rochester, NY 716-424-6611
Syracuse, NY 315-652-5000 • Boston, MA 617-429-4120
Totowa, NJ 201-785-1830 • Danbury, CT 203-797-9674
Columbia, MD 301-995-1226 • Atlanta, GA 404-449-4133
Clearwater, FL 813-443-4514 • Palm Bay, FL 305-725-4520
Chicago, IL 312-595-1000 • Michigan 800-323-1002
Wisconsin 800-323-1002 • Minneapolis, MN 612-572-0313
Dallas, TX 214-931-3404 • Salt Lake City, UT 801-486-4134
Denver, CO 303-740-8300 • Costa Mesa, CA 714-549-8401
Sunnyvale, CA 415-964-1700 • 408-734-1900
Chatsworth, CA 213-341-4411 • San Diego, CA 714-292-5693
International 516-454-6400 Telex: 143242 DIPELEC

AZ **Tempe**
Anthem Elctrns., 602-244-0900

AZ **Tempe**
Bell Inds., 602-966-7800

AZ **Tempe**
Time Elctrns., 602-967-2000

AZ **Tucson**
Kierulff Elctrns., 602-624-9986

CA **Chatsworth**
Anthem Elctrns., 213-700-1000

CA **Los Angeles**
Kierulff Elctrns., 213-725-0325

CA **Palo Alto**
Kierulff Elctrns., 916-924-8522

CA **San Diego**
Anthem Elctrns., 714-279-5200

CA **San Diego**
Kierulff Elctrns., 714-278-2112

CA **San Jose**
Anthem Elctrns., 408-946-8000

CA **Sunnyvale**
Bell Inds., 408-734-8570

CA **Sunnyvale**
Diplomat Elctrns., 408-734-1900

CA **Tustin**
Anthem Elctrns., 714-730-8000

CA **Tustin**
Image Elctrns., 714-730-0303

CA **Tustin**
Kierulff Elctrns., 714-731-5711

CO **Denver**
Kierulff Elctrns., 303-371-6500

CO **Englewood**
Diplomat Elctrns., 303-740-8300

CO **Wheatridge**
Bell Inds., 303-424-1985

CT **Danbury**
Diplomat Elctrns., 203-797-9674

CT **S. Norwalk**
Bond Elctrns., 203-852-1001

CT **Wallingford**
Kierulff Elctrns., 203-265-1115

FL **Clearwater**
Diplomat Elctrns., 813-443-3514

FL **Ft. Lauderdale**
Diplomat Elctrns., 305-971-7160

FL **Ft. Lauderdale**
Time-Florida, 305-974-4800

FL **Orlando**
Hammond Elctrns., 305-849-6060, 800-432-6720

FL **Palm Bay**
Diplomat Elctrns., 305-723-4520

FL **St. Petersburg**
Kierulff Elctrns., 813-576-1966

GA **Norcross**
Diplomat Elctrns., 404-449-4133

IL **Bensenville**
Diplomat Elctrns., 312-595-1000

IL **Chicago**
Bell Inds., 312-982-9210

IL **Elk Grove Village**
Kierulff Elctrns., 312-640-0200

IL **Lombard**
R.M. Electronics, 312-932-5150

IN **Indianapolis**
R.M. Electronics, 317-247-9701

IA **Cedar Rapids**
Deeco Inc., 319-365-7551

MD **Columbia**
Diplomat Elctrns., 301-995-1226

MA **Billerica**
Kierulff Elctrns., 617-667-8331

MA **Chicopee Falls**
Diplomat Elctrns., 413-592-9441

MA **Holliston**
Diplomat Elctrns., 617-429-4120

MA **Wilmington**
R.C. Components, 617-657-4310

MA **Woburn**
Time-New England, 617-935-8080

MI **Farmington Hills**
Diplomat Elctrns., 313-477-3200

MI **Grand Rapids**
R.M. Electronics, 616-531-9300

MN **Edina**
Kierulff Elctrns., 612-941-7500

MN **Fridley**
Diplomat Elctrns., 612-572-0313

MO **Maryland Heights**
Kierulff Elctrns., 314-739-0855

MO **St. Louis**
Time Elctrns., 314-391-6444

NJ **Bellmawr**
Mid-Atlantic Elctrns., 609-931-5303

NJ **Fairfield**
Kierulff Elctrns., 201-575-6750

NJ **Totowa**
Diplomat Elctrns., 201-785-1830

NM **Albuquerque**
Alliance Elctrns., 505-292-3360

NY **Buffalo**
M & M Forwarding

NY **Liverpool**
Diplomat Elctrns., 315-652-5000

NY **Melville**
Diplomat Elctrns., 516-454-6400

NY **Port Chester**
Zeus Components, 914-937-7400

NY **Rochester**
Rochester Radio Supply, 716-454-7800

NC **Greensboro**
Kierulff Elctrns., 919-852-9440

OH **Aurora**
Indl. Products, 216-562-8113

OH **Bedford Heights**
Kierulff Elctrns., 216-587-6558

OH **Centerville**
Indl. Products, 513-435-2086

OK **Tulsa**
Kierulff Elctrns., 918-252-7537

OK **Tulsa**
Quality Comps., 918-664-8812

OR **Lake Oswego**
Bell Inds., 503-241-4115

PA **Broomall**
Time Mid-Atlantic, 215-359-1200

TX **Addison**
Quality Comps., 214-387-4949

TX **Austin**
Component Spec., 512-837-8922

TX **Austin**
Kierulff Elctrns., 512-835-2090

TX **Austin**
Quality Comps., 512-835-0220

TX **Dallas**
Kierulff Elctrns., 214-343-2400

TX **Houston**
Kierulff Elctrns., 713-530-7030

TX **Houston**
Quality Comps., 713-772-7100

UT **Salt Lake City**
Bell Inds., 801-972-6969

UT **Salt Lake City**
Diplomat Elctrns., 801-486-4134

UT **Salt Lake City**
Kierulff Elctrns., 801-973-6913

WA **Bellevue**
Bell Inds., 206-747-1515

WA **Tukwila**
Kierulff Elctrns., 206-575-4220

WI **Waukesha**
Kierulff Elctrns., 414-784-8160

Can **Dorval, Quebec**
Semad Elctrns., 514-636-4614

Can **Downsview, Ontario**
Semad Elctrns., 416-663-5680, 416-663-5650

Can **Ottawa, Ontario**
Semad Elctrns., 613-729-6145

Intl **Australia, Sandringham, Victoria**
Daneva Australia, TEL: 61/03-5985622

Intl **Belgium, Ougree (Liege)**
MCA Tronix, TEL: 41/362795, 41/362780

Intl **Brazil, Sao Paulo-SP**
Cosele Ltda., TEL: 230/1733, 230/1994

Intl **Denmark, Kokkedal**
C-88, TEL: 45/02-244888

Intl **England, Ilford, Essex**
Pronto Electronics, TEL: 44/01-5546222

Intl **Finland, Espoo**
Komdel OY, TEL: 358/90-885011

Intl **France, Levallois-Perret**
Technology Resources, TEL: 33/1-757-3133

Intl **Hong Kong, Quarry Bay**
White & Allcock, TEL: 852/5-632112-8, 852/5-644312

Intl **Israel, Givataim**
E.I.M. Intl., TEL: 761423, 767251

Intl **Italy, Milano**
Comprel S.R.L., TEL: 39/2-6120641

Intl **Japan, Tokyo**
Panetron Div., TEL: 81/03-343-4411

Intl **Netherlands, Am Utrecht**
Diode BV, TEL: 31/030-884214

Intl **Norway, Nesbru**
Hans H. Schive, TEL: 47/02-785160

Intl **South Africa, Pinegowrie**
South Continental Dev., TEL: 27/(011) 798-2400

Intl **South India, Trivandrum, PIN**
Kyronix

Intl **Spain, Madrid**
Diode SA., TEL: 455/3686

Intl **Sweden, Vaellingby**
Teleimport AB, TEL: 46/08-890265

Intl **Switzerland, Baden Daettwil**
W. Stolz AG, TEL: 41/056-840151

Western Digital (Cont)

Intl **Taiwan, Taipei**
Taiwan Automation, TEL: 886/02-77109403

Intl **West Germany, Munchen**
Electronics 2000, TEL: 49/089-434061

Wintek

Wintek Corporation
1801 South Street
Lafayette, Indiana 47904
317-742-8428

Xicor

Xicor, Inc.
851 Buckeye Court
Milpitas, California 95035
408-946-6920
TWX: 910-379-0033

Sales Offices & Representatives

AL **Huntsville**
Beacon, 205-881-5031

AZ **Scottsdale**
Thom Luke Sales, Inc., 602-941-1901

CA **Los Alamitos**
Santana Sales Corp., 213-431-3533

CA **Los Altos**
Ewing-Foley, Inc., 415-941-4525

CA **San Diego**
Harvey King, Inc., 714-566-5252

CO **Denver**
D/Z Assocs., Inc., 303-429-9369

CT **Waterbury**
HLM Assocs., 203-753-9894

FL **Clearwater**
Beacon, 813-796-2378

FL **Ft. Lauderdale**
Beacon, 305-491-1054

FL **Maitland**
Beacon, 305-647-3498

FL **Melbourne**
Beacon, 305-724-8010

GA **Atlanta**
Beacon, 404-256-9640

IL **Elk Grove Village**
Oasis Sales Corp., 312-640-1850

IN **Indianapolis**
SAI Mktg. Corp., 317-241-9276

IA **Cedar Rapids**
John G. Twist Co., 319-393-8703

KS **Prairie Village**
John G. Twist Co., 913-236-4646

KS **Wichita**
John G. Twist Co., 316-686-6685

LA **Baton Rouge**
Nova Mktg., Inc., 504-383-8636

MD **Baltimore**
Micro Comp. Inc., 301-247-0400

MA **Burlington**
Contact Sales, Inc., 617-273-1520

MI **Brighton**
SAI Mktg. Corp., 313-227-1786

MN **Bloomington**
John G. Twist Co., 612-835-2120

MO **St. Louis**
John G. Twist Co., 314-432-2830

NJ **Bellmawr**
TAI Corp., 609-933-2600; 215-627-6615

NJ **Parsippany**
HLM Assocs., 201-263-1535

NM **Albuquerque**
Thom Luke Sales, Inc., c/o Power Entprs., 505-298-1918

NY **East Syracuse**
Nycom, 315-437-8343

NY **Northport**
HLM Assocs., 516-757-1606

NC **Greensboro**
Beacon, 919-275-9997

NC **Raleigh**
Beacon, 919-787-0330

OH **Centerville**
SAI Mktg. Corp., 513-435-3181

OH **Shaker Heights**
SAI Mktg. Corp., 216-751-3633; 412-261-0482

OH **Zanesville**
SAI Mktg. Corp., 614-454-8942

OR **Portland**
Vantage Corp., 503-227-1369

TN **Johnson City**
Beacon, 615-282-2421

TX **Dallas**
Nova Mktg., Inc., 214-385-9669

TX **Houston**
Nova Mktg., Inc., 713-988-6082

UT **Salt Lake City**
D/Z Assocs., Inc., 801-268-2876

VA **Huddleston**
Micro Comp. Inc., 703-297-7614

WA **Bellevue**
Vantage Corp., 206-455-3460

Distributors

Can **Concord, Ontario**
Kaytronics Ltd., 416-669-2262

Can **Surrey, British Columbia**
Kaytronics Ltd., 604-581-7611

Can **Ville St. Pierre, Quebec**
Kaytronics Ltd., 514-367-0101

Intl **Australia, Burwood, Victoria**
R & D Elctrns., TEL: 03-288-8232

Intl **Cyprus, Nicosia**
Poly Electronics Ltd., TEL: 21-27982

Intl **France, Le Chesnay**
A2M, TEL: 954-91-13

Intl **India, Bangalore**
Zenith Electronics, TEL: 83645

Intl **India, Bombay**
Zenith Electronics, TEL: 384214-389774

Intl **India, Calcutta**
Zenith Electronics, TEL: 228797

Intl **India, New Delhi**
Zenith Electronics, TEL: 522281

Intl **Israel, Herzliya**
Telsys Ltd., TEL: 482126/7/8

Intl **Italy, Vittorio Veneto**
De Mico S.P.A., TEL: 02-95-20-551

Intl **Japan, Tokyo**
Internix, Inc., TEL: 369-1101

Intl **New Zealand, Auckland**
Delphi Inds. Ltd., TEL: 563-259

Intl **South Africa, Transvaal**
Taltronics (Pty.) Ltd., TEL: 27-11-618-2014

Intl **Sweden, Solna**
Naxab, TEL: 08-98-5140

Intl **United Kingdom, Thame Oxon**
Thame Components Ltd., TEL: 084-421-4561

Intl **West Germany, Gerlingen**
Positron, TEL: 2-30-51

Xycom

Xycom
750 North Maple Road
Saline, Michigan 48176
313-429-4971

Zendex

Zendex Corporation
6644 Sierra Lane
Dublin, California 94566
415-828-3000

Zilog

Zilog, Inc.
1315 Dell Avenue
Campbell, California 95008
408-370-8000
TWX: 910-338-7621

Sales Offices & Representatives

AL **Huntsville**
Elctrn. Sales, Inc., 205-533-1735

AZ **Scottsdale**
Thom Luke Sales, Inc., 602-941-1901

CA **Campbell**
Sales & Tech. Ctr. Zilog, Inc., 408-370-8120

CA **Cupertino**
Costar, Inc., 408-446-9339

CA **Irvine**
Sales & Tech. Ctr. Zilog, Inc., 714-549-2891

CA **San Diego**
Littlefield & Smith Assoc., 714-455-0055

CA **Van Nuys**
Sales & Tech. Ctr. Zilog, Inc., 213-989-7485

CO **Englewood**
Thorson Rocky Mountain, 303-779-0666

FL **Alamonte Springs**
Dyne-A-Mark Corp., 305-831-2097

FL **Clearwater**
Dyne-A-Mark Corp., 813-441-4702

FL **Clearwater**
Tech. Ctr. Zilog, Inc., 813-535-5571

FL **Fort Lauderdale**
Dyne-A-Mark Corp., 305-771-6501

FL **Palm Bay**
Dyne-A-Mark Corp., 305-727-0192

GA **Atlanta**
Sales & Tech. Ctr. Zilog, Inc., 404-451-8425

GA **Norcross**
Elctrn. Sales, Inc., 404-448-6554

IL **Schaumburg**
Micro-Tex, Inc., 312-885-1131

IL **Schaumburg**
Sales & Tech. Ctr. Zilog, Inc., 312-885-8080

IN **Ft. Wayne**
Giesting & Assoc., 219-486-1912

IN **Indianapolis**
Giesting & Assoc., 317-263-0005

IA **Davenport**
Ensco-Rep. Co., 319-386-6600

KS **Overland Park**
Ensco-Rep. Co., 913-381-7557

KS **Wichita**
Ensco-Rep. Co., 316-683-1070

MD **Severna Park**
New Era Sales, 301-544-4100

MA **Burlington**
Sales & Tech. Ctr. Zilog, Inc., 617-273-4222

MA **Lexington**
Nova Sales, 617-861-1820

MI **Coloma**
Giesting & Assoc., 616-468-4200

MI **Novi**
Giesting & Assoc., 313-348-3811

MN **Minneapolis**
H.M.R., Inc., 612-831-7400

MO **Maryland Heights**
Ensco-Rep Co., 314-423-3935

NJ **Cedar Knolls**
Sales & Tech. Ctr. Zilog, Inc., 201-540-1671

© IC MASTER 1983

Zilog (Cont)

NJ **Franklin**
ABC Elctrn. Sales Co., 201-827-9045

NM **In Touch Systems**
Shetler-Kahn, 505-294-7151

NY **E. Syracuse**
L-Mar Assocs., Inc., 315-437-7779

NY **New York**
Zilog, Inc., 212-398-4497

NY **Rochester**
L-Mar Assocs., Inc., 716-544-8000

NY **Williston Park**
ABC Elctrn. Sales Co., 516-747-6610

NC **Raleigh**
Glen White Assoc., 919-787-7016

OH **Woodmere**
Sales & Tech. Ctr. Zilog, Inc., 216-831-7040

OR **Beaverton**
LD Electronics, 503-649-6177

PA **Bala Cynwyd**
Vantage Sales Co., 215-667-0990

TN **Gray**
Glen White Assoc., 615-477-8850

TX **Austin**
Zilog, Inc., 512-453-3216

TX **Dallas**
Nova Marketing, 214-385-9669

TX **Dallas**
Sales & Tech. Ctr. Zilog, Inc., 214-931-9090

TX **Houston**
Nova Marketing, 713-988-6082

TX **Houston**
Zilog, Inc., 713-840-5475

UT **West Valley**
Thorson Rocky Mountain, 801-973-7969

VA **Arlington**
Zilog, Inc., 703-243-7900

VA **Lynchburg**
Glen White Assoc., 804-237-6291

WA **Bellevue**
Sales & Tech. Ctr. Zilog, Inc., 206-454-5597

WI **Waukesha**
Micro-Tex, Inc., 414-542-5352

Can **Cornwall, Ontario**
Zilog, Inc., 613-938-1121

Can **Etobicoke, Ontario**
R.F.Q., Ltd., 416-626-1445

Can **Ottawa, Ontario**
R.F.Q., Inc., 613-820-8445

Can **West Vancouver, British Columbia**
Blakewood Elctrn. Sys., Inc., 604-926-8000

Intl **France, Paris La Defense**
Zilog, Inc., TEL: (1) 778-14-33

Intl **Japan, K.K.**
Zilog/Japan, TEL: (03) 587-0528

Intl **United Kingdom, Berkshire**
Zilog (U.K.) Ltd., TEL: (628) 36131

Intl **West Germany, Munich**
Zilog GmbH, TEL: 89-612-6046

Distributors

AL **Huntsville**
Hall-Mark Elctrns., 205-837-8700

AL **Huntsville**
RM Elctrns., 205-852-1550

AL **Huntsville**
Schweber Elctrns., 205-882-2200

AZ **Phoenix**
Hall-Mark Elctrns., 602-243-6601

AZ **Phoenix**
Kierulff Elctrns., 602-243-4101

AZ **Tempe**
Anthem Elctrns., 602-244-0900

CA **Anaheim**
Zeus Comps., Inc., 714-632-6880

CA **Canoga Park**
Schweber Elctrns., 213-999-4702

CA **Chatsworth**
Anthem Elctrns., 213-706-1000

CA **Cupertino**
Western Microtechnology, 408-725-1660

CA **Irvine**
Schweber Elctrns., 714-556-3880

CA **Los Angeles**
Kierulff Elctrns., 213-725-0325

CA **Mountain View**
Intectra/Latin America, 415-967-8818

CA **Palo Alto**
Kierulff Elctrns., 415-968-6292

CA **Roseda**
JAN Devices, Inc., 213-708-1100

CA **Sacramento**
Schweber Elctrns., 916-929-9732

CA **San Diego**
Anthem Elctrns., 714-279-5200

CA **San Diego**
Kierulff Elctrns., 714-278-2112

CA **San Francisco**
Kanematsu-Gosho (USA) Inc./Hong Kong & Japan, 415-788-3800

CA **San Jose**
Anthem Elctrns., 408-946-8000

CA **Santa Clara**
Schweber Elctrns., 408-748-4700

CA **Santa Clara**
Zeus Comps., 408-727-0714

CA **Sunnyvale**
Micro Aids Intl., 408-733-0695

CA **Sunnyvale**
Multitech Elctrns. Inc./Taiwan, 408-773-8400

CA **Tustin**
Kierulff Elctrns., 714-731-5711

CO **Denver**
Kierulff Elctrns., 303-371-6500

CO **Wheatridge**
Bell Inds., 303-424-1985

CT **Danbury**
Schweber Elctrns., 203-792-3500

CT **Wallingford**
Kierulff Elctrns., 203-265-1115

FL **Altamonte Springs**
Schweber Elctrns., 305-331-7555

FL **Fort Lauderdale**
Hall-Mark Elctrns., 305-971-9280

FL **Hollywood**
Schweber Elctrns., 305-927-0511

FL **Orlando**
Hall-Mark Elctrns., 305-855-4020

FL **St. Petersburg**
Kierulff Elctrns., Inc., 813-576-1966

GA **Norcross**
Hall-Mark Elctrns., 404-447-8000

GA **Norcross**
Schweber Elctrns., 404-449-9170

IL **Bensenville**
Hall-Mark Elctrns., 312-860-3800

IL **Elk Grove Village**
Kierulff Elctrns., 312-640-0200

IL **Elk Grove Village**
Schweber Elctrns., 312-364-3750

IL **Lombard**
RM Elctrns., 312-932-5150

IN **Indianapolis**
RM Elctrns., 317-247-9701

IA **Cedar Rapids**
Schweber Elctrns., 319-373-1417

KS **Lenexa**
Hall-Mark Elctrns., 913-888-4747

KS **Overland Park**
Schweber Elctrns., 913-492-2921

MD **Baltimore**
Hall-Mark Elctrns., 301-796-9300

MD **Gaithersburg**
Schweber Elctrns., 301-840-5900

MA **Bedford**
Schweber Elctrns., 617-275-5100

MA **Billerica**
Kierulff Elctrns., 617-667-8331

MA **Burlington**
Lionex Corp., 617-272-9400

MA **Norwood**
Gerber Elctrns., 617-769-6000

MI **Grand Rapids**
RM Elctrns., 616-531-9300

MI **Livonia**
Schweber Elctrns., 313-525-8100

MN **Bloomington**
Hall-Mark Elctrns., 612-854-3223

MN **Eden Prairie**
Schweber Elctrns., 612-941-5280

MN **Edina**
Kierulff Elctrns., 612-941-7500

MO **Earth City**
Hall-Mark Elctrns., 314-291-5350

MO **Earth City**
Schweber Elctrns., 314-739-0526

MO **Maryland Heights**
Kierulff Elctrns., 314-739-0855

NJ **Cherry Hill**
Hall-Mark Elctrns., 609-424-7300

NJ **Fairfield**
Kierulff Elctrns., 201-575-6750

NJ **Fairfield**
Lionex Corp., 201-227-7960

NJ **Fairfield**
Schweber Elctrns., 201-227-7880

NM **Albuquerque**
Bell Inds., 505-292-2700

NY **Hauppauge**
Lionex Corp., 516-273-1660

NY **Port Chester**
Zeus Comps., Inc., 516-822-9469

NY **Rochester**
Schweber Elctrns., 716-424-2222

NY **Westbury**
Schweber Elctrns., 516-334-7474

NC **Greensboro**
Kierulff Elctrns., 919-852-9440

NC **Raleigh**
Hall-Mark Elctrns., 919-872-0712

NC **Raleigh**
Schweber Elctrns., 919-876-8000

OH **Beachwood**
Schweber Elctrns., 216-464-2970

OH **Cleveland**
Kierulff Elctrns., 216-587-6558

OH **Dayton**
Schweber Elctrns., 513-439-1800

OH **Highland Heights**
Hall-Mark Elctrns., 216-473-2907

OH **Westerville**
Hall-Mark Elctrns., 614-891-4555

OK **Tulsa**
Hall-Mark Elctrns., 918-665-3200

OK **Tulsa**
Kierulff Elctrns., 918-252-7537

OK **Tulsa**
Schweber Elctrns., 918-622-8000

OR **Portland**
Kierulff Elctrns., 503-641-9150

PA **Horsham**
Schweber Elctrns., 215-441-0600

PA **Pittsburgh**
Schweber Elctrns., 412-782-1600

TX **Austin**
Hall-Mark Elctrns., 512-258-8848

TX **Austin**
Kierulff Elctrns., 512-835-2090

TX **Austin**
Schweber Elctrns., 512-458-8253

TX **Dallas**
Hall-Mark Elctrns., 214-343-5000

TX **Dallas**
Kierulff Elctrns., 214-343-2400

TX **Dallas**
RM Elctrns., 214-263-8361

TX **Dallas**
Schweber Elctrns., 214-661-5010

TX **Dallas**
Zeus Comps., Inc., 214-783-7010

© IC MASTER 1983

Zilog (Cont)

TX **Houston**
Hall-Mark Elctrns., 713-781-6100

TX **Houston**
Kierulff Elctrns., 713-530-7030

TX **Houston**
Schweber Elctrns., 713-784-3600

UT **Salt Lake City**
Bell Inds., 801-972-6969

UT **Salt Lake City**
Kierulff Elctrns., 801-973-6913

WA **Tukwila**
Kierulff Elctrns., 206-575-4420

WI **Brookfield**
Schweber Elctrns., 414-784-9020

WI **Oak Creek**
Hall-Mark Elctrns., 414-761-3000

WI **Waukesha**
Kierulff Elctrns., 414-784-8160

Can **Downsview, Ontario**
Future Elctrns., 416-663-5563

Can **Calgary, Alberta**
Future Elctrns., 403-259-6408

Can **Montreal, Quebec**
Future Elctrns., 514-694-7710

Can **Ottawa, Ontario**
Future Elctrns., 613-820-8313

Can **Vancouver, British Columbia**
Future Elctrns., 604-438-5545

Intl **Australia, Adelaide, S.A.**
Protronics Pty. Ltd. (S.A.), TEL: (61) (08) 212-3111

Intl **Australia, Auburn**
Warburton Franki, Sydney, TEL: (61) (2) 648-1711

Intl **Australia, Camperdown**
George Brown & Co. Pty., Ltd., TEL: (61) (02) 519-5855

Intl **Austria Vienna**
Kontron Electronik, TEL: 223-686631

Intl **Belgium, Merelbeke**
Heliagraph, TEL: 91-301314

Intl **Colombia, Bogota**
ITT De Colombia, TEL: (05) 285-37-00

Intl **Denmark, Glostrup**
Ditz Schweitzer A/S, TEL: 2-453044

Intl **Denmark, Naerum**
SC Metric A/S, TEL: 2-804200

Intl **Finland, Espoo**
Finn Metric oy, TEL: 0-42-39-11

Intl **France, Antony**
Almex, TEL: 666 2112

Intl **France, Asnieres Cedex**
Alfatronic, TEL: 791-44-44

Intl **France, Le Chesnay**
A2M, TEL: 954-9113

Intl **Greece, Athens**
Microsystems O.E., TEL: 1-346-9002

Intl **Hong Kong, GPO**
Electronic Scientific Eng Ltd., TEL: (852) (05) 487007

Intl **India, Trivandrum**
Kryonix, TEL: 63805

Intl **Israel, Ramat Hasharon**
R.D.T., TEL: 483211-5

Intl **Italy, Milan**
De Mico SpA, TEL: 02-9520551

Intl **Japan, Tokyo**
Kanematsu Elctrn. Comps. Corp., TEL: (3) 447-4141

Intl **Japan, Tokyo**
Marubun Corp., TEL: (03) 662-8151

Intl **Japan, Tokyo**
Matsushita Elec. Trading Co., Ltd., TEL: (81) 435-4580

Intl **Japan, Tokyo**
Nihon Teksel Co., Ltd., TEL: (81) 461-5121

Intl **Korea, Seoul**
Duksung Trading Co., TEL: (82) (02) 854-5047

Intl **Netherlands, Zoetermeer**
Tekelec Airtronic, TEL: 79-310100

Intl **New Zealand, Auckland**
Micro Computer Elctrns. Co., Ltd., TEL: (64) (09) 504-774

Intl **Norway, Oslo**
Metric A/Z, TEL: 282624

Intl **Peru, Lima**
ITT del Peru, TEL: (51) (14) 401715

Intl **South Africa, Transvaal**
Radiokom Pty., Ltd., TEL: (001) 789-1400/5

Intl **Spain, Barcelona**
Unitronics S.A., TEL: 242-5204

Intl **Sweden, Solna**
Scandia Metric AB, TEL: 8-820 400

Intl **Switzerland, Baden-Daettwil**
W. Stolz AG, TEL: 056 84 01 51

Intl **Taiwan, Tapei**
Multitech Intl. Corp., TEL: (86) (02) 769-1225

Intl **Turkey, Istanbul**
Electro Akustik Sanayi, TEL: (90) 11-48-50-77

Intl **United Kingdom, Bar Hill, Cambridge**
Hi-Tek Distribution, TEL: 954-81996

Intl **United Kingdom, Slough, Berkshire**
Crellon Elctrns. Ltd., TEL: 6286-4434/4300

Intl **United Kingdom, Slough, Berkshire**
Macro Mktg., Ltd., TEL: 6286-4422

Intl **West Germany, Camberg**
Jermyn GmbH, TEL: 6434 6005

Intl **West Germany, Eching**
Kontron Electronik GmbH, TEL: 319011

Intl **West Germany, Hamburg**
Microscan GmbH, TEL: 40 6305067

Intl **West Germany, Uterhaching**
E.B.V. Electronik, TEL: 89-61105

ZyMOS

ZyMOS Inc.
477 North Mathilda
Sunnyvale, California 94088
408-730-8800

© IC MASTER 1983

IC MASTER Order Form

1983

SEND TODAY FOR YOUR OWN COPY

☐ My check or money order is enclosed for $95.00 (postpaid),
plus sales tax (California, 6½%; Illinois, 4%; New York, 7¼%.)

Name ..... Title .....

Company .....

Address .....

City ..... State ..... Zip .....

Signature ..... Date .....

DOMESTIC EDITION ONLY; INTERNATIONAL EDITION RATES AND AVAILABILITY ON REQUEST

IC MASTER Order Form

1983

SEND TODAY FOR YOUR OWN COPY

☐ My check or money order is enclosed for $95.00 (postpaid),
plus sales tax (California, 6½%; Illinois, 4%; New York, 7¼%.)

Name ..... Title .....

Company .....

Address .....

City ..... State ..... Zip .....

Signature ..... Date .....

DOMESTIC EDITION ONLY; INTERNATIONAL EDITION RATES AND AVAILABILITY ON REQUEST

IC MASTER Order Form

1983

SEND TODAY FOR YOUR OWN COPY

☐ My check or money order is enclosed for $95.00 (postpaid),
plus sales tax (California, 6½%; Illinois, 4%; New York, 7¼%.)

Name ..... Title .....

Company .....

Address .....

City ..... State ..... Zip .....

Signature ..... Date .....

DOMESTIC EDITION ONLY; INTERNATIONAL EDITION RATES AND AVAILABILITY ON REQUEST

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 2209 GARDEN CITY, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

IC MASTER

645 Stewart Avenue, Garden City, NY 11530

U.S.A.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 2209 GARDEN CITY, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

IC MASTER

645 Stewart Avenue, Garden City, NY 11530

U.S.A.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 2209 GARDEN CITY, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

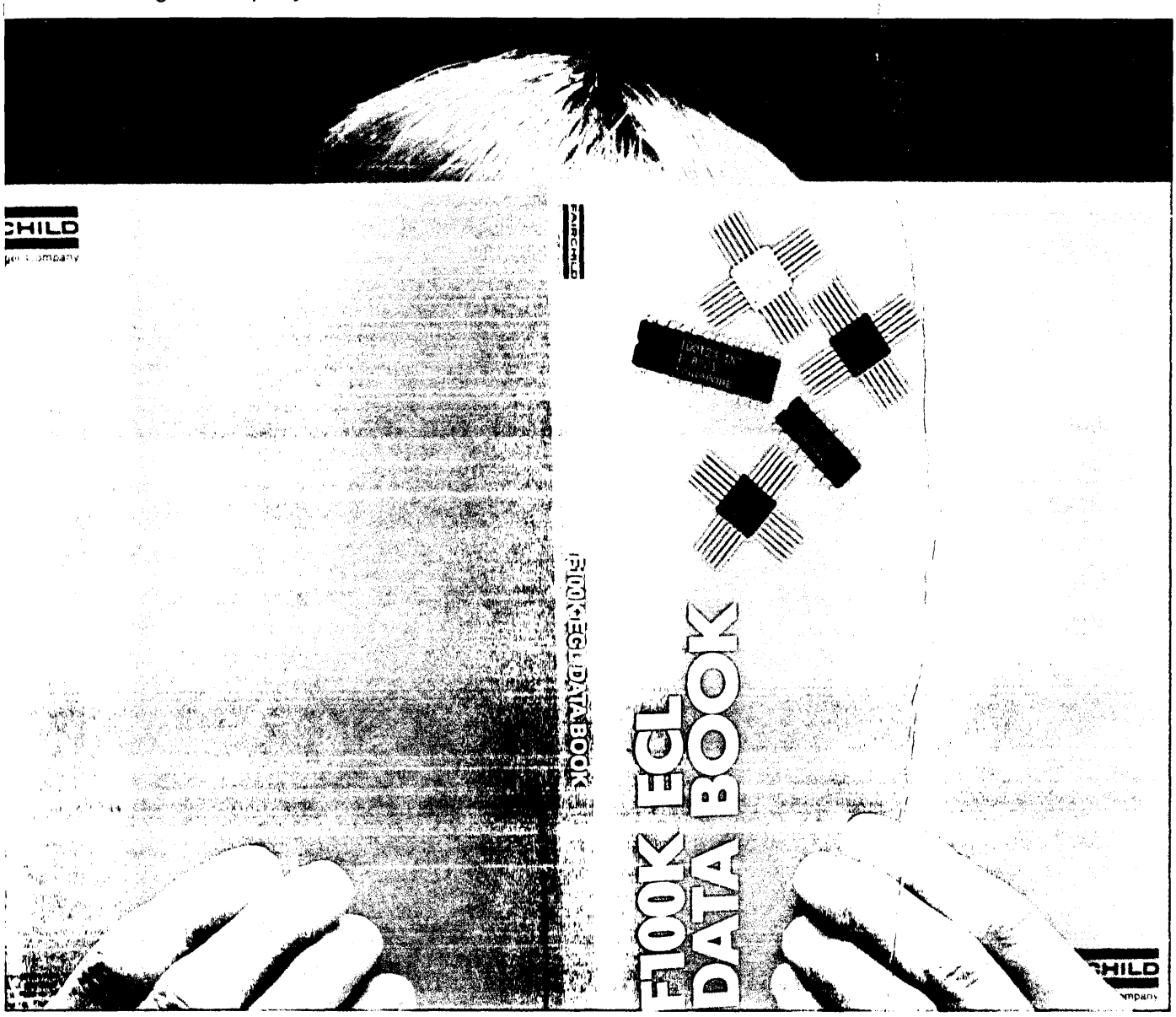
IC MASTER

645 Stewart Avenue, Garden City, NY 11530

U.S.A.

FAIRCHILD

A Schlumberger Company



Speed reading.

In high-performance applications, if you want speed, you have to go F100K. If you want F100K, you have to go Fairchild. And if you really want to do it right, you have to go by the book. The F100K ECL Data Book.

It's filled with all kinds of incredible specs. Did you know we have a complete logic family of 38 devices with 4 new ones planned for 1983? Did you know we've got logic internal gate delays of 750 ps—with all parts available in both DIPs and Flatpaks? There's voltage and temperature compensation for ease of use. And delivery times almost as fast as the parts themselves.

F100K. For sizzling reading, just call or write Fairchild Advanced Bipolar and request the F100K Data Book or User's Handbook.

441 Whisman Rd.,MS 23-1250, Drawer #7283, Mountain View, CA 94039. Telephone (415) 962-2356.

Advanced Bipolar

Fairchild Camera and Instrument Corporation

IC MASTER

PREFERRED WORLDWIDE

Hearst

HEARST BUSINESS COMMUNICATIONS, INC./UTP DIVISION
645 Stewart Avenue, Garden City, NY 11530 (516) 222-2500 TWX: 510-222-1673